



# HYANNIS Access Study

## Final Report – August 2008



### Office of Transportation Planning

in cooperation with



Prepared by

**TranSystems, Inc.**

*In association with*

Fitzgerald and Halliday, Inc.  
TraInfo Communications, Inc.  
FXM Associates

This report has been prepared with funding provided by the Executive Office of Transportation and the Massachusetts Highway Department with the cooperation of the Federal Highway Administration.



**Acknowledgments**

Massachusetts Executive Office of Transportation & Public Works

Bernard Cohen Secretary of Transportation

Massachusetts Highway Department

Luisa Paiewonsky Commissioner

Office of Transportation Planning

David Mohler Deputy Secretary for Planning  
Bob Frey Manager of Statewide Planning  
Adriel Edwards Manager of the Hyannis Access Study  
Douglas Carnahan Study Assistant  
Paul Nelson Park-and-Ride Coordinator  
Rachel Bain MPO Liaison

Technical Team

George Gefrich TranSystems Corporation  
Joseph Cahill TranSystems Corporation  
Robert Swierk TranSystems Corporation  
William Grace TranSystems Corporation  
Christopher Smith TranSystems Corporation  
Jessica Eckhardt TranSystems Corporation  
Ed Bromage TranSystems Corporation  
Sudhir Murthy Trafinfo Communications  
Ken Livingston Fitzgerald & Halliday, Inc.  
Leslie Black Fitzgerald & Halliday, Inc.  
Frank Mahady FXM Associates  
Diane Tsitsos FXM Associates

The Executive Office of Transportation & Public Works would like to thank the Task Force members, whose dedication and energy was an integral part of the study:

Task Force members as of 6/30/2008

Rep. Demetrius Atsalis 2<sup>nd</sup> District-Barnstable County  
Tom Bernardo 2<sup>nd</sup> District-Barnstable County  
Sen. Robert O'Leary 5<sup>th</sup> District-Cape and Islands  
Sue Rohrbach 5<sup>th</sup> District-Cape and Islands  
Maggie Geist Association to Preserve Cape Cod  
Tom Mullen Barnstable Land Trust  
Quincy Mosby Barnstable Municipal Airport  
Wendy K. Northcross Cape Cod Chamber of Commerce  
Paul Niedzwiecki Cape Cod Commission  
Joseph G. Potzka Cape Cod Regional Transit Authority  
Peter Fisher Centerville Civic Association  
Paul Maloney Federal Highway Administration  
John Kenney Hyannis Chamber of Commerce  
Rick Angelini Hyannis Chamber of Commerce  
Cynthia Cole Hyannis Main Street Business Improvement District

|                   |                        |
|-------------------|------------------------|
| Allen Goddard     | Hyannis Resident       |
| Rob Miceli        | MassBike               |
| Tim Kochan        | MassHighway District 5 |
| Catherine King    | MassRIDES              |
| Robert L. O'Brien | Steamship Authority    |
| Ann. B. Canedy    | Town of Barnstable     |
| David Munsell     | Town of Barnstable     |
| Harold Tobey      | Town of Barnstable     |
| Mark Ells         | Town of Barnstable     |
| Patty Daley       | Town of Barnstable     |
| Roger Parsons     | Town of Barnstable     |
| George Allaire    | Town of Yarmouth       |

The following are previous Task Force members and others who assisted during the study

|                 |  |
|-----------------|--|
| Shirley Gomes   | Former State Representative – 4 <sup>th</sup> District Barnstable County |
| Margo Fenn      | Cape Cod Commission  |
| Lev Malakhoff   | Cape Cod Commission  |
| Robert Mumford  | Cape Cod Commission  |
| Josh Lehman     | Executive Office of Transportation                                       |
| Mark Carmichael | MassHighway District 5   |
| Jennifer Doyle  | MassRIDES  |
| Robert Burgmann | Town of Barnstable   |
| Steve Seymour   | Town of Barnstable   |
| Ruth Weil       | Town of Barnstable   |

## Table of Contents

|   | <b>Page</b> |
|---|-------------|
| <b>Executive Summary</b>  |             |
| Transit Recommendations   | ES-2        |
| Park-and-Ride Recommendations   | ES-4        |
| Roadway Recommendations   | ES-5        |
| <br>  |             |
| <b>Chapter 1 – Study Foundation</b>   |             |
| 1.1 Background  | 1-1         |
| 1.2 Purpose   | 1-1         |
| 1.3 Study Participants and Outreach   | 1-2         |
| 1.4 Goals   | 1-4         |
| 1.5 Study Area  | 1-11        |
| 1.6 Summary and Conclusion of Study Foundation                                      | 1-12        |
| <br>  |             |
| <b>Chapter 2 – Existing and Future Planned Conditions and Issues Identification</b> |             |
| 2.1 Existing Roadway and Traffic Conditions   | 2-1         |
| 2.2 Ongoing and Planned Roadway Projects  | 2-21        |
| 2.3 Socioeconomic Conditions (Existing and Future Anticipated)                      | 2-22        |
| 2.4 Future No-Build Traffic Conditions  | 2-33        |
| 2.5 Transit and Other Transportation Services                                       | 2-35        |
| 2.6 Existing Land Use and Environmental Conditions                                  | 2-53        |
| 2.7 Summary of Existing and Future Planned Conditions                               | 2-72        |
| <br>  |             |
| <b>Chapter 3 – Alternatives Development</b>   |             |
| 3.1 Exit 6 ½ Alternatives   | 3-4         |
| 3.2 Airport Rotary Alternatives   | 3-12        |
| 3.3 Intersection of Yarmouth Road and Route 28                                      | 3-19        |
| 3.4 Transit   | 3-23        |
| 3.5 Park-and-Ride Options   | 3-29        |
| 3.6 Other considerations and topics of discussion                                   | 3-34        |
| 3.7 Summary of Alternatives Development   | 3-35        |
| <br>  |             |
| <b>Chapter 4 – Evaluation of the Alternatives</b>                                   |             |
| 4.1 Exit 6 ½ Alternatives Evaluation  | 4-2         |
| 4.2 Airport Rotary Alternatives Evaluation  | 4-16        |
| 4.3 The Intersection of Yarmouth Road and Route 28                                  | 4-28        |
| 4.4 Estimated Annual User Benefits  | 4-33        |

|     |  |      |
|-----|--|------|
| 4.5 | Roadway Packages   | 4-35 |
| 4.6 | Transit  | 4-38 |
| 4.7 | Park-and-Ride  | 4-42 |
| 4.8 | Summary and Conclusion of the Evaluation of the Alternatives | 4-46 |

**Chapter 5 – Recommendations**

|     |   |      |
|-----|---|------|
| 5.1 | Roadway Recommendations                             | 5-1  |
| 5.2 | Transit Recommendations                             | 5-12 |
| 5.3 | Park-and-Ride Recommendations                       | 5-15 |
| 5.4 | Implementation Scenarios and Construction Schedules | 5-16 |
| 5.5 | Summary of Recommendations                          | 5-18 |

**List of Figures**

|                |  |       |
|----------------|--|-------|
| Figure ES-1    | Transit Recommendations  | ES-3  |
| Figure ES-2    | Park and Ride Recommendation #1  | ES-4  |
| Figure ES-3    | Park and Ride Recommendation #2  | ES-5  |
| Figure ES-4    | Summary of Immediate and Short-term Roadway Recommendations  | ES-6  |
| Figure ES-5(a) | Proposed Intersection Improvements to Yarmouth Road/Route 28 – West Configuration                        | ES-7  |
| Figure ES-5(b) | Proposed Intersection Improvements to Yarmouth Road/Route 28 – West Configuration                        | ES-8  |
| Figure ES-6(a) | A Potential At-Grade Solution for the Airport Rotary – The Four Leg Intersection                         | ES-9  |
| Figure ES-6(b) | A Potential At-Grade Solution for the Airport Rotary – The Split Intersection                            | ES-10 |
| Figure ES-7    | Preferred Alternative for Exit 6 ½ - The Trumpet Interchange Design at the Existing Rest Area            | ES-11 |
| Figure 1-1     | Study Web site   | 1-3   |
| Figure 1-2     | Study Area   | 1-11  |
| Figure 2-2     | Seasonal Traffic Variation on Route 6 East of Route 149  | 2-8   |
| Figure 2-3     | Hourly Traffic Variation During a Typical Summer Week On Route 6 East of Route 149 (2005 Data)           | 2-9   |
| Figure 2-4     | Hourly Traffic Variation During a Typical Summer Week On Route 28, West of Old Post Road (2005 data)     | 2-10  |
| Figure 2-5     | Projected Study Area Growth  | 2-11  |
| Figure 2-6     | 2006 Summer ADT Study area entry/exit volumes  | 2-13  |
| Figure 2-7     | 2006 Summer Weekday PM Peak Hour Volumes Comparisons Route 28 between Yarmouth Road and East Main Street | 2-14  |
| Figure 2-8     | 2006 Summer Weekday PM Peak Hour Volumes Comparisons at the Rotary                                       | 2-15  |
| Figure 2-9     | 2006 Summer Weekday PM Peak Hour Volumes Comparisons   |       |

|             |  |      |
|-------------|--|------|
|             | Route 132 between Phinney's Lane and Bearse's Way<br>(Post Rt. 132 Widening) | 2-15 |
| Figure 2-10 | 2006 Summer Weekday PM Peak Level of Service                                 | 2-18 |
| Figure 2-11 | Crash Locations 2005   | 2-19 |
| Figure 2-12 | Total Crashes at Intersections 2003-2005                                     | 2-20 |
| Figure 2-13 | Town of Barnstable's Growth Incentive Zone and its Districts                 | 2-24 |
| Figure 2-14 | 2030-2006 Summer ADT Entry/Exit Volumes                                      | 2-34 |
| Figure 2-15 | 2030-2006 Summer Weekday PM Level of Service                                 | 2-35 |
| Figure 2-16 | Regional Overview of Transit and Other Transportation Services               | 2-37 |
| Figure 2-17 | Barnstable Villager Route  | 2-38 |
| Figure 2-18 | Sealine Breeze (Blue Line) Route   | 2-39 |
| Figure 2-19 | H2O Line Breeze (Green Line) Route   | 2-40 |
| Figure 2-20 | Annual CCRTA System Ridership  | 2-42 |
| Figure 2-21 | CCRTA Ridership Breakdown  | 2-43 |
| Figure 2-22 | CCRTA Monthly Ridership (FY 06)  | 2-44 |
| Figure 2-23 | Steamship Authority Volumes, Hyannis-Nantucket 2000-2006                     | 2-47 |
| Figure 2-24 | Hy-Line Passenger Volumes, 2003-2006   | 2-48 |
| Figure 2-25 | Barnstable Municipal Airport Enplanements, FY2000-FY2005                     | 2-49 |
| Figure 2-26 | Surface Water Resources  | 2-55 |
| Figure 2-27 | Floodplains  | 2-57 |
| Figure 2-28 | Zone II Protection Area and Water Supply Wells                               | 2-58 |
| Figure 2-29 | Wetlands and Vernal Pools  | 2-61 |
| Figure 2-30 | Biomap Core Habitat and Rare Wildlife and Species                            | 2-63 |
| Figure 2-31 | Areas of Critical Environmental Concern                                      | 2-64 |
| Figure 2-32 | Historical Properties and Districts  | 2-68 |
| Figure 2-33 | Protected and Recreational Open Space  | 2-71 |
| Figure 3-1  | Alternative 1 – Trumpet Interchange at the Rest Area                         | 3-5  |
| Figure 3-2  | Alternative 2 – Trumpet Interchange West of the Rest Area                    | 3-6  |
| Figure 3-3  | Alternative 3 – Partial Cloverleaf Interchange at Mary Dunn Road             | 3-7  |
| Figure 3-4  | Alternative 4 – Diamond Interchange at Mary Dunn Road                        | 3-9  |
| Figure 3-5  | Alternative 5 – Trumpet Interchange at Mary Dunn Road                        | 3-10 |
| Figure 3-6  | Alternative 6 – Hybrid of Alternatives 1 and 4                               | 3-11 |
| Figure 3-7  | Rotary Alternative 1A – Updated Rotary                                       | 3-13 |
| Figure 3-8  | Rotary Alternative 1B - Roundabout   | 3-14 |
| Figure 3-9  | Rotary Alternative 2 – Four Leg Intersection                                 | 3-15 |
| Figure 3-10 | Rotary Alternative 3 – Split Intersection                                    | 3-16 |
| Figure 3-11 | Rotary Alternative 4 – Route 132 to Route 28 Underpass with Roundabout       | 3-17 |
| Figure 3-12 | Rotary Alternative 5 – Route 28 to Route 28 Underpass with Roundabout        | 3-18 |
| Figure 3-13 | Yarmouth Rd/Rte 28 Widening and Reconfiguration Oriented East                | 3-19 |
| Figure 3-14 | Yarmouth Road / Route 28 Intersection Improvements (East) Lanes              | 3-20 |

|             |   |      |
|-------------|---|------|
| Figure 3-15 | Yarmouth Road / Route 28 Intersection Widening and Reconfiguration Oriented to the West                             | 3-21 |
| Figure 3-16 | Yarmouth Road / Route 28 Intersection Improvements (West) Lanes   | 3-22 |
| Figure 3-17 | Current CCRTA Routes within the Hyannis Area  | 3*24 |
| Figure 3-18 | Proposed improved transfer point at Route 28 and Bearses Way  | 3-25 |
| Figure 3-19 | Pedestrian Improvements in the Route 132 Mall Area  | 3-26 |
| Figure 3-20 | Bus Route Improvements Example  | 3-27 |
| Figure 3-21 | Proposed Locations for Dynamic Message Signs  | 3-28 |
| Figure 3-22 | Park-and-Ride Alternative 1   | 3-30 |
| Figure 3-23 | Park-and-Ride Alternative 2   | 3-31 |
| Figure 3-24 | Park-and-Ride Alternative 3   | 3-32 |
| Figure 3-25 | Park-and-Ride Alternative 4   | 3-33 |
| Figure 4-1  | Traffic Volume Changes Due to an Exit 6 ½ compared to the No-Build Summer Weekday PM Peak Period 3:30 PM to 6:30 PM | 4-3  |
| Figure 4-2  | Exit 6 ½ Desire Lines to and From the East  | 4-4  |
| Figure 4-3  | Volume Changes at Adjacent Interchanges due to Exit 6 ½ 2030 Summer Weekday PM Peak Hour                            | 4-5  |
| Figure 4-4  | General Interchange Volume Pattern on Route 6 and Exit 6 ½ 2030 Summer Weekday PM Peak Hour                         | 4-6  |
| Figure 4-5  | Study Area Roads: Volume Changes Due to Exit 6 ½ 2030 Summer Weekday PM Peak Hour                                   | 4-7  |
| Figure 4-6  | Level of Service Changes Due to Exit 6 ½ Summer Weekday PM Peak   | 4-8  |
| Figure 4-7  | Environmental Screening of Exit 6 ½ alternatives  | 4-12 |
| Figure 4-8  | Evaluation Summary of Exit 6 ½ alternatives   | 4-15 |
| Figure 4-9  | Volume Changes Due to Airport Rotary Improvements   | 4-17 |
| Figure 4-10 | Estimated Volume Reduction due to Airport Rotary Underpass Options  | 4-19 |
| Figure 4-11 | Comparison of Rotary Alternatives Delay   | 4-19 |
| Figure 4-12 | Crash Rate at Area Signalized Intersections Compared to the Airport Rotary  | 4-21 |
| Figure 4-13 | Crashes per million entering vehicles for the No-Build And the various Airport Rotary Alternatives                  | 4-22 |
| Figure 4-14 | Comparison of Airport Rotary Alternatives – Safety  | 4-23 |
| Figure 4-15 | Evaluation Summary of Airport Rotary Alternatives   | 4-27 |
| Figure 4-16 | Volume Changes due to Yarmouth Road / Route 28 Intersection Improvements  | 4-29 |
| Figure 4-17 | Evaluation Summary of Yarmouth Road / Route 28 Intersection Improvement Alternatives                                | 4-32 |
| Figure 4-18 | Summary Evaluation of Roadway Packages  | 4-36 |
| Figure 4-19 | Review of Transit Alternatives  | 4-38 |
| Figure 4-20 | Transit Alternatives Evaluation Summary   | 4-41 |
| Figure 4-21 | Evaluation of Park-and-Ride Alternatives  | 4-45 |

---

|            |  |      |
|------------|--|------|
| Figure 5-1 | Proposed intersection improvements to Yarmouth Road / Route 28<br>The East Configuration | 5-3  |
| Figure 5-2 | Proposed intersection improvements to Yarmouth Road / Route 28<br>The West Configuration | 5-4  |
| Figure 5-3 | Approximate scope of improvements and impacts<br>due to intersection reconstruction      | 5-5  |
| Figure 5-4 | The four-leg at-grade signalized intersection alternative<br>For the Airport Rotary      | 5-7  |
| Figure 5-5 | The split at-grade signalized intersection alternative<br>For the Airport Rotary         | 5-8  |
| Figure 5-6 | Summary of Prioritized Roadway Recommendations   | 5-9  |
| Figure 5-7 | The Preferred Exit 6 ½ Alternative: The Trumpet Interchange                              | 5-10 |
| Figure 5-8 | Park-and-Ride Recommendation #1  | 5-15 |
| Figure 5-9 | Park-and-Ride Recommendation #2  | 5-16 |

**List of Tables**

|            |  |      |
|------------|--|------|
| Table 1-1  | Hyannis Access Study Task Force members                                  | 1-2  |
| Table 1-2  | Technical Team   | 1-4  |
| Table 1-3  | Evaluation Criteria  | 1-9  |
| Table 2-1  | Level-of Service Criteria for Intersections                              | 2-17 |
| Table 2-2  | Level-of Service Criteria for Ramp Junctions                             | 2-17 |
| Table 2-3  | Estimate Population Figures  | 2-24 |
| Table 2-4  | Estimated Employment Figures   | 2-25 |
| Table 2-5  | Transportation to Work of Study Area Residents                           | 2-25 |
| Table 2-6  | Employment Status of Study Area Residents                                | 2-25 |
| Table 2-7  | Study Area Housing Characteristics                                       | 2-26 |
| Table 2-8  | Growth in Households and Income Per Capita                               | 2-26 |
| Table 2-9  | Barnstable Villager Summer and Off-Peak Service Levels                   | 2-39 |
| Table 2-10 | Sealine Breeze Summer and Off-Peak Service Levels                        | 2-39 |
| Table 2-11 | H2O Breeze Summer and Off-Peak Service Levels                            | 2-40 |
| Table 2-12 | Plymouth & Brockton Ridership, 1999-2000                                 | 2-45 |
| Table 2-13 | Vehicle Counts and Utilization Rates at the Barnstable Park-and-Ride Lot | 2-51 |
| Table 4-1  | Estimated Construction costs of Exit 6 ½ Alternatives                    | 4-13 |
| Table 4-2  | Construction costs of Airport Rotary Alternatives                        | 4-25 |
| Table 4-3  | Construction costs of Yarmouth Road / Route 28 Intersection Improvement  | 4-31 |
| Table 4-4  | Estimated Annual User Benefits of the Roadway Alternatives               | 4-34 |

## **Appendices**

- Appendix 1 Commonly Used Acronyms
- Appendix 2 Meeting summaries
- Appendix 3 Travel Demand Model
- Appendix 4 Additional Traffic Count, Volume and Level of Service Information
- Appendix 5 Additional Crash Information
- Appendix 6 Additional Transit Information
- Appendix 7 Other Exit 6 ½ Concepts
- Appendix 8 Other Airport Rotary Concepts
- Appendix 9 Other Concepts for the Intersection of Yarmouth Road and Route 28
- Appendix 10 Town of Barnstable Memo – TOB supports Hyannis Access Study travel demand model assumptions and discusses strategic planning efforts
- Appendix 11 Estimated Right-of-Way impacts for the Airport Rotary Alternatives
- Appendix 12 Estimated Right-of-Way impacts for the Yarmouth Road intersection
- Appendix 13 Letter from the Towns of Yarmouth, Barnstable and Dennis to EOTPW regarding The Railroad Right-of-Way and future bicycle/pedestrian plans. EOTPW's response.
- Appendix 14 Park-and-Ride Study by William Griswold
- Appendix 15 Progress print of the Airport Improvement Project 2005

## Executive Summary

Hyannis is considered the “hub” of Cape Cod serving the area with a regional airport, ferries to the Islands, a historic downtown, dense retail areas, and many cultural and recreational attractions. Hyannis also continues to grow.

The Hyannis Access Study was a comprehensive transportation planning study which sought to determine the best next steps to address the growing traffic congestion in the area. The study took into consideration the various projects underway and the population and economic forecasts specific to the area. Aided by a significant amount of public input, roadway and non-roadway alternatives were developed and evaluated to address deficiencies.

Led by the Executive Office of Transportation and Public Works, the process was guided by an advisory task force comprised of local, regional, state, and federal officials as well as community and business organizations. The Hyannis Access Study Task Force represented diverse interests, but was committed to developing workable solutions and remained very involved throughout the study process. The study was covered by the local newspapers and a web site was maintained to share information with a wider audience and provide an additional forum for community involvement. Two newsletters were produced and distributed. In addition to 18 Task Force meetings, two public informational meetings were held and broadcast on the local cable stations.

The formal purpose of the study was to examine, recommend, and prioritize ways to improve overall transportation mobility for residents, businesses and visitors while minimizing impacts to neighborhoods.

The study considered a new interchange along Route 6 between Exits 6 and 7, as well as other types of roadway improvements, to address the growing congestion. The study looked beyond the immediate vicinity of Exit 6½ and undertook a broad evaluation and analysis of all transportation issues in the area, including transit issues and the Barnstable Park-and-Ride lot. The desired end product was a well-supported comprehensive plan of short- and long-term improvements – including roadway and non-roadway components – that would be cost effective and complement existing and future plans.

Through a series of Task Force meetings at the beginning of the study, the group agreed on a set of common goals, the study area, and key issues on which to focus. This provided a strong foundation for the study.

In order to support the analysis of existing and future conditions, on which the alternatives are based, the study undertook an extensive data collection effort. Numerous traffic counts were collected from existing sources and a number of new traffic counts were taken. The study team examined economic development plans, environmental issues and transit services. This information was augmented with interviews and Task Force meetings. A travel demand model was developed for analyzing the effectiveness of the alternatives.

With regards to traffic, the study team determined that approximately 64,000 vehicles will enter the study area from Route 6 with 38,000 vehicles using Exit 6 and 28,000 vehicles using Exit 7. The total volume of traffic entering the study area from Route 28, Phinneys Lane, and West Main Street is expected to be about 108,000 vehicles, with Route 28 carrying approximately

64,000, Phinneys Lane carrying almost 18,000 vehicles and West Main Street carrying about 26,000 vehicles. Therefore, traffic entering the study area from Route 6 corresponds to about 38% of all study area traffic and more than half of the study area traffic is expected to use the local roads with Route 28 and Phinneys Lane being the most important. This situation is as true today as it is in the future. In addition, the traffic analysis found that operations at adjacent interchanges (Exits 6 and 7) are expected to be acceptable whereas operations are expected to worsen at key intersections along Route 132, 28, and 6A, even taking into account the area's current roadway improvement projects.

With regards to economic development, the study team learned through discussions with Town of Barnstable officials and through the study of the *Hyannis Growth Incentive Zone Application* that the Town has slated the downtown area for mixed-use, higher-density development through simplified and targeted zoning and plans to increase infrastructure capacity. The Application reads that the intention of the GIZ is to “create a healthy community and sustainable economy” and to “maximize the infrastructure advantage while minimizing the negative impacts of growth”. The study team also gathered data on other planned developments in the area, including the expansion of the airport and a new hospital out-patient facility in the Independence Park area.

Environmentally, there are many sensitive areas in the Town of Barnstable - covered in detail in Chapter Two. Two important environmental issues are the protected lands in the vicinity of a potential Exit 6 ½, and the fact that most of the study area is a Zone II wellhead protection area, a Massachusetts Department of Environmental Protection (MDEP) designated protection zone for public groundwater supplies.

Through the extensive analysis of existing and future conditions, the following issues were highlighted:

- The Airport Rotary and the intersection of Yarmouth Road and Route 28 will continue to be key bottlenecks.
- Traffic north of Route 6 is expected to increase, especially on Mary Dunn Road, Phinneys Lane and on Route 6A.
- The overcrowded park-and-ride lot is a key issue for many in the area.
- As Hyannis becomes more and more like a city, there are many opportunities to increase the visibility of transit and improve links to other modes, especially through pedestrian improvements.

The team collaborated with the Task Force to create a variety of alternatives to address the issues listed above. Draft, conceptual alternatives were presented to the Task Force, input was taken and incorporated into the alternatives, then re-presented to the Task Force for further discussion and refinement. In many cases, Task Force meetings were augmented by additional meetings of smaller groups of interest and specialty. Summaries of all the meetings are provided in Appendix 2.

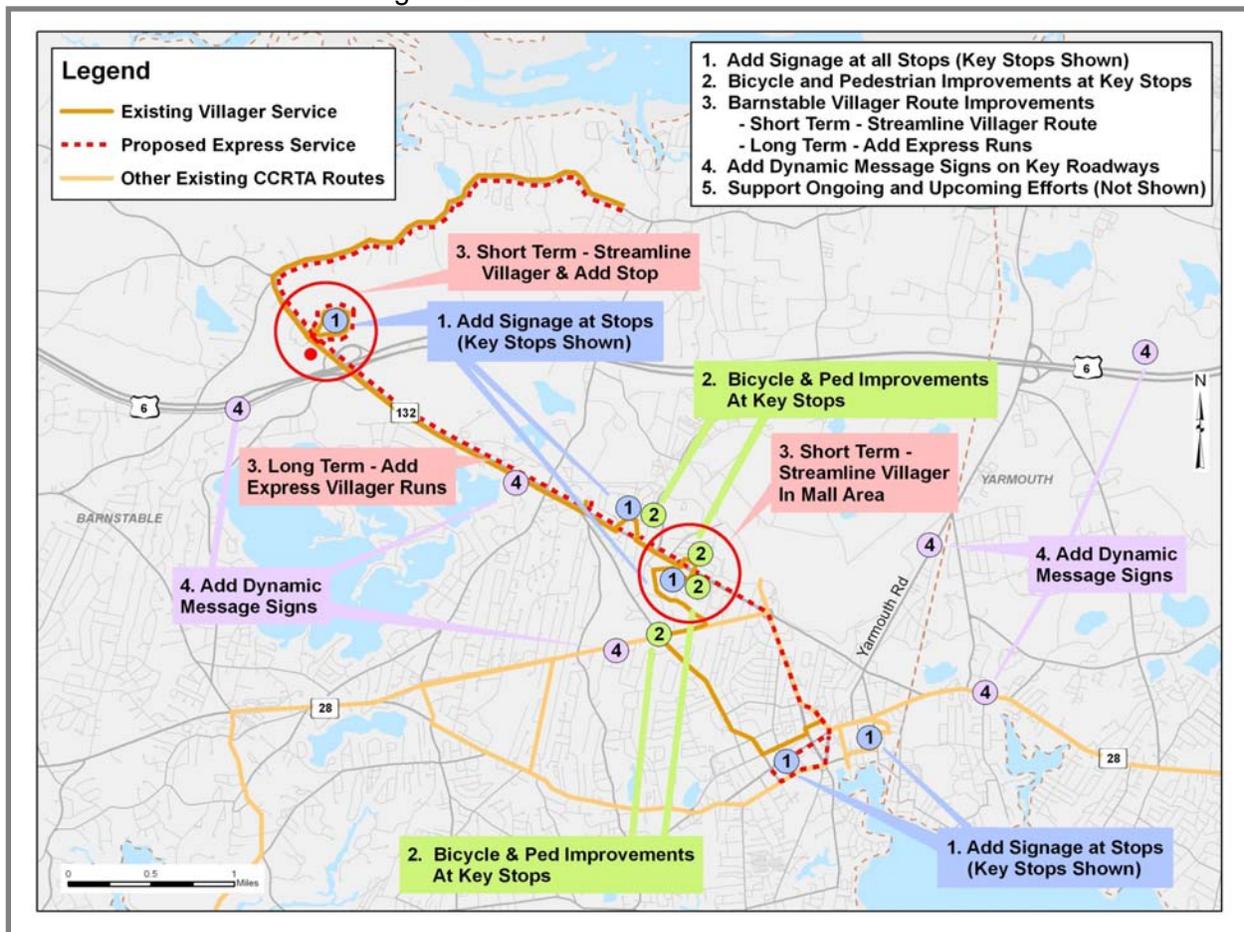
## Transit Recommendations

The goal of the transit recommendations is to make the most of existing services and facilities in the Hyannis area, while supporting and planning for potentially more extensive improvements in the long-term. The recommendations include packaging all the alternatives depicted in Figure ES-1 (discussed in detail in Chapters 3 and 4) into short- and medium-term improvements.

Throughout the study, the team heard that 1) increasing the visibility of transit and 2) making bicycle and pedestrian improvements in the vicinity of stops - are two crucial ways to attract riders to the system. Therefore, the short-term improvements focus on bicycle and pedestrian improvements at key stops as well as static signage at all stops, given that there is no signage at most stops. The short-term improvements also suggest some simple streamlining of the Barnstable Villager Route. Combined, these improvements (transit alternatives 1, 2 and 3 “Short-Term”) would pave the way for further transit improvements and route streamlining.

The medium-term improvements include alternatives 3 (Long Term) and 4, which would add new express runs on the Barnstable Villager Route and dynamic message signs to the area’s roadways to direct travelers to transit options. Other recommendations include coordination with the CCRTA regarding the Barnstable Park-and-Ride lot capacity improvements, and support for the numerous other ongoing planning efforts.

Figure ES-1: Transit Recommendations



## Park-and-Ride Recommendations

The Park-and-Ride recommendations seek to immediately alleviate the overcrowding situation at the Barnstable Park-and-Ride lot by using available capacity at a location in the study area already served by the private bus carriers – the Hyannis Transportation Center (HTC). The recommendations also strongly support the public’s desire to maintain overnight parking at the existing lot and provide more parking at the more popular location.

Figure ES-2 depicts the short-term recommendation of utilizing the available capacity at the long-term lot at the Hyannis Transportation Center by allowing bus patrons to park there at a reduced rate. The recommendation includes security improvements to the lot at the HTC such as fencing and lighting. This would be combined with limiting overnight parking at the Barnstable Park-and-Ride lot. This may be accomplished by segregating overnight parkers to an area with a limited number of spots or by limiting the duration of overnight parking to, for example, ten nights or two weeks. Both options for limiting parking may also be combined. These details are being worked out with EOTPW, MassHighway, the private bus carriers, the CCRTA, and other stakeholders. The goal is to encourage long-term parkers to choose the HTC’s lot in order to free up spots at the Barnstable lot for daily commuters, with positive air quality benefits and minimal impact to the ridership of private bus carriers.

Figure ES-2: Park and Ride Recommendation #1

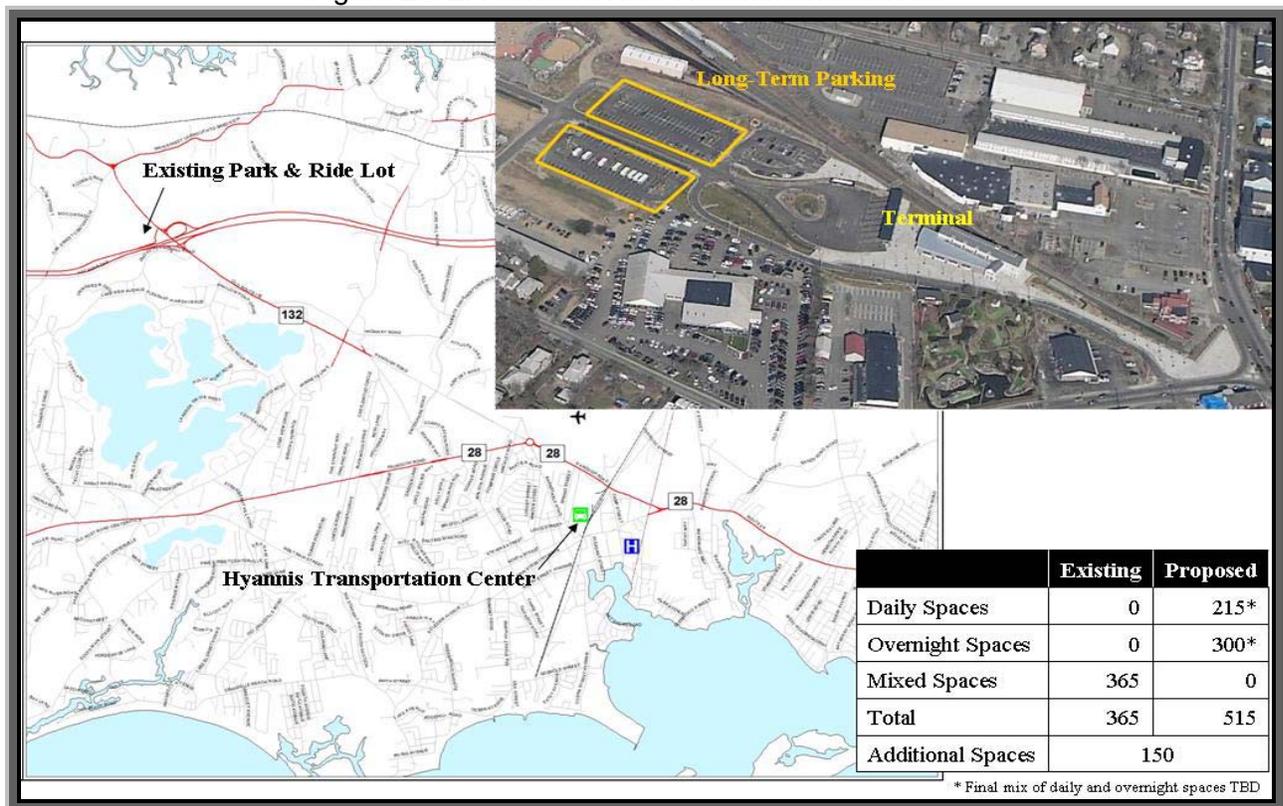
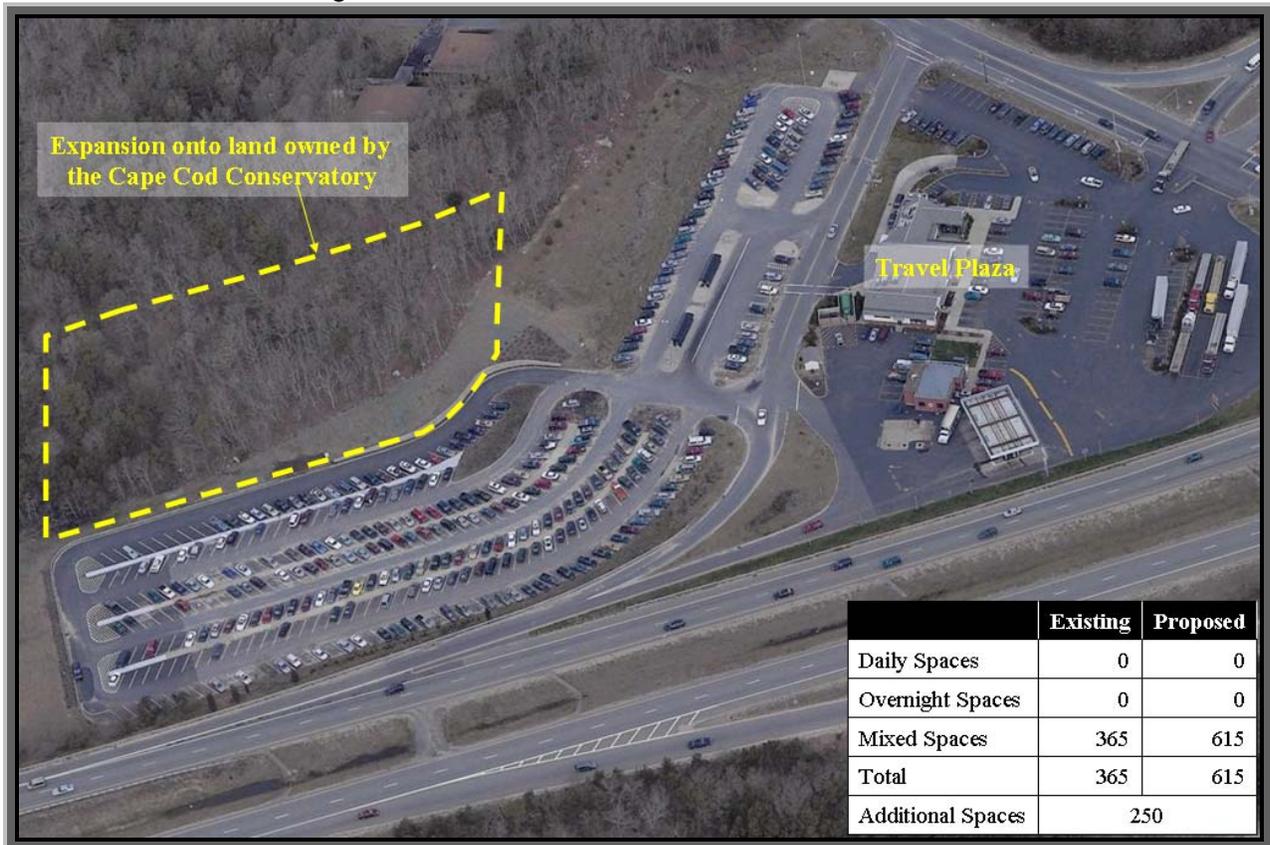


Figure ES-3 depicts the long-term solution to the overcrowding at the Barnstable Park-and-Ride lot, which is to expand the lot onto land owned by the Cape Cod Conservatory. The private bus carriers, the Conservatory, and many public citizens expressed strong support for this idea. This project is more capital-intensive and would require a somewhat longer lead time to plan and implement, including the acquisition of land owned by the Cape Cod Conservatory. However, it would add 250 additional spaces to the lot.

Figure ES-3: Park and Ride Recommendation #2



## Roadway Recommendations

Yarmouth Road is a main corridor in the study area connecting Route 6 to the hospital and downtown Hyannis. Route 28 in the vicinity of Yarmouth Road is also a main corridor linking numerous hotels and other commercial properties in Yarmouth to key destinations in Hyannis such as the Airport and large retail areas. The intersection of Yarmouth Road and Route 28 which links these two main corridors is currently a severe bottleneck in the area. The study team proposed intersection improvements that are expected to not only improve operations at the intersection itself, but also provide relief along both of these corridors. Furthermore, the proposed improvements at this intersection are of a straightforward nature, although they will require property impacts. The Task Force strongly encouraged prioritizing these improvements.

Secondly, the Airport Rotary is a key intersection in the study area. This junction of Route 132, Route 28 and Barnstable Road is expected to process over 60,000 vehicles/day in the year 2030. It operates at level of service F today and is the highest crash location in the area. This condition is expected to worsen in the future. Therefore, after improvements to the intersection of Yarmouth Road and Route 28, this intersection is prioritized.

Figure ES-4 depicts these prioritized roadway improvements as well as the need to incorporate planning efforts for a widened Route 28 into these implementation projects.

Figure ES-4: Summary of Immediate and Short-term Roadway Recommendations



The intersection of Yarmouth Road and Route 28

One possible orientation for improvements to the intersection of Yarmouth Road and Route 28 is depicted in Figure ES-5. Crucial components to the design include two left-hand turn lanes from Route 28 eastbound to Yarmouth Road northbound, two receiving lanes on Yarmouth Road and dedicated left-hand turn lanes from Yarmouth Road to Route 28. These improvements combined with the improvements to the intersection of Camp Street and Yarmouth Road just south of Route 28 would bring greatly improved operations and safety to the immediate area and the adjoining corridors.

While funding is pursued for design and construction of the intersection improvements, there are some immediate action items that the study team recommends. The northbound move from Yarmouth Road to Camp Street just south of Route 28 should be prohibited, to facilitate movement into and out of the intersection at Route 28. Drivers could still travel south on both Yarmouth Road and Camp Street to access downtown and the hospital area, but drivers would

be directed north on Camp rather than Yarmouth Road for access to the intersection. This would address awkward geometry and safety concerns immediately south of the Yarmouth Road/Route 28 intersection. In addition, the existing signal timing and phasing at the intersection of Yarmouth Road/Route 28 should be reviewed for potential modifications and improvements. The signal equipment should be investigated for potential upgrades, keeping in mind that a full intersection reconstruction should follow within six years or less.

Figures ES-5(a) and (b) depict two potential configurations for intersection improvements at Yarmouth Road and Route 28. The two configurations would require a similar level of property impacts, but represent trade-offs with regards to specifically which properties would be affected. For example, the west configuration would impact the historic brick building in the northwest quadrant. More details on each of these configurations are provided in Chapter 3.

Figure ES-5(a): Proposed Intersection Improvements to Yarmouth Road / Route 28  
West Configuration

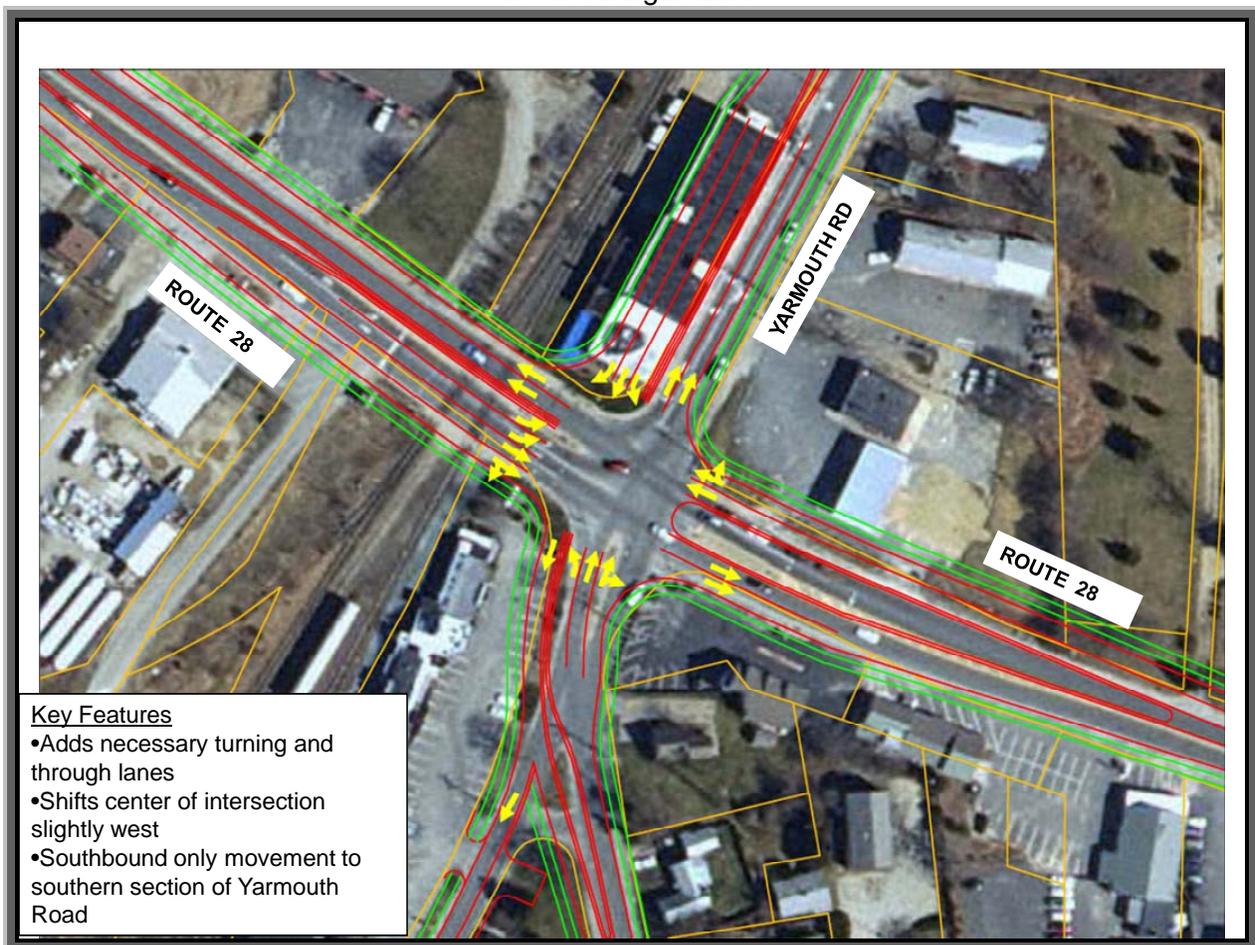


Figure ES-5(b): Proposed Intersection Improvements to Yarmouth Road / Route 28 East Configuration



### The Airport Rotary

After the development and evaluation of 12 distinct concepts and additional variations for the Airport Rotary, the study team determined that the most cost-effective solution - balancing the various goals and objectives of the study - would be one of two at-grade signalized intersection solutions. Both at-grade signalized options could be carried forward to design studies for further development, evaluation and comparisons. Although less capital-intensive than grade-separated solutions, converting the existing rotary to one or two signalized intersections will still require significant additional planning and lead time. Therefore, the team has proposed a number of immediate action items. Detailed in Chapter Five, these include the consideration for advance signage and possible re-striping. Operations and safety at the Airport Rotary would likely benefit from advance signage providing guidance to approaching motorists. However, the type, size, and location of any potential signs should be carefully reviewed prior to installation. Improper designations on the signs may cause additional driver confusion and, as such, decrease safety and capacity of the rotary. The same is true for striping and other lane markings. Careful review should take place prior to implementation.

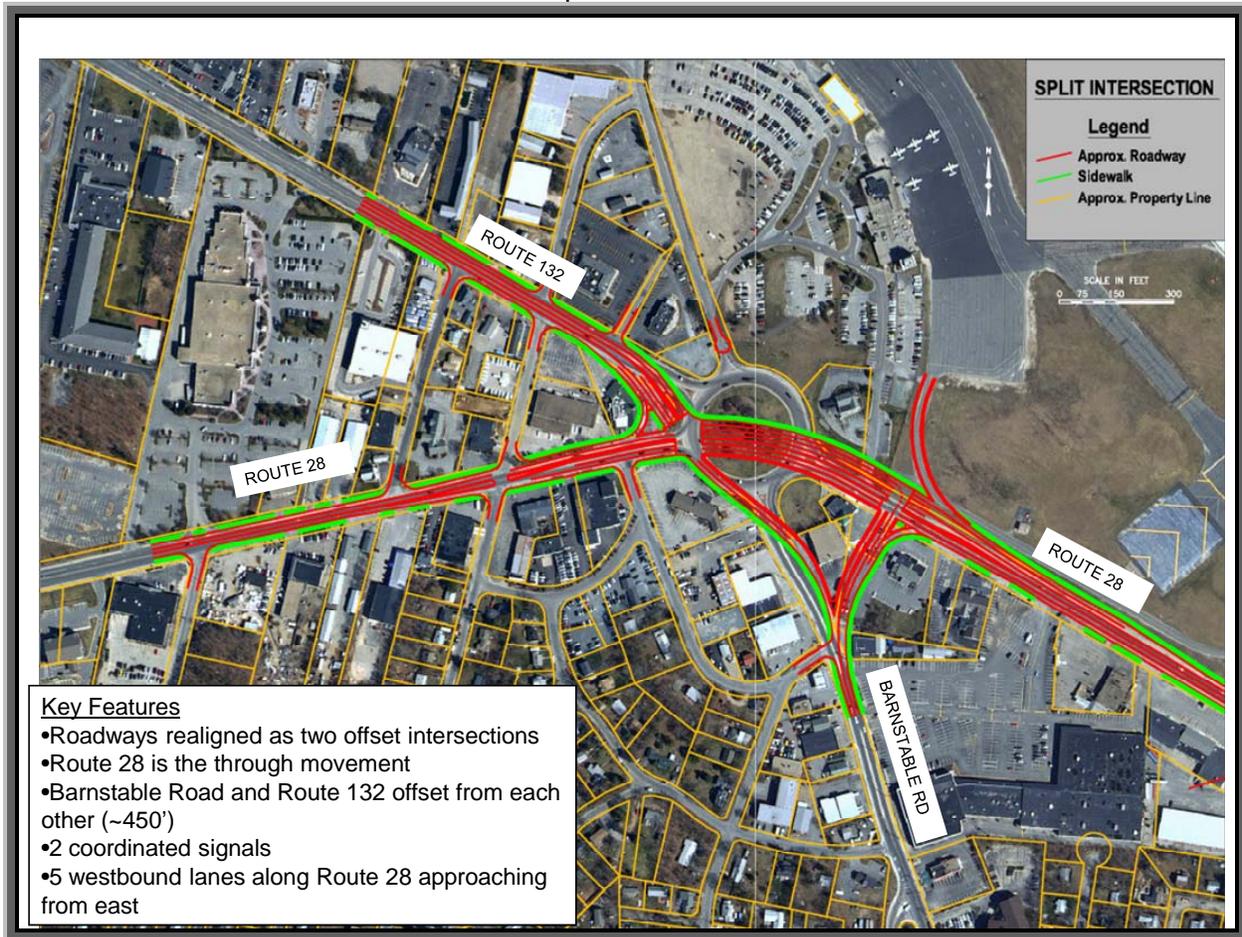
Figures ES-6(a) and (b) depict two potential at-grade signalized intersection solutions for the Airport Rotary that the study team recommends move forward into the environmental and design stages. The alternative shown in Figure ES-6(a) would replace the rotary with a signalized intersection, with the four roadways (Route 28 east and west, Route 132, and Barnstable Road) realigned to create the four legs of the intersection. A bypass lane would be provided on three of the four approaches.

Figure ES-6(a): A potential at-grade solution for the Airport Rotary  
The Four Leg Intersection



Figure ES-6(b) depicts a configuration that would realign the roadways to create two offset intersections, separated by 450 feet, with Route 28 as the through movement. The combined level of service from both intersections would be expected to be D.

Figure ES-6(b): A potential at-grade solution for the Airport Rotary  
The Split Intersection



It should be noted here that although there was strong agreement to address the issues at the Airport Rotary, there was not strong agreement among the public and the Task Force about how to do this. For example, some Task Force members wish to forward the grade-separated alternatives to design. Chapter Four, in particular pages 4-25 through 4-28, covers this in more detail. What is presented here are the study team's recommendations based on objective analysis, collective input, and cost considerations.

Other recommendations

The study examined Exit 6 ½ and determined that it is not expected to address the area's problem intersections, and in fact, may worsen operations at some intersections. In addition, the potential interchange, with an estimated construction cost (in 2007 dollars) of around \$20 million, exists in a sensitive environmental area surrounded by residences. The industrial park is south of the potential interchange. However, the study also found that traffic growth on sections of Route 6A, Phinneys Lane and Mary Dunn Road is expected to be substantial – on the order of 30-40%. Exit 6 ½ would be expected to mitigate this traffic to a large degree. In addition, the park area is slated for various developments which would benefit from improved access off of the state route. There was not consensus on whether to include Exit 6 ½ in the recommendations and what its timeline should be, should it be included. Based on the facts, modeling efforts, and collective input, the study team decided to include the preferred alternative of Exit 6 ½ as part of other recommendations for further consideration after the prioritized areas are addressed. Important, required steps for a future Exit 6 ½ are outlined in Chapter Five, section 5.1.4.

Figure ES-7 is a depiction of the preferred alternative for Exit 6 ½. This design is very similar to the preferred alternative from the 1998 MassHighway *Conceptual Design and Feasibility Study for New Route 6 Interchange in the Town of Barnstable* with a slightly modified ramp geometry. It provides direct access to Independence Drive via a bridge structure over Route 6. The rest area would have to be relocated.

ES-7: Preferred Alternative for Exit 6 ½  
The Trumpet Interchange Design at the Existing Rest Area



Over the course of the study, the Task Force discussed many issues that were not fully covered in this study. However, some important recommendations came out of these discussions and are mentioned here to guide future efforts.

The improvements to the intersection of Route 28 and Yarmouth Road are expected to address the traffic issues along the Yarmouth Road corridor to a large degree. However, some queuing issues will still exist due to left-hand turns into and out of the businesses along the road. The corridor is tightly constrained on both sides, presenting a challenge for any widening options. Just west of the roadway and its abutting commercial properties, and just east of Airport property is an EOTPW-owned rail line. This active rail line serves a tourist excursion train as well as freight service. At the same time, the Towns of Barnstable and Yarmouth are interested in extending the bicycle facility network from the Cape Cod Rail Trail Extension to the Hyannis Transportation Center. The current vision held by Town planners and other stakeholders is that such a connection could occur inside EOTPW's rail right-of-way. The study therefore recommends a feasibility study to fully examine these issues and others related to the Yarmouth Road corridor, and develop well-supported recommendations. The study should take into consideration the constraints of the commercial businesses, the active rail line, the desire for a bicycle facility which would cross Route 28 and lead to the HTC, as well as roadway options for improved access to the businesses while maintaining efficient flow.

Chapter Five provides much more detail on these recommendations as well as information on implementation roles, responsibilities and potential timelines. For further information on the evaluation and input that led to these recommendations, please refer to Chapter Four.

## Chapter One: The Foundation of the Study

### 1.1 Background

Due to significant commercial, industrial, and residential development in recent years, traffic congestion has increased steadily in and around Hyannis. In 1998, MassHighway completed a "Conceptual Design and Feasibility Study for a New Route 6 Interchange in the Town of Barnstable." This potential interchange became known as "Exit 6 ½," and was proposed to provide direct access to the industrial properties along Independence Drive, west of Mary Dunn Road.

Current roadway improvement projects in the area include the widening of Route 132 (Exit 6 of Route 6), Bearses Way reconstruction, and the recent widening of Willow Street (Exit 7). These projects are improving traffic operations throughout the area, and needed to be considered as part of an updated evaluation of Exit 6 ½ and other potential improvements.

### 1.2 Purpose

The Hyannis Access Study sought to determine the best next steps to address the growing congestion in the area, whether through a new interchange, another type of improvement, or a combination of improvements. The study looked beyond the immediate vicinity of Exit 6 ½ and undertook a broad, comprehensive evaluation and analysis of all transportation issues in the area.

The formal purpose of the study was to examine, recommend, and prioritize ways to improve overall transportation mobility for residents, businesses and visitors while minimizing impacts to neighborhoods and communities.



**Purpose**

*Examine, recommend and prioritize ways to improve overall transportation mobility for residents, businesses and visitors, while minimizing impacts to neighborhoods and communities.*

The desired end result of this study, outlined in Chapter 5 of this report, was a well-supported, comprehensive plan of short- and long-term improvements, consisting of roadway and non-roadway components, that are cost-effective and complement existing and future plans.

### 1.3 Study Participants and Outreach

This study was sponsored and led by the Massachusetts Executive Office of Transportation and Public Works, and specifically its Office of Transportation Planning. EOTPW conducts its studies with a high level of public participation, which it considers vital to the success of any transportation project. This is in keeping with the principle of basing decisions on objective, transparent, and inclusive planning. Therefore, EOTPW, in cooperation with local officials, formed an advisory task force to provide a forum for community involvement and input into the study. These task forces typically include federal, state, regional and local agencies, legislators, local elected officials, and interested community and business organizations. The members of the Hyannis Access Study Task Force and their affiliations are listed below in Table 1-1.

**Table 1-1: Hyannis Access Study Task Force Membership**

| <b>AFFILIATION</b>                          | <b>NAME</b>         | <b>TITLE</b>                     |
|---|---------------------|----------------------------------|
| 2nd District - Barnstable County            | Demetrius Atsalis   | Office of Rep. Demetrius Atsalis |
| 2nd District - Barnstable County            | Tom Bernardo        | Office of Rep. Demetrius Atsalis |
| 5 <sup>th</sup> District – Cape and Islands | Robert O’Leary      | Office of Sen. Robert O’Leary    |
| 5 <sup>th</sup> District – Cape and Islands | Sue Rohrbach        | Office of Sen. Robert O’Leary    |
| Assoc. to Preserve Cape Cod                 | Maggie Geist        | Executive Director               |
| Barnstable Land Trust                       | Tom Mullen          | President                        |
| Barnstable Municipal Airport                | Quincy Mosby        | Airport Manager                  |
| Cape Cod Chamber of Commerce                | Wendy K. Northcross | CEO                              |
| Cape Cod Commission                         | Paul Niedzwiecki    | Executive Director               |
| Cape Cod Commission                         | Robert Mumford      | Transportation Program Manager   |
| Cape Cod Regional Transit Authority         | Joseph G. Potzka    | Administrator                    |
| Centerville Civic Association               | Peter Fisher        | President                        |
| Federal Highway Administration              | Paul Maloney        | Transp. Planning Engineer        |
| Hyannis Chamber of Commerce                 | John Kenney         | Immediate Past President         |
| Hyannis Chamber of Commerce                 | Rick Angelini       | Interim CEO                      |
| Hyannis Main Street BID                     | Cynthia Cole        | Executive Director               |
| Hyannis Resident                            | Allen Goddard       | Resident                         |
| MassBike                                    | Rob Miceli          | Cape Cod & Islands Chapter Pres. |
| MassHighway Dept., District 5               | Tim Kochan          | Transportation Planner           |
| MassRIDES                                   | Catherine King      | Outreach Coordinator             |
| Steamship Authority                         | Robert L. O’Brien   | Vice Chairman                    |
| Town of Barnstable                          | Ann B. Canedy       | Councilor, Precinct I            |
| Town of Barnstable                          | David Munsell       | Planning Board Member            |
| Town of Barnstable                          | Harold Tobey        | Councilor, Precinct II           |
| Town of Barnstable                          | Mark Ells           | Director Public Works            |
| Town of Barnstable                          | Patty Daley         | Int. Dir. of Growth Management   |
| Town of Barnstable                          | Roger Parsons       | Public Works Roads Program       |
| Town of Yarmouth                            | George R. Allaire   | Public Works Director            |

The Hyannis Access Study Task Force was a very committed and involved group of people that provided significant, valuable contributions and input to each task of the study. There was strong attendance at all 18 Task Force meetings, which were working meetings held during regular business hours, open to the public, and covered by the local newspapers. There were two public informational meetings held in the evening to share information and gather further input from a wider audience. Public access television videographed the events and broadcast them afterwards. Summaries of all the meetings are provided in Appendix 2.

EOTPW maintained an informational website ([www.hyannis-access.com](http://www.hyannis-access.com)) where meeting notices, meeting summaries, and other study documents, data, and presentations were posted. After the conceptual alternatives were refined based on Task Force input, they were posted to the website along with comment forms to get further input from the greater public. In addition to input received at Task Force and the public informational meetings, many comments were received through the website. EOTPW staff responded to most of the comments. Below is an image of one of the pages of the web site.

Figure 1-1: Study Website



In addition to EOTPW’s Office of Transportation Planning and the Task Force, this study was aided by a team of technical experts lead by TranSystems. The technical team members and their roles are listed in below.

**Table 1-2: Technical Team**

| Company Name                      | Team Member       | Role                                 | Logo and Web site   |
|-----------------------------------|-------------------|--------------------------------------|---|
| TranSystems                       | George Gefrich    | Consultant Study Manager             | <br><a href="http://www.transystems.com">www.transystems.com</a>   |
|                                   | Joseph Cahill     | Highway Design Engineer              |   |
|                                   | Rob Swierk        | Transit                              |   |
|                                   | Jessica Eckhardt  | Graphics support                     |   |
|                                   | Christopher Smith | Engineering support                  |   |
|                                   | Ed Bromage        | Travel demand modeling               |   |
|                                   | William Grace     | Report Production Assistant          |   |
| Fitzgerald & Halliday             | Ken Livingston    | Public involvement and Environmental | <br><a href="http://www.fhiplan.com">www.fhiplan.com</a>   |
|                                   | Leslie Black      | Public involvement                   |   |
| TraInfo Communications            | Sudhir Murthy     | Traffic Operations and Analysis      | <br><a href="http://www.trainfo.com">www.trainfo.com</a>   |
| FXM Associates                    | Frank Mahady      | Land Use and Economic Development    | <br><a href="http://www.fxm.biz">www.fxm.biz</a>  |
|                                   | Diane Tsitsos     |                                      |   |
| Office of Transportation Planning | Paul Nelson       | Park-and-Ride Coordinator            | <br>MASSACHUSETTS<br>EXECUTIVE OFFICE<br>OF TRANSPORTATION<br><a href="http://www.eot.state.ma.us">www.eot.state.ma.us</a> |

#### 1.4 Study Goals

EOTPW Planning, the consultant team, and the Task Force collectively developed a set of goals which revealed significant overlaps and common interests. The following primary goals and objectives provided a clear mission statement for the study:

- ***Improve safety for motorists, pedestrians and bicyclists***
- ***Improve traffic flow in and around the local focus area***
- ***Maintain and enhance support for regional economic activity by strengthening transportation networks***
- ***Improve mobility and transportation choice***
- ***Protect and enhance the natural and cultural environment***

In addition, the Task Force listed objectives and strategies for achieving the goals listed above. These objectives and strategies are listed in the boxes below.

**Goal: Improve safety for motorists, pedestrians and bicyclists**

Objectives:

1. Eliminate or improve locations and situations that pose hazards.
2. Ensure adequate weave areas, acceleration/deceleration lanes, and sight distances.
3. Improve sidewalks and pedestrian crossings.
4. Improve signage to major destinations especially as major roadway projects are completed.
5. Ensure design-speed of new facilities is consistent with community character (e.g., use of traffic calming design)

Potential strategies and specifics:

1. Some street signs may need larger print.
2. Consider a branding process when creating new signage.
3. Add signage to inform motorists of timed sequence of lights so that drivers do not speed up to the next intersection.
4. Provide signage to inform cyclists when to walk their bikes.
5. Provide education programs for cyclists/pedestrians regarding safety rules of the road for all.

**Goal: Improve mobility and transportation choice**

Objectives:

1. Explore expanding public transportation service both within the area and from the upper and lower Cape.
2. Find ways to prioritize transit and give visibility to its importance in the region.
3. Seek to improve coordination of existing transit services and provide safe links to and from alternative modes, such as bike paths to transit stations.

Potential strategies and specifics:

1. Enlarge bus stops and provide more frequent service to increase the visibility of transit services.
2. Work with the Cape Cod Hospital to promote transit.
3. Support the Hyannis Traffic Control Signal Center and highlight it as a low-cost traffic congestion mitigation measure.
4. Support the Yarmouth rail trail project into downtown Hyannis and a potential extension to the ferry.
5. At Hyannis Transportation Center, provide traveler information in different languages.
6. Explore enhancements of bicycle and pedestrian facilities including additional bike racks at key destinations.
7. Explore ridesharing options – carpooling and vanpooling.
8. Consider implementing Intelligent Transportation Systems (ITS) such as dynamic message signs and highway advisory radio to provide directions and traffic updates.

**Goal: Improve traffic flow in and around the local focus area**

Objectives:

1. Decrease congestion and reduce delays on the Willow Street/Yarmouth Road corridor.
2. Decrease congestion and reduce delays on Route 28 heading into Hyannis.
3. Decrease congestion and reduce delays on Route 132 into the mall and Main Street.
4. Reduce, wherever possible, cut-through traffic in residential neighborhoods.
5. Avoid creating new opportunities for cut-through traffic in residential neighborhoods.

Potential strategies and specifics:

1. Explore Exit 6 ½ options.
2. Explore alternatives to improve the Airport Rotary.
3. Explore other “Fix It First” alternatives that may address accessibility more cost effectively than a new Exit 6 ½.
4. Support Barnstable’s conceptual plans for a bypass road parallel to Yarmouth Road.
5. Support the plans to reconstruct Route 28 between the rotary and the Barnstable/Yarmouth Town line.
6. Explore dedicated left-hand turn lanes and other solutions such as turn restrictions.
7. Consider consolidating curb cuts.
8. Consider making Willow Street one-way south and Camp Street one-way north.
9. Improve enforcement of illegal parking.

Challenges and opportunities:

1. Protect Mary Dunn Road neighborhoods.
2. Protect Hyannis neighborhoods and ensure connectivity of neighborhoods/community.
3. Respect scenic and historic areas and roadways.

Corollary outcomes of achieving this goal:

1. Understand the effects of current transportation projects on the existing system.
2. The development of a set of modeling tools for analyzing a range of alternatives – roadway and non-roadway – to support intelligent decision-making.

**Goal: Maintain and enhance support for regional economic activity by strengthening transportation networks**

Objectives:

1. Improve access to the Cape Cod Hospital.
2. Improve access to the Main Street area.
3. Improve access to the Ferry.
4. Improve access to the Cape Cod mall and other businesses in that area, including on or around Independence Drive; consider improvements from Phinney's Lane to the Airport.
5. Improve access to other tourist attractions.
6. Improve access to Hyannis from other parts of the Cape.
7. Ensure that transportation system supports community objectives for the Growth Incentive Zone (GIZ).
8. Support the needs of freight movements by truck, rail, ship, and air.

Potential strategies and specifics:

1. Consider deck parking for downtown area.
2. Consider the impacts and benefits of the hospital expansion to Independence Drive.
3. Explore Exit 6 ½ options.
4. Explore alternatives to improve the Airport Rotary.
5. Explore other "Fix It First" alternatives that may address accessibility more cost effectively than a new Exit 6 ½.
6. Preserve and enhance recreational and maritime uses of the ferry area and its visual appeal

**Goal: Protect and enhance the natural and cultural environment**

Objectives:

1. Improvement should reflect the scenic character of the Cape.
2. Provide protection to residential and business properties.
3. Minimize visual impacts on the communities and enhance the visual environment where possible.
4. Protect ground water supplies.
5. Minimize noise impacts to residential neighborhoods and other sensitive receptors.
6. Provide protection for wetlands and water bodies.
7. Provide protection for wildlife habitats, particularly habitats that support threatened or endangered species.
8. Protect air quality.
9. Provide protection for historical and archeological resources, public parkland and conservation land.
10. Properly address any areas contaminated by hazardous materials.
11. If impacts cannot be avoided, minimize them to the greatest extent possible.

Potential strategies and specifics:

1. Improve landscaping on Route 132 and other roads.
2. Landscape buffer zones between roadways and developments.
3. Keep the visitor center and bathrooms at the rest area east of Exit 6 open all year round.
4. Minimize to the extent possible impervious surfaces.

Challenges and opportunities:

1. Ongoing maintenance costs of landscaping may be addressed by partnering with advertisers and/or abutters.

For each goal and its corresponding set of objectives, the technical team provided a number of measures which would be used to evaluate how well the transportation improvements meet the goals and objectives. These measures are referred to as evaluation criteria and are listed below in Table 1-3 along with the objectives to which they correspond.

**Table 1-3: Evaluation Criteria**

| <b>Goals and Objectives of the Study</b>  | <b>Evaluation Criteria</b><br>How to Measure each Alternative?<br>(Quantitative and Qualitative)           |
|---|--|
| <b><i>Improve traffic flow in and around the local focus area</i></b>   |  |
| Decrease congestion and reduce delays   | Average speed<br>Queue lengths at key intersections; Level of Service (LOS) at key intersections and links |
| Minimize local street impacts   | Changes in forecast traffic volumes on key local streets   |
| <b><i>Improve safety for motorists, pedestrians and bicyclists</i></b>  |  |
| Eliminate/improve hazardous situations  | Focus on hot stops from crash records – changes in contributing factors to safety hazards                  |
| Ensure adequate weave areas, acceleration/deceleration lanes, and sight distances   | Number of deviations from AASHTO and MassHighway guidelines  |
| Improve signage   | Completeness and accuracy of existing signage; potential for sign branding; number of additional signs     |
| Ensure design speeds consistent with community character  | Traffic calming measures used  |
| <b><i>Improve mobility and transportation choice</i></b>  |  |
| Explore expanding public transportation and ITS   | Number of routes, ridership, frequency of services   |
| Find ways to prioritize transit   | Ridership numbers, frequency of service  |
| Improve coordination of existing services and safe links to and from alt. modes, such as bike/ped paths to transit stations | Count modal connections, bike and/or pedestrian paths, lanes, racks and other facilities                   |

**Table 1-3: Evaluation Criteria (continued)**

| <b><i>Protect and enhance the natural and cultural environment</i></b>   |  |
|--|--|
| Improvements should reflect the scenic character of the Cape   |  |
| Provide protection to residential and business properties  |  |
| Protect ground water supplies  | Net increase in impervious surface; avoidance of activity in wellhead protection areas                               |
| Protect wetlands   | Number of wetlands affected and square feet of encroachment  |
| Protect habitats   | Number of habitats affected and square feet of encroachment  |
| Improve regional and local air quality   | Within regional emissions targets (macro analysis)   |
| Protect historic/archeological resources   | Specific resources affected and degree   |
| Protect parkland/conservation land   | Specific park/conservation land affected and degree  |
| Properly address contaminated areas  | Description of effect on any such areas and measures to appropriately address  |
| If impacts cannot be avoided, minimize them  | Mitigation measures for selected alternative(s)  |
| <b><i>Maintain and enhance support for regional economic activity by strengthening transportation networks</i></b> |  |
| Maintain/improve Hyannis connections/accessibility for residents, employees, visitors                              | Auto and transit access modes into Hyannis<br>Travel times to Hyannis resident, business, institutional destinations |
| Provide ease of freight movements into/out of Hyannis  | Travel times for trucks to study area businesses and institutions  |
| Support new development within the Growth Incentive Zone (GIZ) District  | Accessibility to/from GIZ compared to other potential growth locations   |
| <b><i>Develop recommendations that can be implemented efficiently</i></b>  |  |
| Constructability   | List potential construction obstacles and their severity   |
| Minimize construction impacts  |  |
| Quality of life  | Description, severity, and duration of construction impacts and measures to mitigate                                 |
| Cost   | Conceptual costs   |
| Meet MassHighway Design Manual Criteria  | Any instances where desirable design standards can not be met?   |
| Consider federal funding criteria  |  |

The following recurring themes were noted in the discussions on the goals, objectives and evaluation criteria.

- General congestion: Route 132, Route 28, Willow Street and Yarmouth Road
- Safety
- The hospital and the hospital expansion
- The Airport Rotary
- Exit 6 ½

- Alternatives to, or complementing, Exit 6 ½
- Parking
- Technology
- Signage, signage, signage
- “Hyannis is a City”

### 1.5 Study Area

The Study Area for the Hyannis Access Study, shown in the figure below, is roughly bounded by Exits 6 and 7 on Route 6; Route 6A to the north; Route 132 and the West End Rotary to the west; Main Street, the ferry area, and the hospital to the south; and the intersection of Route 28 and East Main Street to the east. The Cape Cod regional travel demand model, discussed in the next section, includes the entire Cape (not including the islands).

Figure 1-2: Study Area



## 1.6 Summary and Conclusion

Through a series of Task Force meetings at the beginning of the study, the group agreed on a set of common goals, the area of concern, and key issues on which to focus. This provided a strong foundation for the study.

The following chapter covers the data collection efforts and the analysis of existing and future conditions. Chapter 3 contains detailed descriptions of all the alternatives that were developed to address the deficiencies highlighted in Chapter 2. Chapter 4 covers how the various alternatives were evaluated with respect to the goals and objectives of the study with input from the public. Chapter 4 also covers the results of the evaluations and the work that led to the recommendations. Chapter 5 covers the recommendations, responsibilities regarding implementation, potential timelines, and remaining issues.

## Chapter Two: Existing and Future Planned Conditions and Issues Identification

This chapter presents a summary of the existing and future planned conditions in the Hyannis Access Study area, as well as deficiencies and constraints related to transportation access. The chapter is organized into sections on existing roadway and traffic conditions; ongoing and planned roadway projects; socioeconomic conditions; future no-build traffic conditions; transit and other transportation services; environmental conditions; and a summary of transportation deficiencies and area constraints.

### 2.1 Existing Roadway and Traffic Conditions

The study area contains a complex network of roadways. While Route 6 is the main thoroughfare, there are important feeder and parallel arterials that serve a myriad of origins and destinations into/out of and through the study area. In order to understand how this system functions, it is vital to know the configuration of these roadways, the associated intersections, the volumes of traffic that they carry, how well they operate and their safety features. This section covers these details.

#### 2.1.1 Roadways

The following section provides brief physical descriptions of the major roadways and intersections in the study area. The primary emphasis in this study in terms of roadways was on area-wide traffic and on roadways that are under the jurisdiction of the State, rather than local roadways and intersections that are under the jurisdiction of the municipalities. It is recognized that some local roadways and intersections may require attention separate from this study.

#### Route 6

The study area includes the section of Route 6 between Exit 6 at Route 132 and Exit 7 at Willow Street. In this section, which extends between mile marker 68 and mile marker 73, Route 6 is a four lane divided limited access highway with 12 foot lanes, a 10 foot shoulder and a wide median. The grass median varies in width from about 100 feet at the interchanges to as much as 350 feet. The speed limit is posted at 55 mph. Approaching Exit 6 from the west, Route 6 eastbound has a down grade of roughly 5%. Around mile marker 71, Route 6 eastbound has a rest area. In addition to the grade separated interchanges at Exits 6 and 7, Route 6 is grade separated at Phinney's Lane and Mary Dunn Road.

#### Route 6 – Exit 6

Route 6 Exit 6 is at Route 132, also called Hyannough Road. This grade separated interchange is more or less a diamond interchange with one loop ramp for Route 132 northbound to Route 6 westbound. The Route 6 eastbound off-ramp initially splits into two, with one intersection Route 132 and the other forming a Service Road connection to Shoot Flying Hill Road. Presently the Route 132 intersection at Route 6 eastbound off-ramp and Route 6 eastbound on-ramp is unsignalized under STOP control. As part of the Route 132 reconstruction project, MassHighway proposed the installation of a traffic signal at this location. The Route 6 westbound off-ramp and the loop ramp intersects with Route 132 at a signalized intersection. This intersection also provides access to the Exxon Gas Station, some fast-food restaurants and a park-and-ride facility. There is also access to Route 6 westbound through this area via an on-ramp.

### **Route 6 – Exit 7**

Route 6 Exit 7 at Willow Street is a half clover-leaf interchange. The Route 6 eastbound off-ramp and the on-ramp intersect Willow Street south of Route 6. The Route 6 westbound off-ramp and the on-ramp intersect Willow Street north of Route 6. As part of the Willow Street reconstruction project, both the intersections on Willow Street are signalized.

### **Route 28 – Falmouth Rd./Iyannough Rd./Main St.**

Route 28 is a major arterial through Cape Cod starting at the Bourne Bridge to the west and running more or less parallel to Route 6 through the towns of Falmouth, Barnstable, Yarmouth, Harwich, Chatham and Orleans. It ends at Route 6 at the Orleans Rotary. While Route 6 primarily serves long-distance travelers, Route 28 serves primarily local traffic. Route 28 goes through the heart of the study area. It begins in the west of the study area as Falmouth Road until reaching the Airport Rotary. South of the rotary, Route 28 is called Iyannough Road up to the Yarmouth Town Line. Within the Town of Yarmouth, Route 28 is referred to as Main Street. Route 28 is generally a two-lane undivided highway with additional turn lanes at major intersections. Within the study area, land use adjacent to Route 28 is primarily commercial.

### **Route 132 (Iyannough Road)**

Route 132 is a minor arterial in the study area and runs between Route 6A to the north and Route 28 at the Airport Rotary to the south. In this section, Route 132 is also called Iyannough Road. In general, Route 132 is currently a two-lane undivided highway with 10 foot shoulders on both sides. South of Phinney's Lane, Route 132 is a 4-lane undivided highway with a 2 foot curb offset. However, MassHighway began the Route 132 reconstruction project in Spring 2007. As part of this project, Route 132 from Route 6 to Phinney's Lane will be widened to four lanes with a 10 foot shoulder on both sides. The posted speed limit is 40 mph north of Phinney's Lane, and reduced to 35 mph south of Phinney's Lane. Land use along Route 132 is commercial, with the level of intensity increasing as one travels south towards the Airport Rotary.

### **Willow St/Yarmouth Road**

Willow Street runs north-south from Route 6A in the north in the Town of Yarmouth to the Barnstable Town Line. In Barnstable, the road is called Yarmouth Road, and it continues south to intersect with Route 28/Iyannough Road and ends at Main Street in Downtown Hyannis. The entire stretch of the road is generally a two-lane undivided highway. As part of the on-going Willow Street reconstruction project, the road is being widened to four lanes between Route 6 and the Barnstable Town Line. In Yarmouth, land use along Willow Street is mostly residential with some commercial land uses around Exit 7. Further south, especially in the Town of Barnstable, Yarmouth Road goes through intense commercial land uses.

### **Route 6A**

Route 6A is an historic highway that traverses the mid-Cape region parallel to Route 6, similar to Route 28. The study area includes the section of Route 6A between Route 132 in the west and Willow Street in the east. In this section, Route 6A is a two-lane undivided highway with 11 foot lanes and minimal shoulders. Route 6A has several steep horizontal curves resulting in limited sight distance at many of the intersections. The land use along Route 6A is a mixture of residential and commercial, with several historic structures along it.

**Phinney's Lane**

Phinney's Lane is a north-south street and it extends from Route 28/Falmouth Road in the south, intersects Route 132, continues under Route 6 and terminates at the intersection with Hyannis Road. Phinney's Lane is a two-lane road. Land use is mostly residential with some commercial land uses in the vicinity of Route 132 and Attucks Lane.

**Bearse's Way**

Bearse's Way begins at Route 132 and travels south towards Hyannis Downtown after crossing Route 28. It is a two-lane road, with major industrial/commercial land uses between Route 132 and Route 28. South of Route 28, Bearse's Way has mostly residential land uses along it.

**Independence Drive**

Independence Drive provides access between Route 132 and the Industrial Park area in the Town of Barnstable and connects Route 132 to Mary Dunn Road. It is four-lane divided road. It has a wide median between Attucks Lane and Mary Dunn Road. Land use is mostly commercial/industrial.

**Mary Dunn Road**

Mary Dunn Road runs from Route 6A in the north, proceeds under Route 6 and terminates near Mary Dunn Pond in the south. It is two lane undivided road with mostly residential land use, except near Independence Drive where the land use is commercial.

**2.1.2 Intersections**

After reviewing the study area network and prior studies conducted in the area, a total of 21 intersections (including the Airport Rotary) were identified as the set of study intersections. These intersections are described below.

**Airport Rotary**

The Airport Rotary is one of the most important study locations. It is at the junction of three major roads within the study area: Route 132, Route 28 and Barnstable Road. The existing rotary has five approaches consisting of Route 132 to the northwest, Route 28 to the east and west, Barnstable Road to the south and Airport Road to the north. Both Route 132 and Barnstable Road are two lane approaches while the remaining three approaches all have one lane. All approaches have a center channelizing island. The rotary is roughly 300 feet in diameter with the circulating road width enough for two lanes (however, the rotary is not currently striped for two lanes). There are YIELD signs posted on all approaches. The land use north of the rotary is the Barnstable Airport. Between the Rte 28 approach to the east and Barnstable Road to the south, there is a Citizen's Bank.

**Route 132 at Route 6 Westbound Ramps**

This is a signalized intersection. Under the proposed Route 132 reconstruction project, additional lanes will be provided at this intersection. The Route 132 northbound approach will have an exclusive left turn lane into the rest area and two general purpose lanes. An additional free right turning lane will be provided onto the Route 6 westbound on-ramp. Route 132 southbound approach will also have an exclusive left turning lane and two general purpose lanes. The Route 6 westbound off-ramp will have two lanes and an additional free right turning lane under YIELD control. The driveway from the rest area will be stripped for two lanes. All the lanes will be 12 feet wide. The traffic signal system will be fully actuated with four phases. The phases will consist of lead protected left turn phases for Route 132, following by the mainline through-right. Separate phases will be provided by the Route 6 westbound off-ramp and the driveway approaches. The traffic signal at this intersection will be coordinated with others along Route 132.

**Route 132 at Route 6 Eastbound Ramps**

Currently this intersection is unsignalized under STOP control. As part of the Route 132 reconstruction, this intersection will be signalized and improved. The Route 132 northbound approach will have two lanes and an additional free right turn lane. The southbound approach will have two through lanes and an exclusive left turning lane. A pedestrian cross walk will be provided across the off-ramp approach. The Route 6 eastbound off-ramp will have one lane and an exclusive right turning lane under YIELD control. All lanes will be 12 feet wide. The signal will be fully-actuated with a 3-phase system consisting of a southbound protected left turn lead, following by the mainline phase with concurrent pedestrian phase, and the phase for the Route 6 eastbound off-ramp. This signal will be within a coordinated signal system along Route 132.

**Route 132 at Shoot Flying Hill Road**

Currently Shootflying Hill Road intersects Route 132 just south of the intersection with the Route 6 eastbound ramps. As part of the Route 132 reconstruction project, Shootflying Hill Road will be relocated parallel to Route 132 to intersect first with the existing Huckins Neck Road before intersecting with Route 132 at a signalized intersection. This intersection would also include the driveway to the Golf Course. Both approaches on Route 132 will have an exclusive left turn lane and two general purpose lanes. The Shootflying Hill Road approach will have two lanes including an exclusive left turn lane. The Golf Course driveway will have one lane. A pedestrian cross walk will be provided across the Shootflying Hill Road approach. The signal system will have a 3-phase system with a Route 132 lead green followed by the mainline green with concurrent pedestrian phase and finally the side street phase. This intersection will be coordinated with the adjacent signals.

**Route 132 at Attucks Lane**

This intersection is currently unsignalized with Attucks Lane under STOP sign control. The land uses are not dense adjacent to the intersection. As part of the Route 132 reconstruction project, this intersection will be signalized. The Route 132 southbound approach will have two through lanes and an exclusive left turn only lane. The northbound approach will also have an exclusive left turn lane for U-turns in addition to the two through lanes. Attucks Lane will have three approach lanes comprised of two exclusive right turn lanes and one exclusive left turn lane. The new traffic signal system will be a 3-phase system including protected left turns from Route 132 southbound onto Attucks Lane.

**Route 132 at Phinney's Lane**

As part of the Route 132 reconstruction project, this intersection will have exclusive left turn lanes and two general purpose lanes on Route 132, and left, through and right lanes on both approaches of Phinney's Lane. Pedestrian crosswalks will be provided across Route 132 north of the intersection and across Phinney's Lane west of the intersection. There will be a 4-phase signal system with protected lead left turn phasing on all four approaches. The mainline phases will have concurrent pedestrian phases. The signal at this intersection will be coordinated with the adjacent signal at Route 132 and Bearse's Way, and with the intersection of Phinney's Lane and Attucks Lane.

**Route 132 at Bearse's Way**

This is a signalized intersection with exclusive left turn lanes and two general purpose lanes on Route 132. The Route 132 southbound approach has an additional free right turning lane onto Bearse's Way. The Bearse's Way eastbound approach has three lanes consisting of an exclusive left turn lane, a left-through lane and an exclusive right turning lane. The westbound approach has an exclusive left and a general purpose lane. There are pedestrian crosswalks on the north side and west side of the intersection. The signal system has 4 phases, with lead protected left turn phases for Route 132. The side street phases are split between Bearse's Way and the driveway to the east. The pedestrian phases occur concurrently with the Route 132 mainline phase and the phase for Bearse's Way.

**Route 132 at Independence Drive/Enterprise Road**

At this signalized intersection, the Route 132 northbound approach has two general purpose lanes. The Route 132 southbound approach has two general purpose lanes and an exclusive right turning lane. Enterprise Road approach has a left, through and right lane, while Independence Drive has an exclusive left and a through-right lane. There are pedestrian crosswalks on the north and west sides of the intersection. This intersection has a 3-phase signal with permitted left turns for Route 132, and a protected left turning phase for Independence Drive and Enterprise Road.

**Route 28 at Bearse's Way**

This intersection is being reconstructed as part of a MassHighway project on Bearse's Way. After reconstruction, the Route 28 approaches will have exclusive left turn lanes and two general purpose lanes. The Bearse's Way southbound approach will have an exclusive left, through and an exclusive right turn lane. The northbound approach will have an exclusive left and a through-right lane. There are no sidewalks and crosswalks at this intersection. The traffic signal will have 4 phases with protected lead left turn phases on Route 28 as well as on Bearse's Way.

**Bearse's Way at Enterprise Road**

As part of the MassHighway Bearse's Way project, this intersection will be signalized (currently it is unsignalized). Bearse's Way southbound will have an exclusive left lane and a through lane. The northbound approach will have a through lane and an exclusive right turn lane. Enterprise Road will have exclusive left and right turning lanes. Sidewalks and crosswalks will be provided on the east side along Bearse's Way. There will be a 3-phase signal system with a lead left turn phase for Bearse's way. The pedestrian phase will be concurrent with the Bearse's Way through phase.

**Willow Street at Route 6 Westbound Ramps**

As part of the ongoing Willow Street reconstruction project, this intersection will be signalized. The Willow Street approaches will be provided with two general purpose lanes. In addition the northbound approach will also have an exclusive right turn lane under YIELD control. The Route 6 westbound off-ramp will have two left turning lanes and an exclusive right turning lane under YIELD control. No sidewalks or crosswalks would exist at this intersection. The signal system would have 3-phases with a lead green phase for Willow Street southbound.

**Willow Street at Route 6 Eastbound Ramps**

Similar to the above intersections, this intersection will be signalized. The Willow Street approaches will be provided with two general purpose lanes. In addition the northbound approach will also have an exclusive right turn lane under YIELD control. The Route 6 eastbound off-ramp will have two left turning lanes and an exclusive right turning lane under YIELD control. No sidewalks or crosswalks would exist at this intersection. The signal system would have 3-phases with a lead green phase for Willow Street southbound.

**Route 28 at Yarmouth Road**

This intersection is currently being studied by the Town of Barnstable. At this time, at this signalized intersection, there are two lanes on the Route 28 approaches. The eastbound approach has an additional exclusive left turning lane. Both the Yarmouth Road approaches have two lanes. The northbound approach has an exclusive left and a through-right lane while the southbound approach has a left-through and exclusive right turn lane. Left turns from Route 28 westbound are currently prohibited. Presently the signal has 3 phases with a left protected left turn phase for Route 28 eastbound.

**Route 28 at East Main Street**

This intersection is within the Town of Yarmouth. Left turns from East Main Street onto Route 28 westbound cannot be made. All traffic on East Main Street joins Route 28 eastbound. This intersection is signalized with a simple two phase signal allowing for left turns from Route 28 westbound approach onto East Main Street. There are two lanes on all the three approaches. On Route 28 westbound, one of the two lanes is exclusively for left turning traffic. On Route 28 eastbound, there is an exclusive lane for right turning traffic.

**Route 6A at Hyannis Road/Millway**

This is the only signalized intersection on Route 6A within the study area. All approaches at this intersection have one general purpose lane. The signal is a simple two-phase signal system with permitted left turns on all four approaches.

**Route 6A at Route 132/Oak Street (2 intersections)**

The intersection of Route 6A at Route 132 is about 50 feet north of the Route 132 at Oak Street intersection. Route 132 at Route 6A is under STOP control, while Oak Street at Route 132 is under STOP control.

**Route 6A at Mary Dunn Road/Indian Trail Road**

This intersection is unsignalized with STOP sign control on Mary Dunn Road and on Indian Trail Road.

**Route 6A at Willow Street/Mill Lane (2 intersections)**

The Route 6A at Willow Street intersection is about 50 feet east of the Route 6A at Mill Lane intersection. Both Willow Street and Mill Lane are unsignalized and operate under STOP control.

**Mary Dunn Road at Independence Drive**

At this unsignalized intersection, Independence Drive is under STOP control.

**2.1.3 2006 Traffic Data Collection and Volumes**

A large amount of data is required for a planning study, in particular to support the development of the study's travel demand model.

A travel demand model is an important tool for planning studies, and required by the Federal Highway Administration. A travel demand model depicts the transportation network in a given area for a specified time period. It is used to better understand current travel patterns and the potential patterns of a future year. For our study, the current or "base" year was set to 2006, since that is when the study started and a large amount of data for that year was available. The model is calibrated to the base year and the outputs of the model are compared to actual traffic counts and other data to confirm that the model accurately represents reality. Once the model has been adjusted and calibrated to accurately reflect current conditions, it is developed for a future year. This is done using population, employment, and economic development projections that have been determined through a collaborative process with the state, the regional planning agencies and the local officials. The future year model is called the "no-build" because it does not contain the alternatives that are to be considered as part of the study. It does contain projects which are committed and expected to be completed by the future year. Therefore, the no-build reflects the future year transportation network with the additional traffic that comes from population growth and economic development. For our study, the no-build year was set to 2030, approximately 25 years from the present. This standard timeframe is chosen because significant roadway improvements should be designed to operate effectively well for at least that long. Of course, planners and designers hope that the improvements will serve their purposes well beyond 2030. However, the model depends on population and employment projections which become increasingly uncertain after 25 years. Once the no-build model is developed, the "build" alternatives are programmed into it to gauge how travel patterns may change. In this way, the future transportation network and traffic loads without the alternatives (the no-build) can be compared to the network with the alternatives (the build) and to the base case. This is a powerful tool which helps planners determine and compare the relative effectiveness of various transportation improvements.<sup>1</sup>

The first purpose of traffic data collection task is to determine the appropriate time period for travel demand modeling. The following paragraphs and figures outline the decision to select the weekday PM peak period for analysis and modeling. Existing data from MassHighway's continuous count stations in the area were used, as were counts collected by the Cape Cod Commission.

---

<sup>1</sup> The Travel Demand Model is discussed in more detail in Appendix 3.

Figure 2-2 shows the seasonal variation in traffic on Route 6 based upon the data at the MassHighway continuous count station east of Route 149. Volumes on Route 6 are a good indication of the general magnitude of traffic and traffic trends in the area. Based upon data from 2001 through 2005, volumes vary from about 40,000 vehicles a day (in both directions) in January to a high of about 75,000 vehicles a day in July and August. The summer is the appropriate time period for the development and analysis of potential improvements. Otherwise, improvements may fall short of meeting the demand during these important travel months.

Figure 2-2: Seasonal Traffic Variation on Route 6 East of Route 149

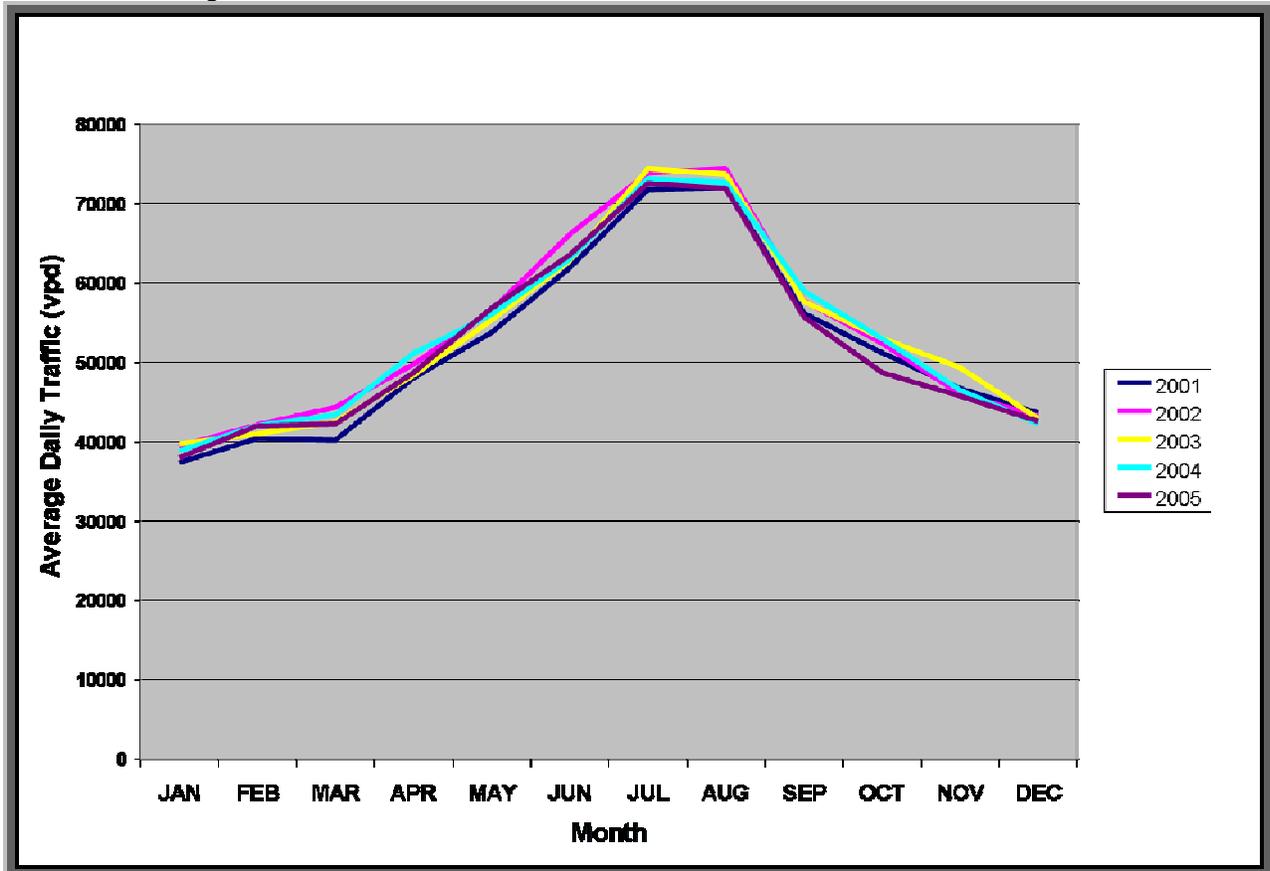
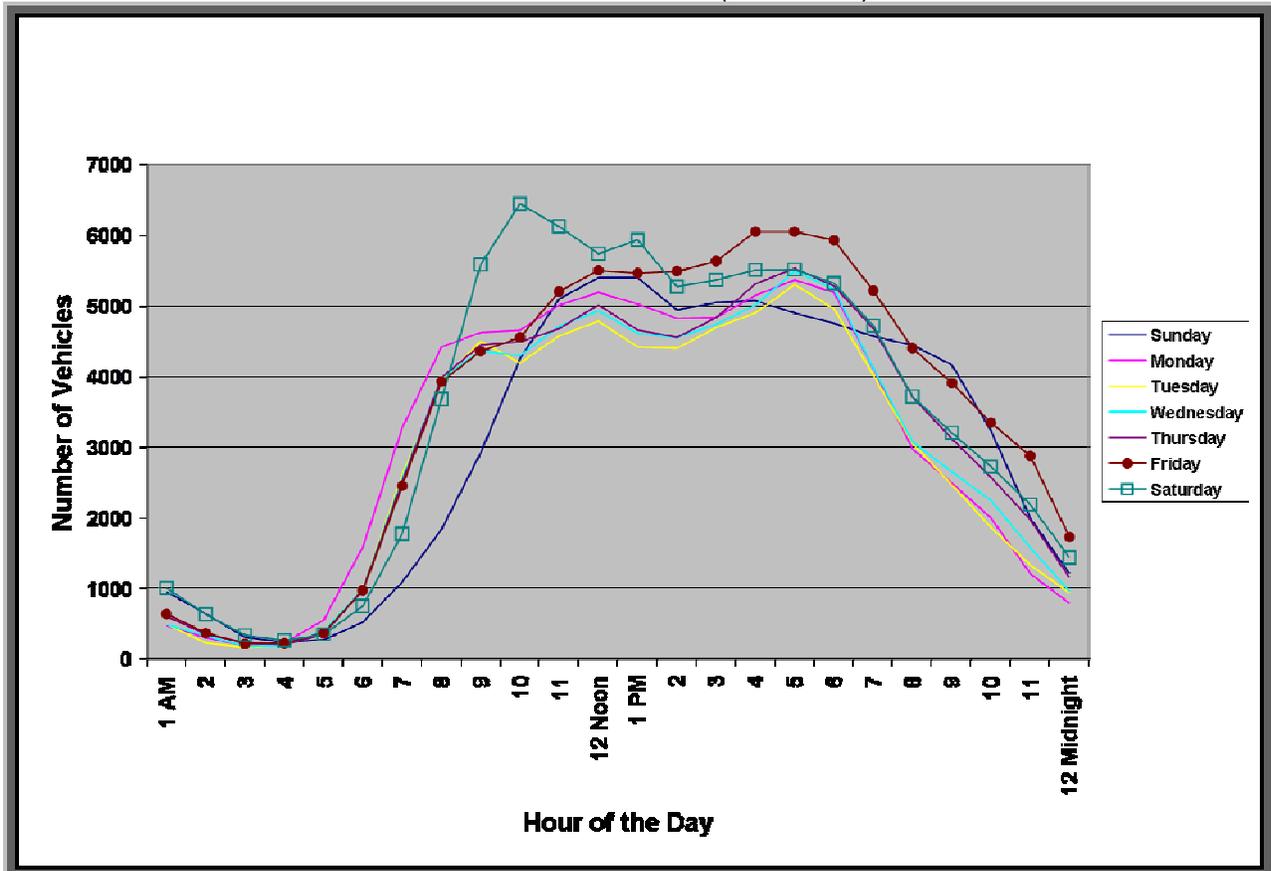


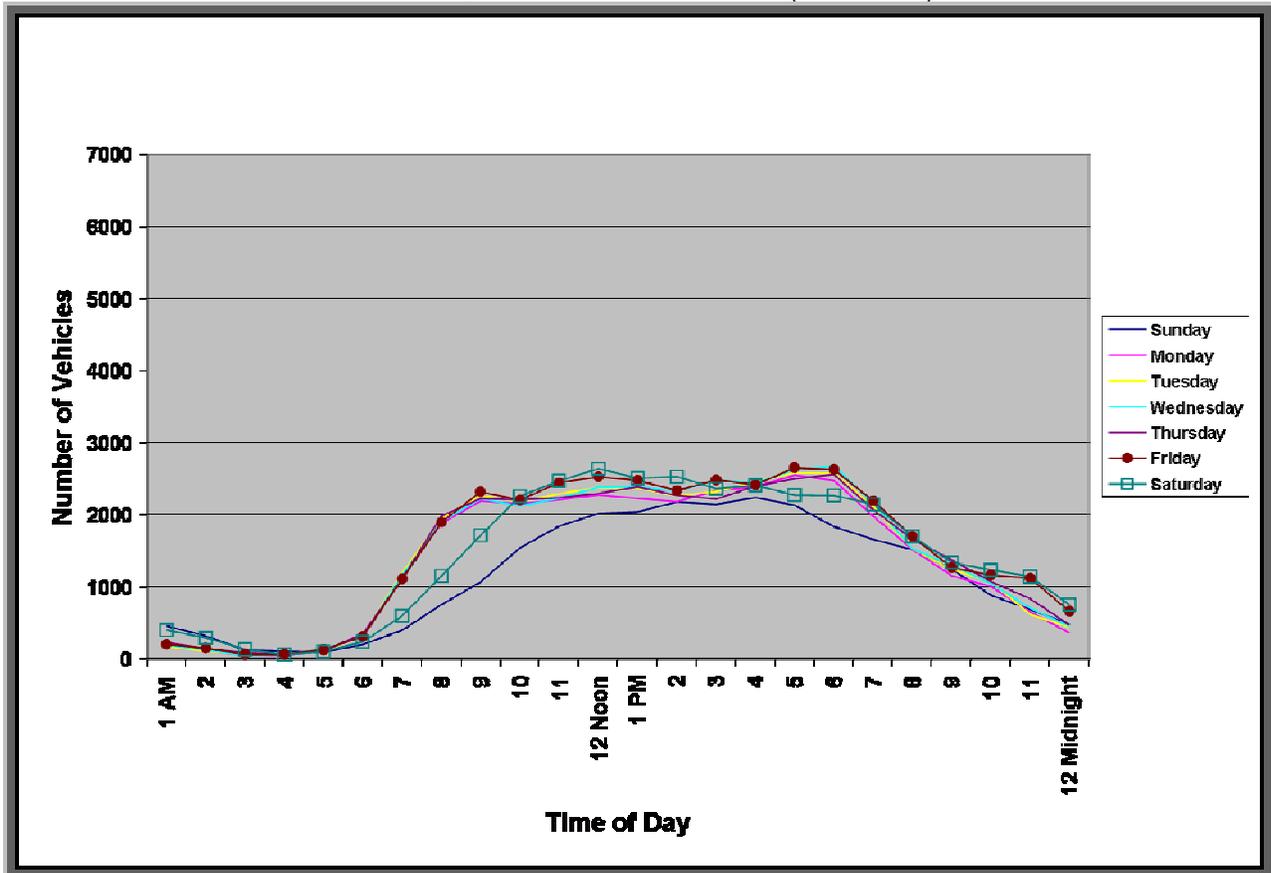
Figure 2-3 shows the variations in traffic on Route 6 east of Route 149 on an hourly basis during a typical summer week in 2005. The graph shows that the Route 6 Saturday midday peak hour volumes are higher than any peak hour volumes on any day during a typical summer month, followed by the weekday PM peak hour.

Figure 2-3: Hourly Traffic Variation During a Typical Summer Week  
Route 6 East of Route 149 (2005 Data)



Hourly variations on Route 28 are depicted in Figure 2-4, which shows that the volumes during the weekday PM peak hour during a typical summer week are similar or marginally higher than the Saturday midday peak hour.

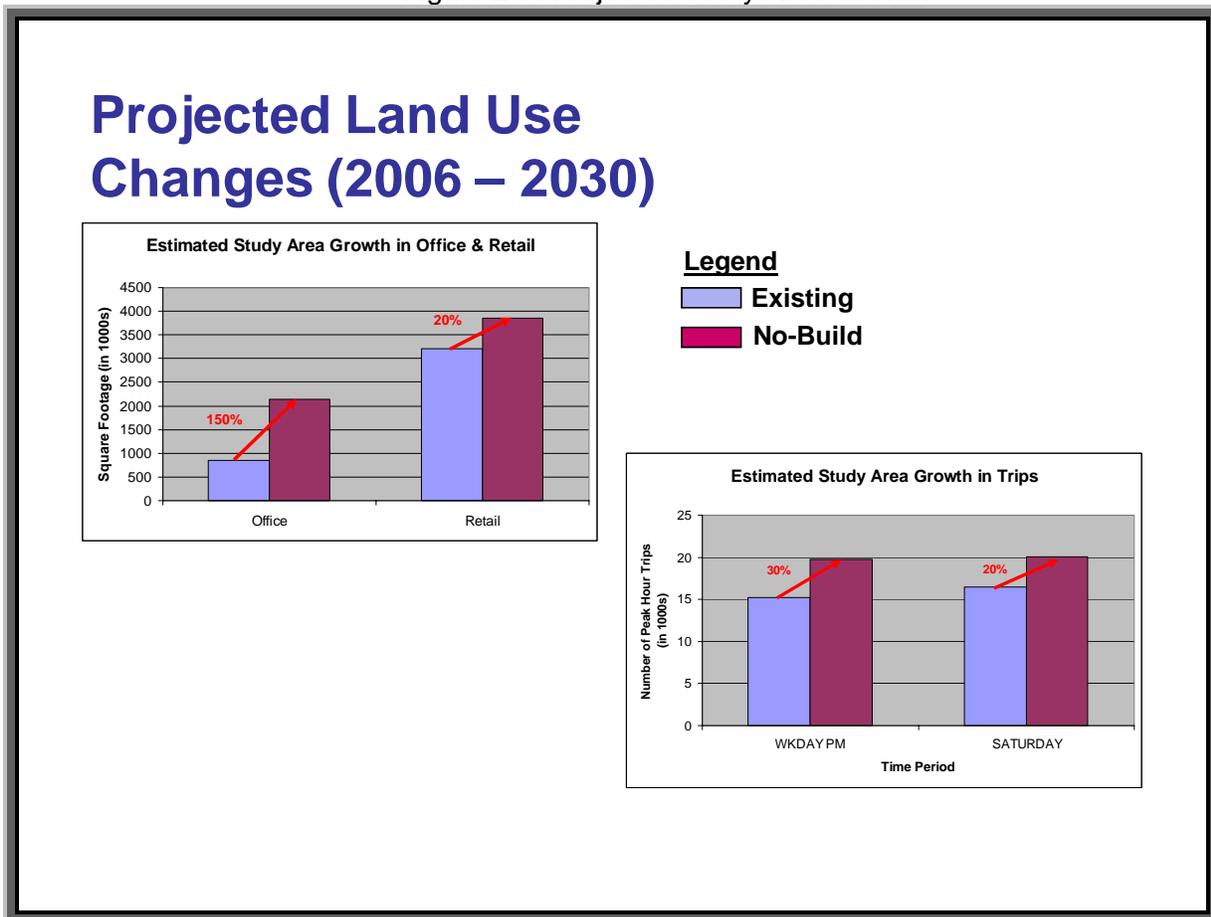
Figure 2-4: Hourly Traffic Variation During a Typical Summer Week On Route 28, West of Old Post Road (2005 data)



Since the alternatives are to be analyzed in the future year travel demand model, it is important to understand what the peak period is expected to be in the future year as well as what it is today.

The figure below shows the estimated study area growth in office and retail. This was done to estimate whether the future peak period would continue to be the Saturday mid-day time period as it is now, or whether it would shift to the weekday. The figure below also shows the estimated study area growth in trips in both the weekday PM and Saturday time periods. The growth in office space, which typically generates more weekday traffic, is expected to be approximately 150% whereas the growth in retail is expected to be about 20%. *Based on the information above and below, the technical team determined that it would be most appropriate to select the weekday PM peak period for the modeling period.*

Figure 2-5: Projected Study Area Growth



Once the appropriate modeling period was selected, existing counts could be collected and new counts could be conducted to support the development and calibration of the travel demand model.

Several existing data sources and recent studies were used for the traffic counts they contained, including the MassHighway **Traffic Volumes** publication, the Growth Incentive Zone application, the Barnstable Airport Improvement Project Development of Regional Impact application, and the Cape Cod Commission’s historic traffic count database. These counts were augmented with 33 new automatic traffic recorder counts for a 6-day period and 14 manual

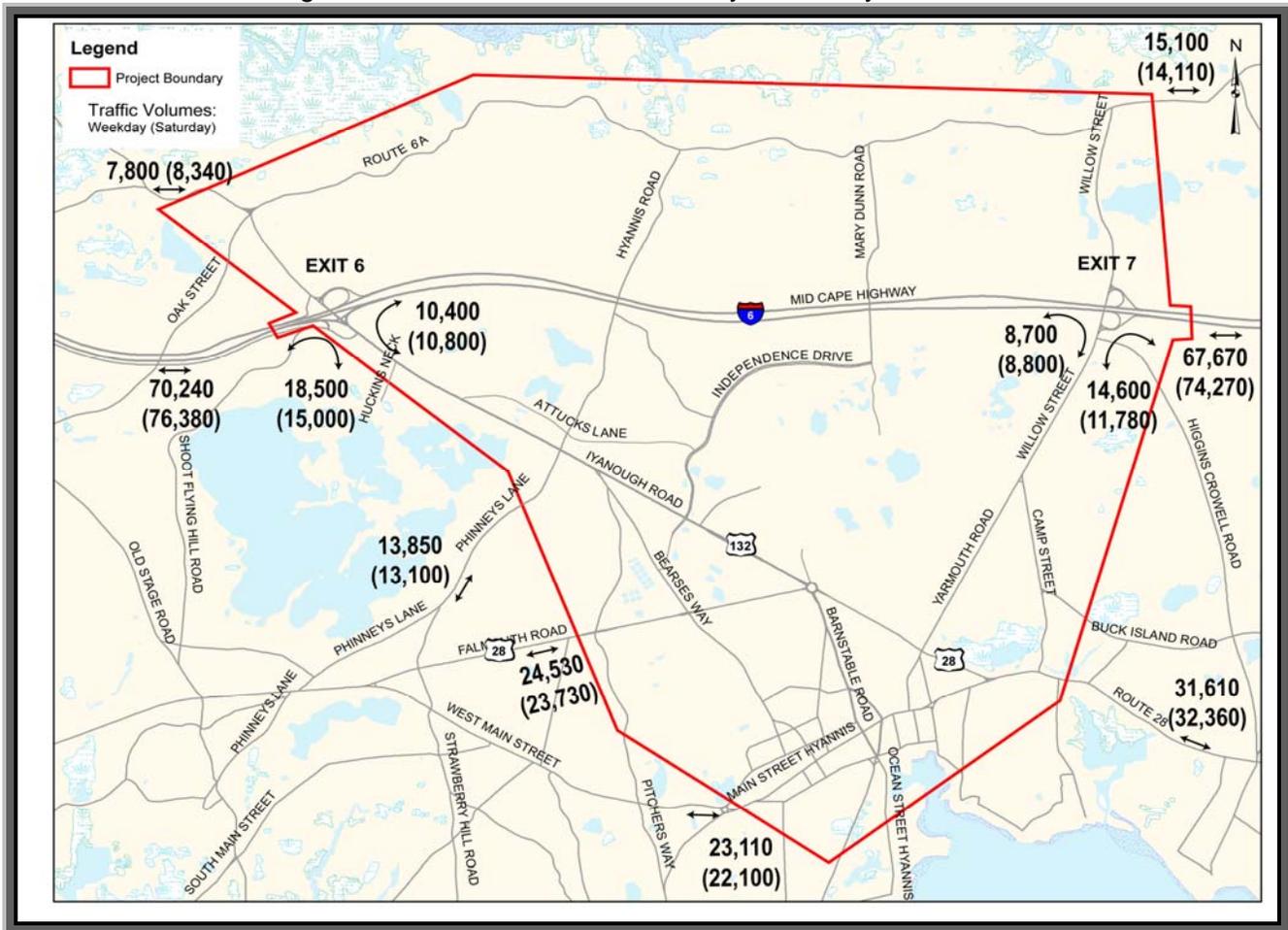
turning movement counts. These counts were taken in the height of the summer in 2006 to represent the busiest time period in the Hyannis area. Using these counts, the Hyannis Access Study travel demand model was calibrated for the base year of 2006 for the weekday PM peak period. The following information was gleaned from the base year model. The counts are tabulated in Appendix 4.

The 2006 summer weekday and Saturday ADT volumes on the major roads entering/exiting the study area are displayed graphically in Figure 2-6. The summer weekday ADT on Route 6 is approximately 69,000 vehicles per day (vpd) and approximately 76,000 vpd during a summer Saturday. Roughly 28,900 vehicles per day use Exit 6 to enter/exit the study area on a summer weekday and 25,800 during a summer Saturday. About 23,300 vpd use Exit 7 to enter/exit the study area on a weekday and 20,600 during a Saturday in summer. This indicates that - using Route 6 - a total of about 52,200 vpd travel to and from the study area on a summer weekday and 46,400 vpd travel to and from the study area on a summer Saturday.

Phinney's Lane, Route 28 and West Main Street carry a higher level of traffic into the study area than Route 6 does.

About 32,000 vpd during Saturdays and weekdays enter/exit the study area using Route 28 at the Yarmouth/Barnstable Town Line. At the western side of the study area, Route 28 serves 25,000 vpd on a weekday and 24,000 vpd during a Saturday. All of the traffic that enters/exits on Route 28 at either end of the study area is not destined into the study area. There is likely a significant portion that can be considered as "through" trips, those who do not originate or are destined to within the study area but merely pass through. Finally, another important number to note is the level of traffic on Phinney's Lane south of Route 132 at approximately 14,000 vpd on a weekday and 13,000 vpd on a Saturday. It can be surmised that most of the traffic on Phinney's Lane as well as that on West Main Street originated from Route 28. If one were to add up the volumes on Phinney's Lane, Route 28 and West Main Street and account for through traffic on Route 28, it would indicate that Route 28 carries a higher level of traffic that originates/destined to within the study area than Route 6 does. This is an important point to keep in mind while developing alternatives to improve transportation access to the study area.

Figure 2-6: 2006 Summer ADT Study area entry/exit volumes



Figures 2-7, 2-8, and 2-9 show the peak hour volumes at several key intersections in the study area. These results are from the manual turning movement counts described above. Both the summer weekday PM and the summer Saturday midday are shown.

Traffic from Willow Street and Route 6 destined towards the Cape Cod Mall overlaps with traffic from Yarmouth and points east resulting in very heavy traffic on the section of Route 28 between the Airport Rotary and Yarmouth Road.

Looking closely at the turning movement volumes, two sections are identified to have the highest volumes. Route 132 (Iyannough Road) between Phinney's Lane and Bearses Way has the highest level of traffic. A similarly high level of traffic exists on Route 28 (Iyannough Road) between the Airport Rotary and Yarmouth Road. A significant amount of traffic from the west and south use Phinney's Lane to access Route 132 and points north in the Industrial Park area. There is also a large number of vehicles from points west on Route 132 that use Bearses Way to access the Hyannis Downtown and the waterfront. These two major moves overlap on top of the heavy through move on Route 132 causing the section between Phinney's Lane and Bearses Way to have the heaviest traffic volumes during a summer Saturday midday peak

hour. Traffic from Willow Street and Route 6 destined towards the Cape Cod Mall overlap with the Route 28 traffic from Yarmouth and points east on the section of Route 28 between the Airport rotary and Yarmouth Road resulting in very heavy traffic.

Figure 2-7: 2006 Summer Weekday PM Peak Hour Volumes Comparisons  
Route 28 between Yarmouth Road and East Main Street

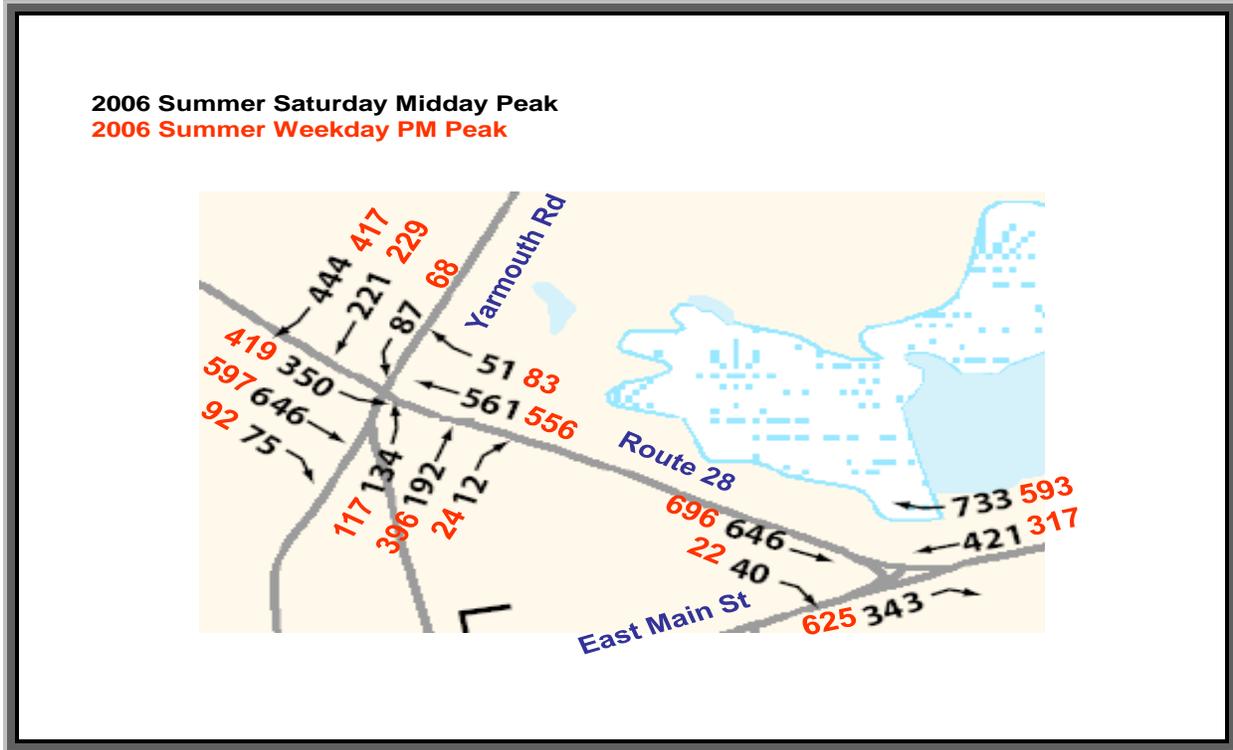


Figure 2-8: 2006 Summer Weekday PM Peak Hour Volumes Comparisons at the Rotary

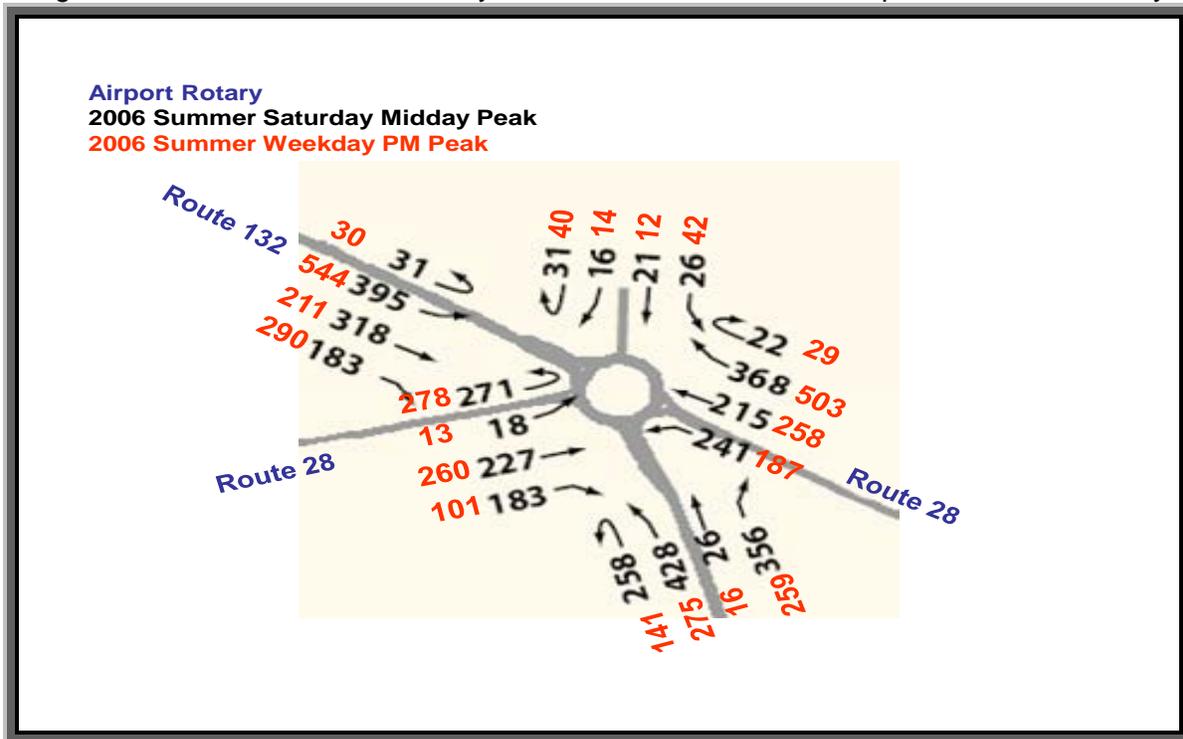
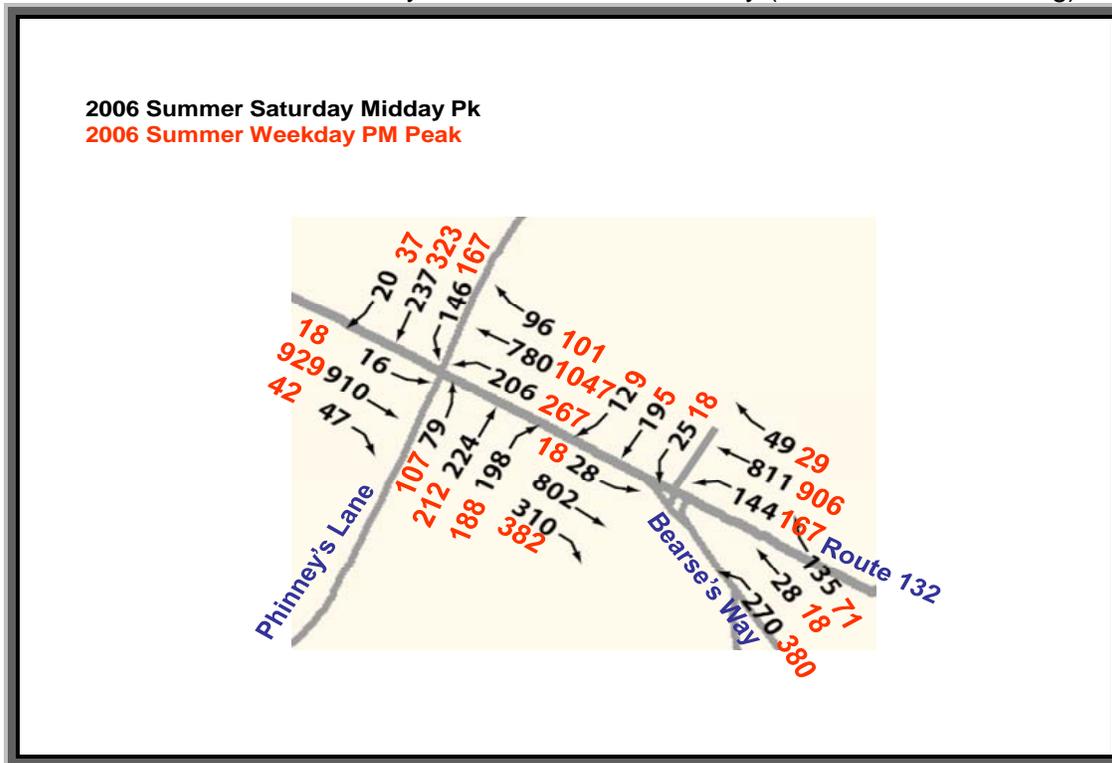


Figure 2-9: 2006 Summer Weekday PM Peak Hour Volumes Comparisons Route 132 between Phinney's Lane and Bearse's Way (Post Rt. 132 Widening)



#### 2.1.4 Level of Service Analysis

The data collection effort described above also supports the level of service analyses that were performed to determine how the intersections and the Airport Rotary currently operate in the study area. In addition, the on- and off-ramps on Route 6 at Exits 6 and 7 were also analyzed. The analyses were conducted using the Synchro software for all of the signalized and unsignalized intersections, the SIDRA software for the Airport rotary, and the HCS 2000 for all ramp junctions. While the Synchro software implements procedures presented in the Highway Capacity Manual 2000 (HCM), the SIDRA software implements a widely accepted procedure for the analysis of roundabouts. Level of service analysis generally provides important pieces of information that measure the operational effectiveness of an intersection, rotary or roadway segment: density in terms of number of vehicles per mile per lane, volume to capacity (v/c) ratio, delay, average and 95<sup>th</sup> percentile queue lengths, and level-of-service (LOS). Volume represents the travel demand and capacity represents the amount of traffic the roadway or facility can accommodate under prevailing conditions. Thus, the v/c ratio for a roadway segment is a reflection of how the facility is accommodating the demand. Volume to capacity ratio that approaches or exceeds 1.0 indicates traffic congestion or poor operating condition.

Level-of-service (LOS) is a term used to denote different operating conditions that occur at a given intersection or roadway segment under various traffic volume loads. It is a qualitative measure of the effect of a number of factors including intersection geometrics, speed, travel delay, freedom to maneuver, and safety. The LOS at an intersection is divided into a range of six letter grades, ranging from A to F, with A being the best and F the worst. LOS A-D is considered “acceptable”.

LOS designation is reported differently for signalized and unsignalized intersections. For signalized intersections, it is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, LOS criteria are quantified in terms of average control delay per vehicle for the peak hour, which is reported for the entire intersection and by lane or lane group approach.

For unsignalized intersections, the analysis assumes that the traffic on the mainline is not affected by traffic on the side street. The LOS for each movement is calculated by determining the length of gaps that are available in the conflicting traffic stream. Based upon the length of the gaps between vehicles, the capacity of the movement can be calculated. The demand of the movement is then compared to the capacity and utilized to determine the average control delay for the movement. For unsignalized intersections, an overall intersection LOS is not determined. It is generally reported in terms of delay for left-turns on the mainline, as well as all side street movements.

The delay ranges differ slightly between unsignalized and signalized intersections due to driver expectations and behavior for each LOS. Table 2-1 summarizes the LOS criteria.

Table 2-1  
Level-of-Service Criteria for Intersections

| Level-of-Service (LOS) | Signalized Intersection Control Delay (sec/veh) | Unsignalized Intersection Control Delay (sec/veh) |
|------------------------|---|---|
| A                      | 0-10  | 0-10  |
| B                      | >10-20  | > 10-15   |
| C                      | >20-35  | >15-25  |
| D                      | >35-55  | >25-35  |
| E                      | >55-80  | >35-50  |
| F                      | >80   | >50   |

Source: 2000 Highway Capacity Manual (Special Report 209)

Similar to unsignalized intersections, the rotary operations analysis is based primarily on the delay for vehicles entering the rotary. As traffic entering the rotary is required to yield to traffic in the rotary, delay is based on the driver’s ability to find acceptable gaps and safely merge into the rotary traffic.

Level of service analysis at the ramp merge and diverge points are based upon the density of vehicles upstream of the merge and downstream of the diverge points. Table 2-4 summarizes the LOS criteria.

Table 2-2  
Level-of-Service Criteria for Ramp Junctions

| Level-of-Service (LOS) | Density (pass cars/mile/lane) |
|------------------------|-------------------------------|
| A                      | 0-10                          |
| B                      | >10-20                        |
| C                      | >20-28                        |
| D                      | >28-35                        |
| E                      | >35                           |
| F                      | Demand Exceeds Capacity       |

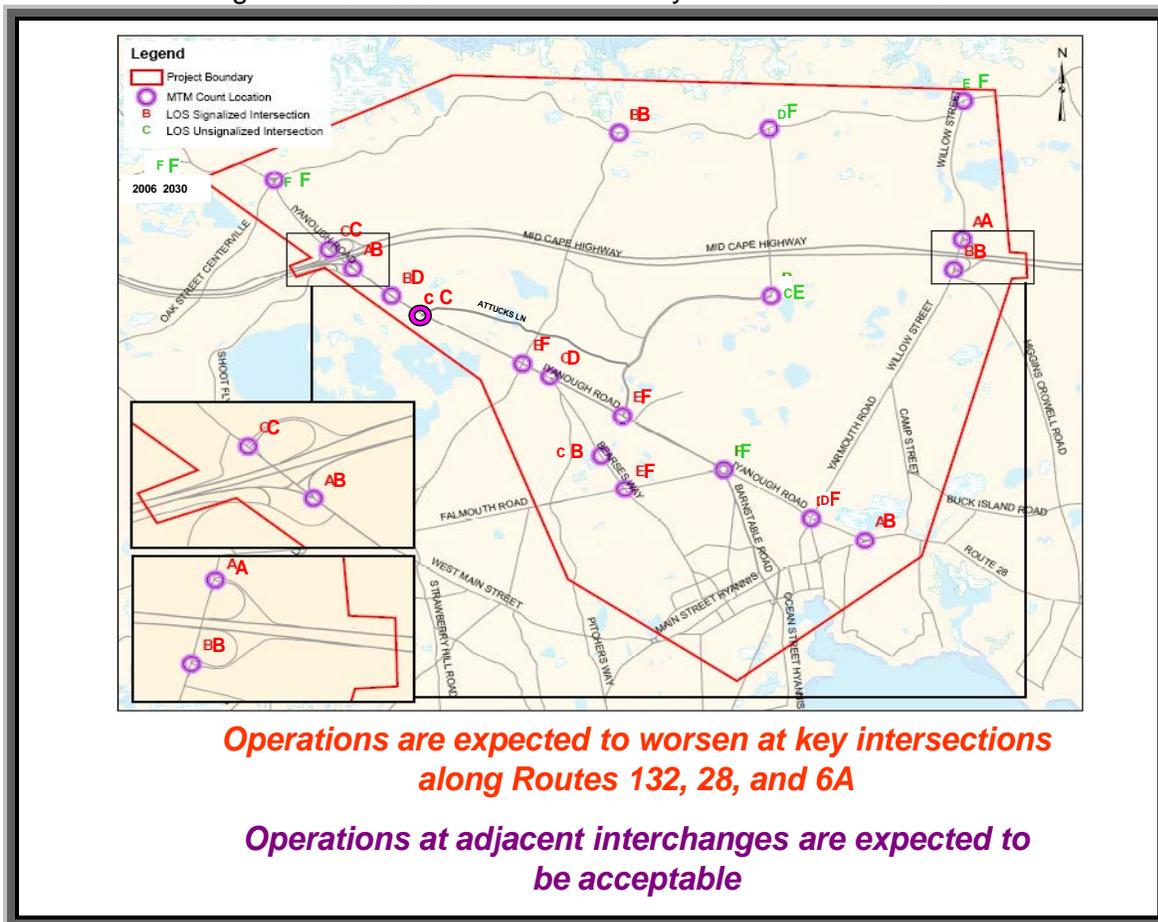
Source: 2000 Highway Capacity Manual (Special Report 209)

The level of service analyses were performed for the 2006 summer weekday PM peak hour for all of the 18 study intersections including the Airport Rotary as well as the ramp junctions on Route 6. Figure 2-10 present the overall level of service at each location for the weekday PM peak hours. Further details of the results from the operations analysis at the Airport Rotary, signalized and unsignalized intersections are shown in Appendix 4 - Additional Traffic Information. Ramp junction analysis results are also shown in Appendix 4.

It is important to note that the analyses reflect the improvements proposed under the following on-going/imminent construction projects as if the projects were already complete:

- Route 132/Iyannough Road, Barnstable
- Willow Street, Yarmouth
- Bearse’s Way, Barnstable

Figure 2-10: 2006 Summer Weekday PM Peak Level of Service



The following describes five locations that were identified as locations that operate at a failing LOS (E or F) for the overall intersection.

- Route 132 at Phinney's Lane operates at LOS E during the summer Saturday midday peak hour and LOS F during the summer weekday PM peak hour. Further, the Route 132 northbound left turns, as well as the left turns from Phinney's Lane in both directions, operate at LOS F. The Route 132 widening project will have brought significant improvements to this intersection, but it is still expected to operate poorly after construction. This is discussed in more detail in Appendix 4.
- Route 132 at Independence Drive operates at an overall LOS E during summer Saturday and LOS D during weekday PM peak hours, with several intersection movements either at LOS E or F.
- Route 28 at Bearse's Way operates at LOS E during the summer Saturday and LOS D during the weekday PM peak hours. Both the Bearses Way approaches have one of the moves operating at LOS E or LOS F during a summer Saturday midday peak hour.
- Route 28 at Yarmouth Road during weekday PM peak hours has both the Route 28 approaches at LOS E.

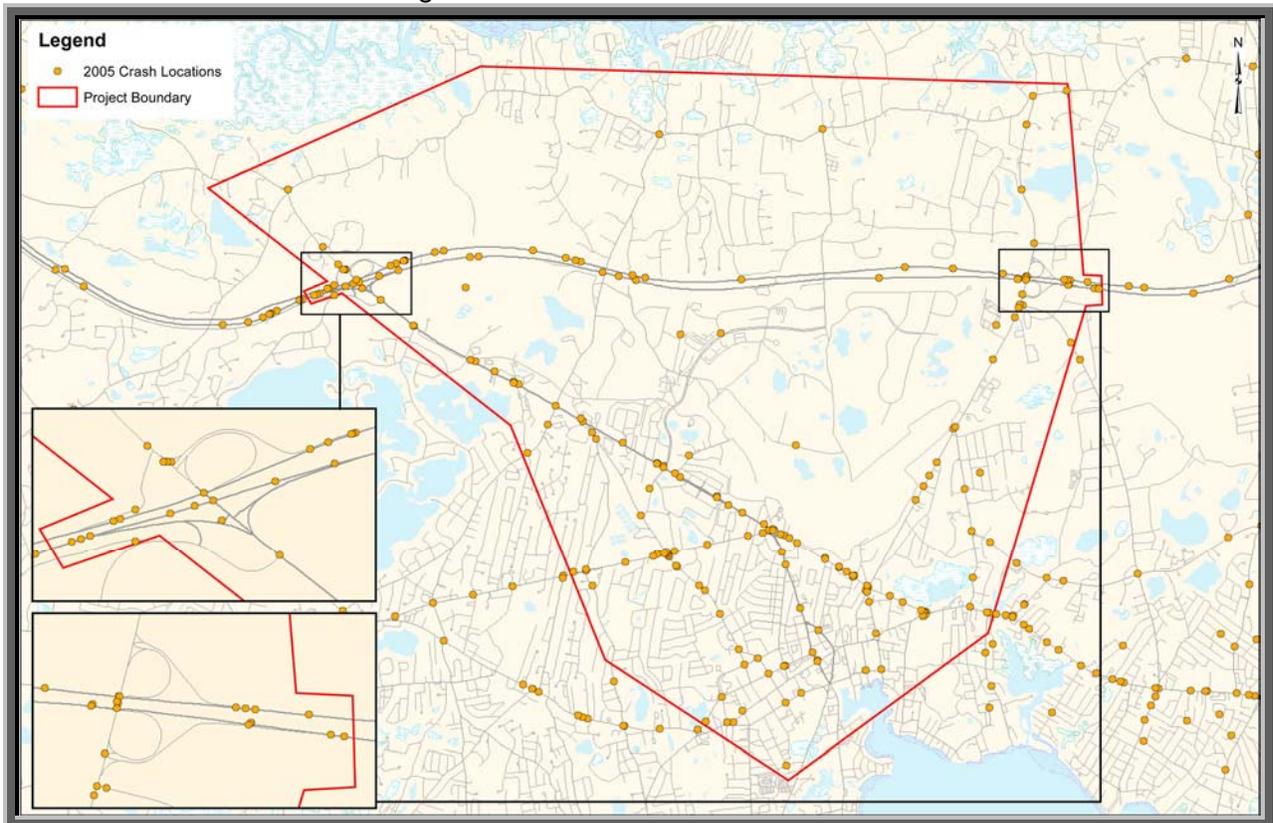
- Route 6A at Route 132 is an unsignalized intersection. Traffic on Route 132 faces inordinate delays when looking to make a left turn on to Route 6A and this intersection operates at LOS F.
- The Airport Rotary operates at LOS F. This is a critical location in the study area as poor operations and the resulting long queues at the rotary can extend and impact the operations of upstream intersections.

### 2.1.4 Crash Summary

Crash analysis was conducted for the study area. The crash data was obtained from the Massachusetts Highway Department for the three latest years available: 2002, 2003 and 2004.

As the crash data was provided for the entire Towns of Barnstable and Yarmouth, a detailed search was performed to extract all crashes in the vicinity of each of the study intersections as well as on Route 6. Figure 2-11 shows the crash locations in 2005, and Figure 2-12 shows the overall number of crashes at each study intersection over the three year period between 2003 and 2005.

Figure 2-11: Crash Locations 2005





## 2.2 Ongoing and Planned Roadway Projects

Transportation projects underway in the study area were reviewed for their characteristics, key issues, and expected benefits. Projects planned and committed to – such as the Attucks Lane extension and Route 28 widening - were also reviewed. This information provided an understanding of soon-to-be-complete improvements and helped the Task Force and the team identify gaps where improvements would likely still be needed. Other projects such as the Barnstable Municipal Airport Improvement Project and the Town of Barnstable Growth Incentive Zone (GIZ – described below in section 2.3) were also taken into consideration.

| <u>Existing Conditions</u>   | <u>Future Conditions – No-Build</u>  |
|--|--|
| <i>Projects included:</i> <ul style="list-style-type: none"><li>• Route 132 widening</li><li>• Willow St widening</li><li>• Bearses Way reconstruction</li></ul> | <i>Projects included:</i> <ul style="list-style-type: none"><li>• Route 28 – 4 lanes between Rotary and Yarmouth Rd</li><li>• Attucks Ln extension to Airport Rd</li></ul> |
| <i>Other assumptions:</i> <ul style="list-style-type: none"><li>• Year 2006</li></ul>  | <i>Other assumptions:</i> <ul style="list-style-type: none"><li>• Year 2030</li></ul>  |

The Bearses Way project involved the reconstruction of 4,300 feet of Bearses Way from Route 28 to Pitcher’s Way. The intersection with Enterprise Road has been signalized, sidewalks provided on the eastern side, bicycle accommodations have been added, and exclusive turning lanes at Enterprise Road and Route 28 have been added. This project was completed in July of 2007. In addition to improving travel between Route 132 and Route 28, this project will improve access to the mall and downtown Hyannis. The southern portion of Bearses Way, south of Route 28, was not addressed as part of this project. However, the Town of Barnstable has given some consideration to redesigning the intersection at the Kennedy Rink, which is along Bearses Way south of Route 28.

Congestion to Route 28 south of the Willow Street project was frequently a subject of Task Force discussion and identified as a key issue in the goals and objectives discussed in Chapter 1. Therefore, the study developed alternatives to address congestion south of the project through intersection improvements at Route 28, as discussed in Chapter 3.

The Willow Street project involved the reconstruction of one mile of Willow Street in Yarmouth, from 400 feet north of Exit 7 off of Route 6 to just north of the Barnstable town line. Willow Street in Yarmouth becomes Yarmouth Road at the Barnstable town line, then extends to Route 28 and to Main Street in Hyannis. Together, Willow Street and Yarmouth Road form a vital

corridor to downtown Hyannis, the Cape Cod Hospital, and most of Hyannis. Historically, this corridor is often congested from Exit 7 all the way to Route 28. There have also been safety issues for the left-hand turn movements at the end of the exit ramps to head towards Hyannis. This project involved the reconstruction of Willow Street with turning lanes, ramp modifications, and the installation of a median. Oak Street has been realigned and traffic signals have been installed at the bottom of the Route 6 ramps and also at Higgins Crowell Road. This project was completed in April 2008. Congestion to Route 28 south of the Willow Street project was frequently a subject of Task Force discussion and identified as a key issue in the goals and objectives discussed in Chapter 1. Therefore, the study developed alternatives to address congestion south of the project through intersection improvements at Route 28, as discussed in Chapter 3.

The Route 132 project will widen two miles of Route 132 from two to four lanes, between Route 6 and Bearses Way. It will also include a number of intersection improvements, widened sidewalks, landscaping, and drainage and sewer improvements. The project is intended to benefit year-round residents as well as tourists by providing easier access to the employment hub in Hyannis. The key issues that this project is intended to address include the volume of traffic that uses the roadway as well as two high accident locations. The project includes three new signals (at Shootflying Hill Road, Huckins Neck, and the end of the Route 6 ramps), as well as two signal upgrades. There will be additional turning lanes at Phinney's Lane, shoulders will be added, the existing sidewalk will be widened. As a part of this project, the traffic signals on this stretch of Route 132 will be synchronized, which will improve and facilitate traffic flow. As of August 2008, this project was 60% complete with a scheduled completion date of January 2010.

### **2.3 Socioeconomic Conditions (Existing and Future Anticipated)**

An important goal of this study is to “maintain and enhance support for regional economic activity by strengthening transportation networks.” The section below provides current and projected figures on the key contributors to economic activity and traffic: population, employment and housing. The following sections cover the current economic activity centers and the economic development plans for the area.

In addition to providing a foundation for understanding the study area, this information is vital to the development of the travel demand model. Discussed above in the beginning of section 2.1.3, the travel demand model is the planners' tool for evaluating current and future conditions on the transportation network with and without various transportation improvements.

#### **2.3.1 Population, Employment, and Households**

For the Hyannis Access Study transportation planning model, EOTPW started with the Community and County population, employment, and household growth projections previously completed in a cooperative planning effort between EOTPW and the Cape Cod Commission. This previous effort was conducted to support the Federal mobile emission air quality planning programs.

This previous effort is known as a top down methodology. This forecasting process begins at the State level where population and employment growth is forecast based on national and historical trends, market conditions, and relationships between the number of households with

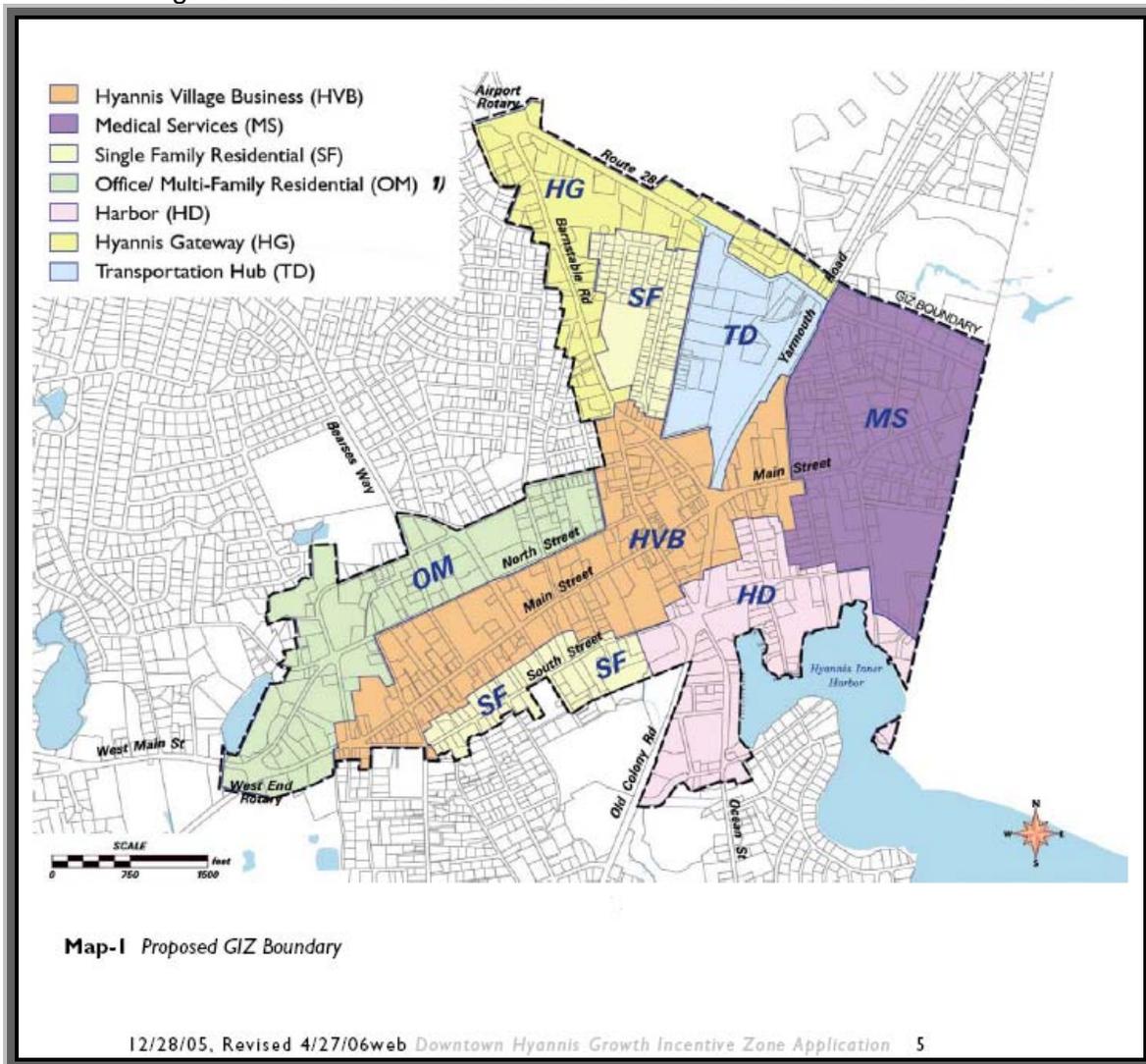
workers and the number of jobs. This top down method is then applied at a County level with the sum of the State's County projections bounded by State Control totals.

Within each County, historical trends, market conditions, and local planning inputs are used to allocate County growth to the member Communities. Within each community, population and employment growth is then allocated to areas within the community based on available local input.

For the Hyannis Access Study, the growth allocations within the Towns of Barnstable and Yarmouth were re-examined in order to fine-tune the previous efforts. The re-examination was based on a detailed review of aerial photography; a windshield survey to identify vacant buildings; an assessment of market conditions; interviews with Town officials; and in-depth interviews with key property owners. As a result of this effort, the forecasts were prepared based on the best available data at that time. These forecasts show that the population growth for the Towns of Barnstable and Yarmouth (from 2007 to 2030) will be approximately 12,900 and 2,800 respectively. The Towns of Barnstable and Yarmouth have a projected employment growth of 6,200 and 2,000 for this same period. Within the Town of Barnstable, the employment in the Independence Park Industrial area will double. The majority of the remaining employment growth in the Town of Barnstable is projected to occur in the Growth Incentive Zone.

The Growth Incentive Zone (GIZ) is an area focused on downtown Hyannis and Main Street where the regulatory review of economic development projects has been streamlined through a cooperative effort with the Town of Barnstable and the Cape Cod Commission. The area defines density bonuses and offsets, and creates design and infrastructure parameters for development and redevelopment. The GIZ is discussed in more detail below. Figure 2-13 shows the various GIZ districts.

Figure 2-13: Town of Barnstable’s Growth Incentive Zone and its Districts



Tables 2-3 and 2-4 provide current and projected population and employment figures and the related growth rates over the study time period. Significant growth is anticipated in Barnstable and in the GIZ specifically.

Table 2-3: Estimated Population Figures

|                        | 2007   | 2030   | Growth (rounded) | % change 2007-2030 |
|------------------------|--------|--------|------------------|--------------------|
| GIZ                    | 3,750  | 4,705  | 955              | 25.5               |
| Study area (incl. GIZ) | 13,970 | 17,270 | 3,300            | 23.6               |
| Barnstable total       | 50,150 | 63,000 | 12,900           | 25.7               |
| Yarmouth total         | 25,200 | 28,000 | 2,800            | 11.1               |

Table 2-4: Estimated Employment Figures including seasonal jobs and self-employment

|                        | 2007   | 2030   | Growth (rounded) | % change 2007-2030 |
|------------------------|--------|--------|------------------|--------------------|
| GIZ                    | 5,800  | 8,380  | 2,580            | 44.5               |
| Study area (incl. GIZ) | 19090  | 21640  | 2,550            | 13.3               |
| Barnstable total       | 37,600 | 43,800 | 6,200            | 16.4               |
| Yarmouth total         | 12,000 | 14,000 | 2,000            | 16.7               |

A recent review of the Town of Barnstable’s latest assessment of the Industrial Park has shown that the Town’s latest vision for this area is in keeping with the estimates developed for the Hyannis Access Study. Appendix 10 speaks to the Town’s support for the study’s assumptions in this regard.

Table 2-5 shows that more people walk to work downtown, but that the proportion of those using transit is only slightly higher than in the focus area overall.

Table 2-5: Transportation to Work of Study Area Residents

| Mode of travel to work      | Study Area overall | %          | GIZ only     | %          |
|-----------------------------|--------------------|------------|--------------|------------|
| Drove alone                 | 4,218              | 73         | 1,020        | 62         |
| Car pool                    | 699                | 12         | 255          | 15         |
| Public Transportation       | 111                | 2          | 42           | 3          |
| Walked                      | 439                | 8          | 276          | 17         |
| Bicycle                     | 22                 | 0          | 1            | 0          |
| Other                       | 104                | 2          | 18           | 1          |
| Worked at home              | 193                | 3          | 38           | 2          |
| <b>Total</b>                | <b>5,786</b>       | <b>100</b> | <b>1,650</b> | <b>100</b> |
| <b>Average Time to work</b> | <b>21</b>          |            | <b>20</b>    |            |

Source: Claritas, Inc., Site Reports, 2005, and FXM Associates

With regard to employment characteristics, the unemployment rate is higher downtown, but the rates for both are significantly higher – 7% for the focus area, 9% for the GIZ -- than the state average of 3% as shown below in Table 2-6.

Table 2-6: Employment Status of Study Area Residents

| Employment Status | Study Area Overall | %    | GIZ only | %    |
|-------------------|--------------------|------|----------|------|
| Civilian Employed | 5,878              |      | 1,684    |      |
| Unemployed        | 430                | 6.83 | 173      | 9.32 |

Source: Claritas, Inc., Site Reports, 2005, and FXM Associates

With regards to population and housing characteristics, low-income residents (below poverty level) are concentrated in the Village of Hyannis, which has a greater share of affordable housing than other villages in Barnstable. Downtown Hyannis is also an employment and service center, and has land use patterns and public facilities (including wastewater) better suited to higher densities typical of affordable housing.<sup>2</sup>

Table 2-7 shows that renter-occupied units are by far the dominant tenure downtown. Multi-family housing is also more prevalent downtown, where the Town’s plans encourage increase densities.

Table 2-7: Study Area Housing Characteristics

| <b>Tenure</b>                          | <b>Study Area Overall</b> | <b>%</b> | <b>GIZ only</b> | <b>%</b> |
|--|---------------------------|----------|-----------------|----------|
| Owner – occupied                       | 2,752                     | 55       | 273             | 19       |
| Renter - occupied                      | 2,267                     | 45       | 1,148           | 81       |
| <b>Total occupied houses and units</b> | 5,019                     | 100%     | 1,421           | 100%     |
| <b>Types of housing</b>                |                           |          |                 |          |
| 1 unit attached or detached            | 3,807                     | 65       | 551             | 34       |
| 2 or more units                        | 1,988                     | 35       | 1,053           | 66       |
| <b>Total Housing Units</b>             | 5,807                     | 100%     | 1,604           | 100%     |

Source: Claritas, Inc., Site Reports, 2005, and FXM Associates

The number of households has grown, and is projected to grow, considerably faster in the downtown than in the rest of the study area. Table 2-8 shows that households are expected to grow 9.5% between 2005 and 2010 in the GIZ area. The table also shows a lower household income per capita in the GIZ area.

Table 2-8: Growth in Households and Income Per Capita

| <b>Households</b>           | <b>Study area overall</b> | <b>%</b> | <b>GIZ only</b> | <b>%</b> |
|-----------------------------|---------------------------|----------|-----------------|----------|
| 2000                        | 4,693                     |          | 1,258           |          |
| 2005 estimate               | 5,019                     | 6.9      | 1,422           | 13.0     |
| 2010 projection             | 5,308                     | 5.8      | 1,557           | 9.5      |
| Household income per capita | \$24,059                  |          | \$17,478        |          |

Source: Claritas, Inc., Site Reports, 2005, and FXM Associates

<sup>2</sup> Town of Barnstable CDBG application to U.S. Department of Housing and Urban Development, *Second Program Year Action Plan*, May 2006.

The information and statistics above illustrate that there would be advantages to supporting and enhancing pedestrian and bicycle facilities and public transportation as densities continue to grow throughout Hyannis and in the GIZ specifically. In addition, the information above highlights the importance of the routes to downtown.

### 2.3.2 Key Activity Areas

#### Downtown Hyannis

Downtown Hyannis is a key activity area serving as a hub for local and regional bus services, travel to the islands by ferry, and centralized medical services at the hospital. It is a tourist destination in its own right. The heart of downtown Hyannis is historic Main Street with its numerous restaurants, clothing boutiques, galleries, as well as various Town offices. Downtown Hyannis contains the GIZ.

#### The Barnstable Municipal Airport

The Barnstable Municipal Airport, also described below in section 2.5.5, is a center of economic activity. It is owned by the Town of Barnstable and is operated by the Barnstable Municipal Airport Commission (BMAC). It is the primary airport serving Cape Cod, Martha's Vineyard and Nantucket with intra-regional service to the Islands, Boston and New York City area. The Airport is ranked the third largest and busiest commercial airport in the Commonwealth, with 200,490 enplanements (passengers boarding and leaving aircraft) in 2001 and passengers are projected to increase 65 percent by 2015 to 310,000 annually.<sup>3</sup> Cape Cod has been identified as an emerging market for airport services that will grow to almost 2 million passengers by 2020, reflecting the Cape's evolution from primarily a seasonal vacation/retirement community to a more balanced year-round economy and increasing demand for service by all airports on the Cape.<sup>4</sup> The Barnstable Municipal Airport has 27 full-time professional employees from throughout Cape Cod, and over 43 tenant businesses operate on the Airport property employ more than 1,143 personnel, making the Airport the second largest employer on Cape Cod next to the school system.<sup>5</sup> Each fiscal year, the Airport returns to the Town of Barnstable over \$675,000 in direct and indirect service.<sup>6</sup> The airport's countywide economic impact was estimated at \$82,987,152 in the 2001 Massachusetts Aeronomics Commission (MAC) Economic Impact Report, and its total economic impact was estimated at \$130,006,396.<sup>7</sup>

The BMAC has received approval from the Cape Cod Commission to implement a comprehensive facilities improvement project that includes a new terminal, new entrance road, parking and aircraft operations enhancements; however, there has been an appeal from an abutter, so the approval is not yet final.<sup>8</sup> The project components are expected to be:

- a new 31,000 – 34,000 square foot terminal to accommodate increased passenger traffic through 2015 while incorporating FAA safety and security requirements;

---

<sup>3</sup> *Barnstable Airport Improvement Project DEIT/DEA Part 1*, July 2003.

<sup>4</sup> The New England Airport Coalition, *The New England Regional Airport System Plan*, Fall 2006.

<sup>5</sup> *Manager's Message*, Barnstable Municipal Airport Website.

<sup>6</sup> Ibid.

<sup>7</sup> The New England Airport Coalition, *Economic Impacts of Public-use Airports in Massachusetts*, Massachusetts Aeronomics Commission, 2001.

<sup>8</sup> *Barnstable Municipal Airport Improvement Project Development of Regional Impact Application*, Executive Summary, April 7, 2006.

- a new access road connecting the terminal to Attucks Way that will also reduce traffic congestion on Route 132;
- closure of the two existing Airport entrances from the Airport Rotary and construction of two new entrances (one from Rte. 28 eastbound, another from Rte. 132 across from Nightingale Lane);
- parking reconfiguration to provide 801 parking spaces located immediately adjacent to the new terminal, and 1,669 overflow parking spaces along the new access road;
- a new fuel storage facility; and, relocation of taxiways.<sup>9</sup>

The Airport roadway and access improvements are expected to result in a net reduction in traffic volume, and improved traffic flow on Route 132, Route 28 and the Airport Rotary. The Airport Improvement Plan will remove buildings from Airport property (TD BankNorth Branch office, former Operations Building, existing terminal building and former Continental Airways terminal), as well as remove other buildings for the new access road and remote parking area (Blackburn's Auto Salvage Yard and retail uses at 191 and 192 Airport Road). A progress print of the Airport Improvement Project from 2005 is provided in Appendix 15.

#### Cape Cod Community College

Currently, the Cape Cod Community is served by the Barnstable Villager Route, which provides a forty minute trip from the Hyannis Transportation Center. College officials would like transit services to the College to be expanded and improved. It considers this key to attracting, serving, and expanding its diverse student body.

The Cape Cod Community College is located on Iyannough Road in West Barnstable, just north of Exit 6 on Route 6. The college has recently completed a 25-year Master Facilities Plan sponsored by the Division of Capital Asset Management and the Board of Higher Education. This Plan was done as part of an effort for all state and community colleges; the first 10 years of the plan provided input for a capital bonding request to the Massachusetts legislature. The college has indicated that it will need new education buildings on site, including parking, plus on-campus housing (200-300 units), and a wind turbine. The West Barnstable Civic Association opposes the plan for housing, citing traffic and water issues.

Currently, the Cape Cod Community is served by the Barnstable Villager Route, which provides a forty minute trip from the Hyannis Transportation Center. College officials would like transit services to be expanded and improved. It considers this key to attracting, serving, and expanding its diverse student body.

#### Cape Cod Hospital

Cape Cod Hospital is operated by Cape Cod Healthcare, which is the leading provider of health care services for residents and visitors of Cape Cod. Across the region, Cape Cod Healthcare has more than 400 physicians, 4,600 employees, and 1,000 volunteers at a number of locations including Cape Cod Hospital, Falmouth Hospital, the Visiting Nurses Association (VNA) of Cape

---

<sup>9</sup> Ibid

Cod, skilled nursing and rehabilitation facilities, an assisted living facility, and multiple outpatient centers. Cape Cod Healthcare's net revenue in 2006 was \$540 million.<sup>10</sup>

Cape Cod Hospital, located at 27 Park Street in Hyannis, saw more than 80,000 emergency department visits in 2006, and has the busiest emergency room in Massachusetts during the summer months. The hospital also provided over 6,000 outpatient surgeries, 11,000 MRI scans, and 40,000 CT scans in 2006. An expansion of the Hospital recently opened, which included 30 additional beds in private rooms and about 40-50 new parking spaces.

Cape Cod Healthcare is planning to construct an Ambulatory Care Campus on land it purchased within the past few years in Independence Park. The site comprises 42 acres and is located just north of BJ's Club, east of Phinney's Lane and west of Independence Drive. When complete, the project as proposed in Cape Cod Healthcare's DRI application to the Cape Cod Commission will comprise 263,100 square feet of building space and will generate 3,728 car trips per weekday and 1,471 car trips per Saturday.

According to Cape Cod Healthcare, many of these auto trips are expected to be offset by ones already occurring to Cape Cod Hospital which will shift to the new ambulatory care campus. Cape Cod Healthcare plans to construct the new ambulatory care campus in phases. The target for Phase 1 is approximately 30,000 square feet of space, while the target for Phase 2 is roughly an additional 50,000 square feet of space. The actual size of the facilities, as well as their phasing, will be determined by the availability of funding.

#### Cape Cod Mall

Mall managers noted that CCRTA service levels match the summer peak in mall employment, but are not well-matched to the holiday peak, when employment surges but CCRTA operates its scaled-back winter service.

The Cape Cod Mall is located on Route 132. In 2000, the Mall underwent a major expansion that doubled its size; there are no plans for additional expansion. Transportation conditions are essentially the same now as when volumes of traffic reports were prepared for the Mall's renovation/expansion project in 2000 (number of vehicles, o/d, turning movements, etc. on Rte. 28 and Rte. 132). The Mall has two seasonal peaks: summer and end-of-year holidays, each of which generates about a third of their total business. Mall employment also has two peaks: average 1,700 to 2,500 during June, July and August and up to 3,000 during November and December.<sup>11</sup> Mall management indicated that a relatively small proportion of Mall employees use CCRTA transit services to get to work now, but that more employees would take transit if the service levels were more favorable. Mall managers noted that CCRTA service levels match the summer peak in mall employment, but are not well-matched to the holiday peak, when employment surges but CCRTA operates its scaled-back winter service.

---

<sup>10</sup> This section is adapted from a presentation by Stephen Abbott of Cape Cod Healthcare at a Hyannis Access Study Task Force meeting, January 9, 2007.

<sup>11</sup> FXM interview with Leo Fein, November 1, 2006.

### Independence Park and Cape Cod Aggregates

Independence Park is located on the south side of Route 6, between exits 6 and 7, and is bounded on the south by Route 132. It is zoned for industrial and retail (along Route 132) activity. Currently the Park houses a variety of businesses, including restaurants and retail, a BJ's Wholesale Club, Shepley Wood Products, and satellite facilities of the Cape Cod Hospital. Together, the businesses in Independence Park account for about 5,000 jobs. There are about 45 to 48 acres of developable land remaining in Independence Park. Independence Park has no plans to redevelop or intensify the use of already-developed parcels within its control, although individual businesses in the park who own their land might do so. Independence Park has no plans to develop significant retail on the land within its control. Individual land owners within the park may wish to develop smaller retail properties.<sup>12</sup>

Together, the businesses in Independence Park account for about 5,000 jobs.

In addition to the businesses within Independence Park, Cape Cod Aggregates (CCA) Corporation is located near the business park but is not part of or associated with it. CCA is a gravel, stone and sand company based in Hyannis. CCA owns about 100 acres in the area near Independence Park. This does not include land CCA recently sold to Cape Cod Health Care nor the land CCA sold during the summer of 2006 to Atlantis Development for a proposed Stop & Shop. Most of the remaining 100 acres owned by CCA are located adjacent to Independence Park: about 50 acres east of Kidd's Hill Road (zoned Industrial) and 47 acres west of Kidd's Hill Road (zoned Industrial and included in the Medical Use Overlay District.)

### Route 132 between Enterprise Drive and Route 6

Route 132 is lined with numerous retail outlets, restaurants and hotels. As described in the section on existing roadway projects, Route 132 is currently being widened from 2 to four lanes between Route 6 and Bearses Way which will facilitate traffic flow through this area. A sewer line is being extended to the Cape Cod Community College and the project will include access improvements through consolidation of curb cuts. The Town of Barnstable has identified the corridor as a strategic planning corridor and is working with a committee to address future plans for the corridor.

### **2.3.3 Economic Development Plans**

A number of economic development planning studies have been conducted, but the most important ones for purposes of the Hyannis Access Study are the Town's application to the Cape Cod Commission for the establishment of a Growth Incentive Zone (GIZ) and the Local Comprehensive Plan, updated in 2006. The GIZ application is key to understanding Town priorities for where future growth should occur. Its approval by the Cape Cod Commission streamlines the regulatory review of economic development projects, defines density bonuses and offsets, and creates design and infrastructure parameters for development and redevelopment.<sup>13</sup> In a separate action, in July 2005, the Town revised its zoning by-laws to

---

<sup>12</sup> Presentation by Mark Thompson of Independence Park at a Hyannis Access Study Task Force meeting, January 9, 2007.

<sup>13</sup> Town of Barnstable, *Local Comprehensive Plan*, Section 3, Economic Development, May 2006.

permit greater residential densities and a greater range of commercial development downtown. The establishment of the GIZ, coupled with the zoning changes, is already producing new economic activity in the downtown area.

The GIZ application contains a buildout analysis which projects the maximum and most likely residential and commercial development to beyond 20 years. The study says that the most likely development at buildout would be:

| <b>"Most Likely" Buildout Scenario</b> |             |                                   |
|--|-------------|-----------------------------------|
|  | <b>unit</b> | <b>additional<br/>by year 20+</b> |
| residential                            | units       | 1,736                             |
| hotel rooms                            | number      | 87                                |
| restaurant                             | sf          | 183,442                           |
| retail                                 | sf          | 360,082                           |
| office                                 | sf          | 1,255,103                         |
| total commercial                       | sf          | 1,798,627                         |

Source: Town of Barnstable, Growth Management Department,  
*Downtown Hyannis Growth Incentive Zone Application*,  
Rev. 4/27/06

If the above development were realized in Hyannis, the village would experience almost a doubling of its residential units. Its commercial space would grow by almost 37%.<sup>14</sup>

Several features of the Growth Incentive Zone are key considerations in planning for transportation facilities that support economic development:<sup>15</sup>

- The GIZ is part of a larger effort to revitalize downtown Hyannis with more diverse and intense uses of land and structures: multi-unit residential, retail, institutional, commercial;
- The GIZ takes advantage of existing excess infrastructure capacity in the short run but will require additional investments in infrastructure, including transportation, in order for approval by the Cape Cod Commission to extend past the initial five years;
- The GIZ will balance development between that which will benefit year-round residents while continuing to accommodate tourism.

The Town's Local Comprehensive Plan, updated in 2006, reinforces the goals of the GIZ. It notes that:

- Downtown has existing infrastructure capacity, but many underperforming properties.
- Major challenges are to build and maintain appropriate infrastructure that supports the Comprehensive Plan, including adequate and efficient roadways and parking facilities; and to enhance visitor-based economic activities.
- Development should be directed toward appropriate activity centers.

<sup>14</sup> Town of Barnstable, Growth Management Department, *Downtown Hyannis Growth Incentive Zone Application*, March 24, 2006 (rev.), p 14.

<sup>15</sup> ,*ibid.*, pp. 4 ff.

The GIZ takes advantage of existing excess infrastructure capacity in the short run but will require additional investments in infrastructure, including transportation, in order for approval by the Cape Cod Commission to extend past the initial five years.

The Plan's Economic Development Action Plan Matrix calls for a 10-year strategic economic development planning process which encompasses the Growth Incentive Zone (GIZ) in Hyannis, along with a series of measures, such as a property tax policy which balances residential and commercial interests, being proactive with developers regarding comprehensive plan policies, offering incentives for desired economic growth, and amending the zoning ordinance to better coordinate design standards.

### 2.3.4 Other Development Considerations

There are several planned and potential developments in the study area that were identified in the course of interviews and review of available documents. Some of them are preliminary, and complete information on exact location and the specific characteristics of the developments is not yet known or not available. The list below is not comprehensive, but rather it is indicative of the kinds of economic activities either underway or being considered for the area under study over the next several years.

- 23 residential units above retail at the corner of Main and Ocean - in permitting
- Medical offices and some residential units at the corner of South and Lewis Bay near the hospital
- A mixed used office over retail development near the Transportation Center
- 27 new residential units on Main St. and 24 new residential units on North St.
- The Hibel project, corner of Ocean and Main, is permitted for mixed use: three stories with 1<sup>st</sup> floor retail and office and 22 condos up above for 58,000 sf total.
- 29 residential units on two acres at the old Hood Mill plant
- A new community/youth center at the Kennedy Rink
- The headquarters of International Friends of Animals in the Wild (IFAW) is building a new 35,000 sf building for 150 employees at exit 7.
- A 40(B) project of 148 units permitted but not yet broken ground near Independence at Mary Dunn (near Route 6).
- A new Circuit City with 25,000 sf and 150 parking spaces is expected near the Airport Rotary.

As the list above shows, there is strong interest in developing 2<sup>nd</sup> floor residential units downtown, and re-developing many other properties throughout the study area.

#### Summary statements

The above sections on socioeconomic conditions shows that the Hyannis Access Study area contains many diverse activity centers along with numerous complementing and competing needs.

Accessibility is the basic criterion by which various solutions will be judged from an economic development perspective. Accessibility refers to the time it takes for autos and trucks to travel between locations to and from the immediate project area and locations outside the immediate project area. Changes in accessibility will affect the attractiveness of existing land uses and vacant land to residential and commercial markets, influencing sales potential for businesses and property values for residences as well as businesses. The travel time data will be derived from the modeling component of the study.

## 2.4 Future No-Build Traffic Conditions

The future no-build reflects the future year transportation network with the additional traffic that comes from population growth and economic development. For the Hyannis Access Study, the no-build year was set to 2030, approximately 25 years from the present, and the assumptions regarding population and economic development growth are described above. The following sections describe the expected traffic volumes and levels of service at area intersections based on the results of the travel demand model.

Once the no-build model is developed, the “build” alternatives are programmed into it to gauge how travel patterns may change. In this way, the future transportation network and traffic loads without the alternatives (the no-build) can be compared to the network with the alternatives (the build) and to the base case.

### 2.4.1 Future No-Build (2030) Traffic Volumes

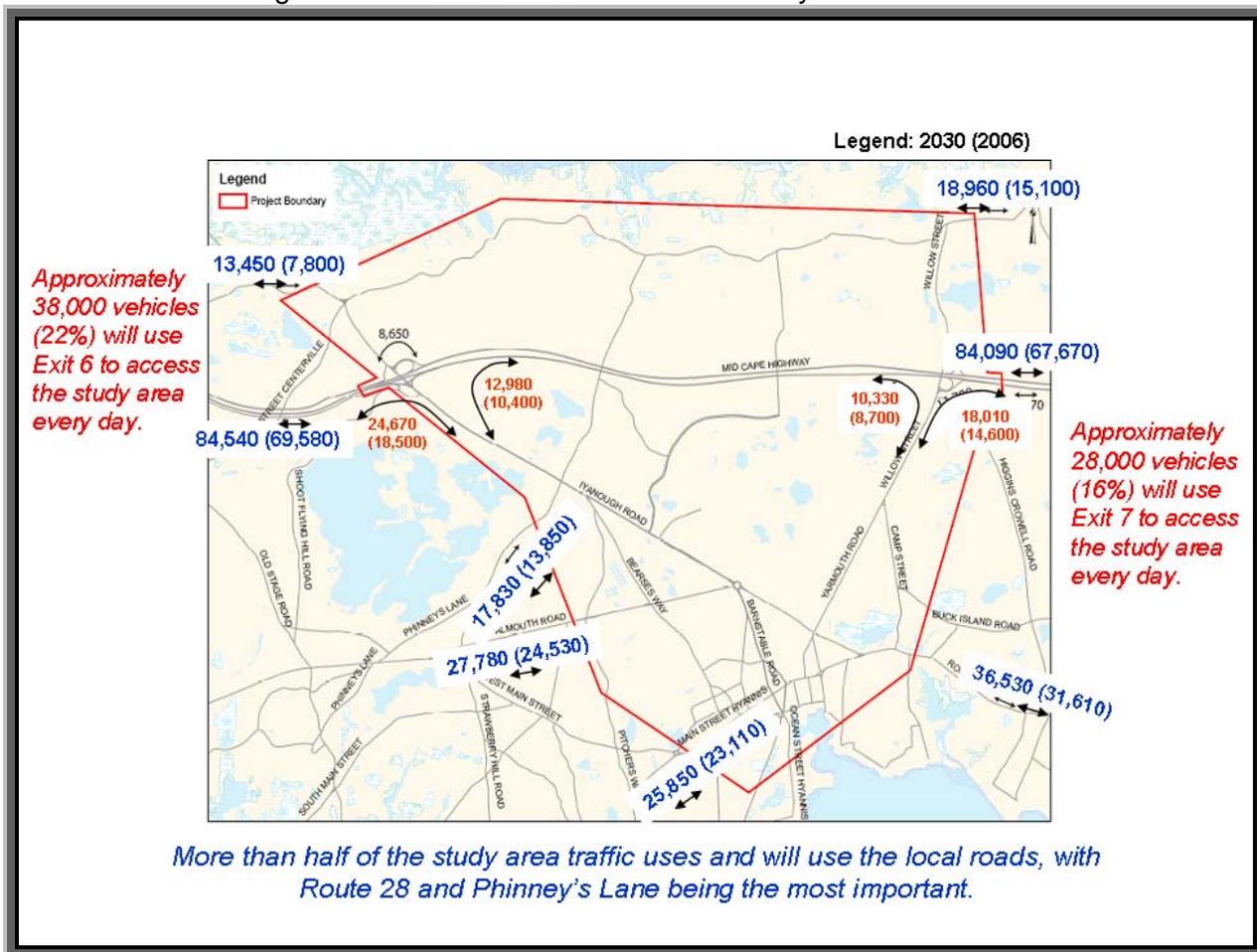
Traffic projections for the year 2030 generated by the regional travel demand forecasting model were compared against model calibrated 2006 traffic volumes. The difference between the 2030 and calibrated 2006 volumes from the model were applied to the actual 2006 existing traffic counts to estimate the 2006 average summer weekday ADT.

The total volume of traffic entering the study area from Route 28, Phinneys Lane, and Main Street is expected to be more than half of the total traffic entering the study area, and much greater than the volume of traffic entering from Route 6.

Some of the important changes in travel patterns in 2030 from those in 2006 are:

- The proportion of vehicles on Route 6 originating from/destined to the west of the study area that uses Exit 7 will increase.
- The proportion of vehicles on Route 6 originating from/destined to the east of the study area that uses Exit 6 will also increase.
- Traffic growth on Route 6A will be relatively higher. Another important road anticipated to have a major increase in traffic is Phinneys Lane.
- Given the amount of development projected within the Growth Incentive Zone, the downtown Hyannis area will attract a greater amount of traffic.

Figure 2-14: 2030-2006 Summer ADT Entry/Exit Volumes



Based on the no-build travel demand model, approximately 64,000 vehicles are expected to enter the study area from Route 6. Adding the volumes of traffic entering the study area from Route 28 (from the east and west), Phinneys Lane, and Main Street yields approximately 108,000 vehicles, which is more than half of the total traffic entering the study area. The same is true today, and this trend is expected to continue into the future. This is an important point when contemplating transportation improvements.

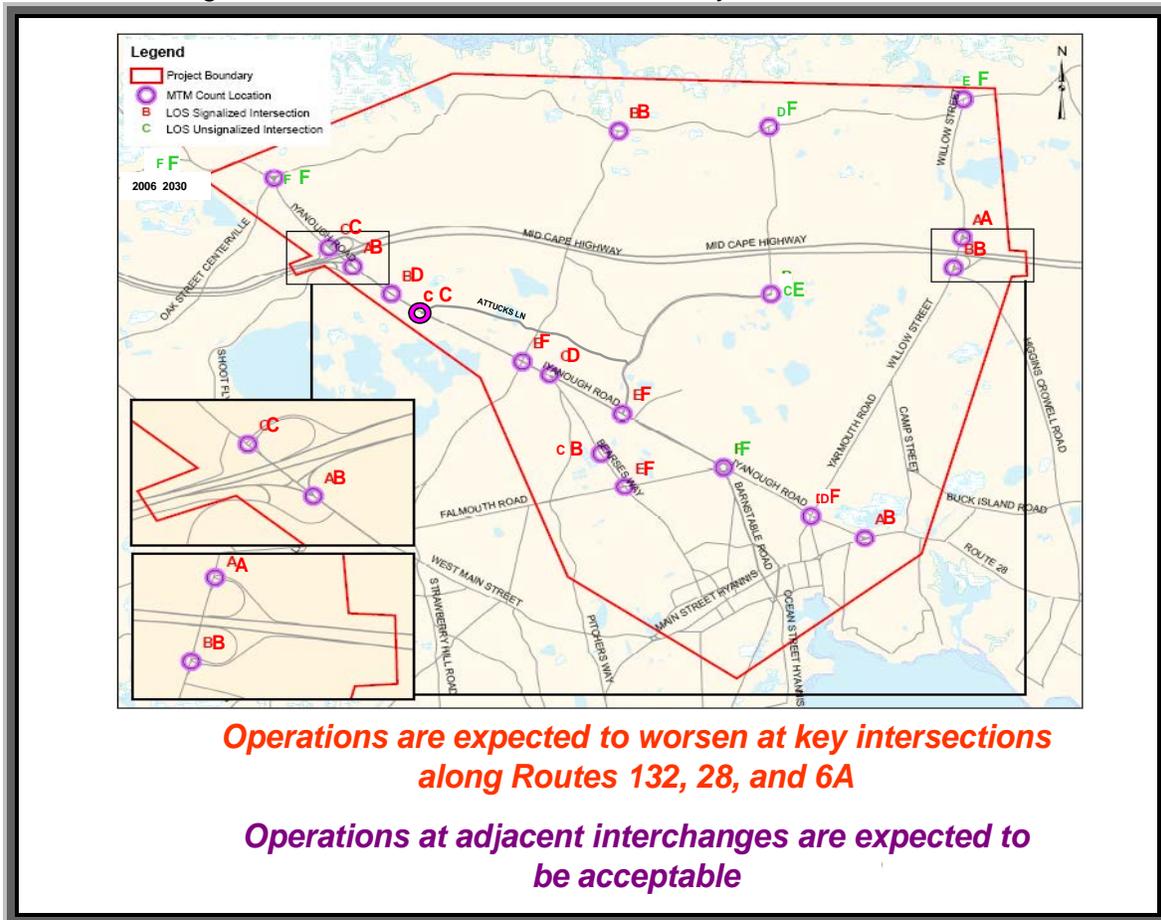
Using a similar methodology that was applied to generate the ADT forecasts, the Weekday PM peak hour volume forecasts were generated by computing the difference between the 2030 Weekday PM peak hour volumes and the model calibrated 2006 Weekday PM peak hour volumes and applying it to the actual weekday PM counts.

#### 2.4.2 Future No-Build (2030) Level of Service Analysis

Level of service analysis was performed at each of the study intersections similar to what was done for existing conditions. The signalized and unsignalized intersections were analyzed using the Synchro software, the airport rotary was analyzed using the SIDRA software and the Route 6 ramp junctions were analyzed using the HCS software. Overall intersection level of service at

the study intersections are shown in Figure 2-15. Appendix 4 provides the detailed level of service analysis results for signalized, unsignalized and ramp junctions respectively.

Figure 2-15: 2030-2006 Summer Weekday PM Level of Service



As is shown above, operations are expected to be acceptable at Exits 6 and 7, in large part due to the ongoing roadway projects there. However, operations at key intersections are expected to worsen.

## 2.5 Transit and Other Transportation Services

Transit and other transportation services within the study area are provided by the Cape Cod Regional Transit Authority (CCRTA), Plymouth & Brockton, Peter Pan/Bonanza, the Steamship Authority, Hy-Line Cruises, and several air carriers at the Barnstable Municipal Airport. The CCRTA provides local bus service through many parts of Hyannis as well as paratransit service throughout the study area. Plymouth & Brockton and Peter Pan/Bonanza provide intercity bus service to more distant destinations, while the Steamship Authority and Hy-Line provide ferry service between Hyannis, Martha's Vineyard, and Nantucket. The Cape Cod Central Railway also provides seasonal excursion train service between Hyannis and Bourne. These services are described in more detail in the sections below. Figure 2-16 provides a regional overview of transit and other transportation services across Cape Cod.

### **2.5.1 Cape Cod Regional Transit Authority (CCRTA) Services**

The CCRTA operates several local and regional bus routes in the Hyannis area, as well as a paratransit service called the b-bus that serves persons with disabilities, seniors, as well as the general public. CCRTA was created under State Law in 1976 and consists of 15 Cape Cod towns from Bourne to Provincetown. It is an independent regional agency, and is designated by the Governor to receive Federal and State funds. Its role is to plan, regulate, and coordinate public transit service within the Cape Cod region. CCRTA is governed by a 15-member Advisory Board, whose members are designated by law as the Chairmen of the Board of Selectmen of their respective communities, or their designees.

The following sections cover the fixed-route services, demand-response services, other services, ridership, issues and opportunities.

Figure 2-16: Regional Overview of Transit and Other Transportation Services



Source: 2006-2007 SMART Guide, www.smartguide.org

### Fixed-Route Services

The most relevant CCRTA fixed-route service to this study is the Barnstable Villager Breeze, also called the Yellow Line, which operates from the Hyannis Transportation Center to Bearse's Way, to the Cape Cod Mall and nearby shopping centers, to Cape Cod Community College, and the Barnstable County Courthouse in Barnstable Village. Figure 2-17 shows the Villager Route.

Figure 2-17: Barnstable Villager Route

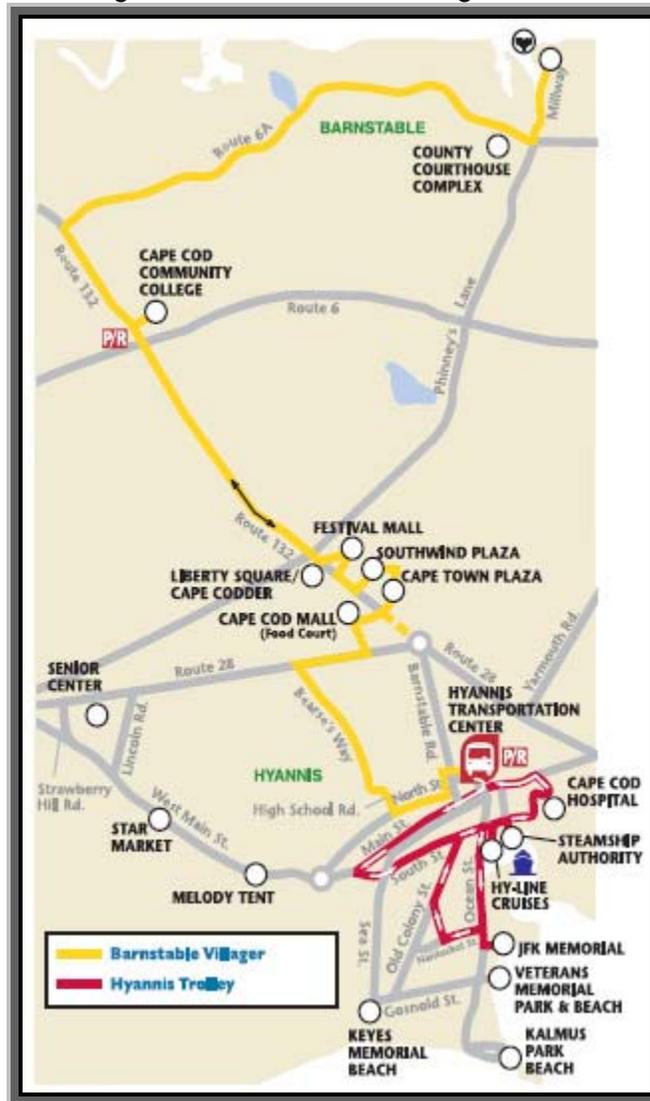


Table 2-9 : Barnstable Villager Summer and Off-Peak Service Levels

| Route                                    | Summer Service Level  | Off-Peak Service Level                        |
|--|---|---|
| Barnstable Villager Breeze (Yellow Line) | Monday-Friday:<br>Every 30 minutes, 7:30AM-10:30PM                  | Monday-Saturday:<br>Every 60 minutes, 8AM-6PM |
|  | Saturday, Sunday, and Holidays:<br>Every 30 minutes, 9:30AM-10:30PM | Sunday:<br>No service                         |

One of the two regional routes operate within the study area is the Sealine Breeze (Blue Line) which provides service between the Hyannis Transportation Center and Falmouth/Woods Hole along Route 28. Figure 2-18 displays the route and Table 2-10 displays the frequency of service.

Figure 2-18 : Sealine Breeze (Blue Line) Route

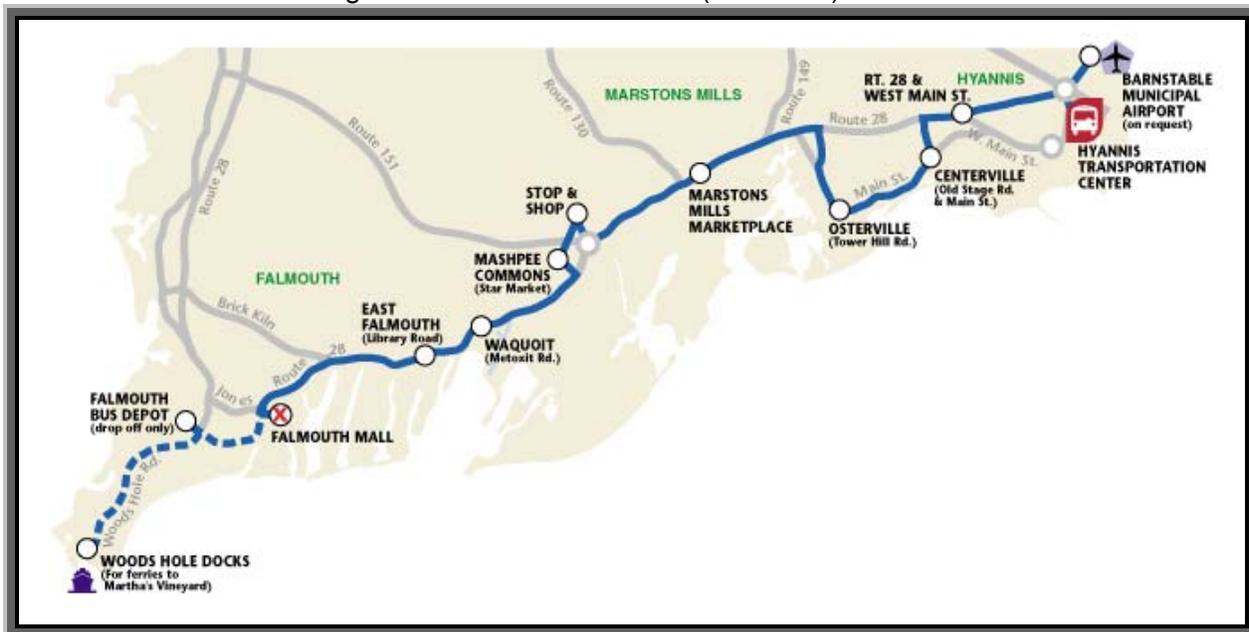


Table 2-10: Sealine Breeze Summer and Off-Peak Service Levels

| Route                      | Summer Service Level   | Off-Peak Service Level                           |
|----------------------------|--|--|
| Sealine Breeze (Blue Line) | Monday-Friday:<br>Every 70-110 min, 5:30AM-8:30PM                  | Monday-Saturday:<br>Every 70-110 min, 5:30AM-8PM |
|                            | Saturday, Sunday, and Holidays:<br>Every 70-110 min, 9:30AM-8:30PM | Sunday:<br>No service                            |

The other regional service that serves the Hyannis area is the H2O Line Breeze (the Green Line) which provides service between the Hyannis Transportation Center and Orleans along Route 28, including service to the Cape Cod Hospital. Figure 2-19 shows a map of the H2O

Breeze and Table 2-11 displays the service frequencies in the summer months and also during the off-peak months.

Figure 2-19 : H2O Line Breeze (Green Line) Route

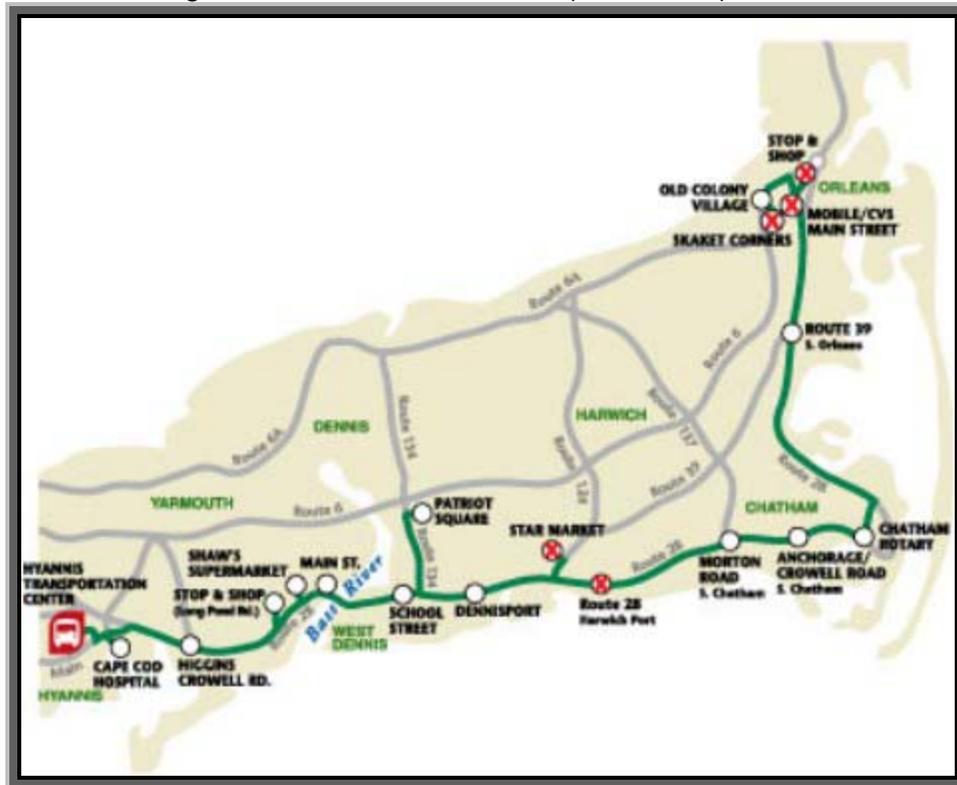


Table 2-11: H2O Breeze Summer and Off-Peak Service Levels

| Route                   | Summer Service Level  | Off-Peak Service Level                              |
|-------------------------|---|---|
| H2O Breeze (Green Line) | Monday-Friday:<br>Every 70-110 min, 7:05AM-8:10PM                   | Monday-Saturday:<br>Every 70-110 min, 7:05AM-8:15PM |
|                         | Saturday, Sunday, and Holidays:<br>Every 70-110 min, 10:30AM-8:10PM | Sunday:<br>No service                               |

The Hyannis Beaches Breeze operates during the summer peak season, from the Hyannis Transportation Center to Main Street, Sea Street, Gosnold Street, Ocean Street, the Hy-Line Ferry Dock, Kalmus Beach and Veterans Beach.

Until March of 2008, the CCRTA operated a “Hyannis Villager” service from the Hyannis Transportation Center to Main Street, the West End Rotary, Star Market (Main Street), Cape Cod Hospital, and the Senior Center. Most of this route is covered by the Barnstable Villager and the Sealine, and was discontinued due to funding constraints. Ridership numbers include this route, however.

In addition to the above local and regional routes, CCRTA also operates several other summer shuttles. These include the Provincetown-Truro Shuttle, the Yarmouth Shuttle, and the WHOOSH (Woods Hole-Falmouth) Trolley, which operate outside of the study area.

Outside of the study area, on the Outer Cape, CCRTA operates a service called the Flex Route. This route runs between Harwich and Provincetown primarily along Route 6A and Route 6. The bus follows a standard route, picking up and dropping off passengers at designated stops. The bus also “flexes” off its route to serve people who cannot get to a regular stop. The Flex Route itself has a variable schedule, running days and times when passenger demand is greatest. The bus runs Monday through Saturday only. Sunday travel in these areas is provided by CCRTA’s b-bus service.

### Demand Response Services

As noted above, CCRTA provides b-bus paratransit service in addition to fixed-route bus services. The b-bus service is a demand-responsive, dial-a-ride service in which users call by 5PM the day before they wish to travel to make a reservation. The b-bus service is open to the general public, but CCRTA gives priority to disabled and elderly residents on the b-bus. People with disabilities will be given absolute first preference, and can bump a non-disabled passenger. The b-bus service operates seven days per week: 7AM to 7PM Monday through Friday, 9AM to 7PM on Saturdays, and 9AM to 1PM on Sundays. Information on b-bus ridership numbers and destinations is provided in Appendix 6.

### Other Services

The CCRTA provides or assists in the provision of several other types of service:

- CCRTA provides service on weekdays to 15 medical facilities in Boston; service begins in Wellfleet and picks up passengers in Eastham, Orleans, Harwich, Barnstable, and Sagamore.
- CCRTA also provides brokerage services for human service transportation on Cape Cod and the Islands; this includes clients of Mass Health, the Department of Mental Retardation, and the Department of Public Health, as well as Adult Day Health and Cape Cod Child Development.
- CCRTA provides vehicles and coordinates with 10 Councils on Aging (COAs) including the Barnstable COA; vehicles are purchased and leased to the COA to provide transportation for seniors in the community.
- CCRTA also provides capital assistance for intercity bus operations in the area; recently CCRTA purchased two buses and leased them to Plymouth & Brockton to be operated between Hyannis and Provincetown and between Hyannis and Boston. P&B paid the 20% local share while CCRTA obtained the 80% Federal share on behalf of P&B.

CCRTA Ridership

Ridership on the overall CCRTA system (including fixed routes, demand-response and contract services) was approximately 660,000 passenger boardings in Fiscal Year 2006. This represents an increase from about 600,000 boardings in FY 2004 and FY 2005 and a return to the levels of FY 2003, before a funding shortfall forced CCRTA to cut service. Figure 2-20 shows these trends in ridership on the CCRTA system.

Figure 2-20: Annual CCRTA System Ridership

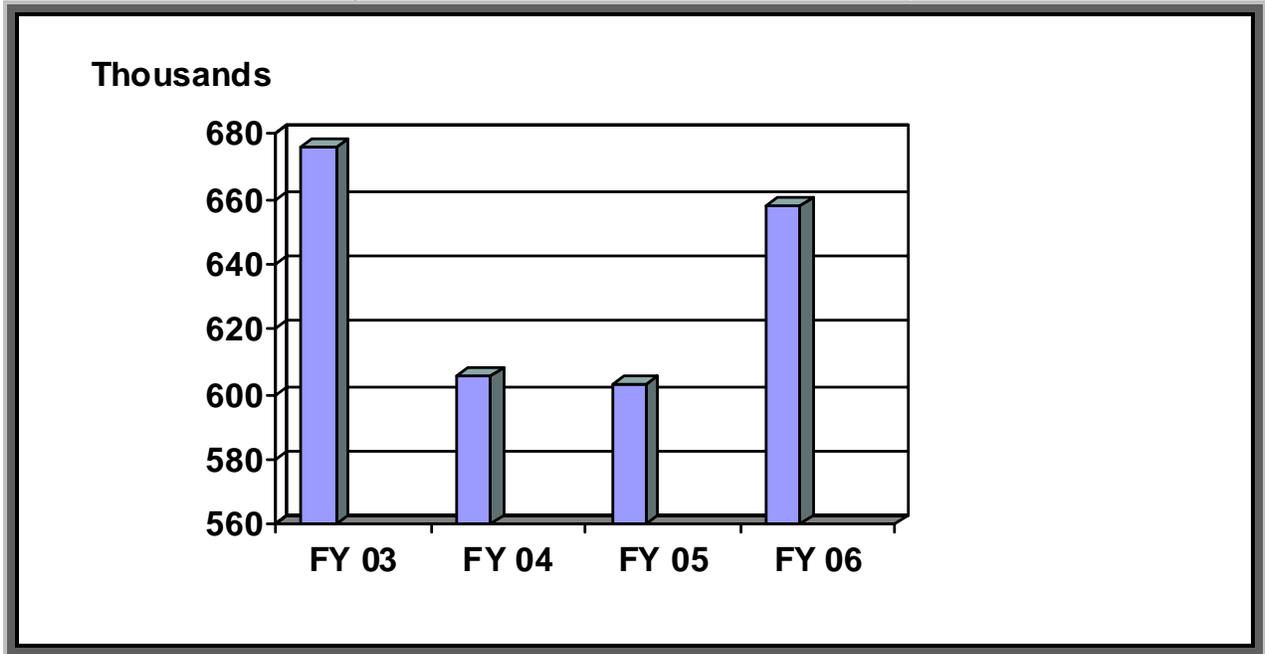


Figure 2-21 shows the breakdown of CCRTA's system ridership by type of service: fixed route, demand response, and contract service. Roughly one-half of CCRTA's ridership occurs on its fixed route services (including the Flex Route), one-third is on CCRTA demand response services, and about one-sixth is on its contract services.

Figure 2-21: CCRTA Ridership Breakdown (FY 06)

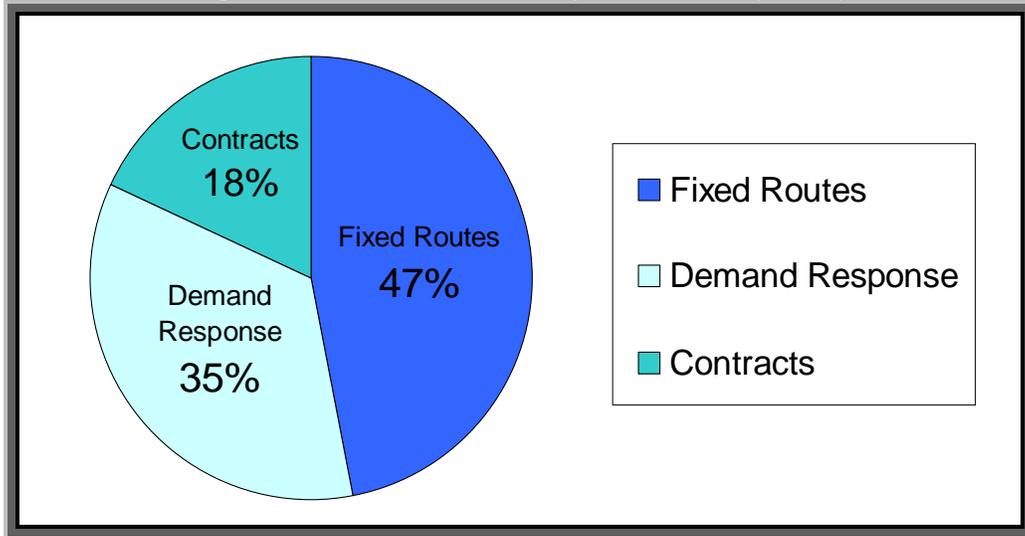
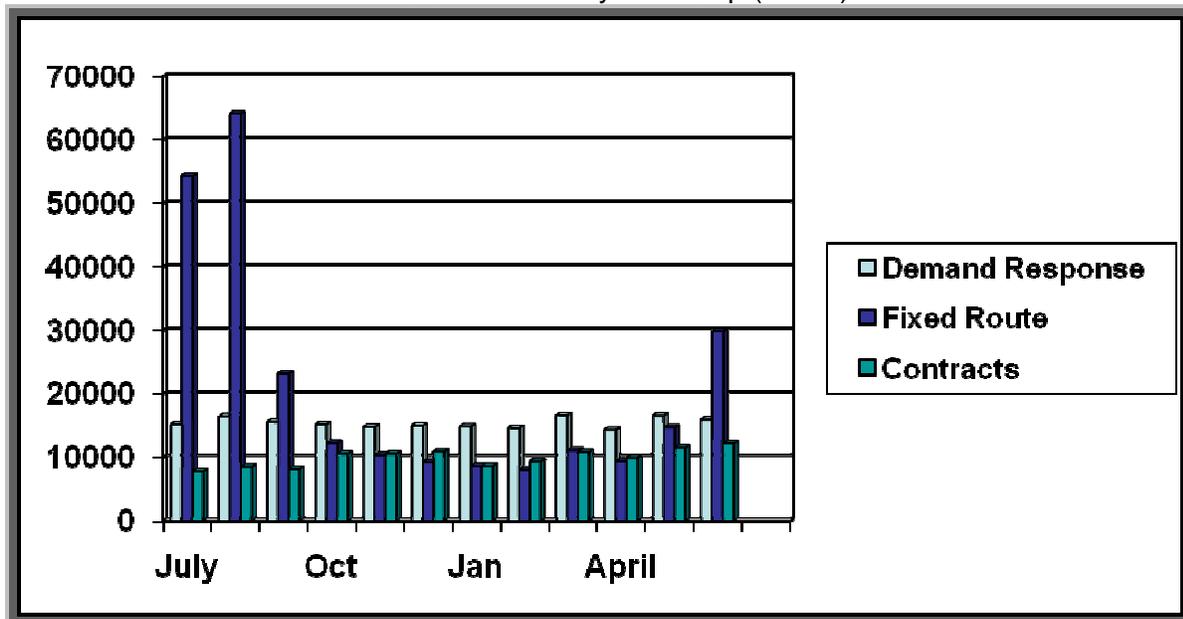


Figure 2-22 shows the trend in CCRTA system ridership by month in Fiscal Year 2006. As the graph indicates, ridership on CCRTA fixed route services varies widely over the course of the year, peaking at over 60,000 boardings per month in the summer but dropping to around 10,000 boardings per month in the winter. By contrast, ridership on CCRTA demand response and contract services is fairly steady over the course of the year, averaging about 15,000 demand response and 10,000 contract service boardings per month.

Figure 2-22  
CCRTA Monthly Ridership (FY 06)



Summary of CCRTA Services and Issues

As part of the Hyannis Access Study, CCRTA staff developed a list of issues to be considered regarding the agency’s services in the study area. These included the following:

- CCRTA services provide a good foundation of transit services, covering a broad area and a broad variety of demands.
- Hyannis fixed routes are destination rich but origin poor.
- Pedestrian access along main roads is problematic.
- The one-way section of Main Street makes transit very difficult to succeed.
- Signage is lacking.
- Ridership to Barnstable Municipal Airport is low.
- Current Hyannis transit riders are transit dependent individuals, not choice riders.

## 2.5.2 Intercity Bus Service

Intercity bus service in the Hyannis area is provided by two operators: the Plymouth & Brockton Street Railway Company, and Peter Pan Bus Lines, which acquired Bonanza Bus in 2003.

The Plymouth & Brockton Street Railway Company (P&B) provides intercity bus service between Boston and Provincetown including stops in Hyannis, Barnstable, Plymouth, and other intermediate points. Frequent service geared towards commuting is provided between Hyannis and Boston: on weekdays, buses run every 30 minutes (31 round trips per day), and on weekends, buses run every 60 minutes (17 round trips per day). Additional service is offered during the summer months. Most trips service downtown Boston, while some run express to Logan Airport and are branded as P&B's "Logan Direct" service. P&B offers limited service between Provincetown and Hyannis (2 round trips per day).

Within the study area, P&B buses stop at the Hyannis Transportation Center and at the Barnstable Park-and-Ride facility at Exit 6 on Route 6. All the P&B buses that service the Barnstable Park-and-Ride facility either start at the Hyannis Transportation Center or stop there before stopping at the Park-and-Ride lot. Representative fares on P&B's routes from Hyannis include the following:

- Hyannis-downtown Boston: \$17 one-way, \$67 for a 10-ride pass (equivalent to one week of commuting)
- Hyannis-Logan Airport: \$22 one-way
- Provincetown-Hyannis: \$10 one-way

The 10-ride pass is a discounted fare, subsidized by EOT. P&B is dependent on travelers that purchase one-way tickets to downtown and Logan Airport for the sustainability of its business. Often these travelers are overnight parkers at the Barnstable Park-and-Ride lot. Therefore, P&B strongly supports free overnight parking at the Barnstable Park-and-Ride lot and expanding the lot to provide for more of this.

According to a single-day count in March 2002, there were 262 boardings on P&B buses at the Exit 6 Park & Ride facility on a weekday. Ridership figures provided by P&B for services to Hyannis are shown in Table 2-12.

Table 2-12: Plymouth & Brockton Ridership, 1999-2000

| Route                           | Annual Boardings | Average Daily Boardings |
|---------------------------------|------------------|-------------------------|
| Hyannis-Boston, Orleans-Boston* | 368,881          | 1,011                   |
| Logan Direct                    | 137,739          | 375                     |
| Provincetown-Hyannis            | 27,095           | 74                      |

\*Note: Service has been restructured on this route since these ridership counts.

Peter Pan Bus Lines, which in 2003 acquired Bonanza Bus Lines, provides intercity bus service between Hyannis and New York, NY via Providence, RI. Connecting service is provided to Falmouth, Woods Hole, and other Massachusetts cities. Peter Pan/Bonanza stops at two locations in the study area: the Hyannis Transportation Center and the Barnstable Park & Ride

facility at Exit 6 on Route 6. The route serving Hyannis, Providence, and New York offers 5 round trips per day.

Representative fares on Peter Pan/Bonanza from Hyannis include the following:

- Hyannis-Providence: \$22.50 one-way, \$41 round trip (midweek)
- Hyannis-New York City: \$52.95 one-way, \$95.95 round trip (midweek)
- Hyannis-Falmouth: \$11.50 one-way, \$22.00 round trip (midweek)
- Hyannis-Woods Hole: \$11.50 one-way, \$22.00 round trip (midweek)

Peter Pan/Bonanza charges a surcharge for weekend travel, and offers discounts for seniors and children.

### **2.5.3 Cape Cod Central Excursion Rail Service**

The Cape Cod Central Railroad offers seasonal excursion train service from Hyannis to Bourne via West Barnstable and Sandwich. Most service is offered from April through October, with limited service in November and December. Terminals with parking are located at Hyannis (adjacent to the Hyannis Transportation Center) and in Sandwich. The Cape Cod Central Railroad makes connections with CCRTA local buses and Plymouth & Brockton and Peter Pan/Bonanza intercity buses at the Hyannis Transportation Center.

Excursion trip fares on the Cape Cod Central Railroad range from \$18 for a two-hour excursion trip without a meal to \$65 for an evening excursion trip that includes dinner. Discounts are offered for seniors and children, and a Rail & Sail combination package is offered which includes a one-hour Hy-Line Cruises scenic tour of Hyannis Harbor.

### **2.5.4 Ferry Service**

#### Steamship Authority

The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority is a public authority that was created by the Massachusetts legislature in 1973 to provide for passenger and freight transportation to and from the islands of Nantucket and Martha's Vineyard. The Authority's mission is to serve as the "Lifeline to the Islands" and it is the only ferry service for the Islands that carries both passengers and vehicles, including commercial freight trucks.<sup>16</sup> The Steamship Authority operates service directly, and also licenses private ferry services such as Hy-Line Cruises.

The Steamship Authority provides service between Hyannis and Nantucket, and also between Woods Hole and Martha's Vineyard. Between Hyannis and Nantucket, the Authority operates a high-speed passenger ferry as well as a traditional-speed ferry that can accommodate autos and certain trucks. The high-speed passenger service provides 5 round trips per day during the summer months and 4 round trips per day during the rest of the year. The traditional-speed auto ferry provides 6 round trips per day during the summer and 3 round trips per day during the rest of the year.

---

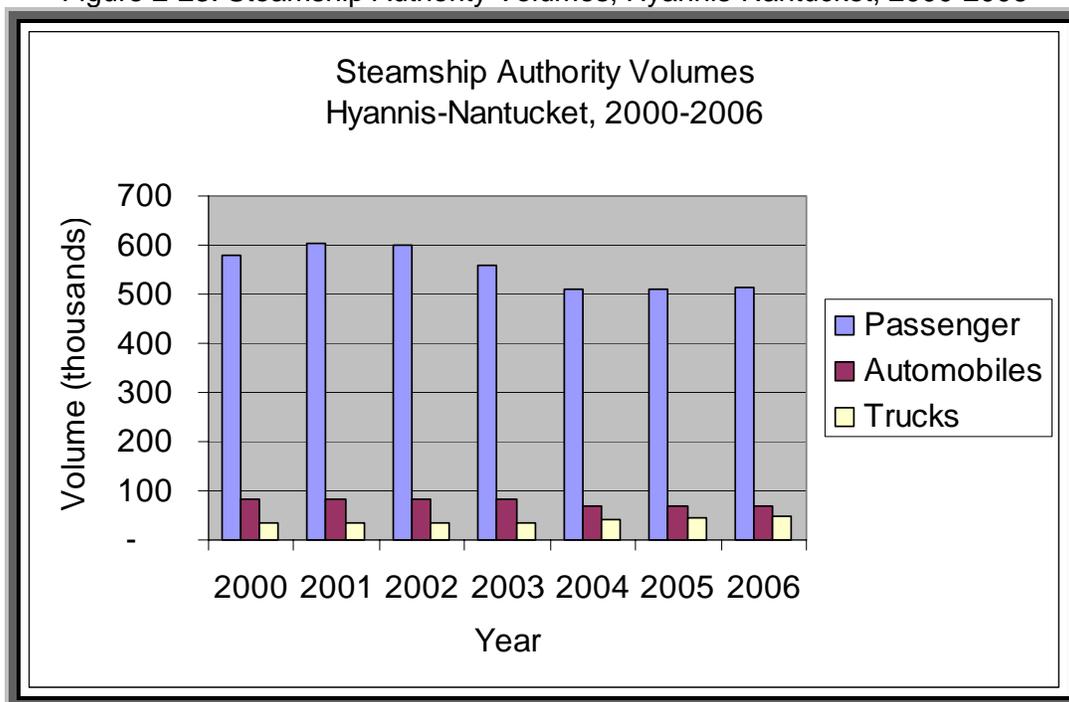
<sup>16</sup> Steamship Authority website ([www.steamshipauthority.com](http://www.steamshipauthority.com))

Fares on the Steamship Authority services between Hyannis and Nantucket range from \$15.00 one-way per person on the traditional ferry service to \$29.50 per person on the high-speed service. Discounts are offered for children and active members of the military. The charge for passenger automobiles ranges from \$120 one-way during the off-season to \$180 one-way during the peak season from April through October.

The Steamship Authority operates 4 parking lots in Hyannis for its patrons and charges parking fees ranging from \$8 to \$12 per day depending on the season. The Authority provides a free parking shuttle service between its parking lots and terminal, operated with alternative-fueled shuttle vehicles.

Over 2.6 million passengers traveled on all Steamship Authority services in 2006. The Steamship Authority transported approximately 515,000 passengers, 70,000 automobiles, and almost 50,000 trucks between Hyannis and Nantucket in 2006. Figure 2-23 shows the trend in Steamship Authority travel volumes between Hyannis and Nantucket over the past several years. As the figure indicates, passenger volumes on the Steamship Authority's Hyannis-Nantucket route have been relatively flat over the past several years, after dropping slightly earlier in the decade. Automobile volumes have also remained steady for the past few years after a drop earlier in the decade. Part of this drop can be attributed to a reclassification of some light trucks from the automobile to the truck category several years ago. Truck volumes have increased over the past several years, both due to this reclassification and to growth in the movement of freight to the islands.

Figure 2-23: Steamship Authority Volumes, Hyannis-Nantucket, 2000-2006

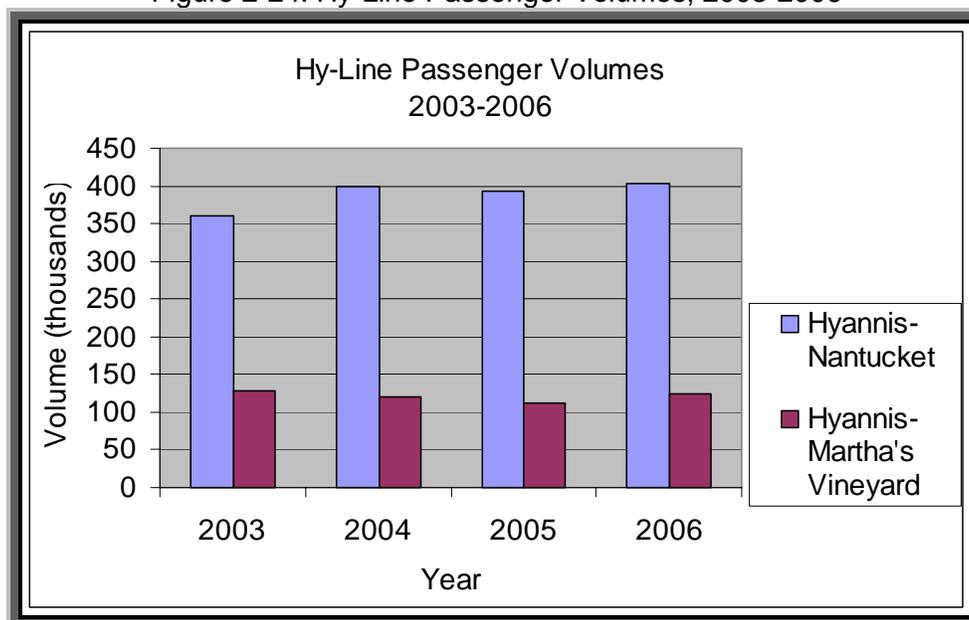


### Hy-Line Cruises

Hy-Line Cruises is a private ferry operator that is licensed by the Steamship Authority to provide passenger ferry service between Cape Cod and the Islands. Hy-Line offers passenger-only service between Hyannis and Nantucket as well as between Hyannis and Martha's Vineyard. Hy-Line operates both high-speed and traditional service on both routes during the spring, summer, and fall, and high-speed service only during the winter.

Figure 2-24 shows that over 525,000 passengers traveled on all Hy-Line ferry services in 2006. The Hy-Line transported approximately 404,000 passengers on its Hyannis-Nantucket route in 2006, and just over 125,000 passengers on its Hyannis-Martha's Vineyard route in the same year. Figure 2-24 shows the trend in Hy-Line passenger volumes over four years. As the figure indicates, passenger volumes on Hy-Line's Hyannis-Nantucket route increased between 2003 and 2004, then held steady in 2005 and 2006. Volumes on the Hyannis-Martha's Vineyard route have held steady over the 2003-2006 period.

Figure 2-24: Hy-Line Passenger Volumes, 2003-2006



On the Hyannis-Nantucket route, Hy-Line operates 6 high-speed round trips per day during the summer and 5 round trips per day during the rest of the year. On the same route, Hy-Line operates 3 traditional-speed round trips per day during the summer and 1 round trip per day during the spring and fall; no traditional-speed service is offered during the winter.

On the Hyannis-Martha's Vineyard route, Hy-Line operates 5 high-speed round trips per day during the summer and 4 round trips per day during the rest of the year. On the same route, Hy-Line operates 1 traditional-speed round trip per day during the spring, summer, and fall; no traditional-speed service is offered during the winter.

Fares on the Hy-Line services between Hyannis and Nantucket range from \$18.50 one-way per person on the traditional ferry service to \$38.00 per person on the high-speed service. Discounts are offered for children, and a first-class option is offered for an additional charge.

Fares between Hyannis and Martha's Vineyard range from \$18.50 one-way per person on the traditional ferry service to \$31.50 per person on the high-speed service, with discounts offered for children. Hy-Line operates one parking lot in Hyannis at its Ocean Street dock. Parking fees range from \$5 to \$15 per day depending on the season.

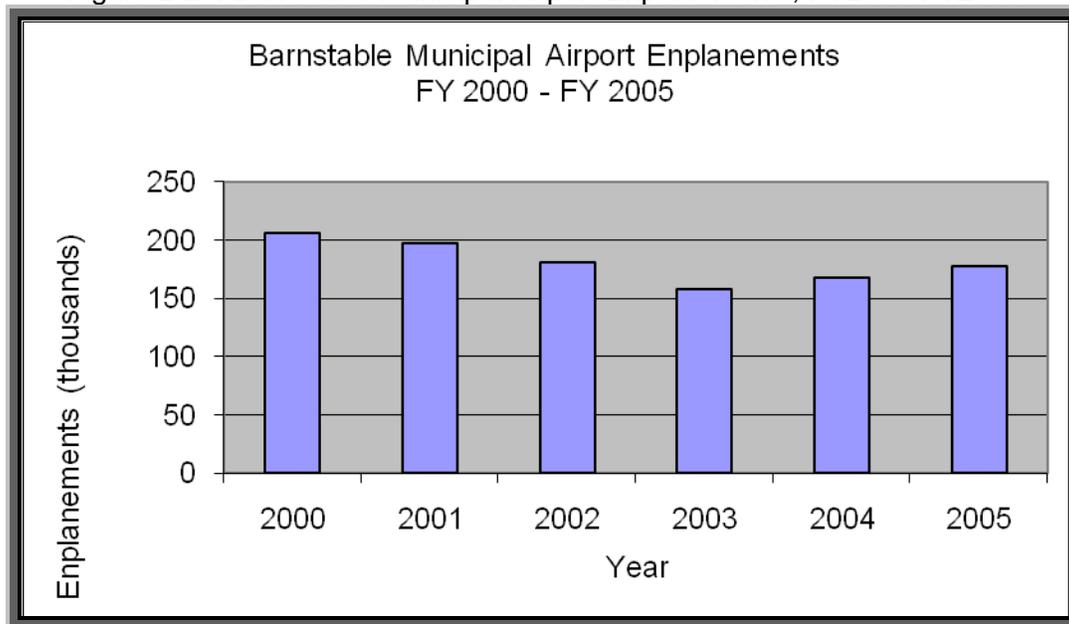
### 2.5.5 Barnstable Municipal Airport

Barnstable Municipal Airport (also discussed above in section 2.3), the primary public airport in the mid-Cape region, is owned by the Town of Barnstable and operated by the Barnstable Municipal Airport Commission. The Airport is located in the center of the study area, east of Route 132, west of Willow Street/Yarmouth Road, and south of Route 6. Five carriers offer scheduled airline services from Barnstable Municipal Airport at present: Nantucket Airlines, Cape Air, Island Air, USAir/Colgan Air, and Nantucket Shuttle. Scheduled destinations include Nantucket, Martha's Vineyard, New York City, Providence, and Boston. Connecting service is offered to a number of other destinations from Boston, Providence, and New York.

In addition to scheduled passenger service, numerous General Aviation services are offered at Barnstable Municipal Airport as well. These services include corporate jets, cargo services, charter services, and other types of flights. The Airport is also a significant center of employment; more than 1,100 people currently work at 43 businesses on the Airport property.

In 2006, Barnstable Municipal Airport saw almost 220,000 passenger enplanements.<sup>17</sup> This represents a significant increase from 2003, when the Airport experienced approximately 160,000 enplanements. Passenger enplanements at the Airport have been increasing steadily over the past four years after a significant decline following the September 11<sup>th</sup>, 2001 terrorist attacks.

Figure 2-25: Barnstable Municipal Airport Enplanements, FY2000-FY2005



<sup>17</sup> Enplanements is a term for passenger boardings at airports that have scheduled passenger service.

The Barnstable Municipal Airport Commission has developed plans for an Airport Improvement Project which would relocate the Airport terminal, reconfigure much of the Airport parking, and make other improvements. The key issues this project would address include the need for modernization of the Airport's facilities, and the need for Airport security improvements. This project is expected to include:

- A new 31,000 – 34,000 square foot terminal
- Closing of the access points on the rotary
- A new access road connecting the terminal to Attucks Way
- An access point from Route 28 east of the rotary
- An access point from Nightingale Lane on Route 132 west of the rotary

With these improvements, the Airport would be able to support substantially more traffic, and traffic operations in the vicinity of the Airport would be improved. The Airport Commission has submitted a Development of Regional Impact (DRI) application for the project. Design work on the project began in Fall 2006, and changes to the roadway network and the terminal would likely occur 18 to 24 months after the beginning of the design work. A progress print from 2005 of the Airport Improvement Project is provided in Appendix 15.

### 2.5.6 ITS Utilization in Transit

Intelligent Transportation Systems (ITS) technologies are being used in certain aspects of the transit system in the Hyannis area. CCRTA has deployed a system that provides real-time information about bus locations and arrivals via flat-panel video displays (such as at the Hyannis Transportation Center) and via the CCRTA website ([www.capecodtransit.org](http://www.capecodtransit.org)). Travelers can also use an interactive trip planner to plan trips on CCRTA routes via the Authority's website.

### 2.5.7 Park-and-Ride Facilities

MassHighway maintains 25 park-and-ride lots across the state, primarily sited along the radial highways that move travelers in and out of Boston. The primary purpose of the MassHighway park-and-ride system is to allow travelers to leave their vehicles behind and utilize more efficient modes of transportation (carpools, vanpools, commuter bus, etc.). This helps decrease the number of vehicles on the road, reducing both roadway congestion and the amount of pollutants released into the atmosphere. Park-and-Ride lots are used primarily by two different types of travelers: daily and long-term travelers. Daily travelers are mostly commuters traveling to and from work each day. Accommodating these commuters has the largest air quality benefit because it helps reduce the number of vehicles on the road at the most congested times (morning and early evening) each day. Long-term travelers are away for many days, often a week or longer. Accommodating these travelers at the park-and-ride lots has less of an air quality benefit because these people travel at different times of the day and only remove one round trip over their longer stay.

Accommodating daily commuters has the largest air quality benefit because it helps reduce the number of vehicles on the road at the most congested times (morning and early evening) each day. Accommodating long term travelers has less of an air quality benefit.

A number of different agencies are responsible for monitoring and maintaining the park-and-ride system. The Executive Office of Transportation and Public Works' Office of Transportation Planning (EOTPW Planning) monitors usage at lots in the MassHighway system and plans for improvements. Each lot is maintained by personnel from the appropriate MassHighway district office and security is provided through patrols by local and state police.

The MassHighway park-and-ride system on Cape Cod consists of three lots along Route 6 located in Harwich, Barnstable and Sagamore. All three lots are served by intercity bus routes that link them with cities such as Boston, Providence and New York. The Plymouth and Brockton Street Railway Company (P-B) provides commuter bus service to Boston from the Barnstable and Sagamore lots. P-B also offers service to Logan Airport from all three lots with a service called Logan Direct. Peter Pan Bus Lines provides service from the Barnstable lot to Providence with connecting service to New York.

The Barnstable park-and-ride lot is located on Route 132 adjacent to exit 6 along Route 6. The lot is located adjacent to a travel plaza which offers a number of amenities including restaurants, a convenience store and restrooms. Its 365 spaces are used by daily commuters, charter bus patrons, and overnight travelers, making it the location with the widest variety of travel options. The number of amenities provided at the lot combined with the amount of transportation services help make this location a very successful park-and-ride lot. It is so successful, that it is often difficult to find an open space at the lot. A listing of observations from the past two years is shown in table 2-13:

Table 2-13: Vehicle Counts and Utilization Rates at the Barnstable Park-and-Ride Lot

| Date                       | Day of Week | Time of Count | Number of Vehicles | Utilization |
|----------------------------|-------------|---------------|--------------------|-------------|
| 2/17/2005                  | Thursday    | 11:45 AM      | 381                | 104%        |
| 5/18/2005                  | Wednesday   | 11:06 AM      | 388                | 106%        |
| 8/17/2005                  | Wednesday   | 10:12 AM      | 377                | 103%        |
| 5/11/2006                  | Thursday    | 10:25 AM      | 359                | 98%         |
| 10/26/2006                 | Thursday    | 10:09 AM      | 350                | 96%         |
| 4/11/2007                  | Wednesday   | 11:27 AM      | 364                | 99%         |
| Average Number of Vehicles |             |               | 370                | 101%        |

The field observations (above) conducted by EOTPW Planning show that the lot is consistently at or over capacity.

Observations of overnight parking activity at the Barnstable park-and-ride lot were conducted by the Cape Cod Commission in 2002 and by William Griswold in 2007 (please see Appendix 14). Both observations show that many vehicles park overnight for extended periods of time. Mr. Griswold's observations showed that only approximately 56% of the vehicles parked in the lot each day are daily travelers. The remaining 44% are overnight travelers who park their vehicles at the lot for an average of 6 days. These observations show that any solution to the overcrowding will have to address the large amount of overnight parking at this lot.

### 2.5.8 Transportation Demand Management (TDM)

MassRIDES is a statewide program that offers free assistance to commuters, employers, and students on alternative travel options. Through their toll-free, bilingual hotline (1.888.4COMMUTE) and their web site (www.commute.com), MassRIDES assists travelers by finding carpoolers, vanpoolers and transit options for them. MassRIDES maintains an extensive

ride-matching database which currently contains over 10,000 commuters' schedules and home and work addresses. In addition to working with individuals, MassRIDES also partners with area employers to map employee origins and customize plans of mobility and access to worksites. The benefits to employers that partner with MassRIDES include tax benefits, enrollment in the "emergency ride home program", and increased recruitment and retention, among others.

MassRIDES began work in the Barnstable/Yarmouth area in 2003, and has since registered close to 200 participants. Over the course of the Hyannis Access Study, the list of MassRIDES partners on Cape Cod has grown to include:

- Barnstable County
- Barnstable Municipal Airport
- Cape Cod Chamber of Commerce
- Cape Cod Commission
- Cape Cod Community College
- Cape Cod Hospital
- Cape Cod Regional Transit Authority
- Cape and Islands Workforce Investment Board
- Mid-Cape Home Centers
- Plymouth & Brockton Street Railway Company
- Town of Barnstable
- Town of Yarmouth
- Willie's Gym

MassRIDES plans to increase employer participation, work with stakeholders to promote the program, implement incentive programs, and increase registrants in the MassRIDES database. MassRIDES is also working with the Cape Cod Mall.

## 2.6 Existing Land Use and Environmental Conditions

To assess existing environmental conditions for the Hyannis Access Study, data from the Massachusetts' Geographical Information System (MassGIS) database were acquired and overlaid onto aerial photography of the project study area. This GIS data was supplemented by resource information reported in the following documents:

- Frederic R. Harris Inc., *New Route 6 Interchange in the Town of Barnstable Conceptual Design & Feasibility Study*, 1998
- Centerline Studios Inc., *2005 Barnstable Open Space and Recreation Plan*, November 15, 2005,
- Town of Barnstable, *Local Comprehensive Plan*, 2006,
- Epsilon Associates Inc, *Barnstable Airport Improvement Project Draft Environmental Impact Report*, July 2003, and
- Cape Cod Metropolitan Planning Organization, *Draft 2006 Regional Transportation Plan*, Fall 2006.

Information gathered from a variety of natural resources websites and mapping was also used to document existing conditions in the study area. No field investigation was conducted at this early planning stage to verify the specific location and quality of identified resources. Similarly,

only limited coordination with resource agencies was undertaken for this preliminary planning study. Coordination with natural resource agencies becomes more important as a project advances into the formal environmental documentation phase that would be required by both the National Environmental Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA).

The project study area includes the area within Route 6A on the north, the Main Street business area (including West End Rotary) on the south, Yarmouth Road / Willow Street / Exit 7 ramps on the east, and Shallow Pond / Exit 6 ramps on the west.

### 2.6.1 Existing Land Use

The Hyannis Access Study area is located primarily in Barnstable, MA, though a small portion of the study area is in Yarmouth, MA. There are a number of different land uses in the study area including residential, commercial, industrial, open space/parks/recreation, transportation, and undeveloped land.

Land use in the portion of the study area that is north of Route 6 is primarily residential interspersed with large tracts of agricultural and undeveloped land. Much of the residential land is close to Route 6A, which forms the northern boundary of the study area. Cape Cod Community College and Cape Cod YMCA are also located north of Route 6 near Exit 6 in the northwestern corner of the study area.

The portion of the study area south of Route 6 is more developed and includes commercial, industrial, and transportation land uses. Independence Park, an industrial park, is located south of Route 6 and west of Mary Dunn Road. There are many commercial establishments, including the Cape Cod Mall, along the Route 132 corridor and within the Main Street business area. Barnstable Municipal Airport, the Hyannis Intermodal Facility, and the ferry terminals are also located south of Route 6. Additionally, the 357 acre Hyannis Ponds Wildlife Management Area, is located south of Route 6 and just north of the airport. Residential land use south of Route 6 is primarily concentrated south of Route 132.

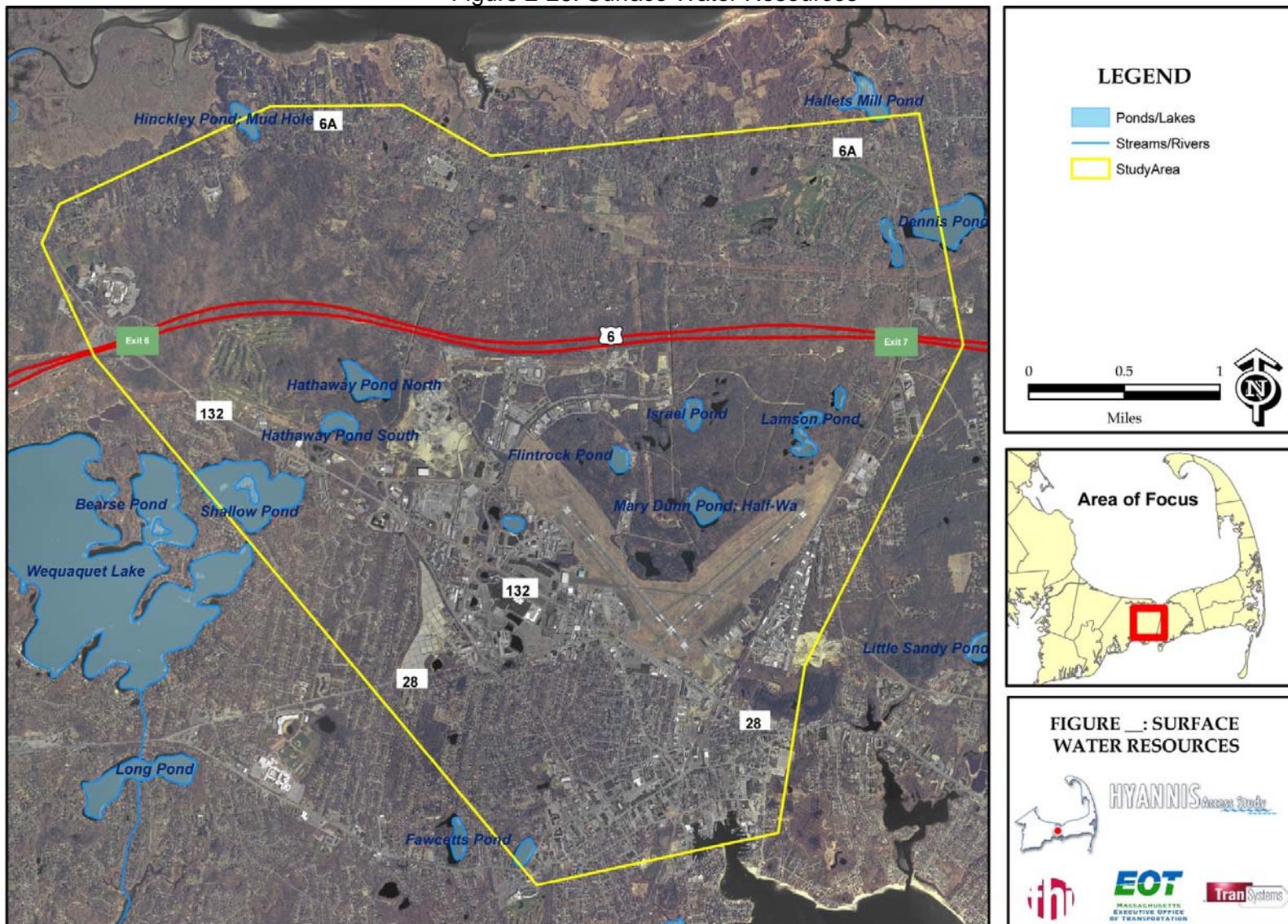
## 2.6.2 Surface Water Resources

Approximately 15 freshwater kettle ponds exist in the project area. Many of the ponds are located within undeveloped areas, such as the Hyannis Ponds Wildlife Management Area. There are a few ponds just north and west of the Barnstable Municipal Airport as well as some ponds near Independence Park. Wequaquet Lake is the largest body of water in the area at 654 acres. It is located just outside the western border of the project area. The largest surface water feature located within the study area is Shallow Pond, which is located between Wequaquet Lake and Route 132, along the western boundary of the study area. Figure 2-26 displays the surface water resources in the project area.

There are no major streams or rivers within the study area. The southernmost tip of the study area incorporates Hyannis Harbor, and inlet of Nantucket Bay.

The ponds provide natural, scenic, and recreational amenities. The *Town of Barnstable Local Comprehensive Plan* states that a number of the ponds contain rare and endangered species which occupy unique, specialized environmental niches.

Figure 2-26: Surface Water Resources



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

### 2.6.3 Floodplains

Digital Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map shapefiles (July 1997) available from Mass GIS were reviewed to identify floodways and 100-year and 500-year floodplains within the Hyannis Access Study project area. Wequaquet Lake and most of the kettle ponds in the study area are in the 500-year floodplain. A 500- flood is calculated to be the maximum level of flood water expected to occur on average once every 500 years. In a given year, land within the 500-year floodplain has a one five-hundredth of a chance (0.02%) of being inundated. The coastal areas on the north end of Barnstable on Cape Cod Bay and the coastal area in and around Hyannis Harbor and Nantucket Bay are in the 100-year floodplain. Land within the 100-year floodplain have a one percent chance of being inundated in a given year. Figure 2-27 displays a map of the 100-year and 500-year floodplains. As can be seen in the figure, there are virtually no 100-year or 500-year floodplains in the study area north of Route 6. There are no floodways identified by FEMA in the study area.

### 2.6.4 Aquifers and Groundwater Resources

Aquifer and groundwater information was obtained from the United States Geological Survey Hydrologic Atlas produced by the USGS Water Resource Discipline via MassGIS (June 2003). Groundwater resources in the Commonwealth of Massachusetts are not assigned a water quality classification but instead are designated as either high or medium yield aquifers.

A sole source aquifer is a designation assigned when over half of the population of an area depends on the aquifer for their sole source of water supply, and the supply can not be replaced for a reasonable cost. The *Town of Barnstable Local Comprehensive Plan* notes that groundwater is the only source of drinking water in the town.

All of Barnstable is within an U.S. Environmental Protection Agency (EPA) designated Cape Cod sole source aquifer that provides the principal or sole source of drinking water for Cape Cod. A sole source aquifer is a designation assigned when over half of the population of an area depends on the aquifer for their sole source of water supply, and the supply can not be replaced for a reasonable cost. The *Town of Barnstable Local Comprehensive Plan* notes that groundwater is the only source of drinking water in the town. This aquifer is considered a medium yield aquifer.

### 2.6.5 Public Water Supplies

#### Water Supply Wells

Approximately 15 public water supply wells are located in the project study area. About one-half of these wells are operated by Barnstable Water Company, with the remainder being operated by either the Barnstable Fire District or Yarmouth Water Company.

Figure 2-27: 100-year and 500-year Flood Plains

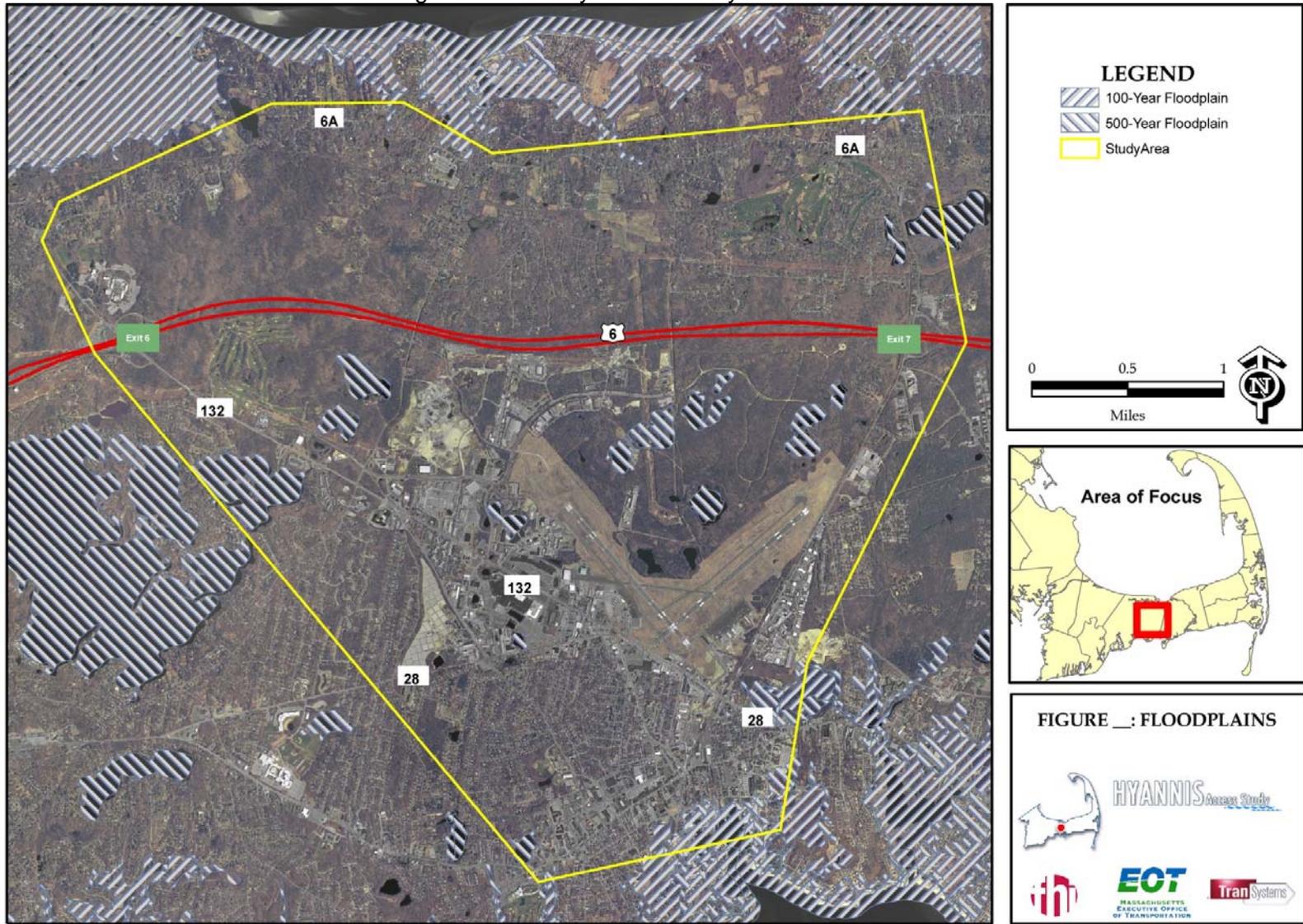
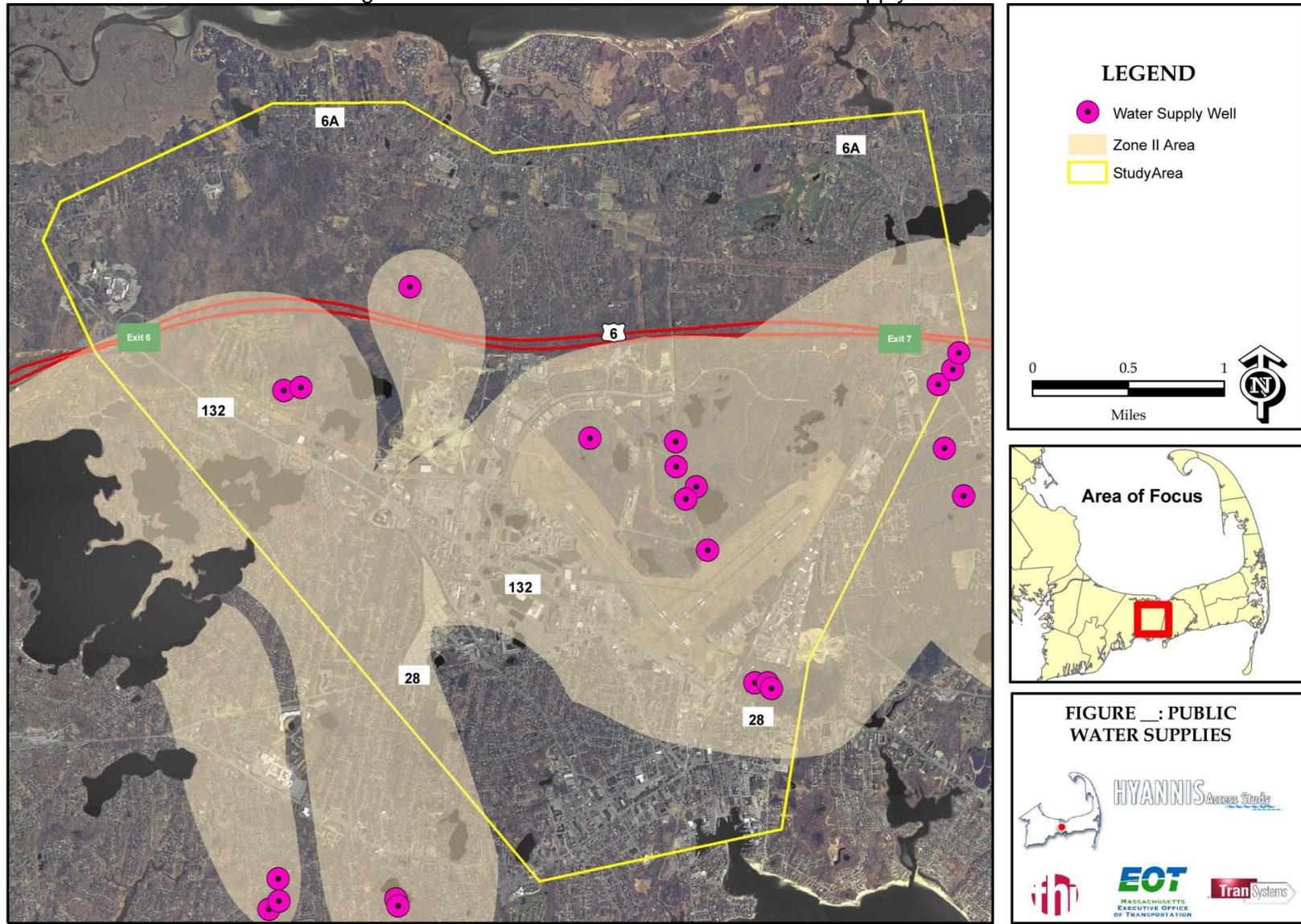


Figure 2-28: Zone II Protection Area and Water Supply Wells



Six of the wells are located within or near the Hyannis Ponds Wildlife Management Area north of the airport. Three wells are clustered near the intersection of Route 28 and Yarmouth Road in the southeastern corner of the study area a second cluster of three wells is located near Exit 7 off of Route 6 on the eastern boundary of the study area. Two wells are located east of Hyannis Golf Course at Iyannough Hills located southeast of Exit 6 and the remaining well is located north of Route 6, about ½ mile northwest of Independence Park. Figure 2-28 displays the water supply wells and the well head protection areas.

#### Interim Wellhead Protection and Zone II Areas

Wellhead protection areas are important for protecting the recharge area around public water supply wells. The Massachusetts Department of Environmental Protection (MDEP) has established two designated protection zones for public groundwater supplies. The first designation, referred to as Zone II, is a wellhead protection area that has been determined by hydro-geologic modeling and approved by MDEP. The second, or interim wellhead protection area, is a designated interim one-half mile protection zone for public water supply wells that do not yet have a MDEP approved hydrological study. Interim wellhead protection areas are established based on well pumping rates or default values. In addition, MDEP requires that a 400-foot radius around public supply wells be controlled by the water supplier and protected from development.

Wellhead protection areas are important for protecting the recharge area around public water supply wells. Much of the study area is located within a wellhead protection zone.

Much of the study area is located within the Zone II wellhead protection area associated with the 15 water supply wells. There are no interim wellhead protection areas in the study area.

#### **2.6.6 Wetlands**

The MassGIS database entitled DEP Wetlands (1:12,000), updated in June 2006, was used to identify wetland resources in the study area. Figure 2-29 depicts study area wetlands.

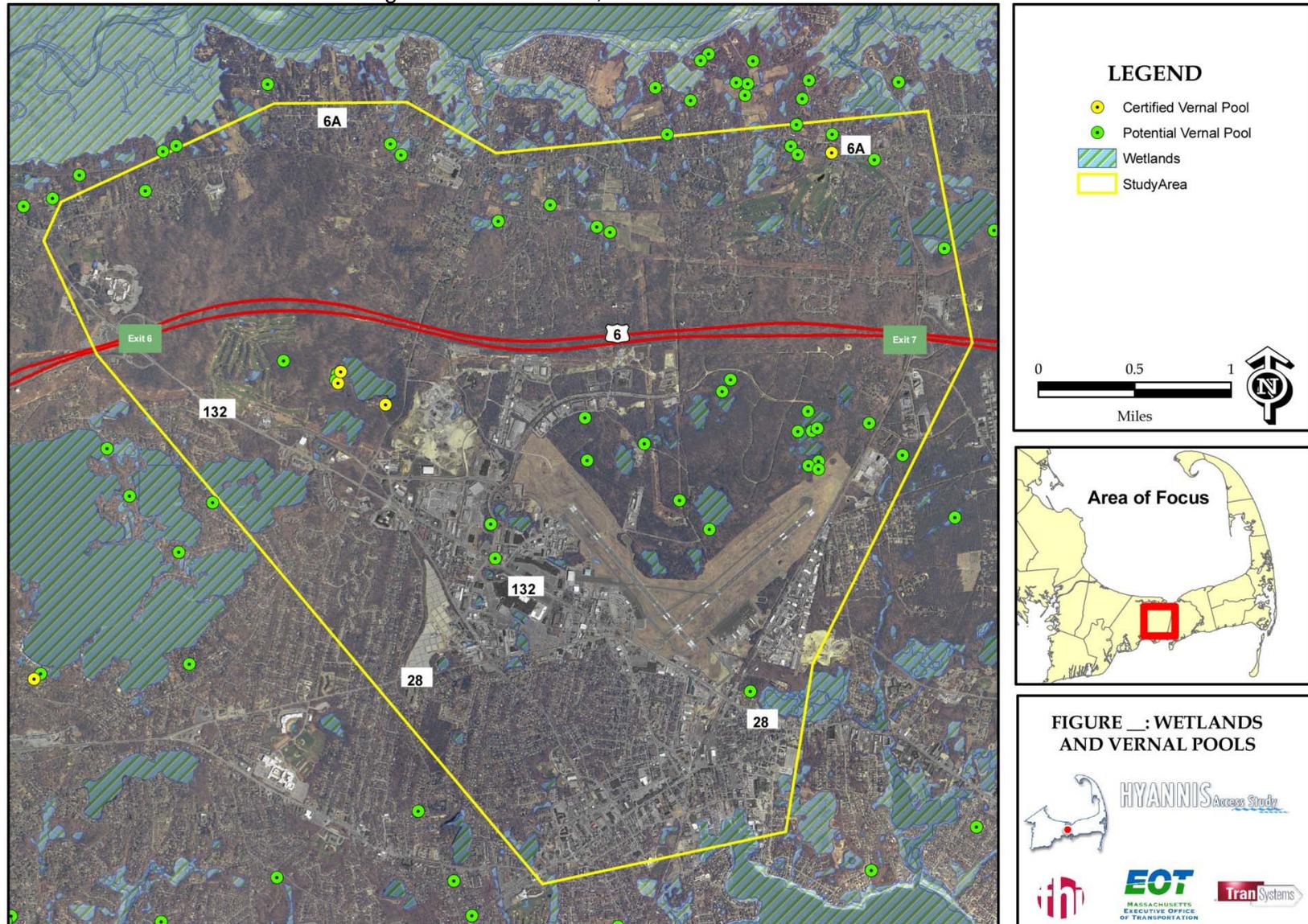
A significant number of wetlands are identified by the MassGIS database in the study area. Many of these wetlands are open water wetlands, though others include deep marsh, coastal beach, shallow marsh meadow/fen, salt marsh, shrub swamp, upland, tidal flat, and wooded swamp wetlands. The large number of wetlands can be attributed to low elevations and high groundwater levels. Wetlands are interspersed throughout the project area.

There are four certified vernal pools and 36 potential vernal pools in the project area. A vernal pool is a contained basin depression lacking a permanent above ground outlet that retains water on a seasonal basis. Certified vernal pools are those that have been recognized to contain biological indicators such as obligate species. These pools receive vernal pool protection under the Wetland Protection Act. Figure 2-29 displays the vernal pools in the project area. Three of the four certified vernal pools are located in the vicinity of Hathaway Pond North. The fourth is located south of Route 6A at the extreme northeastern corner of the study area. Of the 36

potential vernal pools, approximately 14 are located within the Hyannis Ponds Wildlife Management Area. There are no vernal pools in the developed area south of Route 132.

As this study transitions into the formal environmental documentation phase required by NEPA and MEPA, and assessment of wetland functions and values, vegetative species composition, and overall quality will be undertaken. Potential wetland mitigation areas will also be identified and screened during this phase of environmental documentation. Wetland delineation will only be conducted during the permitting phase so that potential wetland impacts can be accurately quantified.

Figure 2-29: Wetlands, Certified and Potential Vernal Pools



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

### 2.6.7 Threatened and Endangered Species

Massachusetts Natural Heritage and Endangered Species Program (NHESP) digital data contained on the MassGIS website were reviewed to identify the potential for threatened and endangered species and critical habitats within the project study area. NHESP GIS coverages that were examined include Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, Biomap Core Habitat, and Biomap Supporting Natural Landscape. Figure 2-30 displays these habitats.

The Priority Habitats of Rare Species datalayer contains polygons representing the geographic extent of habitat of state-listed rare species in Massachusetts. The Estimated Habitats of Rare Wildlife datalayer contains polygons that are a subset of the Priority Habitats of Rare Species. They are based on occurrences of rare wetland wildlife observed within the last 25 years and documented in the NHESP database. The Biomap Core Habitat layer depicts the most viable habitat for rare species and natural communities in Massachusetts. The Biomap Supporting Natural Landscape buffers and connects Biomap Core Habitat polygons and identifies large, naturally vegetated blocks that are relatively free from the impact of roads and other development.

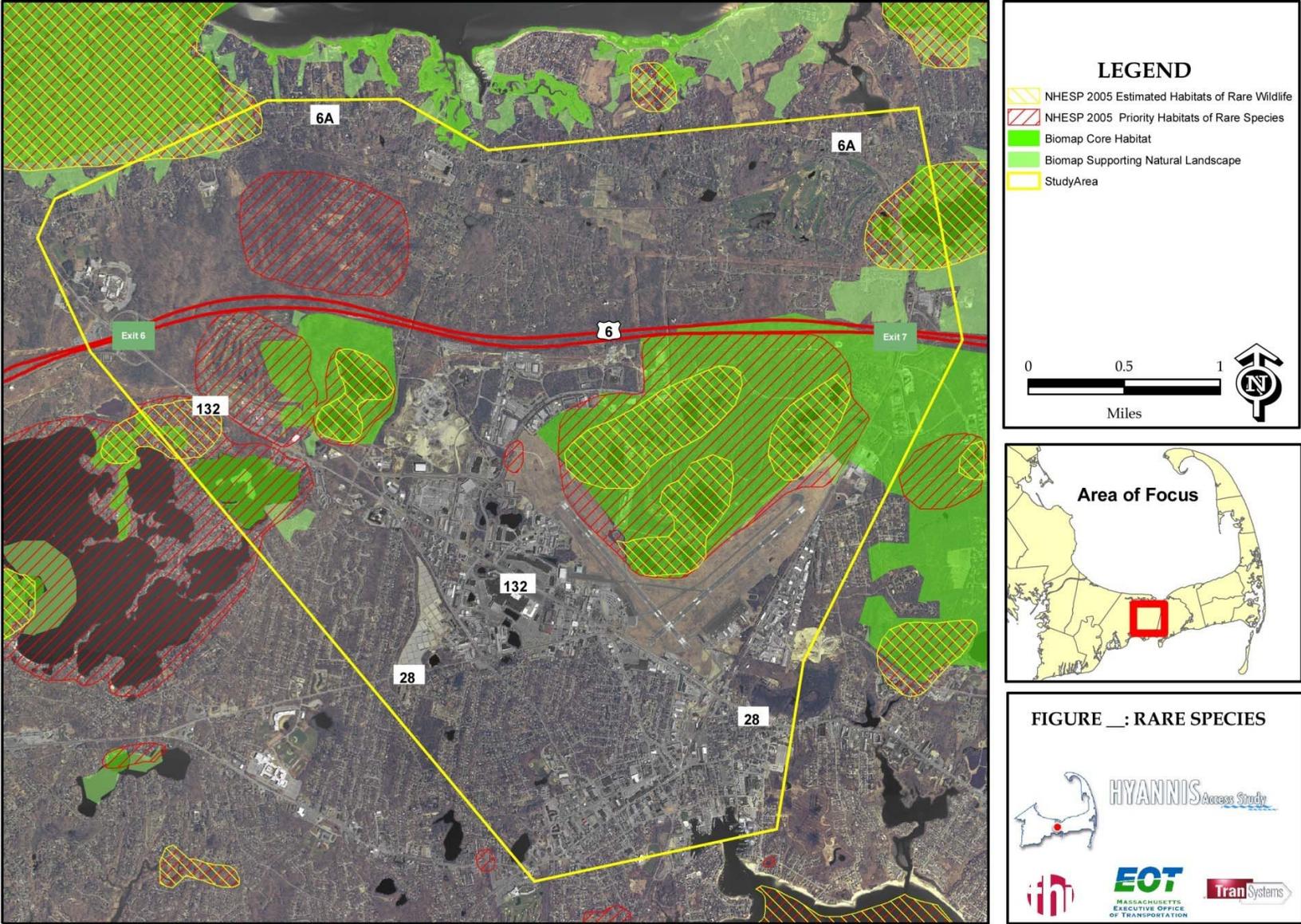
Rare species habitat occurs in several areas of the project study area. The habitats surround a number of kettle ponds at the Hyannis Ponds Wildlife Management Area. Kettle ponds along Route 132, including Barse Pond, Shallow Pond, Hathaway Pond North, and Hathaway Pond South have associated rare species habitat. In addition, the area directly north of these ponds (across Route 6) has rare species habitat.

### 2.6.8 Areas of Critical Environmental Concern

A review of the Massachusetts Department of Conservation and Recreation's (DCR) digital Areas of Critical Environmental Concern (ACEC) map contained on the MassGIS website revealed that there is one ACEC in the project area. ACECs are places in Massachusetts that receive special recognition because of the quality, uniqueness, and significance of their natural and cultural resources.

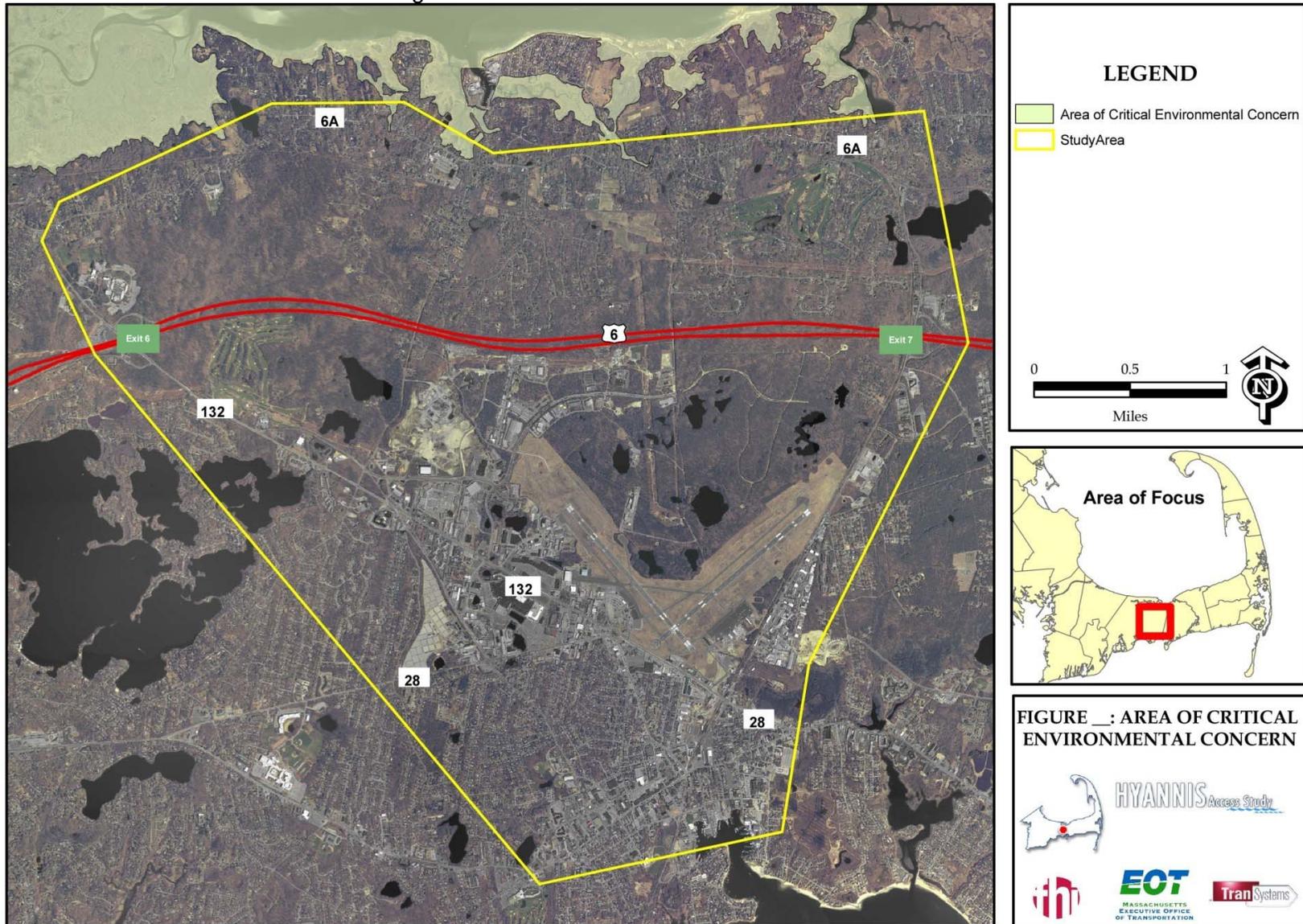
The ACEC located in the project area is Sandy Neck / Barnstable Harbor, which is displayed in Figure 2-32. The harbor is located north of Route 6A and overlaps Route 6A in approximately five separate locations. It was designated an ACEC in December of 1978. The *Barnstable 2005 Open Space and Recreation Plan* states that ten percent of Barnstable's land mass is salt marsh, most of which is located in the Sandy Neck / Barnstable Harbor ACEC.

Figure 2-30: Biomap Core Habitat and Rare Wildlife and Species



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

Figure 2-31: Areas of Critical Environmental Concern



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

### 2.6.9 Hazardous Waste Sites

A review of hazardous materials GIS data for the project area illustrated the locations of 77 Underground Storage Tank (UST) sites. No field verification or visual inspection of these locations has been conducted at this planning stage. All but seven of these USTs are located south of Route 6 in Hyannis. The USTs south of Route 6 are located near the marina (three USTs), the airport (six USTs), Yarmouth Road (four USTs), Route 132 (20 USTs), Route 28 (eight USTs), and the Main Street Business Area (>10 USTs).

There are seven USTs located north of Route 6. Three of these USTs are located in Barnstable Village and the others are at Cape Cod Community College, Usher's Store, and Cummaquid Golf Club.

Additional studies would be required to determine the presence of any potential hazardous waste sites, and this would be true of any of the intersection alternatives.

### 2.6.10 Cultural, Historical and Archaeological Resources

Section 106 of the National Historic Preservation Act of 1966 [16 USC 470f] states that any federally funded project must "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register."

The first step in evaluating potential impacts to historic resources is to establish a preliminary Area of Potential Effect (APE) for a project. This is a planning tool to identify potential historic resources that might be affected by future transportation improvements. For this Hyannis Access Study, the preliminary APE is defined as the entire project study area. The Hyannis Access Study alternatives would not incur any potential impacts, including visual impacts, beyond this range. This preliminary APE has not been reviewed by the Massachusetts State Historic Preservation Office. Formal coordination with SHPO would take place during the NEPA and MEPA environmental documentation phase to determine specific limits of the APE.

With a preliminary APE defined, the State Register of Historic Places data on the MassGIS website was consulted. This data includes significant historic properties and sites with legal designations under local, state, and/or federal statutes.

There are 23 historic properties in the APE. All of these properties are national register multiple resource areas, and all but one are listed on the national register as individual properties. These properties include:

- Benjamin Baker, Jr. House
- Nathaniel Baker House
- Barnstable Old Jail
- Crocker Tavern
- Barnstable County Superior Court House
- U.S. Customs House
- Agricultural Hall
- Colleen C. Campbell House
- 614 Main Street

- 606 Main Street
- 600 Main Street
- Captain William Hallett House
- Harnett Canary House
- 237-239 Main Street
- Captain Allen H. Bears House
- Captain Sylvester Baxter House
- Captain Oliver Bears House
- Captain Seth Baker Jr. House
- Captain Thomas Gray House
- Seth Hallett House
- Edward Francis Gleason House
- Captain Rodney J. Baxter House
- Crosby House

Additionally, the query revealed seven national register districts in the APE. Five of these seven districts are also national register multiple resource areas, and the Northside and Old Kings Highway districts are also local historic districts. These districts include:

- Old King's Highway Historic District
- Northside Historic District
- Mill Way Historic District
- Hyannis Road Historic District
- Yarmouth Campground Historic District
- Pleasant School Street Historic District
- Municipal Group Historic District

Historic resource data is displayed in Figure 2-32. This historical district data reflects listings through 1997. As the project advances into the formal environmental documentation phase, the most recent and accurate State Register of Historic Places (available at the State House Bookstore) should be consulted for updates. This is particularly true for archeological resources, which have yet to be defined at this planning stage.

### 2.6.11 Air Quality

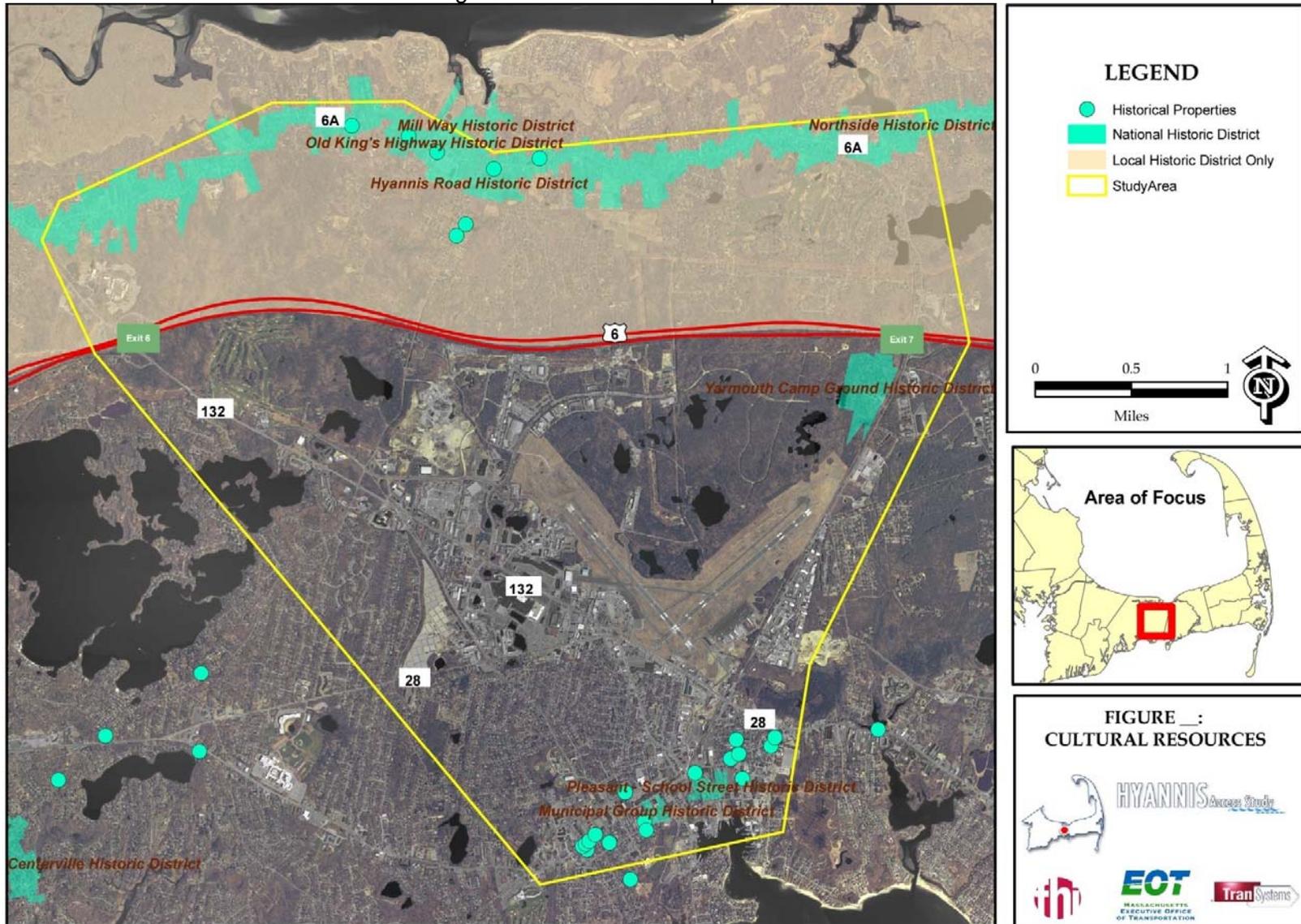
The Clean Air Act of 1970 and the 1990 amendments established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants including carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), ozone, and particulate matter (PM). The Clean Air Act Amendments requires states to monitor regional air quality to determine if regions meet the NAAQS. If a region shows exceedances of any of the NAAQS, that region is classified as nonattainment for that pollutant, and the state must develop an air quality plan, called the State Implementation Plan (SIP), that will bring the region into compliance. Eastern Massachusetts, which includes Cape Cod, is considered to be in non-attainment because it does not meet the NAAQS for ozone.

Because the Cape Cod region is part of a nonattainment area, a conformity determination is required on any new/revised transportation plan. Conformity requires that implementation of projects in the Regional Transportation Plan (RTP) and the Transportation Improvement

Program (TIP) must not cause or contribute to further violations of the NAAQS and must conform to the SIP's purpose of meeting air quality attainment. This demonstration requires an extensive modeling effort to estimate vehicle miles of travel on a regional transportation system and the resulting motor vehicle emissions. EOT conducts the conformity analysis in this region using their statewide model.

The existing conformity analysis does not include Hyannis Access Study area improvement(s) as the type and nature of improvements has not yet been defined. This study will assist in defining the desired improvements. Once improvements are defined, they will be required to have a conformity analysis to be part of an approved RTP and TIP.

Figure 2-32: Historical Properties and Districts



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

### 2.6.12 Noise

Noise sensitive land uses include:

- Residences, hotels, and other buildings where people sleep;
- Institutional buildings such as churches, schools, hospitals, and libraries; and
- Various tracts of land where silence is an essential element of the land's intended purpose, such as a historic landmark where outdoor interpretation routinely takes place.

Aerial photographs of the project study area were reviewed to identify noise sensitive land uses and to obtain a better understanding of the existing noise environment. Residential development is the densest in the southern portion of the study area immediately northwest of the Main Street business area. Less dense residential development exists between Pitcher's Way / Route 132 and the western study area boundary as well as north of Route 6. Two churches in the study area are located in Hyannis Village, near the Main Street business area, and two are located on Route 6A. Cape Cod Hospital is located in the Hyannis Village area, directly northeast of the ferry terminals. In addition, schools are interspersed in the study area. Hyannis Junior High School is located near the Main Street business area. West Barnstable Elementary School is located off of Route 6A. Barnstable High School is located on West Main Street near the intersection of Route 28. Cape Cod Community College is directly northeast of Exit 6 off of Route 6.

Existing noise levels have not been measured for this study. One prior study, the *Barnstable Airport Improvement Project Draft Environmental Impact Report*, measured existing noise levels within the study area. The noise model results for 2000 showed that the 65 DNL noise level countour, the most critical noise contour, just barely extends beyond the airport property. The 60 DNL noise contour extends into 51 acres of residential areas. All residential land uses are compatible with noise levels less than 65 dBA, and thus no residential land uses were identified as being impacted in this report.

Suburban and commercial environments are general considered to be moderately noisy places, with noise predominantly generated by traffic on local streets and nearby highways. Noise levels within suburban environments typically range from 55 dBA (A-weighted decibels to 60 dBA (Transit Noise and Vibration Impact Assessment, DOT-T-95-16, April 1995). Existing noise levels in the project study area are expected to fall within this decibel range, if not higher, given the proximity of Route 6 and heavily congested commercial routes in Hyannis.

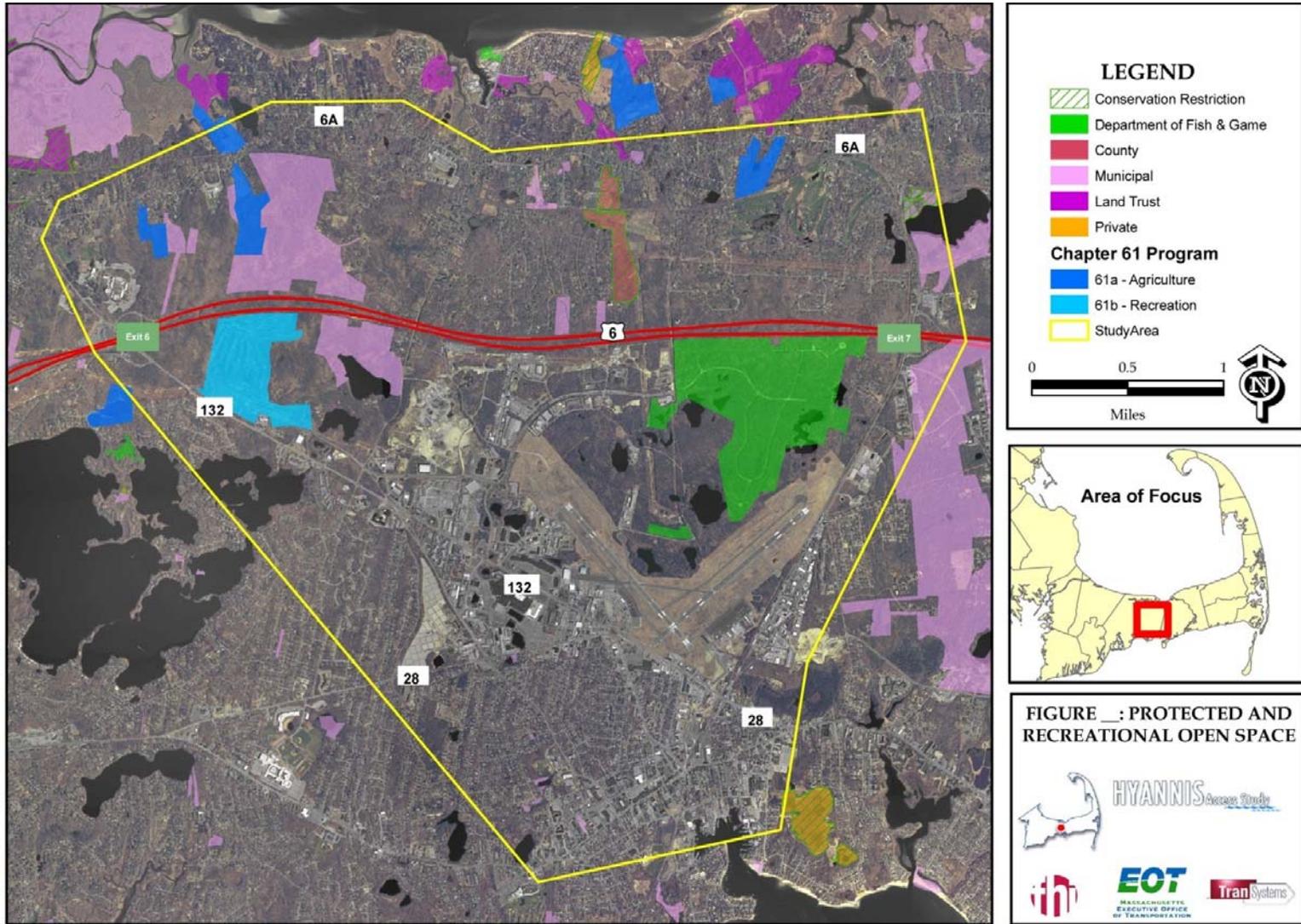
Detailed noise analyses will need to be completed for the alternatives selected for further study, and comparisons of alternatives regarding noise impacts, or benefits, can only be done at that time.

### 2.6.13 Protected and Recreational Open Space

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303) protects historic resources eligible for listing or listed on the National Register of Historic Places, as well as significant publicly owned parks, recreation areas, and wildlife/waterfowl preserves. Section 4(f) also affords protection to National Register listed archaeological resources that are important for preservation in place. Section 4(f) properties may only be impacted if there is no feasible and

prudent alternative and if the project includes all possible planning to minimize harm resulting from such use.

The project study area contains a number of dedicated public parks, and open spaces. Figure 2-33 display these areas. Further environmental research and analysis conducted during the NEPA and MEPA environmental documentation phase will determine potential impacts on any of these sources.



Graphic Created by Fitzgerald & Halliday, Inc. October 2006

## 2.7 Summary of Existing and Future Planned Conditions and Issues Identification

As described in this Chapter, there are a number of characteristics of existing and future conditions that indicate the types of alternatives that would provide benefits to the area. In addition, the examination of these conditions highlighted constraints, issues and opportunities.

The following are key conditions either today or in the future that the study team and the Task Force wished to address through the development of alternatives:

- Congestion at the Airport Rotary, which constrains accessibility to downtown and possibly development and redevelopment in these areas, is severe today and expected to worsen.
- Congestion along Yarmouth Road and at the intersection of Route 28, which also constrains accessibility to downtown and the hospital in particular, is severe today and expected to worsen.
- Accessibility to Independence Park, the Airport, and the malls along Route 132 continues to be a concern for some. Potential new development at Independence Park is perceived by businesses to be constrained by accessibility issues.
- The Barnstable Park-and-Ride lot is consistently overcrowded.
- There are opportunities to increase the visibility of transit, enhance existing services and improve links to major connection points and other modes.
- Pedestrian access is problematic.

The following are key constraints and issues:

- Groundwater is the only source of drinking water in the Town and much of the study area is in a wellhead protection zone.
- There are numerous historical properties throughout the study area.
- There are protected lands south of Route 6 in the vicinity of a potential Exit 6 ½.
- Many areas are constrained by existing facilities, developments and residential areas.

Various proposed improvement alternatives to address the conditions outlined in this Chapter are presented in the next Chapter, Chapter 3 and the evaluation of these alternatives is presented in Chapter 4.

## Chapter 3 – Alternatives Development

The analysis of existing and future conditions discussed in Chapter 2 revealed, among other things, that traffic operations are expected to worsen at key intersections not addressed by the area's roadway projects.

It has been long thought and hoped by many that a new interchange on Route 6 between Exits 6 and 7 would reduce traffic congestion in and around Hyannis while also supporting economic development. Therefore, five possible build alternatives were developed for "Exit 6 ½":

1. Trumpet interchange at the rest area
2. Trumpet interchange west of the rest area
3. Partial cloverleaf interchange at Mary Dunn Road
4. Diamond interchange at Mary Dunn Road
5. Trumpet interchange at Mary Dunn Road
6. Hybrid of alternative 1 and 4

The first five of these alternatives were presented at the April 4, 2007 Hyannis Access Study Task Force Meeting. The hybrid alternative was later suggested by a member of the public audience. This alternative combined elements of the trumpet interchange at the rest area with the diamond interchange at Mary Dunn Road. All Exit 6 ½ alternatives were discussed again at later Task Force meetings as cost and other information was developed and as the concepts were revised based on input.

Variations of the trumpet interchange at Mary Dunn Road were developed which would prohibit or discourage access to Mary Dunn Road north of Route 6. In addition, the team was asked to consider Phinneys Lane as a location for a potential interchange. The team and the Task Force also discussed the option of a partial exit would which only provide access to and from the east. These options are displayed and discussed in Appendix 7.

The junction of Route 132, Route 28 and Barnstable Road is expected to process over 60,000 vehicles a day in the year 2030. A primary route to downtown Hyannis as well as various other retail areas, the Airport Rotary is tightly constrained with commercial properties on all sides. It is frequently congested, often operating at unacceptable levels of service, and is the location of the highest number of crashes in the area. In addition, town officials and other Task Force members emphasized early in the study (at the June 20, 2006 Task Force meeting) that the Rotary needs to be studied and addressed. Therefore, the study team and the Task Force developed a spectrum of alternatives for the Airport Rotary:

### At-grade options:

- 1A. Updated Rotary
- 1B. Modern roundabout
2. Four-leg intersection with Route 28 to Route 28 aligned as the through movement
3. Split Intersection

Grade-separated options:

4. Route 132 to Route 28 underpass with a roundabout at-grade
5. Route 28 to Route 28 underpass with a roundabout at-grade

The following options were also developed but dropped after many meetings:

- Skewed intersection: Four-leg intersection with Route 132 and Route 28 aligned as the through movement
- Route 28 to Route 28 underpass with signalized intersection at-grade
- Route 132 to Barnstable Road underpass with a roundabout at-grade
- Route 132 to Barnstable Road underpass with signalized intersection at-grade
- Compressed Split Intersection
- Compressed Split Intersection with Bypass Lane 1
- Compressed Split Intersection with Bypass Lane 2
- Split intersection with Bypass Lane

These options and the reasons for dropping them are presented in Appendix 8.

In addition to Exit 6 ½ and the Airport Rotary, the technical team and the Task Force identified the Yarmouth Road corridor as an area of concern. At the time of the study, improvements were underway at Exit 7 and along Willow Street (as described in Chapter 2). Task Force members expressed concern that the widening of Willow Street would worsen congestion along Yarmouth Road from Willow Street to Route 28, making it a more severe bottleneck. Initially, the technical team and the Task Force discussed options for increasing the capacity of Yarmouth Road either through widening, creation of a bypass road, or by using Old Yarmouth Road or Camp Street in a one-way pair configuration. However, after further analysis of that area, both the technical team and the Town of Barnstable's engineers agreed that addressing the intersection is the crucial first step, and in fact, that improvements to the intersection would address the issues along both Yarmouth Road and Route 28 to a large degree. Although intersection improvements would have some property impacts, the design options are relatively straightforward: the appropriate number of through- and turning-lanes simply need to be provided. Therefore, the following options were developed for the intersection of Yarmouth Road and Route 28:

1. Widening and reconfiguration oriented to the east
2. Widening and reconfiguration oriented to the west

A roundabout option was also developed for the intersection, but was dropped due to the greater number of expected impacts and the proximity of the rail crossing. The drawing is shown in Appendix 9.

The development of the roadway alternatives discussed above consisted of early conceptual alignments overlaid on aerial photographs. Although basic engineering principles including MassHighway and AASHTO standards were used in the development of these alternatives, they remain conceptual given the early nature of this study and the lack of any formal survey or mapping.

The analysis of existing and future conditions discussed in Chapter 2 also revealed that there are many opportunities to increase the visibility of transit and enhance existing services. The following transit alternatives were developed:

1. Add signage to all stops
2. Bicycle and pedestrian improvements at key stops
3. Barnstable Villager Route improvements
  - a. Short term – Streamline Villager Route
  - b. Long term – Add express runs
4. Add dynamic message signs on key roadways
5. Support ongoing and upcoming efforts

Previous to the Hyannis Access Study, the Cape Cod Transit Task Force developed 9 Park-and-Ride alternatives. This Task Force consisted of town officials, representatives from the Cape Cod Commission and various other stakeholders. This Hyannis Access Study undertook further development and refinement of those alternatives, combining and culling them into the following four alternatives:

1. Allow reduced parking rate for bus patrons at the Hyannis Transportation Center and limit overnight parking at the Route 132 lot
2. Construct additional spaces at the existing location
3. Construct an additional park-and-ride lot at a new location
4. Construct a parking structure at the existing location

During the development of all the alternatives - roadway, transit, and park-and-ride - EOTPW Planning and the technical team collaborated extensively with the Task Force. Alternatives were added, dropped, significantly revised and finally refined through an iterative process which involved not only Task Force meetings but also additional meetings of smaller sub-groups of specialty and interest. All the alternatives were posted to the study's web site along with comment forms, and covered at the March 5, 2008 public informational meeting. Many public comments were taken into consideration as well.

Because the study addressed roadway, park-and-ride, and transit issues, and covered a large area, the development of alternatives was considered rather comprehensive. Being in the Planning stage – an early stage in the transportation project implementation process - offered EOTPW Planning, the technical team and the Task Force the luxury of contemplating a spectrum of solutions.

The following presents a brief description of each of the six Exit 6 ½ interchange alternatives, the six airport rotary alternatives, the five Transit alternatives and the four Park-and-Ride alternatives. Chapter 4 will provide more information on these alternatives, including their expected benefits and costs.

### 3.1 Exit 6 ½ Alternatives

The 1998 MassHighway "Conceptual Design and Feasibility Study for a New Route 6 Interchange in the Town of Barnstable" developed nine (9) potential build alternatives. EOTPW Planning and the technical team reviewed this previous study in the development of further alternatives, discussed below.

#### 3.1.1 Alternative 1 - Trumpet Interchange at the Rest Area

A trumpet interchange is traditionally used where one divided highway terminates at another divided highway; it involves at least one loop ramp connecting traffic either entering or leaving the terminating highway with the far lanes of the continuous highway. These junctions are also useful for toll roads since they concentrate all entering and leaving traffic in a single stretch of road, where toll booths can be installed.

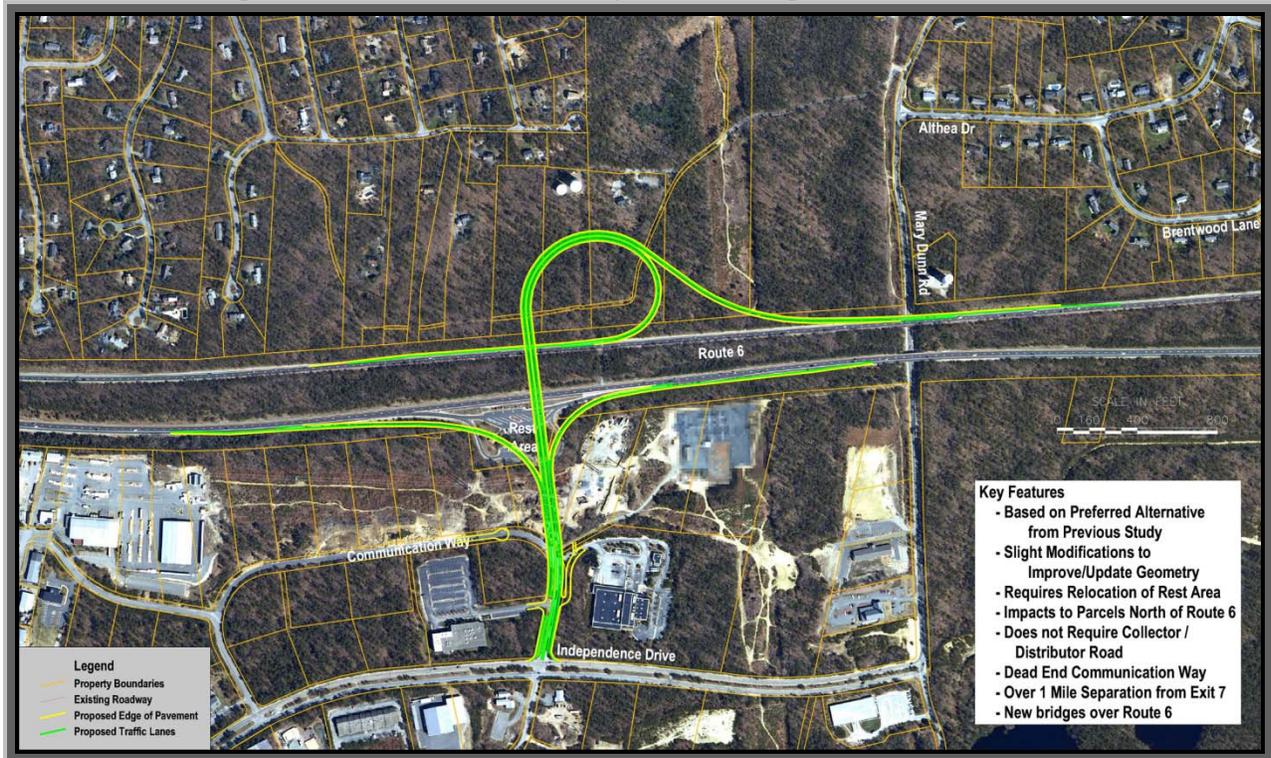
The trumpet interchange located at the exiting rest area was based on a preferred alternative from the previous study, but with some modifications to improve the geometric layout and design to conform to the latest design standards. This alternative would require the relocation of the rest area and also would impact at least four properties north of Route 6. Alternative 1 would not require a collector/distributor road and would be located more than one mile from Exit 7.

This interchange would connect to Independence Drive and would require that Communication Way become a dead-end street. Eastbound traffic exiting and entering Route 6 at this interchange would do so via Independence Drive. New bridges over Route 6 would be required to provide connections for westbound Route 6 traffic.

**Alternative 1 Key Features:**

- Requires relocation of rest area
- Impacts parcels north of Route 6
- Does not require a collector/distributor road
- Dead end at Communication Way
- Over one mile of separation from Exit 7
- New bridges over Route 6 would be required

Figure 3.1 Alternative 1 – Trumpet Interchange at the Rest Area



### 3.1.2 Alternative 2 - Trumpet Interchange West of the Rest Area

Alternative 2 shifts the trumpet interchange to the west of the rest area, allowing the rest area to remain in place. Route 6 eastbound off traffic would use this interchange, but traffic accessing Route 6 eastbound would do so from a new access ramp off of Mary Dunn Road. Although three of the four movements at this interchange would be more than one mile from Exit 7 (and Exit 6), the eastbound on-ramp off of Mary Dunn Road would be less than one mile<sup>1</sup>. This alternative would also involve the construction of new bridges over Route 6, and would impact several properties north of Route 6. Modifications to the alignment of Communication Way would also be necessary.

#### **Alternative 2 Key Components:**

- Maintains rest area location
- Eastbound on-ramp located off of Mary Dunn Road, which is less than one mile from Exit 7
- Property impacts north of Route 6
- New bridges over Route 6 will be required
- Communication Way would need to be realigned

Figure 3.2 Alternative 2 – Trumpet Interchange West of the Rest Area



<sup>1</sup> Federal Highway Administration guidelines suggest at least a mile separation between exits on limited access highways.

### 3.1.3 Alternative 3 - Partial Cloverleaf Interchange at Mary Dunn Road

The partial cloverleaf interchange design is a modification of a full cloverleaf interchange. The design of this interchange removes weaving patterns and allows for more acceleration and deceleration space on the highway. The design has become widely used for connecting highways to arterial roadways, and roughly mirrors the other interchanges on Route 6 on Cape Cod.

Locating this alternative interchange at Mary Dunn Road allows the rest area to remain in place, but would involve impacts to properties in the northwest and southeast quadrants. An eastbound collector/distributor road would be required, as well as a new bridge over Mary Dunn Road. The collector/distributor road would merge with the mainline at a point only  $\frac{3}{4}$  of a mile from Exit 7, less than the standard one mile.

#### Alternative 3 Key Components:

- Eastbound collector/distributor road would be needed
- Collector/distributor road merges with the mainline  $\frac{3}{4}$  of a mile from Exit 7
- Rest area maintained
- Property impacts in the northwest and southeast quadrants
- New bridge over Mary Dunn Road
- Modifications to Mary Dunn Road

Figure 3.3 Alternative 3 – Partial Cloverleaf Interchange at Mary Dunn Road



### 3.1.4 Alternative 4 - Diamond Interchange at Mary Dunn Road

Diamond interchanges are commonly used where a highway crosses a secondary road. The highway itself will be grade-separated from the secondary road, with a bridge being provided for one or the other. Approaching the interchange from either direction, an off-ramp diverges only slightly from the freeway and runs directly across the secondary road, becoming an on-ramp which returns to the highway in similar fashion.

The two places where the ramps meet the secondary road are treated as conventional intersections. Traffic on the off-ramp typically faces a stop sign at the minor road, while traffic turning onto the highway is unrestricted.

The diamond interchange makes more efficient use of space than most types of highway interchange, and avoids the interweaving traffic flows that occur in interchanges such as the full cloverleaf. Thus, it is most effective in areas where traffic volumes are relatively light and a more expensive interchange type is not needed. But where there is significant traffic, the two intersections within the interchange may cause congestion and accidents, requiring additional features such as traffic lights and extra lanes dedicated to turning traffic.

This alternative would require the relocation of the rest area and would have some impacts to properties in all four quadrants, particularly in the northeast quadrant. The diamond configuration eliminates the need for loop ramps and would not require a collector/distributor road. Some modifications to Mary Dunn Road would be necessary.

**Alternative 4 Key Components:**

- Relocation of Rest Area
- Impacts to residential properties, particularly in the northeast quadrant
- Does not require loop ramps
- Does not require collector/distributor road
- Interchange is over one mile from Exit 7
- Modifications to Mary Dunn Road would be necessary

Figure 3.4 Alternative 4 – Diamond Interchange at Mary Dunn Road



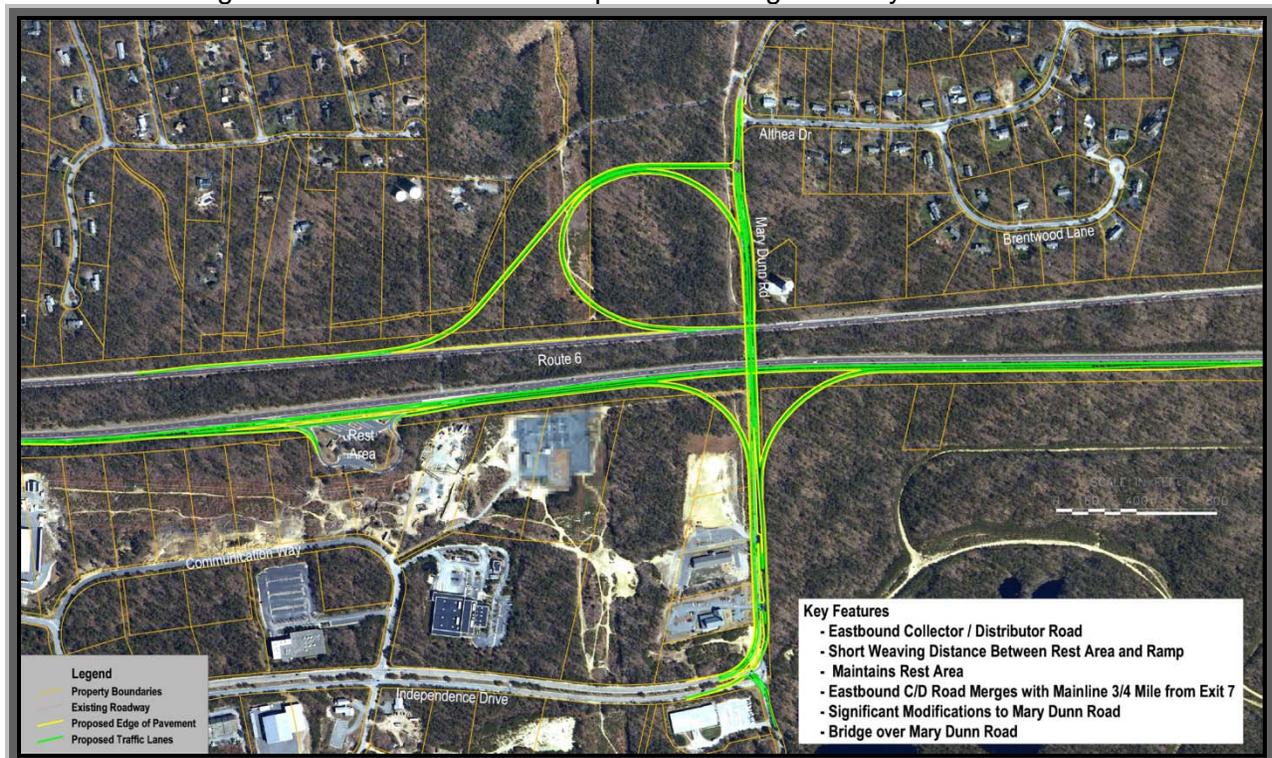
### 3.1.5 Alternative 5 - Trumpet Interchange at Mary Dunn Road

Alternative 5 shifts the trumpet style interchange to Mary Dunn Road. This alternative would allow the rest area to remain in place but would require an eastbound collector distributor road that would merge with the mainline only  $\frac{3}{4}$  of a mile from Exit 7, less than the standard one mile. The distance from the rest area to the eastbound off ramp would allow some room for weaving movements but this distance would be relatively short. This alternative would require a bridge over Mary Dunn Road as well as substantial modifications along Mary Dunn Road. Property impacts resulting from the new ramps would be most noticeable in the northwest quadrant, but would also be required in the southwest and southeast quadrants.

#### Key Features of Alternative 5:

- Eastbound collector/distributor road
- Short weaving distance between rest area and eastbound off ramp
- Maintains rest area
- Collector/distributor road merges with the mainline  $\frac{3}{4}$  of a mile from Exit 7
- Substantial modifications to Mary Dunn Road would be necessary
- Bridge over Mary Dunn Road would be required

Figure 3.5 Alternative 5 – Trumpet Interchange at Mary Dunn Road



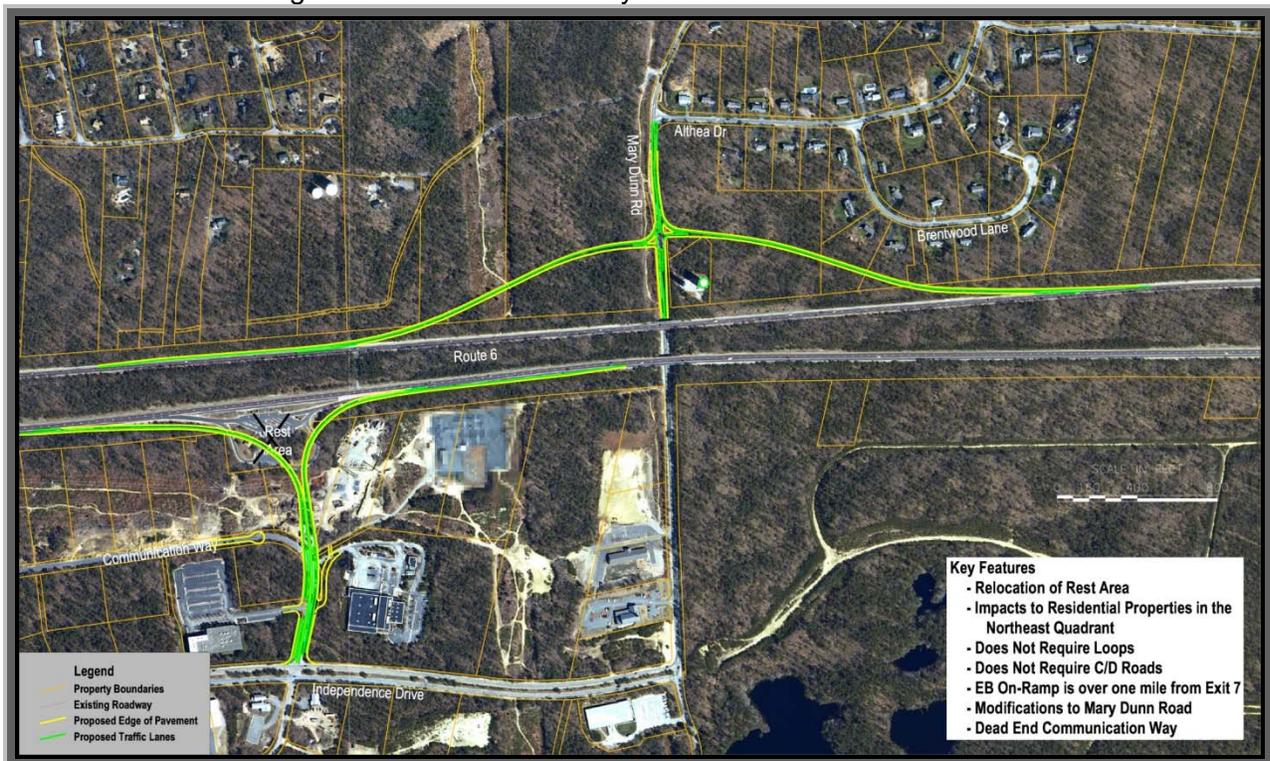
### 3.1.6 Alternative 6 - Hybrid of Alternatives 1 and 4

This alternative was submitted by a member of the public audience at one of the Task Force meetings. It combines elements of Alternatives 1 and 4 by locating the eastbound on and off ramps at the rest area and the westbound on and off ramps at Mary Dunn Road. The eastbound ramps would require the relocation of the rest area and Communication Way would become a dead end. The eastbound on ramp would be located over one mile from Exit 7. The westbound on and off ramps would be located at Mary Dunn Road, similar to half of the diamond interchange alternative. This would involve some impacts to residential properties in the northwest quadrant and some properties in the northeast quadrant, and some modifications to Mary Dunn Road, but would not require a new bridge over Mary Dunn Road. There would not be any loop ramps and no collector/distributor road.

**Key Features of Alternative 6:**

- Relocation of the rest area would be necessary
- There would be impacts to residential properties in the northwest quadrant, and some in the northeast quadrant
- Does not require loop ramps
- Does not require collector/distributor road
- The eastbound on ramp would be located over one mile from Exit 7
- Modifications to Mary Dunn Rd would be necessary, but not a new bridge
- Communication Way would become a dead end road

Figure 3.6 Alternative 6 – Hybrid of Alternatives 1 and 4



## 3.2 Airport Rotary Alternatives

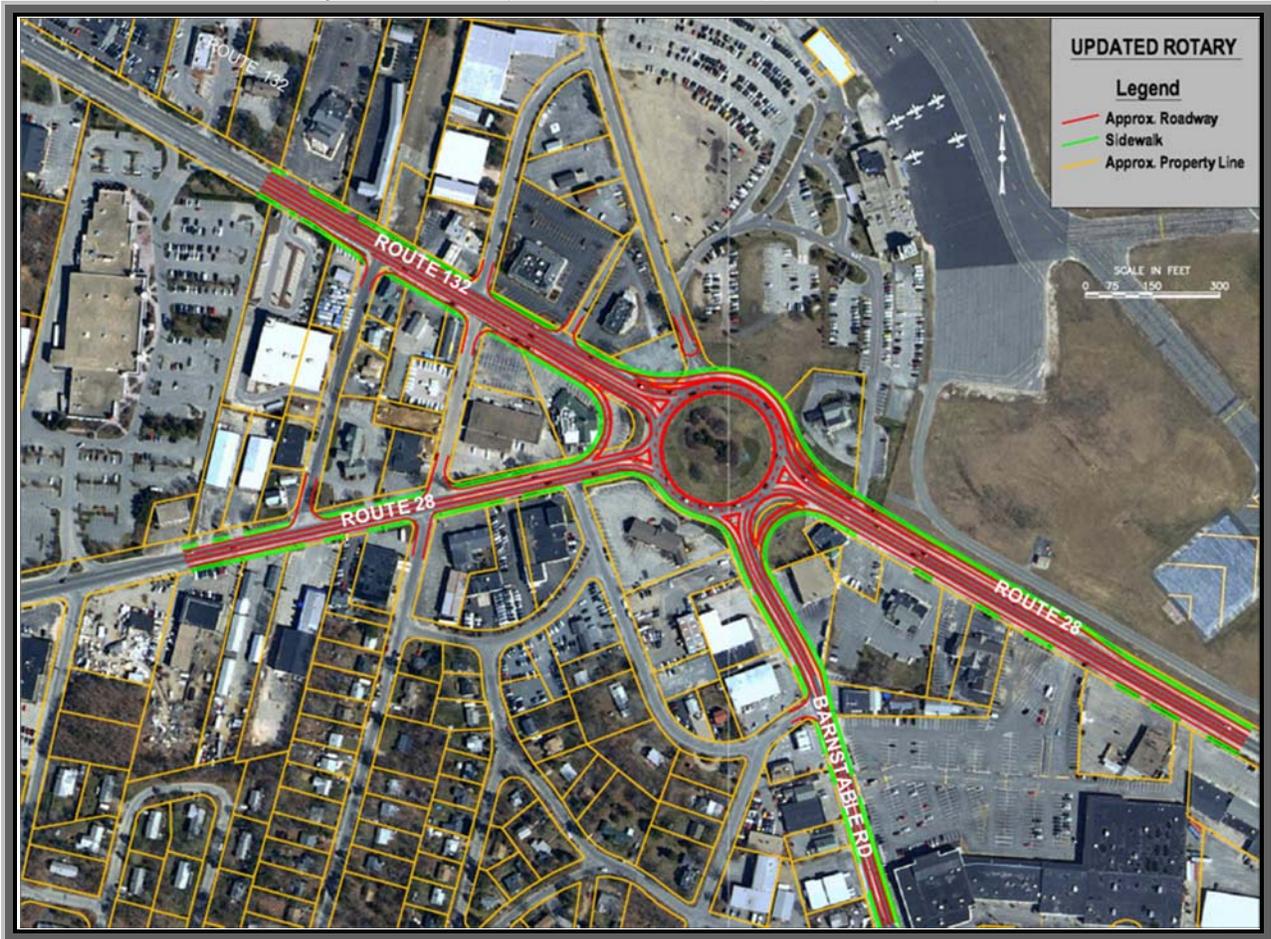
The Airport Rotary is one of the most important study locations. It is the junction of three major roads within the study area: Route 132, Route 28 and Barnstable Road. The existing rotary has five approaches consisting of Route 132 to the northwest, Route 28 to the east and west, Barnstable Road to the south and Airport Road to the north. In the future, the Airport Road will not connect to the Rotary due to the Airport Improvement Project. A progress print from 2005 of the Barnstable Municipal Airport Improvement Project is provided in Appendix 15. Both Route 132 and Barnstable Road are two lane approaches while the remaining three approaches all have one lane. All approaches have a center channelizing island. The rotary is roughly 300 feet in diameter with the circulating road wide enough for two lanes (however, the rotary is not currently striped for two lanes). There are YIELD signs posted on all approaches. The Barnstable Airport is north of the rotary. Between the Route 28 approach to the east and Barnstable Road to the south, there is a Citizen's Bank.

Appendix 11 provides zoomed-in views of all the airport rotary alternatives discussed below.

### 3.2.1 Rotary Alternative 1A – Updated Rotary

This alternative allows the rotary to remain in place, but with improvements. The rotary would remain an unsignalized at-grade convergence of the four major roadways (two legs of Route 28, Route 132, and Barnstable Road). Bypass lanes would be added on 3 of the 4 approach legs; all approach legs would have 2 lanes; Route 132 and Route 28 east would have 2 exit lanes; and Route 28 west and Barnstable Road would have one exit lane. This alternative would not improve bicycle or pedestrian access over what currently exists.

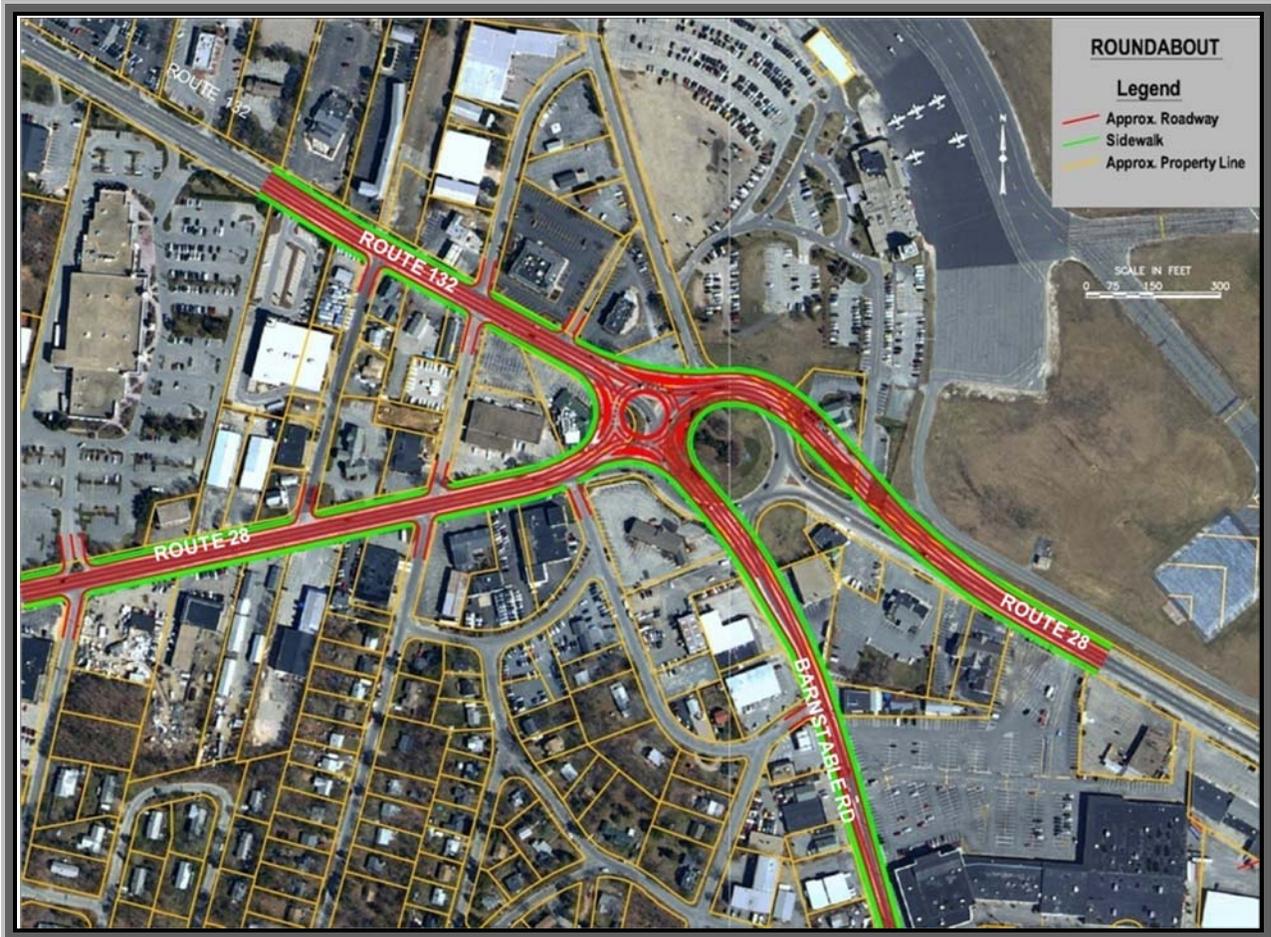
Figure 3.7 Rotary Alternative 1A – Updated Rotary



### 3.2.2 Rotary Alternative 1B – Roundabout

This alternative would also involve an unsignalized at-grade option, using a roundabout instead of a rotary. This alternative would include bypass lanes on all approach legs; two lanes on all approaches; two exit lanes on Route 132 and Route 28 (east and West), and; one exit lane on Barnstable Road. Similar to the updated rotary alternative, pedestrian and bicycle access would not be improved compared to existing conditions. The roundabout is shifted to the west of the existing lay-out to optimize the approaches and separate them to 90 degrees – to the extent possible.

Figure 3.8 Rotary Alternative 1B - Roundabout



### 3.2.3 Rotary Alternative 2 – Four Leg Intersection

This alternative would replace the rotary with a signalized intersection, with the four roadways (Route 28 east and west, Route 132, and Barnstable Road) realigned to create the four legs of the intersection.

A bypass lane would be provided on three of the four approaches. Route 28 westbound would have two dedicated lanes for travel to Route 132, one through lane for continuing onto Route 28 westbound, and a left-hand turn lane for turning onto Barnstable Road, for a total of four lanes on the approach. There would be two lanes for receiving traffic. Route 132 would also have four lanes on the approach – two for turning onto Route 28 eastbound and two for heading south to Barnstable Road. Access to Route 28 westbound would be provided through a bypass lane. Route 132 would also have two receiving lanes. Route 28 eastbound would have four lanes on the approach – two for continuing onto Route 28 and two for turning onto Route 132. Access to Barnstable Road would be provided through a bypass lane. This leg of Route 28 would also have two receiving lanes. Barnstable Road would have three lanes on the approach – two for Route 132 and one for turning left onto Route 28 westbound. Access to Route 28 eastbound would be provided with a bypass lane. Barnstable Road would have two receiving lanes.

Figure 3.9 Rotary Alternative 2 – Four Leg Intersection

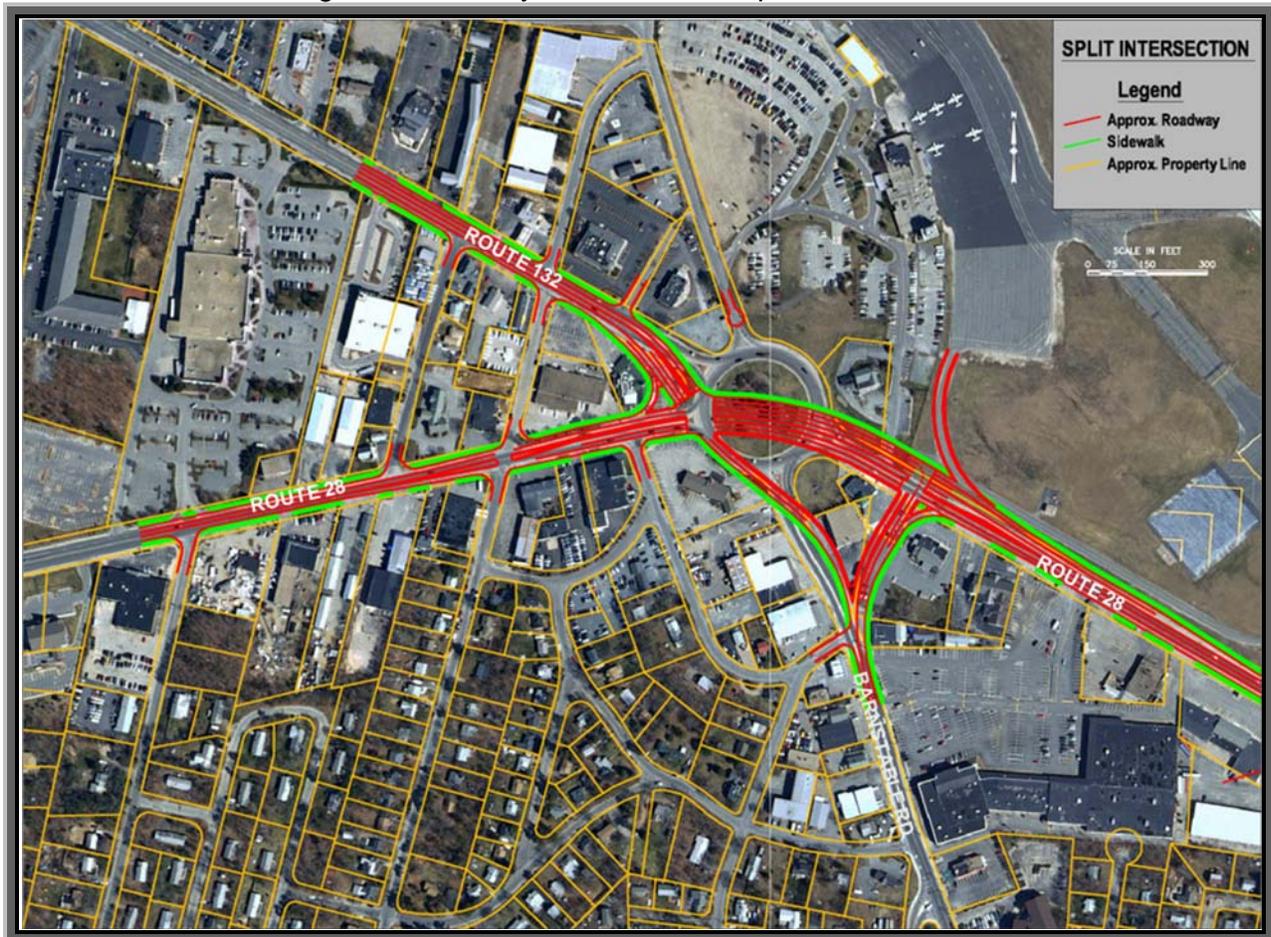


### 3.2.4 Rotary Alternative 3 – Split Intersection

This alternative realigns the roadways to create two offset intersections, with Route 28 as the through movement. Barnstable Road/Route 28 intersection and the Route 132/Route 28 intersection would be offset from each other by a distance of approximately 450 feet. Each intersection would be signalized and the signals would be coordinated. There would be five westbound lanes along Route 28 approaching from the east.

The concept is to separate one large intersection (the four-leg option) into two smaller intersections, with the main benefit being that several moves are accommodated at one of the intersections. Some traffic would have to traverse both intersections.

Figure 3.10 Rotary Alternative 3 – Split Intersection



### 3.2.5 Alternative 4 – Route 132 to Route 28 Underpass with Roundabout

This alternative would involve the construction of a single lane roadway underpass crossing underneath the existing rotary, which would be modified into a modern roundabout. The single lane underpass would carry southbound traffic from Route 132 to Route 28 east. A second northbound lane (Route 28 to Route 132) could be added at grade along the right side of the rotary. This alternative would require a long underpass structure, approximately 600 feet long, and this structure would need to contend with possible drainage and groundwater issues. This option would also interrupt the flow of through traffic on Route 28. Two exiting lanes would be required on Route 132 and on Barnstable Road. The underpass would also substantially increase future maintenance requirements and the associated costs.

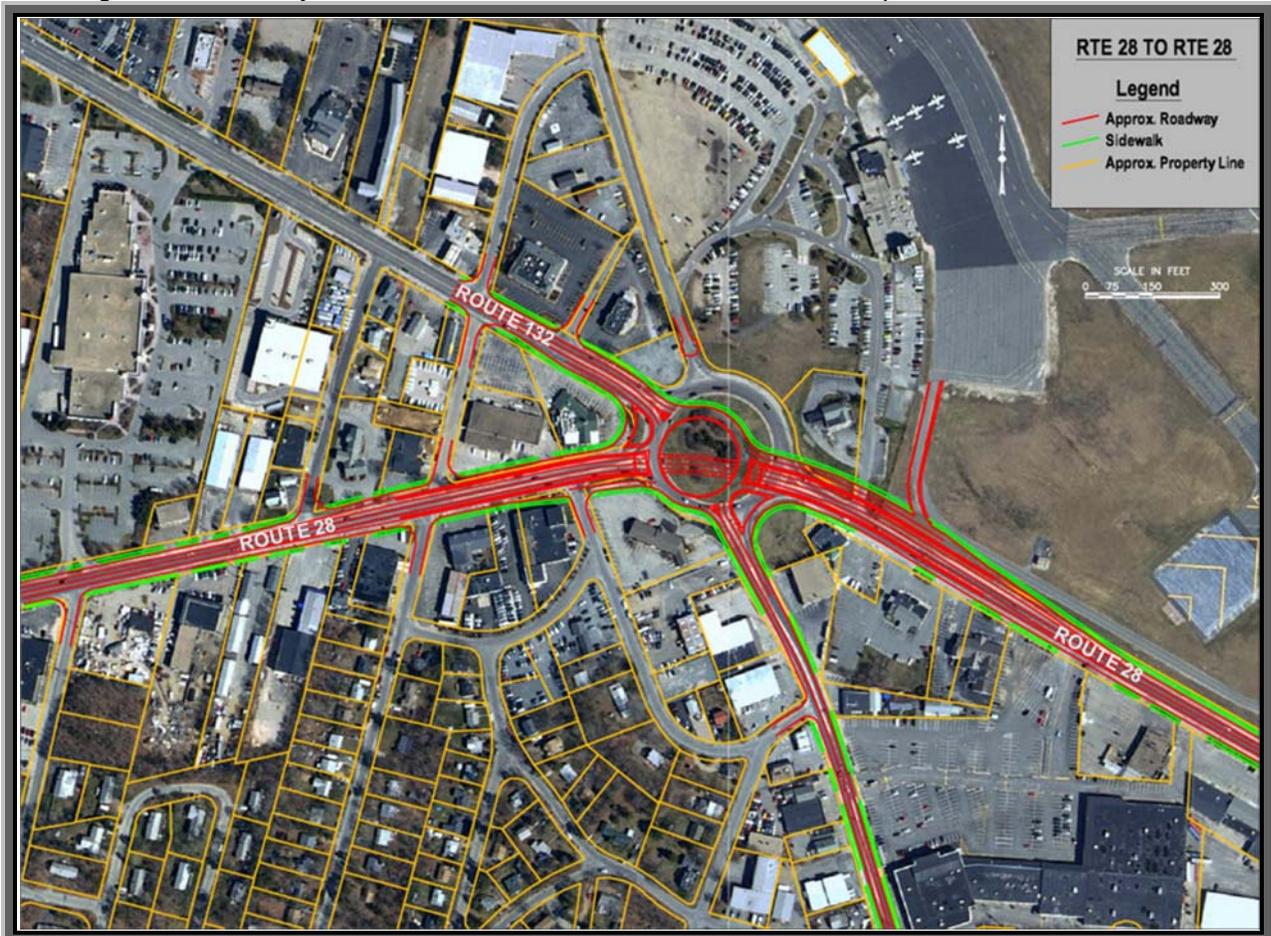
Figure 3.11 Rotary Alternative 4 – Route 132 to Route 28 Underpass with Roundabout



### 3.2.6 Rotary Alternative 5 – Route 28 to Route 28 Underpass with Roundabout

This alternative would involve the construction of a two lane underpass that would maintain the through movement along Route 28, which is in keeping with the issue of regional connectivity along a state route. This option would involve fewer impacts to abutting properties when compared with a signalized intersection, but would also involve more difficult construction sequencing, potential drainage and groundwater issues, and increased future maintenance requirements and costs.

Figure 3.12 Rotary Alternative 5 – Route 28 to Route 28 Underpass with Roundabout



### 3.3 Intersection of Yarmouth Road and Route 28

Improvements to the Yarmouth Road/Route 28 intersection were developed as a crucial first step to provide traffic congestion relief along this section of Yarmouth Road. Two options were developed for this intersection:

1. Widening and reconfiguration oriented to the east
2. Widening and reconfiguration oriented to the west

Either option would involve additional turning lanes and through lanes, which would alleviate traffic congestion, but would also involve substantial property impacts. The two options provide trade-offs with regards to property impacts.

#### 3.3.1 Widening and Reconfiguration Oriented to the East

##### Key Features

- Adds necessary turning and through lanes
- Shifts center of intersection slightly east to minimize impacts
- Southbound only connection to southern section of Yarmouth Road

Figure 3.13 Yarmouth Rd/Rte 28 Widening and Reconfiguration Oriented East

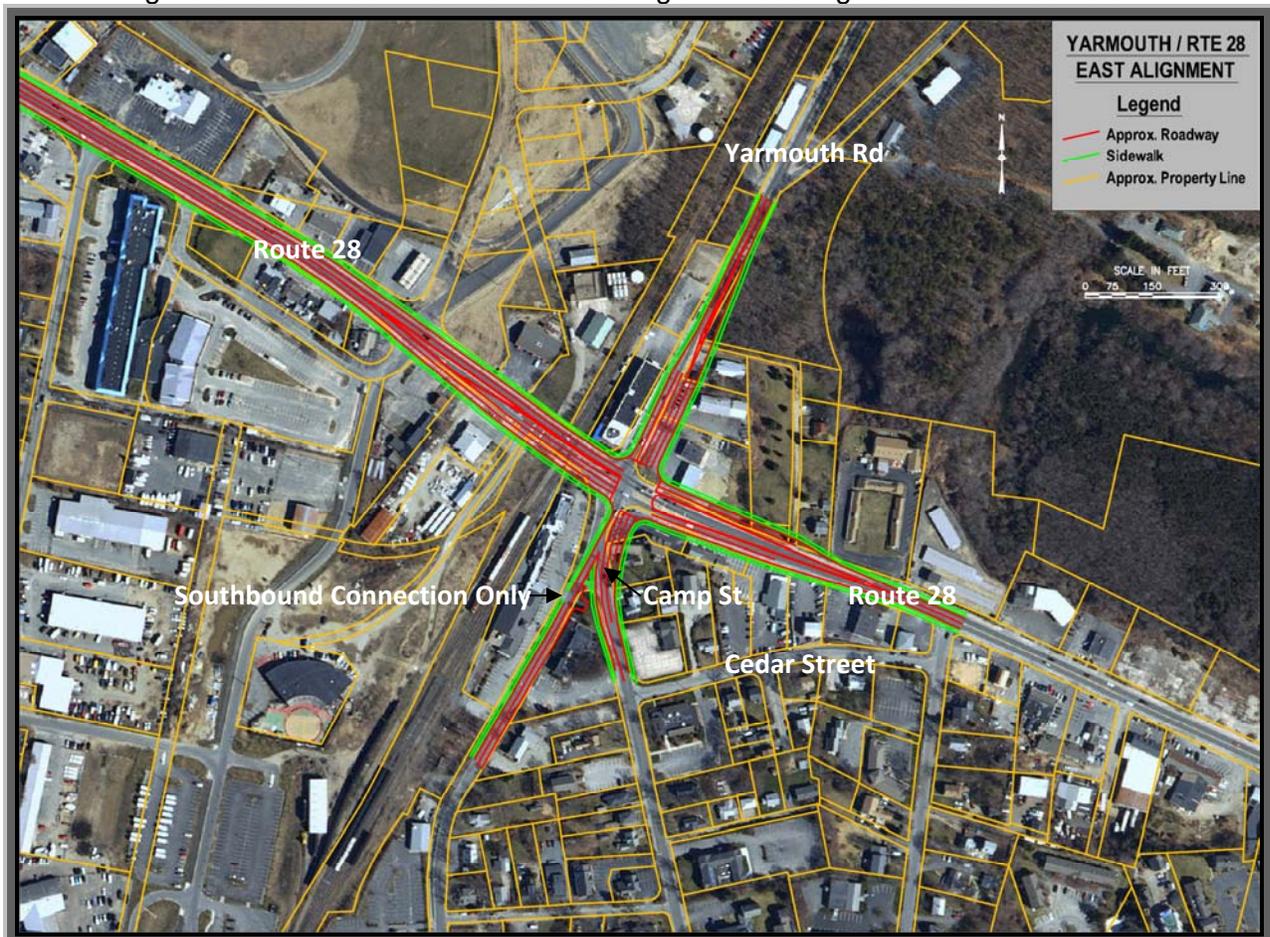


Figure 3.14 Yarmouth Road/Route 28 Intersection Improvements (East) Lanes



Appendix 12 provides zoomed-in views and estimated property impacts of these two configurations.

### 3.3.2 Widening and Reconfiguration Oriented to the West

#### Key Features

- Adds necessary turning and through lanes
- Shifts center of intersection slightly west
- Southbound only movement to southern section of Yarmouth Road

Figure 3.15 Yarmouth Road/Route 28 Intersection Widening and Reconfiguration Oriented to the West

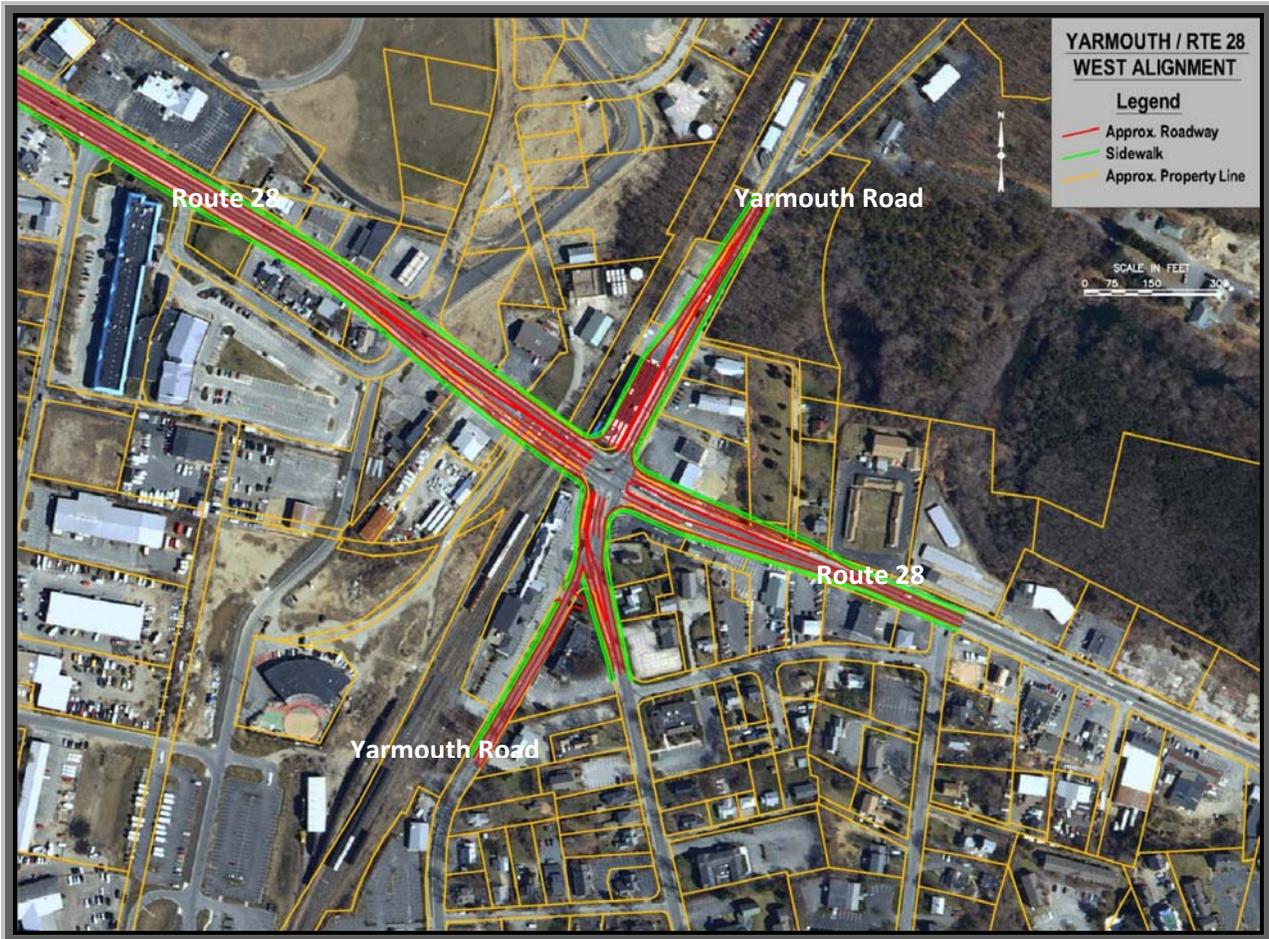
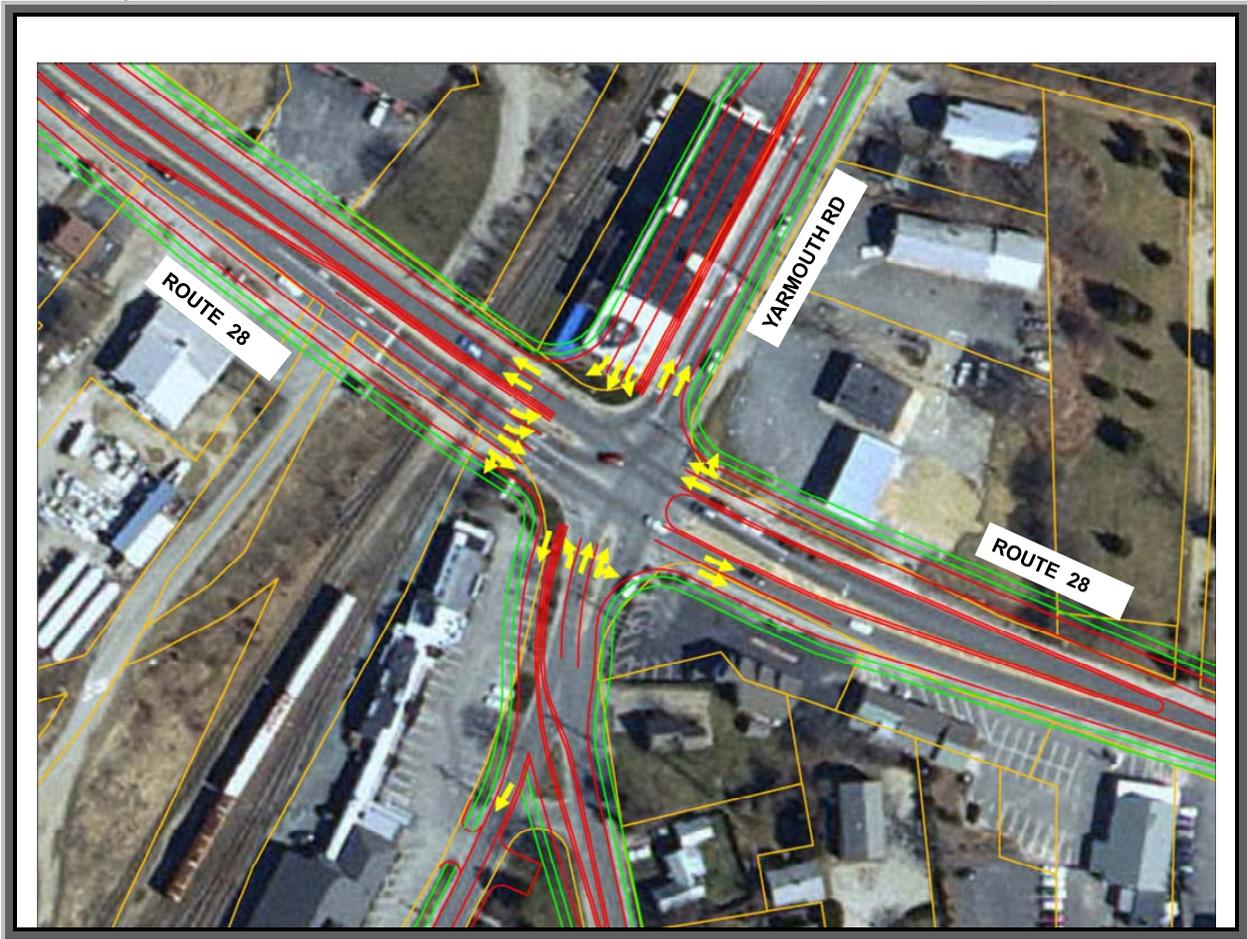


Figure 3.16 Yarmouth Road/Route 28 Intersection Improvements (West) Lanes



### 3.4 Transit Alternatives

The review of existing transit services discussed in Chapter 2 revealed that although there is a good foundation of transit services in the area, the following issues should be addressed:

1. Information, signage, and marketing are lacking.
2. Pedestrian amenities are lacking along the routes, especially in the mall areas.
3. Due to the lack of pedestrian friendly environments, buses are obliged to take more circuitous routes.
4. Areas around the Cape Cod Mall provide substantial opportunities for improvements and reduced travel times.

Information gleaned from the Task Force at the October 6, 2006 workshop meeting helped the technical team's transit consultant develop the following guiding principles:

- Focus on Hyannis area – congested corridors and major activity centers (e.g., Route 132, Hyannis Transportation Center, Cape Cod Mall, 4Cs)
- Improve convenience, travel times
- Cost-effective solutions – “bang for the buck”
- Pedestrian and transit improvements must go hand-in-hand
- Consider both short-term and longer-term

These guiding principles were used in the development of the transit alternatives discussed in the following sections.

#### 3.4.1 Transit Alternative 1 - Signage at all Bus Stops

CCRTA bus stops are advertised on their web site and through pamphlets distributed by the CCRTA, but are not signed at the stops themselves. This has given riders the flexibility to stand at slightly different locations for pick-up, which the drivers understand and accommodate. However, it does not inform would-be riders where they should stand if they should like to try the service. It was felt that informative signage is an important step to attract a greater pool of would-be riders to the system.

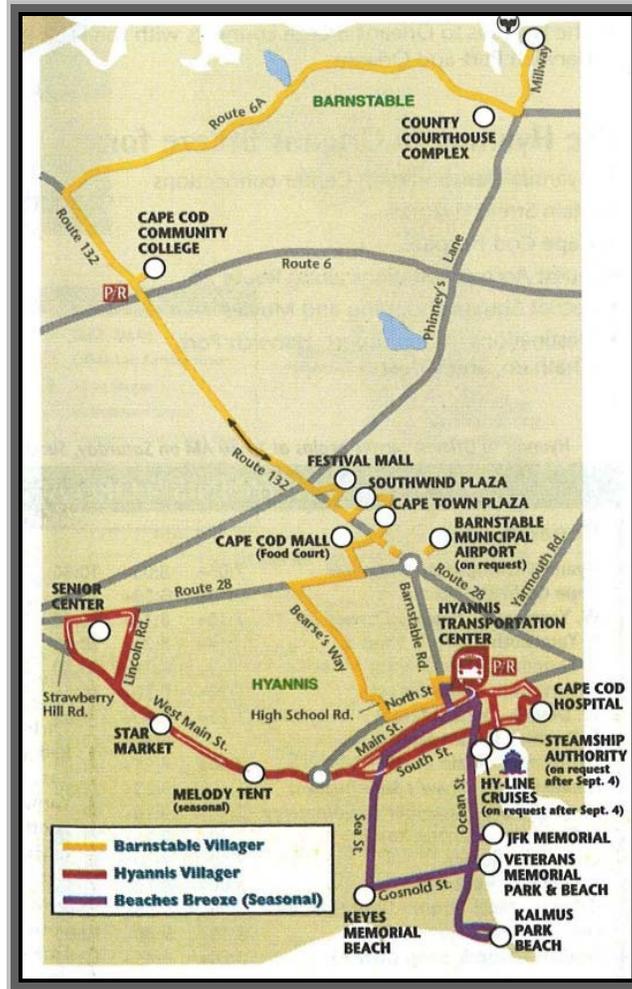
Two levels of signage and information are proposed. At “Key Stops”, sign boards with system maps, service information (hours, frequency, and fare) in multiple languages, and CCRTA contact information would be used in addition to dynamic message signs (DMS) with real-time bus arrival information. The key stops are:

1. Downtown Hyannis (Main Street/South Street/North Street)
2. The Cape Cod Community College
3. The Route 132 malls
4. The ferry terminals
5. The Cape Cod Hospital
6. The Barnstable Municipal Airport

Signage at all other bus stops along the Barnstable Villager would involve bus stop signs with route name, destination, and CCRTA contact information. The other designated stops are along Route 132, Bearses Way, and Route 6A.

Figure 3.17 shows the current CCRTA routes in Hyannis.

Figure 3.17 Current CCRTA Routes within the Hyannis Area



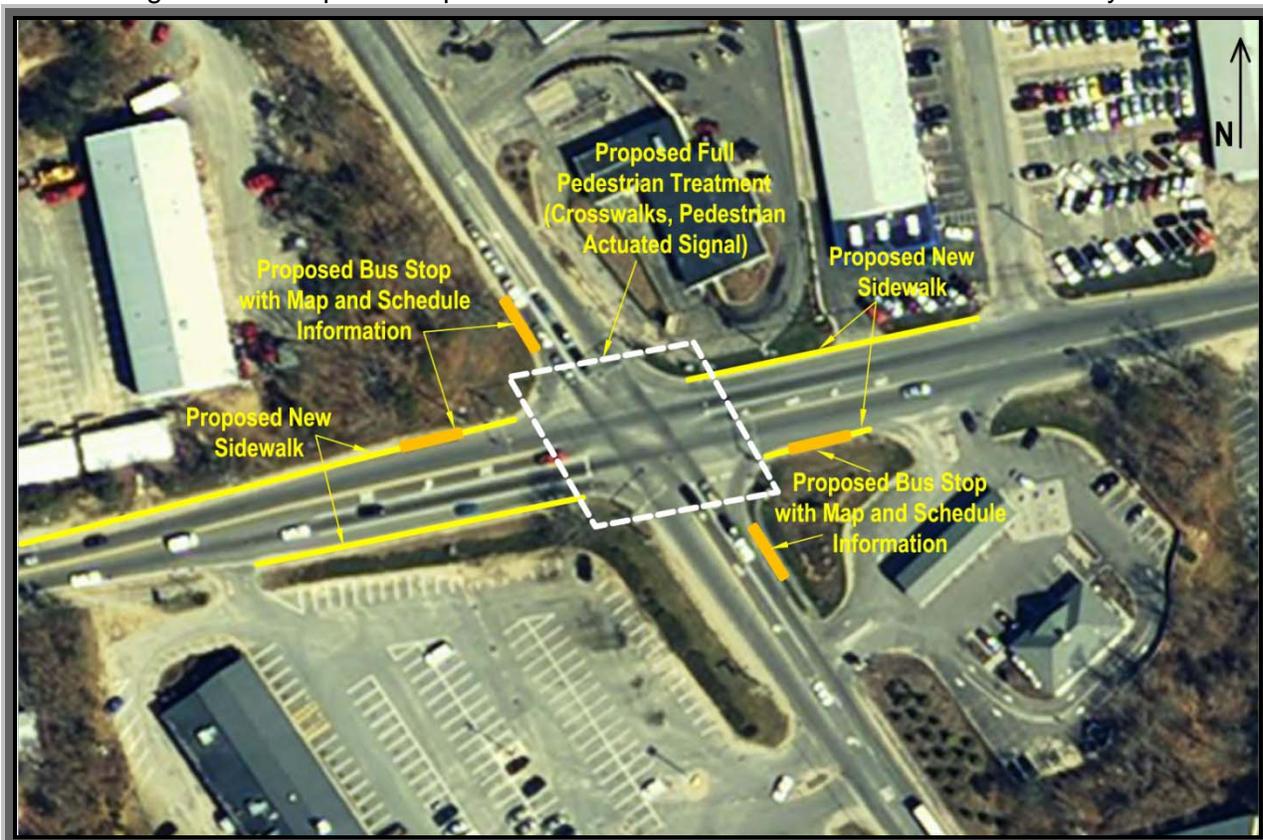
### 3.4.2 Transit Alternative 2 – Bicycle and Pedestrian Improvements in Key Areas

One concern echoed repeatedly over the course of the study is the need to improve the pedestrian environment to support the viability of transit. In some cases, as in the case of the intersection of Route 28 and Bearses Way, the pedestrian environment may simply need to be improved at an existing stop. In other cases, such as along Route 132, targeted pedestrian improvements will enable more direct routing and shorter travel times.

Where appropriate, improvements in key areas would include: bicycle racks, additional sidewalks, and shelters. Proposed locations would include: the Route 28 and Bearses Way transfer point; along Route 132 in the area of the malls; and at the Cape Cod Community College.

The intersection of Route 28 and Bearses Way is a significant transfer point for the Villager and Sea Line (Hyannis-Falmouth) bus routes. There are currently no amenities at this location other than partial sidewalks. Proposed improvements at this location would include adding bus shelters, pedestrian treatments such as signalized crosswalks at the intersection, and sidewalks in all four quadrants. Figure 3.18 shows the proposed improvements at this location.

Figure 3.18 Proposed Improved Transfer Point at Route 28 and Bearses Way



Pedestrian improvements in the Route 132 mall area should focus on those areas from Bearses Way to the Airport Rotary where there are currently sidewalks only on one side of the road (the Cape Cod Mall side), and there are limited pedestrian treatments in the parking lots of both the

Cape Cod Mall and Cape Town Plaza. The proposed improvements would allow for more direct transit routing, would increase ridership and would encourage people to leave their cars and walk. These improvements would include strengthened pedestrian connections within the plazas and improving the Route 132 crossing with either an at-grade crossing, a shuttle service, or a pedestrian/bicycle bridge. Similar improvements are needed at other shopping plazas. Figure 3.19 shows the proposed improvements at this location.

Figure 3.19 Pedestrian Improvements in Route 132 Mall Area

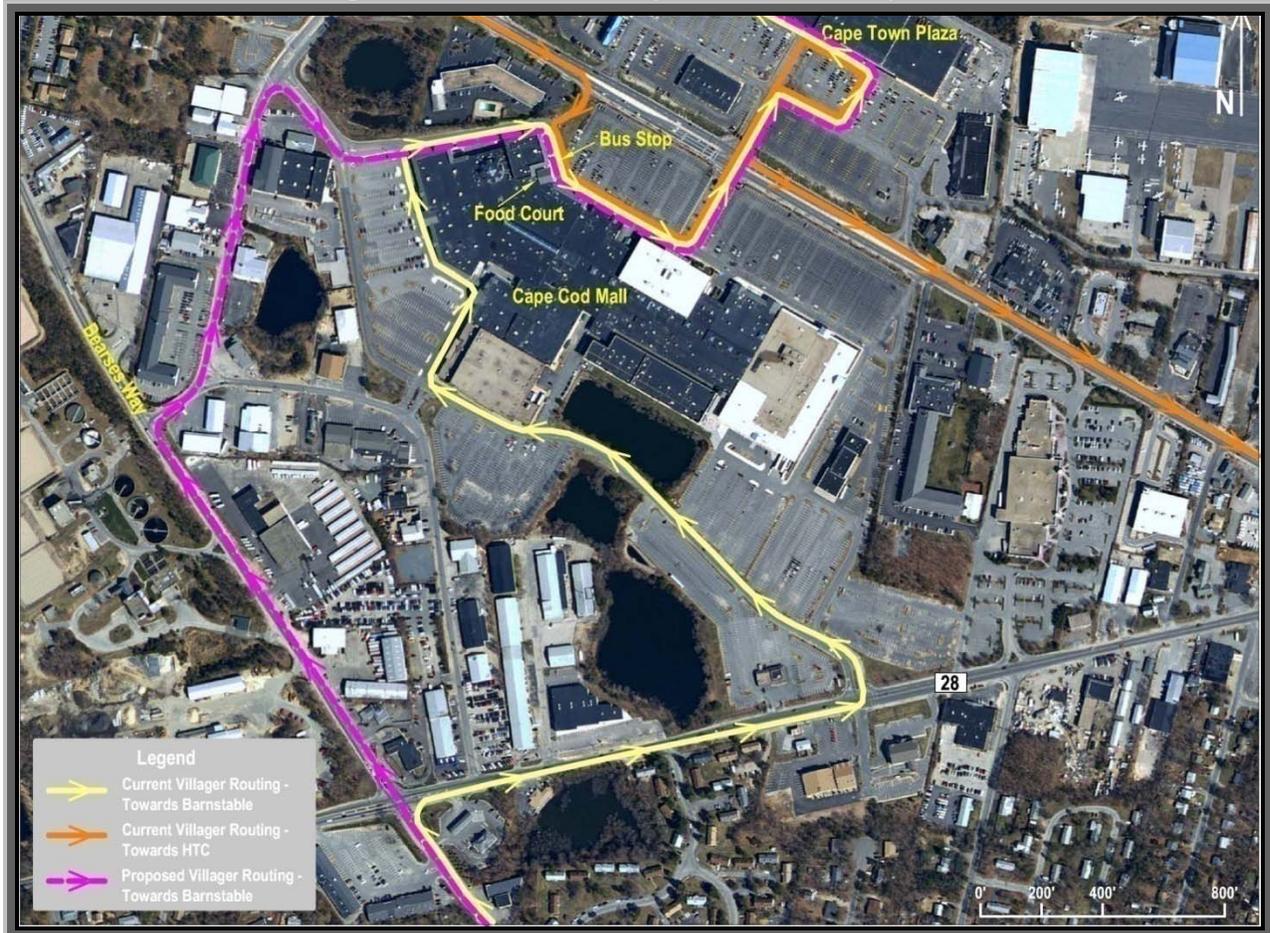


### 3.4.3 Transit Alternative 3 - Bus Route Improvements

The CCRTA Villager bus route is currently circuitous mainly due to the difficult pedestrian environment, especially in the parking lots of retail areas and along the major routes. Buses need to drive directly up to the curbing alongside area buildings to pick up riders in a safe location. This translates into long travel times which in turn results in relatively low ridership numbers. With the current pedestrian environment, only minor improvements would be possible. More substantial changes to the pedestrian environment (described in the previous alternative) would be necessary to make the bus route truly viable and attract more riders. However, there are some opportunities to shorten routes and travel times in the short term. For example, it would be possible to shift the outbound route to Bearses Way from the back of the mall. Also, at

the South Wind Plaza, it would be possible to use the southern entrance from Independence Drive. Other improvements may also be possible. Longer term improvements would include a mall area shuttle or possible AM/PM peak express trips on Route 132, both of which would require pedestrian improvements. Figure 3.20 shows an example of bus route improvements.

Figure 3.20 Bus Route Improvements Example



### 3.4.4 Transit Alternative 4 - Dynamic Message Signs on Key Roadways

The use of dynamic message signs (DMS) can help inform drivers of transit, route and park-and-ride options. This alternative proposes adding DMS on key roadways to guide drivers to park-and-ride facilities and ferries, suggest alternate routes, and to inform drivers of special events and/or closures. Signs are proposed at six locations: Route 6 (two signs), Route 132 west of Attucks, Yarmouth Road near the airport, and Route 28 (two signs). The signs will need to be located strategically to allow the driver sufficient time to make a decision. Figure 3.21 shows the proposed locations for the DMS.

Figure 3.21 Proposed Locations for Dynamic Message Signs



### 3.4.5 Transit Alternative 5 – Support Ongoing Efforts

This alternative would provide support for ongoing efforts involving transit improvements. These would include:

1. Promote transit at Hospital, 4Cs, and Barnstable Airport
2. CCRTA analysis of other service improvements (Transit Development Plan)
3. Planning for connection of bicycle trail to HTC
4. Ongoing coordination between ferry operators, intercity bus carriers, and CCRTA local transit

MassRIDES is currently leading the effort to promote transit at the Cape Cod Hospital, the community college, and the Barnstable Airport. Their outreach ensures that employers are aware of transit options by making transit schedules and maps available at information booths and at kiosks. They also discuss facility plans that may affect and enhance transit access, and provide possible transit incentives or pass programs for employees and students.

The Barnstable Transit Development Plan is expected to explore more commuter- oriented service, with better service span and frequency. In addition, the effort is expected to explore providing flexible, route deviation-type service, and other technology advancements.

The Hyannis Access Study created a bicycle/pedestrian subcommittee which held three meetings. The summaries of these meetings are included Appendix 2. One of the major topics of subcommittee's discussions was the towns' (Barnstable and Yarmouth) desire to extend the Cape Cod Rail trail to the Hyannis Transportation Center by creating a shared use path parallel to Yarmouth Road.

### **3.5 Park-and-Ride Options**

Due to the overcrowding of the Barnstable park-and-ride lot described in Chapter 2, the following four alternatives have been developed to address the parking situation. The alternatives presented below vary in complexity from simple and low cost to more complex and higher cost. All of the alternatives seek to increase the parking capacity at the Route 132 parking lot, especially for daily commuters, in varying degrees.

#### **3.5.1 Park-and-Ride Alternative 1 – Allow reduced parking rate for bus patrons at the Hyannis Transportation Center and limit overnight parking at the Route 132 Park-and-Ride lot.**

The Barnstable park-and-ride is a major facility for people traveling off of Cape Cod. The Hyannis Transportation Center (HTC) is a second major facility in the study area for people traveling off of Cape Cod. The HTC is located approximately four miles from the Barnstable park-and-ride lot in downtown Hyannis. It is owned by the Cape Cod Regional Transit Agency (CCRTA) and operates as the hub of its bus system. The HTC has a full service terminal and 182 long-term parking spaces for travelers. The CCRTA charges for parking at the HTC on a sliding scale depending on the season to insure that the lot is not used by people destined for the ferries to Martha's Vineyard and Nantucket. Both Peter Pan and Plymouth & Brockton provide service to the HTC with the same regularity as they do to the Barnstable park-and-ride lot.

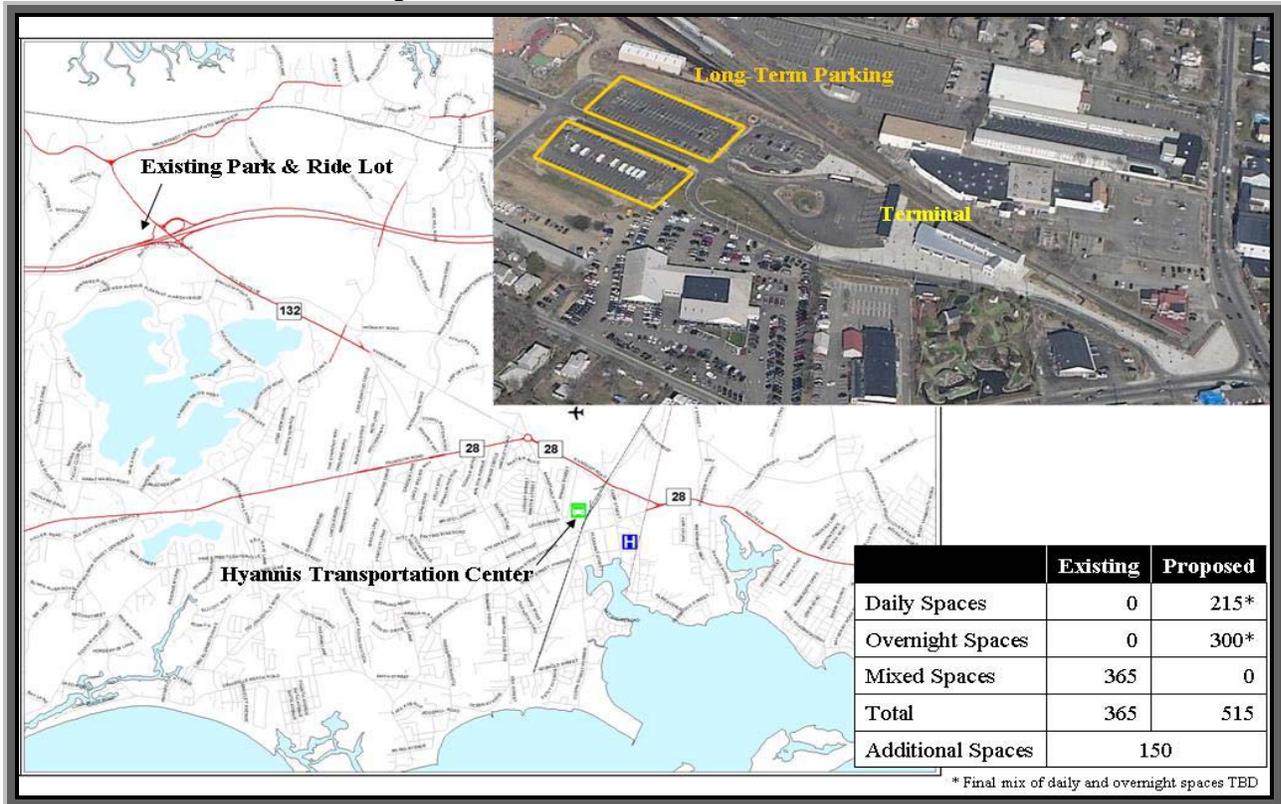
One solution to the overcrowding at the Route 132 park-and-ride lot would be to encourage travelers to park at the HTC by making it a more attractive alternative and limiting some of the overnight parking at the Route 132 lot. As was indicated in Chapter 2, some travelers park at the Barnstable lot for a long time.

Both the Barnstable park-and-ride lot and the Hyannis Transportation Center provide regular bus service and an array of amenities for travelers. But the Barnstable park-and-ride lot is regularly at capacity and the HTC's parking lot is mostly empty. Observations by EOTPW Planning have shown that 150 of the 182 spaces are not used each day. The CCRTA currently uses some of the open space to store its transit vehicles many of which could be relocated to the CCRTA garage. In addition to relocating the CCRTA buses to free up space a new parking system would be installed to provide a discounted parking rate for bus customers. New fencing and lighting could also be added to increase the security of the facility.

These improvements to the HTC would be coupled with a strategy to limit overnight parking at the Route 132 park-and-ride lot. Limiting overnight parking at the Route 132 lot is necessary to free up parking spaces for daily commuters who provide the greatest air quality benefit and currently are unable to find parking spaces as the lot fills up each day. Limiting overnight parking could be accomplished in two ways, either by limiting the duration of stay at the lot to a

specific number of days or by segregating overnight parking to designated areas of the lot. Both strategies have advantages and disadvantages that need to be discussed. The discussion on the best strategy for this situation will include and seek to meet the needs of both the implementing agencies such as MassHighway and the CCRTA and the affected parties such as the bus companies and travelers. Once the final system has been agreed upon, EOTPW Planning will work with the Cape Cod Commission and MassRIDES to notify travelers in advance of the new system at the lot through fliers, signs and an outreach campaign. Figure 3.22 depicts this alternative.

Figure 3.22 Park-and-Ride Alternative 1



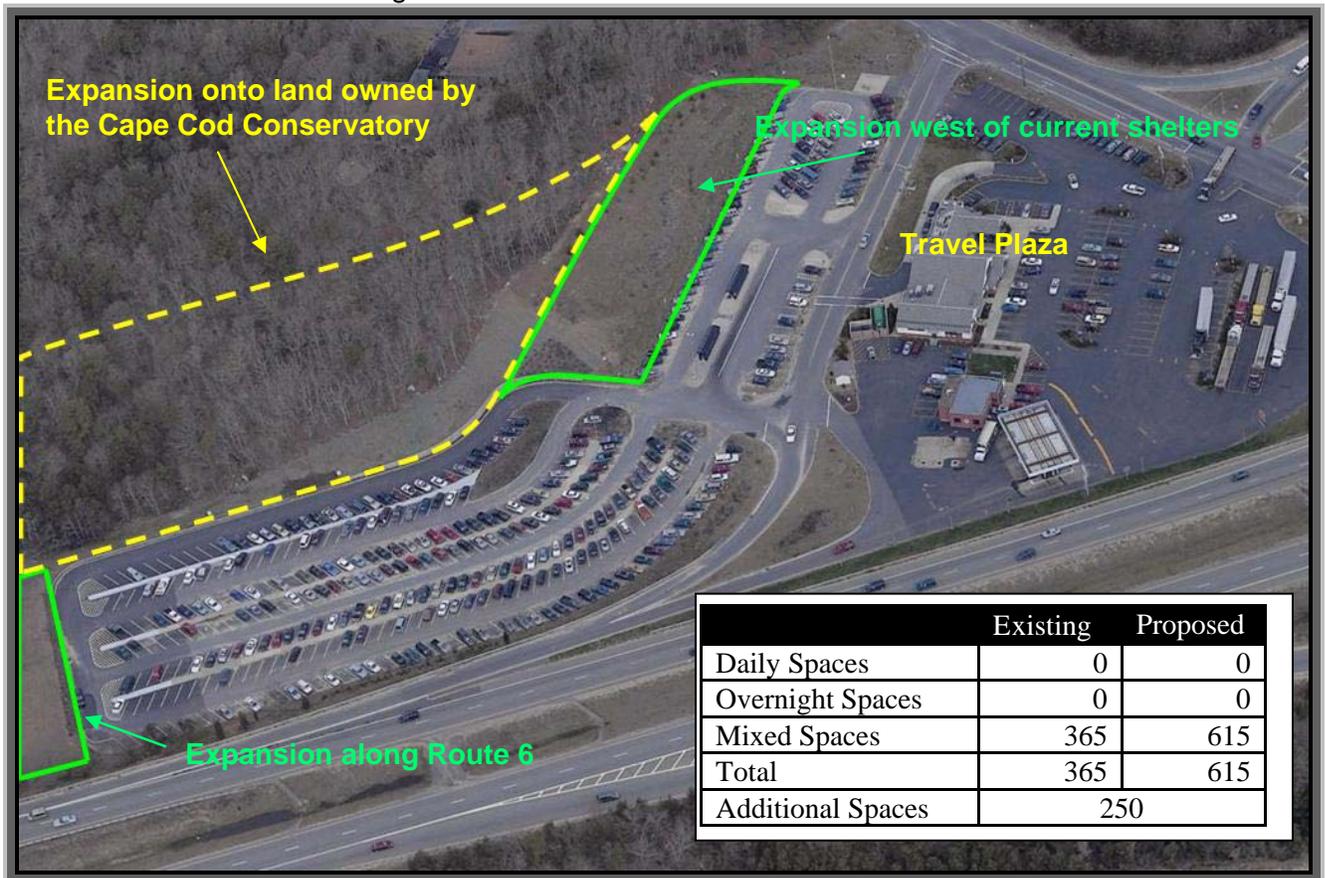
### 3.5.2 Park-and-Ride Alternative 2 – Construct additional spaces at the existing location

The existing location of the Route 132 lot has the benefit of being immediately accessible from Route 6. It is highly visible, easy to find, and access is particularly easy for westbound morning commuters. Therefore, there are advantages to pursuing expansion of the current location.

The current layout of the lot is tightly constrained. The area west of the existing bus shelters cannot be paved over because it currently serves as the septic system for the travel plaza. Expanding north, the larger half of the lot has encroached on the property line. Expanding along Route 6 is the only direction available within the existing property limits however; security is a concern because this is the most isolated section of the park-and-ride lot.

There are two developments that may allow expansion of the existing lot both north and west. The Town of Barnstable is currently in the process of expanding its sewer system to the Cape Cod Community College, which is northeast of the lot on the opposite side of Route 132. If the travel plaza were connected to the planned extension, this would free up the space over the existing septic system. Additionally, the Cape Cod Conservatory, which owns the land north of the existing lot, has expressed interest in selling a portion of its property to MassHighway for use as an expansion of the lot. The bus shelters may also be relocated to better serve the new configuration of the park-and-ride lot and ensure that the maximum number of parking spaces is provided. A total of 250 spaces would be created if all three of these options are pursued.

Figure 3.23 Park-and-Ride Alternative 2



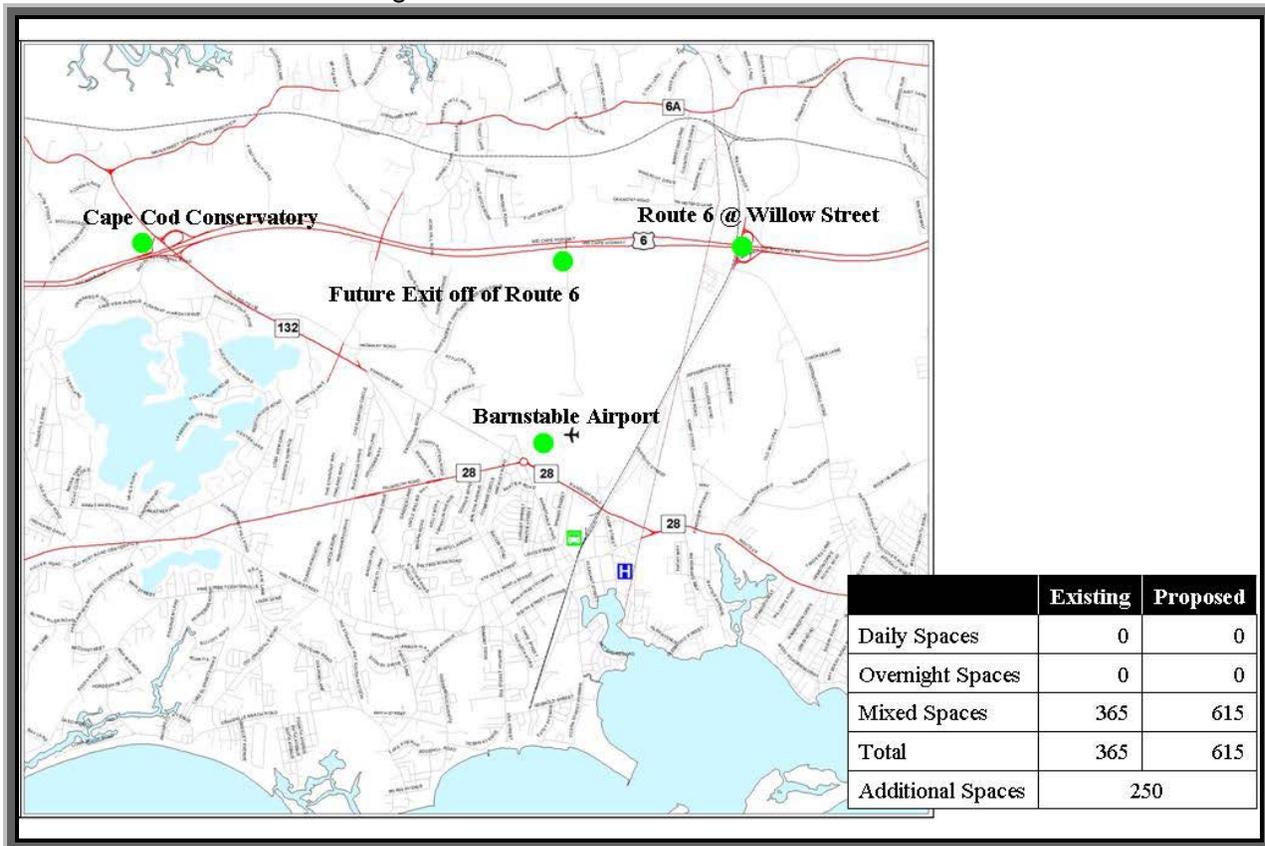
### 3.5.3 Park-and-Ride Alternative 3 – Construct a new lot

As Barnstable and Cape Cod continue to grow, it may be necessary to provide additional parking at another new location. The new lot would have to be approximately 250-spaces to effectively relieve any long-term congestion at the Route 132 lot. A lot of this size would also attract enough patrons to be served regularly by the bus routes that operate in the area.

There are many potential locations for a new park-and-ride lot within the Hyannis Access Study Area. Some of the most likely locations for the new park-and-ride lots are along Willow Street off Exit 7 of Route 6, at the Barnstable Airport, and possibly incorporated into any future exit off of Route 6.

It is important that the selected site be both convenient for commuters and fit within the existing bus routes. Due to the constraints at the Route 132 site, the new location should also be large enough to accommodate any long-term expansion needs. Overnight parking may still be an issue that could affect proper maintenance at both the Route 132 lot and the new park-and-ride lot. Figure 3.24 shows these potential locations.

Figure 3.24 Park-and-Ride Alternative 3

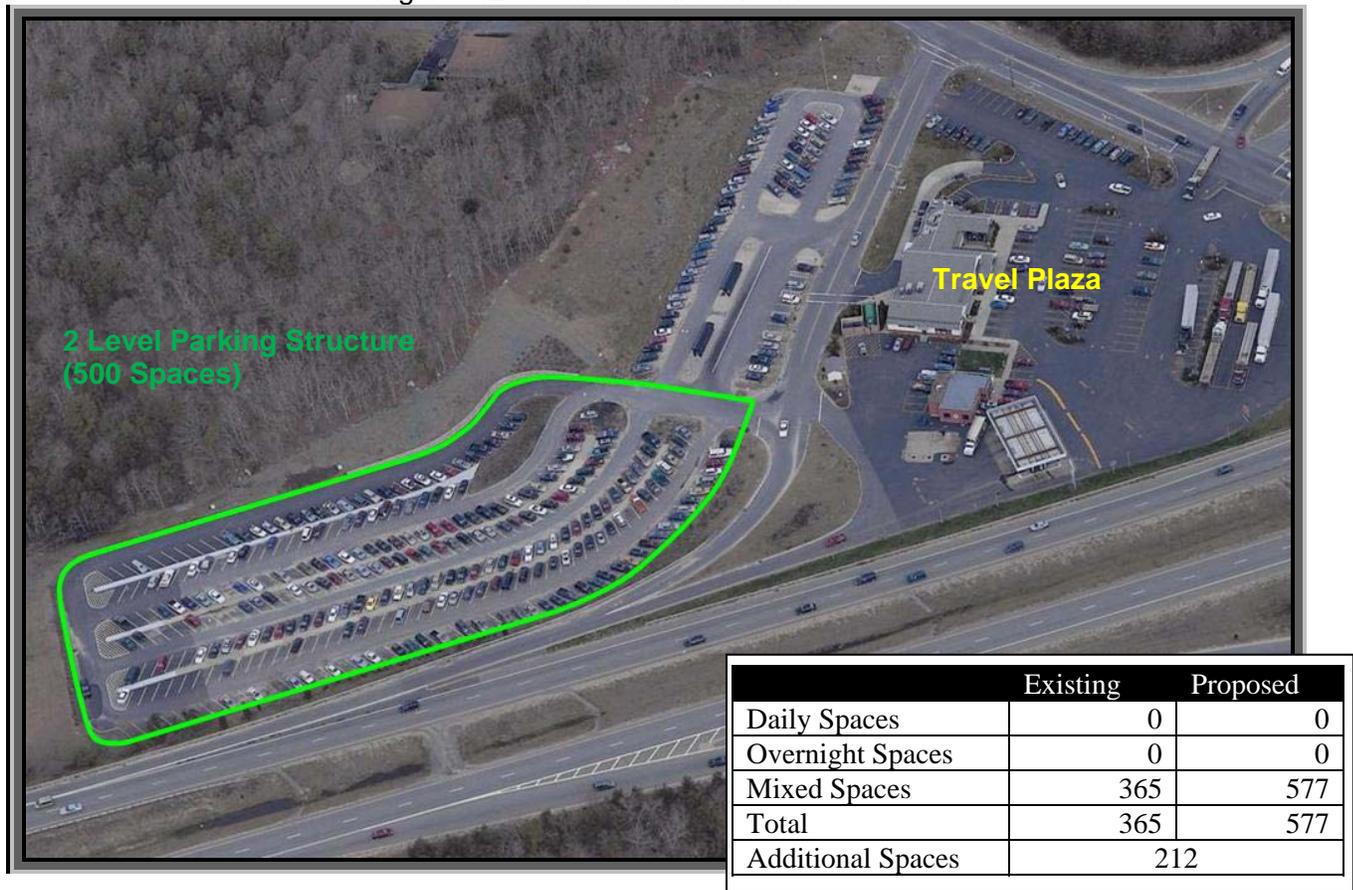


### 3.5.4 Park-and-Ride Alternative 4 – Construct a parking structure

The final alternative for addressing the overcrowding at the Barnstable park-and-ride lot would involve the construction of a parking structure at the current location. Many different configurations may be used based on a number of factors including visual impacts and the desired number of parking spaces. For comparison purposes, a 500-space, two-level parking structure placed along Route 6 along with the existing 77-space surface parking spaces around the bus shelters is proposed. The new facility would have a total of 577 spaces.

Building a structure would severely impact operations at the lot and potentially at the adjacent travel plaza. Any project would have to include a plan to accommodate parkers during construction. A structure may also have a visual impact on the surrounding area, but placing the structure along Route 6 would help reduce the impact. MassHighway does not currently maintain any structured parking facilities so the recurring maintenance costs, which may be significant, should be considered. Figure 3.25 shows this alternative.

Figure 3.25 Park-and-Ride Alternative 4



### 3.6 Other considerations and topics of discussion

EOTPW Planning and the Hyannis Access Study Task Force formed a bicycle/pedestrian subcommittee to discuss these needs in the area and also to make sure that any alternatives would complement existing and future bicycle/pedestrian facilities.

The bicycle/pedestrian subcommittee met three times. The first meeting was an information-sharing session. Representatives from the towns provided information and maps on existing paths and plans in the study area. The meeting also covered the statewide bike plan, examples of CMAQ projects, and the new project development guidebook as it relates to bicycle and pedestrian accommodations. In addition, subcommittee members discussed education of bicycle facilities, outreach, and proper signage. Throughout the meeting both towns emphasized the desire to use EOTPW's railroad right-of-way which runs parallel to Yarmouth Road to connect the planned Cape Cod Rail Trail extension to the Hyannis Transportation Center. The future Claire Saltonstall path which is to run parallel to Route 6 through the Fish & Wildlife lands would also connect to this segment. This bicycle/pedestrian extension would require crossing Willow Street and the current preferred method is a bridge over Willow Street in the vicinity of the Route 6 bridge. The Massachusetts Aeronautics Commission conducted an airspace analysis of this proposed bike bridge and expressed concern about the location, since a 6' person would be only 6' from the airspace. However, no regulations would be violated.

At the second meeting, the subcommittee discussed the CMAQ and Transportation Enhancements funding process since both of these sources may be used for bicycle facilities and equipment, such as lockers. The group also shared information on maintaining facilities through grassroots efforts, in response to concerns about the lack of state funds and commitment to the maintenance of bicycle and pedestrian facilities. Knowing this to be a national problem, the group shared information on how other cities, towns and regions tackle the problem. The group also continued the discussion of sharing EOTPW's railroad right-of-way (alongside Yarmouth Road) for a bicycle trail extension to the HTC.

After the second meeting, EOTPW responded in writing (letter in Appendix 13) to the Towns' request for guidance and approval to pursue bicycle and pedestrian plans that would use the state-owned railroad right-of-way. Components of the response were:

- EOTPW supports municipal efforts to extend bicycle trails and increase the connectivity of trails to other transportation facilities, such as the Cape Cod Rail Trail and the HTC.
- A wide range of alternatives for a bicycle connection to the HTC does not seem to have been developed. There are a number of issues and opportunities that should be further considered before finalizing any plans – and before any potential endorsement by EOTPW.
- EOTPW has safety concerns with the favored option, given that the rail line is active. In general, EOTPW has not allowed bicycle travel in its active corridors due to these safety concerns.
- Potential shared use of the rail line in the Yarmouth Road corridor would need to be further examined regarding potential impacts to the rail operator, federal guidance and documentation, and other states' experience with similar corridors.
- A more detailed examination of the motor vehicle access issues along the Yarmouth Road corridor and potential solutions may offer additional opportunities for bike

connections between the section planned for the Higgins Crowell area and the Hyannis Transportation Center.

- The Towns are encouraged to collaborate and conduct a comprehensive study of the corridor as a whole, taking into consideration the input of various stakeholders, including but not limited to: the rail operator, the Barnstable Municipal Airport, business owners along the corridor, the Cape Cod Commission, bicycle groups, and other community organizations.
  - EOTPW would like to be involved in the study effort.
  - The recommendations of the Hyannis Access Study should also be considered as well.

Appendix 13 contains the letter from the Towns and the Secretary of Transportation's response to the Towns on this issue. Chapter 5 covers the recommendations that resulted from the work of the bicycle/pedestrian subcommittee.

Alternatives for expanding rail were not developed as part of the Hyannis Access Study. At the time of the study, EOTPW was conducting another study which was examining the feasibility of extending the commuter rail line from Middleborough to Bourne or Buzzards Bay (in Wareham). This would precede extending the commuter line to Hyannis. In the 2003 PMT, the MBTA looked at the feasibility of extending rail from Wareham to Hyannis. The capital and operating costs for such projects were determined to be relatively high with low effectiveness given the attractiveness and frequency of bus service from Hyannis. In addition, the operator license for the rail corridor that runs through Yarmouth, Barnstable and on to Falmouth and then to the Semass trash facility in Rochester, MA (near Wareham) was up for renewal during the course of the Hyannis Access Study. The license was renewed and a new contract began with Mass Coastal Railroad in January 2008.

John Kennedy of Mass Coastal Railroad attended the April 22, 2008 Task Force meeting to share information on his company's operations and future plans and hear concerns of the Task Force. This discussion is covered in detail in the April 22, 2008 meeting summary in Appendix 2. The Town suggested that the new operator coordinate with the Town on maintenance projects, especially at grade crossings where the rail crosses the road. Task Force members expressed concern for the Route 28 crossing in the vicinity of Yarmouth Road.

### **3.7 Summary of Alternatives Development**

The process of alternatives development was collaborative and iterative in nature. The study covered a large area and developed options for the following:

- Existing transit services,
- The Barnstable Park-and-Ride lot,
- Exit 6 ½,
- The Airport Rotary, and
- The intersection of Yarmouth Road and Route 28,

Over the course of many months, alternatives were added, dropped, significantly revised, and finally refined based on substantial Task Force and public input. Although the alternatives are conceptual and draft (given the early nature of this study and the lack of formal survey and mapping) the options reflect a lot creativity, engineering expertise, and community interests.

The next chapter covers how the alternatives were evaluated and selected for inclusion in the recommendation package.

## Chapter 4: Evaluation of the Alternatives

This chapter presents the evaluation of all the alternatives covered in Chapter 3. The evaluation included a variety of measures - both quantitative and qualitative. Quantitative measures for roadway improvements include changes in traffic volumes and patterns, levels of service at key intersections, costs, economic development potential, and safety, among other measures. For transit, quantitative measures include ridership increases and other benefits. For the park-and-ride alternatives, measures include ease of implementation and the number of available parking spots for both daily and overnight parkers. Qualitative measures included input from the Task Force and the public on their preferences and perspectives. Implementation feasibility was also a factor. All these measures relate back to the evaluation criteria discussed in Chapter 1.

As discussed in detail in Chapter 3, the Hyannis Access Study developed roadway improvements in three areas: at the Airport Rotary, at the intersection of Yarmouth Road and Route 28, and along Route 6 between Exits 6 and 7 in locations suitable for a potential new interchange. The alternatives at each of these locations were first analyzed and compared to each other in isolation, without other improvements except for those assumed in the no-build case<sup>1</sup>. This was done in order to find the best concept for that particular location if nothing else were to be done, and to determine if one improvement would negate the need for improvements at other locations. As is described in this chapter, the analysis determined that there is not one fix to the traffic issues in Hyannis.

The alternatives were then combined into distinct packages. For example, one package included only shorter-term measures without long-term options. This was a lower cost package. Two other packages were considered which varied in their long-term options. These packages were compared to each other and considered for their relative benefits, impacts, and implementation feasibility. This process solicited important feedback on priorities, and led to the recommendation package outlined in Chapter 5.

The evaluation of the transit and park-and-ride alternatives was more straightforward. In the case of transit, operating and capital costs were developed for each of the alternatives, along with estimated increases in ridership and other benefits. In the case of Park-and-Ride, costs were estimated where possible and qualitative benefits were assessed. This information, presented in this chapter, was presented to the Task Force and the public. Based on their input, also summarized in this Chapter, all of the transit alternatives and two of the Park-and-Ride alternatives were adopted as recommendations. They are packaged by priority and complexity as described in Chapter 5.

The following sections cover the evaluation of the alternatives at each of the roadway locations followed by transit and park-and-ride alternatives.

---

<sup>1</sup> Projects assumed in the no-build case are Route 28 widened to four lanes between the Airport Rotary and Yarmouth Road and Attucks Lane extension to the Airport Access Road, in addition to the projects assumed for the base year – Route 132 widening, Exit 7 reconstruction, and Willow Street widening.

## 4.1 Exit 6 ½ Alternatives Evaluation

The following sections cover the technical team's analysis in the areas of traffic and travel demand benefits, safety, environmental considerations, economic development potential, and costs for the Exit 6 ½ alternatives. This is followed by Task Force and public input, an evaluation summary and the result.

### 4.1.1 Exit 6 ½ Traffic and Travel Demand Impacts and Benefits

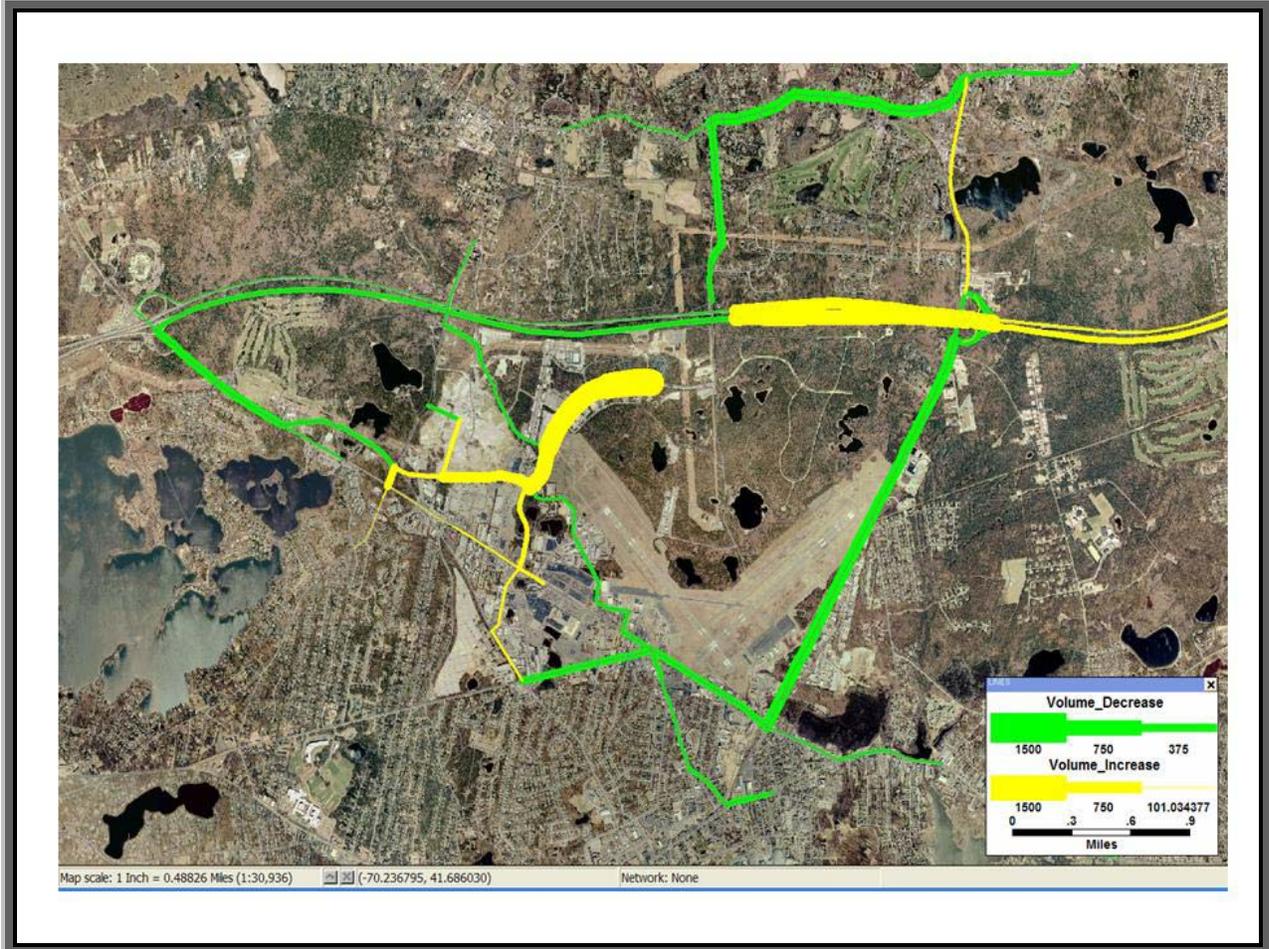
The Hyannis Access Study travel demand model<sup>2</sup> was used to determine the expected changes in travel patterns in the event of an Exit 6 ½. The model period, used for the analysis of all the roadway alternatives, was the summer weekday PM peak period. The graphic below shows where the volume decreases and increases are expected to be. It is important to note that the analysis determined that the changes in travel demand patterns would be the same whether the exit were located at the rest area, west of the rest area, or at Mary Dun Road.

The yellow bands show an increase in traffic on Route 6 east of the potential exit, with the most notable increase being between the potential exit and Exit 7. A large increase in traffic would also be expected along Independence Drive. Smaller increases in traffic would be expected on Attucks Lane, Enterprise Drive, Willow Street north of Exit 7, and sections of Bearses Way and Phinneys Lane. The most notable decreases are expected to be along Mary Dunn Road north of Route 6, Yarmouth Road, Route 6 west of the potential interchange, and Route 6A east of Mary Dunn Road. Other decreases are expected along Route 28 on either side of the Airport rotary, and sections of Route 132, Attucks Lane, Barnstable Road.

---

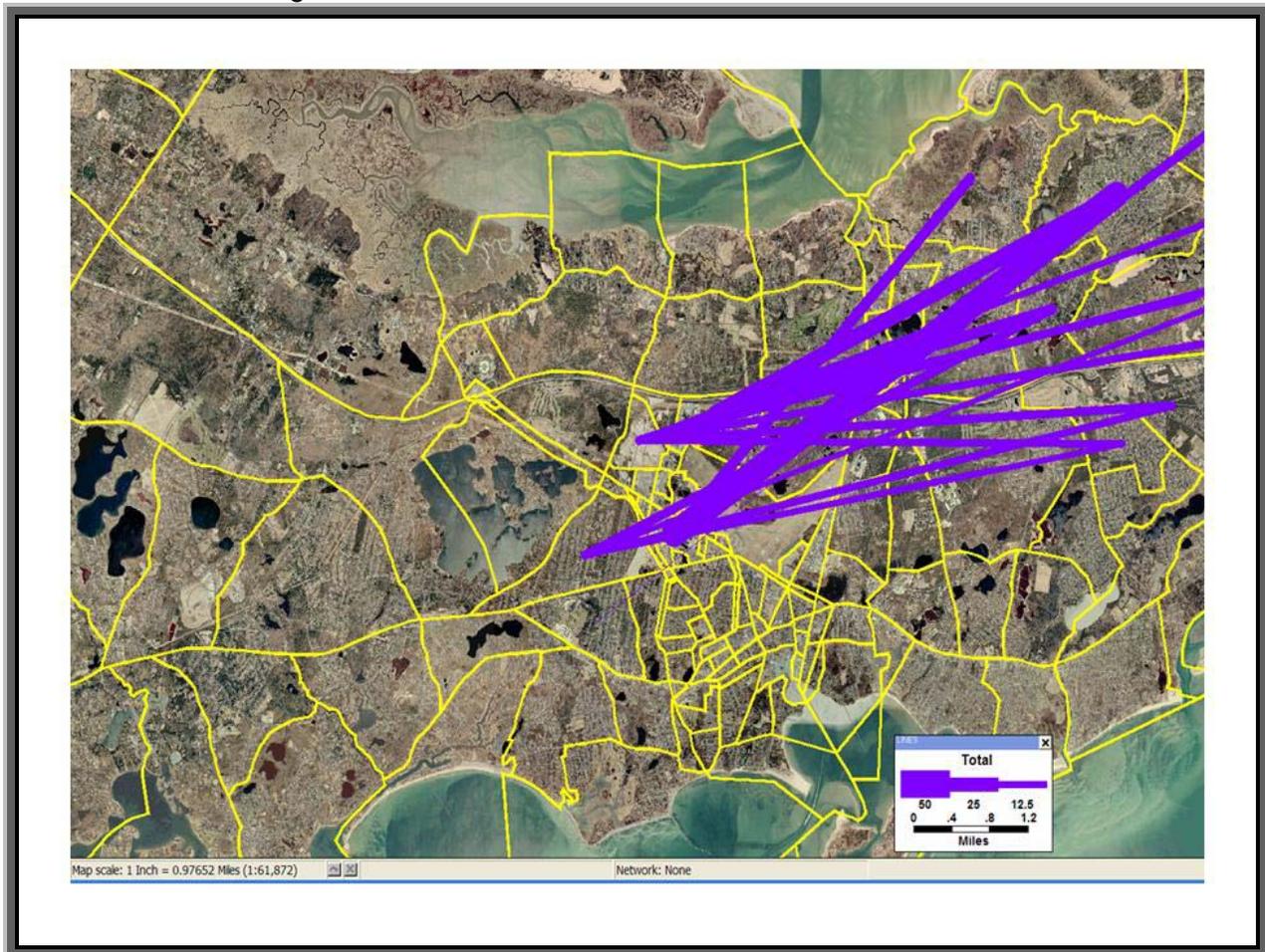
<sup>2</sup> More information on the Travel Demand Model is provided in Appendix 3.

Figure 4-1: Traffic Volume Changes Due to an Exit 6 ½ compared to the No-Build Summer Weekday PM Peak Period 3:30 PM to 6:30 PM



Desire lines are straight lines between two locations depicting the level of travel demand between the two locations. The graphic below reveals that the majority of the trips that would use the new interchange originate east of the interchange and are headed for the Park itself, the retail area of the Cape Cod Mall, or a residential area in the proximity of the mall.

Figure 4-2: Exit 6 ½ Desire Lines To and From the East



The following is a summary of the travel demand model results:

1. Most Exit 6½ users travel to/from the east.
2. Most Exit 6½ users have origins and destinations in the Independence Drive and Cape Cod Mall area.
3. Exit 6½ is expected to generally reduce traffic on Route 6A east of Mary Dunn Road.

The travel demand model produced estimated 2030 traffic volumes for the areas' roadways and intersections, with which traffic operations analyses can be performed. Whereas the travel demand model produces a macro-level view of the travel pattern changes of a particular improvement, the traffic operations analysis provides more a micro-view at specific locations.

Figure 4-3 depicts the expected changes in volumes at the adjacent interchanges – Exits 6 and 7 on Route 6. A drop in the number of vehicles coming off and on both interchanges from the east is expected. A slight increase in the number of vehicles coming from and going to the west is to be expected at Exit 7, though. Together, these numbers indicate that some drivers from/to the east that would typically exit at Exits 6 and 7 would use Exit 6 ½ instead.

Figure 4-3: Volume Changes at Adjacent Interchanges due to Exit 6 ½  
2030 Summer Weekday PM Peak Hour

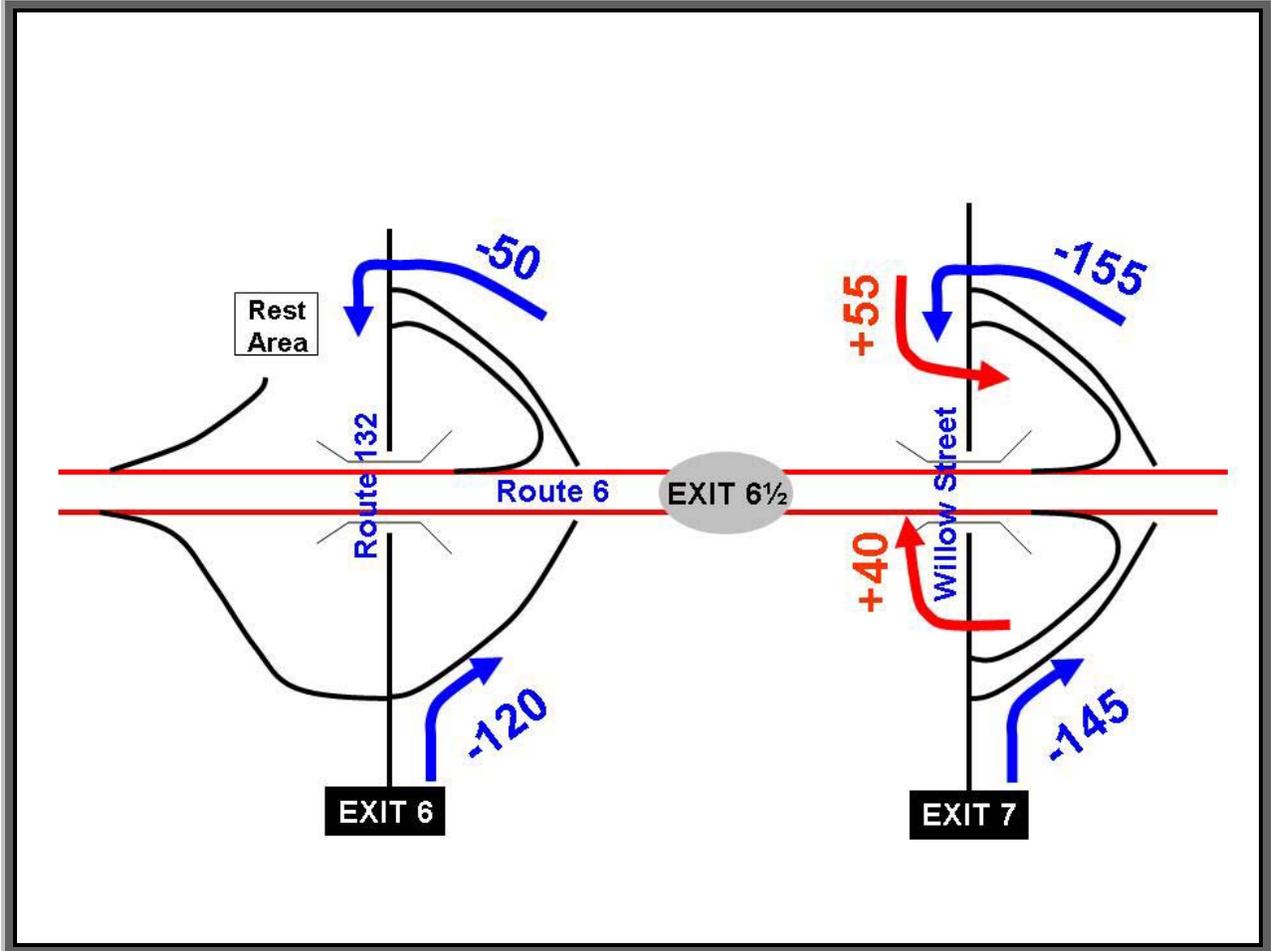


Figure 4-4 depicts the expected ramp volumes on a potential Exit 6 ½ during the summer weekday PM peak hour in the build year of 2030.

Figure 4-4: General Interchange Volume Pattern  
Route 6 at Exit 6 ½  
2030 Summer Weekday PM Peak Hour

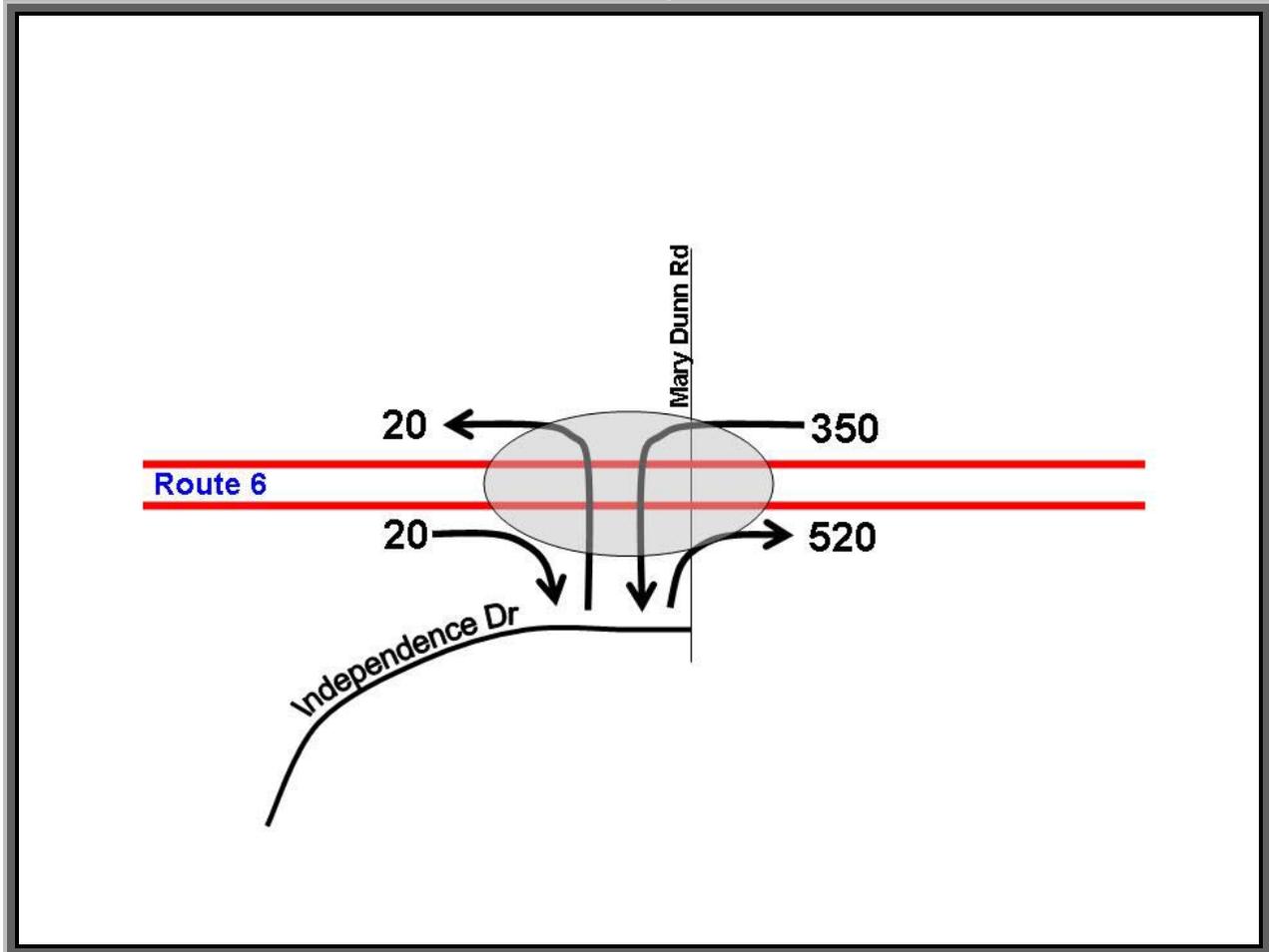
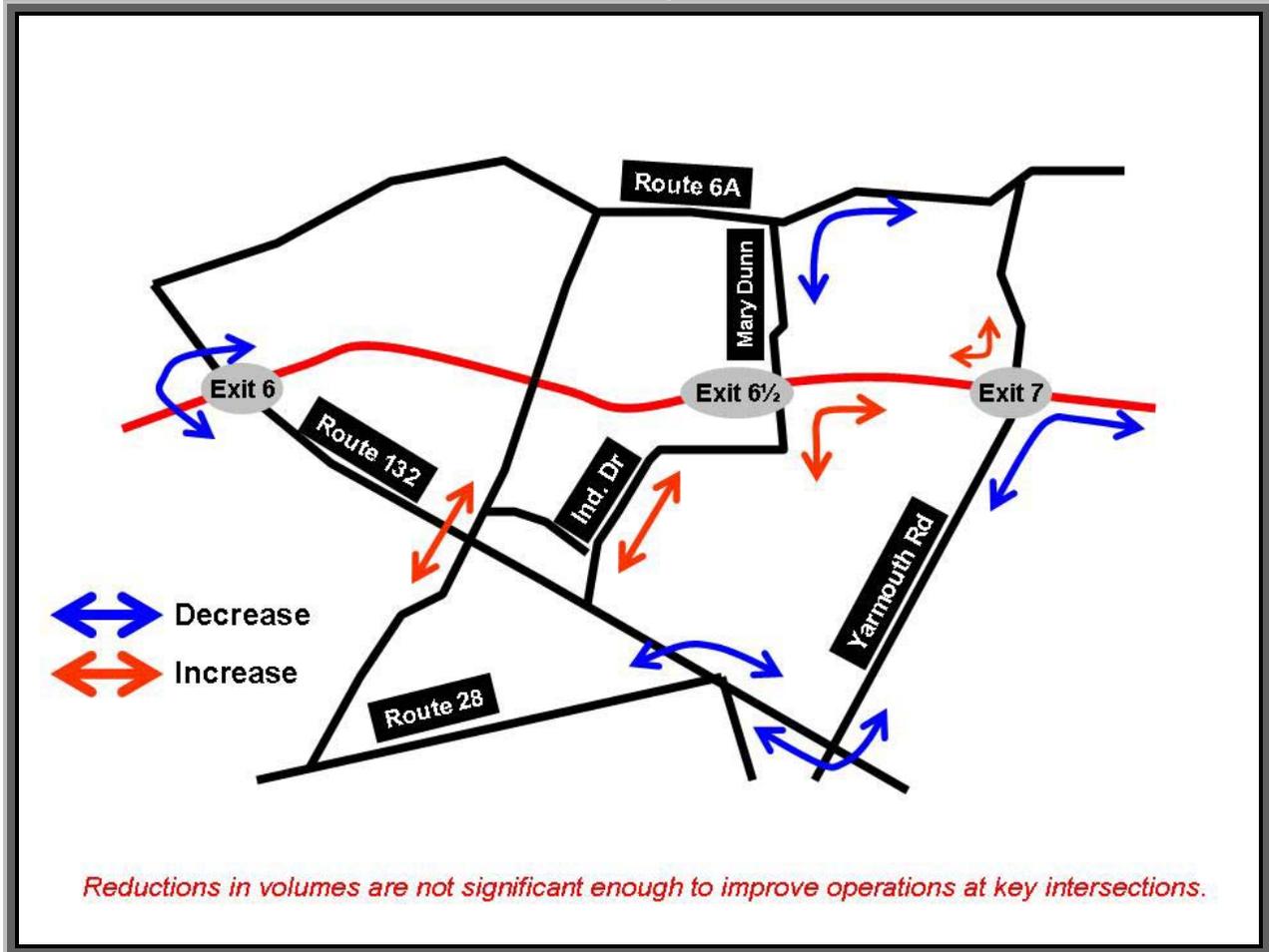


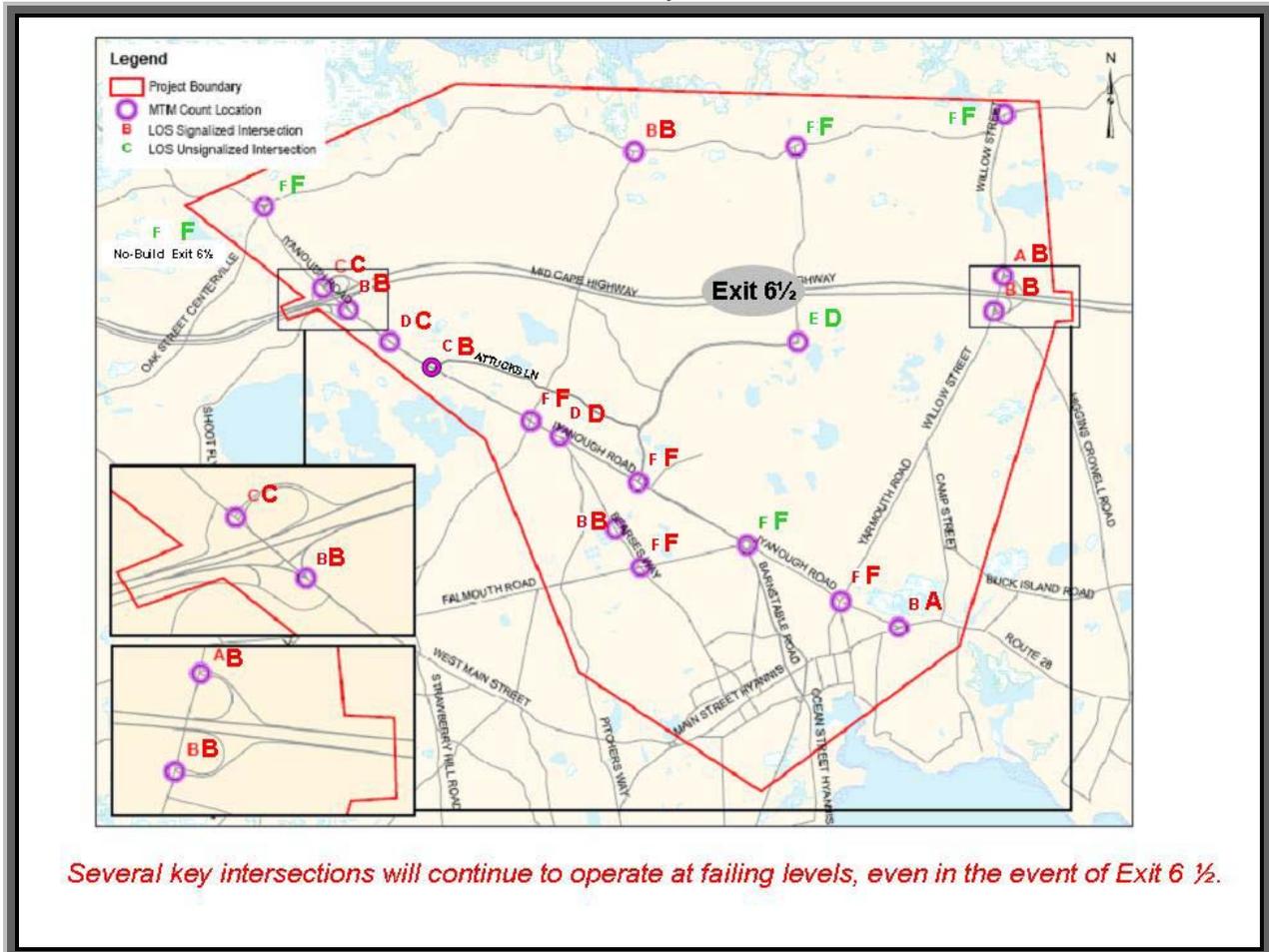
Figure 4-5 is a simplified depiction of Figure 4-1, showing the expected general travel pattern shift in the event of an Exit 6 ½.

Figure 4-5: Study Area Roads  
Volume Changes Due to Exit 6 ½  
2030 Summer Weekday PM Peak Hour



When evaluating roadway alternatives, including Exit 6 ½, the team examined the following key (problem) intersections to see if there would be improvements: Route 132 and Phinneys Lane, Route 132 and Independence Drive, the Airport Rotary, Route 28 and Yarmouth Road, and Route 28 and Bearses Way. Although some volumes go down at some of the intersections, the changes are not expected to be significant enough to bring operations to acceptable levels where they are currently failing. Furthermore, while improvements to Level of Service (LOS) were observed at other intersections, these intersections were already operating at acceptable LOS. Figure 4-6 summarizes the LOS at area intersections comparing the no-build and the build Exit 6 ½ option.

Figure 4-6: Level of Service Changes Due to Exit 6 ½  
Summer Weekday PM Peak



Summary of traffic benefits and impacts at area intersections due to Exit 6 ½:

- Similar LOS at area intersections whether the interchange is at the Rest Area, west of Rest Area, or at Mary Dunn Rd
- LOS at several intersections remain the same under exit 6 ½ as under the future year no-build. Key intersections include:
  - Route 132 at Phinney's Lane
  - Route 28 at Bearse's Way
- Several key intersections performing poorly today and in the future do not improve significantly with Exit 6½:
  - Rt. 28 and Yarmouth Road (Delay reduces, but still LOS F)
  - The Rotary (Operations improve, still LOS F)
- A key intersection performing poorly today and in the future worsens with Exit 6 ½
  - Rt. 132 & Independence Drive
- An intersection that performs well today worsens with Exit 6½
  - Independence Drive and Mary Dunn Road
- Some intersections performing poorly today and in the future improve somewhat with exit 6 ½
  - Rt. 6A and Mary Dunn Road
- Some key intersections performing at acceptable levels of service today and in the future improve with Exit 6 ½
  - Route 132 at Attuck's Lane
  - Willow Street and Exit 7 WB Ramps

#### 4.1.2 Exit 6 ½ Safety Considerations

The conceptual designs of all of the Exit 6 ½ alternatives meet federal and state highway design guidelines. These guidelines are intended to ensure that the final roadway configuration minimizes potential crashes. While the conceptual designs meet these criteria and thereby reduce the likelihood of crashes, a new interchange on roadway sections previously uninterrupted introduces new conflict points. Because there is not an interchange at this location now, pre-build and post-build crash rates can not be compared.

In general, alternatives that require vehicles to perform left turning movements onto and off of the secondary road such as the diamond interchange introduce conflict points with the crossing maneuvers. The alternatives that require merges from the ramp onto the mainline or secondary road such as the trumpets increase the potential for merging crashes. Although the rest area introduces additional merging maneuvers, it is unlikely that the volumes entering and exiting the rest area are significant enough to increase the potential for crashes. Historical crash data bears this out.

Although there are differences in safety features of the various interchange options, the technical team is confident that any of the six alternatives could be carried forward in the future during the design process while continuing to meet federal and state highway design guidelines and result in a safe, effective interchange.

In this particular case of the Hyannis Access Study, the other factors discussed in these sections (on Exit 6 ½) such as traffic and economic benefits, and environmental and community concerns, weighed more heavily in the selection of a preferred alternative.

#### 4.1.3 Exit 6 ½ Environmental and Community Considerations

There is potential for environmental impacts with all of the Exit 6 ½ alternatives.

All of the alternatives have the potential to impact the Zone II wellhead protection area, depicted in Chapter 2. Slightly less impact would be expected from alternative 2, the trumpet west of the rest area. All of these alternatives would require further study and potential modification to the designs to ensure that the aquifer would not be compromised. However, it should also be noted that much of this area is already developed and includes numerous roadways, an airport, and residential, commercial and industrial development.

No direct impacts to any wetland resources or freshwater kettle ponds, based on available mapping, would be anticipated with any of these alternatives. The alternatives at Mary Dunn Road would be closer to mapped wetland resources than those at the rest area, or west of the rest area.

Two local historic districts, Northside Historic District, and Old King's Highway Historic District, would have the potential to be impacted by the Exit 6 ½ alternatives. Further study and investigations for these districts, as well as for any other historic and/or archeological resources, would need to take place should any of those alternatives move forward.

Some intuitive observations can be made with regards to air quality. Assuming the project would improve mobility and traffic flows, a beneficial effect on air quality can be anticipated when compared to the existing traffic conditions.

Some of the alternatives, namely 1, 2, and 5 may need attention to potential visual impacts due to the new bridge structures that would be involved.

MassHighway's Type I noise abatement program covers noise barrier construction coincidental with construction of major highways on new location, or physical alteration of an existing highway, including widening or realignment. As part of the analysis required for the preparation of NEPA and MEPA environmental documents, the need for a noise barrier would be evaluated for this project and if determined to be reasonable and feasible could be constructed as part of the project.

Noise sensitive land uses include a) residences, hotels, and other buildings where people sleep, b) institutional resources such as churches, schools, hospitals, and libraries, and c) various tracts of land where quiet is an essential element of the land's intended purpose. The Hyannis Access Study Task Force, as well as the general public, have noted that ambient noise levels within the project area under existing conditions are a concern in some areas. As a result, a thorough analysis of existing noise levels would be completed in future project development phases. Potential positive and negative noise level impacts would need to be assessed for the build alternatives along with possible mitigation measures. It is anticipated that the build alternatives as proposed in this study would not result in an increase in noise levels in exceedance of the state and federal guidelines, but this would need to be verified by the noise analysis.

By improving traffic operations and reducing peak hour delay and congestion, it is anticipated that emergency response times would improve with any of the Exit 6 ½ alternatives.

The following discussions provide additional information related to potential environmental impacts for the various alternatives.

**Alternatives 1 and 2**

These alternatives which are at and west of the rest area would be expected to have less potential for impacts to the habitats of wildlife and threatened and endangered species.

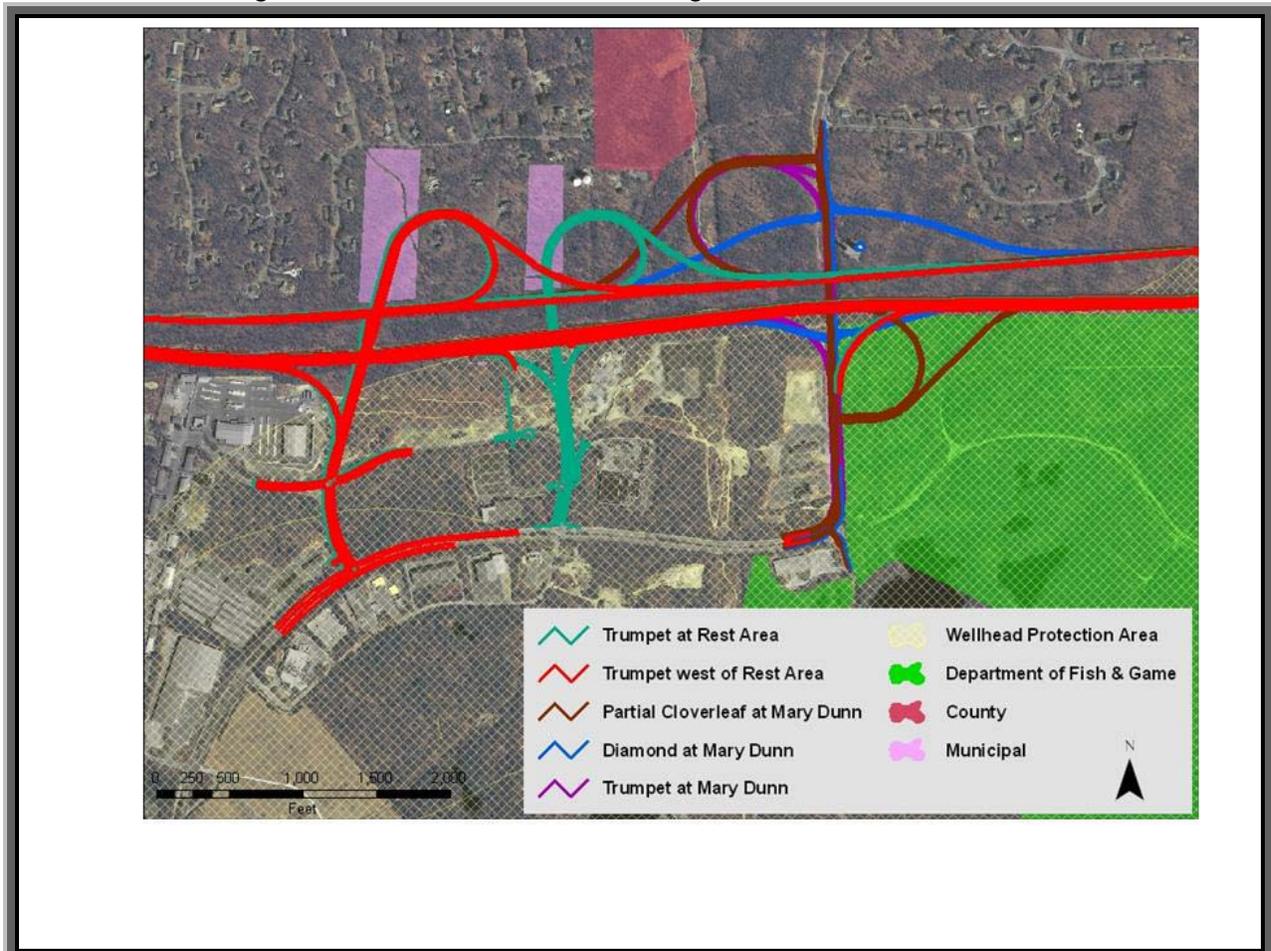
**Alternatives 3, 4, 5, and 6**

These alternatives which are located at Mary Dunn Road are expected to have greater potential for impacts to habitats of wildlife and threatened and endangered species. The partial cloverleaf alternative at Mary Dunn Road would have the most encroachment into the Hyannis Ponds WMA and therefore the greatest potential for wildlife habitat impacts.

Figure 4-7 and the following provides a summary of the key environmental issues:

- Activity in and near wellhead protection areas (WHPA)
- Needs for stormwater and runoff treatment
- Potential noise issues with neighborhoods north of Route 6
- Activity in Historic District
- Activity in and near protected lands (MA F&W)

Figure 4-7: Environmental Screening of Exit 6 ½ Alternatives.



At this early stage, there are many resources which would require additional investigation, research and coordination to more accurately determine the potential for impacts, as well as the opportunity for mitigating these impacts. Based on mapping information, as well as input from the Task Force and the public, the key environmental resources and issues of concern have been identified and the team has made a sincere effort to examine alternatives for a potential Exit 6 ½ that would improve mobility, safety and potentially economic development, while minimizing impacts to the natural, cultural and socioeconomic environments.

**4.1.4 Exit 6 ½ Costs**

The following costs were developed for the six interchange alternatives and are based on MassHighway’s 2007 weighted average bid prices. The costs below are for construction and construction staging only. They do not include right-of-way acquisitions, design or environmental mitigation costs.

Table 4 –1: Estimated construction costs of Exit 6 ½ alternatives

| <u>Alternatives</u> | <u>Description</u>                   | <u>Construction Costs (2007) \$<br/>millions</u> |
|---------------------|--------------------------------------|--|
| Alt 1               | Trumpet at the Rest Area             | 19   |
| Alt 2               | Trumpet West of the Rest Area        | 18.5   |
| Alt 3               | Partial Cloverleaf at Mary Dunn Road | 20   |
| Alt 4               | Diamond at Mary Dunn Road            | 10   |
| Alt 5               | Trumpet at Mary Dunn Road            | 19.5   |
| Alt 6               | Alt. 1/4 Hybrid                      | 10.8   |

Table 4-1 shows that three of the alternatives would be just under \$20 million while two of the alternatives would be around \$10 million.

**4.1.5 Exit 6 ½ Task Force and public input**

Members of the Task Force expressed concern about pursuing Exit 6 ½ until appropriate land-use regulations are in place in the industrial zones just south of Route 6. Other members of the Task Force expressed frustration that those regulations are not already in place and cited examples of concessions that landowners and developers would be willing to make. The Town of Barnstable documented in a memo to the Office of Transportation Planning (see Appendix 13) that the industrial zones in the vicinity of a potential Exit 6 ½ are part of “a strategic planning area slated for future planning analysis.” As such, the Town expects to address those zones after the Route 132 corridor is addressed – a priority given the widening project underway there. Another priority has been the downtown area where the infrastructure and infrastructure plans can support high-density growth. The Town recognizes the potential value of the Independence Park area, and proponents of Exit 6 ½ are eager to work with the Town to facilitate new development there.

Environmental and community concerns were voiced repeatedly by some members of the Task Force. The travel demand model showed that traffic on Route 6A and Mary Dunn Road would be returned to approximately its 2006 levels, thereby effectively mitigating the traffic growth on those roads due to the development in the Park area. However, members of the Task Force and public contend that Exit 6 ½ would not mitigate traffic growth north of Route 6 but instead increase it. In addition, members of the public expressed concern for the levels of traffic on Mary Dunn Road today and requested that any Exit 6 ½ project include improvements to Mary Dunn Road.

As was the case with the public’s input, Task Force members – in general - preferred the concept at the rest area as opposed to the concepts at Mary Dunn Road.

The following summarizes the public input received:

- Strong support for Exit 6 ½ alternatives 1 and 2
- Concerns for development pressure if an interchange were to be constructed
- Many express community and environmental concerns
- Concerns about traffic on Mary Dunn Road
- Preference for altnvs 1 and 2 -even among those that do not support the exit in general

**4.1.6 Exit 6 ½ Evaluation Result**

The following matrix depicts the evaluation summary of the various Exit 6 ½ alternatives compared to each other with respect to the study’s goals, objectives, and evaluation criteria.

Evaluation Matrix Legend

|                             | Some  | Moderate  | Substantial   |
|-----------------------------|---|---|---|
| <b>Benefits</b>             |  |  |  |
| <b>Impacts</b>              |  |  |  |
| <b>No Benefit or Impact</b> |  |  |  |

1. Trumpet interchange at the rest area
2. Trumpet interchange west of the rest area
3. Partial cloverleaf interchange at Mary Dunn Road
4. Diamond interchange at Mary Dunn Road
5. Trumpet interchange at Mary Dunn Road
6. Hybrid of alternative 1 and 4

Figure 4-8: Evaluation Summary of Exit 6 ½ Alternatives

| Objectives   | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| Improve Traffic Flow in and Around the Local Focus Area  | ○ | ○ | ○ | ○ | ○ |
| Minimize Local Street Impacts  | ○ | ○ | ○ | ○ | ○ |
| Improve Safety for Motorists, Pedestrians and Bicyclists   | ○ | ○ | ○ | ○ | ○ |
| Improve Mobility & Transportation Choice   | ◇ | ◇ | ◇ | ◇ | ◇ |
| Protect and Enhance the Natural and Cultural Environment   |   |   |   |   |   |
| Protect Groundwater Supplies   | ○ | ○ | ■ | □ | □ |
| Visual Environment   | □ | □ | ■ | ■ | ■ |
| Protect Wetlands   | □ | □ | □ | □ | □ |
| Protect Habitats   | □ | □ | ■ | ■ | ■ |
| Improve Air Quality  | ○ | ○ | ○ | ○ | ○ |
| Protect Hist./Arch. Resources  | □ | □ | □ | □ | □ |
| Address Contaminated Areas   | ○ | ○ | ○ | ○ | ○ |
| Minimize Impacts   | ○ | ○ | ○ | ○ | ○ |
| Maintain and Enhance Support for Regional Economic Activity by Strengthening Transportation Networks | ○ | ○ | ○ | ○ | ○ |
| Develop Recommendations that can be Implemented Efficiently  |   |   |   |   |   |
| Constructability Impacts   | ■ | ■ | □ | □ | □ |
| Quality of Life  | □ | ■ | □ | ■ | □ |
| Costs  | ■ | ■ | ■ | □ | ■ |
| Meet MassHighway Design Criteria   | ◇ | ◇ | □ | ◇ | □ |

Based on the collective input of the Task Force and the public, EOTPW Planning and the technical team would support alternative 1 as the preferred option for Exit 6 ½.

However, the interchange should not be prioritized for implementation at this time because:

- It does not address the key traffic goals of the study
- Environmental risks
- High cost
- Lack of community consensus

Despite these shortcomings and challenges, there are benefits to the interchange. These are namely:

- It would mitigate traffic growth north of Route 6 in the study area to a large extent.
- It would reduce cut-through traffic in some neighborhoods north of Route 6.
- It would provide better access to the industrial and retail zones south of Route 6 in the study area.
- It offers time savings to travelers coming from the east and destined to the Industrial Park and the Cape Cod Mall.
- Favorable access for trucks into and out of the industrial zones.

As is discussed in the next Chapter, Exit 6 ½ may be pursued after the priority areas in Hyannis are addressed. Once the short-term recommendations move forward, alternative 1 should stand as the preferred alternative and may be further developed beyond conceptual design while addressing community concerns, environmental constraints, and funding availability through MassHighway's standard project development process.

## 4.2 Airport Rotary Alternatives Evaluation

The following sections cover the technical team's analysis in the areas of traffic and travel demand benefits, safety, environmental considerations, economic development potential, and costs for the Airport Rotary alternatives. This is followed by Task Force and public input, the evaluation summary and result.

### 4.2.1 Airport Rotary Alternatives Traffic and Travel Demand Impacts and Benefits

As was the case for Exit 6 ½ alternatives, the Hyannis Access Study travel demand model was used to estimate the travel shifts that would be expected with improvements to the Airport Rotary. Traffic operations analyses determined the levels of service and the relative safety benefits of the various concepts.

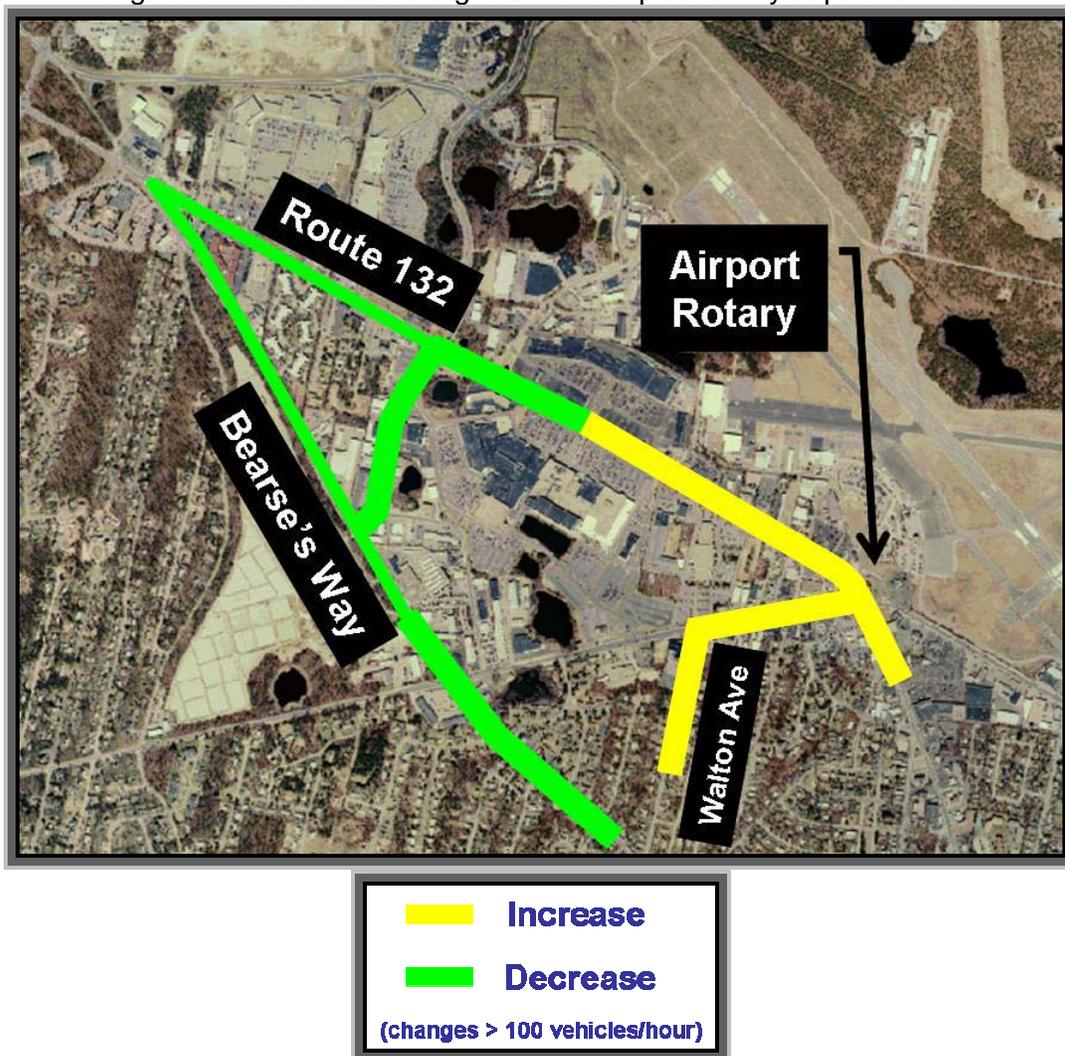
The technical team modeled three conditions with the travel demand model that reflected the capacity improvements inherent in the six rotary improvements, due to the likelihood of similar travel pattern shifts for various concepts and the high cost of modeling efforts.

The three conditions modeled were:

- A small capacity improvement on all approaches, reflective of the updated rotary (alternative 1A) and roundabout (alternative 1B) alternatives.
- A greater capacity improvement on Route 132 and Route 28 east of the airport rotary with smaller capacity improvements on the other approaches, reflective of the split intersection (alternative 3) and Route 132-Route 28 grade-separated (alternative 4).
- A greater capacity improvement on the Route 28 approaches with smaller capacity improvements on the other approaches, reflective of the 4-legged at-grade signalized (alternative 2) and Route 28-Route 28 grade-separated (alternative 5) alternatives.

While the travel demand model indicated marginal increases in volumes on approaches with capacity improvements, the overall patterns of traffic in the airport rotary did not change among the three conditions modeled to any significant level. Figure 4-9 shows that in the event of improvements to the Airport Rotary, traffic is expected to shift back to the rotary area, which has been or will have been avoiding the area and using side roads. This is expected to provide a localized benefit.

Figure 4 – 9: Volume Changes Due to Airport Rotary Improvements



The following is a summary of the travel demand model results for the Airport Rotary improvements.

- There are not expected to be any significant changes in regional travel patterns between the no-build and build options.
- Only shifts in local travel patterns would be expected, due to the improved operations at the intersections.
- Reductions in cut-through traffic in Hyannis Downtown would also be expected.

Traffic operations analyses was performed on all six alternatives.

Alternative 1A, the updated rotary, is expected to operate at an overall acceptable level of service. However, the traffic analysis tools do not show the tendency for traffic to stay in the outside lane of the two-lane rotary, slowing traffic volume and increasing safety concerns. In particular, it is expected that a queue would form on Barnstable Road northbound on the approach to the rotary, as drivers will not want to cross the traffic exiting to Route 28 eastbound. Theoretically, the overall level of service would be D and the Barnstable Road approach would be F. The technical team advised against this alternative as it is expected to be operating poorly by the time it is constructed. Alternative 1B, the modern roundabout, is expected to operate at acceptable levels of service, level of service D. Alternative 2, the at-grade four-leg signalized intersection, is large enough to accommodate the number of lanes required for an acceptable level of service D. Alternative 3, the split intersection, is expected to operate at level of service B at each individual intersection with a combined level service D. Alternative 4, the grade-separated Route 132-28 roundabout option is expected to perform at a level of service B. Alternative 5, the grade-separated Route 28-28 roundabout option is expected to perform at a level of service C. All the build alternatives provide significantly better operations than the no-build.

Figure 4-10 shows that the percent reduction in volume with the Route 132-28 underpass option is expected to be approximately 30% whereas the percent reduction in volume with the Route 28-Route 28 option is expected to be approximately 15%.

Figure 4-10: Estimated Volume Reduction due to underpass options  
At the Airport Rotary

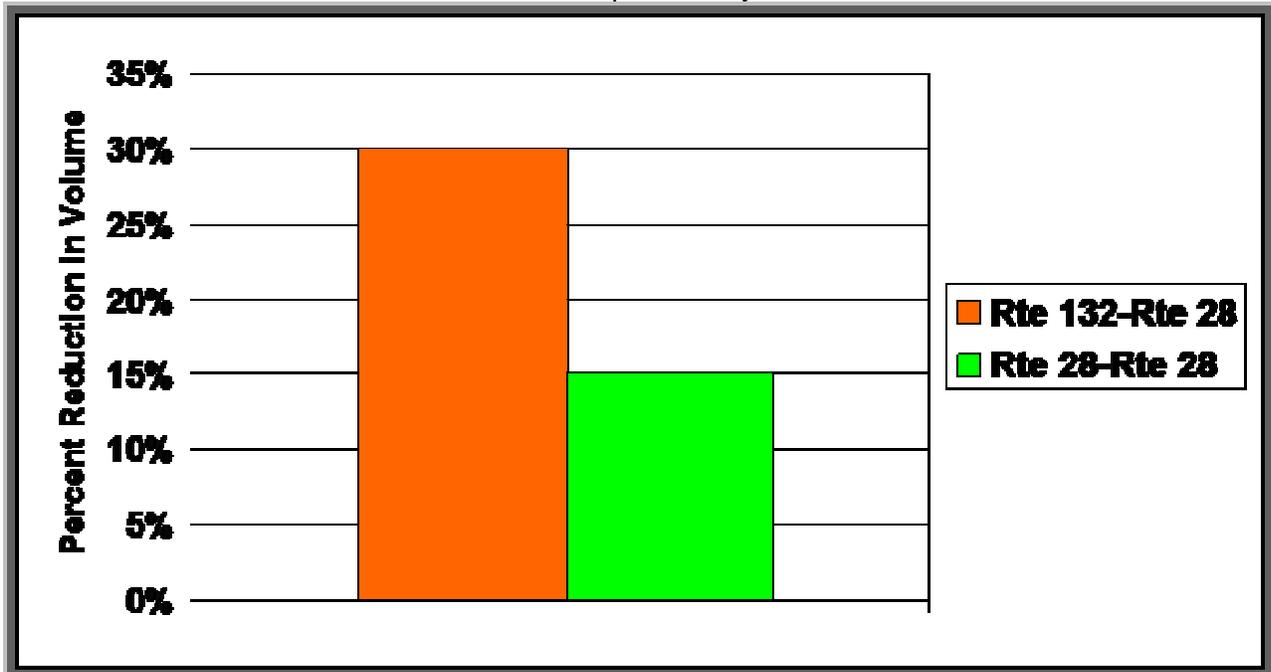
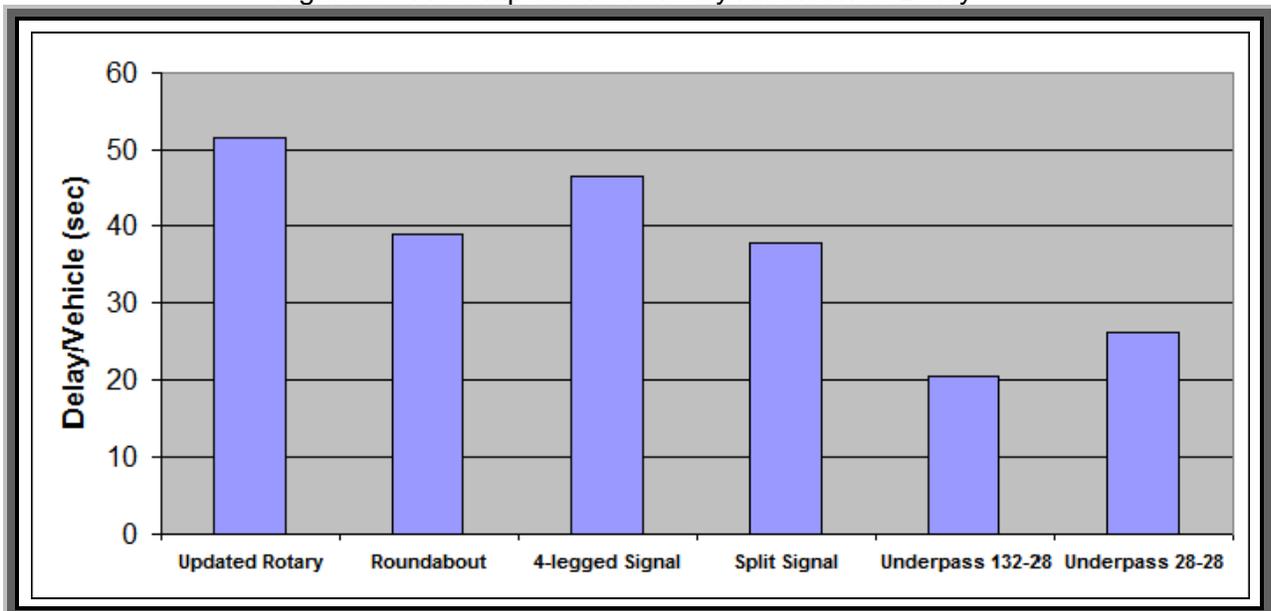


Figure 4-11 shows the relative delay per vehicle in seconds that would be expected to result from the various Airport Rotary alternatives.

Figure 4 –11 Comparison of Rotary Alternatives Delay



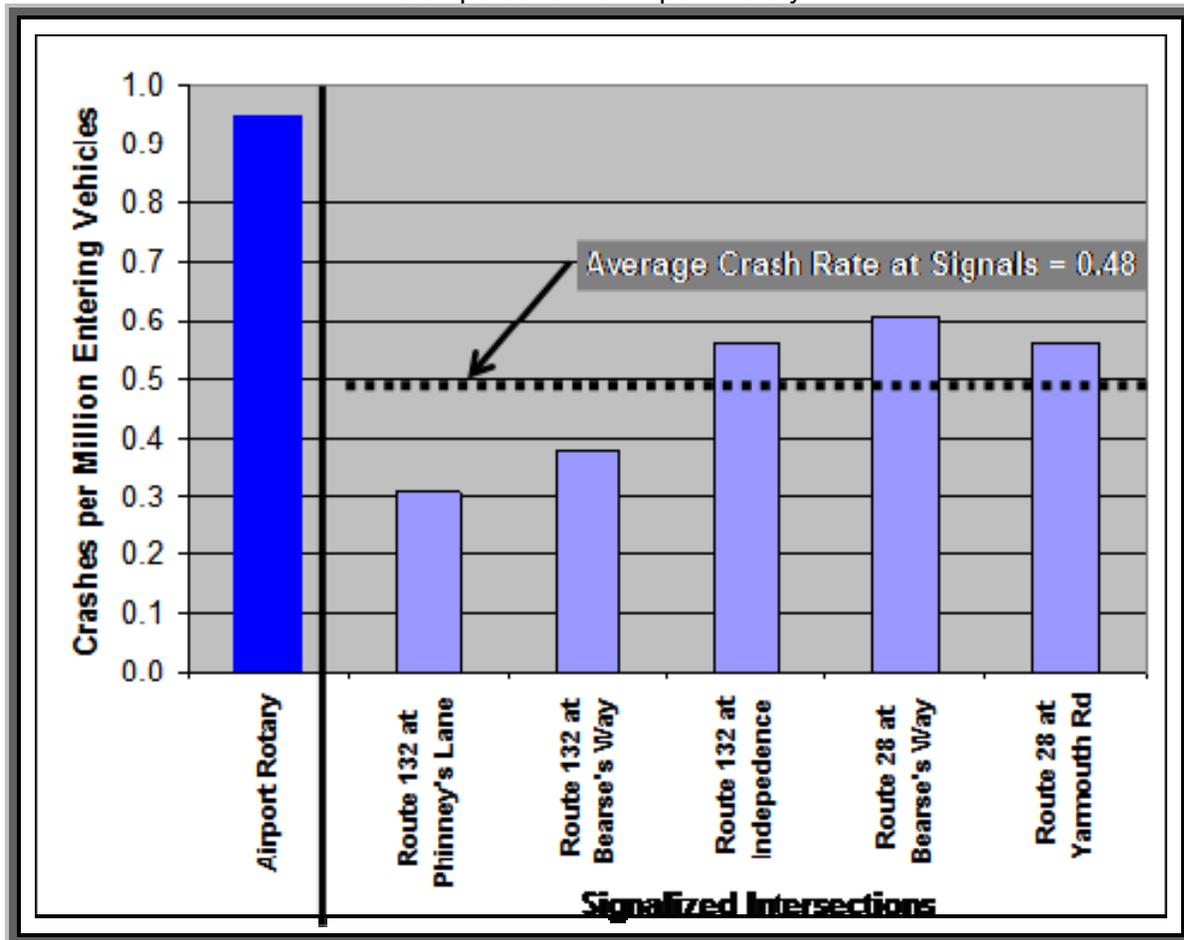
From a traffic operations perspective, the Route 132 - Route 28 grade-separated roundabout solution is expected to perform the best because 30% of the traffic is expected to be removed from the roundabout. However, this comes at a higher cost as described in section 4.2.5.

#### **4.2.2 Airport Rotary Alternatives Safety Considerations**

The safety of an intersection is described by a crash rate, which is the number of crashes in a year for every million vehicles that enter the intersection. Intersections with high traffic volumes, in general, are more likely to have a greater number of crashes than those with lower volumes. The computation of the crash rate takes the volumes into consideration and allows traffic engineers to identify the intersections with safety problems.

The crash rate was computed using data from 2003, 2004 and 2005 for the Airport Rotary as well as for five other signalized intersections each of which were determined to operate at level of service E/F during either the 2006 existing condition or the 2030 No-Build condition. Figure 4-12 presents the crash rates at these locations. The crash rates at the five signalized intersections varied from 0.3 to 0.6, with an average of 0.48. The crash rate at the Airport Rotary was 0.95. It is important to note that the crash rate at the Airport Rotary is much higher than the crash rates at the five poorly-operating signalized intersections. Usually, engineers have found that signalized intersections have higher crash rates than rotaries and roundabouts. Furthermore, if the signalized intersection has poor traffic operations, the crash rate tends to be higher. However, in this study, the crash rate at the Airport Rotary was found to be higher, which is an important point. This indicated to the study team that given the level of traffic volumes and the turning patterns at the Airport Rotary, if the rotary were to be converted to a signalized intersection, the crash rate would likely drop.

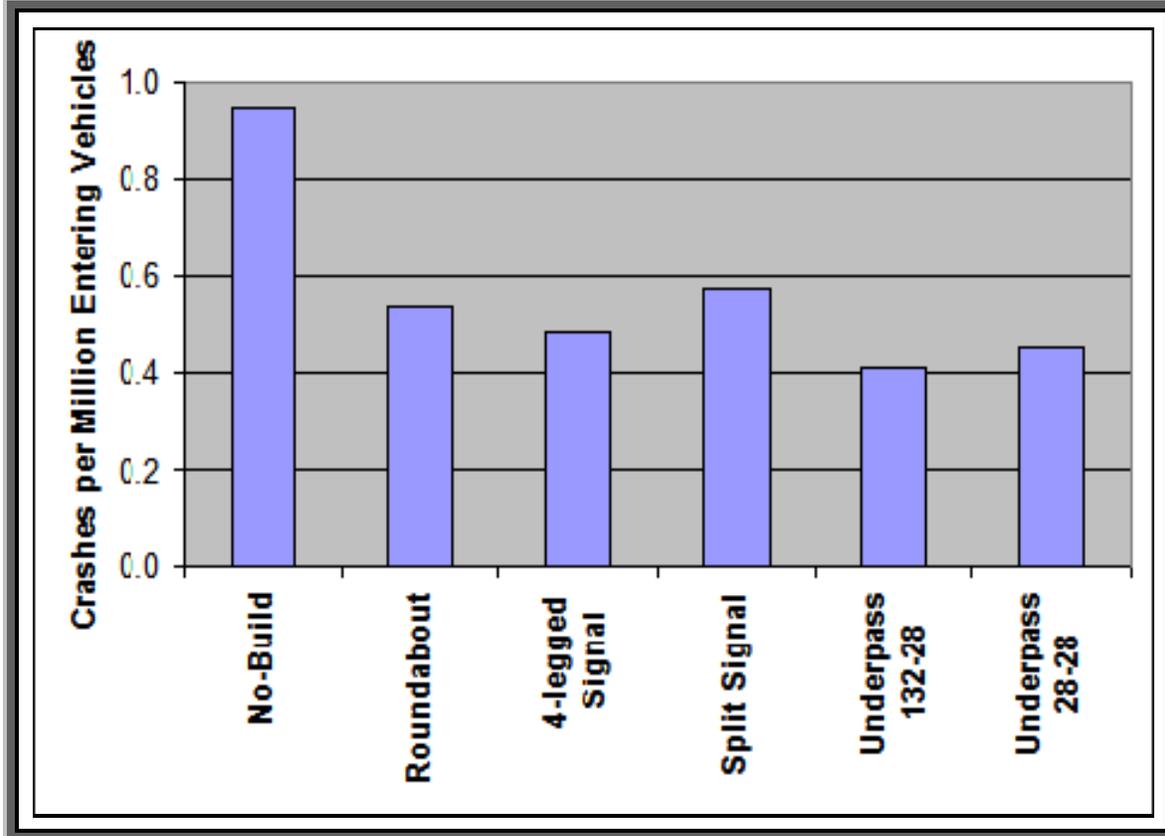
Figure 4 – 12: Crash Rate at area signalized intersections Compared to the Airport Rotary



The next step was to estimate the number of crashes or the crash rate for the various improvement alternatives under consideration at the Airport Rotary. The publication *“Roundabout: An Information Guide”* from the Federal Highway Administration provides crash prediction methodology borrowed from the United Kingdom. Before applying the borrowed methodology to the alternatives, the methodology was first applied to the existing rotary and calibrated to reflect the number of crashes under existing conditions. Subsequently, this methodology was applied to the various Airport Rotary alternatives.

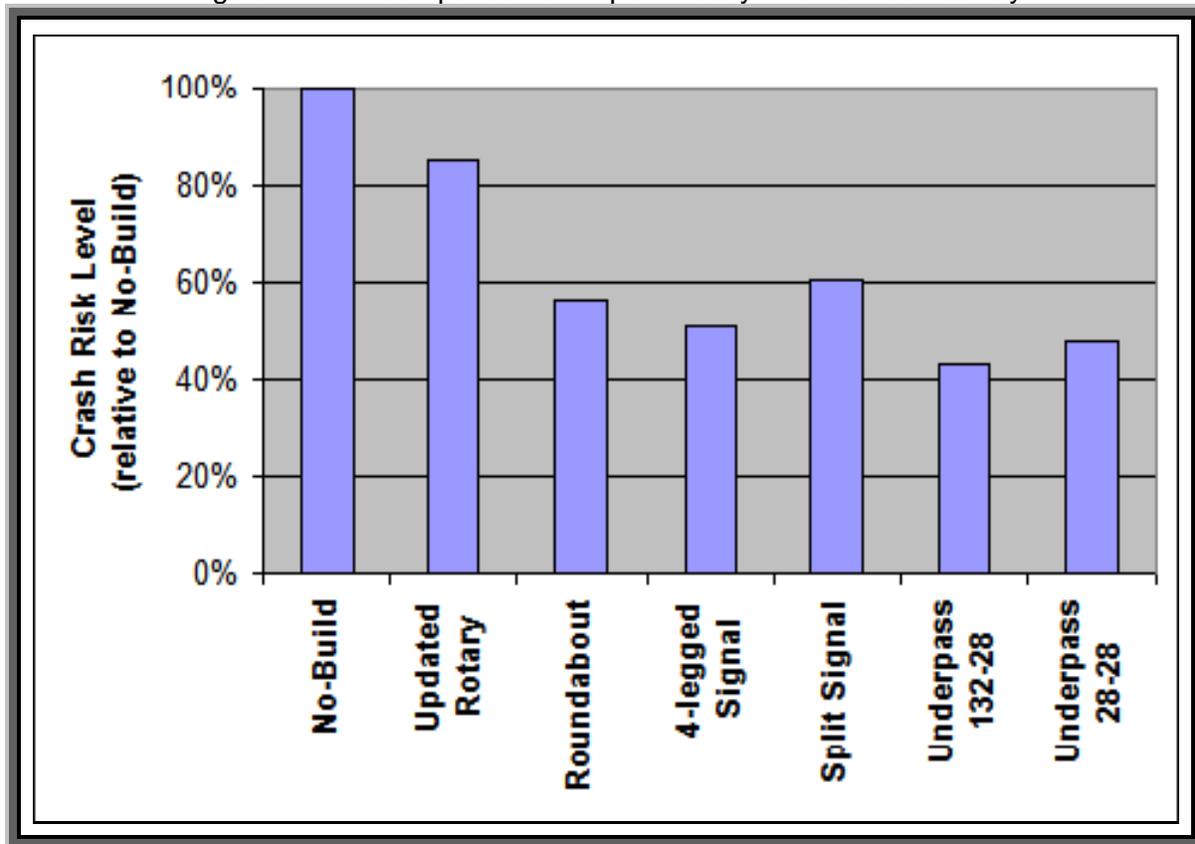
The crash prediction methodology takes into account various factors such as traffic volume entering the roundabout, traffic volume circulating in the roundabout, width and angle of the various approaches, distances between the approaches, diameter of the roundabout, etc. Figure 4-13 presents the expected crashes per million entering vehicles for the various Airport Rotary alternatives as well as the crash rate under No-Build conditions.

Figure 4 – 13 : Crashes per million entering vehicles for the No-Build And the various Airport Rotary Alternatives



Predicting crashes has always proved to be a challenge to traffic engineers. The methodology used in this analysis is based upon a methodology borrowed from the UK. Another way to compare the safety improvements from the alternatives is to normalize based upon the No-Build. In other words, if the No-Build is assumed to be a 100 percent, what would be the relative crash rate of the alternatives? This is presented in Figure 4 –14.

Figure 4 – 14: Comparison of Airport Rotary Alternatives - Safety



In summary, any of the Airport Rotary alternatives would result in significant safety improvements over the No-Build. The Route 132-Route 28 underpass alternative provides the greatest safety improvement given 30% reduction in rotary volumes. The Updated Rotary concept would result in the least amount of improvement. In terms of safety improvement, following are the at-grade alternatives in descending order 1) 4-legged Signal, 2) Roundabout, 3) Split Signal.

Any improvement that is ultimately selected for the Airport Rotary will follow the MassHighway Design Guidebook and the Manual of Uniform Traffic Control Devices (MUTCD) to address pedestrian and bicycle safety. At signalized intersections, pedestrian safety is addressed through implementation of pedestrian phases as part of the signal system. Providing for pedestrian and bicycle safety at a roundabout is a bit more challenging. While roundabouts are typically designed to accommodate bicycle and pedestrians, given the relatively high traffic volumes through this location, it would be beneficial if the Town were to establish alternate bicycle routes that avoid this highly congested intersection.

### 4.2.3 Airport Rotary Alternatives Environmental and Community Considerations

Since the Airport Rotary is located in an area that is already developed, there would be minimal impacts to the natural environment. No impacts would be anticipated to surface waters, floodplains, wetlands, fish and wildlife habitat, threatened and endangered species, the ACEC, and protected and recreational open space. Chapter 2 depicts these features as well as others. The interior of the existing rotary contains about an acre of landscaped land which would be disturbed by several of the improvement alternatives. Opportunities to mitigate this loss should be investigated as the project advances.

Two of the airport rotary improvement alternatives would involve the construction of an underpass (Alternatives 4 and 5) which would raise some concerns regarding the potential for impacts to subsurface water resources. If either of these alternatives were advanced, the potential for these impacts would require additional investigations.

There are no identified cultural, historic or archeological resources within or adjacent to the Airport Rotary. However, additional studies would need to take place to more accurately determine whether there are any cultural resources within the area that could be affected.

There have not been any detailed analyses of the potential positive or negative effects the project may have on air quality, but some intuitive observations can be made. Since any of the Airport Rotary alternatives would improve mobility and traffic flows, a beneficial effect on air quality can be anticipated when compared to the existing traffic conditions. It is very difficult to compare the proposed alternatives currently under consideration for their potential effects on air quality without more detailed studies. Such comparisons can only be based on known parameters with the focus on mobility.

Graphical representations of the approximate right-of-way acquisitions can be found in Appendix 11. These exhibits show the direct impacts (yellow highlights) and the potential for indirect impacts which could result in changes in access to certain properties due to restrictions on turning movements.

By improving traffic operations and reducing peak hour delay and congestion, it is anticipated that emergency response times would improve with any of the airport rotary alternatives. Additionally, any intersection improvements would include the hardware to allow priority to emergency vehicles, thereby improving response time.

In general, it is expected that as an improvement is pursued through design phases more detailed study of the environmental and community concerns of the area will reveal an overall benefit with regards to environmental and community issues.

### 4.2.4 Airport Rotary Alternatives Construction Costs and Maintenance Issues

The following are construction and maintenance issues for each of the Airport Rotary alternatives.

- Alternative 1A – Updated Rotary
  - Most construction occurs outside of existing roadway footprint
  - No new signals or structures to maintain

- Alternative 1B –Roundabout
  - Roundabout constructed on top of existing rotary complicating construction
  - No new signals or structures to maintain
- Alternative 2 – 4 Leg Intersection
  - Most construction occurs inside the rotary with widening on the approaches
  - 1 new signal to maintain
- Alternative 3 – Split Intersection
  - Construction of 2 signalized intersections over existing roadway footprint likely to be more complicated
  - 2 new signals to maintain
- Alternative 4 – 132 to 28 Underpass
  - Complicated construction with construction of boat section and tunnel
  - Significant inspection & maintenance needs with below grade tunnel structure and boat sections
- Alternative 5 – 28 to 28 Underpass
  - Complicated construction with significant construction impacts
  - Significant inspection & maintenance needs with below grade underpass and boat sections

Table 4-2 lists the construction costs for the Airport Rotary alternatives. None of the estimates include potential right-of-way acquisitions. The at-grade options range from \$1.6 million to \$3.4 million, and the grade-separated options range from \$14.6 million to \$19.6 million.

Table 4 – 2: Construction costs of Airport Rotary Alternatives

| Alternatives            | Construction Costs (2007) |
|-------------------------|---------------------------|
| Updated Rotary          | \$1,600,000               |
| Roundabout              | \$2,200,000               |
| Four Leg Intersection   | \$3,100,000               |
| Split Intersection      | \$3,400,000               |
| 132/28 Underpass w/ RDB | \$19,600,000              |
| 28/28 Underpass w/ RDB  | \$14,600,000              |

#### 4.2.5 Airport Rotary Alternatives Task Force and public input

Although Task Force members acknowledged severe congestion and safety issues, many expressed a “fondness” for the Airport Rotary. Some expressed concerns about the difficulty that visitors have navigating the Airport Rotary, but there was not strong consensus to eliminate the rotary to deal with this issue. Rather, members of the Task Force suggested better signage and lane markings. Members of the public added that drivers should be educated in its use. It is considered a beautiful gateway into Hyannis, with its interior over an acre and fully landscaped. The technical team was strongly encouraged to exhaust all possibilities to maintain the rotary in some format. The team determined that the updated rotary would not deliver the necessary traffic benefits. The modern roundabout, which is expected to perform at acceptable levels of service, was not well-received by the Task Force. Intuitively, it was thought impossible that a roundabout with a smaller diameter could process traffic better than the large diameter rotary that exists there today.

Some Task Force members liked the low-cost, straightforward nature of the at-grade four-leg signalized intersection concept. Some expressed concern for the number of lanes required, potential queuing, loss of the landscaped area, and aesthetics in general.

Some Task Force members seemed intrigued by the opportunities surrounding the split intersection solution, especially with regards to potential redevelopment in the area. The concerns for the four-leg intersection were repeated here and combined with concerns that two intersections would be “psychologically” more discouraging for travelers and there would be an increased potential for accidents and queuing.

Town officials, strong supporters of the GIZ, expressed a desire to further study the rotary and keep the grade-separated options under consideration. Some members of the Task Force expressed concern that the improvements for the Rotary were driven by development plans for the downtown area which exceed desirable levels.

The Bicycle/Pedestrian subcommittee came to no conclusions with regards to a preferred alternative from the standpoint of bicycle and pedestrian safety. Some felt that bicycle travel should be re-routed through different roads in the area.

#### 4.2.6 Airport Rotary Alternatives Evaluation Result

The following matrix depicts the evaluation summary of the various Airport Rotary alternatives compared to each other with respect to the study’s goals, objectives, and evaluation criteria.

Evaluation Matrix Legend

|                             | Some | Moderate | Substantial |
|-----------------------------|------|----------|-------------|
| <b>Benefits</b>             |      |          |             |
| <b>Impacts</b>              |      |          |             |
| <b>No Benefit or Impact</b> |      |          |             |

At-grade options:

- 1A. Updated Rotary
- 1B. Modern roundabout
2. Four-leg intersection with Route 28 to Route 28 aligned as the through movement
3. Split Intersection

Grade-separated options:

4. Route 132 to Route 28 underpass with a roundabout at-grade
5. Route 28 to Route 28 underpass with a roundabout at-grade

Figure 4-15: Evaluation Summary of Airport Rotary Alternatives

| Objectives   | 1A | 1B | 2 | 3 | 4 | 5 |
|--|----|----|---|---|---|---|
| Improve Traffic Flow in and Around the Local Focus Area  |    |    |   |   |   |   |
| Minimize Local Street Impacts  |    |    |   |   |   |   |
| Improve Safety for Motorists, Pedestrians and Bicyclists   |    |    |   |   |   |   |
| Eliminate/Improve Hazardous Situations   |    |    |   |   |   |   |
| Ensure Adequate Weave Areas, Accel/Decel, Sight Distances  |    |    |   |   |   |   |
| Improve Signage  |    |    |   |   |   |   |
| Design Speeds Consistent with Character  |    |    |   |   |   |   |
| Improve Mobility & Transportation Choice   |    |    |   |   |   |   |
| Protect and Enhance the Natural and Cultural Environment   |    |    |   |   |   |   |
| Maintain and Enhance Support for Regional Economic Activity by Strengthening Transportation Networks |    |    |   |   |   |   |
| Develop Recommendations that can be Implemented Efficiently  |    |    |   |   |   |   |
| Constructability   |    |    |   |   |   |   |
| Minimize Construction Impacts  |    |    |   |   |   |   |
| Quality of Life  |    |    |   |   |   |   |
| Costs  |    |    |   |   |   |   |
| Meet MassHighway Design Criteria   |    |    |   |   |   |   |

Based on the analysis and collective input, EOTPW Planning and the technical team recommended to the Task Force that one of the two at-grade signalized options be forwarded on to design. EOT Planning and the technical team recommend that the updated rotary option **not** be pursued due to the lack of any long-term traffic improvements and the lack of significant safety improvements.

Some Task Force members, Town of Barnstable officials in particular, wish to keep the option that is the grade-separated roundabout with the Route 132 to Route 28 underpass.

Improvements to the Airport Rotary should be prioritized because:

- They address the key traffic goals of the study
- Economic development in the GIZ is dependent on it
- The environmental risks are manageable
- The costs of at-grade improvements are manageable

Despite these benefits, there are challenges to this major intersection. These are namely:

- Although there is much consensus that the Airport Rotary needs to be addressed, there is not agreement on what should be done.
- Safety and access issues along Route 28 and Route 132 are related to the types of improvements implemented at the Airport Rotary.
- Incorporating aesthetic features will be important to the community.
- The grade-separated options are of high cost, carry on-going maintenance costs, and would need to address water table issues.

As is discussed in the next Chapter, the Airport Rotary should be pursued during or immediately after the intersection of Yarmouth Road and Route 28. The section of Route 28 between the Airport Rotary and Yarmouth Road should also be re-designed, while not impeding progress on the Rotary.

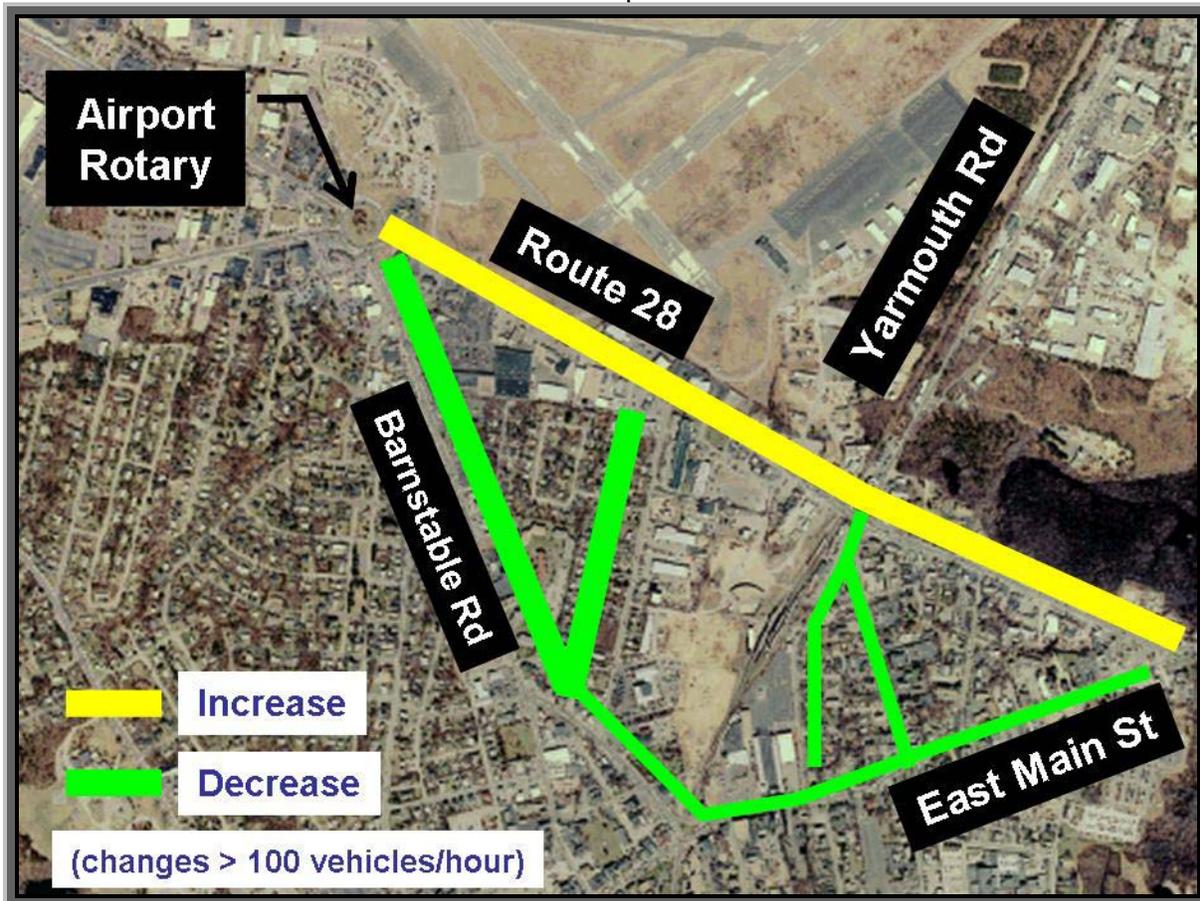
### **4.3 The intersection of Yarmouth Road and Route 28**

The following sections cover the technical team's analysis in the areas of traffic and travel demand benefits, safety, environmental considerations, economic development potential, and costs for the alternatives for the intersection of Yarmouth Road and Route 28. This is followed by Task Force and public input and the result of the evaluation.

#### **4.3.1 Yarmouth Road and Route 28 Intersection Alternatives Traffic and Travel Demand Impacts and Benefits**

Given the similarity of the two intersection alternatives, it is expected that the traffic and travel demand benefits will be very similar. In the event of improvements to the intersection at Route 28 and Yarmouth Road, traffic will increase on Route 28 and decrease on Barnstable Road, East Main Street, Camp Street, and other local roads. This is similar to the effect of improvements at the Airport Rotary in that diverting traffic returns to the major route where it is processed more smoothly. Figure 4-16 depicts this with green lines indicating where traffic will drop and yellow lines where traffic will increase.

Figure 4 – 16: Volume Changes due to Yarmouth Road / Route 28 intersection improvements



#### 4.3.2 Yarmouth Road and Route 28 Intersection Alternatives Safety Considerations

The proposed improvements at Route 28 and Yarmouth Road would significantly improve traffic operations at this congested intersection. Congested conditions at signalized intersection are a major contributor to crashes. Improvements in traffic operations that would result at this intersection would certainly make it safer. Furthermore, currently the northbound approach left turns have a permitted signal phase where the traffic has to look for gaps in the opposing southbound traffic before making the left turn. The proposed improvements provide for a protected plus permitted signal phasing which improves the safety for this left turning traffic. Currently, the southbound approach has one lane for both the through as well as left turning traffic. Under the proposed improvements, separate lanes are provided for these two moves, which would also contribute towards improving safety at this intersection.

An important aspect of the proposed improvement is that the two leaving lanes on the approach north of Route 28 will merge to form one lane. Making the length prior to the merge as well as the merge length itself as long as possible should ensure safe operations.

### **4.3.3 Yarmouth Road and Route 28 Intersection Environmental and Community Considerations**

Since this intersection is located in an area that is already developed, there would be minimal impacts to the natural environment. No impacts would be anticipated to surface waters, floodplains, wetlands, fish and wildlife habitat, threatened and endangered species, the ACEC, protected and recreational open space, aquifers, groundwater, or public water supplies. Chapter 2 depicts these features as well as others. There is an area mapped as a potential vernal pool in the northeast quadrant of this intersection, and additional field studies will need to be done to determine if there is a vernal pool at this location, and if so, the potential for impacts from the proposed improvements will need to be analyzed. Similarly, there are three water supply wells clustered in the same area, and the potential for impacts will need to be studied as the project design progresses.

There are a few historic buildings in the vicinity of the intersection. However, additional studies would be needed to accurately determine the extent to which the historic and/or cultural resources would be effected, and whether the effects could be mitigated.

Appendix 12 shows expected direct impacts (yellow highlights) and the potential for indirect impacts which could result in changes in access to certain properties due to restrictions on turning movements.

Similar to the Airport Rotary alternatives, some intuitive observations can be made with regards to air quality. Since either of the intersection alternatives would improve mobility and traffic flows, a beneficial effect on air quality can be anticipated when compared to the existing traffic conditions.

By improving traffic operations and reducing peak hour delay and congestion, it is anticipated that emergency response times would improve with either of the intersection improvement alternatives. Additionally, the intersection improvements would include the hardware to allow priority to emergency vehicles, improving response time.

In general, it is expected that as one of these improvements is pursued through design phases more detailed study of the environmental and community concerns of the area will reveal an overall benefit with regards to these issues.

### **4.3.4 Yarmouth Road and Route 28 Intersection Alternatives Costs**

The construction of either alternative for this intersection is considered relatively straightforward, and a significant amount of it would occur off of the existing roadway. No major additional maintenance is anticipated. The costs include the replacement of the existing signal with a new signal.

Table 4 -3 : Yarmouth Road / Route 28 Intersection Improvement  
Construction Costs

| Alternatives                  | Construction Costs (2007) |
|-------------------------------|---------------------------|
| Yarmouth/28 Intersection East | \$1,850,000               |
| Yarmouth/28 Intersection West | \$1,850,000               |

The costs above do not include any land acquisitions or further design work. Both alternatives are estimated to cost approximately \$1.85 million.

#### 4.3.5 Yarmouth Road and Route 28 Intersection Alternatives Task Force and Public Input

In general, Task Force members and the public are strongly in favor of addressing this intersection in the immediate future, and there is general agreement that the proposed number of turning and through lanes is appropriate and necessary. The team discussed options for widening Yarmouth Road north of the intersection. The proposed widening to approximately Old Yarmouth Road is deemed the appropriate length for merging traffic, but there may be opportunities to extend the widening further north somewhat. The team also received input on the design south of Route 28, which lead the configuration shown in Chapter 3, with the southbound connection to Yarmouth Road maintained and the northbound movement to the intersection only allowed on Camp Street. The Town is continuing to explore options for improving flow to and from downtown to this intersection.

Although there was not strong opposition or support for orienting the intersection to the east or west, some Task Force members favor orienting the intersection to the east in order to maintain the historic brick building in the northwest quadrant. A property owner from the immediate vicinity of the intersection expressed a desire to know as soon as possible the potential impacts and timeline for acquisition of properties in the area. Property impacts will be an important factor in the final design of this intersection.

In addition, several Task Force members expressed concern for the rail crossing and its impact on operations at the intersection.

The study team found that addressing the intersection will address the issues along the Yarmouth Road corridor to a large degree. Many Task Force members expressed a desire to address local access and safety issues along the entire corridor of Yarmouth Road.

### 4.3.6 Yarmouth Road and Route 28 Intersection Alternatives Evaluation Result

The following matrix depicts the evaluation summary of the various Airport Rotary alternatives compared to each other with respect to the study’s goals, objectives, and evaluation criteria.

Figure 4-17: Evaluation Summary of Yarmouth Road / Route 28 Intersection Alternatives

| Objectives   | YW | YE |
|--|----|----|
| Improve Traffic Flow in and Around the Local Focus Area  | ●  | ●  |
| Minimize Local Street Impacts  | ◇  | ◇  |
| Improve Safety for Motorists, Pedestrians and Bicyclists   |    |    |
| Eliminate/Improve Hazardous Situations   | ○  | ○  |
| Ensure Adequate Weave Areas, Accel/Decel, Sight Distances  | ○  | ○  |
| Improve Signage  | ◇  | ◇  |
| Design Speeds Consistent with Character  | ◇  | ◇  |
| Improve Mobility & Transportation Choice   | ○  | ○  |
| Protect and Enhance the Natural and Cultural Environment   | ◇  | ◇  |
| Maintain and Enhance Support for Regional Economic Activity by Strengthening Transportation Networks | ○  | ○  |
| Develop Recommendations that can be Implemented Efficiently  |    |    |
| Constructability   | □  | □  |
| Minimize Construction Impacts  | ■  | ■  |
| Quality of Life  | □  | □  |
| Costs  | □  | □  |
| Meet MassHighway Design Criteria   | ○  | ○  |

Based on the analysis and collective input, EOT Planning and the technical team recommended to the Task Force that both of the two at-grade signalized options be forwarded on to design, and that the better option be selected during that process.

Improvements to the intersection of Yarmouth Road and Route 28 should be prioritized because:

- It address the key traffic goals of the study
- The environmental and community risks are manageable
- The costs of at-grade improvements are manageable
- There is considerable community support and momentum at the Town and at MassHighway for these improvements

The major challenge to implementing improvements at this intersection are the right-of-way takings that would be necessary to provide the adequate number of turning and through lanes.

The Town of Barnstable is exploring options to improve traffic flow south of the intersection into and out of downtown. Task Force members also wish to address the left-hand turns into and out of the businesses along the Yarmouth Road corridor to improve queuing and safety.

#### 4.4 Estimated Annual User Benefits

One way to compare the relative economic benefits of alternative transportation investments is to assess how each proposed alternative generates travel time savings compared to the no-build. Travel time differences between the no-build and build conditions are then converted to dollar values to represent the economic effect on personal auto and freight users of the roadways. Data in Table 4-4 summarize the results of this analysis for the Rotary improvement alternatives, proposed improvements at Yarmouth Road and for a new Exit 6 ½. Also shown in Table 4-4 is an assessment of potential annual user benefits compared to estimated annual costs of debt service for construction and roadway maintenance. The resultant benefit/cost ratio shown in Table 4-4 is a measure of the relative cost-effectiveness of each alternative in achieving economic benefits to auto and freight roadway users. Costs of right-of-way – including property acquisition and relocation of utilities and households and businesses (if any) are not included. Inclusion of these costs in subsequent analyses will have the effect of lowering the benefit/cost ratios shown for each alternative, and may alter the relative ranking of alternatives based on user benefits compared to investment costs.

As shown by the data in Table 4-4, each of the roadway improvement alternatives generate travel time savings and user economic benefits. The Rotary Roundabout alternative ranks highest in user benefits, while the Route 28 at Yarmouth Road alternative ranks lowest. When considering estimated construction costs (but not including Right-of-way costs which have not been estimated to date), and comparing these on an annualized basis to annual user benefits in the design year, each of the alternatives shows a positive benefit-to-cost ratio. On this measure, the Rotary Roundabout alternative again ranks first, while the new Exit 6 ½ Alternative ranks last.

Table 4-4 – Estimated Annual User Benefits of Roadway Alternatives

|   | Rotary Alternatives |                            |                         |                         |                        | Route 28 at Yarmouth Road | Exit 6 1/2          |
|---|---------------------|----------------------------|-------------------------|-------------------------|------------------------|---------------------------|---------------------|
|   | Alt 1B: Roundabout  | Alt 2: 4-Legged Signalized | Alt 3: Split Signalized | Alt 4: Underpass 132-28 | Alt 5: Underpass 28-28 |                           |                     |
| <b>Annual Vehicle Hour Savings Compared to No-Build</b> | <b>206,000</b>      | <b>178,100</b>             | <b>193,000</b>          | <b>206,900</b>          | <b>198,700</b>         | <b>43,400</b>             | <b>64,700</b>       |
| Annual Person Hours Saved                               | 247,200             | 213,800                    | 231,600                 | 248,200                 | 238,500                | 52,100                    | 77,600              |
| Average Hourly Wage Barnstable/Yarmouth                 | \$ 21.85            | \$ 21.85                   | \$ 21.85                | \$ 21.85                | \$ 21.85               | \$ 21.85                  | \$ 21.85            |
| Value of Annual Passenger Hours Saved                   | \$ 5,401,600        | \$ 4,670,700               | \$ 5,059,900            | \$ 5,423,600            | \$ 5,210,100           | \$ 1,137,300              | \$ 1,696,400        |
| Annual Freight Hours Saved                              | 8,200               | 7,100                      | 7,700                   | 8,300                   | 7,900                  | 1,700                     | 2,600               |
| Value per hour Freight                                  | \$ 93.00            | \$ 93.00                   | \$ 93.00                | \$ 93.00                | \$ 93.00               | \$ 93.00                  | \$ 93.00            |
| Value of Annual Freight Hours Saved                     | \$ 766,400          | \$ 662,700                 | \$ 717,900              | \$ 769,500              | \$ 739,200             | \$ 161,400                | \$ 239,400          |
| <b>TOTAL ANNUAL USER BENEFITS</b>                       | <b>\$ 6,168,000</b> | <b>\$ 5,333,300</b>        | <b>\$ 5,777,800</b>     | <b>\$ 6,193,000</b>     | <b>\$ 5,949,300</b>    | <b>\$ 1,298,700</b>       | <b>\$ 1,935,900</b> |
| <b>Estimated Construction Costs</b> ( See Note 1)       | \$ 2,200,000        | \$ 3,100,000               | \$ 3,400,000            | \$ 19,600,000           | \$ 14,600,000          | \$ 1,850,000              | \$ 19,000,000       |
| Annual Costs of Debt Service & Maintenance              | (\$40,600)          | (\$57,200)                 | (\$62,700)              | (\$361,700)             | (\$269,400)            | (\$34,100)                | (\$350,600)         |
| <b>USER BENEFIT COST RATIO</b>                          | 132.6               | 93.2                       | 92.1                    | 17.1                    | 22.1                   | 38.0                      | 5.5                 |

**Note 1:** Excludes Right-of-way Costs. Annual costs assume 25-year bond at 5% interest and maintenance at 5% of debt service costs

**Sources:** TraffInfo Communications, Inc.; TranSystems; Massachusetts Department of Workforce Development; FHWA 2007 Urban Mobility Report Methodology; and FXM Associates

As with the other measures of evaluation criteria, estimated economic benefit based on travel time savings is one part of the picture. The important thing to note above is the relative difference between the improvements based on time saved.

## 4.5 Roadway Packages

Based on the evaluation of the roadway alternatives in the three specific areas, it was clear that one alternative would not sufficiently address all the traffic issues in the Hyannis area. Therefore, the team combined the preferred alternatives into three draft packages organized by short, medium and long-term solutions to provide different implementation scenarios. The Task Force then discussed and assessed the benefits of the three packages.

Each package provides some immediate fixes to the intersection of Yarmouth Road and Route 28 and the Airport Rotary and prioritizes Yarmouth Rd as a mid-term solution. The packages differ in their mid- and long- term solutions, but all provide workable solutions and would improve existing conditions.

Package 1 (P1) included addressing the Airport Rotary with a lower-cost at-grade solution and also addressing the Yarmouth Road / Route 28 intersection. Some immediate fixes would be applied to those areas in less than 5 years with the final improvements taking place in the next 5 to 12 years. This package was the least expensive of the three, taking into consideration the other transportation needs in the area, such as transit development and the expansion of bike trails. It did not include Exit 6 ½ or any long-term solutions.

Package 2 (P2) was similar to package 1 but also included Exit 6 ½.

Package 3 (P3) was similar to both packages 1 and 2 in that the intersection of Yarmouth Road and Route 28 would be prioritized, but differed in that the solution for the Airport Rotary would be one of the grade-separated solutions. Due to the resources required to implement the high cost grade-separated solutions, Exit 6 ½ was not included in Package 3.

The travel demand model was run for these three packages. For package 1, the model results were level of service D (acceptable) at both the Airport Rotary and the Yarmouth Road intersection, even with the anticipated minor volume increases in those areas due to the combined improvements. The proposed improvements are adequate to absorb the minor volume increases (over the volume increases associated with constructing the improvements in isolation.) There is not anticipated to be any changes in traffic volumes or levels of service at other intersections. With package 2, there would be slightly lower volumes at the Airport Rotary and the intersection of Yarmouth Road and Route 28. The level of service improves to C at the intersection of Yarmouth Road and Route 28 and remains D at the Airport Rotary. The changes to levels of service at other intersections are the same as when Exit 6 ½ is considered by itself. Package 3 would invite minor volume increases at both the Airport Rotary and the intersection of Yarmouth Road and Route 28, but the proposed improvements would be adequate to absorb the increases. The level of service at the Airport Rotary would improve to B and the level of service at the Yarmouth Road intersection would improve to C. There would not be any changes to the levels of service at other intersections.

The team considered all the impacts and benefits of these packages with respect to the study's evaluation criteria, and this is summarized in Figure 4-18.

Figure 4-18: Summary Evaluation of Roadway Packages

| Objectives   | P1 | P2 | P3 |
|--|----|----|----|
| Improve Traffic Flow in and Around the Local Focus Area  |    |    |    |
| Minimize Local Street Impacts  |    |    |    |
| Improve Safety for Motorists, Pedestrians and Bicyclists   |    |    |    |
| Ensure Adequate Weave Areas, Accel/Decel, Sight Distances  |    |    |    |
| Improve Signage  |    |    |    |
| Design Speeds Consistent with Character  |    |    |    |
| Improve Mobility & Transportation Choice   |    |    |    |
| Protect and Enhance the Natural and Cultural Environment   |    |    |    |
| Protect Groundwater Supplies, Habitats, and Wetlands   |    |    |    |
| Visual Environment   |    |    |    |
| Improve Air Quality  |    |    |    |
| Protect Hist./Arch. Resources  |    |    |    |
| Address Contaminated Areas   |    |    |    |
| Minimize Env. Impacts  |    |    |    |
| Maintain and Enhance Support for Regional Economic Activity by Strengthening Transportation Networks |    |    |    |
| Develop Recommendations that can be Implemented Efficiently  |    |    |    |
| Constructability Impacts   |    |    |    |
| Minimize Construction Impacts  |    |    |    |
| Quality of Life  |    |    |    |
| Costs  |    |    |    |
| Meet MassHighway Design Criteria   |    |    |    |

There was substantial input from the Task Force on the packages described above. The April 8, 2008 meeting summary, in Appendix 2, provides the details. In general, there was strong agreement among Task Force members to prioritize improvements to the intersection of Yarmouth Road and Route 28. In fact, the Task Force felt strongly that improvements there could be accelerated from the timelines sketched by the consultant team. Both the Town of

Barnstable and MassHighway agreed on this. There was also strong agreement that the Airport Rotary should be prioritized immediately after the Yarmouth Road intersection. The Task Force also agreed that safety and access issues need to be taken into consideration as the segment of Route 28 between the rotary and Yarmouth Road is re-designed. As the reader may recall, for the purposes of this study, it was assumed that Route 28 between those two areas would be widened to four-lanes. However, the Task Force disagreed as to the types of improvements that should be pursued at the Airport Rotary and the degree to which Exit 6 ½ should be supported, if at all, and the suggested timeline for Exit 6 ½.

The technical team and the Office of Transportation Planning felt that there was sufficient support and potential long-term benefit to Exit 6½ that it should remain part of the recommendations, with the conditions outlined in the next Chapter. Given the need to address the Airport Rotary as soon as feasible, the shortage of funds statewide, and the need for other transportation improvements elsewhere, the technical team and the OTP felt that one of the lower cost, at-grade solutions at the Airport Rotary should be pursued and that consideration of the grade-separated rotary solutions be dropped. The Town requested that the grade-separated solutions be kept on the table as further planning and design gets underway for that area.

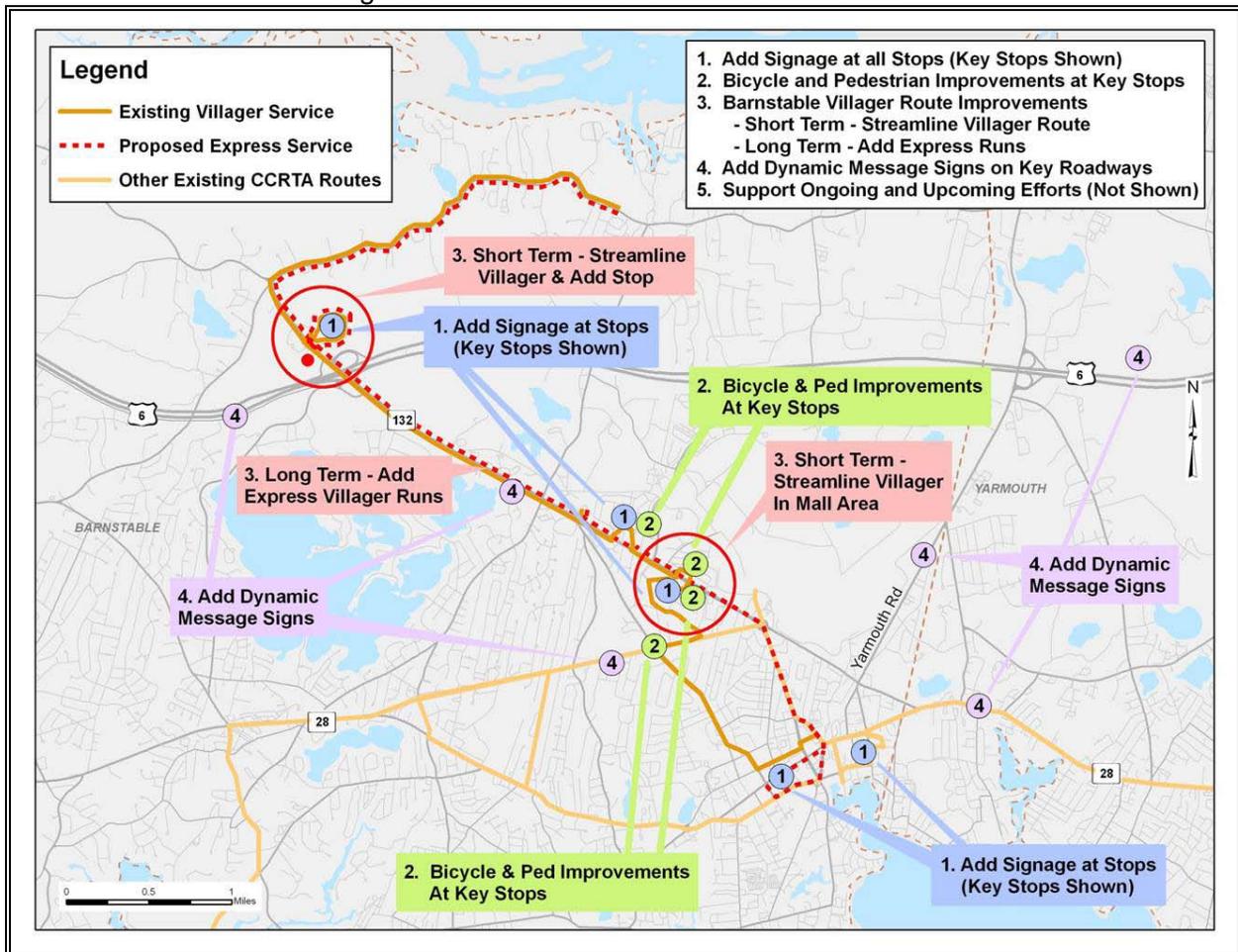
Other suggestions included the use of the phrase "immediate" improvements in place of "short-term" improvements and more aggressive time frames overall. The Task Force also requested that intermediate steps such as design work be itemized where possible. The group agreed that it would be beneficial to have a cohesive plan for the Route 28 corridor and the rotary, but that creating a new design for the corridor, incorporating proper access and safety improvements, etc., should not stall improvements at the rotary. It was reiterated that many options for the corridor would be compatible with many options for the Airport Rotary.

## 4.6 Transit

The following sections cover the estimated benefits and costs of the transit alternatives. This is followed by an evaluation summary, Task Force and public input, and the result of the evaluation.

Figure 4-19 provides a review of the transit alternatives.

Figure 4 – 19: Review of Transit Alternatives



Of the entire set of evaluation criteria, the following are most relevant to transit:

- Improve Mobility and Transportation Choice:
  - Potential for demand shift to transit (increased ridership)
  - New intermodal connections and facilities
- Protect / Enhance the Natural and Cultural Environment:
  - Potential reduction in emissions from SOV use
  - Encourage pedestrian and bicycle activity
- Maintain and Enhance Support for Regional Economic Activity by Strengthening Transportation Networks

- Potential to improve accessibility to several key areas
  - GIZ
  - Other retail areas
  - Cape Cod Community College
- Costs:
  - Conceptual capital cost
  - Conceptual operations & maintenance cost

#### 4.6.1 Estimated Benefits and Costs of the Transit Alternatives

Ridership potential was estimated at the conceptual-level, because the Cape Cod regional model does not include transit 'mode split'. The estimates were based on existing ridership data which is considered reliable. To refine the estimates, elasticities and adjustment factors from industry research were used.

Other benefits such as intermodal connections were assessed qualitatively. Emissions reductions were assumed to be proportionate to the demand shift to transit. And the increase of accessibility to the GIZ and other areas was assessed qualitatively.

All the costs that were developed for the transit alternatives are conceptual-level and in 2007 dollars. The capital costs are unit costs from cost databases (MassHighway, USDOT) or typical industry/vendor figures and include 10% contingency for uncertainties. Some of the operations & maintenance costs are negligible such as those for bike racks, and sidewalks. The estimates for shelter maintenance is based on MBTA experience. The estimated maintenance costs for ITS structures are based on standard industry guidelines. And vehicle operating cost figures were provided by CCRTA.

Alternatives 1: Signage at all Hyannis stops (static at all stops, dynamic at key stops)

- Benefits:
  - Potential demand shift: 10 to 20 summer boardings/day (on base of 160 boardings/day at stops besides HTC)
  - Some/modest reduction in emissions
  - Improved wayfinding to attractions in the GIZ
- Cost:
  - Capital costs \$80K to \$180K (dep. on dynamic sign type)
  - O&M costs: \$4K to 11K/year

Alternative 2: Pedestrian & bicycle improvements at key stops (including Route 28/Bearses, Route 132 Malls, 4Cs)

- Benefits:
  - Potential demand shift: 5 to 10 summer boardings/day (on base of 120 boardings/day at these locations)
  - Some/modest reduction in emissions
  - New intermodal connections; easier transfer between Villager and Sea Line improves access to GIZ
- Cost:
  - Capital costs: \$300K to \$450K

- O&M costs: \$9K to \$13K/year

Alternatives 3 – Short term: Streamline the Villager route in the Route 132 Malls area and through the 4Cs campus, add stop at Exit 6 P&R

- Benefits:
  - Potential demand shift: 15 to 25 summer boardings/day (on base of 125 boardings/day on Villager)
  - Some/modest reduction in emissions
  - New intermodal connection at Exit 6; faster travel time to the GIZ
- Cost:
  - Capital costs: None
  - O&M costs: Minimal (no extra hours, some extra mileage)

Alternative 3 – Long term: Add peak-only express trips between HTC/GIZ area and Barnstable Village (1 or 2 round trips in each peak)

- Benefits:
  - Potential demand shift: 20 to 40 summer boardings/day (on base of 125 boardings/day on Villager)
  - Moderate reduction in emissions
  - New intermodal connection at Exit 6; faster travel time to the GIZ and employment
- Cost:
  - Capital costs: \$275K to \$325K (one new vehicle)
  - O&M costs: \$35K to \$70K/year (depending on service level)

Alternative 4: Add Dynamic Message Signs at 6 locations; provide info about congestion, events, transit, P&R options

- Benefits:
  - Potential demand shift: 20 to 80 summer trips/day shifted to the HTC lot (high end assumes changes in parking fees)
  - Moderate reduction in emissions
  - Substantial improvement in accessibility to the GIZ (by informing people in real-time about options, routing)
- Cost:
  - Capital costs: \$240K to \$460K
  - O&M costs: \$15 - \$30K/year

Alternative 5: Support ongoing and upcoming efforts:

1. Promote transit at Hospital, 4Cs, and Barnstable Airport
  2. CCRTA analysis of other service improvements (Transit Development Plan)
  3. Planning for connection of bicycle trail to HTC
- Benefits and costs will vary by project, but have the potential to be substantial

Figure 4-20 provides a summary of the evaluation of the transit alternatives. As is clear from the graphic, the long term option of alternative 3 and alternatives 4 has the highest costs but also the highest expected benefits.

Figure 4 – 20: Transit Alternatives Evaluation Summary

| Goal/Area                          | Evaluation Criteria                   | 1<br>(Signage at bus stops) | 2<br>(Key stops- bikes & peds) | 3<br>(Routing) |           | 4<br>(DMS on key roadways) | 5<br>(Support other efforts)            |
|------------------------------------|---------------------------------------|-----------------------------|--------------------------------|----------------|-----------|----------------------------|---|
|                                    |                                       |                             |                                | Short-Term     | Long-Term |                            |   |
| Mobility and Transportation Choice | Potential Demand Shift to Transit     |                             |                                |                |           |                            | Benefits and costs will vary by project |
|                                    | New Intermodal Connections/Facilities |                             |                                |                |           |                            |   |
| Environmental                      | Air Quality-Emissions                 |                             |                                |                |           |                            |   |
| Economic Activity                  | Accessibility to the GIZ              |                             |                                |                |           |                            |   |
| Efficiency of Implementation       | Capital Cost                          |                             |                                |                |           |                            |   |
|                                    | Operations & Maintenance Cost         |                             |                                |                |           |                            |   |

#### 4.6.2 Transit Alternatives Task Force and Public Input Summary

The following bullet points summarize the input received from the Task Force and the public.

- Pedestrian improvements at transit stops are critical to increasing ridership
- Strengthen intermodal connections to the GIZ and between existing travel routes/modes
- Improve service information and promotion
- Integrate transit, roadway, bicycle/pedestrian, and Park and Ride options
- Seek partnerships with mall and store owners, airport, hospital, college and transit operators

#### 4.6.3 Transit Alternatives Evaluation Result

In general, the benefits are expected to be small to moderate demand shifts from auto to transit (from 10 to 80 new summer boardings/day, depending on alternative), modest reductions in auto emissions, new intermodal connections, improved accessibility to destinations such as the GIZ, and preservation of the character of the Cape while improving access to jobs.

In general, the capital costs are expected to range from low to moderate (from no cost to approx. \$450,000, depending on alternative). The operating costs are expected to range from low to moderate (from negligible cost to approx. \$70,000/year, depending on alternative).

Based on the technical team’s evaluation and the collective input from the Task Force and the public, all the alternatives were selected for inclusion in the recommendations. The lower cost, higher benefit alternatives are prioritized and the recommendations are packaged so that the more capital-intensive alternatives are paired with the required pedestrian improvements. This is detailed in Chapter 5.

## 4.7 Park-and-Ride

The following sections cover the estimated benefits and costs of the park-and-ride alternatives. This is followed by an evaluation summary, Task Force and public input, and the result of the evaluation.

The park-and-ride alternatives were evaluated using criteria related to the following goals of the study:

- Improve mobility and transportation choice
- Protect and enhance the natural and cultural environment
- Maintain and enhance support for regional economic activity by strengthening transportation networks
- Develop recommendations that can be implemented efficiently

### 4.7.1 Park-and-Ride Alternatives - Estimated Benefits and Costs

The overall demand for commuter parking spaces at the Barnstable Park-and-Ride lot was estimated based on the journey-to-work data from the 2000 Census, which shows the number of commuting trips made between communities by mode. For example, the data indicates the number of people that travel from Yarmouth to Boston by bus, vanpool, or in a carpool. The lot's catchment area includes the communities of Barnstable, Yarmouth, Dennis, Brewster and Harwich. Therefore, the estimated number of commuters from these communities to Boston and other selected points off-Cape were totaled and then adjusted based on conservative assumptions of who would use the lot and the size of the carpool or vanpool, etc. This estimate of potential commuters that would use the lot was combined with the observations of overnight parking conducted by the Cape Cod Conservatory and William Griswold for a total estimated demand of 525 parking spaces.

All the costs that were developed for the park-and-ride alternatives are conceptual-level and in 2007 dollars. The capital costs are unit costs from cost databases (MassHighway, USDOT) or typical industry/vendor figures and include 10% contingency for uncertainties.

#### **Alternative 1: Allow reduced parking rate for bus patrons at the Hyannis Transportation Center (HTC) and limit overnight parking at the Route 132 park-and-ride lot**

- Benefits:
  - Addresses the overcrowding at the Barnstable park-and-ride lot
  - Utilizes capacity at the under-used HTC lot
  - Adds security features to the HTC lot which should encourage users to park downtown and overnight
  - Improves availability of commuter options for Hyannis and other Cape Cod residents.
  - May increase patronage of Hyannis businesses.
  - No additional right-of-way necessary.
  - Minor construction impacts.
  - No impact on wetlands, protected habitats or conservation land.
  - Helps improve regional and local air quality by encouraging carpooling, vanpooling and use of bus services helping to reduce vehicle emissions.

- Costs Estimate:
  - Total capital cost of \$250,000 for parking control system at the Barnstable park-and-ride and improvements to the HTC. The breakdown is:
    - \$125,000 for a new parking system for HTC lot (McGann Associates Quote)
    - \$85,000 for signage and security infrastructure upgrades at the HTC lot (estimate)
    - \$50,000 for expected changes to the Route 132 lot
  - Limited ability to expand and meet additional demand in the future.

### **Alternative 2: Construct Additional Spaces at the Existing Location**

- Benefits:
  - Addresses the overcrowding at the Barnstable park-and-ride lot.
  - Ability to expand and meet additional demand in the future.
  - No impact on wetlands, protected habitats or conservation land. The property owned by the Cape Cod Conservatory, which would be used in the expansion, is wooded but is not protected parkland or conservation land.
  - Helps improve regional and local air quality by encouraging carpooling, vanpooling and use of bus services helping to reduce vehicle emissions.
  - Improve availability of commuter options for Hyannis and other Cape Cod residents.
  - Minor construction impacts.
- Costs:
  - Capital cost of \$1,750,000 for purchase of Cape Cod Conservatory land and construction of 250 additional surface parking spaces. The breakdown is:
    - \$1,000,000 for construction of a new 250-space park-and-ride lot (\$4,000 per space)
    - \$600,000 for the purchase of 2-acre parcel from the Cape Cod Conservatory (\$300,000/acre - estimate)
    - \$150,000 for construction of a sewer connection for the Travel Plaza
  - Additional right-of-way necessary.
  - Would not have a significant impact increasing patronage to Hyannis businesses.

### **Alternative 3: Construct a New Lot**

A feasible location for the construction of a new lot in the study area was not identified. Potential locations at the Barnstable airport, the Route 6 & Willow Street interchange and in the vicinity of the Exit 6 ½ alternatives were evaluated. All were found to be infeasible for a number of reasons including environmental constraints, neighborhood opposition and lack of available land. This alternative was still evaluated on a generic basis to provide an adequate comparison to the other alternatives.

- Benefits:
  - Addresses the overcrowding at the Barnstable park-and-ride lot.
  - Ability to expand and meet additional demand in the future.

- Helps improve regional and local air quality by encouraging carpooling, vanpooling and use of bus services helping to reduce vehicle emissions.
- Improve availability of commuter options for Hyannis and other Cape Cod residents.
- Minor construction impacts.
- Costs:
  - Capital cost of \$1,600,000 for the construction of 250 additional surface parking spaces. The breakdown is:
    - \$1,000,000 for construction of a new 250-space park-and-ride lot (\$4,000 per space)
    - \$600,000 for the purchase of 2-acre parcel (\$300,000/acre - estimate)
  - With limited sites available, and the large amount of protected habitats, there is a potential for impact.
  - Additional right-of-way necessary.
  - Would not have a significant impact increasing patronage to Hyannis businesses.

#### **Alternative 4: Construct a Parking Structure**

Given the popularity of the existing location of the Park-and-Ride lot with its proximity and access to the highway and travel amenities, it was suggested to explore the construction of a parking structure on the existing site. There would be benefits to this, along with high costs. In addition, currently, MassHighway does not maintain any structured parking.

- Benefits:
  - Addresses the overcrowding at the Barnstable park-and-ride lot.
  - No impact on wetlands, protected habitats or conservation land.
  - Helps improve regional and local air quality by encouraging carpooling, vanpooling and use of bus services helping to reduce vehicle emissions.
  - Improve availability of commuter options for Hyannis and other Cape Cod residents.
- Costs:
  - Capital cost of \$10,000,000 for construction of a 2-level garage with 500 parking spaces (\$20,000 per space).
  - Maintenance costs associated with the structure.
  - Limited ability to expand and meet additional demand in the future.
  - Major construction impacts on operations at the Barnstable park-and-ride lot.
  - Would not have a significant impact increasing patronage to Hyannis businesses.

Figure 21 displays the evaluation of the Park-and-Ride alternatives.

Figure 21: Evaluation of Park-and-Ride Alternatives

| GOAL   | Evaluation Criteria   | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|--|---|---------------|---------------|---------------|---------------|
| Protect and enhance the natural and cultural environment   | Protect wetlands  | ◇             | ◇             | ◇             | ◇             |
|  | Protect habitats  | ◇             | ◇             | □             | ◇             |
|  | Improve regional and local air quality  | ●             | ●             | ●             | ●             |
|  | Protect parkland/conservation land  | ◇             | ◇             | ◇             | ◇             |
| Maintain and enhance support for regional economic activity by strengthening transportation networks | Maintain/improve Hyannis connections/accessibility for residents, employees, visitors | ●             | ●             | ●             | ●             |
| Develop recommendations that can be implemented efficiently  | Constructability  | ●             | ○             | ○/□           | □             |
|  | Minimize construction impacts on the existing lot                                     | □             | □             | ◇             | ■             |
|  | Cost  | □             | □             | □             | ■             |
| Improve mobility and transportation choice   | Address congestion at Route 132 lot   | ○             | ●             | ●             | ●             |
|  | Improve condition of existing services and safe links to and from alt. modes          | ●             | ●             | ○/□           | ●             |

#### 4.7.2 Task Force and Public Input on the Park-and-Ride Alternatives

Many comments were received on the Park-and-Ride alternatives. The following is a summary of the input received:

There was strong support from the public and others to make the best use of the parking spaces available at the Hyannis Transportation Center. The Cape Cod Regional Transit Authority also supports alternative 1, as a way to get more use out of their facility. There was support from many members of the public and the Plymouth and Brockton Street Railway Company for expanding the existing lot and allowing overnight parking without a fee. Some also stated that overcrowding is the issue that should be addressed immediately, possibly by prohibiting overnight parking at the existing lot. Others commented that if the charge to park at the HTC is eliminated, more people will use it. The board of directors of the Cape Cod Conservatory voted to support alternative 2.

Some members of the public felt that a new park-and-ride lot should be built in Sandwich near exit 2 or 3 instead of increasing the size of the existing lot. The study team conducted a study that looked at the community of origin for vehicles parked in both the Barnstable and Sagamore park-and-ride lots based on license plate data. The observations show that the Barnstable lot is primarily used by vehicles from Barnstable, Yarmouth and Dennis and that the Sagamore lot is primarily used by vehicles from Bourne, Falmouth and Sandwich. These results show that the service area for both lots complement each other well and that there are not any underserved

areas of the upper Cape. Any new lot along Route 6 in such proximity to the other lots would degrade bus service by increasing travel times and could possibly fragment the bus routes, reducing service at each lot.

Concern was also expressed by West Barnstable residents over the loss of trees and impact on groundwater that would accompany some of the alternatives. Any recommendation carried forward will be designed to best address these concerns.

#### **4.7.3 Park-and-Ride Alternatives Evaluation Result**

Based on the technical team's evaluation and the collective input from the Task Force and the public, alternatives 1 and 2 were selected for inclusion in the recommendations as described in more detail in the next Chapter. The lower cost alternative was prioritized and immediate action is underway for implementation.

### **4.8 Summary and Conclusion of the Evaluation of the Alternatives**

The evaluation of the alternatives involved both quantitative measures, such as projections of traffic operations at key intersections, and qualitative and subjective input, such as Task Force and public input.

Although the alternatives would improve operations in their key areas, they do present trade-offs in terms of aesthetic qualities, property and community impacts, costs, ease of construction, and other criteria.

Based on the extensive analysis described above and the detailed, thoughtful input of the Task Force, the technical team and the OTP developed the recommendations described in the next Chapter.

## Chapter 5: Recommendations

This chapter covers the study's recommendations which resulted from a full evaluation of the alternatives as described in the previous chapter. Task Force input, public input, and the discussions on the draft implementation packages discussed in Chapter 4, section 4 also provided significant contributions.

The recommendations include immediate action items for transit, park-and-ride and roadway improvements. The immediate action items are the initial steps and lay the foundation for the alternative solutions which address the deficiencies described in Chapter 2. The immediate action items, alternative solutions and various intermediate steps are all described in this chapter in detail.

This chapter is organized by sections – roadway, transit, and park-and-ride – similarly to Chapters 3 and 4. Within each of these sections, immediate, short-term, and other recommendations are made.

### 5.1 Roadway Recommendations

Yarmouth Road is a main corridor in the study area connecting Route 6 to the hospital and downtown Hyannis. Route 28 in the vicinity of Yarmouth Road is a main corridor linking numerous hotels and other commercial properties in Yarmouth to key destinations in Hyannis such as the Airport and large retail areas. The intersection of Yarmouth Road and Route 28, which links these two main corridors, is currently a severe bottleneck in the area. The study team proposed intersection improvements that are expected to not only improve operations at the intersection itself, but also provide relief along both of these corridors. Furthermore, the proposed improvements at this intersection are of a straightforward nature. The Task Force strongly encouraged prioritizing these improvements.

Secondly, the Airport Rotary is a key intersection in the study area. This junction of Route 132, Route 28 and Barnstable Road is expected to process over 60,000 vehicles/day in the year 2030. It operates at level of service F today and is the highest crash location in the area. This condition is expected to worsen in the future. Therefore, after improvements to the intersection of Yarmouth Road and Route 28, this intersection is prioritized.

The study examined Exit 6 ½ and found that it is not expected to address the area's problem intersections, and in fact, may worsen operations at some intersections. In addition, the potential interchange, with an estimated construction cost (in 2007 dollars) of around \$20 million, exists in a sensitive environmental area surrounded by residences. The industrial park is south of the potential interchange. However, the study also found that traffic growth on sections of Route 6A, Phinney's Lane and Mary Dunn Road is expected to be substantial – on the order of 30-40%. Exit 6 ½ would be expected to mitigate this traffic to a large degree. In addition, the park area is slated for various developments which would benefit from improved access off of the state route. There was not consensus on whether to include Exit 6 ½ in the recommendations and what its timeline should be, should it be included. Based on the facts, modeling efforts, and collective input, the study team decided to include the preferred alternative of Exit 6 ½ in the category "Other Recommendations", with important, required steps outlined in the section 5.1.4.

### 5.1.1 The intersection of Yarmouth Road and Route 28

The study team and the Task Force strongly recommend reconstructing the intersection of Yarmouth Road and Route 28. The following immediate action items below lay the ground work for full reconstruction, whether the final configuration be oriented to the east or the west.

- *Review signal timing* – The existing signal timing and phasing at the intersection of Yarmouth Road/Route 28 should be reviewed for potential modifications and improvements. Also, the signal equipment should be investigated for potential upgrades. However, it should be kept in mind that a full intersection reconstruction would probably follow within six years or less.
- *Cape Cod Commission and MPO coordination* – As the 2007 Regional Transportation Plan is amended periodically, language specifying the Yarmouth Road/Route 28 intersection improvement proposal should be inserted into the Transportation Projects Listing in Chapter 6: Analysis of Alternatives.
- *Eliminate the northbound connection to Camp St. from Yarmouth Rd.* – The northbound connection from Yarmouth Road to Camp Street south of Route 28 should be eliminated. This would address awkward geometry and safety concerns immediately south of the Yarmouth Road/Route 28 intersection. Motorists would still be able to travel south on Yarmouth Road and Camp Street to Main Street and north on Camp Street to Route 28. This modification is a component of a short-term improvement discussed below.

Recommendation: Reconstruct and widen the intersection of Yarmouth Road / Route 28.

- *Pursue funding for design and construction of the intersection* - In order for construction to take place, funding needs to be secured and accounted for in the regional planning process. For construction funding to be secured, usually design work needs to have progressed to the 25% stage, and this needs to be funded as well. Typically, municipalities are responsible for funding the 25% design stage to demonstrate local commitment to the project.
- *Begin design work for the intersection* – For construction to occur in the 4-6 year time frame, the associated design work needs to be completed beforehand (approximately 2 to 3 years before the start of construction).

The final reconstruction of the intersection would provide additional through and turning lanes as depicted in Figures 5-1 and 5-2. Crucial components to the design include two left-hand turn lanes from Route 28 eastbound to Yarmouth Road northbound, two receiving lanes on Yarmouth Road, and dedicated left-hand turn lanes from Yarmouth Road to Route 28. These improvements combined with the improvements to the intersection of Camp Street and Yarmouth Road just south of Route 28 would bring greatly improved operations and safety to the immediate area and the adjoining corridors. Both the east and west intersection configurations would provide the necessary level of improvements with a similar level of impacts. The final configuration chosen (east or west) should be determined by the Town and MassHighway, along with public input. It is possible that the reconstruction could occur in less than six years, based on the technical team’s experience, and input from both MassHighway

and the Town of Barnstable. The final configuration would provide an acceptable level of service D. The existing level of service is F.

Figure 5-1 shows proposed intersection improvements oriented to the east. In his configuration, properties in the southeast and northeast quadrants would be most impacted. The intersection itself would be slightly further away from the railroad tracks than in the west configuration (Figure 5-2).

Figure 5-1: Proposed intersection improvements to  
Yarmouth Road / Route 28  
East Configuration

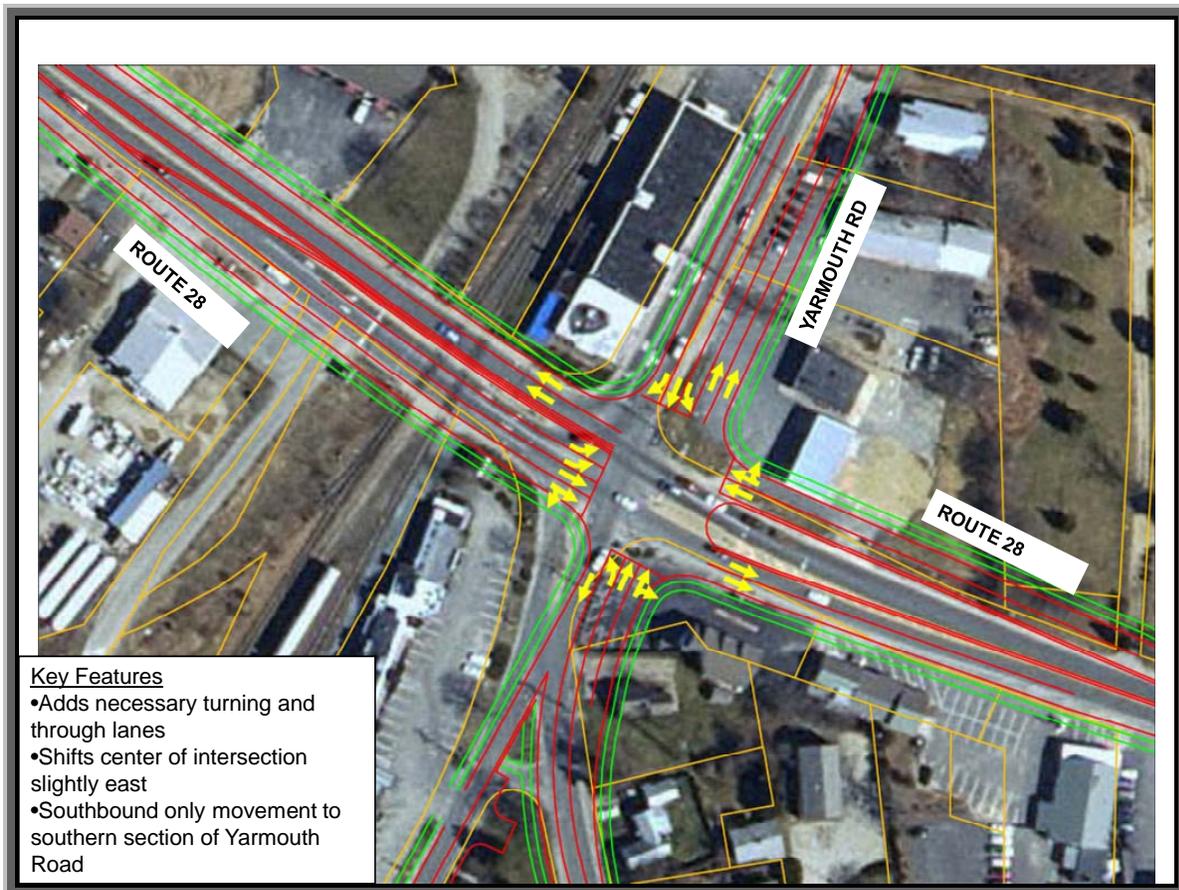


Figure 5-2 shows proposed intersection improvements oriented to the west. In this case, the brick building in the northwest quadrant would be most impacted. The intersection would also be closer to the railroad crossing.

Figure 5-2: Proposed intersection improvements to  
Yarmouth Road / Route 28  
West Configuration

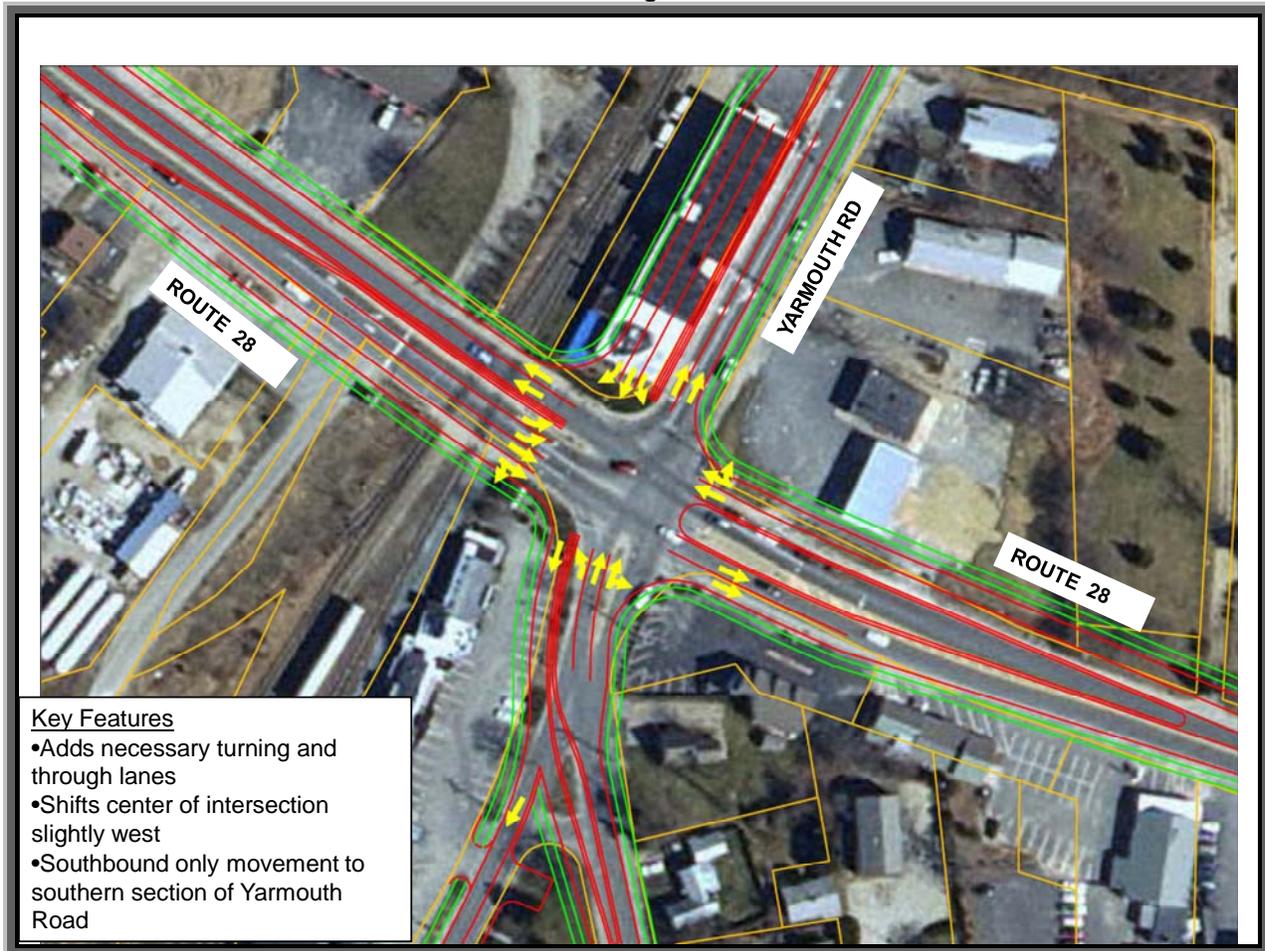
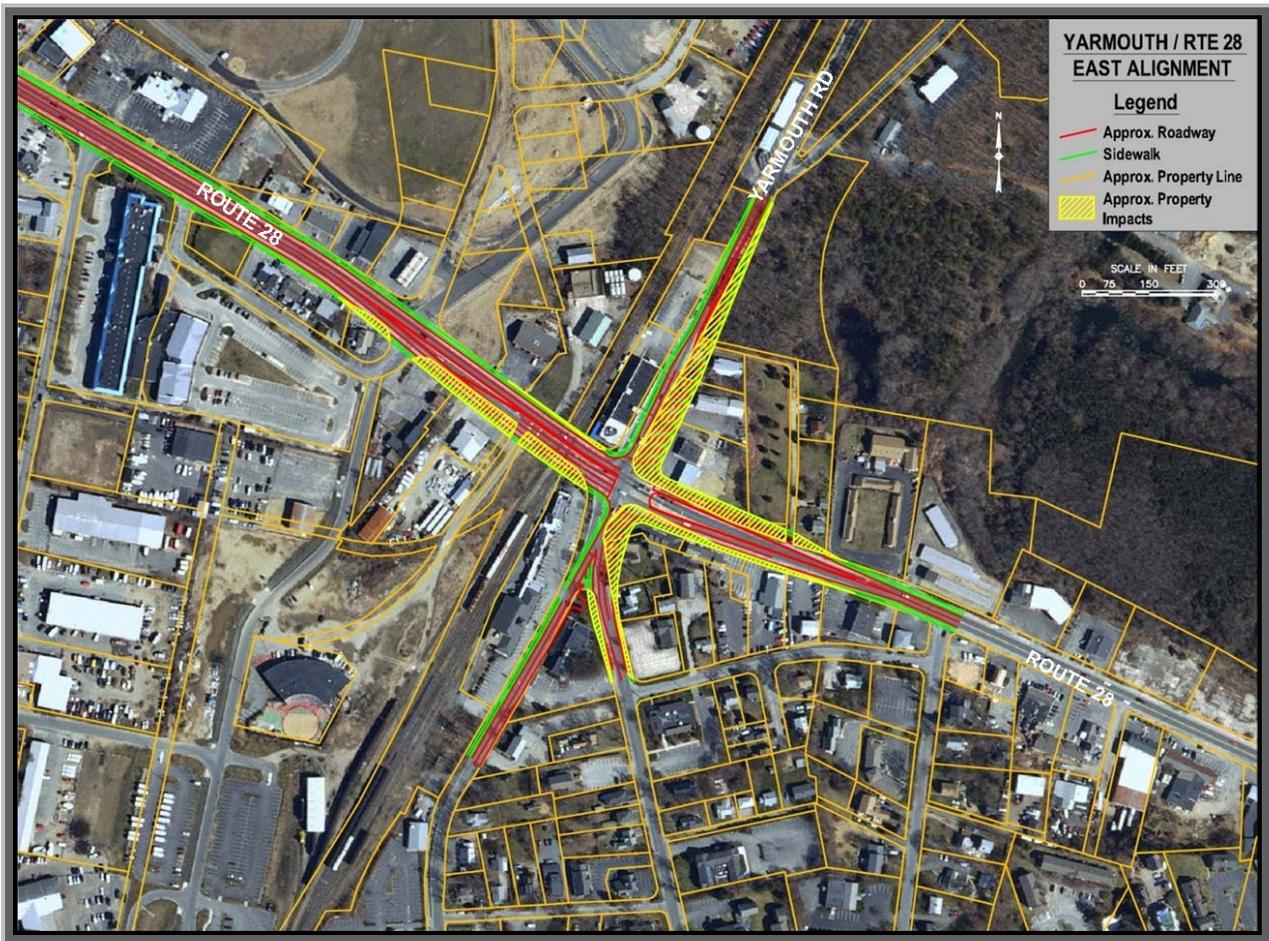


Figure 5-3 gives an approximation of the scope of improvements and impacts to the south, north, east and west. It is clear from the image below that the widening of the intersection is expected to extend north to just south of Old Yarmouth Road and west to just beyond Mary Dunn Way, in the case of the east alignment. The scope of improvements and impacts are similar for the west alignment, and demonstrated in Appendix 12. Regardless of which alignment is chosen, there will be right-of-way issues that will need to be coordinated by both the state and the Town of Barnstable. In addition, consideration should be given to the buses that are required to exit the HTC from the rear and need to take left hand turns onto Route 28. As the project proceeds through design, facilitating exits from the HTC onto Route 28 should also be taken into consideration.

Figure 5-3: Approximate scope of improvements and impacts  
Due to intersection improvements



### 5.1.2 The Airport Rotary

A large number of alternatives for the Airport Rotary were explored as part of this process as outlined in Chapter 3. Chapter 4, in particular, pages 4-25 through 4-28, which summarizes Task Force input, public input, and the evaluation summary, demonstrates both the need to prioritize the rotary and the wide variety of opinions on it. Based on objective analysis, collective input, and cost considerations, the study team recommends that one of the two at-grade intersection alternatives be pursued.

Recommendation: Replace the Airport Rotary with one of the two at-grade signalized intersection alternatives.

Some Task Force members felt that further planning for the Airport Rotary should continue to consider the grade-separated alternatives.

The following immediate action items below lay the ground work for fully reconstructing the rotary and converting it to a signalized intersection.

- *Advance Signage* – Currently there is minimal signage at the rotary providing guidance to the proper method of driving it including lane assignments and route identification. Its operations and safety would likely benefit from advance signage providing guidance to approaching motorists. However, the type, size, and location of any potential signs should be carefully reviewed prior to installation. Improper designations on the signs may cause additional driver confusion and, as such, decrease safety and capacity of the rotary. Also, the designations on the signs need to consider the potential roadway improvements including widening Route 28 to four lanes and other measures which may be part of any potential re-development.
- *Review Possible Re-Striping* – The rotary should be reviewed for potential opportunities to improve its operations and safety through improved pavement markings. As with advance signage, re-striping could add to driver confusion and, as such, decrease safety and capacity. Possible re-striping should be carefully reviewed before implemented.
- *Cape Cod Commission and MPO coordination* – As the 2007 Regional Transportation Plan is amended, RTP Proposal # 3308 ‘Airport Rotary Modification’ should specify ‘Replacement of Airport Rotary with a preferred signalized intersection scheme.’
- *Pursue funding for the design and construction* — Like the Yarmouth Road/Route 28 Intersection improvements described above, short-term improvements to the Airport Rotary will require securing the necessary funding in the immediate-term.
- *Begin design work* — The design work for the Airport Rotary should follow a similar schedule as the Yarmouth Road/Route 28 intersection work. It is listed separately from the intersection because a different party may be responsible for the design of the rotary.
- *Begin the planning and design work for the Route 28 corridor between Yarmouth Road and the Airport Rotary* — Plans to widen Route 28 between Yarmouth Road and the Airport Rotary had been developed to the 75% level. The development of these plans was halted pending resolution of safety and abutter access issues.

These issues should be resolved and this project restarted in the near future. The short-term improvements at the Yarmouth Road/Route 28 intersection and the Airport Rotary were developed and modeled assuming a four lane section along this portion of roadway. While both sets of improvements can be modified to accommodate either a two lane or four lane (with or without median) roadway, resolution of the highway access issues and further development of these plans would ensure current and future project coordination, phasing and implementation. Discussions between the Town of Barnstable, MassHighway District 5 and other key stakeholders are needed along with a series of public informational meetings to solicit community input toward revising the scope of work for implementation.

Figures 5-4 and 5-5 depict two at-grade options for reconstructing the Airport Rotary. Figure 5-4 depicts the four-leg intersection alternative which would replace the rotary with a signalized intersection, with the four roadways (Route 28 east and west, Route 132, and Barnstable Road) realigned to create the four legs of the intersection. The expected level of service would be D with enhanced safety.

Figure 5-4: A potential at-grade solution for the Airport Rotary  
4-Leg Intersection

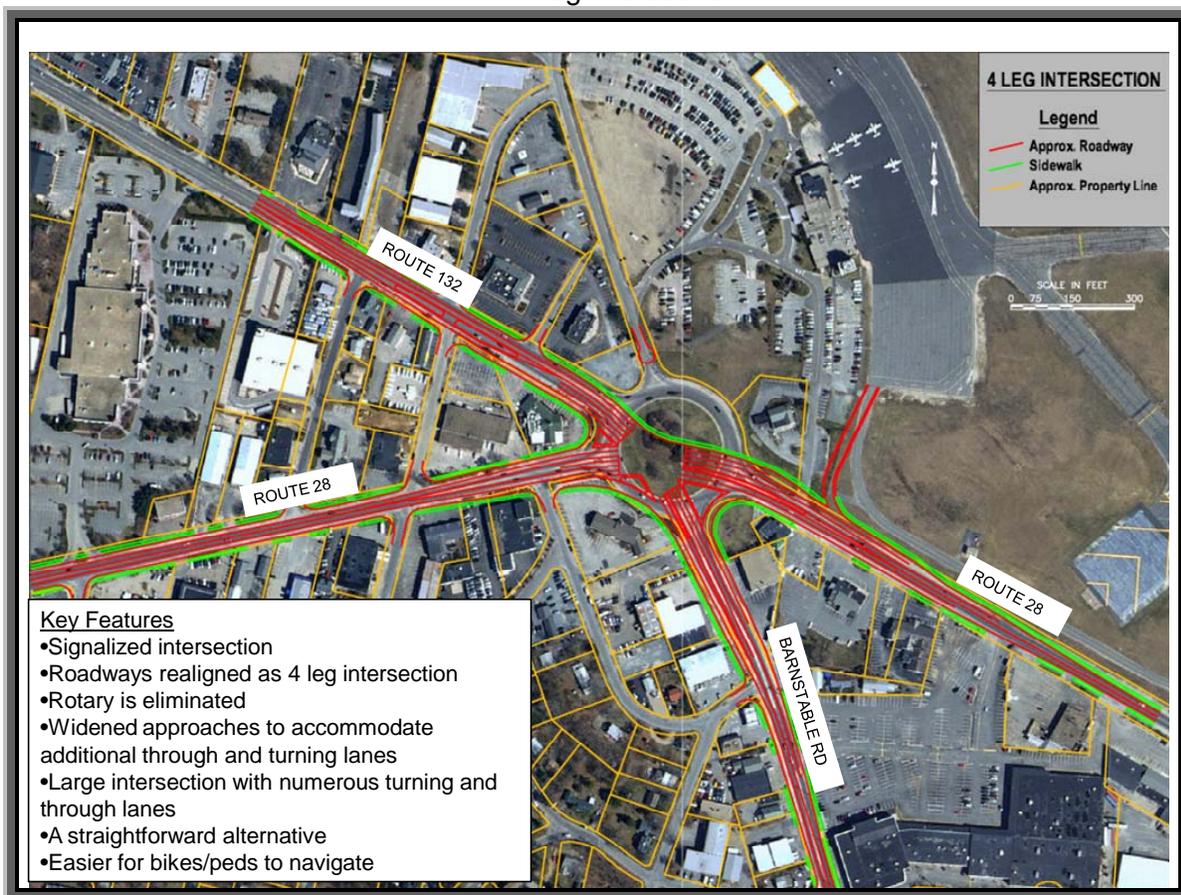
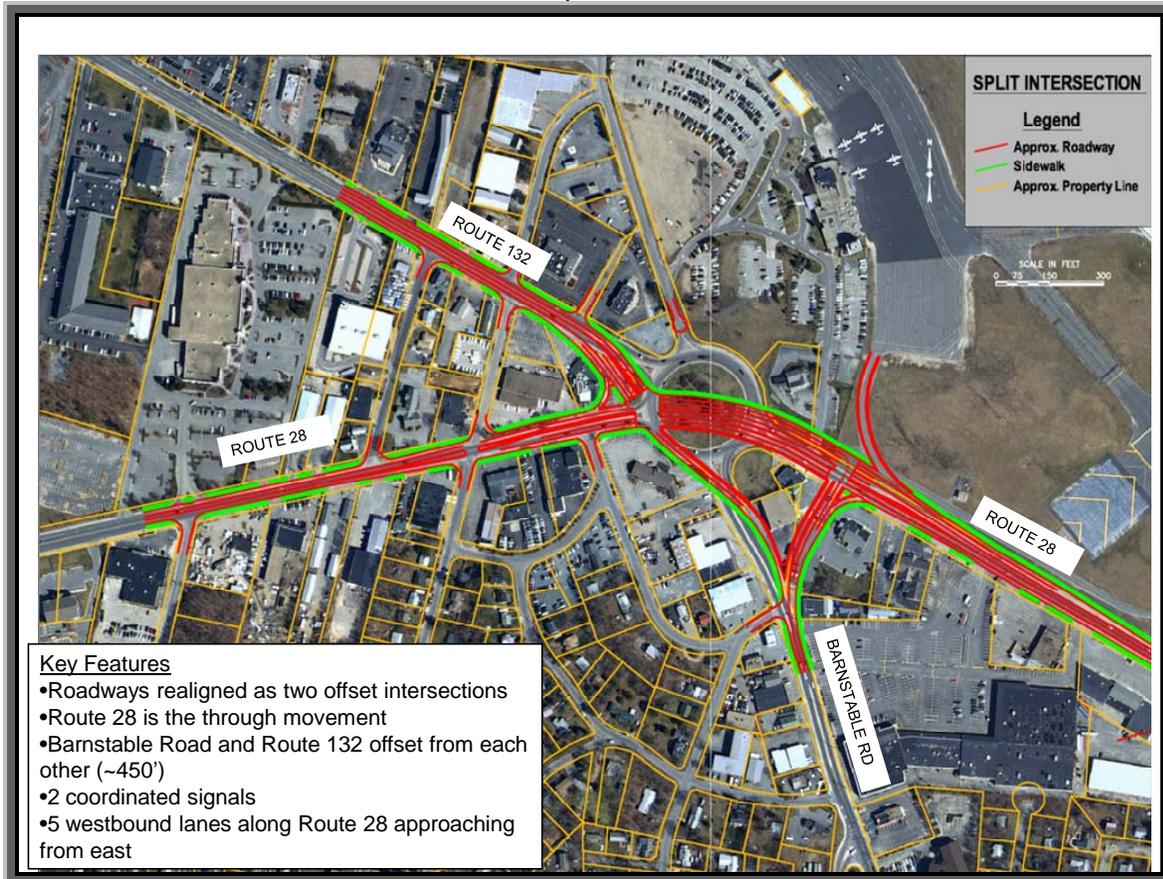


Figure 5-5, the split intersection alternative, realigns the roadways to create two offset intersections, with Route 28 as the through movement. Barnstable Road/Route 28 intersection and the Route 132/Route 28 intersection would be offset from each other by a distance of approximately 450 feet. Each intersection would be signalized and the signals would be coordinated. There would be five westbound lanes along Route 28 approaching from the east. The combined level of service from both intersections would be expected to be D.

Figure 5-5: A potential at-grade solution for the Airport Rotary  
The Split Intersection



### 5.1.3 Summary of Roadway Recommendations

Figure 5-6 shows the area's prioritized roadway recommendations. This includes further planning and design work for the Route 28 corridor connecting the two key intersections.

Plans to widen Route 28 between Yarmouth Road and the Airport Rotary had been developed to the 75% level. The development of these plans was halted pending resolution of safety and abutter access issues. These issues should be resolved and this project restarted in the near future. The short-term improvements at the Yarmouth Road/Route 28 intersection and the Airport Rotary were developed and modeled assuming a four lane section along this portion of Route 28. While both sets of improvements can be modified to accommodate Route 28 with either two lanes or four lanes (with or without median), resolution of these access issues and further development of these plans would improve project phasing implementation and reduce the likelihood of modifying sections of roadway that were just reconstructed.

Figure 5-6: Prioritized Roadway Recommendations



Recommendation: Conduct planning and begin the design work for widening Route 28 to four lanes between Yarmouth Road and the Airport Rotary. This work should involve a variety of stakeholders and coordinate with the efforts involving improvements to the Airport Rotary and the intersection of Route 28 and Yarmouth Road.

Combined, these improvements are expected to address two of the area's worst intersections and provide relief along the adjoining corridors. They complement other ongoing roadway projects and support the goals of the region's comprehensive plans.

### 5.1.4 Other recommendations

Extensive analysis revealed that in the long term, Exit 6 ½ is expected to mitigate traffic north of Route 6 on Mary Dunn Road, Phinney's Lane, and sections of Route 6A. Although not expected to improve operations significantly at the area's key intersections, there would be benefits and time savings to travelers headed to the Independence Park area from the east. Once the short-term recommendations move forward, Alternative 1 (a trumpet design at the existing rest area) for Exit 6 ½ should be further developed beyond conceptual design while addressing community concerns, environmental constraints, and funding availability through MassHighway's standard project development process. Figure 5-7 depicts the preferred alternative for Exit 6 ½.

Recommendation: Once the short-term recommendations move forward, Alternative 1 (a trumpet design at the existing rest area) for Exit 6 ½ should be further developed beyond conceptual design while addressing community concerns, environmental constraints, and funding availability through MassHighway's standard project development process.

Figure 5-7: Exit 6 ½ - Trumpet Interchange Design at the Existing Rest Area



As discussed in Section 3.6, the Hyannis Access Study Task Force formed a bicycle/pedestrian subcommittee, the objectives of which were to discuss needs in the area. The subcommittee also sought to facilitate coordination of the study's recommendations with Yarmouth's and Barnstable's existing and future bicycle/pedestrian plans.

The subcommittee discussed the roadway, transit, and park-and-ride recommendations but did not strongly opine on any of them. The subcommittee served more as a forum for sharing information and advancing existing plans through the opportunity to increase communication with various agencies, in particular EOTPW.

The work of the subcommittee resulted in 5 recommendations:

- Barnstable and Yarmouth should form a bicycle/pedestrian Task Force that continues after the completion of the Hyannis Access Study and meets regularly for the purposes of regional advocacy and coordination of the town's efforts and plans.
- More consideration and initiative should occur for east-west bicycle/pedestrian connections in particular for commuters.
- Strong support for EOTPW's recommendation for a comprehensive study of the Yarmouth Road corridor in order to explore a range of alternatives for a bicycle/pedestrian connection to the HTC and the future Claire-Saltonstall path which is to run parallel to Route 6 through the Fish & Wildlife lands.
  1. Alternatives to address motor vehicle safety and access issues along the corridor should also be developed
  2. This study should be town-led or led by the Cape Cod Commission with EOTPW involvement.
- Continue to support educational efforts such as
  1. Safe Routes to School
  2. MassRIDES
  3. Smart Transit Week events
  4. Fall 2008 "Moving Together" Conference in Boston
- Follow the MassHighway Project Development and Design Guidebook to incorporate bicycle/pedestrian accommodations in roadway projects.

Over the course of the Hyannis Access Study, Task Force members expressed concern for the Yarmouth Road corridor, its constraints, congestion, safety and access issues. The improvements to the intersection of Yarmouth Road and Route 28, discussed in detail in Chapters 3 and 4, are expected to improve conditions along the corridor. The study sought to provide Hyannis with broad recommendations and concrete next steps for key transportation improvements: it was beyond the scope of this study to solve the safety and access issues of this one corridor in detail. Therefore, study recommends a town-led comprehensive study of this particular corridor, taking into consideration the active rail line, the bicycle/pedestrian plans, and other issues.

Recommendation: The Towns or the Cape Cod Commission should lead a comprehensive study of the Yarmouth Road corridor to explore a range of alternatives to address vehicle access and safety issues, which may require potential widening in sections. The alternatives should also provide for a bicycle/pedestrian connection to the HTC. This study should involve a variety of stakeholders and take into consideration all the opportunities and constraints in the area, as well as the improvements planned at the intersection with Route 28.

## 5.2 Transit Recommendations

The transit and park-and-ride options developed as part of the Hyannis Access Study are described in Chapter 3, and the evaluation of the conceptual-level benefits and costs are described in Chapter 4. All of these components were presented to the Task Force and to the public at the Public Informational Meeting held on June 11, 2008. Subsequently, the comments received from the public were discussed by the Advisory Task Force on June 18, 2008. All of these options were viewed favorably by the general public.

As a result, the technical team packaged the transit improvements so that the lower cost, higher benefit options would be implemented in the short-term and lay the groundwork for the medium-term options, which rely on more capital-intensive investments such as the acquisition of a new transit bus and pedestrian improvements to support an express run along the Route 132 corridor.

1. Package of short-term transit improvements: Transit Alternative 1 (Add signage to all bus stops), Alternative 2 (Bicycle and pedestrian improvements at key stops), and Alternative 3 Short Term (Barnstable Villager route improvements) should be packaged together and advanced as a short-term set of improvements. It is suggested that the Cape Cod Regional Transit Authority (CCRTA) and the Town of Barnstable take the lead in advancing these improvements, with guidance from EOT on funding and input from the Cape Cod Chamber of Commerce and the Hyannis Chamber of Commerce on sign content and possible partnerships with visitor attractions.

Recommendation: Add signage to all bus stops.

Recommendation: Make bicycle and pedestrian improvements at key stops.

Recommendation: Make Barnstable Villager route improvements.

2. Medium-term transit improvements: Transit Alternative 3 Longer Term (New express runs on the Barnstable Villager) and Transit Alternative 4 (Add Dynamic Message Signs to roadways) should be pursued as medium-term improvements. These projects are somewhat more capital-intensive and would require a somewhat longer lead time to plan and implement, including the acquisition of a new transit bus (in Alternative 3) and electronic sign boards (in Alternative 4).
  - a. Barnstable Villager express runs: CCRTA recently initiated the Barnstable Transit Development Plan (TDP), a comprehensive study of the local transit system in the Town of Barnstable. This plan could further refine the concept for the Alternative 3 Long Term, including assessing the market for the service, proposing a new schedule, and exploring how the proposed new vehicle could be used at other times of day. It is suggested that CCRTA and the Town of Barnstable take the lead in advancing this recommendation.
  - b. Roadway Dynamic Message Signs promoting transit: Implementing Dynamic Message Signs (DMSs) in the study area to promote alternative modes of transportation will require more detailed study as well as coordination between several parties. The May 2007 and December 2007 Task Force presentations

contain initial proposals for sign locations, types and uses. As a follow-up to this study, further consideration will be needed regarding exactly how the signs can be used, including specific sign locations, sign sizes and types, specific messages, coordination of information, funding, and other logistics. It is suggested that MassHighway and CCRTA take the lead in advancing this recommendation, with input from the Town of Barnstable on locations and the Cape Cod Commission on consistency with the regional Intelligent Transportation Systems (ITS) architecture.

Recommendation: Add new express runs on the Barnstable Villager Route.

Recommendation: Add Dynamic Message Signs to roadways.

3. Coordination regarding Park & Ride capacity and local transit: Park-and-Ride options have been presented to the HAS Task Force periodically throughout the study, and input has been received and incorporated into the Park-and-Ride recommendations. It is suggested that continued coordination take place between EOT, the Town of Barnstable, the private bus carriers, and CCRTA on the Park-and-Ride recommendations. This should include consideration of connections between Park-and-Ride facilities, intercity buses, and CCRTA local bus services in the Hyannis area.
4. Support for ongoing planning efforts: The Study Team recommends that the key stakeholders continue to be involved in and support ongoing planning efforts related to transit and other alternative modes of transportation, including ride-sharing and bicycling. These efforts include the following:
  - a. Promoting transit at key activity centers: This study laid groundwork for promoting and enhancing transit to key activity centers in the Hyannis area, particularly Cape Cod Community College, Cape Cod Hospital, Barnstable Municipal Airport, and the Route 132 malls. It is recommended that coordination continue between the interested parties to develop specific improvements and programs, and identify possible funding sources (if applicable) and next steps for implementation. For instance, at the Community College, further consideration can be given to ways to expedite the movement of CCRTA buses through the campus, to give students, faculty and staff an incentive to take transit, and to provide better information about transit and alternative modes. It is suggested that the CCRTA and the Town of Barnstable take the lead in these planning efforts and work with other entities such as MassRIDES, the Cape Cod Commission, the Community College, the Airport, the Hospital and the malls.
  - b. Barnstable Transit Development Plan: As noted above, CCRTA recently initiated a Transit Development Plan in the Town of Barnstable. The TDP will look at other possible transit improvements beyond those identified in this study (which focused mainly on shorter-term, incremental improvements to the existing system). The Transit Development Plan may look at more commuter-oriented services, span and frequency improvements, flexible services, services to new areas such as Independence Park, and technology enhancements. It is suggested that the Town of Barnstable, the Cape Cod Commission, EOT, and other stakeholders continue to support and provide input to CCRTA on this plan.

- c. Planning for connection of bicycle trail to the Hyannis Transportation Center: In a parallel effort to the Hyannis Access Study, EOT and the Town of Barnstable have been exploring the feasibility of connecting the Hyannis Transportation Center to the regional bicycle trail network. Such a connection would improve intermodal connectivity and provide another option for residents and visitors to travel car-free in the Hyannis area. It is recommended that EOT and the Town continue to pursue this planning effort.

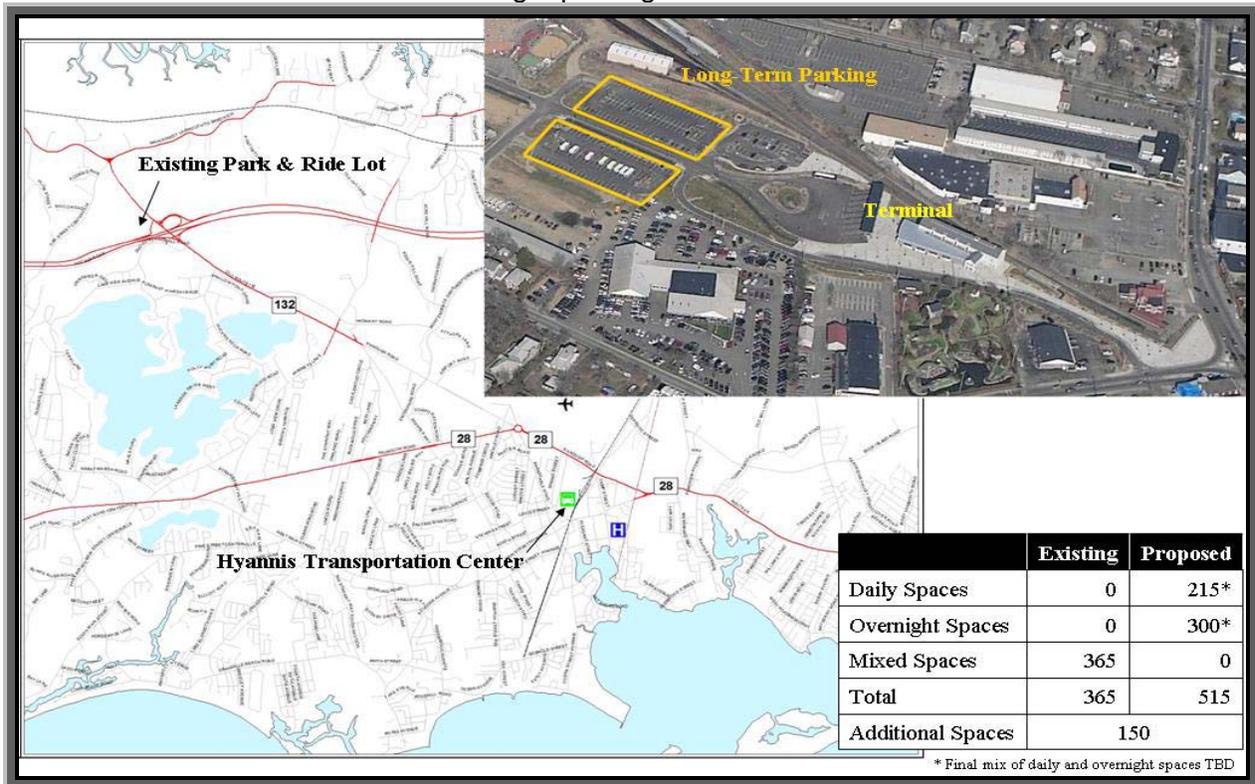
The above transit recommendations combine immediate action items and targeted mid-term improvements to make the most of existing services in the Hyannis area, while supporting and planning for potentially more extensive improvements in the long-term.

### 5.3 Park-and-Ride Recommendations

The Park-and-Ride recommendations seek to immediately alleviate the overcrowding situation at the Barnstable Park-and-Ride lot by using available capacity at a location in the study area already served by the private bus carriers. The recommendations also strongly support the public’s desire to maintain overnight parking at the existing lot and provide more parking at the more popular location.

Figure 5-8 depicts recommendation #1, which is to allow bus patrons to park at the Hyannis Transportation Center for a reduced rate while limiting overnight parking at the Route 132 park-and-ride lot. The reduced parking rate, along with security improvements to the long-term parking lot at the HTC, would encourage travelers to park there. This combined with a limit – by duration or by segregation – on the number of days one could park at the existing lot would free up some spaces for the daily commuter, who has the most air quality impact.

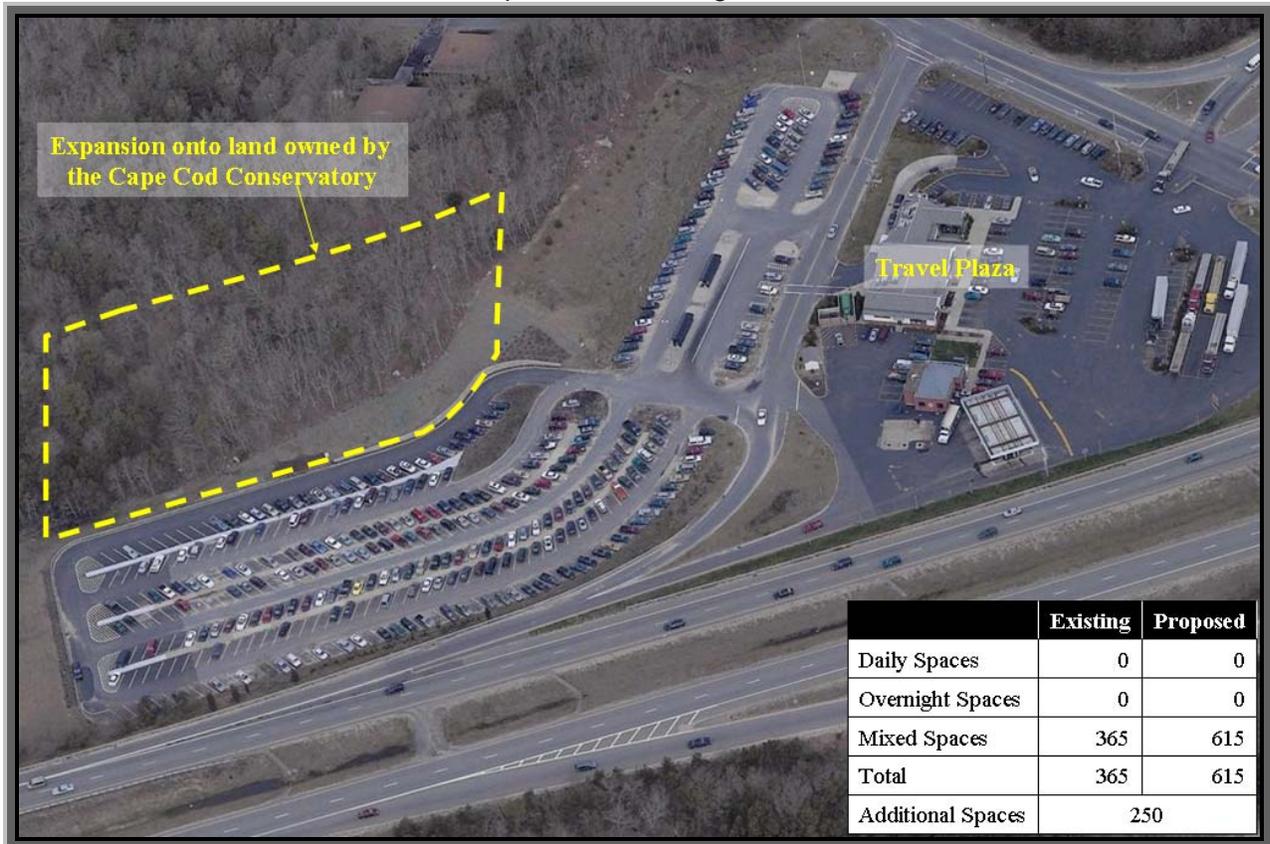
Figure 5-8: Park-and-Ride Recommendation #1:  
 Allow reduced rate at HTC and  
 Limit overnight parking at Barnstable Lot



Recommendation: Allow bus patrons to park at the Hyannis Transportation Center for a reduced rate while limiting overnight parking at the Route 132 park-and-ride lot.

Figure 5-9 depicts a longer term option for the existing Barnstable Park-and-Ride lot, which is to pursue construction of additional spaces at the existing Barnstable Park-and-Ride location using land owned by the Cape Cod Conservatory. This project is more capital-intensive and would require a somewhat longer lead time to plan and implement, including the acquisition of land owned by the Cape Cod Conservatory. Some members of the public have expressed concerns about the felling of trees for the expansion of the lot, although this land is not protected habitat or wetland. As this project proceeds, these potential environmental impacts would be evaluated in more detail and compared to the benefits of potential reduction in congestion and emissions.

Figure 5-9: Park-and-Ride Recommendation #2  
Expand the Existing Lot



Recommendation: Construct additional spaces at the existing Barnstable Park-and-Ride location using land owned by the Cape Cod Conservatory.

#### 5.4 Implementation Roles, Responsibilities and Potential Timelines

As discussed previously, the alternatives developed present two general levels of improvements: those that could be implemented in the immediate future (less than 3 years) and those that will require a longer time frame to develop and implement (4-6 years).

In terms of initiating and implementing any or all of the recommended the improvements, MassHighway, the Town of Barnstable, legislators, and the CCRTA were all members of the Advisory Task Force and were thoroughly involved in all aspects of the study process. However, it is recommended that the Town of Barnstable, legislators, the CCRTA, and/or any interested parties send a project initiation request letter to the Massachusetts Highway Department Commissioner and District 5 Highway Director to express support for the study's recommendations.

Further, it is recommended that a committee, with a similar makeup as the Hyannis Access Study Task Force, continue to meet on a regular basis in order to track the progress of the study's recommendations, as a show of continued support, and to continue the local, regional and state coordination efforts. It would be helpful to select a chair or coordinator to lead the committee. The person in this position should be forward-thinking, as neutral as possible, and able to work with a variety of people with diverse interests and concerns.

### ***Immediate-Term Roadway Improvements***

The immediate-term improvement packages consist of improvements that could be implemented with varying timelines, but all within three years of the completion of this study.

- **Advanced Signage at the Rotary** and the **Review of Possible Re-Striping at the Rotary** are improvements that would fall under the category of general maintenance and, as such, could be implemented within 6 months depending on MassHighway District 5's staff availability. Any striping or sign installation would be done in conformance with the Manual on Uniform Traffic Control Devices.
- **Review of Yarmouth Road/Route 28 Signal Timing**, and **Eliminate the Northbound Connection to Camp Street from Yarmouth Road** are modifications which, given their design complexity and anticipated construction cost, would require additional coordination between the Town of Barnstable, District 5, and MassHighway, and may also require programming of additional funds.
- **Pursue Funding for Design and Construction of the Airport Rotary and the Yarmouth Road/Route 28 Intersection; Begin Design Work for Airport Rotary and Yarmouth Road/Route 28 Intersection; and Begin the Planning and Design Work for the Route 28 Corridor Between Yarmouth Road and the Airport Rotary**, are modifications which would require additional coordination between the Town of Barnstable, District 5, and MassHighway, and would require the programming of additional funds.

### ***Short-Term Roadway Improvements***

Given the similarities between the Short-Term Alternatives, they would follow the same implementation process and have generally the same required time frame.

The alternatives will need to be advanced to the Environmental Study Phase by the Massachusetts Highway Department as the proponent. This phase will review the identified alternatives in terms environmental impacts and prepare an Environmental Assessment at the Federal level, and an Environmental Notification Form followed by a Draft and Final Environmental Impact Report at the State level. This phase will result in a selected alternative

that can be advanced to the Final Design Phase. The Environmental Phase of the project including consultant procurement or in-house preparation, environmental documentation, and design development is anticipated to require approximately two to three years for completion.

The Final Design Phase of the projects will consist of engineering design, acquisition of all necessary environmental permits, and completion of the Right-of-Way process. This phase is anticipated to require one to two years to complete.

Upon completion of design and permitting and acquisition of all necessary ROW, this project will need to be programmed for funding in the regional and Statewide TIP. Next it will need to be advertised for construction. It is anticipated that the construction phase of the project will require approximately one to two years for completion.

This results in a minimum total project time frame of between four and six years upon completion of this study to completed construction. However, a number of variables could extend the time frame, such as the complexity of the environmental process and determining mitigation; the right-of-way process; project design; the availability of funding for construction; and construction staging.

## **5.5 Summary of Recommendations**

The transit recommendations seek to improve existing services, encouraging commuters and recreational travelers to leave their cars behind. As Hyannis becomes more like a city, it becomes less possible to provide additional capacity on existing roadways and more important to support public transportation and other modes of travel, such as bicycling and walking.

The park-and-ride recommendations also seek to support higher-occupancy modes of travel by immediately alleviating the overcrowding situation at the Barnstable lot off of Route 6 while planning for expansion of that lot.

The roadway recommendations outline immediate action items to lay the groundwork for more permanent, cost-effective solutions to two key intersections and its linking corridor.

Together, the recommendations above provide specific action items for immediately addressing the area's key problem areas while laying the foundation for more permanent solutions and other longer term transportation improvement projects.

**APPENDIX #1  
ACRONYMS**

## Acronyms used during the Hyannis Access Study

|          |   |
|----------|---|
| AADT     | Annual Average Daily Traffic  |
| ADT      | Average Daily Traffic   |
| AM Peak  | Traffic volumes in the morning usually 2 hours in duration.   |
| B/C      | Benefit over Cost ratio   |
| BMAC     | Barnstable Municipal Airport Commission   |
| CAD      | Computer Aided Design   |
| CCC      | Cape Cod Commission   |
| CCCC     | Cape Cod Community College  |
| CCRTA    | Cape Cod Regional Transit Authority   |
| CCTV     | Closed-Circuit Television   |
| C-D Road | Collector-Distributor Road  |
| CE       | Categorical Exclusion under NEPA guidelines   |
| CORSIM   | Corridor Simulation – a microscopic traffic simulation model  |
| DMS      | Dynamic Message Signs   |
| EA       | Environmental Assessment under NEPA guidelines  |
| EIR      | Environmental Impact Report under MEPA guidelines   |
| EIS      | Environmental Impact Statement under NEPA guidelines  |
| EOEA     | Executive Office of Environmental Affairs   |
| EOTPW    | Executive Office of Transportation and Public Works   |
| FHWA     | Federal Highway Administration  |
| GIS      | Geographic Information System   |
| GIZ      | Growth Incentive Zone   |
| HAS      | Hyannis Access Study  |
| HCM      | Highway Capacity Manual   |
| HTC      | Hyannis Transportation Center   |
| ITS      | Intelligent Transportation Systems  |
| LOS      | Level of Service usually performed for highway and roadway segments or turning movements at intersections |
| MBTA     | Massachusetts Bay Transportation Authority  |
| MDEP     | Massachusetts Department of Environmental Protection  |
| MEPA     | Massachusetts Environmental Policy Act  |
| MEV      | Million Entering Vehicles (used in computing crash rates at intersections)                                |
| MHD      | Massachusetts Highway Department  |
| MPO      | Metropolitan Planning Organization  |
| NEPA     | National Environmental Policy Act   |
| NEPA     | National Environmental Protection Agency  |
| MVM      | Million Vehicle Miles (used in computing crash rates on highways)   |
| OTP      | Office of Transportation Planning (under the Executive Office of Transportation and Public Works)         |
| P-B      | Plymouth and Brockton Street Railway Company  |
| PDO      | Property Damage Only (crash type)   |
| PM Peak  | Traffic volumes in the afternoon or evening usually over a 2 hour period                                  |

|         |   |
|---------|---|
| QA/QC   | Quality Assurance and Quality Control   |
| ROW     | Right-of-Way  |
| RTA     | Regional Transit Authority  |
| Scoping | Formal process under MEPA for determining what is to be studied which is conducted by EOEA in a formal public meeting.                                    |
| SOW     | Scope of Work which is relative to setting the parameters of study for any project and or the formal items to be studied in conducting NEPA/MEPA studies. |
| TDM     | Transportation Demand Management  |
| TF      | Task Force  |
| TSM     | Transportation System Management  |
| V/C     | Volume over Capacity ratio  |
| VHT     | Vehicle-hours Traveled  |
| VMS     | Variable Message Signs  |
| VMT     | Vehicle-miles Traveled  |
| VPD     | Vehicles per day  |
| VISSIM  | Visual microscopic traffic simulation to graphically show traffic conditions in near realistic modeling   |

**APPENDIX #2  
MEETING SUMMARIES**

# Hyannis Access Study

**Task Force Meeting  
Tuesday, June 20, 2006  
10:00 AM**

**Barnstable High School  
Barnstable, Massachusetts**

## Attendance

### **Task Force Members and Public who signed in:**

|                    |                              |                    |                          |
|--------------------|------------------------------|--------------------|--------------------------|
| Rick Angelini      | Barnstable Resident          | Robert Berry       | Barnstable Resident      |
| Ann Canedy         | Barnstable Town Council      | Cynthia Cole       | Main Street BID          |
| Judith Crocker     | Comm for Will Crocker        | Jennifer Doyle     | MassRIDES                |
| Robert Edwards     | Yarmouth Resident            | Marge Fenn         | Cape Cod Commission      |
| Peter Fisher       | Centerville Civic Assoc.     | Maggie Geist       | Assoc. to Preserve CC    |
| Allen Goddard      | Hyannis Civic Assoc.         | Rep. Shirley Gomes | State Representative     |
| Karen Greene       | Town of Yarmouth             | Robert R. Jones    | Steamship Port Council   |
| John Kenney        | Hyannis COC                  | David Luce         | MassHighway              |
| Lev Malakoff       | CCC staff                    | Rob Miceli         | MassBike                 |
| Quincy "Doc" Mosby | Barnstable Municipal Airport | Tom Mullen         | Barnstable Land Trust    |
| Paul Niedzwiecki   | Barn. Asst. Town Mgr         | Wendy Northcross   | Cape Cod COC Marily      |
| Palle              | Resident                     | Joe Potzka         | CCRTA                    |
| Tom Palle          | Resident                     | Lynne M. Poyant    | Town of Barnstable staff |
| Susan Rohrbach     | Senator O'Leary              | Damaris Santiago   | FHWA                     |
| Steve Seymour      | Town of Barnstable staff     | David Still II     | Barnstable Patriot       |
| Harold Tobey       | Barnstable Town Council      | Ruth Weil          | Dir. Grwth Mngmnt Barn.  |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Rachel Bain      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |

### **Consultant team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation) |
| Leslie Black   | Fitzgerald & Halliday, Inc (Public Participation)  |
| Marcy Miller   | Fitzgerald & Halliday, Inc (Public Participation)  |

## **Meeting Summary**

### **Welcome and Introduction of Consultant**

Adriel Edwards welcomed everyone to the second Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that the purpose of today's meeting is to introduce the consultant team to the group and begin the discussion of other projects and studies in the area.

Adriel asked everyone around the table to introduce themselves for the benefit of the consultant team and the members of the public in the audience. Then she invited George Gefrich of TranSystems Corporation to introduce himself and his team. George briefly discussed his experience on other challenging transportation projects with TranSystems and in his prior role at the Rhode Island Department of Transportation. Ken Livingston of Fitzgerald & Halliday, Inc. introduced himself and his team-members, Marcy Miller and Leslie Black.

### **Administrative Items**

Adriel recalled the questions at the previous meeting regarding how the public would be kept informed about the study and meetings. She stated that public participation is a crucial part of this study and a web site, [www.hyannis-access.com](http://www.hyannis-access.com), has been developed to support this effort. It is now online. All project documents - such as meeting announcements and agendas, summaries, and presentations - will go on the website. There will also be a place for people to submit comments and get on the mailing list. She encouraged everyone to check the web site often and to let others know about it.

Adriel asked Task Force members if there were any questions or concerns about the meeting summary which was distributed via email prior to the meeting. There were none, so she informed members that the summary would be posted to the web site. She then thanked Task Force members for their comments and input to the Scope of Work. She stated that the scope was revised based on the input received and then emailed to all members. She asked if there were any additional questions or concerns about the Scope of Work. There were none.

### **Overview of Existing Projects and Studies**

Adriel said the purpose of reviewing existing projects and studies is for everyone to start the study on the same page, with a solid understanding of local projects and their expected impacts. The idea is to conduct a systematic analysis to arrive at meaningful next steps. Status, main characteristics, key issues, and local and regional impacts would be covered for several projects in the area. Projects nearest completion would be covered first followed by projects in more preliminary stages. She asked that the Task Force provide input, especially in the area of expected local and regional impacts. She pointed out that all the input would be recorded by Leslie on the flipcharts. She proceeded with the presentation and invited George Gefrich to describe the typical project life cycle for background information. George described how a planning study is usually

the first step in examining a transportation problem. He stressed that the desired outcome of a planning study is a set of recommendations that are well-supported by the Task Force and the public. Consensus is reached through a thorough examination of existing conditions and projections of future conditions, followed by the development of a wide variety of conceptual alternatives, which are eventually refined and culled into the set of recommendations. Significant input from the Task Force and public is taken throughout the study process. If the project has sufficient support, it moves to the environmental process, which involves more detailed engineering design. George described a number of different types of environmental analyses, which depend on the complexity of the project. Following the environmental process is the Metropolitan Planning Organization's (MPO) funding process (to pay for implementation), described in more detail in a handout which was provided at the sign-in table. This is followed by final design and implementation. In response to questions about the typical length of the environmental process, George explained that it varies greatly depending upon the complexity of the project.

Adriel reviewed the basics of the Bearses Way project, which involves reconstruction from Route 28 to Pitcher's Way. The intersection with Enterprise Road is being signalized, sidewalks and bicycle accommodations are being provided, and exclusive turning lanes at Enterprise Road and Route 28 will be provided. It is under construction and 60 percent complete. In addition to improving travel between Route 132 and 28, access to the mall and downtown Hyannis is to be improved. Adriel then asked for the Task Force to provide input and ask questions. It was asked if the utility poles would be removed. Yes. Cynthia Cole raised a concern about the current striping on Bearses Way at Route 28, which she felt does not indicate clearly in which lane drivers should be. Drivers end up in the left-hand turn lane, but continue across the intersection in the direction they wish to go. Paul Niedzwiecki explained that the current configuration is temporary, and that when the project is complete, this will be improved. In discussing how Bearses Way provides access to Main Street, it was mentioned that the southern portion of the roadway, south of Route 28, is not being addressed at this time. However, the Town of Barnstable has given some consideration to redesigning the intersection at the Kennedy Rink, which is along Bearses Way south of Route 28.

Adriel then reviewed the basics of another project under construction, Willow Street in Yarmouth. Willow Street turns into Yarmouth Road at the Barnstable town line, which extends to Route 28 and then to Main Street. Together, Willow Street and Yarmouth Road form a vital corridor to downtown Hyannis, the Hospital, and most of Hyannis. Historically, this corridor is often congested from Route 28 all the way to Exit 7 (on Route 6). There have also been safety issues for the left-hand turn movements at the end of the exit ramps to head towards Hyannis. Adriel explained that one mile of Willow Street in the vicinity of Exit 7 is being reconstructed with turning lanes, ramp modifications, and a median installation. Oak Street is being realigned and traffic signals will be installed at the bottom of the Route 6 ramps and also at Higgins Crowell Road.

Task Force members expressed concern that this improvement will push the bottleneck to the Barnstable town line, where the improvement ends. Adriel said that the project team and the Town of Barnstable are aware that this is an issue. She stated that later in the agenda, they will be discussing Barnstable's concept for relief to the congestion of Yarmouth Road. Adriel also

commented that some improvements must be made incrementally. Doc Mosby expressed concern that a landing light extension (for the Airport which abuts the project) is in the direct path of the right southbound lane. Doc asked the Town of Yarmouth to provide more information on this. Margo Fenn agreed to address this. Rob Miceli pointed out that there is a bicycle project that is planned for that area, that would cross Willow Street. Cynthia Cole commented that she is in favor of encouraging people to bike downtown and asked if that project could be incorporated or if it was too late. The team agreed to provide more information on this.

Adriel then discussed the Route 132 project, for which construction is pending. The improvements include widening the road from 2 lanes to 4 between Route 6 and Bearses Way. Three new signals and two signal upgrades are planned. There will also be additional turning lanes and drainage improvements. The key issues include the need to address the volume of traffic that uses the roadway as well as two high accident locations. Paul Niedzwiecki informed attendees that a sewer system improvement has been incorporated into the design and also that the landscaping is an important issue. Rob Miceli asked if the shoulder would be wide enough to accommodate bicycles. There were a couple other questions about the specifics of the design and Paul said that he had the plans at the Town Hall and those details could be provided. Cynthia stated that the additional signals make it more difficult to market Main Street as a destination. She felt that this project would make a potential exit 6½ even more necessary. Others also expressed concern about the number of signals. Paul informed attendees that the lights will be synchronized, which will improve and facilitate traffic flow. Based on the discussion, Adriel commented that the project is intended to benefit year-round residents as well as tourists, by providing for more easy access to the employment hub in Hyannis.

Adriel provided some basic information about the proposed improvements to the Barnstable Municipal Airport, which are currently under environmental review. The Development of Regional Impact Application has been submitted. Adriel informed attendees that part of the proposal is to eliminate the access points to the airport that are now off of the Airport Rotary. A new access road will connect via Attucks Way. The two other access points will be east and west of the rotary. Together these should improve operations at the rotary while also improving access to the Airport. Doc Mosby informed attendees that design work should commence in the fall, and that changes to the road network would likely occur in the next 18-24 months, which is the same timeframe for construction of the terminal. There were concerns about the impacts to residential neighborhoods, since one of the entrance points passes by some residences. There were questions about the funding. Doc answered that the FAA used to pay 95 percent for access roads, but not any more. The plan is to apply for funds through the Transportation Improvement Program. Wendy Northcross commented that the Park & Ride lot at Exit 6 is frequently at capacity and asked if the proposal includes any Park & Ride lots. Doc said that there will be four remote lots between Attucks Lane and the terminal, but their use for Park & Ride has not been discussed. Wendy suggested that this idea be considered.

Next, Adriel introduced a concept being developed by the Town of Barnstable for addressing the congestion along Yarmouth Road. The idea, which is still preliminary, is to construct a new road beginning in the vicinity of Rosary Lane, which would cross Yarmouth Road and the railroad tracks and then connect with Mary Dunn Way. From there it would go south to Route 28. This would allow for the splitting of traffic coming from the Exit 7 area. Those headed west would get

on the new road and those headed east would stay on Yarmouth Road. In response to specific questions about the design, Paul answered that the plans are at the Town Hall and can be viewed there. The desire for a bicycle lane was again mentioned.

Paul expressed some frustration, echoed by others in the room, that the airport rotary is not being directly addressed. He feels that the current projects will only make it easier to get to the rotary, which is already a significant bottleneck. He stated that it is choking off historical Hyannis and the hospital, and that businesses located at the rotary are failing. He stressed that he does not have a solution for the rotary, but that it needs to be studied and considered. Wendy said it confuses tourists – it is a foreign traffic pattern. Doc stated that is too large. Cynthia said it is one acre, but that it is pretty. Adriel and George summarized the sentiment that as an important landmark, any improvements must maintain the scenic character.

Paul then provided the group a brief overview of the Growth Incentive Zone Application, a comprehensive effort to revitalize downtown Hyannis. A growth management department has been created within the Town of Barnstable – a multi-disciplinary group of planners, engineers, economic development experts, etc. Zoning has been simplified from fourteen to seven zones, most of which encourage mixed-use development, with the exception of the transportation zone. Task Force members wanted to hear more about the growth incentive initiative, thus it will be included in a future meeting. Shirley Gomes said getting to the final destination in Hyannis from outside of Barnstable is still an issue. This concern was echoed by Doc, who said that he was at a conference recently where former frequent travelers to Hyannis have chosen other destinations because the traffic has gotten so bad. Robert Jones also said that it is important to get travelers to their final destination. George said that all of these issues would be taken into consideration.

### **Other Business / Next Meetings**

Robert Jones said that the Steamship Authority council meets on the first Thursday and third Tuesday of each month. He asked that our meetings not be scheduled for those days. Adriel said the team would make every effort to avoid those days. Cynthia offered to work with the team to find other locations for the meetings. Finally, the group agreed to meet again in September. The day and time will be determined later.

# Hyannis Access Study

**Task Force Meeting**  
**Tuesday, September 12, 2006**  
**2:00 PM**

**Hyannis Transportation Center**  
**Hyannis, Massachusetts**

## Attendance

### **Task Force Members and Public who signed in:**

|                 |                          |                      |                             |
|-----------------|--------------------------|----------------------|-----------------------------|
| George Allaire  | Yarmouth DPW Director    | Lev Malakhoff        | CCC Staff                   |
| Rick Angelini   | Hyannis COC              | Ed Marsney           | Hyannis Resident            |
| Robert Berry    | Barnstable Resident      | Bob Mumford          | Cape Cod Commission         |
| Ann Canedy      | Barnstable Town Council  | David Munsell        | Barnstable Planning Board   |
| Mark Carmichael | Mass Highway-District 5  | Paul Niedzwiecki     | Barn. Asst. Town Mgr        |
| Cynthia Cole    | Main Street BID          | Wendy Northcross     | Cape Cod COC                |
| Jennifer Doyle  | MassRIDES                | Robert O'Brien       | Steamship Authority         |
| Robert Edwards  | Yarmouth Resident        | Robert O'Leary       | State Senator               |
| Mark Ells       | Barnstable DPW           | Stephanie Ostapowich | Town of Barnstable staff    |
| Peter Fisher    | Centerville Civic Assoc. | Joe Potzka           | CC Regn'l Transit Authority |
| Maggie Geist    | Assoc. to Preserve CC    | John S. Powers       | Hyannisport Resident        |
| Allen Goddard   | Hyannis Civic Assoc.     | Lynne M. Poyant      | Town of Barnstable staff    |
| Shirley Gomes   | State Representative     | Susan Rohrbach       | Senator O'Leary staff       |
| M. Jones        | Shepley Wood Products    | Steve Seymour        | Town of Barnstable staff    |
| John Kenney     | Hyannis COC              | William Taylor       | Hyannis Resident            |
| George Kovatek  | Cummaquid Resident       | Ruth Weil            | Town of Barnstable          |
| Deidre Lang     | WQRC-Hyannis             |                      |                             |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |

### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |
| Sudhir Murthy  | TrafInfo Communications, Inc. (Traffic)            |
| Diane Tsitsos  | FXM Associates (Economic Planning & Research)      |

## **Meeting Summary**

### **Welcome and Opening Comments**

Adriel Edwards welcomed everyone to the third Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that future public informational meetings would provide further opportunity for public comment. Adriel said the website [www.hyannis-access.com](http://www.hyannis-access.com) also provides a forum for public input. Thirty public comments have been received to date, all of which have been responded to by the EOT. She encouraged Task Force members to read the comments which have been submitted. The meeting summary of the June 20<sup>th</sup> meeting was distributed prior to this meeting and is available on the website for review. A sampling of web cards advertising the web site were provided today and will be available to Task Force members at the October meeting to pass out to the public.

The purpose of today's meeting is to continue the discussion started at the June 20<sup>th</sup> Task Force meeting on existing projects and studies. A presentation on the Growth Incentive Zone (GIZ) by Barnstable Assistant Town Manager, Paul Niedzwiecki is also planned. A preview of draft study goals and objectives - to be developed more fully in cooperation with the Task Force at a later meeting - will be distributed. Before closing the meeting, the consultant team will report on the data collection efforts.

### **Existing Projects and Studies, continued**

George Gefrich responded to questions posed at the previous meeting regarding shoulder widths planned for Willow Street and Route 132. Shoulders will be limited to 2 feet in the vicinity of the interchanges and 4 feet elsewhere along the project lengths. The shoulders are designed to allow for bicycle travel.

Adriel mentioned that a project will be developed in a future year for the easterly leg of Route 28 from the Airport Rotary to the Barnstable/Yarmouth town line by MassHighway in cooperation with the Town of Barnstable. The project will seek to incorporate the concept being developed for Airport Way, the potential bypass to Yarmouth Road. In the meantime, this section of Route 28 will be repaved. Mark Ells and Mark Carmichael provided some details confirming these efforts.

Adriel responded to questions posed at the previous meeting regarding a potential bike path to the Transportation Center from Yarmouth. She said that there is money for the three towns of Yarmouth, Dennis, and Barnstable to design and construct such a bike path. Adriel provided handouts with the locations, times and dates of the upcoming public hearings.

George Allaire, the Yarmouth DPW Director noted a correction to the map that was then made by George Gefrich.

Adriel informed attendees that an intermodal task force, which was formed prior to the start of this study, has been working on the Park & Ride capacity issue at the lot off of Exit 6. Alternatives are being refined and will be presented at a future Task Force meeting for review by the Task Force before being presented to the public.

Paul Niedzwiecki, Barnstable Assistant Town Manager, gave a presentation on the GIZ. Paul showed a map of the GIZ area which is roughly bounded by Route 28 and the Airport Rotary to the north,

Yarmouth to the east, the Harbor to the south and the West End Rotary and Aunt Betty's Pond to the west. He explained that the GIZ is a plan to encouraging higher density, mixed development in downtown Hyannis while minimizing negative impacts of growth. Among the goals of the GIZ are to provide for more housing for all incomes, encourage a broad range of commercial activity and year-round employment, and to foster the arts. Additional goals include maintaining the historic character of the area, enhancing pedestrian access and improving access to the waterfront. The designation of the area as a GIZ allows for more local control by raising the Development Regional Impact thresholds, the thresholds which typically require review by the Cape Cod Commission. Paul explained that the plan is divided into phases. Paul also discussed the major components that will contribute to the success of the GIZ. He said that the Town of Barnstable restructured its internal departments of the town to encourage interdisciplinary coordination – between economic development, engineering, property management, community planning, and traffic and parking management. In addition, the Town has committed to investing millions of dollars to infrastructure improvements. Another key element of the GIZ is the simplified zoning. Paul described each of the seven zones in detail. For example, the transportation hub district hosts the regional transit center. According to the GIZ, parcels are encouraged for use as parking or transit support. The hope is that centrally located parking will encourage walking, biking and alternative transportation modes.

Wendy Northcross asked when did the “clock start ticking” on the first five – year phase. Paul said on June 14, 2006 when the plan was adopted by the Assembly of Delegates. Paul showed some pictures of residential developments currently underway, indicating that the plan has already encouraged the right kind of development.

In response to questions, Paul said that with 2,000 public parking spaces in the GIZ, there is enough parking but better management is needed, so long-term parkers are parking in the right areas. In response to a question from George Gefrich, Paul said that no parking structure is being constructed for the hospital area.

Bill Taylor expressed concern that bikes were not mentioned in the presentation. Paul responded that sidewalks were extensively considered in the GIZ and bikes are part of every roadway design in Barnstable. A bike path from Willow Street to the Regional Transportation Center and beyond is under consideration, and an east-west bike path south of Route 6 is also being considered. An multi-use path is planned for Rte 132 and Bearses Way.

Before concluding his presentation, Paul opined that exit 6 ½ needs to happen and the Airport Rotary also needs to be fixed, or downtown Hyannis will be choked off. Many important community services are south of the rotary.

### **Preview of Goals & Objectives: Strategies and Specifics**

Adriel reported that study goals and objectives have been drafted based on feedback from the Task Force and the public. Five draft goals have been identified:

1. Improve mobility and transportation choice
2. Protect and enhance the natural and cultural environment
3. Maintain and enhance support for regional economic activity by strengthening transportation networks
4. Improve traffic flow in and around the local focus area

## 5. Improve safety for motorists, pedestrians, and cyclists

The Task Force was given goal sheets for review. Each goal sheet included:

1. The project purpose (same on each sheet)
2. The desired end product (same on each sheet)
3. Objectives relative to the goal
4. Potential strategies and examples relative to the goal
5. Challenges and opportunities relative to the goal

The Task Force was asked to review the five goal sheets and be prepared at the October Task Force meeting to break into small working groups to discuss the goals and brainstorm on a large number of objectives. Not all objectives will be taken forward to the final draft but a “wide net has been cast” to obtain as much feedback as possible.

### **Next Steps**

George Gefrich reported that traffic counts were taken in the summer of 2006 at 68 locations including 12 intersections. Sudhir Murthy of TrafInfo said he is developing a baseline traffic analysis of existing conditions for 2006 will reflect road movements and turning conditions during AM and PM peak hours during the summer. Model calibrations for the study are being based on these counts. Sudhir reported that he is also examining accident information from MassHighway to identify safety issues. This analysis will involve a comparison with statewide statistics to further identify problems within the study area. Mark Ells of Barnstable DPW offered to contact the local police department to obtain more detailed accident information. George Gefrich thanked Mark and said that TranSystems does often work with the local police to augment the information they obtain from the state.

In response to a question from Mark Ells, George responded that planned future developments are being taken into consideration in the analysis. Diane Tsitsos, of FXM Associates, reported that square footage of future potential development will be added to the model to accurately assess future traffic patterns.

George added that transit options will be considered in the analysis by looking at nodal connections of the existing transit network and the relation of movement of people. Access to hospital and serviceability of the transit system to needy populations will be evaluated. Bike and pedestrian facilities will also be evaluated in the analysis of the movement of people in the study area. Bob Mumford of Cape Cod Commission noted that land use issues would be looked at as part of the study.

### **Questions/Comments**

- Ann Canedy asked if Cummaquid Heights is part of the area being studied. Adriel responded that yes, that area in particular is being considered as part of this study and in general, minimizing traffic through residential areas is a goal of the study.
- Cynthia asked about where traffic counts were taken. Adriel listed some of the general locations and Sudhir listed some specific locations. More information related to data collection will be presented at the October Task Force Meeting.
- Senator O’Leary asked if additional traffic count locations could be made if requested. Adriel responded yes, additional counts could be taken. For example, new data is being gathered to reflect the new Stop & Shop location.

- In response to a question from Cynthia Cole about the prospect of converting Main Street to a two-way roadway, Paul opined that once congestion issues on Route 28 and at the Airport Rotary are addressed, traffic would be less dependent on Main Street as a throughway to other parts of Barnstable. At that time, converting Main Street to a two-way roadway may be a feasible option.
- Cynthia commented that on a recent trip to another state, center turn lanes were used extensively and seemed to have a positive impact on traffic flow. George Gefrich responded that adding a center turn lane to existing roadways requires space. The proximity of buildings and other properties can make that difficult. Adriel commented that there may be opportunities to consider a center turn lanes on certain roadways as the study progresses.

**Other Business/Next Meetings**

The next Task Force meeting will be held on Tuesday, October 3, 2006 from 2-4 PM with a location TBD.

# Hyannis Access Study

**Task Force Meeting  
Tuesday, October 3, 2006  
2:00-4:00 PM**

**Heritage House Hotel  
259 Main Street, Hyannis**

## Attendance

### **Task Force Members and Public who signed in:**

|                |                          |                      |                             |
|----------------|--------------------------|----------------------|-----------------------------|
| Rick Angelini  | Hyannis COC              | Tom Mullen           | Barnstable Land Trust       |
| Ann Canedy     | Barnstable Town Council  | Bob Mumford          | Cape Cod Commission         |
| Cynthia Cole   | Main Street BID          | David Munsell        | Barnstable Planning Board   |
| Jennifer Doyle | MassRIDES                | Wendy Northcross     | Cape Cod COC                |
| Mark Ells      | Barnstable DPW Director  | Stephanie Ostapowich | Town of Barnstable staff    |
| Peter Fisher   | Centerville Civic Assoc. | Tony Pelletier       | Hyannis Civic Assoc.        |
| Allen Goddard  | Hyannis Civic Assoc.     | Joe Potzka           | CC Regn'l Transit Authority |
| Shirley Gomes  | State Representative     | Susan Rohrbach       | Office of Senator O'Leary   |
| John Kenney    | Hyannis COC              | Steve Seymour        | Town of Barnstable staff    |
| David Luce     | MassHighway District 5   | Harold E. Tobey      | Barnstable Town Council     |
| Lev Malakhoff  | CCC Staff                | Ruth Weil            | Dir. Growth Mngmnt Barn.    |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Rachel Bain      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |

### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Rob Sweirk     | TranSystems Corporation (Transit)                  |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |
| Sudhir Murthy  | Trafinfo Communications, Inc. (Traffic)            |
| Diane Tsitsos  | FXM Associates (Economic Planning & Research)      |

## **Meeting Summary**

### **Welcome and Opening Comments**

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting and thanked Cynthia Cole for arranging for today's meeting location. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that there are continuous opportunities for public comment through the web site [www.hyannis-access.com](http://www.hyannis-access.com). The web site has already received many comments, all of which have been responded to by the EOT. Also, public informational meetings will be held later in the study and will provide further opportunity for public comment. The September 12 meeting summary was distributed to Task Force members prior to the meeting. There were no comments and it is now posted on the website. Business cards with the website address are available to pass out to the public.

### **Study Area Discussion**

Adriel explained the study area by referring to two maps. One map - of the entire Cape (not including the islands) - depicts the area covered by the Cape Cod regional model. This travel demand model includes all the major roads on the Cape and will be used to analyze system-wide impacts that may result from changes in the transportation network. In this sense, the entire Cape is covered. The second map is of the Barnstable area and a portion of Yarmouth which borders Barnstable. A lightly shaded box depicts the local focus area roughly bounded by exits 6 and 7 on Route 6, Route 6A to the north, the West End Rotary, and the ferry area, the hospital, and Main Street to the south. Because this is a large area, certain areas within this area will receive additional analysis, depending on the discipline. For example, certain environmentally sensitive areas, such as the areas east and west of Mary Dunn Road and south of Route 6, may receive additional scrutiny. Certain roadway and intersections will receive additional traffic analysis. Sensitive areas anticipated for further analysis are circled by different colors and patterns for different disciplines and considerations. Adriel asked if any there were any questions or comments about the study area. There were none.

### **Goals and Objectives Break-out Groups and Discussion**

Mr. George Gefrich reviewed the five potential goals of the study (not necessarily in order of priority) which were distributed in draft form at the previous meeting:

1. Improve mobility and transportation choice.
2. Protect and enhance the natural and cultural environment.
3. Maintain and enhance support for regional economic activity by strengthening transportation networks.
4. Improve traffic flow in and around the local focus area.
5. Improve safety for motorists, pedestrians and bicyclists.

George explained that the Task Force would break up into small groups to provide input on the potential goals and objectives and to identify possible strategies to obtain the goals. Each group is to work on one goal, marking up the maps and other hand-outs in order to clarify ideas. George urged members to

prioritize objectives and strategies. A consultant team member will be present at each group's table to record the suggestions and comments. After the break-out sessions, a Task Force member will summarize the group's comments and suggestions for the goals and its objectives and strategies.

The summaries are as follows:

Improve traffic flow in and around the local focus area:

Tom Mullen provided the overview for this goal. He said that in general, the group was pleased with the objectives which were drafted previously. They felt that the first objective – regarding decreasing congestion and reducing delays on the Willow Street/Yarmouth Road corridor – is a major issue that should be a strong focus of this Task Force and this process. Tom said the group felt similarly about objective two and the congestion on Route 28. The suggestion was made to carry the Route 132 designation all the way down to Main Street as a way to reduce motorist confusion. Tom explained that the group agreed with objectives 4 and 5, but suggested that objective 6 be split up as follows:

- #6: Explore exit 6 ½ options.
- #7: Explore other alternatives that are less expensive.
- #8: Explore alternatives to improve the Airport Rotary.

Under “potential strategies and specifics”, the group added to the two which were drafted previously:

- Explore dedicated left-hand turn lanes.
- Consider consolidating curb cuts.
- Consider making the Willow Street/Yarmouth Road corridor one-way South and Camp Street one-way North.
- Improve enforcement of illegal parking.

Under “challenges and opportunities”, the group suggested the following:

- Protect Mary Dunn Road neighborhoods.
- Protect Hyannis neighborhoods and ensure connectivity of neighborhoods/community.
- Respect scenic and historic areas and roadways.

George informed the group that the consultant team has on record the roads that the state has designated as historic, but not the roads which the town has designated as historic. Ruth Weil said she would provide that information. Bob Mumford asked that the Task Force not rule out other solutions for the roadways which may work as well or better than dedicated left hand turns. He said that two-way left turn lanes, median strips to prevent left-hand turns, driveway turn restrictions and consolidation of access points may all be solutions.

Maintain and enhance support for regional economic activity by strengthening transportation networks:

John Kenney provided the overview for this group's discussion. He said that the group discussed many of the ideas that Tom Mullen just reviewed. In general, the group agrees with the objectives which were drafted previously for this goal. In addition, they discussed the GIZ and the impacts it would have on the area. The following points were also offered:

- The hospital expansion in the Industrial Park is expected to have big impacts. This should be considered as part of this study.
- Funding is necessary for the Route 132 construction project.
- The section of Route 132 from Phinney's Lane to the airport should also be considered.
- Deck parking for downtown should be considered.
- Give Exit 6 ½ a strong look.

John said that the group said that a “suburban mentality in an urban environment” is holding Hyannis back. He also said that members of his group discussed the need to reduce through traffic on Main Street. Anecdotally, they are aware that many drivers use Main Street in order to avoid congestion on Route 28 and Route 132. He added that there may be an opportunity to change the Airport Rotary since most of the businesses surrounding it are currently closed. Ruth reiterated that addressing the rotary is a big issue.

#### Improve safety for motorists, pedestrians and bicyclists:

Lev Malakoff provided the overview for this section. This group suggested that the following be added to the existing four objectives:

- Ensure design-speed of new facilities is consistent with community character (e.g. use traffic calming designs)
- Add signage to inform motorists of timed sequence of lights so that drivers do not speed up to the next intersection.
- Provide signage to inform cyclists when to walk their bikes.
- Provide education programs for cyclists/pedestrians/motorists re: safety rules of the road for all.
- Bring Yarmouth rail trail to downtown and to the ferry area.

Similar to other groups, this group also suggested consolidating curb cuts. Ruth reiterated her concern that too many curb cuts pose safety issues. Cynthia Cole suggested that when possible, developers should be required to design systems parallel to the roadway to accommodate traffic traveling between developments.

#### Protect and enhance the natural and cultural environment:

Sue Rohrbach provided the overview for this group's discussion. She said that in general, the group agreed with the previously drafted objectives, but would like them to be phrased in a more positive way. For example, instead of the phrase “avoid impacts”, they suggested the phrase “provide protection.” In addition, the following additional ideas were presented for the “potential strategies and specifics” section:

- Landscaping along Route 132 is a big issue.
- Improve landscaping on other roads.
- Landscape buffer zones between roadways and developments.
- Use a branding process when creating new signage.
- Use radio to provide directions and traffic updates.
- Consider implementing other ITS measures such as dynamic message signs.
- Keep the visitor center and bathrooms at the rest area east of exit 6 open all year round.

Wendy Northcross discussed the importance of the number and size of signs. She mentioned the “ladder signs” as an example of a type of sign that is consistent with the community character. This group also stressed the need to protect the integrity of historical areas along Route 6A.

Improve mobility and transportation choice:

Joe Potzka provided the summary for this group’s discussion. He stated that in general, the group agreed with the objectives which were drafted previously. Regarding objective number 1, the group suggested that the objective also focus on providing access to the study area from the upper and lower Cape, and not just focus on access within the area. Regarding objective number 4, Joe pointed out that many of the CCRTA’s vehicles are already equipped with bicycle racks. The group suggested that the objective be instead to provide more bike racks at key destinations. Regarding objective number 5, the group asked that the terms “carpools” and “vans” be used instead of HOVs. To the existing seven objectives, the group asked that the following be added:

- At the Hyannis Transportation Center, use technology to provide traveler information in different languages.
- Find ways to prioritize transit and give visibility to its importance in the region.

Joe continued, saying some specific strategies to prioritize transit and give it more visibility may be to enlarge the bus stops and make service more frequent. He added that a higher level of investment is needed. He suggested that they work with the Cape Cod Hospital to promote transit information. Joe said, “Hyannis is a city,” and added the following points to his overview:

- Develop pedestrian friendly areas.
- Seek safe ways to link alternative modes such as bike paths to transit stations.

**Data Collection Progress Report**

Adriel introduced this agenda item by saying that this is not a comprehensive review of the existing conditions, but since significant progress has been made, the team wanted to give an update.

Mr. Sudhir Murthy presented some results from the traffic data collection efforts. He showed 3 slides of traffic volumes for Route 6 east of Route 149. The first slide showed how the volumes vary over the course of the year. Sudhir explained that the counts on which this data is based are very reliable. He displayed the last five years’ worth of data which showed a consistent pattern: that traffic varies from a low of about 40,000 vehicles a day (in both directions) in January to a high of about 75,000 vehicles a day in July and August. The second slide shows how traffic volumes on Route 6 vary over the course of a typical summer week. Volumes are highest on Friday and Saturday. Sudhir also showed how traffic volumes vary over the course of a each day during the summer. Although volumes remain relatively high over the course of the entire day, they peak about mid-morning. Again, this was for Route 6 east of Route 149. Sudhir then presented level of service (LOS) and crash numbers for several key intersections. Sudhir explained that the LOS was calculated based on construction being complete on Route 132 and Willow Street. It is important that our analysis account for the work that will be complete in the short term. He also pointed out that the LOS presented is an average for the whole intersection, but that certain

approaches may have better or worse LOS. The Airport Rotary is one of the only two “F”s and also had the highest number of crashes (23 in 2005). It was noted that crashes were recorded in the area of the intersections, but did not necessarily occur directly in the intersection.

**Other Business/Next Meetings**

The next Task Force meeting will be held on Tuesday, November 14, 2006 from 2-4 PM at the Heritage House Hotel. The next meeting will recap the results of the goals and objectives discussion and provide a comprehensive review of the existing conditions.

# Hyannis Access Study

**Task Force Meeting  
Tuesday, November 14, 2006  
2:00-4:00 PM**

**Heritage House Hotel  
259 Main Street, Hyannis**

## Attendance

### **Task Force Members and Public who signed in:**

|                |                         |                      |                              |
|----------------|-------------------------|----------------------|------------------------------|
| George Allaire | Town of Yarmouth        | Quincy Mosby         | Barnstable Airport           |
| R.F. Andres    | Barnstable Resident     | Tom Mullen           | Barnstable Land Trust        |
| Robert Berry   | Barnstable Resident     | Bob Mumford          | Cape Cod Commission          |
| Ann Canedy     | Barnstable Town Council | David Munsell        | Barnstable Planning Board    |
| Peter Doiron   | Barnstable Who          | Robert O'Brien       | Steamship Authority          |
| Mark Ells      | Barnstable DPW Director | Stephanie Ostapowich | Town of Barnstable staff     |
| Robert Edwards | Yarmouth Resident       | Tony Pelletier       | Greater Hyannis Civic Assoc. |
| Margot Fenn    | CCC Staff               | Joe Potzka           | CC Reg. Transit Authority    |
| Allen Goddard  | Hyannis Civic Assoc.    | Susan Rohrbach       | Office of Senator O'Leary    |
| Shirley Gomes  | State Representative    | Damaris Santiago     | FHWA                         |
| John Kenney    | Hyannis COC             | Bill Scully          | MS Transportation Systems    |
| David Luce     | Mass Highway District 5 | Steve Seymour        | Town of Barnstable staff     |
| Lev Malakhoff  | CCC Staff               | Harold E. Tobey      | Barnstable Town Council      |
| Ed Marony      | Barnstable Patriot      |                      |                              |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Rachel Bain      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |

### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)                            |
| Rob Swierk     | TranSystems Corporation (Transit)                                    |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation and Environmental) |
| Sudhir Murthy  | Trafinfo Communications, Inc. (Traffic)                              |
| Frank Mahady   | FXM Associates (Economic Planning & Research)                        |

## Meeting Summary

### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting and thanked Cynthia Cole for arranging for today's meeting location. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that there are continuous opportunities for public comment through the web site [www.hyannis-access.com](http://www.hyannis-access.com). The web site has already received many comments, all of which have been responded to by the EOT. Also, public informational meetings will be held later in the study and will provide further opportunity for public comment. Adriel welcomed Quincy "Doc" Mosby as a new Task Force member representing the Barnstable Municipal Airport.

The October 3rd meeting summary was distributed to Task Force members prior to the meeting. Tom Mullen had requested some minor clarifications to the summary. Adriel reviewed these changes, and stated that the final version is now posted on the web site.

### Goals and Objectives

Adriel reviewed the development of the goals and objectives which occurred at the previous meeting through break-out sessions and discussions. She stated that in general, Task Force members seemed pleased with the draft goals and objectives as they were presented, but requested more positive language. Through the discussions, a number of "recurring themes" surfaced. Adriel listed these:

- General congestion: Rte. 132, Rte. 28, Willow Street and Yarmouth Road
- Safety
- The hospital and the hospital expansion
- The Airport Rotary
- Exit 6 ½
- Alternatives to, or complementing, exit 6 ½
- Parking
- Technology
- Signage, signage, signage
- "Hyannis is a City"

Task Force members also provided a number of additional ideas and comments. Adriel informed attendees that Planning and the consultant staff incorporated as many of these comments as possible. As a result, the goals and objectives are extensive and comprehensive - as intended. She pointed out that a variety of parties and agencies may ultimately be responsible for evaluation and implementation of these various objectives. Over the course of the study, priorities and trade-offs will emerge. Adriel stated that this is an EOT study, which implies that the focus will be on state-owned facilities and state-provided services. Many of the destinations in Hyannis are accessed by town-owned roadways. The goal is to improve overall mobility to those destinations by improving the facilities and services under the state's jurisdiction. Other recommendations that complement and support those improvements may be made. Adriel informed attendees that she will post the finalized goals and objectives to the web site.

Harold Tobey referenced the “Recurring Themes” document and expressed concern about mentioning alternatives to a new exit 6½. Adriel explained that the Planning Office was charged to evaluate a broad range of transportation improvement alternatives. While exit 6½ will be considered as a specific alternative, other improvements to existing infrastructure and non-infrastructure alternatives are also being considered. The goal is to improve mobility in the study area in the most effective manner possible without a pre-determined alternative. In response to a question from Ann Canedy, Adriel and George Gefrich responded that in addition, there may be recommendations made for local roads that would be under the authority of local towns to implement. As this is a comprehensive study, all improvements both small and large will be considered.

### **Evaluation Criteria**

George Gefrich distributed a draft hand-out of potential evaluation criteria. Evaluation criteria are measures that are used to assess whether - and to what extent - the goals and objectives of the study are met. In most cases, the criteria are quantitative in nature. For example, to measure the reduction in congestion, queue lengths and levels of service at key intersections will be calculated. In other cases, the criteria are qualitative. For example, determining whether a particular alternative impacts or enhances the visual environment will be based on subjective input. The hand-out was organized by the agreed-upon goals of the study and listed one or more criterion per objective along with comments on the source of information that would be used to make the assessment. These criteria will be applied to the various transportation improvement alternatives being considered. George stated that the criteria are based on a 20-year planning horizon. He reviewed all the criteria that would be examined for each objective.

Tom Mullen pointed out that under the environmental goal, one of the objectives should be to “protect groundwater supplies.” It was noted that it was an oversight to omit this and it would be added to the document. Requests were also made to elaborate on the bicycle and pedestrian objectives under the mobility goal. George agreed to this and said that in some cases capacity improvements are necessary and in other cases new connections would be most beneficial. Allen Goddard brought up the issue of freight, expressing concern over the volume of freight served by the Hyannis harbor to the islands. He suggested that New Bedford and other ports be used to carry more freight to the islands. Damaris Santiago asked to what extent will noise impacts be considered in this study. Mark Ells asked about nutrient loading assessments and other environmental issues. George replied that this study is a feasibility study, and as such the environmental issues are addressed more qualitatively than quantitatively. A qualitative assessment will identify potential issues or areas of concern where further study would be required during any subsequent environmental study as required by Federal and State regulations. Adriel presented an overview of the EOT planning process and where this study fits. Recommendations from this study would then proceed into a more detailed study as required by NEPA and MEPA.

George then presented a sample evaluation matrix which would be used to compare various strategies to each other.

### **Existing Conditions**

The remainder of the meeting consisted of presentations on the existing conditions data collection tasks for socio-economics, traffic, and environmental conditions.

**Socio-Economics**

Frank Mahady presented socio-economic data for the study area as a whole and also for Barnstable's Growth Incentive Zone specifically. Frank reported that about 12,000 people live in the study area and the population will grow to about 13,000 by 2010. 30% of the study area's population lives in the GIZ area. Businesses in the study area employ about 30,000 people and almost \$3 billion in sales is generated annually. Approximately 40% of both the employment and sales occurs within the GIZ. The biggest sectors are service and retail, followed by transportation and communication. Frank reported that the population for both the town and the county is expected to continue to grow. According to the Massachusetts Institute for Social and Economic Research, the population of the town of Barnstable is expected to grow to over 65,000 by 2020 and to almost 300,000 for the county. Frank also showed a graphic which displayed the population distribution by age group. This revealed that today, a large majority of the population (about 70%) is between the ages of 20 and 65 and this is expected to be true in the future as well. Frank then reviewed a number of statistics related to employment by occupation type for the study area and the GIZ specifically. Frank displayed Census journey to work data, showing that a large majority (85%) of the area's residents drive to work. However, large numbers also walk and carpool. In the GIZ specifically, 276 walk and 255 carpool. Frank concluded his presentation by saying that more work needs to be done to identify where shifts in demographics are expected over the next 20 years due to the GIZ, how these changes will affect travel demand, and what infrastructure improvements will best serve the needs of the area.

Robert Berry asked Frank about the accuracy of the data and the methods used to develop the forecasts. Frank stated that a variety of public and proprietary data sources were consulted to develop a composite picture. While there are inherent uncertainties with any forecasting model, he is confident about the projections presented based on his expertise in the field and the general protocol followed in this process.

**Traffic**

Mr. Sudhir Murthy reviewed some slides which he presented at the previous meeting for background information and then also presented some new work.

He showed 3 slides of traffic volumes for Route 6 east of Route 149. The first slide showed how traffic volumes vary over the course of the year. Five years' worth of data was graphed and it showed a consistent pattern: that traffic varies from a low of about 40,000 vehicles a day (in both directions) in January to a high of about 75,000 vehicles a day in July and August. The second slide showed how traffic volumes on Route 6 vary over the course of a typical summer week. Volumes are highest on Friday and Saturday. Sudhir also showed how traffic volumes vary over the course of a each day during the summer. Although volumes remain relatively high over the course of the entire day, they peak about mid-morning. The most pronounced peak is on Saturday in the AM. Again, this was for Route 6 east of Route 149.

Sudhir reviewed the data sources on which his work is based. An extensive data collection effort was undertaken to provide the study with a current, complete picture. Sudhir then explained the traffic flows into and out of the study area which revealed overlapping traffic patterns. For example, a lot of north-south traffic flows on Phinney's Lane and much of the east-west traffic flows along Route 28, Route 132 and Main Street. He also showed turning movement counts at a few key intersections. These showed the predominant moves in the study area. Sudhir reviewed the level of service at many intersections within the study area, reminding attendees that the LOS is based on successful completion of the projects which are

currently under construction or soon to be constructed. This includes Willow Street, Route 132 and Bearses Way. He also showed the total number of crashes at several key intersections between 2003-2005 as well as the specific locations of all the crashes in the study area in 2005. Sudhir reminded the audience that several of the high accident locations are being addressed with current projects.

By reviewing the traffic volumes and patterns, the team determined that the summer Saturday morning period should be used as the time period in the traffic model. Sudhir explained that the volumes and patterns are similar on Saturday to the weekday PM peak. There was a discussion regarding whether the Saturday morning time period is a correct representation of traffic patterns in the study area. Sudhir explained that much consideration went into this recommendation and the belief is that this time period will correctly represent and be the correct peak period of traffic representing traffic flow during a variety of non-peak situations, i.e. Friday evening or off-season travel periods.

### **Environmental**

Mr. Ken Livingston presented an overview of how environmental resources were identified in this study. Ken utilized existing data sources and reports including the prior Exit 6 ½ Study, the Barnstable Airport EIR, MassGIS, Cape Cod Commission data, and Town of Barnstable information. He stated the two primary issues in the study area are groundwater supply for the Town's drinking water and historic Route 6A. At the end of the presentation, he stated this study will identify potential issues and opportunities to be considered in the development of transportation alternatives. The review of environmental conditions will highlight potential "red flags" or areas that may need a heightened level of concern or review in subsequent stages of the project development process.

### **Other Business/Next Meetings**

The next Task Force meeting will be held on Tuesday, December 12, 2006 from 2-4 PM at the Heritage House Hotel. This December meeting will focus on transit and transportation demand management services in the area. We will hear from the Cape Cod Regional Transit Authority, MassRIDES, the statewide travel options program, and EOT's Park & Ride coordinator about options for the commuter lot at exit 6 on Route 6.

## Hyannis Access Study

| Goals and Objectives of the Study | Evaluation Criteria<br>How to Measure each Alternative?<br>(Quantitative and Qualitative) | Comments/Source |
|-----------------------------------|---|-----------------|
|-----------------------------------|---|-----------------|

| <b>Improve traffic flow in and around the local focus area</b> |   |                                 |
|--|---|---------------------------------|
| Decrease congestion and reduce delays                          | Average speed   | Highway Capacity Manual/Synchro |
|  | Queue lengths at key intersections; Level of service (LOS) at key intersections and links | Highway Capacity Manual/Synchro |
| Minimize local street impacts                                  | Changes in forecast traffic volumes on key local streets                                  | Travel demand forecasting model |

| <b>Improve safety for motorists, pedestrians and bicyclists</b> |  |   |
|---|--|---|
| Eliminate/improve hazardous situations                          | Focus on hot spots from crash records - changes in contributing factors to safety hazards              | Detailed analysis of crash data and qualitative assessment of safety improvements |
| Ensure adequate weave areas, accel/decel, sight distances       | Number of deviations from AASHTO and MassHighway guidelines  | AASHTO and MassHighway guidelines   |
| Improve signage   | Completeness and accuracy of existing signage; potential for sign branding; number of additional signs | Field survey  |
| Ensure design speeds consistent with community character        | Traffic calming measures used  |   |

| <b>Improve mobility and transportation choice</b>   |  |  |
|---|--|--|
| Explore expanding public transportation and ITS   | # of routes, ridership, frequency of services  |  |
| Find ways to prioritize transit   | Ridership numbers, frequency of service  |  |
| Improve coordination of existing services and safe links to and from alt. modes, such as bike/ped paths to transit stations | Count modal connections, bike and/or pedestrian paths, lanes, racks and other facilities |  |

| <b>Protect and enhance the natural and cultural environment</b> |   |  |
|---|---|--|
| Improvements should reflect the scenic character of the Cape    |   |  |
| Provide protection to residential and business properties       |   |  |
| Protect ground water supplies                                   | Net increase in impervious surface; Avoidance of activity in wellehad         | Consultation with Cape Cod Commission Water Resources Office |
| Minimize impacts/enhance visual environment                     | Description of changes in views at representative locations                   | Field survey   |
| Protect wetlands  | Number of wetlands affected and square feet of encroachment                   | Mass/GIS and town records                                    |
| Protect habitats  | Number of habits affected and square feet of encroachment                     | Mass/GIS and town records                                    |
| Improve regional and local air quality                          | Within regional emissions targets (macro analysis)                            | Air quality conformity process                               |
| Protect historic/archeological resources                        | Specific resources affected and degree  | Mass/GIS and town records                                    |
| Protect parkland/conservation land.                             | Specific park/conservation land affected and degree                           | Mass/GIS and town records                                    |
| Properly address contaminated areas                             | Description of effect on any such areas and measures to appropriately address | Mass/GIS and town records                                    |
| If impacts cannot be avoided, minimize them                     | Mitigation measures for selected alternative(s)                               | Study recommendations  |

| <b>Maintain and enhance support for regional economic activity by strengthening transportation networks</b> |  |  |
|---|--|--|
| Maintain/improve Hyannis connections/accessibility for residents, employees, visitors                       | Auto and transit access modes into Hyannis                             |  |
|   | Travel times to Hyannis resident, business, institutional destinations | Traffic model; analysis of economic activities and potential |
| Provide ease of freight movements into/out of Hyannis   | Travel times for trucks to study area businesses and institutions      | Traffic model; analysis of economic activities and potential |
| Support new development within the Growth Incentive Zone District   | Accessibility to/from GIZ compared to other potential growth locations | Traffic model; analysis of economic activities and potential |

# Hyannis Access Study

Task Force Meeting  
Tuesday, December 12, 2006  
2:00 PM

Heritage House, Hyannis, MA  
Hyannis, Massachusetts

## Attendance

### Task Force Members and Public who signed in:

|                |                         |                      |                           |
|----------------|-------------------------|----------------------|---------------------------|
| George Allaire | Yarmouth DPW            | David Munsell        | Barnstable Planning Board |
| R. F. Andres   | Barnstable Resident     | Paul Niedzwiecki     | Barn Asst Town Mgr        |
| Rick Angelini  | Hyannis COC             | Wendy Northcross     | Cape Cod COC              |
| Robert Berry   | Barnstable Resident     | Robert O'Brien       | Steamship Authority       |
| Ann Canedy     | Barnstable Town Council | Stephanie Ostapowich | Town of Barnstable staff  |
| Peter Doonan   | Barnstable WHO          | Joe Potzka           | CC Reg Transit Authority  |
| Jennifer Doyle | MassRIDES               | John S. Powers       | Hyannisport Resident      |
| Robert Edwards | Yarmouth Resident       | Susan Rohrbach       | Senator O'Leary staff     |
| Peter Fisher   | Centerville Civic Assoc | Steve Seymour        | Town of Barnstable staff  |
| Allen Goddard  | Hyannis Civic Assoc     | Mark Thompson        | Independence Park, Inc.   |
| James Haidas   | Cooke's Restaurant      | Harold Tobey         | Town Councilor            |
| Ed Lambert     | Cape Cod Aggregates     | Steve Voluckas       | Hyannis Resident          |
| Deidre Lang    | WQRC                    | Ruth Weil            | Town of Barnstable staff  |
| John Kenney    | Hyannis COC             | Joshua Wyman         | Boston-Wyman, Inc.        |
| Lev Malakhoff  | CCC Staff               | (Burger King)        |                           |
| Tom Mullen     | Barnstable Land Trust   | Michael Wyman        | Boston-Wyman, Inc.        |
| Bob Mumford    | CCC Staff               | (Burger King)        |                           |

### Executive Office of Transportation Staff:

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Rachel Bain      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |
| Paul Nelson      | Office of Transportation Planning                        |

### Consultant Team:

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |

## Meeting Summary

### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the latest Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She said the web site [www.hyannis-access.com](http://www.hyannis-access.com) provides continuous opportunity for public comment. Also, future public informational meetings will provide further opportunity for public interaction. If there is time remaining after the meeting, comments from the public audience can be addressed.

She informed attendees that the November meeting summary was distributed via email prior to today's meeting. There were no comments and it now posted on the website. Business cards with the website address are also available to Task Force members to pass out to the public.

Adriel reviewed for attendees the progress made to date with the study. Existing projects in the area were reviewed, and goals and objectives have been established. Data on existing conditions has been collected, analyzed and presented. The next planning study tasks involve understanding the future conditions and developing alternatives. This study will involve both roadway and non-roadway recommendations, and today's focus is on the non-highway components: transit services, travel demand management, and the Route 132 Park & Ride lot. Each presenter will cover existing conditions and services as well as options and opportunities for the future.

### CCRTA Transit Services: Existing Conditions, Issues and Opportunities

Mr. Joseph Potzka began with background information on the Cape Cod Regional Transit Authority, saying the Authority's mission is to plan, provide, regulate and coordinate public transit service for the region. The CCRTA includes the 15 Cape towns from Bourne to Provincetown. CCRTA's services include para-transit (b-bus) service, which is a demand responsive, dial-a-ride service for eligible riders; Boston Hospital Transportation, which offers service to 15 Boston Medical facilities from several pick-up stops on the Cape; fixed regional and local routes; summer shuttles with connections to the airport and the beaches; contract services for human services; Council on Aging transportation; and intercity capital assistance. The annual ridership in 2006 approached 660,000 with 47% riding fixed routes, 35% using demand response services and 18% using contract services. Whereas b-bus ridership and ridership on the contracted services is fairly stable throughout the year, fixed route ridership rises significantly in July and August. The CCRTA does not provide school bus, tour & charter, intercity, taxi, rail, or air & ferry services.

Issues for the CCRTA include:

- Most routes are destination rich but origin poor, meaning that it is easier for riders to reach their final destination from the route than it is for riders to reach the route from their home or point of origin.
- The environment along the main routes is not pedestrian friendly.
- Main Street is one-way west-bound, which makes east-bound service to Main Street difficult. The east-bound route is on another road parallel to Main Street and riders must walk to reach Main Street.
- Ridership is low to and from the Barnstable Airport.

- Most riders are transit-dependent and not by-choice riders.

Joe commented that the challenge is for the CCRTA to make the services convenient enough for choice riders. He added that transit must become a community priority to succeed. He also feels that it must be prominent, frequent, and convenient in order to play a role in reducing traffic congestion.

Joe advocated for the recommendations contained within the “Five Year Transit Service & Capital Plan for Massachusetts RTAs” which recommends restoration of service to the levels that existed prior to 2002. It also recommends that service be provided earlier and later in the day and on weekends, and that the frequency of service be increased. It also recommends expansion of service to underserved areas.

Mr. David Munsell asked Joe about the local Villager route between Hyannis and Barnstable Village. Joe replied that the route is not pedestrian friendly, takes too long, and is not conducive to fast, easy service.

### **Other Transit Services, Overall Transit Issues and Opportunities**

Mr. Robert Swierk from TranSystems presented information on other transit services including intercity bus service by Plymouth & Brockton as well as Peter Pan/Bonanza, rail service on Cape Cod Central, ferry service provided by the Steamship Authority and Hy-Line Cruises, and air transportation via the Barnstable Municipal Airport.

Rob echoed some of the issues Joe mentioned and highlighted some other issues for transit services in the area:

- There is a need for more operating funding to improve service frequency.
- Service levels are highest in the summer, but this contrasts with attendance at the community college and holiday retail employment, both of which are highest during the off-season.
- There is a lack of parking availability at terminals.
- Roadway approaches to ferries are congested.

Rob elaborated on some of the opportunities for transit services which Joe had mentioned previously, namely to increase the visibility of transit services by improving transit information with on-street signs, maps, kiosks, and via the media such as web, phone, radio, and newspaper advertisements. He also suggested that:

- Connections be improved to facilitate transfers between modes
- Cross-promotion of transit occur with partnerships between retail, employers, transit
- Roadway projects include targeted pedestrian improvements

Mr. Paul Niedzwiecki asked if Rob could give examples of targeted pedestrian improvements. Rob informed attendees that the Route 132 reconstruction project would include pedestrian improvements. Paul commented that the width of certain roads, like Route 132 and Bearses Way make it difficult to provide for safe pedestrian crossings. Rob commented that some roadway treatments address wide roads. For example, sometimes it's possible to pinch the route in one location or provide an island for pedestrians half-way across.

Wendy Northcross informed attendees that the work of the Cape Cod Transit Task Force resulted in a Smart Guide (see [www.smartguide.org](http://www.smartguide.org)) which promotes transit and teaches tourists how they can travel to and around the Cape without a car.

A question was asked about the estimated baseline of traffic flow that uses transit and the impact on current congestion on a peak Saturday. Adriel responded that information would be obtained and responded to off-line.

Rob explained that next steps would involve the development of improvement options and the development of conceptual costs and benefits. Improvement options will be integrated with roadway and other non-roadway improvements. He asked for additional input for recommendations, and gave his contact information: [rswwierk@transystems.com](mailto:rswwierk@transystems.com) (781) 333-3724.

### **MassRIDES Travel Options**

Jennifer Doyle of MassRIDES presented information on the statewide program that offers free assistance to commuters, employers, and students on alternative travel options. Through their toll-free, bilingual hotline (1.888.4COMMUTE) and their web site ([www.commute.com](http://www.commute.com)), MassRIDES assists travelers find other carpoolers, vanpoolers and the transit options that available to them. Jennifer explained that MassRIDES maintains an extensive ride-matching database which currently contains 10,000 commuters' schedules and home and work addresses. In addition to working with individuals, MassRIDES also partners with area employers to map employee origins and customize plans of mobility and access to worksites. Jennifer listed the many benefits to employers that partner with MassRIDES, including tax benefits, enrollment in the "emergency ride home program", and increased recruitment and retention, among others.

Jennifer reviewed the results of her outreach in the region so far. She listed the current partners on the Cape:

- Barnstable County
- Town of Barnstable
- Cape Cod Hospital
- Cape Cod Community College
- Cape Cod Chamber of Commerce
- Cape Cod Regional Transit Authority
- Cape Cod Commission
- Plymouth & Brockton

Since beginning work in the Barnstable/Yarmouth area in 2003, MassRIDES has registered close to 200 participants. Jennifer plans to increase employer participation, work with stakeholders to promote the program, implement incentive programs, and increase registrants in the MassRIDES database.

Jennifer informed attendees that she will soon be meeting with the management at the Cape Cod Mall and the Barnstable Municipal Airport. Jennifer encouraged input and provided her contact information: [Jennifer.doyle@eot.stae.ma.us](mailto:Jennifer.doyle@eot.stae.ma.us) (617) 892-6086.

### **Route 132 Park & Ride**

Paul Nelson presented information about the statewide Park & Ride program and the lot at exit 6 at Routes 6 and 132 specifically. Paul informed attendees that it is MassHighway policy to provide free

parking along major routes, prioritizing daily commuters. The Route 132 lot utilization is over 100% most days of the week. The site is constrained by a travel plaza, a septic system, steep grade changes on perimeter lands, privately owned land, and Route 6. Options being considered include:

- Use the Hyannis Transportation Center for overflow parking.
- Use the Cape Cod Community College for overflow parking.
- Increase the frequency of Plymouth & Brockton bus service to the outer Cape, so some commuters will park in Harwich.
- Build or lease another parking lot for use by the Plymouth & Brockton Logan Direct patrons or by the charter buses.
- Construct a parking structure at the existing location.
- Expand the Route 132 lot into the unused sections of the travel plaza.
- Ban overnight parking on Route 132 lot.
- Segregate overnight parking to specific section of the lot.

Each option had some benefits such as increasing parking capacity for daily commuters and some disadvantages, such as increased cost or less convenient parking elsewhere.

Paul Niedzwiecki suggested that the septic system be sewerred to free up the septic field. He also suggested that the Cape Cod Conservatory might be amenable to having the land used for parking versus a more commercial use. David Munsell asked if a potential new exit 6 ½ would be able accommodate an adjacent parking lot. Mr. L. Malakhoff asked about the lease details of the service plaza. Ed Lambert suggested that fill for the grade changes would be inexpensive compared to other options. The southeast corner of the interchange is vacant land and it was suggested that that option be investigated. Ms. Wendy Northcross suggested talking to agencies such as the Council for Aging and schools to find alternate parking meeting points and shuttle from there rather than use parking at the Park & Ride lot.

Paul thanked the Task Force for their input. He stated that next steps involve developing a set of draft recommendations for the lot to be included as part of the non-highway solutions. Additional input, questions or comments can be directed to Paul at [paul.nelson@eot.state.ma.us](mailto:paul.nelson@eot.state.ma.us) or at (617) 973-7479.

### **Intelligent Transportation Systems**

Mr. G. Gefrich from TranSystems discussed ITS (Intelligent Transportation Systems) as a consideration for helping to meet the transportation flow needs of the community. ITS are electronic signage systems that respond to information provided from remote locations in real time. This form of signage can encourage different transportation route choices based on information relayed to travelers. Mr. Gefrich asked the Task Force to give thought to where the best locations for ITS would be in the transportation system such as along Route 6, Yarmouth Road, and Route 132.

### **Other Business/Next Meetings**

The next Task Force meeting will be held on Tuesday, January 9, 2007 from 2-4 PM with the location to be determined. Independence Park and Cape Cod Hospital will be topics of presentations at that meeting.

# Hyannis Access Study

**Task Force Meeting  
Tuesday, January 9, 2007  
2:00 PM**

**Hyannis Golf Course  
Route 132  
Hyannis, Massachusetts**

## Attendance

### **Task Force Members and Public who signed in:**

|                   |                          |                      |                           |
|-------------------|--------------------------|----------------------|---------------------------|
| Steve Abbott      | Cape Cod Healthcare      | Paul Lorusso         | Cape Cod Aggregates       |
| George Allaire    | Yarmouth DPW             | Lev Malakhoff        | CCC Staff                 |
| Rick Angelini     | Hyannis COC              | Quincy Mosby         | Barnstable Airport Mgr    |
| Robert Burgmann   | Town of Barnstable Staff | Tom Mullen           | Barnstable Land Trust     |
| Ann Canedy        | Barnstable Town Council  | Bob Mumford          | Cape Cod Commission       |
| Mark Carmichael   | MassHighway District 4   | David Munsell        | Barnstable Planning Board |
| Kathie Charboneau | Resident                 | Paul Niedzwiecki     | Barn. Asst Town Mgr       |
| John Diaz         | Greenman-Pedersen, Inc.  | Wendy Northcross     | Cape Cod COC              |
| Peter Doiron      | Barnstable WHO           | Robert O'Brien       | Steamship Authority       |
| Jennifer Doyle    | MassRIDES                | Stephanie Ostapowich | Town of Barnstable staff  |
| Joe Dugas         | C.S.R. H.G.T. Inc.       | Joe Potzka           | CC Reg Transit Authority  |
| Margo Fenn        | Cape Cod Commission      | Susan Rohrbach       | Senator O'Leary staff     |
| Peter Fisher      | Centerville Civic Assoc  | Steve Seymour        | Town of Barnstable staff  |
| Allen Goddard     | Hyannis Civic Assoc      | Tony Shepley         | Shepley Wood Products     |
| Greg Hunt         | Cape Cod Healthcare      | William Taylor       | MASSBIKE                  |
| Don Keeran        | Assoc to Preserve CC     | Mark Thompson        | Independence Park, Inc.   |
| John Kenney       | Hyannis COC              | Harold Tobey         | Town Councilor            |
| Ed Lambert        | Cape Cod Aggregates      | Steve Voluckas       | Hyannis Resident          |
| Deidre Lang       | WQRC                     | Ruth Weil            | Town of Barnstable        |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Rachel Bain      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |
| Paul Nelson      | Office of Transportation Planning                        |

### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Robert Swierk  | TranSystems Corporation                            |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Public Participation) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |
| Sudhir Murthy  | Trafinfo   |
| Frank Mahady   | FXM Associates                                     |

## **Meeting Summary**

### **Welcome and Opening Comments**

Ms. Adriel Edwards welcomed everyone to the latest Hyannis Access Study Task Force meeting, and thanked Barnstable for hosting the meeting at the Golf Course. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She said the web site [www.hyannis-access.com](http://www.hyannis-access.com) provides continuous opportunity for public comment. Also, future public informational meetings will provide further opportunity for public interaction. If there is time remaining after the meeting, comments from the public audience can be addressed.

She informed attendees that the December 12 meeting summary was distributed via email prior to today's meeting. There were no comments and it now posted on the website. Business cards with the website address are also available to Task Force members to pass out to the public.

The purpose of today's meeting is to see presentations relating to future conditions in the area. Specifically, Cape Cod Healthcare President and CEO Stephen L. Abbott will present future expansion plans for the Cape Cod Hospital. Tony Shepley of Shepley Wood Products and Mark Thompson of Independence Park Inc. will present future growth expectations for Independence Park.

### **Cape Cod Hospital and its expansion to the Independence Park area:**

Stephen Abbott, Cape Cod Healthcare President and CEO opened his presentation with a discussion of an optimal location for a new health care facility on the Cape. Priorities would include a central location, sufficient land, ease of access, proximity to Route 6, and ample parking. The site adjacent to Independence Park in Hyannis was chosen for these reasons.

Mr. Abbott listed the facilities and services of Cape Cod Healthcare. This umbrella organization includes the Cape Cod Hospital, the Falmouth Hospital, a skilled nursing facility, an assisted living facility, and multiple outpatient facilities. The organization also provides mental health services and includes the Cape's largest home health services agency (VNA). The total number of employees across all these locations is 4,650 with a net revenue of \$540 million in 2006. Mr. Abbott said that today's presentation would focus on the Cape Cod Hospital and the new planned facility.

Mr. Abbott discussed the growth of services at the Cape Cod Hospital. Already the busiest emergency room in the state in the summertime, emergency room visits increased to 84,000 in 2006 - a 5,000 increase over 2005. There were 56,000 emergency room visits in 1996. Year-round, the Cape Cod Hospital has one of the top three busiest emergency rooms in the state. He showed slides depicting the growth in the number of outpatient surgeries, MRI scans, and CT scans at the hospital since 1993. Mr. Abbott explained that the main hospital would stay at the downtown location for some time. A significant amount of funds, on the order of about \$200 million, would be necessary to completely relocate the downtown facility. Also, the downtown location has recently been expanded with a new unit of 30 beds in private rooms. About 40-50 new parking spaces have also been created.

Mr. Abbott explained that outpatient services do not require beds – as they are services that are performed within a day. Therefore, it is possible to provide these services at a different location. The new facility will therefore be an outpatient facility with an imaging center, an urgent care center, and a women's

center among other services. It will be called the “Ambulatory Care Center” and the plan is to also provide some medical offices. Mr. Abbott said that Cape Cod Healthcare purchased 42 acres from Cape Cod Aggregates for the development. The site is just north of BJ’s Club, east of Phinney’s Lane and west of Independence Drive.

Some characteristics of the development include:

- 263,100 square feet when fully complete
- Prime office space for physicians
- 3,728 car trips per weekday
- 1,471 car trips per Saturday
- Many of these trips are existing trips currently made to the Cape Cod Hospital.
- Phase 1 target about 30,000 square feet
- Phase 2 target an additional 54,000 square feet approximately
- The phasing and final size of the development will be determined by funding.

Mr. Abbott stated that this information is documented in CC Healthcare’s approved Development of Regional Impact Application to the Cape Cod Commission, which is five years old. The Commission will provide a copy to EOT.

Harold Tobey asked Mr. Abbott if traffic impacts were examined. Mr. Abbott replied that he believes that 6 ½ would provide more direct access to the planned facility as well as relieve traffic to the downtown location. Cynthia Cole asked if the plans included moving the emergency room to the new location. Mr. Abbott said that the new location would not serve any emergency visits, and will not be able to accept ambulances. He explained that it is important to keep the emergency room at the downtown location because of the critical systems that support it. Those systems must stay with the in-patient facility, at least for the foreseeable future. Rick Angelini asked whether the new facility would generate new jobs or if some of the organization’s 4,650 employees would shift to the new location. Mr. Abbott said that it depends on the population projections for the Cape and the demand for services. Tom Mullen considers the new development a great concept and asked how much of a difference a new exit would make since the travel time between the proposed new exit and exit 6 is two and half minutes. Mr. Abbott said that critically ill patients would not be coming to the new facility as it is not an emergency center. Adriel asked if any infrastructure in the area is needed for the new facility. She also asked about the timeline of the development. Mr. Abbott said that the main issue is funding, but that the recruitment of doctors is also a challenge. He commented that there has been significant philanthropic support for the downtown location and for the recruitment of doctors, and his organization is working to generate support for the new planned facility as well. In addition, the lack of prime office space in the mid-cape area is also an issue and that is why the plans include space for about 10 physicians and specialists. He added that the new development would continue, however, whether or not 6 ½ is built. He considers there to be no other suitable location with sufficient land for such a development.

Discussion followed about whether housing for the facility’s staff would be built in the vicinity of the new location to reduce traffic impact. Ed Lambert of Cape Cod Aggregates said that CCA owns 40-50 acres that would be an ideal site for housing for medical personnel.

**Independence Park:**

Adriel invited Tony Shepley, of Shepley Wood Products in Independence Park, to speak to the Task Force about his views on the traffic patterns in the area, business growth and the benefits of a new exit. Mr. Shepley explained that his business is a wholesale lumber distribution center serving contractors and not the general public. He considers the traffic patterns of his employees and customers to be representative of other businesses in the area. With 160 employees and approximately 80 customers patronizing the facility daily, Mr. Shepley estimates about 240 one-way trips or a total of approximately 500 trips are made to and from his facility each day. He estimates that 2/3 of the traffic to his business comes from Route 6 and would use the new exit. Extrapolating, he opined that 2/3 of all the traffic to the Independence Park area would use a new exit instead of Route 132 and Route 28.

Mr. Shepley also discussed truck trips, expressing concern for the safety of truck travel on Route 132 and Mary Dunn in particular. He stated that his fleet has been involved in accidents. He opined that the accidents were caused by over capacity and poor road layout, which he considers symptoms of a road that carries more traffic than for which it was designed.

Mr. Shepley spoke strongly in favor of an exit 6 ½, saying that it would provide safer and easier access for trucks to and from his business. He also remarked that trucks deliver all sorts of goods to the Cape and an exit 6 ½ would serve many other businesses and consumers with more direct access for trucks to make deliveries to business and retail sector. Businesses included in the discussion were Home Depot, Harvey Industries, F.W. Webb, the Cape Cod Mall, and others.

Mr. Shepley said that concerns about undesirable development such as big box stores, strip malls and fast food restaurants could be easily addressed with the Town through zoning.

Mr. Mullen asked if Mr. Shepley if he has considered what the traffic would be like when the Route 132 widening project and the Attucks Lane extension is complete. Mr. Shepley said that he does not consider these improvements to be enough, even including the improvements at Willow Street and exit 7. He suggested a phased approach which would construct a new exit 6 ½ before Route 132 reconstruction is started, to relieve pressure on traffic during the construction phase. Town of Barnstable engineer Bob Burgmann stated that reconstruction of Route 132 is expected to last 2 ½ years. Mr. Shepley also expressed concern about the driving conditions on Route 132 when construction is underway.

Barnstable town resident, Mr. Peter Doiron, disagreed that a new 6 ½ exit would be the answer to the problem.

Mark Thompson, President of Independence Park, Inc., said businesses in Independence Park provide about 5,000 jobs. He said that there are about 45-48 acres of developable land remaining in Independence Park. Ed Lambert added that Cape Cod Aggregates has 100 acres yet to be developed, so together there are about 150 acres remaining for development. Mr. Thompson said he is working hard to select land uses that will provide good jobs. He would also like to see housing constructed for Barnstable residents. Of the 45 acres, 28 acres are being considered for a three-stage retirement living complex with independent, assisted care and full care living facilities for the elderly. Mr. Thompson expects this to generate about 150 - 200 jobs. In response to questions, Mr. Thompson said that Independence Park has no plans to redevelop or intensify use on already-developed parcels within its control, but it's possible that individuals who own their land in the area might do that. He also said that Independence Park has no plans to develop significant retail such as big box stores or strip malls. He added that minor retail developments may be beneficial to support the other businesses in the area. Mr. Thompson informed

attendees that Independence Park would be willing to forego retail development in exchange for exit 6 ½. In response to questions from Harold Tobey and John Kenney, Mr. Thompson said about 4 acres has been donated to the Town of Barnstable for the purposes of a new exit. The land is restricted for that use. He added that another 4 acres could be made available for a commuter lot, if exit 6 ½ were to happen. Mr. Thompson spoke strongly in favor of exit 6 ½, saying it would be for the betterment of the town. He added that development in the park and surrounding area would continue whether or not the new exit is built. David Munsell agreed that adding 6 ½ would be beneficial to the area.

Tom Mullen stressed the need for prudent planning to ensure protection of the area's ground water supply. Tom also expressed concern about the intersection of Independence Drive and Enterprise Drive on Route 132 with the addition of Exit 6½.

**Other comments:**

Paul Niedzwiecki addressed Independence Park and the potential new exit on behalf of the Town of Barnstable. Paul said that his greatest hope is that a comprehensive list of projects be developed with consensus and broad public support. He said that projects should not be pitted against each other, because they are all necessary. Paul also said that it is time to address the needs of year round residents, whose number one complaint is Route 28 followed by Route 132. He stated that the Airport Rotary must be addressed, that every civic organization in Barnstable agreed that exit 6 ½ should be built and that if 6 ½ is built, then the extension to Attucks way is an absolute necessity. He opined that the town will have to go beyond the Transportation Improvement Program (TIP) to get the funding "to do it all". He feels another funding source will be necessary. He asserted that exit 6 ½ alone would not fix the congestion that restricts traffic from accessing the downtown area, and he asked attendees to consider the needs of the southern half of Hyannis. Paul spoke optimistically about rezoning and the development of a comprehensive traffic management strategy while planning for sensitive habitats, water, and wastewater treatment.

Margo Fenn also expressed support for a comprehensive plan.

Adriel agreed with Paul Niedzwiecki's comment that funding will be a critical issue and a compelling case for projects must be made. A comprehensive plan, consensus, and strong public support are other key components to successful project implementation. She informed attendees that across the state, a significant gap between transportation needs and available funds is anticipated based on projections through 2020. This trend is occurring across the nation as well.

Adriel reviewed the work of the 1998 Feasibility Study which focused on alternatives for a new exit 6 ½, to provide background information to the Task Force and inform them of the starting point of alternatives for this study. She stated that the Task Force would not meet next month so that the Study Team can create draft alternatives looking at four general areas of consideration:

- Exit 6 ½
- Airport Rotary
- Key Intersections (2-3)
- Recommendations for Transit and Transit Demand Management

For a potential exit 6 ½, options may include severing Mary Dunn Road from Independence. If the rest area was used for exit 6 ½, other rest area options might include Exit 6 Eastbound or a previously-closed rest area. Regarding the Airport Rotary, the technical team will explore options for converting it to an at-

grade intersection. There is a prior study which will be referenced, and the plans for the new terminal will be considered. A member of the public audience suggested that a roundabout be considered at this location. Cynthia Cole asked that the landscaping in the center of the Rotary be preserved because of the cost incurred from its installation.

Sudhir Murthy from Trafinfo provided an example of traffic simulation of the rotary for the audience. He also reviewed level-of-service (LOS) ratings for intersections in the study area. He displayed the LOS for various approaches at the key intersections. He reminded attendees that the results displayed include projects which are under construction or soon-to-be constructed, like the Route 132 widening project. Phinney's Lane at Route 132 gets an "E" rating with "F" being a failing grade. Route 132 at Independence Drive also rated an "E" and Route 28 at Yarmouth Road rated a "C".

Rob Swierk from TranSystems briefly touched on a range of possible transit improvements being considered including a bus cut-out on Route 132 to allow the bus to pull out of traffic and save on route time.

### **Other Business/Next Meetings**

The next Task Force meeting will be held at a date to be determined in March after some concepts have been drafted. Adriel informed attendees that she would send an email regarding the date and location of the next meeting.

# Hyannis Access Study

**Task Force Meeting  
Wednesday, April 4, 2007  
2:00 PM**

**Heritage House Hotel  
259 Main Street, Hyannis, MA**

## Attendance

### **Task Force Members and Public who signed in:**

|                |                         |                      |                            |
|----------------|-------------------------|----------------------|----------------------------|
| George Allaire | Yarmouth DPW            | Randy Hart           | VHB                        |
| Rick Angelini  | Hyannis COC             | Don Keeran           | Assoc to Preserve Cape Cod |
| Robert Berry   | Barnstable resident     | Ed Lambert           | Cape Cod Aggregates        |
| Ann Canedy     | Barnstable Town Council | Tom Mullen           | Barnstable Land Trust      |
| Eliza Cox      | Nutter,McClennen & Fish | Bob Mumford          | CCC Staff                  |
| Jennifer Doyle | MassRIDES               | Paul Niedzwiecki     | Barnstable Asst Town Mgr   |
| Robert Edwards | Yarmouth resident       | Robert O'Brien       | Steamship Authority        |
| Mark Ells      | Barnstable DPW          | Stephanie Ostapowich | Town of Barnstable staff   |
| John Fallender | MASSBIKE                | Susan Rohrbach       | Senator O'Leary staff      |
| Peter Fisher   | Centerville Civic Assoc | Bill Scully          | MS Transportations Systems |
| Allen Goddard  | Hyannis Civic Assoc     | Steve Seymour        | Town of Barnstable staff   |
| Shirley Gomes  | Cape Cod resident       | Ruth Weil            | Town of Barnstable staff   |

### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |

### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Project Manager)          |
| Joseph Cahill  | TranSystems Corporation                            |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |
| Sudhir Murthy  | Trafinfo   |
| Ed Bromage     | Traffic Modeling Consultant                        |

## Meeting Summary

### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that two future public informational meetings would provide further opportunity for public comment. Adriel informed attendees that the January 9<sup>th</sup> meeting summary has been posted to the website [www.hyannis-access.com](http://www.hyannis-access.com).

Adriel recalled the success of the last meeting, saying that it helped complete the picture of the future conditions. She thanked Sue Rohrbach for bringing Steve Abbott from Cape Cod Healthcare, and John Kenney for bringing Tony Shepley of Shepley Wood Products and Mark Thompson of Independence Park, Inc. to make presentations at that January 9<sup>th</sup> Task Force Meeting.

Adriel stated that today's focus would be on the future "no-build" conditions in the area and some draft conceptual roadway alternatives to address those conditions and the goals and objectives of the study. Committed projects which are expected to be completed by the future year are included in the "no-build" case, but the alternatives to be examined as part of this study are not included. Instead, those alternatives are coded into the travel demand model, tested and compared to the "no-build" case and the base case. Adriel stressed that although some conceptual roadway alternatives would be presented, no decisions have been made yet. She reminded attendees that EOT's role in this study is to oversee the work of the technical consultant, facilitate the process, and coordinate between all the stakeholders. Decisions will be made through the process and we would strive for consensus within the Task Force. Transit alternatives will be addressed in more detail at a later meeting.

### **Remaining questions and "wrap-up" on existing conditions**

Before proceeding with the discussion of the future "no-build" case, Adriel informed members that some items regarding the existing conditions would be addressed. As had been mentioned in an email to the Task Force previously, the research on the future growth patterns revealed that significant growth is expected in the non-retail sectors such as office development. This indicates more traffic is expected to occur during the weekday peak periods and therefore, the team decided to focus the analysis on this time period. The travel demand model was recalibrated and the traffic analysis was re-done to reflect the weekday PM peak hour. To save time in Task Force meetings, Adriel explained that instead of providing all the weekday PM peak hour analyses here in the meeting, she opted to provide documentation explaining the results. She drew attendees' attention to the hand-outs which were provided on the level of service analysis as well as information on the travel demand model. She indicated that all the existing conditions information has been posted to the web site. This includes the presentations on transit, park & ride, ridesharing, and traffic volumes.

Adriel recalled that at the previous meeting, there had been some confusion regarding the before and after conditions at the intersection of Phinney's Lane and Route 132. Sudhir Murthy's existing conditions intersection analysis took into account the improvements to be made at Phinney's Lane as part of the Route 132 widening project, but the level of service is still expected to be unacceptable. Therefore, Adriel asked Sudhir to present information regarding Phinney's Lane. Sudhir showed that the average delay at almost every approach is expected to improve significantly after reconstruction, but that the overall average delay would still be poor. He also showed a depiction of the before and after configuration of the intersection. This information is included in both the hand-out and in the presentation posted to the web site.

George Gefrich then introduced Ed Bromage who is performing the tasks related to the travel demand model.

### **"No-Build" Future Conditions**

Adriel explained that development of the future year "no-build" case requires knowledge of the future year transportation network. Therefore, Planning sought to determine the likelihood of the Yarmouth Road bypass road concept. Through discussions with the Massachusetts Aeronautical Commission, Planning learned that the alignment proposed for the bypass road - along airport property - would have many disadvantages. At the request of Planning, MAC documented their concerns in a letter to the Town of Barnstable. Paul Niedzwiecki spoke to this issue as well saying that the Town will instead examine other options for addressing the bottleneck. Adriel indicated that concepts for addressing the Willow Street/Yarmouth Road bottleneck would be explored and considered as part of this study.

Adriel also informed Task Force members that as part of the "no-build" future case, it would be assumed that Route 28 between Yarmouth Road and the Airport Rotary will have been widened to four lanes.

Mr. Ed Bromage began his presentation "Travel Demand Model Update" with an introduction of the four-step traffic forecasting process:

1. Trip Generation – Based on socio-economic data, the model determines the total number of trips that are produced by the population which are attracted to the employment and shopping sites, among other destinations.
2. Trip Distribution – The model then determines origin and destination pairs.
3. Mode Split – Mode of travel and vehicle occupancy is also taken into consideration.
4. Assignment – Lastly, through an iterative process, the model determines what route travelers take from their origin to their destination.

Ed discussed traffic analysis zones (TAZs) which are traffic loading points. In an ideal world, activities would be simulated at each individual household and business. Traffic would actually be loaded at existing driveways. However, due principally to resource limitations, parcel level data is usually not collected. Instead, community data is usually disaggregated into traffic zones based on demographics, employment, and other characteristics of the zone. Ed showed the extent of the Cape Cod regional model which includes all the mainland Cape towns and almost all the Cape's roadways. Running the model with all the roads activated would require immense resources, so some of the smaller or less significant roads are deactivated. There are methods for summarizing the effects of a neighborhood of small roads. Ed showed three additional depictions of the model in the focus area and the great level of detail included. The first showed the large number of roadways included. The second showed the large number of traffic analysis zones. The third zoomed into the airport area and showed the large number of traffic analysis zones in that small area. Ed showed a map of the study area depicting year 2006 traffic volumes on the road network. The thickness of the roadways indicated average daily traffic volumes. He then showed the same type of map for 2030. Several of the roads were thicker, indicating higher traffic volumes. Most notable were Phinney's Lane, Bearses Way, Barnstable Road, and 6A among others. Traffic growth is expected to occur throughout the area, and traffic along Barnstable Road to the downtown is expected to be significant.

Ann Canedy asked if the cut-through routes Althea Way and Oakmont Drive are included in the travel demand model. Ed responded that they are included and it is anticipated that those routes will carry about 3,000 vehicles over the course of a day and about 400 vehicles in the peak hour in the year 2030.

Mr. Sudhir Murthy presented forecasted traffic volumes entering and exiting the study area. Some general observations were noted. Sudhir noted that traffic into the study area from the east is forecast to increase more than traffic from the west. Growth in traffic from the east, currently using Exit 7 60% of the time, is forecasted to move towards using Exit 6 more frequently. Traffic from the west, currently using Exit 6 70% of the time will also move towards using Exit 7. Several intersections are expected to deteriorate to level of service E and F including: Rte. 132 at Bearses Way, Rte. 132 at Independence Drive, Rte. 28 at Yarmouth Road, Rte. 6A at Hyannis Road. Bob Mumford expressed surprise that travelers would opt for Route 6 to traverse Hyannis as opposed to using Route 132 with Attucks Lane. He asked if the analysis includes the anticipated access to the airport. Sudhir indicated that the Attucks Lane extension is included. In 2030, there is expected to be too much traffic for the system to flow efficiently. Population growth in the outer cape will increase and place higher demands on the system. Backups at failing intersections will result in diversion of local traffic onto Route 6. Adriel commented that the "no-build" analysis highlights why a comprehensive approach is needed: not one solution will address all the traffic issues. She said it also shows the importance of considering transit and other non-highway solutions.

Mr. Tom Mullen asked if Yarmouth Road construction was included in the analysis. Mr. Sudhir reviewed the committed project which are included in the future year "no-build" case:

1. Rte 132 widening and reconstruction of various intersections
2. Reconstructed Willow Street to 600 feet north of Barnstable town line
3. Bearses Way reconstruction and the improved intersection with Route 28
4. Route 28 widened to four lanes from Yarmouth Road to the Airport Rotary
5. The extension of Attucks Lane to the airport access road.

Adriel informed members that concepts for addressing Yarmouth Road would be coded into the model as alternatives.

Ms. Sue Rohrbach asked if the pattern of usage employed in the model accounted for age demographics. Ed responded that population growth is defined from statewide modeling analysis and that seasonal housing is transitioning to year round housing accounting for more population growth than new housing starts. Ms. Gomes commented that it is the number of cars and not the age of the population that is the issue, and that the access problem is a year round concern for people traveling from the outer cape. Mr. Mullen commented that traffic is heavy between 9:00 and 10:30 AM as retired citizens travel after commuters. Adriel agreed that the peak hour volumes are spreading to account for different population demographics.

### **Some Conceptual Roadway Alternatives:**

Adriel called attendees' attention to a flow chart depicting the stages of a project – from planning through to final design, construction and implementation. She reminded attendees that a planning study is at the beginning of the process and that this is a good time to brainstorm. She asked members to keep an open mind at this stage as the goal is to explore various options and develop creative solutions.

Mr. Joe Cahill, a senior engineer at TranSystems, explained that preliminary alternative development includes examining the goals and objectives of the study, referencing existing and projected traffic counts and problem areas, and drafting solutions to address those things.

He said that today's discussion would focus on concepts for a new interchange and improvements or redesign of the Airport Rotary. Later in the study process concepts for the Yarmouth Road/Willow Street corridor and key intersections along Rte. 132 and Rte. 28 would be examined. Major components, features and issues associated with each concept were identified.

Potential locations for a new interchange are:

- The rest area
- West of the rest area
- Mary Dunn Road (with or without northbound access)

Concepts for a new interchange presented and discussed were:

- A trumpet configuration at the rest area which was the preferred alternative from the previous 1998 study
- A trumpet configuration west of the rest area – which would allow maintenance of the rest area and connection the Park closer to its center.
- A partial cloverleaf at Mary Dunn Road, the configuration of which is consistent with other nearby interchanges. Full access would be maintained with this configuration.
- A trumpet configuration at Mary Dunn Road with Mary Dunn Road dead-ended.
- A trumpet configuration at Mary Dunn Road with access maintained to the roadway, but access from the highway to the area of Mary Dunn Road north of Route 6 would be difficult.

Joe explained how each of the concepts would work. He also explained that the concepts which are located at Mary Dunn Way allow for use of the existing roadway and minimize the visual impacts of a fly-over structure.

Mr. George Gefrich noted that a new interchange always puts pressure on the land use around the interchange. There should be consideration of land use and keeping its natural beauty intact. Mr. Tom Mullen strongly discouraged the trumpet configuration alternatives because of the proximity of the water supply wells. If an oil truck were to overturn on a sharp corner of the trumpet, the water supply would be devastated. He also noted that city ramps may be all that is needed since the connection is being made to a local road. George responded that a "slip ramp" or "diamond" concept could be considered as an alternative to the trumpet configuration. Tom also

asked that if Mary Dunn Road was considered as the location, then look at making it a partial interchange with only eastbound ramps. He also expressed concern about the intersection of Independence Drive at Rte. 132. Mr. Bob Mumford said that because the investment in infrastructure for a new interchange would be substantial, the team should consider allowing access to and from east and west of Route 6. Also, the rest area could be relocated if an interchange is to be built. There is some appeal to the simple “diamond” or “half diamond” interchange concept. Ed noted that a significant amount of traffic from a new interchange would use it to access the mall and the airport. Ms. Ann Canedy asked that the team consider using Phinney’s Lane as an entrance point to Independence Park rather than Mary Dunn Road. Ann commented that Mary Dunn Road is an old and windy road and that it is not a destination. There are destinations in the proximity of Phinney’s Lane however, and that road is in better condition. Mr. Goddard asked that a recent acquisition of approximately 100 acres (Barlaco land) which is part of the Cape water supply be investigated as part of the study. Mr. Gefrich responded that Ken Livingston of FHI will identify the property. Ed Lambert of Cape Cod Aggregates commented that the concept located west of the rest area – which would sever Commerce Way – would not be popular with Independence Park because it divides a parcel. When asked what she thought of the concept that provides a new interchange at Mary Dunn but dead-ends the northerly side of it – disconnecting it from Independence Park – Ann commented that she was in favor of that option if modeling shows that traffic improves elsewhere without environmental issues. She expressed a desire to avoid any impacts on the residential neighborhoods in the proximity of Mary Dunn Road. Bob agreed that the community should be protected, but access by emergency vehicles must be considered. He suggested that the team look at alternatives that discourage traffic northbound to Rte 6A but not prevent access altogether. He suggested that the team discuss the concepts with emergency personnel in Barnstable and Yarmouth. Tom commented that heavy traffic to the courthouse could cause problems on Mary Dunn Road.

Airport Rotary concepts were presented:

- Conversion to an intersection (at-grade or grade-separated)
- Conversion to a roundabout (at-grade or grade-separated)

Joe presented two at-grade signalized intersections to replace the current rotary configuration at the Airport. One favors Route 28 to Route 28 traffic, and the other favors traffic between Route 28 and Route 132. Joe also presented a grade separated signalized intersection which would allow traffic traveling between Route 132 and Barnstable Road to flow uninterrupted under the signalized intersection providing connections to the other roadways. He said that this option addresses the forecasted traffic patterns resulting from growth in the growth incentive zone area. Joe then showed two roundabout options – one at grade and the other with the connection between Route 132 and Route 28 submerged under the roundabout.

George Allaire asked about the water table issue if a grade-separated intersection was adopted since one roadway direction would pass under the other roadway. George Gefrich responded that water issues would be taken into consideration. Sue reminded the team that the proposed intersection with Nightingale Lane – part of the proposed road layout for the new Airport terminal - should included in the analysis. Mr. Fallender asked how the bicycle/pedestrian issue would be handled at the intersection, and George responded that bicycle and pedestrian accommodations should be incorporated into the design. It was explained that the roundabout concept is smaller than the rotary so traffic must enter and travel through it much more slowly. If traffic exceeds 1100-1400 vehicles per lane, then a roundabout becomes congested and not optimal.

Adriel asked Joe from an engineering perspective what design options are optimal for the Airport Rotary and a potential new interchange. Joe responded that the grade separated intersection which favors the Route 132 to Barnstable Road traffic would work well in place of the existing configuration at the Airport Rotary, but he could not choose one best option for Exit 6 ½ without seeing further traffic modeling analysis.

Bob asked that the study team not lose sight of the Willow Street/Yarmouth Road corridor. The towns could still use the resources of this group to work on those areas. Adriel expressed strong agreement with that sentiment.

The next steps are to gather input from the Task Force, refine alternatives based on input and traffic review, and evaluate alternatives relative to goals and objectives of the study.

**Other Business/Next Meetings**

Adriel asked that the Task Force continue to provide input regarding the proposed alternatives.

The next Task Force meeting will be held on May 15, 2007 from 2:00 to 4:00 PM with a location to be determined. Please visit the website to obtain information regarding the date and location of the next meeting.

# Hyannis Access Study

**Task Force Meeting  
Tuesday, May 15, 2007  
2:00 PM**

**Yarmouth Town Hall  
Yarmouth, Massachusetts**

## Attendance

### **Task Force members and public who signed in:**

|                |                        |                |                         |
|----------------|------------------------|----------------|-------------------------|
| Sylvia Doiron  | Resident               | Ann Canedy     | Barnstable Town Council |
| George Allaire | Town of Yarmouth DPW   | Steve Seymour  | Town of Barnstable      |
| Bob Edwards    | Yarmouth resident      | Susan Rohrbach | Senator O'Leary         |
| Jennifer Doyle | MassRIDES              | Harold Tobey   | Barns. Town Council     |
| Allen Goddard  | Hyannis Civic Assoc.   | Ruth Weil      | Town of Barnstable      |
| Ed Lambert     | Cape Cod Aggregates    | Cynthia Cole   | Main St BID             |
| Rick Angelini  | Hyannis Chamber        | Bob Mumford    | Cape Cod Commission     |
| Joe Potzka     | CC Reg. Transit Auth.  | Margo Fenn     | Cape Cod Commission     |
| John Lebica    | CC Community College   | Maggie Geist   | Assoc. to Preserve CC   |
| Peter Kenney   | Resident               | Robert O'Brien | Steamship Authority     |
| Mark Ells      | Town of Barnstable DPW | Edward Maroney | Barnstable Patriot      |
| Tom Mullen     | Barnstable Land Trust  |                |                         |

### **Executive Office of Transportation Staff:**

|                |  |
|----------------|--|
| Adriel Edwards | Office of Transportation Planning, Study Project Manager           |
| Paul Nelson    | Office of Transportation Planning, Park & Ride Program Coordinator |

### **Consultant Staff:**

|                |   |
|----------------|---|
| George Gefrich | TranSystems Corporation (Project Manager) |
| Joe Cahill     | TranSystems Corporation                   |
| Robert Swierk  | TranSystems Corporation                   |
| Sudhir Murthy  | Trafinfo                                  |

## **Meeting Summary**

### **Welcome and Opening Remarks**

Adriel Edwards welcomed everyone to the Task Force meeting. She stated that the summary of the April 4 meeting is posted on the study website, and explained that there are a number of handouts, including two that are repeats from the last meeting (Travel Demand Model summary and Summer PM Peak Hour LOS summary). A printed copy of the handout with roadway alternatives, which was emailed prior to the meeting, is also available.

Adriel stated that the purpose of the meeting is to focus on non-roadway alternatives that are being developed by the study team, including transit alternatives and Park & Ride alternatives. Adriel noted that the study team has been working to develop transit alternatives that reflect the existing and future planned conditions as well as the comments received in the Task Force breakout sessions last fall. The study team has reached out to agencies including the Cape Cod Regional Transit Authority (CCRTA) and the Community College, and conducted a transit site tour in April.

### **Transit Improvement Alternatives**

Robert Swierk of TranSystems gave a presentation summarizing the preliminary transit improvements that have been developed as part of the study. Rob began with an overview of the process the study team has used in developing the preliminary transit alternatives, followed by a brief summary of past studies and efforts related to transit in the Hyannis area. Following this summary, Rob described the guiding principles in the development of the transit alternatives, which included focusing on congested corridors and major activity centers in the Hyannis area; improving convenience and travel time; cost-effective solutions (“bang for the buck”); the relationship between pedestrian and transit improvements; and considering both short-term and longer-term improvements.

Following the description of guiding principles, Rob presented the preliminary transit improvement alternatives. The alternatives included:

- Transit information/bike racks at key bus stops
- Improvements to the CCRTA Villager route
- Pedestrian improvements in the Route 132 Mall area
- Improved transfer point at Route 28 & Bearses Way (CCRTA Villager and Sea Line)
- Dynamic Message Signs (DMS) on key roadways
- DMS at key bus stops
- Other CCRTA service improvements

Rob described each of the proposed improvements in detail, with accompanying graphics and maps for site-specific improvements. During and after the presentation, a number of questions were asked by members of the Task Force and the public. The following is a summary of the key questions and points of discussion:

- Joe Potzka of the CCRTA pointed out that a bill that would have increased operating funding for public transit did not pass in the Massachusetts state legislature last year, but will be reintroduced this year. If such a bill were to pass, levels of service would be increased at the state's regional transit authorities, including CCRTA.
- Adriel Edwards noted that the proposed routing changes to the CCRTA Villager route that were presented at today's meeting were reviewed by CCRTA's operations staff beforehand, and a CCRTA operations supervisor gave positive feedback on the changes.
- Tom Mullen asked how people would cross Route 132 in the area of the malls with the proposed pedestrian improvements. Rob Swierk replied that in the shorter term, pedestrian treatments such as a pedestrian-actuated (push-button) signal, better crosswalks, and sidewalks on the north side of the road could be added to improve the crossing. In the longer term, a pedestrian/bicycle bridge could be built across the road. This bridge would need to be carefully designed for it to be accepted and used; one factor working in favor is the grade difference (raised berm) on the Kmart side of the roadway.
- George Gefrich of TranSystems pointed out key features that contribute to the success of pedestrian/bicycle overpasses; these include a design that fits the local area, a wide walkway to make it appealing and comfortable; and approaches that make it convenient for people to use the bridge as part of their routine.
- Ann Canedy expressed a concern about the maintenance costs associated with a pedestrian bridge that might be borne by the local Department of Public Works. George Gefrich noted that there is a cost for an infrastructure element like this one, but that it should be viewed in the context of the benefits it provides, such as improving travel options and reducing vehicle trips. It may be possible to have the malls in the area contribute to the cost of maintaining a bridge.
- Peter Kenney raised concerns about the construction cost of a pedestrian bridge given the level of expected usage, and another question was asked about whether figures are available as to how many people would use such a bridge. George Gefrich noted that hard figures are not available, but that pedestrian bridges in other areas have often been successful at inducing people to walk if they are designed in an attractive, convenient way. A suggestion was made that a shuttle could be run on a trial basis to cross Route 132 and connect the malls on both sides of the road; Rob Swierk noted that in other cities, businesses and developers contribute to shuttles such as this. Sudhir Murthy pointed out that a pedestrian bridge would be a more attractive option than an at-grade crossing with a pedestrian-actuated signal in terms of traffic flow, especially given that the signals on Route 132 will be coordinated once the current construction project is completed.
- Cynthia Cole asked where downtown Hyannis is represented in the set of proposed transit alternatives. Rob Swierk replied that several of the improvements such as signage at bus stops, bike racks at stops, and Dynamic Message Signs would be located in the downtown area. However, the focus of routing changes has not been on the downtown area because it has fairly good service now, the study team believed there to be more room for improvement in other areas. Adriel pointed out that changes to the Barnstable Villager Route, which were proposed, would benefit downtown since the route starts and ends there. More residents and visitors of downtown may opt to use the service more frequently if it is improved.
- Ann Canedy pointed out that a significant amount of development is planned in the Industrial Park area including assisted living housing, and how the proposed

improvements would serve the Industrial Park area. Rob Swierk pointed out that this area is currently served by the CCRTA b-bus and will continue to be, but noted that fixed-route service would be difficult in the area due to the density of development, which is still relatively low. Joe Potzka agreed that fixed-route service in this area is unlikely to be successful.

- A comment was made about the need to think comprehensively about transit improvements, to make sure that they will work in the shorter-term and also in the long-term, many years from now.
- A question was asked about whether the study team has considered a monorail to connect key destinations in Hyannis. Adriel Edwards replied that the study team has not considered a rail option such as this one, particularly an elevated rail system, due to the extremely high capital cost of such a system.
- A question was asked about whether there is coordination occurring or planned between the ferry terminal, the intercity bus operators, and Barnstable Airport. Rob Swierk replied that the study team has had discussions with the ferry operators and the Airport in the context of this study, and the team has also gotten updates on the intercity bus operators through several sources. The Steamship Authority indicated that they have ongoing discussions with Plymouth & Brockton and Peter Pan/Bonanza about coordinating schedules and improving passenger transfers wherever possible.

Rob Swierk and Adriel Edwards asked for the group's input on the proposed Dynamic Message Signs, both along roadways and at bus stops. The following is a summary of the discussion:

- One attendee stated that DMS along Route 6 are a good idea.
- Sue Rohrbach asked what the DMS on Yarmouth Road and Route 28 would help promote – i.e., what choices are offered to drivers at these points? Rob Swierk replied that on Yarmouth Road, the signs could direct people to park at the Hyannis Transportation Center and take the bus from there, or could direct people to the recommended ferry parking lots and provide information about parking availability. The signs on both approaches on Route 28 would offer similar information and options.
- Robert O'Brien noted that the Steamship Authority already has a sign on Route 6 that does this. Rob Swierk added that the intent would be to build on the success of that system and expand it to encourage Park & Ride to buses, inform people of incidents, special events, and other information.
- Peter Kenney stated that it appears that the alternatives and the DMS locations seem to be neglecting Yarmouth to an extent. Yarmouth needs to be considered because it generates significant traffic congestion in Hyannis, especially as travelers and commuters journey along Route 28. Sue Rohrbach stated that she agreed, and recommended placing a DMS on Route 28 West at the decision point for Route 28 and downtown Hyannis – to encourage people to proceed directly to downtown if that is their destination.
- Ann Canedy asked if DMS could be used at the Barnstable Park & Ride lot to inform people of the arrival of buses there. Paul Nelson of EOT noted that the Park & Ride at Exit 6 is leased, although this obstacle could be overcome. Rob Swierk noted that the intercity bus operators are not on the same vehicle location system as CCRTA, but that some type of information could probably be made available by working with the operators.

Some final comments on the transit portion of the agenda include the following:

- Cynthia Cole stated that we should encourage high school and middle school students to take public transit. She also suggested that CCRTA or the state should explore the possibility of sharing resources for providing public transit and school transportation as a way of saving money.
- Jennifer Doyle of MassRIDES described the Safe Routes to School program and noted that Mashpee, Falmouth, and Truro are participating in the program. Jennifer suggested that Barnstable and Yarmouth may want to take part in the future.

Adriel Edwards summarized the discussion by noting that a lot of good questions and comments were raised, and the discussion could certainly continue further. Good points were raised about the costs of an infrastructure investment like a pedestrian overpass on Route 132 that will be considered by the study team. EOT will create a simple survey/comment form on the study website to allow people to add further comments, including those who couldn't make it to today's meeting.

### **Park & Ride Alternatives**

Paul Nelson, Park & Ride Coordinator at the Executive Office of Transportation, gave a presentation on the improvement alternatives that have been developed for the Barnstable Park & Ride at Exit 6 on Route 6.

Paul noted that nine options for the Exit 6 Park & Ride were developed by the Cape Cod Transit Task Force, and options were presented to the Hyannis Access Study Task Force in December 2006. Input from the Task Force was used to develop four alternatives for consideration as part of the Hyannis Access Study. The four alternatives are:

1. Relocate overnight parking to the Hyannis Transportation Center
2. Construct additional parking spaces at the existing location
3. Construct a separate Park & Ride lot at a new location
4. Construct a parking structure at the existing location.

After presenting on each of the alternatives, Paul noted that the next steps include gathering input on the alternatives from the task force and the public; evaluating the projects according to the MassHighway Evaluation Criteria; and recommending short- and long-term alternative(s) in the study's final report based on input gathered in the previous steps.

During and after the presentation, a number of questions were asked by members of the Task Force and the public. The following is a summary of the key questions and points of discussion:

- Cynthia Cole commented that the difference in parking rates between the Hyannis Transportation Center (which charges for parking) and the Exit 6 Park & Ride (which has free parking) is the problem, and suggested that it would be helpful to offer free overnight parking at the Hyannis Transportation Center for people taking intercity buses from there.

- A question was asked about whether the overnight parking in Alternative 2 would be mixed with the other parking or separated. Paul Nelson replied that the overnight parking would be separated by striping and signage.
- An attendee suggested that Alternatives 1 and 2 could be combined. Paul Nelson commented that this is a possibility.
- Adriel Edwards noted that MassHighway's priority is to accommodate daily commuters since they produce the greatest air quality benefit if they shift to other modes. MassHighway cannot charge a fee at its Park & Ride facilities under the current law. Paul Nelson added that while MassHighway's priority is daily commuters, we also don't want to overlook overnight parkers since they are an existing user group.
- Adriel Edwards stated that EOT has been in close contact with the private bus operators, and they will be invited to the public meetings for this study. The feedback from the operators so far has been that any change in the Park & Ride facilities must be convenient to their existing routes, and must be something customers will want to use.
- Paul Nelson noted that the MassHighway Evaluation Criteria that will be used to evaluate the remaining alternatives include cost-effectiveness per space, public support, and other measures. Bob Mumford said that the Commission has the criteria and they are likely posted on the Commission's Transportation Improvement Program (TIP) web page, or interested individuals can contact the Commission to find out more.
- An attendee suggested that the structure option (Alternative 4) could be designed to take advantage of the grade differences on the site to either build more spaces with the same height, or the same number of spaces with a lower profile (but putting the structure partially below grade and partially above).
- A question was asked about who would own the land in Alternative 3, and whether land would need to be taken by eminent domain. Paul Nelson stated that the site is still to be determined, but it may either be on private land or on State-owned land. The State would seek to avoid eminent domain to the greatest extent possible.
- Sue Rohrbach stated that she thinks women would feel safer accessing long-term parking late at night if it were located at the Hyannis Transportation Center than at the far end (along Route 6) of the Exit 6 Park & Ride. Several attendees added comments about various aspects of safety at both locations. Paul Nelson noted that wherever a long-term parking area would be created, the State would use design features such as good lighting, clear visibility, proximity to other activities, and similar measures to improve the safety and security of the site.
- An attendee noted that it might be possible to implement the four alternatives in a phased approach, in that order (Alt 1 – 2 – 3 – 4). Paul Nelson agreed that this might be possible, or they could also function as stand-alone options.
- Bob Mumford noted that a short-term option should be to increase the Plymouth & Brockton service levels to the Harwich Park & Ride lot, which would give people traveling from the Outer Cape a more viable option from Harwich and make it less necessary to use the Exit 6 facility. Bob suggested that a more direct routing where buses from Harwich could avoid traveling through central Hyannis would help as well.
- An attendee asked what rule-of-thumb figures the State has been using to estimate capital cost of creating parking. Paul Nelson replied that the State has been assuming \$4,000 per surface space and \$20,000 per structured space.

- An attendee stressed that the fact that there is a fee for parking at the Hyannis Transportation Center but not at other locations (except the ferry terminals) discourages people from using the HTC. Adriel Edwards pointed out that one option to address this disparity would be to start charging a fee for on-street parking in downtown Hyannis.
- One attendee suggested that a ticket that would allow people who buy an intercity bus ticket to park for free at the HTC would be very helpful. Paul Nelson replied that this might be advantageous, but would have to be discussed between Cape Cod RTA and the private bus operators.

### **Other Business / Next Meeting**

Adriel Edwards noted that due to the extensive discussion on the transit and Park & Ride alternatives, the study team was not able to get to the discussion on the roadway alternatives. This will be continued at a Task Force meeting in June; Adriel will look at possible dates and meeting room availability and send an announcement of the date as soon as possible. At the next meeting, the goal will be to continue the discussion on the roadway alternatives to reach agreement on which options to evaluate over the summer. A bicycle “subcommittee” may also be convened at or around the June Task Force meeting. With just a few minutes left in the meeting, Adriel noted that the study team planned today to present on three main items: another look at a potential Exit 6 1/2, more on the Airport Rotary, and ideas regarding the Airport access roads. These will be discussed at the June Task Force meeting.

## Hyannis Access Study

### Highlights of the 6/27/2007 Task Force Meeting

The Hyannis Access Study Task Force met on Wednesday, June 27, 2007, at the Barnstable High School. The following is a brief summary of the meeting (more detailed summary to come):

#### Airport Rotary Alternatives:

The following alternatives were presented:

- At-grade options – 3 options
  - Route 28 to Route 28 signalized intersection
  - Route 132 to Route 28 signalized intersection
  - Roundabout – unacceptable level of service
- Grade-Separated – 5 options
  - 3 underpass configurations / 2 options above
    - Route 132 to Barnstable underpass
      - Signalized intersection above
      - Roundabout above
    - Route 132 to Route 28 underpass
      - Signalized intersection above does **not** make sense
      - Roundabout above
    - Route 28 to Route 28 underpass
      - Signalized intersection above
      - Roundabout above

Task Force comments were as follows:

- Maintaining access to local businesses is very important.
- Maintaining local character is important.
- The Task Force did not collectively rule out any options at this time, although some reservations about some alternatives were expressed.
- The Task Force would like more information on traffic operations and the estimated costs of the various options before ruling anything out.
- Some attendees expressed some reservations about the option that would submerge Route 132 to Barnstable Road, one reason being the potential complications of access into and out of abutting commercial properties where Barnstable Road would ascend to grade.

#### 6 1/2:

- A different geometric solution not shown previously - a diamond interchange - was shown.
- Several different geometric solutions are possible in the area.
- Potential environmental concerns could be mitigated.
- Traffic modeling to begin this month. Model results will help us evaluate the traffic benefits of a potential new interchange.

#### Yarmouth Road:

- The intersection of Yarmouth Road and Route 28 needs to be addressed first and then options for the corridor itself considered in light of the needed changes to the intersection.
- A one-way pair with Old Yarmouth Road/Rosary Lane may be an option with a widened Yarmouth Road north and south of Old Yarmouth Road/Rosary Lane.
- A widened Yarmouth Road with two lanes southbound and one northbound may be another option.

In addition the above information and comments, Ms. Edwards informed attendees that some of the Airport access roads may affect options for the rotary or the designs of the access roads may need to be re-considered.

#### Bike Subcommittee:

Ms. Edwards indicated she would like to hold a bicycle facility subcommittee meeting to discuss compatibility of the roadway options with bike path plans in the area. Several members of the Task Force indicated interest in the subcommittee. The meeting adjourned at 4:15 PM.

## Hyannis Access Study

**Task Force Meeting**  
**Wednesday, June 27, 2007**  
**2:00 PM**

**Barnstable High School**  
**744 West Main Street, Hyannis, MA**

### Attendance

#### **Task Force Members and Public who signed in:**

|                |                           |                  |                                |
|----------------|---------------------------|------------------|--------------------------------|
| George Allaire | Yarmouth DPW              | John Kenney      | Hyannis Chamber of Commerce    |
| Ann Canedy     | Barnstable Town Council   | Q. Doc Mosby     | Barnstable Municipal Airport   |
| Cynthia Cole   | Main Street BID           | Wendy Northcross | CC Chamber of Commerce         |
| Jennifer Doyle | MassRIDES                 | Robert O'Brien   | Steamship Authority            |
| Mark Ells      | Barnstable DPW            | Susan Rohrbach   | Senator O'Leary staff          |
| Margo Fenn     | Cape Cod Commission       | Ruth Weil        | Growth Management - Barnstable |
| Allen Goddard  | Hyannis Civic Association |                  |                                |

#### **Others in Attendance:**

|                   |                                  |                |                                    |
|-------------------|----------------------------------|----------------|------------------------------------|
| Robert Berry      | Barnstable resident              | Ed Lambert     | Cape Cod Aggregates                |
| David Chamberlain | Jacobs, Edwards & Kelsey         | John Lebica    | CC Community College               |
| B. Clarke         | Barnstable resident              | Peter Kenney   | Resident                           |
| John M. Clarke    | Barnstable resident - Cummaquid  | Lev Malakhoff  | Cape Cod Commission                |
| Peter Doiron      | WHO                              | Ed Maroney     | Barnstable Patriot                 |
| Joseph Donahue    | Barnstable resident - Cummaquid  | Frank Paparo   | Barnstable resident - Centerville  |
| Lawrence Failey   | Cummaquid Heights Assoc.         | Tony Pelletier | Greater Hyannis Civic Assoc.       |
| Lou Gonzaga       | Barn. Economic Devel. Commission | Bill Scully    | MS Transportations Systems         |
| Fayssal Hussein   | Jacobs, Edwards & Kelsey         | Steve Seymour  | Town of Barnstable Staff           |
| George Kovatch    | Barnstable resident - Cummaquid  | Larry Wheatley | Barn. Municipal Airport Commission |

#### **Executive Office of Transportation Staff:**

|                |  |
|----------------|--|
| Adriel Edwards | Office of Transportation Planning, Study Project Manager |
| Rachel Bain    | Office of Transportation Planning                        |

#### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Consultant Project Manager) |
| Joseph Cahill  | TranSystems Corporation (Highway Design)             |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation)   |
| Sudhir Murthy  | Trafinfo   |

### Meeting Summary

#### **Welcome and Opening Comments**

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. The May 15<sup>th</sup> meeting summary was distributed prior to the meeting. There were no comments and it is now available on the website for review. Business cards with the website address are available to Task Force members to pass out to the public.

Ms. Edwards stated that the purpose of today's meeting is to discuss a wide variety of conceptual alternatives for the Airport Rotary and the Yarmouth Road/Willow Street corridor. An update on Exit 6 ½ would also be provided.

Ms. Edwards stated that no preferred options have been selected. Rather, the study seeks to coordinate and facilitate between stakeholders and reach consensus within the Task Force and ultimately with the public as well.

Ms. Edwards addressed comments from the previous Task Force meeting that the transit alternatives focused too much on the Cape Cod Mall area. Ms. Edwards responded that the development of the transit alternatives relied heavily on comments received from the Task Force over the course of the study, especially during the break-out sessions in the fall of 2006 and that should have been reflected in the presentation. The presentation has since been revised and is on the web site along with a survey for Task Force members and members of the public to provide comments. She added that there is a clear need for pedestrian improvements in the mall area and improved service between the downtown and the mall would benefit the entire region.

### **Joseph Cahill – Airport Rotary Conceptual Alternatives:**

Mr. Cahill reviewed various alternatives for the Airport Rotary. Mr. Cahill informed attendees that general features of all the options are:

- All alternatives require widened approaches to accommodate turning lanes to varying degrees.
- The highest volume movement is between Route 132 and Route 28 while the greatest future growth is predicted for the movement between Route 132 and Barnstable Road.
- All alternatives provide an acceptable Level of Service (LOS) as drawn.
- All options eliminate the access road to the airport, which is consistent with the airport improvement project plans.

PowerPoint graphics accompanied each option:

### **At-Grade Options**

#### **Signalized - Option 1**

- At-grade intersection
- Basic 4 leg configuration
- Rte. 28/Rte. 28 and Rte. 132/Barnstable Rd. aligned as through movements
  - Requires left turn for Rte. 132 to Rte. 28 eastbound traffic
- Most straightforward of alternatives developed

#### **Signalized - Option 2**

- At-grade intersection
- Rte. 132/Rte. 28 East aligned as through movements
- Sharp skew angle on Barnstable Rd. and Rte 28 (West) approaches
  - Some tough turning movements
- Wide pavement area
  - Long turning movements = reduced efficiency
- Requires turns for Rte. 28 to Rte. 28 traffic

#### **Roundabout**

- All approaches are widened to two lanes.
- Two lanes would be provided within the roundabout itself
- Would not provide an acceptable level of service (LOS D or better)
- Would need additional lanes on the approaches and/or the roundabout itself which is not recommended

## **Underpass (Grade-Separated) Options**

### **Route 132 → Barnstable Road**

- Similar to At-Grade Option 1 - Roadways realigned with Rte. 132/Barnstable Rd. and Rte. 28/Rte. 28 as through movements
- Rte. 132/Barnstable Rd. (north/south) traffic bypasses intersection/roundabout via underpass
- Results in a traffic reduction of about 25% at the at-grade intersection/roundabout
- Underpass sections would start just east of Nightingale Lane and just south of Lewis Rd. (based on max. 5% grade)
- Underpass with free flow traffic may lead to higher than desirable speeds on Barnstable Rd and Rte. 132.

### **Signalized Intersection**

- Elimination of north/south movement from intersection removes a signal phase
- Traffic between Rte. 132 and Barnstable Road does not go through the signal; therefore, the signal phasing for Rte. 132 to Rte. 28 eastbound, and Barnstable Rd to Rte. 28 westbound can occur concurrently
- Requires widening of approaches (most significant widening would be on Route 28 Eastbound to 4 approach lanes)

### **Roundabout**

- Similar to the previous option but uses a 2 lane roundabout instead of signalized intersection
- Right turn bypass lanes provided for all approaches
- Roundabout could provide gateway feel (landscaping, driver expectation, etc.)
- Roundabout interrupts flow of traffic on Rte. 28.
- Requires only one lane on Barnstable Road (in addition to the underpass)
- Requires two approach lanes on Rte. 132 (in addition to underpass) which will have impacts to adjacent properties

### **Route 132 → 28**

This particular configuration would be expected to reduce traffic by about 27% at the at-grade roundabout.

### **Signalized Intersection**

- Not developed – one of the major benefits of underpass options are that they provide for more efficient signal timing by allowing for opposing lefts
  - This option would require complicated phasing which would reduce this benefit
  - Would require three approach lanes on Barnstable Road and four approach lanes on Rte. 28 eastbound

### **Roundabout**

- Roundabout similar to 132 → Barnstable
  - But with underpass from southbound Rte. 132 to eastbound Rte. 28
- Only 1 underpass lane needed (southbound)
  - 2<sup>nd</sup> Northbound lane does not provide sig. traffic improvement (if needed, could be done at grade along right side of rotary)
- Underpass section from just east of Nightingale to Staples/TJ Maxx shopping center entrance
- Roundabout could provide gateway feel
  - Particularly for Rte.132 to Barnstable Rd. traffic
- Interrupts flow of through traffic on Rte. 28
- Slows all traffic leading to Barnstable Road and downtown which is considered a positive
- Requires a widened approach on Rte. 28 eastbound to accommodate a right turn lane to Barnstable Road

**Route 28 → 28**

- Free-flow through movement for Rte. 28 traffic
- Underpass section starts just west of Hinckley Lane and at Staples/TJ Maxx parking lot
- May discourage travelers from using Main Street as a cut-through route – which may benefit Main Street.
- Slower traffic on local roads serving local businesses
- The design is in keeping with regional connectivity on state route

**Signalized Intersection**

- This configuration would allow a phase to be eliminated from the signal which would improve operations
- Requires widened approaches
- Significant abutter impacts to south side of Rte. 28

**Roundabout**

- Similar to signalized intersection but with a 2 lane roundabout
- Right turn bypass lanes provided
- Roundabout provides gateway look and feel
  - Slows northbound/southbound traffic heading to downtown (alters driver expectation)
- May require less abutter impacts than signalized intersection

Some discussion followed regarding the distinction between the roundabout and intersection grade-separated designs. With the grade-separated intersection designs, there are a few cases where accessing a property in the immediate vicinity of the rotary would be more difficult if your origin was another property in the immediate vicinity of the rotary. Therefore, it is generally considered that the grade-separated roundabout options may offer better access to local businesses, but may not offer the same safety features of a grade-separated signalized option. Roundabouts are also generally considered to provide the benefits of traffic calming and constant flow. Their efficacy depends upon the number of vehicles using the roundabout and the balance of volume between the different approaches to the roundabout.

Mr. Goddard commented that a small roundabout is counterintuitive since the large rotary is currently failing. He expressed support for the intersection solutions. He added later that some businesses close to the Rotary are in jeopardy if not already closed, and that something needs to be done. Mr. Allaire asked about the efficacy of a two-lane roundabout with the variety of travelers from local to tourist. Mr. Murthy commented that two-lane roundabouts operate effectively with proper pavement markings, indicating that the right hand lane is for exiting and entering traffic. Ms. Canedy spoke against any alternative that limits access to local businesses. Ms. Northcross agreed, saying that ease of access to local businesses is very important. Others nodded. Ms. Northcross added that land takings would be an issue. She expressed concern about the size of the at-grade intersection options, the amount of pavement required and the aesthetics. Mr. Mosby spoke in favor of the grade-separated option that would align Rte. 132 and Rte. 28. He questioned the option that would channel traffic down Barnstable Road. He expressed concern for access to the Staples property in that option. Mr. O'Brien commented that he favors the at-grade options for their simplicity, anticipated lower cost, and considers them more likely to happen. He asked if the signal planned for Nightingale Road as part of the airport improvement project would it be impaired by the various grade-separated options. Ms. Edwards informed the audience that based on discussions with the airport, that planned intersection could be relocated west. Ms. Fenn expressed support for the two grade-separated options that suppress either Rte. 132 to Rte. 28 or Rte. 28 to Rte. 28. She considers those through movements as the most important. She added that she thinks the roundabout serves the downtown best with a gateway feel and positive entry to the village.

Mr. Gefrich added that bicycle and pedestrian traffic would have a more predictable traffic pattern to follow with an at-grade intersection as opposed to an underpass. A roundabout with greenery might have more of a village gateway look.

Ms. Fenn asked for the level of delay with each option. She asked if it could be said that the grade-separated options would perform better than the at-grade intersections. Mr. Murthy responded that all the options – as drawn – would provide an acceptable level of service. He explained that the different options are not directly comparable because different tools are used to do the analysis for different types of options but information on the relative traffic benefits would be presented at a future meeting. Mr. Malakoff asked that other information such as a potential safety benefits, also be provided. Ms. Edwards informed attendees that at a later meeting, the team would present information related to all the evaluation criteria which the Task Force developed last fall. Given the level of effort that that requires, the team was interested to know if the Task Force was inclined to immediately rule out some options before that detailed effort begins. That is one of the reasons that information is not provided today.

#### **Sudhir Murthy – Willow Street/Yarmouth Road Corridor:**

Mr. Sudhir Murthy explained that the intersection at Route 28 and Yarmouth Road is the major contributor to the delays on the approaches and needs to be addressed first. Options to address the intersection include modifying the left turn onto Route 28 from Yarmouth Road by making it an exclusive left turn or prohibit the left turn altogether. The addition of left turn lanes from Route 28 onto Yarmouth Road is limited by the fact that Yarmouth Road would need to accommodate traffic from the two left turn lanes.

Options for the Yarmouth Road corridor were also discussed. Significant land takings would be required to widen it to 4 lanes. Mr. Ells suggested that it may be possible to limit the widening to only three lanes since it is generally agreed that only one northbound lane is needed. The other two lanes would serve southbound traffic. The Willow Street section is four lanes for safety concerns and for the exit area. An alternative option may be to utilize Old Yarmouth Road for northbound traffic only, thereby allowing Yarmouth Road to provide two southbound lanes. This would limit the widening to south of Old Yarmouth Road and north of Rosary Lane. Water supply protection must be considered.

#### **Joseph Cahill – Route 6 ½ Alternatives Update:**

Joe Cahill began the discussion of the update on the alternatives for Exit 6½ by responding to questions that had been posed at previous Task Force meetings. One question had been posed about using Phinney's Lane as the location for the potential exit. Mr. Cahill explained that although the existing underpass could be used at Phinney's Lane (similar to Mary Dunn), it is a more circuitous route for cut-through traffic to north, provides less direct access to Independence Drive, and would very likely directly impact residential properties and structures in that neighborhood. It had also been asked if a diamond configuration would work for the potential interchange as opposed to a cloverleaf or trumpet design. Mr. Cahill explained that a diamond interchange was rejected initially because of the vicinity of the water tower and other potential impacts but should not be ruled out completely at this time. A concern had been raised at a previous meeting about the potential for trucks turning over on a trumpet-style ramp. A technique used on the Maine Turnpike in the area of the Kennebunkport and Wells Water District was examined. Drainage ditches impervious to leakage were constructed which would catch any spill and collect the spillage in a basin where they could be siphoned off, thereby protecting a sensitive area.

Mr. Cahill summarized the discussion by saying that various geometric solutions are possible for a potential Exit 6½ and potential environmental concerns could be mitigated. At this point, it is important to know the traffic benefits that such an interchange would bring to the region. Models runs will be conducted over the summer to evaluate the traffic benefits of a new interchange.

#### **Other Business/Next Meetings**

Before concluding the meeting, Ms. Edwards commented that the alternatives for the Airport Rotary are taking into account the airport access roads proposed as part of the airport improvement project. Ms. Edwards asked that the Task Force continue to provide input regarding the proposed alternatives. She indicated that she would like to hold a bicycle/pedestrian facility subcommittee meeting in the next month or so. She turned to the public audience and asked if they had any comments or questions on the meeting. Peter Kenney commented that alternatives need to be timely, affordable, and take into consideration a 4 mile radius and not just the immediate vicinity. The next Task Force meeting will be announced once a date and location are confirmed.

## Hyannis Access Study

### Bicycle/Pedestrian Subcommittee Meeting

Thursday, November 8, 2007

2:00 PM

### Barnstable Town Hall

367 Main Street

Hyannis, MA

#### Attendance

##### **Task Force Members and Public who signed in:**

|                  |                               |                 |                           |
|------------------|-------------------------------|-----------------|---------------------------|
| Lindsey Counsell | Town of Barnstable            | Alisha Parker   | Town of Barnstable        |
| Joseph DiMagni   | VHB (Consultant for Yarmouth) | Roger Parsons   | Barnstable DPW            |
| Mark Ells        | Barnstable DPW Director       | Rebecca Prosser | Americorp                 |
| Jim Lefter       | Yarmouth DPW                  | Sue Rohrbach    | Office of Senator O'Leary |
| Catherine King   | MassRIDES                     | Steve Seymour   | Barnstable GMD            |
| Lev Malakhoff    | Cape Cod Commission           | Caitlin Welsh   | Americorp                 |
| Rob Miceli       | MassBike                      |                 |                           |

##### **Executive Office of Transportation Staff:**

|                |  |
|----------------|--|
| Adriel Edwards | Office of Transportation Planning, Study Project Manager |
| Rachel Bain    | Office of Transportation Planning                        |

#### Meeting Summary

##### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Bicycle/Pedestrian Subcommittee meeting.

Ms. Edwards began the meeting with a brief overview of the previous meeting, held August 7<sup>th</sup> at the Barnstable Municipal Airport. She said that representatives from the towns provided information and maps on existing paths and plans in the study area. She would provide those materials to anyone that was not in attendance at the last meeting. The meeting also covered the statewide bike plan, examples of CMAQ projects, and the new project development guidebook as it relates to bicycle and pedestrian accommodations. She reminded attendees that at the August 7th meeting she explained that the Massachusetts Aeronautics Commission conducted an airspace analysis of the proposed bike bridge over Willow Street in the vicinity of the Route 6 bridge. They expressed concern about the location, since a 6' person would be only 6' from the airspace, but no regulations would be violated. Other items which were brought up at the last meeting included education of bicycle facilities, outreach, and proper signage. However, throughout the meeting both towns emphasized the desire to use EOT's railroad right-of-way which runs parallel to Yarmouth Road to connect the planned Cape Cod Rail Trail extension to the Hyannis Transportation Center. The future Claire Saltonstall path which is to run parallel to Route 6 through the Fish & Wildlife lands would also connect to this segment.

Ms. Edwards asked if there were any questions on the previous meeting. There were none, so she proceeded to agenda item #2 regarding the railroad right-of-way.

**Update on EOT Efforts**

Ms. Edwards informed attendees that she met with Josh Lehman and Cathy Lynds of EOT on October 18 to discuss the railroad right-of-way issue, explaining to them that both Barnstable and Yarmouth would like to share the right-of-way with the railroad and construct a bike path to the HTC. She indicated that both Barnstable and Yarmouth are looking to EOT for guidance and the approval to pursue plans that would use that land.

EOT suggested that the Towns of Barnstable and Yarmouth and the Senator's office write a letter to EOT outlining their goals regarding bike paths in that area, the desire to use the rail right of way (and why), and request EOT's policy on bicycle and pedestrian paths adjacent to active rail lines. This letter will enable EOT to respond more fully in writing. Some comments:

- There is a precedent for bike paths alongside active rail lines in Massachusetts, but not a strong precedent. There seem to be many examples of active rail lines alongside bike/ped trails across the country, though. We will look at some of those later.
- EOT would, in general, discourage a trail alongside an active rail line for safety reasons, but each case will be looked at individually.
- Federal/state laws will apply.
- The amount of rail activity will be taken into account.
- Any plans would require active involvement and cooperation of the operating railroad.
- EOT is to hire rail director soon.
- EOT is to update the state's specifications regarding trails alongside active rail lines.

The idea is that the exchange of letters would provide guidance for next steps.

Mr. Counsell asked if EOT seemed receptive of the idea. Ms. Edwards replied that they were. Joseph DiMagni stated that VHB has done some preliminary work on the feasibility of sharing the rail right-of-way with a bicycle/pedestrian path.

**Update from the Towns – Barnstable**

Lindsey Counsell informed attendees that Senator O'Leary has contacted the Department of Fish & Game, the Division of Fisheries and Wildlife, who owns over 350 acres north of the airport, west of Willow Street, south of Route 6, and east of Mary Dunn Road. The Town would like to build a bike path through the northern section of this land, just south of Route 6, to provide an off-road recreational facility connecting between Sandwich and Yarmouth. This would replace the on-road facility known as the Claire Saltonstall.

Mr. Counsell provided some background information regarding the Fish and Wildlife lands. The Fish and Game Department acquired the land about 20 years ago by eminent domain, fought legal battles to get it, and therefore is very protective of it. The terrain planned for the bike path is a challenge, but it has already been cleared for what was supposed to be a roadway through that area.

The Town has offered 8 - 15 acres in the southwest corner of the wildlife area as compensation for the 9 acres which would be required for the bike path. Mark Ells indicated that the Town has also offered to help with active management of off-road vehicle use. It is expected that the Town will meet soon with the Fish and Game Department to discuss these options.

Ms. Edwards asked about safety concerns given that people hunt in the wildlife area. Mark Ells informed the group that a 150' offset from the path is required and provides the required safety buffer. This is also in effect alongside the Service Road in West Barnstable and there have not been any issues.

Mr. Counsell reviewed some details of the proposed path, indicating on a map where rest areas would be installed. The construction of the bike path may be eligible for Community Preservation Group funds.

Ms. Edwards noted that the Town has a good handle on this project, and may not need the Hyannis Access Study process to facilitate anything at this time or make specific recommendations. It is helpful to be aware of these projects, however, so that they are taken into consideration during the development of any proposed alternatives. In addition, the Hyannis Access Study could give some visibility to this effort, through the public informational meeting.

### **Update from the Towns – Yarmouth**

Mr. DiMagni, consultant for Yarmouth, informed the group that the feasibility study for the Cape Cod Rail Trail Extension was submitted to the MassHighway District Five office. He added that it has been well circulated. The next step is to obtain funding for the next phase: design.

Rachel Bain informed the group that that Cape Cod MPO and the Joint Transportation Committee has set aside 2010 target CMAQ money for future phases of the bike path. A TIP amendment is proposed. They propose to price the projects at 25% design so that they do not undershoot the final cost as time progresses.

The group briefly discussed safety concerns for bicyclists where off-road facilities end and join with heavily travelled roads. Rob Miceli said safety concerns at crossings should not stall any bike project.

### **CMAQ and Transportation Enhancements Funding Process**

Ms. Bain provided the group with an overview of the CMAQ funding source. CMAQ stands for Congestion Management and Air Quality and it is a flexible funding source to help address those goals. \$1.7 billion is allocated nationwide. Historically, Massachusetts has been a poor CMAQ spender, ranking below all the states and Puerto Rico. Ms. Bain explained that as a state, we are not doing those projects that qualify for that type of funding. However, in recent years, the Cape has been doing a good job of spending its annual CMAQ allocation, which is approximately \$1.3 million. The Shining Sea bike path in Falmouth is an example of a project on the Cape that has utilized CMAQ spending. In addition, some transit has utilized the spending as well. In the current TIP, a few key intersection projects will use CMAQ funding, since other funding sources are scarce. However, future CMAQ funding is being targeted for the Cape Cod Rail Trail extension. Lev Malakoff provided additional information on the process, saying that projects are evaluated to confirm that the work qualifies for CMAQ funding.

Ms. Bain provided some information on Transportation Enhancements, saying that they are funded through the existing package of funds allocated to a region. Enhancements use the Cape's target money, whereas CMAQ funds are listed distinctly. For example, Ms. Bain explained that the Route 132 landscaping job was approved as an enhancement, but the funds came out of the Cape's target monies. Enhancement projects are also less flexible than CMAQ projects.

Rob Miceli asked about the Safe Routes to School program. Ms. Bain provided background information on the program, saying that it is characterized by partnerships with local schools, and seeks to encourage kids to bike and walk to school. The program is predominantly about education, but also includes a small amount of infrastructure funds. Mr. Miceli indicated that MassBike is very involved with the program, and that it will grow in the future. Ms. Rohrbach asked where the money comes from. Ms. Bain responded that the money is federal money that is channeled to the states. Mr. Malakoff discussed the regional planning component of project development and implementation, saying that the regional plans provide an overall guide to needed projects. The TIP has to be in conformity with the Regional Transportation Plan.

### **How to Maintain Facilities – A working session**

Ms. Edwards introduced this portion of the agenda by saying that she gathered information in response to concerns about the lack of state funds and commitment to the maintenance of bicycle and pedestrian facilities. Knowing this to be a national problem, she sought to find out how other cities, towns and regions tackle the problem.

The presentation included examples of other bike paths across the state that are being built and maintained through grassroots efforts. Fundraising is often done through a local non-profit and volunteers participate in maintenance activities. She covered a number of resources that can help localities undertake these efforts. In addition, the Office of Transportation Planning

presentation provided resources on estimating the costs of building and maintaining trails. The presentation is posted to the web site.

Two representatives from Americorp Cape Cod discussed their work, examples of existing projects and how they could help with maintenance efforts. They briefly described the application process and provided the group with contact information.

**Next Steps / Other Business / Next Meetings**

Ms. Rohrbach informed attendees that Senator O'Leary is deeply committed to the development of bicycle paths on Cape Cod. He is in the process of writing a proposal for the next bond bill. Ms. Rohrbach indicated that she would be reaching out to subcommittee members for their ideas and cost estimates for the work that needs to occur to continue the progression of these efforts. Ms. Bain suggested that earmarks are especially helpful for planning studies, since money on the TIP is typically reserved for construction.

Mr. Counsell indicated that he would like to have another meeting to review other bicycle plans in the Hyannis area.

Roger Parsons recommended that cost-benefit analyses be conducted to validate the projects. He also emphasized the importance of collaborating with other agencies, such as the National Seashore for educational and real time connection. He considers this an important opportunity.

Ms. Edwards thanked everyone for their participation and said information relating to an upcoming meeting would be emailed out in the coming weeks.

## Hyannis Access Study

**Task Force Meeting**  
**Tuesday, November 13<sup>th</sup> 2007**  
**2:00 PM**

**Hyannis Golf Course**  
**Route 132, Hyannis, MA**

### Attendance

#### **Task Force Members and Public who signed in:**

|                  |                                |                    |                            |
|------------------|--------------------------------|--------------------|----------------------------|
| George Allaire   | Yarmouth DPW                   | Tim Kochan         | MassHighway District 5     |
| Chris Anzuoni    | Plymouth & Brockton            | Steven Lowell      | Cape Cod Cooperative Bank  |
| Robert Berry     | Barnstable resident            | Ed Maroney         | The Barnstable Patriot     |
| George Blanchard | Barnstable resident            | Lev Malakoff       | Cape Cod Commission        |
| Gary Brown       | Barnstable resident            | J. Bruce MacGregor | Barnstable business owner  |
| Ann Canedy       | Barnstable Town Council        | Tom Mullen         | Barnstable Land Trust      |
| Cynthia Cole     | Hyannis Business District      | Bob Mumford        | Cape Cod Commission        |
| Sylvia Doiron    | Barnstable resident            | Paul Niedzwiecki   | Cape Cod Commission        |
| Peter Doiron     | Barnstable resident            | Wendy Northcross   | CC Chamber of Commerce     |
| Joseph Donahue   | Citizen                        | Jen Ouellette      | Register Newspaper         |
| Robert Edwards   | Yarmouth resident              | Maryann Piccirilli | Barnstable resident        |
| Peter Fisher     | Centerville Civic Assoc        | Susan Rohrbach     | Office of Senator O'Leary  |
| Arnold Ginsberg  | Barnstable property owner      | Bill Scully        | MS Transportations Systems |
| Allen Goddard    | Hyannis Civic Assoc            | Harold Tobey       | Barnstable Town Council    |
| John Kenney      | Hyannis Chamber of<br>Commerce | Steve Voluckas     | Barnstable resident        |
| Tom Kerr         | YCGA                           | Sheldon Wolf       | Citizen                    |
| Catherine King   | MassRIDES                      |                    |                            |

#### **Executive Office of Transportation Staff:**

Adriel Edwards      Office of Transportation Planning, Study Project Manager  
Rachel Bain          Office of Transportation Planning

#### **Consultant Team:**

George Gefrich      TranSystems Corporation (Project Manager)  
Joseph Cahill        TranSystems Corporation  
Ken Livingston       Fitzgerald & Halliday, Inc. (Public Participation)  
Sudhir Murthy        TrafInfo  
Ed Bromage            Traffic Modeling Consultant  
Frank Mahady         FXM Associates

### Meeting Summary

#### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that future public information meetings would provide further opportunity for public comment. Ms. Edwards reminded attendees that comments can also be submitted anytime through the website [www.hyannis-access.com](http://www.hyannis-access.com). Meeting summaries and other documentation are also available on the website for review. Ms. Edwards thanked the Golf Course for providing the meeting room. She introduced Catherine King from MassRIDES, who is replacing Jennifer Doyle and noted that Paul Niedzwiecki would be representing the Cape Cod Commission now instead of the Town of Barnstable in his new role of Executive Director of the commission. Ms. Edwards then led introductions around the table.

For the benefit of the public audience, Ms. Edwards reviewed the purpose of this study and the study process. She stated that this study seeks to find a combination of roadway and non-roadway improvements to address congestion and other transportation-related issues in the area. Exit 6½, which is to be discussed today, is considered one of those potential roadway improvements. Improvements at key intersections are also being considered. She referenced a board which depicts the various stages of project implementation, noting that a planning study, such as this one, is the first stage of a project. At this early stage, it is possible to consider a wide variety of potential improvements. The overarching goal of a planning study is to arrive at a set of well-supported recommendations, so that later (more expensive) stages, can progress more smoothly.

Ms. Edwards explained that EOT follows a standard process for its planning studies. Each study involves an examination of current conditions and projects; the development of goals, objectives, and evaluation criteria; the development of a travel demand model; the development and evaluation of alternatives with respect to the stated goals and objectives of the study; and finally the development of recommendations and a final report. At the April 4th meeting, a large number of conceptual designs for exit 6½ were presented. Feedback was received and incorporated into the concepts. Although some development of the alternatives continues, the team has started to evaluate and compare the alternatives, based on the criteria which were developed collectively by the Task Force last fall.

Ms. Edwards stated that today the travel demand model results and traffic analysis of a potential exit 6½ will be presented. Then Joe Cahill will review five geometric designs, highlighting the refinements that have been made. He will also provide construction cost estimates. Finally, an evaluation and comparison of the exit 6½ alternatives will be presented. An evaluation and comparison of exit 6½ to other roadway improvements will be presented at a later date, after the other roadway improvements have been more fully developed. Ms. Edwards then introduced Ed Bromage.

#### **Ed Bromage – Travel Demand Model Results of a Potential Exit 6 ½:**

Mr. Ed Bromage began his presentation with a review of the travel demand forecasting process. Four key steps are:

1. Trip Generation – Based on socio-economic data, the model determines the total number of trips that are produced by the population which are attracted to the employment and shopping sites, among other destinations.
2. Trip Distribution – The model then determines origin and destination pairs.
3. Mode Split – Mode of travel and vehicle occupancy are also taken into consideration.
4. Assignment – Lastly, through an iterative process, the model determines what route travelers take from their origin to their destination.

Mr. Bromage showed that the extent of the Cape Cod regional model includes all the mainland Cape towns and almost all of the Cape's roadways. Ed showed two depictions of the model in the focus area. The first showed that the "activated" roads, highlighted in red, include all the main roads, as well as many secondary roads and local roads. The next depiction showed thick bands of red where growth in traffic is expected to occur between 2006 and 2030. This represents the so-called "no-build" growth accounting for only the currently programmed projects (not including the alternatives.) This was reviewed and discussed in detail at the April 4<sup>th</sup> meeting.

Mr. Bromage then reviewed the expected change in travel demand which would result from a new interchange, compared to the 2030 "no-build". He showed an aerial photograph of the study area with thick bands of yellow where traffic volumes would increase in the event of a new interchange. The model time period is 3:30 PM to 6:30 PM in the summer. The yellow bands show an increase in traffic on Route 6 east of the potential exit, with the most notable increase being between the potential exit and exit 7. A large increase in traffic is also expected along Independence Drive. Smaller increases in traffic are expected on Attucks Lane, Enterprise Drive, Willow Street north of exit 7, and sections of Bearses Way and Phinneys Lane. The next slide depicted the decrease in traffic with bands of green. The most notable decreases are expected to be along Mary Dunn Road north of Route 6, Yarmouth Road, Route 6 west of the potential interchange, and Route 6A east of the potential interchange. Other decreases are expected along Route 28 on either side of the Airport rotary, and sections of Route 132, Attucks Lane, Barnstable Road.

Mr. Bromage then discussed the concept of "desire lines", which are straight lines between two locations, depicting the desired route one would take if one were not constrained by existing roads. He showed a slide that revealed, with desire lines, that the majority of the trips that would use the new interchange originate east of the interchange and are headed for the Park itself, the retail area of the Cape Cod Mall, or a residential area in the proximity of the mall.

Mr. Bromage also reviewed some travel time comparisons. According to the model, travel times from west of exit 6 to the rotary would be significantly longer if a driver were to take the new interchange as compared to the widened Route 132. The

travel time from east of exit 7 to the rotary would be slightly shorter if a driver took the new interchange as opposed to Willow Street to Yarmouth Road to Route 28 to the rotary.

Mr. Bromage summarized the results of the PM peak period travel demand model:

1. Most exit 6½ users travel to/from the east.
2. Most exit 6½ users have origins and destinations in the Independence Drive and Cape Cod Mall area.
3. Interchange 6½ is expected to generally reduce traffic on Route 6A east of Mary Dunn Road.

He added that as the interchange is moved to the west, the benefit to travelers coming and going to the east is decreased. The benefit to travelers coming and going to the west is increased somewhat, but not very much.

*Questions presented to Mr. Bromage included:*

Q: What was the modeling time for the travel forecasts?

A: The modeling time period is a summer weekday PM. Initially the model was based on summer weekend day, but future conditions and forecasts of employment growth within the GIZ indicated that the model should be based on a summer weekday PM, which is when the highest level of traffic is expected within the study area.

Q: What were the assumptions for the Willow St./Yarmouth Road corridor in the travel demand model?

A: The “no-build” model assumes no improvements beyond those that are under construction or definitively programmed. However, additional improvements to the corridor are being developed as alternatives and therefore will be tested in the model as a “build” option.

Q: Does the model take into account that some drivers may prefer exit 6½ to Route 132 because of safety benefits?

A: Safety benefits are not specifically reflected within the travel demand model. Automobile traffic and/or truck traffic may modify their route preferences based on ease of connections but specific issues of safety are not identified within the model.

Comment: Traffic benefits of exit 6½ are fairly localized to the Independence Drive area, and most of the benefits are to drivers coming from the east (Lower Cape). The interchange acts as a short-cut to the Independence Drive area, removing some traffic flow from the Willow Street area.

Q: Why are travel times not calculated to the Cape Cod mall area instead of the Airport Rotary?

A: It is difficult to identify travel times through the Airport Rotary and therefore the travel time comparisons were considered for routes that stopped there.

### **Sudhir Murthy – Traffic Forecast Analysis:**

Mr. Murthy presented an overview of potential traffic impacts of an exit 6½ alternative on specific intersections and roadways in the study area.

Mr. Murthy’s key point was that while there are potential impacts in terms of changes in volumes to a variety of roadways in the study area, impacts both positive and negative are in most cases not expected to change actual levels of service (LOS) at intersections being evaluated within the study area.

He began his presentation with an overview of the expected changes in volumes at the adjacent interchanges – exits 6 and 7. The slide depicted a drop in the number of vehicles coming off and on both interchanges from the east. A slight increase in the number of vehicles coming from and going to the west is to be expected at exit 7, though. Together, these numbers indicate that some drivers that would typically exit at exits 6 and 7 would use exit 6½. Mr. Murthy also showed a slide which reinforced Mr. Bromage’s presentation on the general changes in travel patterns. He then showed some slides which depicted the general traffic volumes at the potential new interchange.

Mr. Murthy explained that when evaluating an alternative, the team examines the following key (problem) intersections to see if there are improvements: Phinneys Lane and Route 132, Independence Drive and Route 132, the Airport Rotary, Yarmouth Road and Route 28, and Route 28 and Bearses Way. Mr. Murthy said that although some volumes go down at some of the intersections, the changes are not significant enough to bring operations to acceptable levels where they are currently failing. Furthermore, while improvements to LOS were observed at other intersections, these intersections were already operating at acceptable LOS. He showed a table listing the before and after LOS values for several intersections.

*Questions presented to Mr. Murthy included:*

Ms. Canedy expressed concern that the model did not take into account routes through the neighborhoods. She indicated that she felt that was why the model showed that the volumes on Mary Dunn Road had dropped – because drivers diverted to the cut-through routes. Mr. Bromage explained that the cut-through routes are included in the model and that volumes do not increase because more people use exit 6½ to head east when leaving the Hyannis area, instead of continuing north on Mary Dunn to Route 6A.

Mr. Mullen stated that he expects traffic west of Mary Dunn Road to be higher with the interchange because people will use the exit to go to Route 6A westbound for Barnstable Village, where the court house is. Ms. Canedy agreed this was her expectation as well. Ms. Edwards said that the team would check the numbers on this after the meeting.

**Joseph Cahill – Exit 6 ½ Interchange Design Alternatives:**

Mr. Cahill, a highway engineer from TranSystems, presented the five<sup>1</sup> design alternatives for exit 6½. The alternatives are situated either at Mary Dunn Road or just to the west of Mary Dunn Road.

- Alternatives were identified as:
  - Alternative 1: Trumpet at Rest Area
  - Alternative 2: Trumpet West of Rest Area
  - Alternative 3: Partial Cloverleaf at Mary Dunn Road
  - Alternative 4: Diamond at Mary Dunn Rd
  - Alternative 5: Trumpet at Mary Dunn Rd

For each alternative Mr. Cahill explained the key design and operational features. He also covered the estimated costs, explaining that none of the cost estimates include right-of-way or property acquisition, design or environmental mitigation costs. The cost estimates, based on MassHighway's 2007 weighted average bid prices, only include the anticipated cost of construction in present year dollars.

Mr. Cahill began with alternative one, which is based on the preferred alternative from the 1998 MassHighway design feasibility study. Mr. Cahill showed how he refined the design and improved the geometry on the ramps. He explained that although this concept would require the relocation of the rest area, it provides the MassHighway recommended separation between exits, and a more direct entrance to and from the industrial park than the concepts at Mary Dunn Road. The estimated cost is approximately \$19 million. The second alternative is similar to the first, a trumpet design and bridges over Route 6, but west of alternative one, which allows for preservation of the rest area and more direct access into the heart of the industrial area. However, this alternative would likely involve residential property impacts north of Route 6. Also, to preserve the rest area, the eastbound on-ramp would be located east of Mary Dunn Road separating it from the rest of the interchange and placing it closer to exit 7. The estimated construction cost is approximately \$18.5 million.

Then Mr. Cahill reviewed three alternatives located at Mary Dunn Road. Concepts were examined at Mary Dunn Road because by using the existing roadway, the construction of a new bridge over Route 6 could be avoided, leading to potentially lower costs and lower visual impacts. Mr. Cahill explained that alternative three, the partial cloverleaf, reflects an interchange design which is typical along Route 6 on Cape Cod – and would therefore be familiar to Cape Cod drivers. It is not expected to require any residential property impacts. However, in order to preserve the rest area, this alternative would require the construction of a collector-distributor road and widening of the Route 6 bridge over Mary Dunn Road. Although straightforward, this concept is estimated to cost approximately the same as some of the other concepts, \$20 million. Mr. Cahill explained that alternative four, the diamond concept at Mary Dunn Road, would not require loops or a collector-distributor road, and therefore, is estimated to cost less than the other concepts - \$10 million. However, the rest area would need to be relocated and there would be impacts to residential properties in the northeast quadrant. Like alternative three, alternative five is another concept at Mary Dunn which preserves the rest area and does not have residential property impacts, but does include a loop in the design, significant modifications to Mary Dunn Road, and widening of the bridge over Mary Dunn Road. The estimated cost is \$19.5 million.

---

<sup>1</sup> After the meeting, a sixth alternative was developed and the presentation and evaluation were updated to include it. The estimated cost is about \$10.8 million.

Bob Mumford noted that since the majority of the benefits are to travelers coming from and going to the east, that perhaps a “half” alternative should be developed that provides access only to and from the east. The team agreed that this is worth consideration and would respond after some further thought on the idea.

### **Ken Livingston- Environmental Screening Review**

Mr. Livingston presented a brief overview of potential environmental and natural resource issues that will have to be further screened and reviewed if any exit 6½ alternative is brought forward for environmental review (which would be the next step in the implementation process). Key issues that will need to be further reviewed include:

- Water supply land/wellhead protection areas
- Protected natural and open space
- Old Kings Highway Historic District
- Noise and visual issues to surrounding land owners
- Vernal pools

Mr. Livingston explained that for each of the proposed alternatives, at a screening level review, the potential impacts would be similar.

### **George Gefrich- Alternatives Evaluation Criteria and Review**

Mr. Gefrich presented an evaluation of five<sup>2</sup> exit 6½ alternatives based on the criteria which were developed with the Task Force last fall. The criteria in turn were based on the study’s goals and objectives – also developed with the Task Force. Positive, negative, or neutral characteristics were symbolized with green circles, red squares and a black diamond, respectively. An empty green circle indicates some benefit, a half full green circle indicates moderate benefit, and a full green circle indicates substantial benefit. An empty red square indicates some impact, a half full red square indicates moderate impact, and a full red square indicates substantial impact. No impact or benefit is symbolized with a black empty diamond. With the alternatives listed across the top of the sheet, and the criteria listed in rows, each matrix contained these symbols so that the alternatives could be compared to each other visually. Mr. Gefrich explained that the selection of symbols was based on information presented earlier by Mr. Murthy, Mr. Livingston and Mr. Bromage.

Mr. Gefrich continued, saying that each of the five alternatives have generally the same potential benefits and impacts for the following goals:

- Improve traffic flow in and around the local focus area
- Improve safety for motorists, pedestrians and bicyclists
- Improve mobility & transportation choice
- Maintain and enhance support for regional economic activity by strengthening transportation networks

For the goal “Protect and enhance the natural and cultural environment”, the potential impacts for each alternative were similar, except for alternatives 3, 4 and 5 which are located within wellhead protection areas (WHPA), whereas, alternatives 1 and 2, are proposed to be located outside WHPAs.

For the goal “Develop recommendations that can be implemented efficiently”, alternatives 3 and 5 may require waivers from the MassHighway design standard because the use of a collector-distributor road extends the merge point to within close proximity of the exit 7 off-ramp. While not technically substandard, it was ranked slightly lower in this area because it is less desirable to have closely spaced weave and merge areas than ones that are well-spaced apart. The other alternatives meet the MassHighway design standards with regards to spacing the interchanges.

Q: Is the potential extension of Attucks Lane into the Rotary area considered?

A: The planned terminus of Attucks Lane is not the rotary – it is the airport. Attucks Lane extension is included in the model.

Q: What are the sources for the forecast model and how is the model developed?

A: The model is a gravity flow model and is based on current land use and development plans and patterns

---

<sup>2</sup> After the meeting, a sixth alternative was developed and the presentation and evaluation were updated to include it.

Comment: There is a concern that when the study team talks about the airport, there is any underlying acknowledgement that the airport will be more than just a “local airport”.

**Other Business/Next Meetings/Additional Questions/Comments**

Ms. Edwards asked that the Task Force to consider the exit 6½ design alternatives and provide her with any comments and/or questions. She indicated that the presentation would be revised slightly and posted to the web site along with a comment form. An email notification will be sent out regarding this when it is complete.

Q: Have any of the exit 6½ alternatives and travel times taken into account new airport configurations?

A: Future scenarios have taken into account what is currently planned at the airport for construction. New plans or improvements still under consideration are not included.

The next Task Force meeting will focus on non-roadway alternatives and issues and will be held on December 5, 2007 from 2:00 to 4:00 PM with a location to be determined. More information will be sent out through an email and also posted to the web site when available.

The public informational meeting is tentatively planned for mid-February or early March.

## Hyannis Access Study

### Task Force Meeting Wednesday, December 5, 2007 2:00 PM

Hyannis Transportation Center  
215 Iyannough Rd.  
Hyannis, MA

#### Attendance

##### **Task Force Members and Public who signed in:**

|                |                                |                  |                                 |
|----------------|--------------------------------|------------------|---------------------------------|
| Chris Anzuoni  | Plymouth & Brockton Bus Co.    | Lisa Maragnono   | PTM/CCRTA                       |
| Tom Bernardo   | Office of Rep. Atsalis         | Lev Malakoff     | Cape Cod Commission staff       |
| Robert Berry   | Citizen                        | Robert Miceli    | MassBike                        |
| Ann Canedy     | Barnstable Town Council        | Quincy Doc Mosby | Barn. Municipal Airport Mgr.    |
| Cynthia Cole   | Hyannis Business District      | Tom Mullen       | Barnstable Land Trust           |
| Sylvia Doiron  | Citizen                        | Bob Mumford      | Cape Cod Commission             |
| Peter Doiron   | Citizen                        | Wendy Northcross | Cape Cod Chamber of<br>Commerce |
| Robert Edwards | Citizen                        | Robert O'Brien   | Steamship Authority             |
| Mark Ells      | DPW Director of Barnstable     | Roger Parsons    | Barnstable DPW                  |
| Peter Fisher   | Centerville Civic Assoc.       | Joseph Potzka    | CCRTA                           |
| Frank Gibson   | AOPA ASM                       | Susan Rohrbach   | Office of Senator O'Leary       |
| Allen Goddard  | Hyannis Civic Assoc.           | Clay Schofield   | Cape Cod Commission staff       |
| John Kenney    | Hyannis Chamber of<br>Commerce | Bill Scully      | MS Transportations Systems      |
| Tom Kerr       | Resident                       | Steve Seymour    | Town of Barnstable staff        |
| Catherine King | MassRIDES                      | Jeff Skeiber     | RHCI                            |
| Tim Kochan     | MHD- District 5                | Geoff Slater     | Nelson\Nygaard Consulting       |
| George Kovatch | Citizen                        | Harold Tobey     | Barnstable Town Council         |
| C. Lovelock    | Citizen                        | Steve Voluckas   | Citizen                         |
| Ed Lambert     | Cape Cod Aggregates            |                  |                                 |
| Steven Lowell  | Cape Cod Cooperative Bank      |                  |                                 |
| Ed Maroney     | The Register                   |                  |                                 |

##### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Ariel Edwards    | Office of Transportation Planning, Study Project Manager |
| Paul Nelson      | Office of Transportation Planning                        |
| Douglas Carnahan | Office of Transportation Planning                        |
| Rachel Bain      | Office of Transportation Planning                        |

##### **Consultant Team:**

|              |  |
|--------------|--|
| Rob Swierk   | TranSystems Corporation                            |
| Leslie Black | Fitzgerald & Halliday, Inc. (Public Participation) |

#### Meeting Summary

##### Welcome and Opening Comments

Ms. Ariel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that two future public information meetings would provide further opportunity for public comment. Ms. Edwards reminded attendees that comments can also be submitted anytime through the study's website [www.hyannis-access.com](http://www.hyannis-access.com). She informed attendees that the summary of the bicycle/pedestrian subcommittee meeting was sent out to Task Force members via email and it is also posted to the web site. The 11/13 Task Force meeting summary will be sent out soon.

Ms. Edwards introduced new Task Force members, Roger Parsons of Barnstable's Road and Bridge Program, and Tom Bernardo, an assistant to Representative Demetrius Atsalis.

Ms. Edwards stated that the focus of today's meeting would be on the evaluation of the non-roadway alternatives – transit and park & ride. In addition, Mr. Mosby would provide an update on the Airport Improvement Project. As time allows, an update on the bicycle/pedestrian subcommittee would also be given.

### **Follow-up from November 13 Task Force Meeting**

The November 13 Task Force meeting provided a comprehensive evaluation of the exit 6 ½ alternatives. Ms. Edwards addressed outstanding items from that meeting. In response to the travel demand model results, which reported that exit 6 ½ would mainly serve travelers coming from and going to the east, Mr. Bob Mumford broached the idea of a half interchange. Could cost savings be achieved for relatively the same benefits? Ms. Edwards informed the Task Force that she discussed this with the engineers. Building an interchange which would only provide access to those coming from and going to the east would have the potential to reduce the cost of the construction project somewhat, but not by half because of the cost to deploy construction crews. These costs would have to be incurred again if the second “half” of the interchange were to be built at a later date. Therefore, if the intention is to provide full access at a future date, it would be more cost effective to build the entire interchange in one phase. In addition, only a few of the alternatives developed would lend themselves to the concept of a half-interchange, such as the diamond concept. Ms. Edwards suggested this be discussed in the report.

Ms. Edwards informed Task Force members that the travel time comparisons which were presented at the November 13<sup>th</sup> meeting are being revisited. The method used to provide the number of minutes to travel the different routes may not fully account for the delay at various intersections. Therefore, the team is working to confirm the travel time comparisons, and if necessary, provide better estimates. Ms. Edwards added that EOT is working on a contract extension for the consultant team and hopes to include that work in the extension.

At previous meetings, some attendees had asked whether Phinney's Lane would be a good location for the interchange, since it provides a more direct route to Barnstable Village (than Mary Dunn Road) and is also more suited to heavier traffic volumes. Ms. Edwards said that Mr. Bromage explained that the travel demand model results show that as the interchange is moved further to the west, the benefit to travelers coming from the east is decreased. The benefit to the travelers coming from the west is increased somewhat, but not by very much. Therefore, from a traffic standpoint, not much is gained by moving the interchange to Phinney's Lane. In addition, property impacts at this location would likely involve residences, and this type of impact is considered very severe. For both these reasons, an interchange at this location is not being developed at this time.

There were also questions at the November 13<sup>th</sup> meeting about the travel demand model results which projected reductions in traffic on Route 6A, in the event of exit 6 ½. The consultant was asked to confirm this and provide a detailed explanation. Ms. Edwards reported that the consultant confirmed that exit 6 ½ would mitigate traffic growth on Route 6A due to the growth in the Independence Park area. In other words, compared to the no-build scenario, traffic on Route 6A would be lower with an exit 6 ½ in place. The detailed written explanation is still in progress and would be provided soon.

Ms. Edwards discussed updates to the web site. After the November 13 meeting, Steve Voluckas provided the engineers with a concept which combined aspects of alternatives 1 and 4. This new alternative was drafted as alternative 6 and added to the presentation. Other revisions to the presentation were made and it is posted to the web site along with a comment form. Ms. Edwards encouraged the Task Force to post their comments on the evaluation of the alternatives and ask others to do so as well. Go to [www.hyannis-access.com](http://www.hyannis-access.com) → Share Your Opinions → and click on “Look at the alternatives and comment” next to the image of alternative 2.

Ms. Wendy Northcross said it appeared as if some exit 6 ½ alternatives would impact neighborhoods, but that it is hard to tell. Ms. Edwards responded that it is possible to zoom into the photos on the web site and get a better idea of potential impacts. (Editor's note: The drawings are draft, conceptual in nature and subject to change. They represent approximate locations and impacts.)

Ms. Edwards asked if there were any further questions on the previous meeting. There were none.

### **Update on Airport Improvement Project**

Mr. Mosby provided an overview of the changes to the Airport Improvement Project. He stated that the project has been scaled back to stay within town and federal funding constraints. He informed the audience that the planned Attucks Lane extension has been re-routed to reduce the number of property impacts, but it will still connect with Airport Road, simply north of the previously planned connection point. Details of the connection are still being worked out, and some property acquisitions will

still need to be made. He also stated that the size of the terminal has been reduced to about 31-34,000 square feet from the previously proposed 42,000 square feet. Mr. Mosby reported that together, these cost saving measures contribute to a reduced project cost of \$32 million from \$44 million, and that the airport continues to seek other cost saving opportunities. Mr. Mosby said that the parking layout would remain unchanged from the previous proposal. Ms. Mosby also discussed a new access point to the airport that is planned on Route 132. The road connecting to the airport access road would run roughly parallel to Hinckley Road. Mr. Mosby said that the Commission is evaluating the traffic impacts of this proposed intersection.

Mr. Mosby indicated that the design phase is expected to take 12 months with groundbreaking expected for December 2008. He indicated that the airport hopes to build the terminal and the Attucks Lane extension simultaneously.

### **Evaluation of Transit Alternatives**

Ms. Edwards provided background information on the development of the transit alternatives. A break-out session at an early Task Force meeting provided input from Task Force members. In addition to a thorough review of existing services and conditions, TranSystems' transit consultant, Rob Swierk, interviewed staff at the CCRTA, the Cape Cod Commission, the Community College, Barnstable Airport, the hospital, the Steamship Authority, and Hy-Line. The CCRTA also hosted a tour of the Barnstable Villager route with their operations staff followed by a meeting to discuss key issues. Draft alternatives were presented at the May 15, 2007 meeting, during which more input from the Task Force was received. After the May meeting, the presentation was revised and posted to the web site along with a comment form. Additional comments have been incorporated, preliminary capital and operational costs have been estimated, and the alternatives evaluated with respect to the criteria developed in cooperation with the Task Force in the Fall of 2006. Ms. Edwards summarized that significant work has been made on the alternatives and although suggestions and comments are still welcome, the Task Force should consider – during Mr. Swierk's presentation – how the alternatives should be prioritized and packaged. The goal of this meeting is to work towards the Task Force's recommendations. Ms. Edwards introduced Mr. Swierk to present the new information and evaluation.

Rob Swierk began his presentation with an overview of the five alternatives:

1. Add signage to all bus stops
2. Bicycle and pedestrian improvements at key stops
3. Barnstable Villager Route improvements (short-term and long-term)
4. Add dynamic signs to roadways
5. Support ongoing and upcoming efforts

A graphic of the study area provided the approximate geographic locations of the alternatives.

Mr. Swierk then reviewed the evaluation criteria which were developed in cooperation with the Task Force in the Fall of 2006, and highlighted the criteria relevant to the transit alternatives. These are improve mobility and transportation choices, protect/enhance natural and cultural environment, maintain and enhance support of regional economic activity by strengthening transportation networks, and costs.

Mr. Swierk then covered his method for estimating benefits. Generally, new ridership potential was estimated based on existing ridership levels, taking into account travel time, wait time, fares, etc. based on adjustment factors from industry research. Other benefits such as intermodal connectivity, air quality benefits, and accessibility to the GIZ and other areas were assessed qualitatively.

Mr. Swierk then covered the method used to estimate costs. He explained that the costs are conceptual level and based on cost databases or typical industry/vendor figures and contain a 10% contingency for uncertainties.

Mr. Swierk then stepped through the alternatives listed above providing the benefits and costs of each. Alternative one was estimated to have a potential demand shift of 10 to 20 summer boarding per day, with improved way finding to attractions, and the opportunity to display signs in multiple languages. The estimated capital costs range from \$80,000 to \$180,000, depending on the dynamic sign type. Operations and maintenance costs range from \$4,000 a year to \$11,000 a year. Alternative two is expected to provide better intermodal connections, easier transfer between the Villager and Sea Line routes, and additional pedestrian safety and walkability benefits. Ridership is not expected to increase as much as with alternative one, perhaps by 5-10 summer boardings a day. Due to construction costs of sidewalks, etc., the expected capital costs are between \$300,000 and \$450,000 with operational and maintenance costs between \$9,000 and \$13,000. The short-term aspect of alternative three, streamlining the Village route, is expected to increase summer boardings by approximately 15 to 25 a day. The short-term version includes a new stop at the Park & Ride lot, which is considered an important intermodal connection. There are not expected to be any capital costs associated with this alternative since the authority already has the buses to support this

streamlined service. It is expected that there will be minimal operational costs due to a small amount of extra mileage. A Task Force member commented that it is important to include Independence Park as a key area for access with transit because of the Hospital outpatient services and senior housing in the future. Mr. Swierk acknowledged this was a great point and idea, but that this effort really focused on improving existing services. Joe Potzka added that a follow-up to this study, a Transit Development Plan for Barnstable, is just beginning. This will include a full analysis of all routes in Barnstable. Journey to work data, existing riders, demographics, route accessibility, and a non-rider survey will all be incorporated. This new study will consider and develop new routes where appropriate.

The long term aspect of alternative three would seek to add peak-only express trips between the Transportation Center and Barnstable Village. The expected increase in summer boardings is between 20 and 40 a day. Capital costs are expected to be between \$275,000 and \$325,000 for one new vehicle. Operational cost increases are expected to be between \$35,000 and \$70,000, depending on the service level. Alternative four, adding dynamic message signs to roadways at six locations, is expected to have the greatest potential demand shift of between 20 and 80 summer trips a day shifted to the HTC lot. The high end of that estimate assumes a change to parking fees to encourage transit. The benefits also include substantial improvement to the accessibility to the GIZ. Capital costs are expected to be between \$240,000 and \$460,000 with operational costs between \$15,000 and \$30,000 a year. Mr. Swierk reviewed the ongoing and upcoming efforts related to alternative five and stated that the benefits and costs vary by project.

Mr. Swierk then reviewed the evaluation of the alternatives with respect to the criteria based on the goals and objectives. Similar to the roadway alternatives, positive, negative, or neutral characteristics were symbolized with green circles, red squares and a black diamond, respectively. An empty green circle indicates some benefit, a half full green circle indicates moderate benefit, and a full green circle indicates substantial benefit. An empty red square indicates some impact, a half full red square indicates moderate impact, and a full red square indicates substantial impact. No impact or benefit is symbolized with a black empty diamond. With the alternatives listed across the top of the sheet, and the criteria listed in rows, each matrix contained these symbols so that the alternatives could be compared to each other visually. All the alternatives provide some benefit with respect to mobility and transportation choice, the environment, and economic activity. Alternatives 2, 3, and 4 are expected to have more benefit than alternative 1 (adding signs), but alternative 1 is considered an important step to laying a solid foundation to the other alternatives. All the alternatives are also expected to have some cost impacts, with the long term aspect of alternative 3 and alternative 4 expected to be the most expensive.

A question was asked whether gas prices, parking cost and availability were taken into consideration? Mr. Swierk replied that these factors were not explicitly considered in the ridership estimates since a mode-split model does not exist for the Cape Cod region, but these factors are important influences on transit demand. The development and evaluation of the transit alternatives did take parking availability into account in a qualitative way, particularly by considering opportunities to improve access and intermodal connections to Park & Ride facilities.

In response to a question, Mr. Swierk noted that sheltering structures could be developed with a Cape-sensitive design and appropriate aesthetic to suit the environment and the weather patterns for the region, building on past work in the region. This will be noted in the study report.

Would new vehicles be bio-diesel or hybrid types? Joe Potzka replied that CCRTA currently has V-20 bio-diesel buses and propane buses, and although the trend is towards hybrid vehicles, the extra cost of \$100,000 per bus is not feasible currently.

Ann Canedy asked if the proposed dynamic signage could be of a type that is moveable? Mr. Swierk responded that that type of signage can be trailer-mounted or fixed in location and that consideration would be looked at in the final recommendations.

Wendy Northcross stated that the cheap and easy transit alternatives should be implemented immediately, and the other alternatives should be combined into a package with the roadway alternatives. She also informed the group that there is a county-wide plan for DMS. Our alternative four should be compatible with that county-wide plan.

Sue Rohrbach commented that the connection of improved transit with roadway improvement construction may shift people to transit because of construction on roads especially with the airport rotary. Mr. Swierk added that the study could recommend that certain transit improvements be implemented at the start of construction, to help mitigate impacts.

Cynthia Cole commented that international visitors would use transit. She cautioned the use of bio-diesel buses when hybrid vehicles are more environmentally sound. She suggested extending creating a Cape Cod theme for the shelters, the signage and the buses to unify the brand of the transit system. She also suggested that more information be provided on the long term option of alternative three because of its high capital costs.

Ms. Edwards informed the audience that the presentation would be revised and posted to the web site for all to view online and provide comments.

### **Update on Park and Ride Alternative**

Ms. Edwards reviewed the development of the park-and-ride alternatives and recalled the Task Force's comments and suggestions from the previous meeting during which these alternatives were discussed. One of the constraints of the existing Route 132 park-and-ride lot is that it is bounded by the travel plaza's septic tank land and area. A suggestion was made to investigate "sewering" the travel plaza by linking it to the Route 132 sewer project. This would free up the septic tank land surrounding the lot. Another constraint of the lot is the land owned by the Cape Cod Conservatory. A suggestion was made to talk to the Conservatory, as it was known they might be open to selling a portion of their land for the lot's expansion. Ms. Edwards said that Mr. Nelson would provide an update on these options. She also indicated that Mr. Nelson would explain proposed changes to state regulations governing park-and-ride lots. The proposal generated a lot of public input and a discussion with the Plymouth & Brockton Bus Company. As a result, alternative one has been modified as Mr. Nelson will explain. Ms. Edwards encouraged the Task Force to consider, as they did with the transit alternatives, how the alternatives should be prioritized and what the recommendations should be for the report. She then introduced Mr. Nelson.

Mr. Nelson began with the proposed changes to the state regulations on park-and-ride lots, intended to address overcrowding and unwanted use of the lots in Massachusetts. Once enacted, these new regulations would allow EOT to prohibit parking at EOT facilities during restricted times, provided that proper signage is posted. EOT would also be able to tow or fine vehicles parked illegally. These new regulations are necessary to implement some of the current alternatives for the lot being considered as part of this study. Mr. Nelson reported that he received a lot of public input on the proposed regulations and also discussed them at length with the private bus carriers. The public and the private bus carriers both strongly support overnight parking at the lot. There is a strong desire to provide overnight parking for third shift workers and customers of the service to Logan, as well as others. Therefore, as a result of this input, alternative one was modified to reflect that overnight parking would not be banned entirely from the lot, but would be limited to a certain length of stay, as yet undetermined, or to a certain area, also as yet undetermined. The alternative was also modified to indicate that the parking fee structure at the Hyannis Transportation Center would be modified to make it more attractive for Plymouth and Brockton customers to park there. The overall plan for changes to the Route 132 park-and-ride lot continues to be guided by this study.

Mr. Nelson reported that EOT met with the Cape Cod Conservatory. They expressed a willingness to work with EOT and were open to selling a portion of their land for the lot's expansion. Mr. Nelson stated that he modified alternative two based on this meeting, indicating that the lot's expansion could be onto land currently owned by the Conservatory. The updated alternatives are posted on the website.

Mr. Nelson also reported that EOT has contacted the Department of Capital Asset Management to learn more about the planned extension of the sewer line to the Cape Cod Community College (4Cs). To connect the Route 132 travel plaza to the planned extension, a line must be run from the plaza to 4Cs to connect to the pumping station because the new line will be a forced main. He stated that a full evaluation of the updated alternatives would also be posted to the website following the meeting.

Ms. Wendy Northcross asked if the land next to the Chamber of Commerce has been looked at as an overflow lot in the long term? Mr. Nelson replied that it is more favorable for the bus service to keep the parking on the one side of the highway at the travel center. Ms. Edwards added that an overflow parking area is useful to keep in mind for the future.

Plymouth and Brockton Bus Company representative, Mr. Chris Anzuoni, commented that P & B could work with EOT to identify new routing possibilities and lots, but it needs to work economically. Multiple stops are a disincentive to park-and-ride commuters. Also, overnight parking benefits P & B commuters as the fares for commuters are offset by fares to Logan.

Chris Lovelock commented that the upper cape is underserved by transit and that commuters from Mashpee, Centerville, and Osterville backtrack to the park-and-ride lot at Exit 6 when they could be served closer to their community. There could be Brownfield sites in Sandwich or sites under electrical wires at 6A and Route 130 that could serve as parking lots rather than clearing more trees at the travel center site. A study is needed of intercity/express services on the Cape, services not currently being looked at by this study.

Mr. John Kenney commented that private land in Independence Park could become a Park and Ride if Exit 6 ½ becomes a reality.

**Other Business/Next Meetings**

Ms. Edwards stated that the next Task Force meeting will be on January 8, 2008 at a location to be determined. She will notify Task Force members by email with a meeting location. Please visit the website to obtain information regarding the date and location of the next meeting.

A public meeting is tentatively planned for mid-February or early March.

## Hyannis Access Study

### Task Force Meeting Tuesday, January 8, 2008 2:00 PM

Hearing Room  
Yarmouth Town Hall  
1146 Route 28, Yarmouth, MA

#### Attendance

##### Task Force Members and Public who signed in:

|                 |                                |                  |                            |
|-----------------|--------------------------------|------------------|----------------------------|
| George Allaire  | Town of Yarmouth DPW           | Lisa Maragnono   | PTM/CCRTA                  |
| Robert Berry    | Citizen                        | Lev Malakoff     | Cape Cod Commission        |
| Ann Canedy      | Barnstable Town Council        | Tom Mullen       | Barnstable Land Trust      |
| Mike Cipro      | Shepley Wood Products          | Bob Mumford      | Cape Cod Commission        |
| Cynthia Cole    | Hyannis Business District      | David Munsell    | Barnstable Planning Board  |
| Patty Daley     | Town of Barnstable             | Paul Niedzwiecki | Cape Cod Commission        |
| Robert Edwards  | Citizen                        | Wendy Northcross | Cape Cod Ch. of Commerce   |
| Mark Ells       | Town of Barnstable             | Robert O'Brien   | Steamship Authority        |
| Peter Fisher    | Centerville Civic Assoc        | Roger Parsons    | Barnstable DPW             |
| Maggie Geist    | APCC                           | John Robichard   | Citizen                    |
| Arnold Ginsberg | Citizen                        | Susan Rohrbach   | Senator O'Leary assistant  |
| Allen Goddard   | Hyannis Civic Assoc            | Bill Scully      | MS Transportations Systems |
| John Kenney     | Hyannis Chamber of<br>Commerce | Steve Seymour    | Town GMD                   |
| Catherine King  | MassRIDES                      | Rick Sigel       | Citizen                    |
| Tim Kochan      | MassHighway District #5        | Jeff Skeiber     | RHCI                       |
| Ed Lambert      | CC Aggregates                  | Geoff Slater     | Nelson & Nygaard           |
| Mark Lohan      | Citizen                        | David Still II   | Barnstable Patriot         |
|                 |                                | Steve Voluckas   | Citizen                    |

##### Executive Office of Transportation Staff:

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |
| Rachel Bain      | Office of Transportation Planning                        |

##### Consultant Team:

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation                            |
| Joseph Cahill  | TranSystems Corporation                            |
| Sudhir Murthy  | Trafinfo   |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |

#### Meeting Summary

##### Welcome and Administrative Items

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting and thanked the Town of Yarmouth for hosting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that two future public informational meetings would provide further opportunity for public comment. The first of these public meetings is tentatively scheduled for Wednesday, February 27, 2008. (Editor's note: The public informational meeting is now planned for Wednesday, March 5, 2008.) In addition, Ms. Edwards informed attendees that comments can be submitted anytime through the study's website [www.hyannis-access.com](http://www.hyannis-access.com), where much more information is available. The November 13, 2007 meeting summary on the evaluation of Exit 6 1/2 has been recently posted to the web site. The December 5, 2007 meeting summary is still in progress and will be sent out to Task Force members soon. Ms. Edwards introduced Patty Daley with the Town of Barnstable's Growth Management Department. Ms. Daley will serve on the Task Force in place of Ruth Weil, who has taken another position with the Town.

### **Follow-up from previous meetings**

Ms. Edwards provided a summary of the team's progress since the last couple of meetings. At the November 13 Task Force meeting on the evaluation of exit 6 ½ alternatives, Task Force members provided comments and asked questions. The team addressed the questions and comments either at the December 5<sup>th</sup> meeting or in subsequent emails to the Task Force. For example, a more detailed explanation of the expected traffic benefits to the north of Route 6 as a result of a potential exit was provided to Task Force members. In addition, the evaluation of exit 6 ½ presentation was revised and posted to the web site along with a comment form. Over 40 comments have been received, and they have been made visible on the web site. Ms. Edwards encouraged Task Force members to read what their neighbors are saying. The Planning office is in the process of responding to all the comments that have been received. She asked if any questions remained on the November 13 meeting? Ms. Ann Canedy stated that a community group in the vicinity of Mary Dunn Road and Route 6A requested a neighborhood meeting so they could provide feedback on the options. The group was considering a spring meeting in the hopes of greater attendance. Ms. Canedy suggested that the public informational meeting may satisfy the need and desire for a neighborhood meeting, but asked if a separate meeting could be held if it is still desired by the group. Ms. Edwards responded that she would be happy to meet with the community group if the public meeting does not satisfy the community's concerns.

Addressing the December 5 meeting on the transit and park-and-ride alternatives, Ms. Edwards reported that the presentation was revised and posted to the web site along with a comment form. She encouraged attendees to submit their comments. She added that the travel time studies are still in progress.

### **Evaluation of roadway alternatives**

Ms. Edwards stated that the focus of today's meeting is on the alternatives for the Airport Rotary and the intersection of Yarmouth Road and Route 28. She provided an overview of the presentation to be shown by Joe Cahill and Sudhir Murthy. She said that the team will be presenting a number of alternatives for these roadway areas, some of which the Task Force has seen previously and some of which they have not. The alternatives have been developed further since they were last presented in June 2007, due to Task Force input and further analysis. Joe Cahill will cover the geometrics, lane configurations, access limitations where they apply, and potential property impacts. Sudhir Murthy will cover the expected changes in travel patterns resulting from improvements. He will also cover information on the traffic operations for the various alternatives. Ms. Edwards stated that all the rotary alternatives are expected to produce similar changes to the *travel patterns* in the area, but they do vary significantly from the *operational* standpoint. Mr. Murthy will review all of this in detail. Then conceptual construction costs and maintenance issues will be presented followed by an evaluation based on the criteria developed by the Task Force collectively in the fall of 2006. Ms. Edwards reminded attendees, that as was the case at the November 13 meeting, the team has not yet compared the benefits and impacts of the rotary alternatives to the benefits and impacts of exit 6 ½ alternatives or intersection improvements. At this stage, the team continues to evaluate and compare alternatives to each other in each area.

Joe Cahill began with an overview of the input from the Task Force and MassHighway on the rotary alternatives that lead to some of the changes being shown today. At the previous meeting, the Task Force expressed concern about the access restrictions that are inherent with the grade-separated intersection options. Therefore, the team dropped both grade-separated intersection options. In addition, the Task Force expressed concerns about the grade-separated option that submerged Barnstable Road. Therefore, that option was dropped as well. The team had a meeting with MassHighway during which MassHighway expressed concern about long-term maintenance costs related to the grade-separated options and encouraged the team to further investigate an updated rotary option. Therefore, the team developed a two-lane roundabout based on the existing layout which will be shown today. In addition, MassHighway discussed with the team the need to incorporate bicycle and pedestrian accommodations in all designs. Therefore, depicted with green lines, allowances for bicycle and pedestrian travel have been incorporated.

Sudhir Murthy reviewed the change in travel patterns that are expected to result from improvements in the two roadway areas. Green and yellow lines were used to depict decreases and increases in roadway volumes, respectively. The first graphic revealed that, in the event of improvements to the Airport Rotary, traffic is expected to shift back to the rotary area, which has been or will have been avoiding the area and using side roads. This is expected to provide a localized benefit. The second graphic revealed that, in the event of improvements to the intersection at Route 28 and Yarmouth Road, traffic will increase on Route 28 and decrease on Barnstable Road, East Main Street, Camp Street, and other local roads. This is similar to the effect of improvements at the rotary in that diverting traffic returns to the major route where it is processed more smoothly. Mr. Murthy then reviewed the major implications of the travel pattern shifts, citing the 2030 summer weekday PM peak hour volumes and volume changes, highlighting that all the build alternatives provide significantly better operations than the no-build.

Mr. Cahill reviewed the five rotary alternatives now under consideration, which include an updated rotary configuration, a four-leg intersection, a split intersection, and two variations of a grade-separated roundabout with an underpass.

### **Alternative 1: Updated Rotary**

Joe Cahill reviewed the following features of the updated rotary:

- Unsignalized at-grade option
- Rotary remains in-place
- Bypass lanes added on 3 of 4 approach legs
- 2 lanes on all approaches
- 2 exit lanes on Route 132 and Route 28 East
- 1 exit lane on Route 28 West and Barnstable Road
- Straightforward construction
- Does not improve existing bike/ped access

Sudhir Murthy explained that this alternative shows acceptable levels of service (LOS) when it is run through a traffic operations analysis. However, the traffic analysis tools do not show the tendency for traffic to stay in the outside lane of the two-lane rotary, slowing traffic volume and increasing safety concerns. Mr. Murthy elaborated that in particular, he expects that a queue will form on Barnstable Road northbound on the approach to the rotary, as drivers will not want to cross the traffic exiting to Route 28 eastbound. Patty Daley also noted that the area has a great deal of tourist traffic that may not be familiar with the rules of a rotary, and that factor needs to be taken into consideration. David Munsell asked if the proposed bypass lane for the reconfigured rotary alternative would draw much traffic out of the rotary. Mr. Murthy responded that 75% of traffic would still have to go through the rotary. Tom Mullen felt that the two lane exits out of the rotary would work well, but the two-lane entry points would not be safe. The two lanes entering at Barnstable Road now clog traffic. A restricted entrance to control safety would be preferred. Mark Ells asked about the costs for the updated rotary. Mr. Cahill responded that the \$1.6 million cost would be for construction costs only. The cost does not include any land acquisition. Property impacts would be driven by the addition of bypass lanes. Roger Parsons asked about the level of service for this option. Sudhir Murthy replied that, theoretically, the overall level of service would be C and the Barnstable Road approach would be E.

### **Alternative 2: Four-leg intersection**

Mr. Cahill reviewed the following key features of the four-leg intersection:

- Signalized intersection
- Roadways realigned as a 4-leg intersection
- Rotary is eliminated
- Widened approaches to accommodate additional through and turning lanes
- Large intersection with numerous turning and through lanes
- A straightforward alternative
- Easier for bikes/peds to navigate

Mr. Murthy said that the intersection is large enough to accommodate the number of lanes required for an acceptable level of service "D". Steve Seymour asked if the year 2030 was used to project traffic when looking at LOS projections and the team responded in the affirmative. Tom Mullen asked if an alternate route for bicycle and pedestrian travel could be accommodated instead of providing for it here at the intersection. He expressed concern that a pedestrian light sequence would delay the traffic flow. Mr. Murthy responded that the MassHighway Design Guidebook requirement is that bicycle and pedestrian needs are considered and accounted for to the extent possible. He added that if the Town would demonstrate a safe alternate route, that would probably suffice. Tim Kochan asked if the levels of bicycle and pedestrian activity had been documented. Patty Daley said the Town is hoping to promote bicycle and pedestrian travel on alternate routes in that area.

Others asked about a potential bypass road for Route 28 westbound traffic to Route 132, using the land north of the intersection for this purpose. Mr. Murthy and Mr. Cahill expressed concern for the merge area on Route 132 were traffic would rejoin the traffic that had traversed the intersection, but indicated that they would consider this further.

This construction cost of this alternative is expected to be about \$3.1 million.

### **Alternative 3: Split intersection**

Mr. Cahill reviewed the following key features of the four-leg intersection:

- Roadways realigned as two offset intersections
- Route 28 is the through movement
- Barnstable Road and Route 132 offset from each other (~175')
- 2 coordinated signals
- 5 westbound lanes along Route 28 approaching from east

Mr. Cahill further explained that the split intersection has Route 28 as the through movement with two coordinated signals splitting a large intersection into two smaller intersections. Mr. Murthy explained that this design can be more efficient from a traffic operations standpoint. The limitation is a possible queue overflow due to limited storage between the intersections especially if the signal coordination is off. Moving the two intersections further apart would reduce the risk for queue overflow, but increase property impacts. Steve Seymour asked how far apart would be ideal, and Mr. Murthy responded that 350-400 feet would provide improved LOS. The intersection with Barnstable Road would be moved further east on Route 28. Roger Parsons asked what the LOS rank would be for the split intersection and the response was LOS "C". Lev Malakoff questioned the reality of the difference between a single intersection with LOS "D" and two intersections with LOS "C", indicating that the combined delay would approach or exceed the delay at one large intersection. Mr. Murthy acknowledged that this can be the case. Cynthia Cole expressed concern that the design provides only one lane southbound to Barnstable Road, which appears to hamper traffic heading for downtown Hyannis. She expressed concern that the two adjacent intersections appear to be psychologically more difficult. Mr. Murthy responded that one lane is enough because the traffic from Route 132 to Route 28 eastbound moves at the same time, and those volumes dictate the amount of time given to the light, which is enough to handle the volume headed south on Barnstable Road. For example, 603 cars travel at peak in the two lanes from Route 132 to Route 28 while at the same time, 360 cars travel from Route 132 to Barnstable Road in the single lane. Each lane processes approximately the same number of cars. Turn lanes and additional approach lanes are accommodated in the design. Mr. Mullen and Mr. Ells commented that a free through-lane for Route 28 to Route 132 should be looked at again (as was requested for the four-leg intersection) and thereby eliminate two lanes going through a signalized intersection. Mr. Murthy cautioned that ultimately the traffic must merge on Route 132. He explained that this merge could present problems, whereas the signal provides control. Mr. Mullen also asked about ramp metering to control the volumes of traffic that approach the rotary, and suggested that perhaps they could be operational only during peak times. Mr. Murthy cautioned that a very big area is needed to make that work. Roger Parsons said that the area presents a challenge of both engineering and planning and that possible new land uses should be examined in conjunction with the designs. There followed a question about spreading the two intersections further apart to reduce the risk of queue overflow – the property impact would be two buildings – how would the community feel about these property impacts? Mr. Cahill pointed out the access restrictions which would be introduced with this design. The construction cost for LOS "C" would be \$3.1 million (without property takings). Mr. Ells requested that the Town have more time to consider these options and provide more feedback.

A discussion was held about safety differences between the rotary versus an intersection. Arnold Ginsberg commented that accident rates are high and safety must be kept as the highest priority. Tom Mullen commented that fender benders predominate in the existing Airport Rotary without injuries or fatalities.

#### **Alternatives 4 and 5: Underpass Options**

Mr. Cahill reviewed the following general characteristics of both underpass options:

- Underpasses used to bypass through traffic from roundabout
- Boat sections create barriers that impact abutter access
  - Use of roundabout helps to counteract this restriction
- Right turn bypass lanes provided
- Roundabout could provide gateway feel
  - Slows N/S traffic heading to downtown
  - Alters driver expectation
- Still allows all movements to be accommodated at the roundabout
- Use of bypass lanes and a roundabout creates difficulty for bike/peds

Mr. Cahill cautioned that the construction of both underpass options would be complicated and the long-term maintenance needs would be significant. There would be greater ongoing inspection and maintenance work for the tunnels and boat sections compared to the at-grade options.

Mr. Cahill then reviewed the following key features of the Route 132 to Route 28 grade-separated roundabout option:

- Only 1 underpass lane needed (SB)
  - 2<sup>nd</sup> NB lane could be done at grade along right side of rotary
- Boat section from just south of Nightingale to Staples/TJ Maxx shopping center entrance
- Very long underpass structure needed (~600' long tunnel)
- Will need to contend with possible drainage and groundwater issues
- Interrupts flow of through traffic on Rte. 28
- Requires 2 exiting lanes on Barnstable Road and Route 132
- Significantly increases future maintenance requirements and costs

Mr. Murthy informed the Task Force that this grade-separated option is expected to perform at a level of service "C". Mr. Cahill explained that the construction cost for this option would be \$19.6 million.

Mr. Cahill then reviewed the following key features of the Route 28 to Route 28 grade-separated roundabout option:

- Free-flow through movement for 28∅ 28 traffic
- Boat section starts just west of Hinckley Lane and at Staples/TJ Maxx Parking Lot
- Potentially provides positive impacts on Main Street
- Bypass in keeping with regional connectivity on state route
- Requires less abutter impacts than signalized intersection
- Difficult construction sequencing and impacts
- 2 lane underpass needed
- Will need to contend with possible drainage and groundwater issues
- Significantly increases future maintenance requirements and costs

Mr. Cahill explained that the construction cost for this option would be \$14.6 million. Mr. Murthy indicated that the level-of-service for this option is expected to be similar to the level-of-service for the at-grade four-leg intersection. He opined that this grade-separated option is not worth the expense for the traffic benefits it delivers.

Sue Rohrbach asked if the airport entry access has been taken into consideration for any of the alternatives. The study team responded that the communication and dialogue with the airport continues as their plans develop and change. A proposed entry to the Airport on Route 132 which was in close proximity to the rotary has been discarded and another entry point further west on Route 132 is being investigated. The team acknowledged that the Route 132 to Route 28 grade-separated option would have implications for an intersection for the Airport on Route 132. Mark Ells asked the Task Force to consider the beneficial implications of improved level-of-service to Hyannis, albeit at a higher cost.

#### **Route 28 and Yarmouth Road Intersection**

Mr. Murthy explained that 27% growth in volume north-south and 20% east-west is anticipated in future projections. The alternative adds necessary turning and through lanes. The build assumption for 2030 is that the intersection will be widened to two lanes both ways. The alternative shifts the center of the intersection slightly east to minimize impacts, and dead ends southern section of Yarmouth Road. Cedar Street is extended to create a connector road from Yarmouth Road to Camp Street. The alternative holds the western edge of the pavement and widens to the east with property impacts to the east of the intersection. Construction costs are estimated to be about \$2.1 million.

Ann Canedy commented that access to businesses along the corridor is difficult, and that access management must be included in plan. Cynthia Cole expressed concern that Yarmouth Road was no longer connected to Route 28 directly. She opined that the arrangement between Camp Street and Yarmouth Road should be different so that southbound traffic could continue unimpeded down Yarmouth Road. Mark Ells requested that the Town have more time to consider the options. Robert Sigel owns property and two buildings at Camp Street and Route 28, and he would like guidance from the state as to property impacts and the future build date considerations before putting further investment into the properties. Bob Mumford requested that Yarmouth Road be included in the study, and Tom Mullen echoed his sentiments. Ms. Edwards responded that the study team has found that addressing the intersection addresses the issues along the Yarmouth Road corridor to a large degree. The team has found that the issues along the corridor, once the intersection is fixed, are related to local access issues. On the southbound approach, left hand turns into the businesses creates queues further north. In addition, exits from the businesses also create queues along the corridor. These findings are consistent with the opinion of Town officials, voiced several months ago when alternatives for the corridor and intersection were being explored. Both the study team and Town officials agreed that the improvements to the intersection should drive improvements to the corridor.

#### **Evaluation Criteria**

George Gefrich presented the evaluation criteria for each alternative. Peter Kenney wanted to know if changes to the Airport Rotary would have a regional impact or only local impact. Mr. Murthy replied that there would be a regional impact as it is an important node but that impact to local traffic volumes would be most evident.

#### **Other Business/Next Meetings**

Ms. Edwards stated that the next Task Force meeting will be tentatively on February 7, 2008, and the first of two public meetings will be held on February 27, 2008 with locations to be determined. She will notify task force members by email with confirmations of dates and meeting locations. Please visit the website to obtain information regarding the date and location of upcoming meetings.

## Hyannis Access Study

**Task Force Meeting**  
**Thursday, February 7, 2008**  
**1:45 PM**

Selectman's Hearing Room  
Barnstable Town Hall  
367 Main Street, Hyannis, MA

### Attendance

#### **Task Force Members and Public who signed in:**

|                |                           |                  |                              |
|----------------|---------------------------|------------------|------------------------------|
| Rick Angelini  | Hyannis Area Chamber      | Catherine King   | MassRIDES                    |
| Chris Anzuoni  | Plymouth & Brockton Bus   | Tim Kochan       | MassHighway District 5       |
| Robert Berry   | Citizen                   | John Lebica      | Cape Cod Community College   |
| Bob Burgmann   | Town of Barnstable staff  | Lev Malakoff     | Cape Cod Commission staff    |
| Ann Canedy     | Barnstable Town Council   | Quincy Doc Mosby | Barnstable Municipal Airport |
| Mike Cipro     | Shepley Wood Products     | Tom Mullen       | Barnstable Land Trust        |
| Cynthia Cole   | Hyannis Business District | Bob Mumford      | Cape Cod Commission          |
| Bill Cronin    | Citizen                   | David Munsell    | Barnstable Planning Board    |
| Patty Daley    | Town of Barnstable        | Wendy Northcross | Cape Cod Ch. of Commerce     |
| Robert Edwards | Citizen                   | Robert O'Brien   | Steamship Authority          |
| Mark Ells      | Town of Barnstable        | Roger Parsons    | Town of Barnstable           |
| Peter Fisher   | Centerville Civic Assoc   | Susan Rohrbach   | Aide to Senator O'Leary      |
| Maggie Geist   | Assoc. to Preserve CC     | Steve Seymour    | Town of Barnstable staff     |
| Allen Goddard  | Hyannis Civic Assoc       | Harold Tobey     | Barnstable Town Council      |
| John Kenney    | Hyannis Ch. of Commerce   |                  |                              |

#### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |
| Rachel Bain      | Office of Transportation Planning                        |

#### **Consultant Team:**

|               |  |
|---------------|--|
| Joseph Cahill | TranSystems Corporation                            |
| Sudhir Murthy | Trafinfo   |
| Leslie Black  | Fitzgerald & Halliday, Inc. (Public Participation) |

### Meeting Summary

#### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting and thanked Barnstable for hosting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She stated that two future public informational meetings would provide further opportunity for public comment. The first of these is scheduled for Wednesday, March 5, 2008. Ms. Edwards also reported that comments can be submitted anytime through the website [www.hyannis-access.com](http://www.hyannis-access.com). Meeting summaries and other documents are also available on the website for review.

Ms. Edwards recalled that the January 8th discussion on the alternatives for the Airport Rotary and the intersection of Yarmouth Road and Route 28 generated substantial input from Task Force members. She reported that a subcommittee meeting was held to discuss the ideas in more detail, and as result, revisions have been made to the alternatives. These would be presented today. In addition, the team would discuss the format and content for the March 5 public informational meeting.

### **Revised Roadway Alternatives**

Mr. Sudhir Murthy and Mr. Joe Cahill made a PowerPoint presentation of revised roadway alternatives under consideration.

### **Route 28 and Yarmouth Road Intersection**

Mr. Cahill described the changes that were made to the Route 28 and Yarmouth Road intersection alternatives as a result of input received at January 8th Task Force meeting and the January 29th subcommittee meeting. Previously, to address the issue of the intersection of Yarmouth Road and Camp Street immediately south of Route 28, the proximity of which complicates operations at Route 28, Yarmouth Road was severed from Route 28. Drivers would head south on Camp Street and access Yarmouth Road through a new connector road which would be created through the doctor's office parking lot south of the intersection. At the January 8<sup>th</sup> meeting, Ms. Cole opined that Yarmouth Road should not be severed from Route 28. Drivers should be able to continue south on Yarmouth Road from Route 28 to facilitate movements into the downtown area.

Therefore, one major change that the team made to the alternatives was to restore the connection of Yarmouth Road to Route 28, making it southbound only for a section immediately south of Route 28, to eliminate the conflict with Camp Street. Drivers would be able to drive south on either Yarmouth Road or Camp Street, but only drive northbound on Camp Street. Travelers coming from the downtown area to Route 28 (or to cross Route 28) would either head north on Yarmouth Road to Crocker Street, and then to Camp Street, from where they could access Route 28, or simply drive further east on Main Street before turning left onto Camp Street. Drivers would not be able to travel north on Yarmouth Road for its entire length and cross Camp Street just south of Route 28, impeding traffic trying to clear the intersection there. The Town is considering other traffic flow issues related to Main Street, Camp Street, and Yarmouth Road.

In addition, concern was expressed at the subcommittee meeting that because of recent renovations and investment to the doctor's office building, it would be advisable to create the connector between Yarmouth Road and Camp Street further south. Therefore, another change to the intersection alternatives was to suggest that Crocker Street - the existing connection between Camp Street and Yarmouth Road - be used.

As was the case previously, two intersection alternatives were presented, both of which incorporated the modifications described above. Both alternatives add necessary turning and through lanes. The build assumption for 2030 is that Route 28 between the rotary and Yarmouth Road will have been widened to four lanes. Ms. Sue Rohrbach asked if rail traffic is increased in the future, would it have a negative impact on traffic flows on Yarmouth Road. Mr. Murthy responded that future increases in rail traffic would impact flow due to the adjacent at-grade rail crossing. Ms. Cole commented that it would be desirable to maintain the historic brick building in the northwest quadrant of the intersection, and therefore, she did not prefer the alternative oriented to the west.

In addition to the two intersection solutions, the team was asked by the subcommittee to look at a potential roundabout solution with bypass lanes on all four approaches that would replace the intersection. The study team determined that significant property impacts would be incurred with the roundabout solution. In addition, the adjacent at-grade railroad crossing would present further concerns with no way to regulate traffic queuing as there would be with a signalized intersection. Ms. Wendy Northcross commented that a roundabout may be more efficient for emergency services vehicles. The study team responded that the roundabout would not have an effective level of service unless it had bypass lanes and those lanes would increase the size of the footprint of the roundabout. The study team recommended ruling out this option due to significant land takings and the complications with the adjacent rail crossing. Mr. Lev Malakov suggested bringing the bypass lanes in closer to the

roundabout as has been done in a location in Florida. Mr. Murthy responded that the separations clarify who has the right-of-way. Mr. Parsons suggested that the study team cite the reasoning such as cost and property impacts when ruling out options. Both Mr. Tom Mullen and Mr. Rick Angelini expressed concern about the rail traffic at that location which is in such close proximity to the busy intersection. Ms. Edwards offered to invite the new EOT Rail Director to a meeting along with the new operator of the rail line in order to increase communication between Task Force members and the rail interests in the area.

### **Rotary Alternatives**

Ms. Edwards and Mr. Cahill recalled for Task Force members the updated rotary alternative which would maintain the general shape and size of the existing rotary, but delineate two lanes within it, provide two clear lanes on all approaches, and provide a bypass lane on three of the four approaches. Ms. Edwards recalled for Task Force members that according to the rotary traffic operations analysis, this alternative works well, but the traffic operations analysis does not take into account safety issues and concerns that would translate into poor operations. In particular, on the Barnstable Road approach, queuing is expected to occur due to travelers' resistance to use both approach lanes. Mr. Murthy said that he examined the traffic volume growths in the area and determined that the updated rotary solution would work for only 5 years before it would fail. Therefore, at best, it could be considered a short term solution.

Ms. Edwards reported that in the subcommittee meeting, the attendees discussed the advantages of maintaining a rotary, and their desire to address its shortcomings. Mr. Cahill explained that a smaller roundabout would increase drivers' acceptance of smaller gaps between vehicles. He and Mr. Murthy explained that re-orienting the approaches so that they would occur at 90 degrees would also theoretically improve operations. Mr. Cahill presented the revised roundabout alternative, which resulted from team and subcommittee members brainstorming on how to achieve a better roundabout design in the tightly constrained area. A smaller roundabout, as opposed to a large rotary, and the re-development opportunities in the area would allow for the roundabout to be shifted to the west and also would allow for the re-orientation of the approaches to closer to 90 degrees. Mr. Cahill explained that the merging maneuver is now a crossing maneuver which allows for tighter gap acceptance.

Mr. Mullen asked what forced the roundabout to be re-oriented to the west. Mr. Cahill explained that if they attempted to re-orient the roundabout further east instead, Routes 132 and 28 (on the west) would converge on a point, making it difficult to separate those approaches. By re-orienting the roundabout to the west, this separates the Routes 132 and 28 connections on the western side of the roundabout and at the same time, provides some flexibility for re-orienting the Route 28 and Barnstable Road connections on the eastern side of the roundabout.

Mr. Allen Goddard expressed concern about this alternative, saying that it is counter-intuitive that a smaller roundabout would do a better job processing the traffic. He said he would not drive through it. Mr. Mosby expressed strong concern for the revised roundabout solution, saying that it would impact the new terminal's new parking area. He stressed that the main concern in the area is the intersection of Route 28 and Yarmouth Road. He and Mr. Mullen opined that the congestion at the Route 28 and Yarmouth Road intersection is so severe that it backs up to the rotary and prevents people from clearing the rotary. Mr. Mark Ells echoed this sentiment, saying that his observation is that Route 28 eastbound backs up on a regular basis to the rotary. He added that therefore, the intersection of Route 28 and Yarmouth Road should be prioritized over the rotary. Mr. Bob Burgmann agreed with Mr. Ells, saying that the problem with the rotary is that people can't get out of it. Mr. Mosby discussed the improvements to the rotary which will result from the airport improvement project and agreed that the Yarmouth Road and Route 28 intersection should be prioritized.

Mr. Steve Seymour responded to comments that the Task Force concentrate on the intersection of Route 28 and Yarmouth Road without overly concerning itself with the rotary. He asked that Task Force members continue to focus on the big picture and contemplate a solution for the rotary as well as for the intersection of Yarmouth Road and Route 28.

Mr. Bob Mumford expressed concern for the revised roundabout alternative because although the overall level of service is expected to be acceptable, at LOS D in the year 2030, the level of service for a major move – Route 28 westbound to Route 132 – would be LOS F. He asked if the alternative could be modified to address this shortcoming. Mr. Murthy replied that if an extra lane were added, there would be weave issues further down. Mr. Mumford opined that if this alternative were to be a preferred alternative, then the Route 28 to Route 132 movement would have to be improved.

Mr. Murthy discussed why roundabouts work so well in England, for example, and may not work as well here in Hyannis. In England, they are implemented widely. Many of the users of the roundabouts are regular commuters who quickly become familiar with how to navigate them. This would not be the case in Hyannis where tourists come from all over and are often unfamiliar with roundabout configurations. He advised that there would still be safety concerns with the revised roundabout alternative.

### **Four-legged intersection**

Mr. Cahill reviewed for Task Force members the analysis and implications of adding a bypass lane to the four-leg intersection alternative. This was requested at the January 8th Task Force meeting and discussed in the subsequent subcommittee meeting. The bypass lane would utilize space north of the four-leg intersection alternative and provide an additional lane for traffic coming from Route 28 and going to Route 132. The traffic in this bypass lane would bypass the intersection altogether and merge back with traffic on Route 132. Mr. Cahill and Mr. Murthy stated that taking one short lane of cars out of the signalized intersection does not improve the traffic operations significantly enough to change the level of service, and introduces safety and property issues just north of the intersection on Route 132. The team therefore advises against a bypass lane for the four-leg intersection alternative.

### **Revised split intersection**

Mr. Cahill and Mr. Murthy reviewed the split intersection alternative and the changes made to it as a result of both the January 8<sup>th</sup> Task Force meeting and the subsequent subcommittee meeting. In general, separating one large intersection into two smaller adjacent intersections may work very well, but when they are in close proximity, there is a risk of queue overflow. Increasing the distance between the two intersections reduces this risk. Due to redevelopment opportunities in the area, the Town indicated that it may be possible to separate the intersections further than had been presented previously.

Therefore, Mr. Cahill and Mr. Murthy presented a revised split intersection alternative with the two intersections configured further apart. Mr. Cahill also revised the design by adding an additional receiving lane on Barnstable Road southbound. Mr. Tom Mullen asked whether the lights would be coordinated. Mr. Murthy replied that yes, the lights would be coordinated and he reviewed which sequences would occur at the same time. For example, Route 132 eastbound to both Barnstable Road southbound and Route 28 eastbound would occur simultaneously with Route 28 westbound to Route 132 westbound. Mr. Mullen opined that this configuration seems to complicate things and that he prefers the four-leg intersection design. Mr. Murthy stated that the advantage to this alternative is that time is allocated to only three legs at each intersection instead of four legs. This translates into more time for the various moves. Mr. Angelini asked about access issues further down at the Staples parking lot. Mr. Ells asked whether the study team would recommend a median along Route 28, to address safety concerns related to the four-lane corridor, which is assumed for the future year. Mr. Murthy and Ms. Edwards replied that the intersection alternatives would be compatible with a corridor design that calls for a median, but that it is beyond the scope of this study to determine whether the median should be installed. Among other things, access issues to the Staples parking lot would need to be resolved as part the Route 28 corridor design. Mr. Ells opined that these issues should be considered earlier rather than later. Mr. Angelini commented that the split intersection alternative may offer an opportunity to improve access into the Staples property.

### **Airport Access**

Mr. Quincy Mosby indicated that the airport improvement project will include changes to the access to and from the airport and the airport rotary and these changes will have a positive impact. The main entrance to and exit from the airport will be onto Attucks Lane extension. There will be a right turn off Route 28 into the airport for ingress only.

### **Grade-separated intersection**

These options are unchanged from the January 8th meeting. The team informed the Task Force that the Route 28 to Route 28 grade-separated option does not deliver significant improvement in terms of traffic operations over the four-leg intersection solution and therefore, from a traffic and cost perspective, does not seem to be worth the money. The Task Force was asked whether the Route 28 to Route 28 underpass could therefore be dropped from consideration. Mr. Ells opined that all options should be kept available and that other factors such as property takings are important as well as cost and traffic benefits.

Mr. Murthy presented a delay and safety analysis comparing the alternatives. In general, all alternatives would offer improvements over the existing rotary in terms of delay and safety. The Route 132-28 underpass option offers the most improvement with regards to delay, and the split intersection is expected to improve delay better than the four-leg intersection. With regards to safety, the crash risk level of the four-leg intersection is expected to be less (safer) than the split intersection and the roundabout options. Both underpass options are expected to be better from a safety perspective than the at-grade options.

### **Public Meeting**

Ms. Black provided an outline of the agenda for the public meeting to be held at the Barnstable High School Performing Arts Center on the evening of March 5, 2008. The Task Force is encouraged to attend the public meeting and be part of the process. The meeting will be held in an open house format with a short formal presentation at 7 PM followed by a question and comment period. Following the question and comment period, the study team will return to the open house stations to provide the public with the opportunity to ask more detailed questions on the area of interest. The open house stations will provide information on the study process and the various alternatives under consideration. Meeting announcement flyers and informational brochures will be made available to the Task Force for distribution. The Task Force is encouraged to let EOT know the quantities of flyers/brochures needed by each agency for distribution.

Suggestions for the public meeting included:

- Explanation of how the forecast year is chosen
- Easels for comments should be at each station
- Outreach to each state representative

Mr. Bob Berry expressed concern about the format of the public meeting, specifically that not enough time was being allotted to questions and comments from the public. Ms. Edwards explained that the purpose of the meeting is to hear from the public and therefore, every attempt would be made to allot plenty of time for questions and comments. Mr. Berry also expressed concern about the EOT process in general, and specifically about representation on the Task Force and the discussion about uncertainty in the modeling.

### **Other Business/Next Meetings**

Ms. Edwards stated that the next Task Force meeting will be tentatively one month after the public meeting held on March 5<sup>th</sup>. There will be further Task Force meetings to work towards recommendations for the final draft report. She will notify Task Force members by email with confirmations of dates and meeting locations. Please visit the website to obtain information regarding the date and location of upcoming meetings.

## **Hyannis Access Study**

**Public Information Meeting  
Wednesday, March 5, 2008  
6:00 – 9:00 PM**

Barnstable High School  
Performing Arts Center  
744 West Main Street, Hyannis, MA

### **Attendance**

**Task Force Members and Public who signed in:      91 in attendance**

#### **Executive Office of Transportation Staff:**

|                  |   |
|------------------|---|
| Adriel Edwards   | Office of Transportation Planning, EOT Study Manager    |
| Paul Nelson      | Office of Transportation Planning, Park & Ride Analysis |
| Douglas Carnahan | Office of Transportation Planning                       |
| Rachel Bain      | Office of Transportation Planning                       |

#### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation, Consultant Study Manager    |
| Joseph Cahill  | TranSystems Corporation (Transportation Design)      |
| Ed Bromage     | Traffic Modeling                                     |
| Sudhir Murthy  | Trafinfo (Traffic Operations)                        |
| Ken Livingston | Fitzgerald & Halliday, Inc. (Environmental Analysis) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation)   |

### **Meeting Summary**

#### **Welcome and Opening Comments**

Ms. Adriel Edwards welcomed everyone to the first of two Hyannis Access Study Public Informational Meetings. She thanked the Barnstable High School for providing the Performing Arts Center, as well as Elaine Grace and the A/V and custodial staff for their assistance with the meeting. She also thanked Channel 18 for being available to videotape the proceedings. She outlined the agenda for the presentation and emphasized the importance of the question and comment period that would follow the presentation to hear from the public regarding the alternatives presented.

Ms. Edwards discussed the study process and thanked the Study Task Force for their diligence to this important initiative. The Study Task Force is comprised of a variety of local elected officials, local agencies, community groups, and business groups.

State Senator Robert O'Leary, a member of the Study Task Force, addressed the audience. He discussed that the identified transportation issues are critical as Hyannis is the capitol of Barnstable County and the hub of Cape Cod. The problems need to be addressed in a thorough, comprehensive way and he congratulated the study team on their efforts. He stressed that limited funds are available for transportation improvements and the recommendations to come from this study must be prioritized in order to obtain the most positive impact from the funding available. He thanked Representative Demetrius Atsalis for his support of the study and efforts to get funding for the study.

Paul Niedzwiecki, Executive Director of the Cape Cod Commission and member of the Study Task Force, complimented the study team on the inclusive nature of the study process, providing many opportunities for task force members and the public to give feedback as the study has progressed, including the public meeting tonight..

He applauded Study Project Manager, Adriel Edwards of the EOT, saying that her work is an example of how to build consensus and conduct a thorough study process.

Wendy Northcross from the Cape Cod Chamber of Commerce spoke on behalf of Representative Demetrius Atsalis to express his regrets that he could not attend and to commend the study for its thorough process. Ms. Northcross said that the Representative is committed to this process and he asked that the study team and public look to Exit 6 ½ as a priority.

### **Presentation**

Ms. Edwards discussed the public process further. In addition to Task Force meetings, Ms. Edwards outlined the various methods of public outreach including an email mailing list and a study website where meeting notices and study documents are made available: [www.hyannis-access.com](http://www.hyannis-access.com). The presentation from this meeting will also be available on the website. The study website also provides updates of alternatives with comments forms to receive feedback regarding each alternative. These comments are made available on the website for the public to read what the community is saying about the study alternatives.

Ms. Edwards, along with study team members, then gave a presentation that covered the background work that led to the development of alternatives. This included information on the data collection and modeling efforts, as well information on the previous studies which were consulted throughout the process. The presentation then covered all the alternatives which were developed and are still under consideration. The alternatives cover the areas of Park-and-Ride, transit, Exit 6 ½, the Airport Rotary, and the intersection of Yarmouth Road and Route 28. Ms. Edwards explained that through the collaborative and iterative Task Force process, there has been a lot of work done on the alternatives, but they are still conceptual and draft.

Mr. George Gefrich, consultant study manager, stressed that tonight's meeting was an opportunity to hear from the public and get feedback on the draft alternatives. He stated that public feedback is critical to making sure the alternatives are what the public wants to see in the future.

The study team opened the meeting to the public audience to take questions and comments.

### **Public Question and Comment Period:**

#### General Comments:

- The study team should look beyond 2030
- Smart growth issues should be considered
- Consider bikes/commuter options
- Modeling – need to consider uncertainty
- Need to understand future land development that is included in model
- Add simulation to next presentation to better visualize alternatives
- I like the four-leg intersection alternative for the rotary
- Think of ways to benefit all the towns along 6A and not just the merchants in the Cape Cod Mall and in Independence Park

#### Exit 6 ½ Comments:

- Concern about accidents on 6A – limit access to 6A
- Mary Dunn – not safe now to walk, too much traffic
- Avoid an alternative that would be located at Mary Dunn
- Create a service road from Willow Street to Independence Park
- Provide signs at Exit 7 that direct people to Hyannis Village
- Better signage for Exit 7 and improving Route 28 from Chatham to Hyannis to make it a scenic alternative to Route 6A

- What would be the improvements to Mary Dunn?
- At the very least, we expect and want bike trails and sidewalks to be built on Mary Dunn if Exit 6 ½ is built
- Please, no 6 ½ exit at Mary Dunn, too much traffic already
- We do not need a 6 ½ exit, but if you insist on building one, take the rest area, and use plan #1
- Yes to Alternatives 1 and 2; do not put Exit 6 ½ on Mary Dunn. We live on this street and it is unsafe now as people drive very fast and it is too busy now. It would be impossible to live there: NO on Mary Dunn!

#### Airport Rotary Comments:

- Keep rotary – teach how to drive on rotary – update rotary
- Rotary works well; it needs to be four lanes on Barnstable Road
- Need rotary – no ability to go west on Route 132 from businesses, limited left turns on 132
- Education should be provided on how to drive on a rotary
- Eliminate rotary – make 4-way signal
- Signage for how to navigate the rotary should be placed well in advance of the rotary to educate and inform those drivers about how to enter the rotary

#### Route 28/Yarmouth Road Comments:

- The ambulance route along Yarmouth Road to the hospital is an issue
- Yarmouth Road/Route 28 is key for residents
- Yarmouth Road add center turn lane
- What about Yarmouth Road?

#### Park & Ride Comments:

- West Barnstable Civic Assoc. – concern for taking forest
- Look at Sandwich park plus ride issues

The formal presentation adjourned at 8:45 PM to permit the public to return to the open house stations to view study maps and speak with the study team on their areas of interest. The open house stations included:

1. Study Process
2. Existing Conditions
3. Alternatives for Exit 6 ½
4. Alternatives for Airport Rotary and Yarmouth Road/Route 28 Intersection
5. Non-roadway Alternatives: Transit, Park & Ride, Bicycle/Pedestrian Access

## Hyannis Access Study

**Task Force Meeting  
Tuesday, April 8, 2008  
12:00 PM**

Selectman's Hearing Room  
Barnstable Town Hall  
367 Main Street, Hyannis, MA

### Attendance

#### **Task Force Members and Public who signed in:**

|                |                           |                  |                           |
|----------------|---------------------------|------------------|---------------------------|
| George Allaire | Town of Yarmouth          | Lev Malakoff     | Cape Cod Commission       |
| Tom Bernardo   | Aide to Rep. Atsalis      | Paul Maloney     | FHWA                      |
| Cynthia Cole   | Hyannis Business District | David Munsell    | Barnstable Planning Board |
| Patty Daley    | Town of Barnstable        | Wendy Northcross | Cape Cod Ch. of Commerce  |
| Robert Edwards | Citizen                   | Robert O'Brien   | Steamship Authority       |
| Mark Ells      | Town of Barnstable        | Susan Rohrbach   | Aide to Senator O'Leary   |
| Allen Goddard  | Hyannis Civic Assoc       | Bill Scully      | MS Transportation Systems |
| Maria Jones    | Shepley Wood Products     | Harold Tobey     | Barnstable Town Council   |
| John Kenney    | Hyannis Ch. of Commerce   |                  |                           |
| Tim Kochan     | MassHighway District 5    |                  |                           |

#### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |
| Rachel Bain      | Office of Transportation Planning                        |

#### **Consultant Team:**

|               |  |
|---------------|--|
| Joseph Cahill | TranSystems Corporation                            |
| Sudhir Murthy | Trafinfo   |
| Leslie Black  | Fitzgerald & Halliday, Inc. (Public Participation) |

### Meeting Summary

#### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of a fair and open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She reported that the website [www.hyannis-access.com](http://www.hyannis-access.com) has study documents including the recently posted February 7<sup>th</sup> meeting summary. Comments regarding the Rte. 28/Yarmouth Road intersection and Airport Rotary alternatives have been received on the website and can be viewed there. There is still opportunity to provide comments.

Ms. Edwards reviewed upcoming meetings. She stated that the second public informational meeting is scheduled for Wednesday, June 11, 2008 from 6 PM and 9 PM at the Barnstable High School. She said this second public meeting would follow the same open house format as the first public meeting, providing further opportunity for public comment. Ms. Edwards reminded attendees that the next Task Force meeting will be Tuesday, April 22, 2008 at 2 PM here at Town Hall in this room. The purpose of that meeting will be to discuss the non-roadway recommendations for the study. The follow-up to this meeting on the roadway recommendations will be Tuesday, May 6 at noon with a location to be determined soon.

The purpose of today's meeting was to cover the following: (1) Public Meeting #1 review; (2) Roadway recommendations – ideas and discussion, (3) next steps and future meetings.

**Public Meeting #1 Review**

Ms. Edwards reported that a total of 91 people participated in the March 5<sup>th</sup> public informational meeting including 63 public citizens, 16 Task Force members and 12 study team members. She said that the meeting is available to view as a video on the Town of Barnstable website under the cable access link. The meeting notes and the PowerPoint presentation are also available on the study website under Reference Materials → Public Meeting Documents. Many comments have been submitted both before and after the public meeting and EOT and the team is working to respond to all of them.

Ms. Edwards asked the Task Force if they had any suggestions for improving the next public meeting. The Task Force suggested using a smaller venue which would be more acoustically suitable for this type of presentation. After some discussion, it was decided that the team would try to reserve the smaller Knight Auditorium for the formal presentation while still using the lobby area of the Performing Arts Center for display stations.

**Roadway Implementation Packages**

Mr. Sudhir Murthy and Mr. Joe Cahill made a PowerPoint presentation of three draft roadway implementation packages for the Task Force to consider. Over the course of the study, the team has shown that there is no one solution to the transportation issues in Hyannis. Therefore, these packages were prepared. Each package organized various alternatives into short, medium and long range solutions with different implementation scenarios. Each package represented trade-offs with regards to benefits to the area and timelines.

Ms. Edwards provided a review of Task Force and public input that lead to the draft recommendations packages:

- Strong support for improvements to the intersection of Rte 28 and Yarmouth Rd
- Mixed opinions regarding rotary alternatives
  - Some say leave it as it is
  - Less support for roundabout alternative
  - Some favor at-grade intersection alternatives (4-leg or split)
  - Some favor the grade-separated
  - Some unwilling to make any statement until Rte 28 widened to four lanes
- Strong support for Exit 6 ½ alternatives 1 and 2
- Many express community and environmental concerns
- Preference for alternatives 1 and 2 -even among those that do not support the exit in general

Ms. Edwards commented that since the opinions were so mixed on the rotary, EOT weighed heavily on the consultant team's recommendations for the rotary. Mr. Cahill then provided general information regarding the three recommendation packages, saying that each package provides some immediate fixes to the Yarmouth Rd / Rte 28 intersection and the Airport Rotary. He added that each package prioritizes Yarmouth Rd as a mid-term solution, and all packages provide workable solutions that would improve existing conditions. The packages differ in their mid- and long-term solutions.

The following is a summary of each draft package as it was presented to the Task Force:

**Draft Roadway Package 1:**

Short-Term (Less the 5 years)

- Advanced signage at the rotary
- Review Yarmouth Rd/Route 28 Signal Timing and update equipment as necessary
- Eliminate NB connection from Yarmouth Rd. to Camp St.
- Review striping opportunities at the Airport Rotary for potential improvements (careful analysis)

Medium-Term (5 to 12 years)

- Yarmouth Road/Route 28 Intersection (\$2,100,000)
- Signalized Intersection at the Airport Rotary
  - \$3,400,000 for Split Intersection
  - \$3,100,000 for 4-Leg Intersection

Package 1 key points:

- Advance signage at the Airport Rotary would aid drivers in lane selection and proper method of driving the rotary
- Signs at the Airport Rotary need to be carefully considered given space constraints, 1-vs-2 lane approaches, and other potential improvements.
- Yarmouth Road intersection would be phased prior to Airport Rotary
- Signalized intersection at the Airport Rotary would follow

- No longer-term alternatives included
- Does not include any Exit 6 ½ alternatives
- Least expensive package overall that is presented today

#### Draft Roadway Package 2:

##### Short-Term (Less the 5 years)

- Advance signage at the rotary
- Review Yarmouth Rd/Route 28 signal timing and update equipment as necessary
- Eliminate NB connection from Yarmouth Rd. to Camp St.
- Review striping opportunities at the Airport Rotary for potential improvements (careful analysis)

##### Medium-Term (5 to 12 years)

- Yarmouth Road/Route 28 Intersection (\$2,100,000)
- Signalized Intersection at Rotary
  - \$3,400,000 for Split Intersection
  - \$3,100,000 for 4-Leg Intersection

##### Long-Term (Greater than 12 years)

- Exit 6 ½ at Rest Area (\$19,000,000)

#### Package 2 key points:

- Advance signage at the Airport Rotary would aid drivers in lane selection and proper method of driving the rotary
- Signs at the Airport Rotary need to be carefully considered given space constraints, 1-vs-2 lane approaches, and other potential improvements.
- Yarmouth Rd intersection would be phased prior to Airport Rotary
- Exit 6 ½ at Rest Area included as long-term alternative

#### Draft Roadway Package 3:

##### Short-Term (Less the 5 years)

- Advance signage at the rotary
- Review Yarmouth Rd/Route 28 signal timing and update equipment as necessary
- Eliminate NB connection from Yarmouth Rd. to Camp St.
- Review striping opportunities at the Airport Rotary for potential improvements (careful analysis)

##### Medium-Term (5 to 12 years)

- Yarmouth Road/Route 28 Intersection (\$2,100,000)

##### Long-Term (Greater than 12 years)

- Route 132 to Route 28 Grade Separation at Rotary (\$19,600,000)

#### Package 3 key points:

- Advance signage at the Airport Rotary would aid drivers in lane selection and proper method of driving the rotary
- Signs at the Airport Rotary need to be carefully considered given space constraints, 1-vs-2 lane approaches, and other potential improvements.
- Yarmouth Road intersection would be medium-term solution
- No significant rotary improvements in the medium term
- Grade separation at the rotary as a long-term solution
- Does not include any Exit 6 ½ alternatives

Mr. Murthy then discussed the traffic modeling and analysis of the three recommendation packages. Previously, modeling was done for the individual alternatives at each location in isolation to ascertain the proper conceptual design and level of benefits, in the case that other alternatives need not be implemented. The study showed that no one solution would solve all of Hyannis' traffic issues, and therefore the team crafted the packages described above. For the purposes of understanding the benefits and impacts of the recommendation packages, and to confirm that the alternatives would be still valid and necessary if done in combination, three model runs were done which reflect the packages described above.

Mr. Murthy reviewed the results of the modeling. For package one, the proposed improvements to the Airport Rotary and the intersection of Yarmouth Road / Route 28 would attract minor volume increases, but the improvements are adequate to absorb these increases. The expected level of service at both the Airport Rotary and the intersection would be LOS D. Mr. Murthy determined that no other changes in traffic volumes or level of service would occur at the remaining intersections. For package two, which includes Exit 6 ½, the volumes at the Airport Rotary and the intersection of Yarmouth Road and Route 28 would drop slightly, resulting in a LOS C at the intersection. The level of service at the Rotary would still be D. The level of service

at the remaining intersections is expected to be the same as when Exit 6½ is considered in by itself. Regarding package three, the grade-separated solution at the Airport Rotary would attract greater volumes, and the improvements at the intersection of Yarmouth Road and Route 28 would attract minor volume increases. The proposed improvements are adequate to absorb the additional volumes. The overall level of service would be D at the rotary and C at the intersection. There is no expected change in volumes at the other intersections.

Mr. Murthy then reviewed some results regarding the travel time analysis which confirmed earlier analyses that the greatest travel time benefit would be to those traveling to the Independence Park area from the east. There are also time savings to the Hospital and to the mall. The analysis confirmed that people would opt to stay on Route 6, avoiding Route 6A east of Willow Street.

Finally, the packages were compared to each other with respect to the study's goals and evaluation criteria.

Comments and questions from the Task Force included:

Mr. Tim Kochan emphasized the importance of addressing the intersection of Yarmouth Road and Route 28 in the short-term, expressed concern about it being outlined as a mid-term solution and suggested its time-frame be moved up. Ms. Edwards noted that Mr. Cahill outlined concrete steps that may be taken immediately to improve the intersection, as preparation for the intersection reconstruction. Mr. Allen Goddard asked whether there is a downside to eliminating the northbound connection from Yarmouth Road to Camp Street, as had been outlined as a short-term improvement. Mr. Murthy replied that there was not. Ms. Patty Daley enforced what Mr. Kochan said regarding the intersection of Route 28 and Yarmouth Road, saying that improvements to the intersection are critical and could happen faster than outlined. Preliminary designs have been peer-reviewed by MassHighway. Mr. Tom Bernardo agreed with prioritizing the intersection of Yarmouth Road and Route 28, and that the study should identify priorities for the public so that they know what they are and the resources to be used.

Mr. Kenney expressed support for package two, but concern about the timing outlined two for Exit 6 ½. He said that it sounds like the group is suggesting that nothing be done until that time. Ms. Bain suggested that instead of specifying a time period for Exit 6 ½, provide the details on the steps required to prepare for its implementation. There was agreement on this. A discussion followed about the definitions of short-, mid- and long-term. The Task Force requested that the recommendations outline "immediate" actions which would take place in less than three years. The Task Force also suggested that "short-term" actions be those that would occur in 4-6 years, and "mid-term" actions would be those activities that take greater than 6 years. Mr. Bernardo suggested that instead of using the phrase "long-term", the phrase "other recommendations" be used so that if possible, those actions could occur sooner. Ms. Rohrbach and others agreed with the categories.

Ms. Patty Daley said that she appreciates that the study team is looking at Airport Rotary and Yarmouth Road together in this study. She agreed, as had been discussed, that short-term changes to the rotary (signage and striping) may not help (and instead may add confusion) and therefore, she requested that the recommendations indicate a percentage of design work that should be complete on the rotary and when. Ms. Edwards commented that more details on the Route 28 corridor design would be helpful as the Airport Rotary design is finalized. Mr. Kenney agreed but emphasized that re-designing the Route 28 corridor should not hold up the Airport Rotary design. Ms. Edwards suggested a change to the phrasing for the recommendations that reflected Mr. Kenney's concerns about one project hampering the progress of another. Ms. Cynthia Cole commented that the Route 28 corridor was already at 75% design and indicated that perhaps that project could proceed quickly. Mr. Kochan stated the project may need to be re-scoped. Ms. Daley agreed, adding that it was designed as four lanes with no median and the Town would want to completely redesign it, incorporating safety features while still providing adequate access to the businesses along the Route. Ms. Cole said that the Town's DPW and Mass Highway should work together on a revised scope for Route 28 corridor between Yarmouth Road and Route 28 to make a plan that fits with intersection alternatives.

Regarding Exit 6 ½, Ms. Wendy Northcross asked if the \$19 million cost includes the cost of relocating the rest area. Mr. Cahill responded that the rest area relocation cost was included (without a known location) but stated that all costs are in 2007 dollars with no mitigation of environmental issues included because the in-depth environmental impact level of analysis has not yet been conducted in this study process. Ms. Northcross voiced support for package two. Ms. Sue Rohrbach noted that there is a land use implication of adding Exit 6 ½ that must be kept in mind. By improving access to the area, development options open up instead of development of Route 132 and downtown Hyannis. Traffic would also increase at new access point. Mr. Murthy responded that development depends on the zoning that the Town has in place. If access is improved, development will occur if not properly zoned.

Ms. Daley commented that she is concerned about growth impacts of Exit 6 ½ and the subsequent development pressure. She does not prefer package two, because the two intersections are failing now and limited funds need to be directed there instead

of focusing on Exit 6 ½. As an advocate of the GIZ, Ms. Daley supports packages one and three. Mr. Kenney agreed with prioritizing the two intersections. However, he noted that the Town has to act on zoning regulations for Independence Park; there is a concern about big box retail coming in that the public do not want; he does not want the Exit 6 ½ alternative dropped over that concern. Ms. Rohrbach asked if Ms. Daley could provide the Task Force with the Town's assumptions regarding land use and build-out numbers for the Independence Park area. Ms. Daley agreed to this. She also asked that she be given the assumptions made by the consultant on the Independence Park area for the purposes of the modeling.

Ms. Rohrbach suggested that bike plans be put in the short term actions. The Town should work with Mass Highway to include bike path facilities for future connectivity. Also, the Town should address land use issues as part of its comprehensive plan.

Ms. Edwards asked if the grade-separated Airport Rotary option could be taken from the list of options? Ms. Daley responded that she would like to discuss that option with town officials before making final comment.

Mr. John Kenney said he was not comfortable with ruling out alternatives because money is not currently available to pay for the improvements. He opined that the job of the Task Force is to make recommendations and then allow the money to be obtained as necessary. He suggested that all alternatives should be listed and prioritized. As money becomes available, the alternatives will be addressed in order of priority. Mr. Dave Munsell and Ms. Northcross agreed. Mr. Kenney suggested going forward with package two, while adding the grade-separated Airport Rotary to the list. Ms. Edwards responded that she felt it would set unrealistic expectations to keep both the grade-separated rotary solution and Exit 6 ½, each at approximately \$20 million in construction costs alone, as part of the recommendations. Mr. Murthy agreed that it is unrealistic to expect that the state would convert the existing rotary to an at-grade split intersection, which is substantial work, and later rip it out for a grade-separated solution.

In general, the group requested tighter timelines and more details on intermediate steps such as design work. The group requested that the recommendations be more of a roadmap to implementation, stipulating when different percentages of design work should be complete at various stages.

**Actions:**

- Input from Town re: grade-separate Airport Rotary
- Use terminology: immediate, short term and medium term actions instead of short term, medium term, and long term actions in alternatives presentation
- Land use update at next meeting from Ms. Daley
- Funding and fiscal constraints will be discussed at the May 6<sup>th</sup> Task Force meeting
- Use consistent cost formulation when discussing project costs (e.g. Current estimate in 2007 Dollars)

**Other Business/Next Meetings**

Ms. Edwards reminded attendees of upcoming meeting dates, indicating that more information would be sent via email.

## Hyannis Access Study

**Task Force Meeting  
Tuesday, April 22, 2008  
2:00 PM**

Selectman's Hearing Room  
Barnstable Town Hall  
367 Main Street, Hyannis, MA

### Attendance

#### **Task Force Members and Public who signed in:**

|                  |                                     |
|------------------|-------------------------------------|
| George Allaire   | Yarmouth DPW Director               |
| Rick Angelini    | Hyannis Area Ch. of Commerce        |
| Chris Anzuoni    | Plymouth and Brockton Bus Company   |
| Tom Bernardo     | Aide to Rep. Atsalis                |
| Ann Canedy       | Barnstable Town Council             |
| Neil S. Caudle   | Plymouth & Brockton                 |
| Mike Cipro       | Shepley Wood Products               |
| Robert Edwards   | Citizen                             |
| Allen Goddard    | Hyannis Civic Association           |
| William Griswold | Citizen                             |
| John Kennedy     | Cape Rail, Inc.                     |
| Catherine King   | MassRIDES                           |
| Tom Mullen       | Barnstable Land Trust               |
| Roger Parsons    | Barnstable DPW                      |
| Joseph Potzka    | Cape Cod Regional Transit Authority |
| Sue Rohrbach     | Aide to Senator O'Leary             |
| Steve Seymour    | Barnstable Growth Management        |

#### **Executive Office of Transportation Staff:**

|                  |   |
|------------------|---|
| Adriel Edwards   | Office of Transportation Planning, Study Project Manager      |
| Douglas Carnahan | Office of Transportation Planning, Study Assistant            |
| Rachel Bain      | Office of Transportation Planning, MPO Liaison                |
| Tim Doherty      | Office of Transportation Planning, Director of Rail           |
| Paul Nelson      | Office of Transportation Planning, Park-and-Ride Coordinatory |

#### **Consultant Team:**

|            |   |
|------------|---|
| Rob Swierk | TranSystems Corporation, Transit consultant |
|------------|---|

#### **Welcome and Administrative Items**

Adriel Edwards welcomed the group and stated that the focus of today's Task Force meeting is on the non-roadway aspects of the study. Ms. Edwards noted that at the last Task Force meeting, the group discussed the March 5<sup>th</sup> public informational meeting. One of the suggestions was to hold the next meeting in a smaller auditorium if possible; Ms. Edwards stated that our public participation consultant, Leslie Black, is arranging that for the upcoming June 11<sup>th</sup> meeting. The next Task Force meeting will be held on May 6<sup>th</sup> from 12:00PM to 2:30PM and will focus on the roadway recommendations.

Ms. Edwards noted that the order of the agenda would be switched at today's meeting, so that Transit Recommendations would come before the presentation by the EOT Rail Director and Mass Coastal representative.

### **Transit Recommendations – Ideas and Discussion**

Robert Swierk gave a presentation on the draft transit recommendations. These draft recommendations were summarized in a handout that was distributed via email prior to the meeting. Mr. Swierk noted that these recommendations were developed based on the analysis and evaluation that was conducted last fall, as well as input received at meetings and via the project website afterwards. On December 5, 2007, the Task Force discussed packaging the alternatives into recommendations and today's discussion is a continuation of that discussion.

Mr. Swierk reminded attendees that the goal of the transit recommendations package is to improve mobility, focusing on local roads and existing services. New services were not developed for this study. Mr. Swierk discussed the now-underway Barnstable Transit Development Plan (BTDP). He described it as an overall comprehensive look at transit in the Barnstable area, which will consider new routes. The transit efforts as part of the Hyannis Access Study will provide input to the BTDP.

Mr. Swierk reviewed the five alternatives:

1. Add signage at all bus stops
  - Static signage at all stops, electronic signs at key stops
2. Bicycle and pedestrian improvements at key Stops
  - Including shelters, bicycle racks, and targeted sidewalk improvements
3. Barnstable villager route improvements
  - Possible routing, frequency, span of service, and schedule improvements
4. Add dynamic message signs on roadways
5. Support ongoing and upcoming efforts

Mr. Swierk said that although alternative two identifies a few specific key stops, there are probably many others which would benefit from bicycle and pedestrian improvements. Mr. Swierk reviewed the graphic that showed the location of the various proposed improvements. He then reviewed the evaluation of the alternatives with respect to each other, which is summarized in a matrix, with the alternatives listed in columns across the top, and the study's goals listed in rows along the side. In the matrix, green circles represent benefits, red squares represent costs, and black diamonds represent a neutral effect. Mr. Swierk said that in general, the benefits and costs increase with each alternative, with the long-term route improvements and dynamic message signs providing the most potential benefits, but also costing the most.

In general, the transit alternatives provide benefits such as improved access to the GIZ, jobs and improved connections between local service, regional service, and the services provided by private carriers.

The powerpoint slide listed the following general benefits of all the transit alternatives:

- Small to moderate demand shifts from auto to transit  
(from 10 to 80 new summer boardings/day, depending on alternative)
- Modest reductions in auto emissions
- New intermodal connections
- Improved accessibility to destinations such as the GIZ
- Preserving character of the Cape, improving access to jobs

Mr. Swierk explained that the costs of some of the alternatives are negligible, such as routing changes, but some are significant. DMS, for example, which would require the implementation of a communication system, would be costly. The operating costs of the various alternative vary as well, from negligible to significant. The powerpoint slide listed the following general costs of all the transit alternatives:

Costs – in general:

- Low to moderate capital costs  
(from no cost to approx. \$450,000, depending on alternative)
- Low to moderate operating costs  
(from negligible cost to approx. \$70,000/year, depending on alternative)

The long term Barnstable Villager route improvement of adding expressing service along Route 132, for example, could have an operating cost of \$70,000/year with four peak trips. Mr. Swierk stated that this summarizes where we have been.

With regards to the approach to developing recommendations, Mr. Swierk said that the study considered the following questions:

- Should the proposed improvements be pursued together as a package, or individually?
- Should the improvements be packaged with the roadway improvements, or kept separate?
- Are there any transit improvements that are higher priority than the others?
- In what kind of time frame might improvements be pursued?
- Who might take the lead?

Mr. Swierk then presented the following recommendations.

Recommendations #1 - Package of short-term transit improvements

- Static signage component of Alt. 1
- Bicycle and ped. improvements at key stops (Alt. 2)
- Minor streamlining on the Barn. Villager (Alt. 3)
- Suggest CCRTA and TOB take the lead, with input from EOT and Chambers
- TOB and others should look for opportunities to improve pedestrian environment at bus stops

#2 - Medium-term transit improvements

*(Somewhat more capital-intensive, longer lead time to implement)*

- #2a - Electronic signage component of Alternative 1
- #2b - Further improvements to Barn Villager (Alt. 3)
- #2c - Dynamic Message Signs on roadways (Alt. 4)

#2a - Dynamic Message Signs at bus stops

- Displaying real-time bus arrival information could help boost transit ridership
- Further study needed of sign technology, possible locations, funding sources, and O&M arrangements
- Suggest CCRTA take lead, with input from Towns on locations and Cape Cod Commission on Intelligent Transportation Systems (ITS) technology

#2b – Barnstable Villager Improvements

- Barnstable Transit Development Plan (TDP) underway
- Look further at concepts proposed for Barnstable Villager, including possible improvements in:
  - Routing
  - Frequency
  - Span of service
  - Schedule
- Suggest CCRTA and Town take lead, through Barnstable TDP

#2c – Roadway Dynamic Message Signs

- To promote transit and alternative modes
- Further study needed of how to use signs, specific locations, sizes, messages, coordination of information, funding, other logistics
- Suggest MassHighway and CCRTA take lead, with input from Town on locations and Commission on ITS

#3 – Coordination of Park & Ride capacity and local transit

- Continue coordination between EOT, Town, private bus carriers and CCRTA on Park & Ride plans
- Consider connections between Park & Ride facilities, intercity buses and CCRTA local bus services

#4 – Support for ongoing efforts

- Recommend that key stakeholders continue to support ongoing planning efforts for transit and alternative modes

- 4a. Promoting transit at key activity centers - including 4Cs, Cape Cod Hospital, Airport, and Route 132 malls. Suggest CCRTA, MassRIDES, and Commission work with individual entities.
- 4b. Barnstable TDP – may look at a variety of improvements. Suggest Town, Commission, EOT and other stakeholders continue to support CCRTA on this plan.
- 4c. Plan to connect bicycle trail to the Hyannis Transp. Center –Would improve intermodal connectivity; suggest Town and EOT continue to pursue this effort.

Cynthia Cole asked how this effort rolls into the BTDP. She said that she sees some mutual effort and some overlap and asked if Mr. Swierk was working directly with Barnstable’s consultant. Mr. Swierk replied that due to the timing - that we have almost finished our study while they have just started theirs, we are not working directly with them. Mr. Potzka said that all the transit alternatives and recommendations from this study are been submitted to the consultant for the BTDP.

Mr. Potzka stressed that he feels that the most important factors for improving transit ridership in this area are pedestrian improvements. He said that pedestrian improvements need to go hand-in-hand with any transit improvements. Secondly, he said that the phrase “Build it and they will come,” applies to transit services, and gave the example of increased frequency of service along Route 132. He said that the regional transit authority will continue to work with the Town of Barnstable to improve services.

Mr. Potzka then discussed the recent funding issues. He explained that all the regional transit authorities in the state are reimbursed at the end of the fiscal year. In Fiscal Year 2007, there was a shortfall in that the reimbursements did not cover the expenses which were incurred over the course of the year. He said that a lot of RTAs were in a tough situation. He said that the Authority’s Board made service cuts, increased fares to adjust the budget for 2008 in light of the shortfall from the previous year. In the meantime, the legislature came through with funding to cover the 2007 shortfall. Mr. Potzka said that the Board has restored some of the service cuts but not all because they are not 100% confident that all the funding will come through for 2008. Mr. Potzka said that for example, the Flex-route is restored, but not on Saturday. The fare increases will remain in effect.

Mr. George Allaire said that ITS should also be included as part of the roadway recommendations package as it is on the transit side. Mr. Roger Parsons discussed the need for coordinated efforts to address pedestrian improvements that have traditionally been funded through maintenance and Chapter 90 funds. He said that last year the emphasis was on schools and that there continue to be many critical areas. He urged making links and combining efforts to provide the kind of pedestrian environment that encourages transit ridership.

Clay Schofield said that there is a ITS Study that was done for Southeastern Massachusetts which may be informative to this effort. He added that the transit studies should consider the needs of private carriers in their analyses. The issue of shelters for bus patrons came up and Mr. Anzuoni expressed a concern about street people occupying them. He said even if ridership levels warrant shelters, they can sometimes detract customers.

#### **Rail Presentation by EOT Rail Director and Mass Coastal Representative**

Tim Doherty, the Rail Director at the Massachusetts Executive Office of Transportation (EOT), gave an overview of EOT’s rail program, with a focus on rail in the Hyannis area and around the Cape.

- The Commonwealth owns approximately 100 miles of freight lines in the state, approximately 10% of all the lines. The key word in EOT’s role in rail around the state is “stewardship” of these lines.
- EOT contracts out the operation of rail service on these lines to private operators. Mass Coastal recently won the contract to operate the lines on the Cape, which total roughly 60 miles. The transition to Mass Coastal operation happened on January 6, 2008.
- Historical difficulties encountered by the freight rail industry in the 1970s led EOT to purchase a number of rail lines.

- One of the challenges EOT faces in managing its rail assets is balancing multiple uses of the right-of-way (ROW); this is an issue nationally as well. The perspective of the operating railroad in this situation is to emphasize safety first and foremost.

Cynthia Cole stated that she is concerned about the accumulation of trash and the aesthetics of the rail ROW. She noted that a volunteer clean-up was recently held along the ROW in the Barnstable area.

Tim Doherty noted that stewardship has different connotations in different situations – shorter-term (like aesthetics and cleaning up litter) and longer-term (such as shared-used paths, and keeping options open for new rail services).

John Kennedy of Mass Coastal Railroad provided an overview of his company's operations on the Cape:

- Mass Coastal is one of two operating railroads that are part of Cape Rail, Inc., the other being the Cape Cod Central Railroad. Mass Coastal provides freight service, while the Cape Cod Central provides seasonal excursion passenger service. Cape Rail, Inc. is a local company, with headquarters in Hyannis.
- Mr. Kennedy stated that now that Mass Coastal has the operating contract on the freight lines on the Cape, they can have more control over things like trash, aesthetics, and trespassers on the ROW. They will be looking to address these issues over time.
- Mass Coastal must interface with CSX in Middleborough, but does not need to work with CSX at all when it is operating on the Cape.
- Mr. Kennedy noted that railroad infrastructure has a “shelf life”, which deteriorates over time and will eventually reach a crisis if left to decay or if not maintained properly. Mr. Kennedy noted that we are nearly at a crisis in terms of the condition of the rail infrastructure on the Cape. Mass Coastal's first priority is to stabilize the infrastructure, then to improve it over time.
- One of the big types of freight Mass Coastal hauls is trash, to a facility in Rochester, Massachusetts. Mr. Kennedy said he prefers to call these trains “energy trains” since the materials are ultimately burned to produce energy.
- One of Mass Coastal's big initiatives is “trans-loading” which involves innovative solutions for smaller shipments of freight, less than a truckload in size (called LTL shipments).
- Upgrading the rail infrastructure is another major initiative being undertaken by Mass Coastal.

Roger Parsons stated that he would encourage more communication between Mass Coastal and the Town of Barnstable regarding the timing and location of maintenance projects, such as grade crossing improvements. Mr. Kennedy noted that Mass Coastal has identified six at-grade crossings that are priorities to be reconstructed within the next year or so. He noted that interested individuals can reach Mass Coastal by visiting their websites, [www.caperailinc.com](http://www.caperailinc.com) and [www.masscoastal.com](http://www.masscoastal.com). The email addresses of key people in the company are listed on these websites.

It was noted that the Cape's rail infrastructure has good connections to the Steamship Authority ferry system, so there is an opportunity to move freight this way and perhaps reduce truck demand on roadways, particularly the congested bridges leading to from the Cape to the mainland.

A question was asked about the possibility of using some of the rail ROW in the Hyannis area for a rail-trail. Mr. Kennedy replied that there is a policy issue to be resolved to make this a reality.

Tom Bernardo of Representative Atsalis' office made several remarks:

- Representative Atsalis is a big supporter of rail.
- The Representative has confidence in Mass Coastal.
- The rail system on the Cape can be thought of as a three-legged stool, including freight, passenger, and emergency evacuation roles.

John Kennedy noted that there is a third bridge to the mainland from the Cape, which is a rail bridge and which was recently rehabilitated for an investment of over \$20 million. Mass Coastal thinks that there is a way to extend passenger service to the Cape, with much less cost than the \$200 million estimated to extend

MBTA commuter rail service to the Cape. Passenger rail could be an economic development boost to Hyannis and Barnstable, much as it was in the past at Buzzards Bay. Mr. Kennedy stated that he believes that passenger rail and intercity bus service can definitely coexist, and contribute to interconnectivity in the region. He could see having 4 or 6 round trips per day by rail, and the rest of the schedule filled in by intercity bus.

In response to a question from Tom Mullen, John Kennedy stated that the grade crossing at Route 28 and Yarmouth Road does present a problem. The gates at this location are manually operated, which contributes to the situation.

Tom Mullen asked if a passenger terminal on or north of the Airport property could be feasible. Mr. Kennedy stated that he thinks this would make a lot of sense, although it would take a lot logistically to get done.

Cynthia Cole asked what happened to the Amtrak weekend service that used to run to the Cape from Providence. John Kennedy replied that this was a very successful service through the 1980s, but then was made difficult by forcing passengers to transfer at Providence, which caused it to become less popular and eventually to get cut.

Mr. Kennedy stated that he thinks a public-private partnership could be established to provide passenger rail service to the Cape, while still preserving its rural character.

#### **Park & Ride Recommendations – Ideas and Discussion**

Paul Nelson of EOT gave a presentation on draft Park & Ride recommendations for the study. He noted that the alternatives were presented before, and are also posted on the study website. The conceptual evaluation is also posted on the website; each alternative has its pluses and minuses.

EOT's draft recommendations are:

- In the short-term, allow reduced rate parking at the HTC, and limited overnight parking at Exit 6
- In the longer-term, expand surface parking at the Exit 6 location by building onto the Conservatory property

Patty Daley from the Town of Barnstable asked about the cost of surface versus structured parking at Exit 6. Mr. Nelson stated that surface parking would cost roughly \$2 million, while structured parking would cost about \$10 million.

Tom Mullen express concern about the short-term recommendation, which would encourage people to park downtown. This could clog the roads leading to downtowns. Adriel Edwards noted that the recommendation is not intended to worsen congestion on area roadways. It is intended to encourage those travelers who are going away for a longer period of time to park where there is unused capacity, freeing spaces at the Exit 6 lot. Given that the people using the downtown lot would be staying for a while, those additional trips should not significantly add to the area's congestion. Cynthia Cole stated that she would like to encourage people to park at the HTC, to bring more people downtown.

Ann Canedy suggested that in the long term, EOT should build a parking structure off the Exit 6 site, on the Conservatory land. She asked if the Town could be the ultimate owner and maintainer of the structure. Adriel Edwards said she is not sure but could check.

Bill Griswold, a private citizen who used to be transportation professional, gave a brief presentation on some work he did on the Exit 6 park and ride facility:

- He feels that the draft long-term recommendation is deficient because it is too far off.
- He did a study of the parking duration at the Exit 6 facility. Ten percent of parkers there are parking for 2 weeks or more.
- Mr. Griswold thinks that an 8-day time limit on parking would make sense at the Exit 6 facility. He recognizes that the state needs to consider the interests of the private bus operators in setting

parking policies, but thinks that a time limit of this type would actually benefit the carriers such as Plymouth & Brockton and allow them to generate more revenue from airport travelers.

Paul Nelson stated that both strategies – limiting parking duration or limiting the number of spaces for longer-term parking – are on the table. Mr. Nelson stated that he and Joe Potzka of CCRTA are coordinating to discuss the possibility of fee changes at the HTC.

Chris Anzuoni of Plymouth & Brockton stated that P&B has some concerns about disruption of long-term parking. He thinks that a limitation should be longer than 8 days if it is put in place, and suggested that the expansion of the Sagamore lot may help alleviate the park & ride crunch for the time being.

Clay Schofield stated that the Commission has thought about a permit or sticker system for West Yarmouth residents at the HTC.

**Conclusion**

Ms. Edwards concluded the meeting and encouraged attendees to attend the May 6<sup>th</sup> meeting at the Cape Cod and Islands Association of Realtors.

## Hyannis Access Study

**Task Force Meeting  
Tuesday, May 6, 2008  
12:00 PM**

Cape Cod and Islands Association of Realtors  
22 Mid Tech Drive, West Yarmouth, MA

### Attendance

#### **Task Force Members and Public who signed in:**

|                |                                |                  |                           |
|----------------|--------------------------------|------------------|---------------------------|
| George Allaire | Yarmouth Dir of Public Works   | Tim Kochan       | MassHighway District 5    |
| Rick Angelini  | Hyannis Area Ch. of Commerce   | Lev Malakoff     | Cape Cod Commission       |
| Tom Bernardo   | Office of State Rep. Atsalis   | Ed Maroney       | Barnstable Patriot        |
| Robert Berry   | Citizen                        | David Munsell    | Barnstable Planning Board |
| Ann Canedy     | Barnstable Town Council        | Wendy Northcross | Cape Cod Ch. of Commerce  |
| Patty Daley    | Barn Growth Mngmt Dept         | Roger Parsons    | Barnstable DPW            |
| Robert Edwards | Citizen                        | Susan Rohrbach   | Office of Senator O'Leary |
| Mark Ells      | Barnstable Dir of Public Works | Bill Scully      | MS Transportation Systems |
| Peter Fisher   | Centerville Civic Association  | Steve Seymour    | Barn Growth Mngmt Dept.   |
| Allen Goddard  | Hyannis Civic Assoc            |                  |                           |

#### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Ariel Edwards    | Office of Transportation Planning, Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                        |
| Rachel Bain      | Office of Transportation Planning                        |
| John Fallon      | MassHighway Environmental Project Manager                |

#### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation, Consultant Team Project Manager |
| Joseph Cahill  | TranSystems Corporation                                  |
| Ed Bromage     | Traffic Modeling   |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation)       |

### Meeting Summary

#### Welcome and Opening Comments

Ms. Ariel Edwards welcomed everyone to the Hyannis Access Study Task Force meeting. She reminded attendees that in accordance with the Executive Office of Transportation's (EOT) policy of an open study process, all Task Force meetings are open to the public, but agenda items are discussed first with Task Force members. She reported that the website [www.hyannis-access.com](http://www.hyannis-access.com) has study documents that can be viewed there. There is still opportunity to provide comments. She stated that public information meeting #2 would provide further opportunity for public comment and is scheduled for Wednesday, June 11, 2008, at Barnstable High School. The Performing Arts Center lobby will be used for open house stations, and the Knight Auditorium will be used for the formal presentation and Q & A session.

The bicycle-pedestrian sub-committee will meet on May 22, 2008 and those wishing to attend that meeting are urged to contact Ms. Edwards for more information.

The purpose of today's meeting is to cover the following: (1) follow-up on the roadway recommendations discussed at the April 8<sup>th</sup> Task Force meeting (2) next steps – potential environmental documentation and the TIP process, and (3) future meetings. Ms. Edwards added that Patty Daley and Ed Bromage would respond to questions posed at the April 8<sup>th</sup> Task Force meeting regarding development assumptions for the Independence Park Area.

Ann Canedy asked that the Town of Barnstable website include a link to the Hyannis Access Study web site and include a press release/notice of the public meeting in June. She also asked that a slide with the public meeting notice be forwarded to Channel 18. She would like to have the public newsletter further in advance for distribution purposes.

### **Roadway Recommendations – Follow-up discussion**

Ms. Edwards reported that Task Force comments on the three roadway recommendation packages presented at the April 8<sup>th</sup> meeting have been incorporated into one package. She invited Mr. Cahill to present the recommended roadway improvements implementation package.

Implementation Package (Roadway):

Immediate-Term (Less than 3 years)

- Advance signage at the Rotary
- Review possible re-striping at the Rotary
- Review Yarmouth Road/Route 28 signal timing
- Eliminate the northbound connection from Yarmouth Road to Camp Street (south of Route 28).
- Pursue funding for design and construction of the Yarmouth Road/Route 28 intersection
- Pursue funding for design and construction of the Airport Rotary
- Begin design work for intersection of Yarmouth Road and Route 28
- Begin design work for the Airport Rotary
- Determine extent of environmental review for the Rotary
- Begin the design work for the Route 28 corridor between Yarmouth Road and the Airport Rotary

Short-term (4-6 years)

- Yarmouth Road/Route 28 Intersection construction – two alternatives will work at this intersection
- Signalized intersection at Airport Rotary construction

Other Improvements

- Exit 6 ½ - trumpet at Rest Area
  - Secure Funding
  - Environmental Phase (typically 3 to 4 years)
  - Design Phase & ROW Process (typically 3 to 4 years)
  - Construction (typically 3 to 5 years)

The development of Exit 6 ½ will depend on FHWA buy-in for the project at a \$20 million construction cost in 2007 dollars, not including ROW, mitigation, and design fees.

Based on the steps outlined for Exit 6 ½, Wendy Northcross asked if the most optimistic timeframe for the Exit is nine years? Mr. Cahill responded affirmatively that environmental work and preliminary design work can occur in the same timeframe and then final design work would occur, leading up to construction. Tom Bernardo commented that the timeframes provided by the study team may be typical, but questioned if the process could be shorter. Mr. Cahill responded that the estimates provided are based on real processes with similar scale projects. Mr. Gefrich added that the estimates are normal nationwide. They also include the time required for contractor selection, etc. The design/build phase can be shortened if the State commits to going with a single designer/builder, a decision that also provides a cost savings (approx. 3%) in addition to a benefit in schedule (approx. 5-8%). George Allaire stated that he attended a meeting last week where Tom diPaulo, Assistant Chief Engineer for the State commented that the goal is to take a project from concept to ribbon cutting from a ten-year timeframe to a five-year schedule. Mr. Gefrich commented that the federal government would be involved as well as the State, lengthening the approval process. Mr. Fallon commented that projects with a high demonstrated need from the congestion and safety standpoint are better able to compete for limited funds. Ann Canedy asked if there is a built-in process to review Exit 6 ½ again, for example, after the Airport improvement project, to determine if the Exit should be accelerated? Mr. Gefrich responded that two recent projects elsewhere in Massachusetts, Route 2 in Lincoln/Concord and Route 110/113 in Methuen, have had very proactive involved committees who are committed to staying involved and moving the projects along and the timeframe is still long.

Sue Rohrbach commented that the Town of Barnstable should be looking at development opportunities and be planning to use the land in the Industrial Park area appropriately. She stated that Senator O'Leary would be very concerned with Exit 6 ½ going forward before the Town of Barnstable has effected appropriate changes in zoning regulations to guide future development. Wendy Northcross commented that Exit 6 ½ may provide opportunities for higher paying jobs. She asked what is

the shelf life of this effort before it would need to be repeated. George Gefrich responded that data typically has a 3 year shelf life.

Tom Mullen commented that the Exit 6 ½ shows no significant benefit to travelers coming from the west; traffic congestion coming from the east could possibly be mitigated by improvements to Yarmouth Road and Route 28. He opined that Hyannis would benefit more with better in/out access at both ends of Main Street. He feels that Route 132 completion will improve traffic flow and that a future project to widen Route 28 to 4 lanes will also improve flow. He stated that there would be opposition to using Mary Dunn and Route 6A more than currently used now.

Ms. Edwards thanked the Task Force for the comments, saying the questions and comments posed will help the study team better prepare for the public meeting. The team needs to be sensitive to the public's perception of the recommendations and their respective timelines.

### **Next Steps – Potential Environmental Documentation and the TIP Process:**

John Fallon, State Environmental Study Manager, and Rachel Bain, MPO Liaison, provided some information on next steps including:

- potential environmental documentation in the three roadway areas of improvements
- current TIP and TRP outlook

Projects compete for funding in fiscally constrained environment and priorities rise to the top. There is a range of environmental documentation required for the different types of projects.

For the intersection of Yarmouth Road and Route 28:

- This type of improvement would require limited environmental documentation
- Massachusetts Environmental Protection Act (MEPA) thresholds most likely not exceeded
- Will need to coordinate with Mass Historic Commission
- Categorical Exclusion checklist should be sufficient for MEPA

Airport Rotary:

- At-grade solution may exceed MEPA threshold for increase in impervious surface (Environmental Notification Form (ENF) if less than 10 acres, Environmental Impact Report (EIR) if greater than 10 acres
- If grade-separated, most likely would require an EIR/EA (Environmental Assessment)
- Timeframe for study = 4-8 years

Exit 6 ½ :

- Would require Notice of Project Change (NOPC) for 2000 ENF
- Project would most likely require ENF and a Draft and Final EIR
- National Environmental Protection Act (NEPA) would require an EA
- 5-10 years until Notice To Proceed for construction

Tim Kochan suggested that the narrative on the recommendations include the amendments that would be required in the RTP. Relative to the intermediate term roadway improvement bullets starting on page 3 of 4, he suggested adding the following bullets and/or language:

- Amend the 2007 Regional Transportation Plan by adding the Barnstable (Yarmouth Road/Route 28 intersection improvement) proposal to the Transportation Projects Listing in Chapter 6: Analysis of Alternatives;
- Amend the 2007 Regional Transportation Plan relative to RTP Proposal # 3308 – Airport Rotary Modification; this proposal should be amended to read *'replacement of Airport Rotary with a preferred signalized intersection scheme;*
- Above the bullet that reads 'Begin the design work for the Route 28 corridor between Yarmouth Road and the Airport Rotary..' Mr. Kochan suggests adding another bullet that reads *"Reactivate the Route 28 corridor project between Yarmouth Road and the Airport Rotary"* and add some language that relates to why the prior project stalled. He suggested the following details be added: *"Discussions between the Town of Barnstable and MassHighway District 5 are needed along with a series of public informational meetings to solicit community input toward revising the scope of work for implementation."*

Ms. Edwards thanked Mr. Kochan and indicated that these would be added to the recommendations text.

Rachel Bain discussed the TIP (Transportation Improvement Plan), which is a fiscally constrained list of projects. Each region in the state has one, and the MPOs vote on them. Any project must be listed in the TIP to go forward to a vote. An RTP (Regional Transportation Plan) covers a 4 year period and is updated yearly. Projects on the TIP must be in the RTP.

- Current RTP information estimates are that the Cape Cod region may expect \$25 – 30 million in each four-year period. Barnstable typically gets approximately 25% of that amount.
- If these trends continue, Barnstable may expect \$7-8 million in each four year period (2008-2011, 2011-2015)
- In addition, in the 2016-2020 TIP, \$900,000 is listed for the Airport Rotary and \$10 million is listed for the Yarmouth Road corridor. These allocations could be amended to reflect changing needs and/or study recommendations. In the non-fiscally constrained portion of the RTP, there is \$15 million listed generally for Hyannis Access Study recommendations.
- In summary, there is recognition of ongoing needs and some larger-scale projects. The RTP would need to be amended based on new information from this study and other sources.
- John Fallon asked how a decision would be made that a particular project would not come out of a region's TIP allocation? Ms. Bain responded that Exit 6 ½ would probably not be paid for through a regional target.
- Ms. Edwards and Ms. Bain stressed the importance of momentum, public support, and readiness with regards to obtaining funds. They stressed that the best thing the group could do is keep working on the projects, getting them ready, so that when money is available, the projects can move forward. Some projects will not get on the TIP unless they are 75% along design phase, showing local commitment and support.
- Ms. Rohrbach asked if the timelines for various projects were spread out enough so that they would not compete against each other for funding. Ms. Edwards responded that in this study, the process has been to clarify priorities of projects so that they will not compete.
- Ms. Rohrbach noted that there is nothing in the recommendations about improvements to Yarmouth Road corridor and that issue should be moved forward. Mr. Murthy responded that the corridor was not included in the recommendations because corridor issues would largely be resolved with improvements to the Yarmouth Road/Route 28 intersection.

#### **Response to questions from April 8<sup>th</sup> Task Force meeting**

Patty Daley provided a memorandum from the Town's Growth Management Department to the study team in response to questions posed regarding development potential in the IND and IND Limited Zoning districts. Ms. Daley stated that the memorandum explains that the Town supports the assumptions in the travel demand model used by Hyannis Access Study. She added that it also states that the Industrial Park area is identified in the Town's comprehensive plan as an area for strategic planning.

Ed Bromage explained how the model used future growth and development information for the study area. The study team used numbers which correspond to a previous collaborative effort between the state and the Cape Cod Commission, conducted for Federal mobile emission air quality planning programs. The modelers use a top down approach (state, region, county, and town), where the forecasts are based on national and historic trends, market conditions, and the relationships between the number of households with workers and the number of jobs. Towns typically use a bottom up approach with zoning, build-out potential, and occupancy rates. For the Hyannis Access Study, previous the growth allocations were fine-tuned with information gathered from the Town, interviews with private developers, and through the study process

- Adriel Edwards indicated that study analysis numbers must align with the state requirement of the Regional Transportation Plan.
- Wendy Northcross asked where the analysis numbers would be available and Ms. Edwards responded that publicly available data would be available in appendices of the report. Some data of private developers would not be publicly available.
- Sue Rohrbach asked what weight does the state put on local community addressing land use. Mr. Bromage responded that the data has to go through the process and be valid. Patty Daley added that it is incumbent on the town to look at land use issues.

#### **June 11<sup>th</sup> Public Meeting:**

Adriel Edwards discussed the second public meeting coming up at 6:00 PM on June 11<sup>th</sup> at Barnstable High School. The study team would like to go to the public with the big picture of study area recommendations. She asked the Task Force for further input the recommendations so that a consistent message could be presented to the public.

Task Force Comments on the public meeting:

- Mark Ells spoke in favor of leaving the grade-separated solutions for the rotary on the table. He urged that LOS improvements should be presented along with their cost estimates so that the public understands the benefits/improvements associated with a higher price tag. Ms. Edwards expressed concern about leaving the grade-separated rotary solutions on the table given the large number of transportation improvements (including transit) needed in the area. George Gefrich added that all alternatives would be outlined in the report along with a chronological history of how the process moved forward.
- Tim Kochan suggested that Exit 6 ½ be listed as a possible mega-project whereas others would fall on the fiscally constrained list of priorities.
- Tom Mullen commented that the thought process behind the chosen recommendations should be included in the final report. He also commented that a progressive improvement program for the Airport Rotary should be considered to include striping and a double barrel Route 28 approach with moderate costs but valuable differences to reducing congestion.
- Ann Canedy commented that she supported the thought to include all scenarios in options and not just immediate-term options; otherwise, the other options will need to be revisited again in 5-10 years.
- Citizen, Bob Berry suggested that a page of the final report be devoted to the alternatives that did not go forward to recommendations because they were not economically feasible.
- Lev Malakoff suggested that LOS work and crash rates be presented along with alternatives at the public meeting to help people see the benefits over the cost of the alternatives; the most costly alternatives also provide the most benefit to the public with respect to safety and reduction in congestion.
- Roger Parsons echoed Mr. Malakoff's comments and asked the demographics and references be included in the report.

**Actions:**

- Task Force members were reminded to let Ms. Edwards know if they required copies of newsletters for distribution in advance of the meeting. She would have the study team mail to those who had requested copies for the first public meeting.

**Other Business/Next Meetings**

- Public Information meeting #2, Wednesday, June 11, 2008 at Barnstable High School. Task Force members are encouraged to attend
- Task Force final meeting TBD after public meeting
- Final Report scheduled to be completed by the end of June 2008

## **Hyannis Access Study**

### **Public Information Meeting Wednesday, June 11, 2008 6:00 – 9:00 PM**

Barnstable High School  
Performing Arts Center  
744 West Main Street, Hyannis, MA

#### **Attendance**

**Task Force Members and Public who signed in: 28 in attendance**

#### **Executive Office of Transportation Staff:**

|                  |   |
|------------------|---|
| Adriel Edwards   | Office of Transportation Planning, EOT Study Manager    |
| Paul Nelson      | Office of Transportation Planning, Park & Ride Analysis |
| Douglas Carnahan | Office of Transportation Planning                       |
| Rachel Bain      | Office of Transportation Planning                       |

#### **Consultant Team:**

|                  |  |
|------------------|--|
| George Gefrich   | TranSystems Corporation, Consultant Study Manager  |
| Joseph Cahill    | TranSystems Corporation (Transportation Design)    |
| Jessica Eckhardt | TranSystems Corporation                            |
| Sudhir Murthy    | Trafinfo (Traffic Operations)                      |
| Leslie Black     | Fitzgerald & Halliday, Inc. (Public Participation) |

#### **Meeting Summary**

##### **Welcome and Opening Comments**

Adriel Edwards welcomed everyone to the second of two Hyannis Access Study Public Informational Meetings. She thanked the Town of Hyannis and Barnstable High School for use of the Performing Arts Center and Knight Auditorium for the meeting. She thanked Lynne Poyant and Channel 18 for being available to videotape the proceedings. She also thanked the press for consistent and accurate coverage of the study in local media venues. She outlined the agenda for the presentation and emphasized the importance of the question and comment period that would follow the presentation to hear from the public regarding the recommendations presented.

Adriel Edwards discussed the study process and thanked the Study Task Force for their diligence on this important initiative. The Study Task Force is comprised of a variety of local elected officials, local agencies, community groups, and various local businesses.

Sue Rohrbach, representing Senator Robert O'Leary, and a member of the Study Task Force, addressed the audience. She thanked the EOT, study team and Task Force for their diligence in studying improvements for Cape Cod. Barnstable is the hub of the Cape, providing services to a wide area. It is important to evaluate transportation issues from a "big picture" perspective. The problems need to be addressed in a thorough, comprehensive way, mindful that limited funds are available for transportation improvements. The recommendations, well supported by analysis, that come from this study must be prioritized in order to obtain the most positive impact for the funding available.

Tom Bernardo, Community Relations Director for State Representative Demetrius Atsalis, also thanked the EOT, study team and Task Force for their work on the study. Representative Atsalis has long been a proponent of Exit 6 ½, and, although not certain that it is the only solution to Hyannis access issues, he encourages continued study of this alternative. The practical reality is that it would take 5-10 years to develop the alternative if funding is available. Continued development in Independence Park, including plans for hundreds of residential units, a new outpatient facility for Cape Cod Hospital and general growth in the area would suggest that a new exit is important to keep under consideration.

#### **Presentation**

Adriel Edwards discussed the public process further. In addition to Study Task Force meetings, Ms. Edwards outlined the various methods of public outreach including an email mailing list and a study website where meeting notices and study

documents are made available: [www.hyannis-access.com](http://www.hyannis-access.com). The presentation from this meeting will also be available on the website. The study website will also provide updates of recommendations with comments forms to receive feedback regarding each recommendation. These comments are made available on the website for the public to read what others are saying about the study recommendations.

Adriel Edwards, along with study team members, then presented a PowerPoint presentation of the study progress to date, reviewing the purpose of the study, study goals, the planning study process and where this study falls in the process, data collection, and alternative development. Adriel Edwards and George Gefrich then presented draft recommendations for Park & Ride, as well as transit and bicycle/pedestrian access, the Airport Rotary, and the intersection of Yarmouth Road and Route 28. Recommendations included in the immediate term, attention to the Yarmouth Road/ Route 28 intersection, the Airport Rotary, transit improvements, and possible better utilization of parking at both the Park and Ride lot and Hyannis Transportation Center and a possible Park and Ride lot capacity enhancement.

Short term draft recommendations include reconstruction of the Yarmouth Road intersection and expansion of the park-and-ride lot at Exit 6 on Route 6. Other draft recommendations included possible further conceptual development of an option for Exit 6 ½ in 5 – 10 years time. Ms. Edwards stated that the study showed that Exit 6 1/2 is not an optimal benefit that the area needs for the immediate and short-term.

George Gefrich, consultant study manager, commented that tonight's meeting was an opportunity to hear from the public at this point in time regarding the draft recommendations. Public feedback is critical to making sure the alternatives are what the public wants to see in the future.

The study team opened the meeting to the public audience to take questions and comments.

### **Public Question and Comment Period:**

#### Airport Rotary Comments:

- The median strip down 132 to Airport Rotary – is this part of this study? While not part of the Hyannis Access Study, Mark Ells of Barnstable DPW responded that a double lane in both directions is being evaluated at the planning stage by the Town of Barnstable. When asked if this change would alter what happens for traffic at the Airport Rotary and other roadways, George Gefrich responded that when doing studies, any transportation improvements moving ahead in design are included in an analysis. Any identified roadway projects that could be identified and quantified in the study area for this project were included in the study analysis, so the above mentioned changes would not alter analysis findings.
- A question was raised about what the Airport Rotary would really serve – bringing people to Hyannis or providing access away from it? Route 28 is the regional route to Falmouth; improvement serves that and local movement needs. Local access needs must be taken into account.
- Barnstable Municipal Airport Commission member, Don Megathlin, commented that the Commission has waited for the study results to look at Airport access plans. Access issues for the Airport include the need for a signalized intersection. Properties owned by the Airport on Route 28 also have access issues. He also expressed concern for the Airport investment in the extension of Attucks Lane and whether it was valid now that Exit 6 ½ is not being actively pursued as an option. Adriel Edwards responded that the state sees the extension of Attucks Lane to the airport as a valid and necessary project with or without Exit 6 ½ as it is an important link in the area network. She also noted that Airport access is the purview of the Town of Barnstable and the study looked at the Airport Rotary for roadway improvements to optimize traffic movement.

#### Exit 6 ½ Comments:

- Task Force member Tom Mullen commented that the overall project planning process has been excellent. A thoughtful look has been taken in all problem areas when it comes to traffic. Responding to earlier comments which were quite geographically detailed, he noted that the study was intended to provide a regional look from 10,000 feet, then 5,000 feet, as opposed to the ground-level analysis. He also commented that the Exit 6 ½ alternative posed concern for him regarding the public water supply.
- Mark Wiarden opposed Exit 6 ½ because it would bring box stores to the area and draw businesses away from downtown Hyannis. He also saw as premature to begin planning for Exit 6 ½ before evaluating traffic flow changes made by the Route 132 roadway improvements.

Park & Ride Comments:

- A Hyannis resident suggested adding park-and-ride lots to Route 6 Exits 2, 3 and 4 instead of chopping down trees to add spaces at Exit 6. Commuters would have closer access to where they live if other lots were added at different points along Route 6.

The formal presentation adjourned at 8:30 p.m. to permit the public to return to the open house stations to view study maps and speak with the study team. The open house stations included:

1. Study Process
2. Existing Conditions
3. Alternatives for Airport Rotary and Yarmouth Road/Route 28 Intersection
4. Non-roadway Alternatives: Transit, Park & Ride
5. Bicycle and Pedestrian Access
6. Exit 6 ½

## Hyannis Access Study

**Task Force Meeting**  
**Tuesday, June 18, 2008**  
**2:00 PM**

Selectman's Hearing Room  
Barnstable Town Hall  
367 Main Street, Hyannis, MA

### Attendance

#### **Task Force Members and Public who signed in:**

|                |                              |                  |                             |
|----------------|------------------------------|------------------|-----------------------------|
| Rick Angelini  | Hyannis Area Ch. of Commerce | Tim Kochan       | MHD-District #5 Association |
| Chris Anzuoni  | Plymouth & Brockton Bus      | Lev Malakhoff    | Cape Cod Commission         |
| Tom Bernardo   | Rep. Atsalis assistant       | David Munsell    | Barnstable Planning Board   |
| Ann Canedy     | Barnstable Town Council      | Wendy Northcross | Cape Cod Ch. of Commerce    |
| Cynthia Cole   | Hyannis Business District    | Robert O'Brien   | Steamship Authority         |
| Patty Daley    | Town of Barnstable           | Roger Parsons    | Town of Barnstable          |
| Robert Edwards | Citizen                      | Susan Rohrbach   | Senator O'Leary assistant   |
| John Kenney    | Hyannis Ch. of Commerce      | Steve Seymour    | Town of Barnstable          |
| Catherine King | MassRIDES                    |                  |                             |

#### **Executive Office of Transportation Staff:**

|                  |  |
|------------------|--|
| Adriel Edwards   | Office of Transportation Planning, EOT Study Project Manager |
| Douglas Carnahan | Office of Transportation Planning                            |

#### **Consultant Team:**

|                |  |
|----------------|--|
| George Gefrich | TranSystems Corporation (Consultant Study Manager) |
| Leslie Black   | Fitzgerald & Halliday, Inc. (Public Participation) |

### Meeting Summary

#### Welcome and Opening Comments

Ms. Adriel Edwards welcomed everyone to the final meeting for the Hyannis Access Study Task Force and thanked Task Force members for their participation and continuous support for the study process. She reported that the website [www.hyannis-access.com](http://www.hyannis-access.com) with study documents will be active until the study report is completed. Ann Canedy complimented Ms. Edwards and the study team for a comprehensive and thorough study.

The purpose of today's meeting was to cover the following: (1) Public Meeting #2 review; (2) the final report, and (3) study wrap-up.

#### Public Meeting #2 Review

Ms. Edwards reported that the second Public Information Meeting conducted at Barnstable High School on the evening of June 11, 2008 had a turn out of 28 Task Force members and public as well as 10 study team members. The public made few comments regarding the study recommendations, indicating general support of recommendations. Comments leaned more towards ensuring that coordination efforts with other area projects, such as the Airport, were given due diligence.

Ann Canedy announced that there would be a meeting to follow up on study findings re: Route 132 on Friday, June 27<sup>th</sup> at 7:30 AM at the Mid Cape Home Center (opposite EMS Sporting Goods), set up by the Hyannis Chamber of Commerce. The Growth Management group from the Town of Barnstable will be there to talk about study issues pertaining to Route 132.

George Gefrich discussed the public meeting and comments received at the open house stations that affirmed that the recommendations addressed the needs of the study area and were on target for immediate and short term improvements. Other findings to come from this study included an interest in development of Route 132 further and an identification of the need to

advance the development of the Yarmouth Road corridor. The inclusion of Exit 6 ½ is an option to be considered in the future depending on public/private interest/continued support as well as funding availability.

Comments and questions from the Task Force included:

- Rick Angelini expressed concern that the media coverage indicated that the Task Force did not look at Exit 6 ½ seriously when in fact, the study team covered the Exit 6 ½ option thoroughly and determined that other recommendations were of greater priority for the study area in the immediate and short term. The option will be revisited in the future as further development of the area continues. Ms. Edwards responded that the final report will be inclusive of the entire study process and all of its findings and recommendations.
- Ann Canedy noted that the press reports have reflected that priorities rose to the top and the numbers did not support an Exit 6 ½ at this time, but the option may be revisited in the future once other projects are completed.
- John Kenney commented that there is a need for an Exit 6 ½ and there is no further need for study. It should be left on the list of priorities with funding availability and timing, working to develop it in a timely manner. It seems there will be more benefit especially when future projects will necessitate another access point.
- David Munsell reported that a recent survey conducted by the “Patriot” newspaper found that Exit 6 ½ is second to Airport Rotary improvements in general public support.
- John Kenney commented that the Town of Barnstable and the State should take control of available lands now for future consideration if Exit 6 ½ becomes a necessity. George Gefrich and Adriel Edwards responded that federal and state laws do not permit right-of-way takings until a project design process is a certain percent complete and only a few years away from construction.
- Sue Rohrbach noted that with or without public partnership or land being set aside, the priorities for projects have been established by this study, and the Task Force will be best served if the process moves forward with a clear list of priorities and clear local consensus, so that projects can successfully be considered for funding in the TIP process.
- Wendy Northcross agreed that prioritization of a comprehensive list is required, and she would like to see how the final set of recommendations in the report will be worded. Adriel Edwards responded that the set of recommendations will be worded as found in Newsletter #2 produced for the second public meeting.

### **The Final Report:**

- The study team is busy on the final draft chapters for the report. The deadline for the report is June 30, 2008.

Comments from the Task Force included:

- Wendy Northcross would like to see the correct order of prioritized projects.
- Lev Malakhoff would like to see that costs of projects are included so that the general public understands that cost is one of the considerations in determining the feasibility of an alternative.
- Tim Kochan would like to see the matrix measures fleshed out and applied to the recommendations.
- Roger Parsons would like to see criteria for making recommendations included in conclusions.
- Ann Canedy would like to see each alternative outlined with positive and negative points, and then do the same with each recommendation looking at features, cost estimates, etc.
- Sue Rohrbach would like a discussion of the outlook for future transportation funding on Cape Cod (with perhaps a high and low range and mean) versus the costs of each recommendation.
- George Gefrich commented that the study team is working diligently to make the report thorough, comprehensive, and readable for the general public. The Executive Summary should direct readers to sections and appendices for in-depth analysis, while providing an overview of study findings.
- Adriel Edwards will, if possible, put key chapter text (Executive Summary, Chapter 4-Analysis, Chapter 5 – Recommendations) out to Task Force for review while in draft. The document will eventually be available on the EOT website.
- Lev Malakhoff made the suggestion to have the document available electronically via the Cape Cod Commission.
- Wendy Northcross expressed concern about Task Force members rewriting sections. Adriel Edwards reassured the Task Force that the study team will do due diligence to ensure the report accurately reflects the study findings and work of the Task Force.
- Tim Kochan asked that there be a discussion between Mass Highway District 5 and the Town of Barnstable regarding projects. It is important to note that future projects will be a cooperative venture between the two agencies.
- Adriel Edwards noted that following the MPO may be a good way to stay informed as the process moves forward, and that continued support of the process and consensus about project priorities will provide the most successful outcomes in the future.

**Actions:**

- Adriel Edwards will forward sections of the draft report to the Task Force for review as time permits in advance of the June 30<sup>th</sup> deadline for report submission.
- Adriel Edwards will get a final copy of the report in electronic format as a pdf document (divided into chapters/sections) to Lev Malakhoff at the Cape Cod Commission.

**APPENDIX #3**  
**The Hyannis Access Study**  
**Travel Demand Model**

## Hyannis Access Study Travel Demand Model

### A-1 Background

FHWA and FTA regulations require that analytical methods be used as part of the transportation planning process to evaluate transportation projects. Over the course of time, computer simulation programs have been developed to meet this need.

A travel demand model portrays a transportation network in a given geography. Many pieces of information are included in the model. The transportation network and its attributes such as travel time and capacity are key inputs. Data on employment, population, and households as well as the average number of vehicles per household are inputs that determine the trips on the defined network. Through computer programs, models are used to portray both existing conditions and future conditions, and are especially useful for comparing various transportation alternatives to each other, to a future condition without any alternatives (the so-called “no-build” condition), and the current conditions.

In Massachusetts, there is a statewide travel demand model which includes all the major transportation networks across the state. The intent of the statewide model is to predict inter-community travel patterns using major state routes. To meet a more local need of planning for arterial and collector roads as well as intra-community travel, some metropolitan planning organizations, including the Cape Cod MPO, have developed their own regional model which provides more detailed information.

### A-2 Travel demand model set up and calibration

Before a model can be used to forecast future travel demands and patterns, the model must adequately represent the current conditions. With the previously mentioned information regarding the network itself and key demographic factors such as employment and population, the model generates traffic patterns, volumes and speeds. These model results are compared to actual field counts and other observations to determine how well the model reflects “real” (measured) conditions. The model is adjusted so that these comparisons match within in a certain degree of error. The Federal Highway Administration has developed guidelines which form the basis for the validation of travel forecasting models. Statewide, regional, and project specific models are all designed to meet these guidelines before the models are used for planning activities. This process of developing the model to meet these guidelines is called calibration; and the resulting model is often referred to as the “base case”. The base case is not necessarily the present year, but rather the year for which there is sufficient actual traffic counts and other field observations available. The base case is not only useful for highlighting or providing insight on problem areas, but also for comparison purposes as explained in more detail later.

Once the model is properly calibrated, it can be used to forecast future travel demand and patterns. The future transportation network – with committed projects (a committed project is a project already on the transportation improvement program with funds allocated, as well as some level of design and environmental assessment) – is configured in the model, and future population and employment data is inputted. Background traffic growth outside the model area is also considered, and is represented by flows into and out of the area. Together, these factors prepare the model for the forecasting task, which is described below.

### **A-3 Four-step travel demand forecasting**

The four-step travel demand forecasting process includes the following steps:

1. Trip generation: The model estimates the travel demand in terms of the number of person-trips for each of the traffic analysis zones (TAZ). TAZes are geographic boundaries that break the modeling area into smaller pieces and are based upon socio-economic data such as population, households, number of autos per household, income, employment, etc. See discussion below on TAZes.
2. Trip distribution: The model converts the generated trips at each zone into a matrix of origins and destinations.
3. Mode split: This step accounts for the use of different modes (autos, non-motorized, transit, etc.) and converts person-trips into vehicle-trips.
4. Traffic assignment: The model assigns the various origin-destination trips onto the network (accounting for any roadway improvement projects). The assignment process is dynamic in terms of iteratively considering how roadway segment congestion impacts travel route selection. The forecasted traffic volumes can then be used to forecast the level of congestion. This becomes the basis for assessing the performance of the transportation system.

Through an iterative process, the model reaches an equilibrium where the travelers have optimized their trips based on their needs and the constraints in the system. This is an important point: the model analyzes a static situation – when traffic has stabilized into a set pattern. This is often why other tools are used in conjunction with a travel demand model, so that the development of queues can be examined. These types of tools are discussed in detail in the document “Traffic Analysis Tools.”

Once the demand forecasting is complete, the model then reflects the “no-build” case. The “no-build” case includes improvements which have already been planned for, and are likely to exist in the future model year, but not the various alternatives which are developed through the planning process. These alternatives are then coded into the model, tested, and compared to the “no-build” and the base case. In this way, it can be determined whether a particular alternative will offer improvements over current conditions and/or the future “no-build”. It is particularly useful to compare alternatives to each other and to the “no-build”, with respect to the goals and objectives of the study.

### **A-4 Discussion of Traffic Analysis Zones**

The purpose of the TAZes are to have disaggregated traffic loading points. In an ideal world, activities would be simulated at each individual household and business. Traffic would actually be loaded at existing driveways. However, due principally to resource limitations, parcel level data is usually not collected. Instead, community data is usually disaggregated into traffic zones.

The development of traffic zones follows some general guidelines as follows:

- 1) Where possible, TAZ boundaries are set to coincide with visible physical features such as rivers, roads, power lines, and wetlands.
- 2) Zone boundaries should not cross political boundaries, although they sometimes do.
- 3) Zones should have clear loading points such as neighborhoods or subdivisions having one or more clearly defined access/egress points.

- 4) Zones should ideally have common land use characteristics.
- 5) The number and size of the zones is based on the intended use of the model.

The zones were originally created as part of the statewide model to support various transportation activities across the state.

**A-5 Application of forecasting process to the Hyannis Access Study**

The study area for the Hyannis Access Study is roughly bounded by Route 6A, exits 6 and 7 on Route 6, and Barnstable's growth incentive zone (including Main Street, the ferry area, and the Cape Cod Hospital), and the west end rotary.

The travel demand model for this study is a customization of the more general Cape Cod Commission's regional model, which is in turn a customization of the statewide model. The Cape Cod regional model will still be utilized as part of this process and referenced to examine system-wide impacts from changes to the transportation network. However, closer examination of the impacts in the immediate Hyannis area will be analyzed with the specific model developed for this purpose.

The base case for this study model is considered to be the year 2006, although employment and population projections for 2007 are included, since 2006 numbers were not available.

The future year to be analyzed is 2030 for this study. As is typical in transportation planning studies, this timeframe reflects the goal of developing projects that have a "useful" life of at least 20 years. In addition, projections beyond a 25 year time frame are too uncertain to make modeling useful.

The following traffic improvement projects are included in the future year "no-build" model:

- 1 – Willow Street reconstruction, widening and Exit 7 signal and safety improvements
- 2 – Bearses Way reconstruction
- 3 – Route 132 reconstruction and widening
- 4 – Route 28 widening between Yarmouth Road and the Airport Rotary
- 5 – Attucks Lane extension

More detailed descriptions of these projects can be found under the "Meeting Summaries and Notices" section of the web site [www.hyannis-access.com](http://www.hyannis-access.com) in the June 20, 2006 meeting summary.

The original zones in the model were created as part of the statewide model. If the sole focus of the Hyannis Access Study was Route 6, the statewide zones may have sufficed. However, based on the goals and objectives of the study, and the various intersections to be evaluated, the zones were split into smaller pieces with this analysis in mind. Subdividing larger statewide model zones is common practice for developing a sub-regional model. For the Hyannis study, this subdividing occurred within the study area as well as within the GIZ. Through this subdividing process, a specific group of zones can be selected to exclusively represent the study area, and/or the GIZ.

The zone subdividing process (zone-splitting) was done within TransCAD, a geographic information software. The GIZ boundaries used for the splitting were taken from the Barnstable growth incentive zone application produced by Vollmer Associates, LLP in early January 2006. The zone splitting was performed by examining the GIZ boundaries as an overlay to MassHighway's road inventory line layer and MassHighway's aerial photography. There are a total of 28 zones in the study area, 8 of which are in the GIZ.

### **A-6 Other considerations**

Results of a model are not intended to provide an exact picture of future conditions. Forecasted volumes on specific roadways should not be considered exact, but rather should be compared

in an order of magnitude approach to help determine if estimated traffic growth would necessitate improvements.

Models provide one possible picture of the future, given the assumptions made at the time of its development. There are many assumptions made in the development of any model. For example, trends on vehicular ownership and usage as well as traveler's inclination towards transit are all built into the model, often based on past trends and expected future trends. However, there are many unknowns about the future and travelers' behaviors may change unexpectedly or in unpredictable ways. Therefore, it is better to use the model to compare alternatives to each other and to existing conditions, with an understanding of the assumptions made.

For example, in the case of the Hyannis Access Study, it may be determined that one alternative may benefit traffic flow better than another alternative, given the assumptions about traffic trends and employment growth. At the time that this model was developed, these assumptions were reasonable. World events, natural disasters, major climate change or major economic and demographic shifts may affect the local area and change the outlook completely.

Models can help decision makers understand how growth in population and employment, development patterns, and investments in transportation infrastructure are likely to affect travel and congestion.

### Sources:

Ed Bromage, Travel Demand Modeler

<http://www.caliper.com/tcovu.htm>

<http://www.planning.dot.gov/documents/BriefingBook/BBook.htm#10BB>

<http://tmip.fhwa.dot.gov/about/>

[http://ops.fhwa.dot.gov/wz/resources/final\\_rule/wzi\\_guide/appb.htm](http://ops.fhwa.dot.gov/wz/resources/final_rule/wzi_guide/appb.htm)

<http://web.smtcmpo.org/extranet/smtc/publications/DIRECTIONS-Fall2003.pdf>

### More information on the Travel Demand Model

For the Hyannis Access Study transportation planning model, EOT started with the Community and County growth projections previously estimated in a cooperative planning effort between EOT and the Cape Cod Commission. This previous effort was conducted to support the Federal mobile emission air quality planning programs.

This previous effort is known as a top down methodology. This forecasting process begins at the State level where population and employment growth is forecast based on national and historical trends, market conditions, and relationships between the number of households with workers and the number of jobs. This top down method is then applied at a County level with the sum of the State's County projections bounded by State Control totals.

Within each County, historical trends, market conditions, and local planning inputs are used to allocate County growth to the member Communities. Within each community, population and employment growth is then allocated to areas within the community based on available local input.

For the Hyannis Access Study, the growth allocations within the Towns of Barnstable and Yarmouth were re-examined in order to fine-tune the previous efforts. The re-examination was based on a detailed review of aerial photography; a windshield survey to identify vacant buildings; an assessment of market conditions; interviews with Town officials; and in-depth interviews with key property owners. As a result of this effort, the forecasts were prepared based on the best available data at that time. These forecasts show that the population growth for the Towns of Barnstable and Yarmouth (from 2007 to 2030) will be

approximately 12,900 and 2,600 respectively. The Towns of Barnstable and Yarmouth have a projected employment growth of 6,100 and 2,000 for this same period. Within the Town of Barnstable, the employment in the Independence Park Industrial area will double. The majority of the remaining employment growth in the Town of Barnstable is projected to occur in the Growth Incentive Zone.

A recent review of the Town of Barnstable's latest assessment of the Industrial Park has shown that the Town's latest vision for this area is in keeping with the previously developed 6 1/2 estimates.

Basic information on travel demand models and background information on the model for this study is discussed in the Spring 2007 paper "The Travel Demand Model". This paper is also available on the study web site at:

<https://www.commentmgr.com/projects/1166/docs/TravelDemandModel.pdf>

**APPENDIX #4  
ADDITIONAL TRAFFIC INFORMATION**

The table below provides the results of the traffic data collection.

**2006 Summer Saturday ADT and Midday Peak Hour Volumes**

| No.  | Location                          | Sum Sat ADT |       |       | Sum Sat PHV |       |
|------|-----------------------------------|-------------|-------|-------|-------------|-------|
|      |                                   | TOTAL       | EB/NB | WB/SB | EB/NB       | WB/SB |
| 1    | Rte 6A west of Rte 132            | 8340        | 4334  | 4009  | 376         | 380   |
| 2    | Oak St west of Rte 132            | 3200        | 1694  | 1508  | 130         | 143   |
| 3    | Shootflying Hill Rd wo Rte 132    | 3130        | 1293  | 1838  | 96          | 146   |
| 4    | Service Rd wo Shootflying Hill    | 3180        | 1613  | 1565  | 130         | 203   |
| 5    | Conn Rd off-ramp to ShootFly      | 540         | 538   | 0     | 44          | 0     |
| 6.1  | Rte 6 EB off-ramp to Rte 132      | 11270       | 11274 | 0     | 793         | 0     |
| 6.2  | Rte 6 EB on-ramp from Rte 132     | 5340        | 5338  | 0     | 378         | 0     |
| 6.3  | Rte 6 WB off-ramp to Rte 132      | 8190        | 0     | 8188  | 0           | 568   |
| 6.4  | Rte 6 WB on-ramp from Rte 132     | 5670        | 0     | 5671  | 0           | 392   |
| 6.5  | Rte 6 WB on-ramp from P&R         | 1880        | 0     | 1884  | 0           | 125   |
| 7    | Huckins Neck southof Rte 132      | 1540        | 674   | 863   | 56          | 67    |
| 8    | Old Strawberry Rd southof 132     | 1330        | 449   | 877   | 16          | 48    |
| 9    | Pitcher's Way southof Bearse      | 5780        | 2702  | 3081  | 191         | 229   |
| 10   | Bearse's Way northof Enterprs     | 10360       | 4974  | 5383  | 368         | 400   |
| 11   | Rte 28 west of Bearse's Way       | 23730       | 12174 | 11555 | 838         | 781   |
| 12   | Alicia Rd west of Megan Rd        | 600         | 219   | 383   | 16          | 20    |
| 13   | Airport Rd northof Rte 132        | 5820        | 3473  | 2343  | 354         | 247   |
| 14   | Kidds Hill east of Phinneys       | 1470        | 684   | 784   | 68          | 96    |
| 15   | Eldridge Ave west of Megan Rd     | 620         | 349   | 268   | 19          | 16    |
| 16   | Mitchells Way west of Megan       | 1110        | 500   | 614   | 30          | 39    |
| 17   | H.S. Rd Ext northof Main St       | 5230        | 2627  | 2600  | 173         | 191   |
| 18   | Barnstable Rd north of Main St    | 7770        | 1398  | 6373  | 112         | 442   |
| 19   | Bay View Rd south of Main St      | 2820        | 1668  | 1151  | 98          | 112   |
| 20   | Rte 28 east of Baxter Ave         | 32360       | 16845 | 15510 | 955         | 1037  |
| 21   | Buck Isl Rd westof Town Brk Rd    | 3910        | 1794  | 2113  | 140         | 167   |
| 22   | Camp St northof Buck Isl Rd       | 4140        | 2213  | 1925  | 154         | 130   |
| 23   | Willow St southof Higgins Crow    | 17650       | 8983  | 8667  | 555         | 600   |
| 24   | Higgins Crow eastof Willow        | 6660        | 3758  | 2901  | 313         | 244   |
| 25.1 | Rte 6 EB off-ramp to Willow St    | 5190        | 5185  | 0     | 444         | 0     |
| 25.2 | Rte 6 EB on-ramp from Willow      | 6650        | 6654  | 0     | 419         | 0     |
| 25.3 | Rte 6 WB off-ramp to Willow       | 6330        | 0     | 6332  | 0           | 403   |
| 25.4 | Rte 6 WB on-ramp from Willow      | 4610        | 0     | 4608  | 0           | 333   |
| 26   | Summer St westof Old Hyannis      | 170         | 90    | 84    | 7           | 9     |
| 27   | Mary Dunn north of Ind Park Dr    | 5280        | 2642  | 2633  | 229         | 259   |
| 28   | Mary Dunn south of Ind Park Dr    | 120         | 38    | 80    | 4           | 12    |
| 29   | Thacher Shore east of Wharf Ln    | 330         | 220   | 111   | 25          | 13    |
| 30   | Rte 6A east of Wharf Ln           | 14110       | 7346  | 6766  | 663         | 644   |
| 31   | Rte 6 bet Exit 5 & 6              | 76380       | 41653 | 34731 | 3061        | 2670  |
| 32   | Rte 6 bet Exit 7 & 8              | 74270       | 37186 | 37088 | 2621        | 2791  |
| 33   | Oakmount Rd east of Althea Dr     | 1650        | 826   | 826   | 62          | 68    |
| 34   | Phinney's Ln south of Rte 132     | 13100       | 7112  | 5990  | 642         | 508   |
| 35   | Scudder Ave west of W.E Rotary    | 8890        | 4306  | 4588  | 377         | 401   |
| 36   | W. Main St east of W.E. Rotary    | 22100       | 11121 | 10981 | 831         | 739   |
| 37   | Ocean Ave south of Sea St         | 3840        | 1819  | 2016  | 159         | 176   |
| 38   | Rte 6 bet Exit 6 & 7              | 71080       | 35717 | 35364 | 2646        | 2721  |
| 39   | Independence Dr north of Rte 132  | 14570       | 6924  | 7647  | 513         | 567   |
| 40   | Phinney's Ln north of Rte 132     | 8280        | 4227  | 4057  | 346         | 347   |
| 41   | H.S. Road south of Main St        | 3340        | 1524  | 1811  | 188         | 195   |
| 42   | Airport Access Rd north of Rotary | 2790        | 1363  | 1422  | 98          | 94    |
| 43   | Barnstable Rd north of Rotary     | 22710       | 11023 | 11682 | 1068        | 763   |
| 44   | Route 28 at Yarmouth Town Line    | 12660       | 6192  | 6463  | 447         | 438   |
| 45   | Main St east of South St          | 10220       | 10219 |       | 785         |       |
| 46   | Center St north of Main St        | 13580       | 7446  | 6138  | 527         | 423   |
| 47   | Lewis Bay Rd north of South St    | 3070        | 2784  | 290   | 213         | 26    |
| 48   | Camp St north of Route 28         | 3940        | 2116  | 1820  | 152         | 131   |

2006 Summer Weekday ADT and PM Peak Hour Volumes

| No.  | Location                          | Sum Weekday ADT |       |       | Sum Wkdy PM PHV |       |
|------|-----------------------------------|-----------------|-------|-------|-----------------|-------|
|      |                                   | TOTAL           | EB/NB | WB/SB | EB/NB           | WB/SB |
| 1    | Rte 6A west of Rte 132            | 7800            | 3970  | 3826  | 290             | 369   |
| 2    | Oak St west of Rte 132            | 4200            | 2199  | 1998  | 161             | 253   |
| 3    | Shootflying Hill Rd wo Rte 132    | 2810            | 1107  | 1703  | 153             | 246   |
| 4    | Service Rd wo Shootflying Hill    | 3650            | 1661  | 1993  | 134             | 116   |
| 5    | Conn Rd off-ramp to ShootFly      | 430             | 428   |       | 26              |       |
| 6.1  | Rte 6 EB off-ramp to Rte 132      | 12070           | 12075 |       | 725             |       |
| 6.2  | Rte 6 EB on-ramp from Rte 132     | 6100            | 6097  |       | 463             |       |
| 6.3  | Rte 6 WB off-ramp to Rte 132      | 7260            |       | 7260  |                 | 619   |
| 6.4  | Rte 6 WB on-ramp from Rte 132     | 8690            |       | 8688  |                 | 737   |
| 6.5  | Rte 6 WB on-ramp from P&R         | 2370            |       | 2373  |                 | 187   |
| 7    | Huckins Neck southof Rte 132      | 1570            | 670   | 905   | 41              | 76    |
| 7*   | New Shootflying Hill Rd wo 132    | 4390            | 1778  | 2608  | 204             | 323   |
| 8    | Old Strawberry Rd southof 132     | 1710            | 630   | 1077  | 29              | 95    |
| 9    | Pitcher's Way southof Bearse      | 6360            | 2898  | 3463  | 193             | 331   |
| 10   | Bearse's Way northof Enterprs     | 11160           | 5372  | 5791  | 434             | 415   |
| 11   | Rte 28 west of Bearse's Way       | 24530           | 12566 | 11963 | 803             | 958   |
| 12   | Alicia Rd west of Megan Rd        | 630             | 282   | 344   | 21              | 31    |
| 13   | Airport Rd northof Rte 132        | 8580            | 5095  | 3485  | 412             | 309   |
| 14   | Kidds Hill east of Phinneys       | 2770            | 1287  | 1479  | 123             | 152   |
| 15   | Eldridge Ave west of Megan Rd     | 540             | 303   | 239   | 19              | 22    |
| 16   | Mitchells Way west of Megan       | 1190            | 613   | 575   | 45              | 57    |
| 17   | H.S. Rd Ext northof Main St       | 6490            | 3364  | 3125  | 284             | 238   |
| 18   | Barnstable Rd north of Main St    | 7250            | 1564  | 5682  | 98              | 394   |
| 19   | Bay View Rd south of Main St      | 4490            | 2579  | 1914  | 247             | 74    |
| 20   | Rte 28 east of Baxter Ave         | 31610           | 16097 | 15515 | 1226            | 972   |
| 21   | Buck Isl Rd westof Town Brk Rd    | 4230            | 2017  | 2213  | 225             | 175   |
| 22   | Camp St northof Buck Isl Rd       | 4860            | 2616  | 2241  | 236             | 179   |
| 23   | Willow St southof Higgins Crow    | 22620           | 11897 | 10721 | 978             | 712   |
| 24   | Higgins Crow eastof Willow        | 7260            | 4190  | 3072  | 288             | 248   |
| 25.1 | Rte 6 EB off-ramp to Willow St    | 4960            | 4957  |       | 309             |       |
| 25.2 | Rte 6 EB on-ramp from Willow      | 8840            | 8841  |       | 744             |       |
| 25.3 | Rte 6 WB off-ramp to Willow       | 8860            |       | 8861  |                 | 614   |
| 25.4 | Rte 6 WB on-ramp from Willow      | 5530            |       | 5530  |                 | 571   |
| 26   | Summer St westof Old Hyannis      | 350             | 180   | 168   | 16              | 13    |
| 27   | Mary Dunn north of Ind Park Dr    | 7200            | 3682  | 3521  | 490             | 291   |
| 28   | Mary Dunn south of Ind Park Dr    | 190             | 71    | 117   | 32              | 13    |
| 29   | Thacher Shore east of Wharf Ln    | 210             | 123   | 89    | 11              | 11    |
| 30   | Rte 6A east of Wharf Ln           | 15100           | 7892  | 7213  | 817             | 551   |
| 31   | Rte 6 bet Exit 5 & 6              | 70240           | 36140 | 34100 | 2354            | 2764  |
| 32   | Rte 6 bet Exit 7 & 8              | 67680           | 34050 | 33630 | 2527            | 2738  |
| 33   | Oakmount Rd east of Althea Dr     | 1980            | 1034  | 944   | 118             | 63    |
| 34   | Phinney's Ln south of Rte 132     | 13850           | 6354  | 7500  | 507             | 632   |
| 35   | Scudder Ave west of W.E Rotary    | 8290            | 4015  | 4278  | 309             | 374   |
| 36   | W. Main St east of W.E. Rotary    | 23110           | 11688 | 11424 | 766             | 952   |
| 37   | Ocean Ave south of Sea St         | 3580            | 1696  | 1879  | 130             | 188   |
| 38   | Rte 6 bet Exit 6 & 7              | 60470           | 30170 | 30300 | 2092            | 2695  |
| 39   | Independence Dr north of Rte 132  | 15390           | 7314  | 8077  | 789             | 670   |
| 40   | Phinney's Ln north of Rte 132     | 9090            | 4868  | 4220  | 331             | 527   |
| 41   | H.S. Road south of Main St        | 3500            | 1339  | 2160  | 87              | 157   |
| 42   | Airport Access Rd north of Rotary | 3240            | 1647  | 1593  | 87              | 108   |
| 43   | Barnstable Rd south of Rotary     | 18830           | 9790  | 9038  | 686             | 527   |
| 44   | Route 28 at Yarmouth Town Line    | 13580           | 6702  | 6874  | 165             | 361   |
| 45   | Main St east of South St          | 9150            | 9148  |       | 674             |       |
| 46   | Center St north of Main St        | 15820           | 8613  | 7204  | 677             | 554   |
| 47   | Lewis Bay Rd north of South St    | 3500            | 3139  | 359   | 230             | 19    |
| 48   | Camp St north of Route 28         | 4640            | 2138  | 2501  | 135             | 323   |
| 49   | Rte 132 south of Phinney's Ln     | 37450           | 18534 | 18919 | 1415            | 1282  |

**Table 2-5  
2006 Summer Saturday Midday Level of Service – Signalized Intersections**

| NAME                          | MOVEMENT     | V/C  | DELAY | LOS | 50th Q | 95th Q |
|-------------------------------|--------------|------|-------|-----|--------|--------|
| Rte 28 & Beares Way           | EB L         | 0.84 | 48.3  | D   | 135    | 249    |
|                               | EB TR        | 0.77 | 32.4  | C   | 186    | 277    |
|                               | WB L         | 0.63 | 38.4  | D   | 69     | 122    |
|                               | WB TR        | 0.93 | 49.4  | D   | 186    | 285    |
|                               | NB L         | 0.69 | 44.9  | D   | 63     | 139    |
|                               | NB TR        | 1.23 | 153.5 | F   | 327    | 509    |
|                               | SB L         | 0.83 | 62.9  | E   | 73     | 143    |
|                               | SB T         | 0.8  | 44.1  | D   | 154    | 286    |
|                               | SB R         | 0.11 | 26.9  | C   | 0      | 49     |
|                               | Intersection | 0.99 | 60.4  | E   |        |        |
| Bearse's Way at Enterprise Dr | WB L         | 0.71 | 33    | C   | 128    | 206    |
|                               | WB R         | 0.19 | 32.7  | C   | 9      | 57     |
|                               | NB T         | 0.33 | 13.2  | B   | 79     | 176    |
|                               | NB R         | 0.2  | 24    | C   | 0      | 56     |
|                               | SB L         | 0.16 | 5.6   | A   | 15     | 43     |
|                               | SB T         | 0.28 | 6.4   | A   | 59     | 134    |
|                               | Intersection | 0.44 | 19    | B   |        |        |
| Willow St at Rte 6 WB Ramps   | WB L         | 0.61 | 26.9  | C   | 86     | 110    |
|                               | WB R         | 0.03 | 0     | A   | 0      | 0      |
|                               | NB T         | 0.13 | 1.1   | A   | 1      | 6      |
|                               | NB R         | 0.21 | 0.3   | A   | 0      | 10     |
|                               | SB LT        | 0.14 | 4.6   | A   | 20     | 41     |
|                               | Intersection | 0.3  | 9.4   | A   |        |        |
| Willow St at Rte 6 EB Ramps   | WB L         | 0.67 | 27.1  | C   | 105    | 120    |
|                               | WB R         | 0.03 | 21.3  | C   | 0      | 15     |
|                               | NB T         | 0.27 | 5.9   | A   | 52     | 81     |
|                               | NB R         | 0.25 | 0.4   | A   | 0      | 0      |
|                               | SB LT        | 0.37 | 11.1  | B   | 100    | 131    |
|                               | Intersection | 0.45 | 11.7  | B   |        |        |
| Rte 28 & Yarmouth Rd          | EB L         | 0.82 | 46.2  | D   | 240    | 363    |
|                               | EB TR        | 0.4  | 13.5  | B   | 144    | 181    |
|                               | WB TR        | 0.81 | 43.8  | D   | 218    | 322    |
|                               | NB L         | 0.6  | 38.1  | D   | 81     | 203    |
|                               | NB TR        | 0.34 | 26.2  | C   | 110    | 208    |
|                               | SB LT        | 0.67 | 35.8  | D   | 193    | 383    |
|                               | SB R         | 0.32 | 26.1  | C   | 0      | 84     |
|                               | Intersection | 0.76 | 30.9  | C   |        |        |
| Rte 28 & East Main St         | EB TR        | 0.6  | 14.6  | B   | 414    | 468    |
|                               | WB L         | 0.59 | 14.2  | B   | 405    | 610    |
|                               | WB T         | 0.44 | 0.2   | A   | 593    | 866    |
|                               | NE R         | 0.25 | 11    | B   | 93     | 148    |
|                               | Intersection | 0.59 | 9.2   | A   |        |        |
| Rte 6A & Millway              | EB LTR       | 0.61 | 10.6  | B   | 53     | 167    |
|                               | WB LTR       | 0.62 | 10.9  | B   | 55     | 166    |
|                               | NB LTR       | 0.55 | 11.7  | B   | 36     | 126    |
|                               | SB LTR       | 0.07 | 8.7   | A   | 3      | 26     |
|                               | Intersection | 0.58 | 10.9  | B   |        |        |

2006 Summer Weekday PM Level of Service – Signalized Intersections

| NAME                                  | APPROACH            | MOVEMENT            | V/C         | DELAY       | LOS      | 50th Q | 95th Q |
|---------------------------------------|---------------------|---------------------|-------------|-------------|----------|--------|--------|
| <b>Rte 132 at Rte 6 WB Ramps</b>      |                     |                     |             |             |          |        |        |
|                                       | Driveway            | EB LT               | 0.23        | 42          | D        | 13     | 26     |
|                                       |                     | EB R                | 0.05        | 40.7        | D        | 0      | 34     |
| Rte 6 WB Ramps                        | Rte 6 WB Ramps      | WB L                | 0.77        | 39          | D        | 188    | 220    |
|                                       |                     | WB LT               | 0.76        | 38.1        | D        | 187    | 256    |
|                                       |                     | WB R                | 0.21        | 26.2        | C        | 30     | 33     |
| Rte 132                               | Rte 132             | NB L                | 0.62        | 29.2        | C        | 78     | 92     |
|                                       |                     | NB T                | 0.22        | 12.8        | B        | 70     | 95     |
|                                       |                     | NB R                | 0.49        | 1           | A        | 114    | 420    |
| Rte 132                               | Rte 132             | SB L                | 0.54        | 48.4        | D        | 25     | 48     |
|                                       |                     | SB TR               | 0.35        | 26.6        | C        | 87     | 135    |
|                                       |                     | <b>Intersection</b> | <b>0.57</b> | <b>21.4</b> | <b>C</b> |        |        |
| <b>Rte 132 at Rte 6 EB Ramps</b>      |                     |                     |             |             |          |        |        |
|                                       | Rte 6 EB Ramps      | EB L                | 0.56        | 42          | D        | 60     | 94     |
|                                       |                     | EB R                | 0.35        | 0.5         | A        | 0      | 0      |
| Rte 132                               | Rte 132             | NB T                | 0.54        | 8.5         | A        | 209    | 287    |
|                                       |                     | NB R                | 0.21        | 0.3         | A        | 0      | 0      |
| Rte 132                               | Rte 132             | SB L                | 0.63        | 36.9        | D        | 77     | 129    |
|                                       |                     | SB T                | 0.31        | 1.3         | A        | 11     | 37     |
|                                       |                     | <b>Intersection</b> | <b>0.52</b> | <b>6.9</b>  | <b>A</b> |        |        |
| <b>Rte 132 at Shootflying Hill Rd</b> |                     |                     |             |             |          |        |        |
|                                       | Shootflying Hill Rd | EB L                | 0.36        | 39.4        | D        | 42     | 86     |
|                                       |                     | EB TR               | 0.12        | 34.5        | C        | 5      | 57     |
| Golf Driveway                         | Golf Driveway       | WB LTR              | 0.06        | 33.4        | C        | 6      | 28     |
|                                       |                     | NB L                | 0.61        | 42.5        | D        | 72     | 130    |
| Rte 132                               | Rte 132             | NB TR               | 0.6         | 11.9        | B        | 159    | 310    |
| Rte 132                               | Rte 132             | SB L                | 0.69        | 120.5       | F        | 7      | 21     |
|                                       |                     | SB TR               | 0.78        | 26.3        | C        | 383    | 460    |
|                                       |                     | <b>Intersection</b> | <b>0.77</b> | <b>22</b>   | <b>C</b> |        |        |
| <b>Rte 132 &amp; Attucks Lane</b>     |                     |                     |             |             |          |        |        |
|                                       | Attucks Ln          | WB L                | 0.03        | 35.6        | D        | 4      | 14     |
|                                       |                     | WB R                | 0.3         | 17.1        | B        | 80     | 107    |
| Rte 132                               | Rte 132             | NB U                | 0.22        | 61          | E        | 3      | 4      |
|                                       |                     | NB TR               | 0.69        | 11.5        | B        | 282    | 163    |
| Rte 132                               | Rte 132             | SB L                | 0.78        | 50.8        | D        | 147    | 191    |
|                                       |                     | SB T                | 0.44        | 2.2         | A        | 13     | 32     |
|                                       |                     | <b>Intersection</b> | <b>0.66</b> | <b>13.6</b> | <b>B</b> |        |        |
| <b>Rte 132 &amp; Phinneys Lane</b>    |                     |                     |             |             |          |        |        |
| Rte 132                               | Rte 132             | EB L                | 0.83        | 144.9       | F        | 15     | 34     |
|                                       |                     | EB TR               | 0.98        | 59.2        | E        | 341    | 484    |
| Rte 132                               | Rte 132             | WB L                | 1.35        | 223.5       | F        | 274    | 464    |
|                                       |                     | WB TR               | 0.91        | 41.7        | D        | 300    | 631    |
| Phinney's Ln                          | Phinney's Ln        | NB L                | 1.52        | 326.4       | F        | 133    | 193    |
|                                       |                     | NB T                | 0.55        | 34.3        | C        | 140    | 190    |
|                                       |                     | NB R                | 0.15        | 39.4        | D        | 0      | 46     |
| Phinney's Ln                          | Phinney's Ln        | SB L                | 1.57        | 340.1       | F        | 165    | 301    |
|                                       |                     | SB T                | 0.84        | 47.3        | D        | 241    | 288    |
|                                       |                     | SB R                | 0.03        | 25.2        | C        | 0      | 18     |
| <b>Intersection</b>                   | <b>0.9</b>          | <b>85.4</b>         | <b>F</b>    |             |          |        |        |
| <b>Rte 132 &amp; Bearse's Way</b>     |                     |                     |             |             |          |        |        |
| Rte 132                               | Rte 132             | EB L                | 0.42        | 53.6        | D        | 17     | 18     |
|                                       |                     | EB T                | 0.66        | 32.9        | C        | 162    | 270    |
|                                       |                     | EB R                | 0.25        | 0.1         | A        | 0      | 0      |
| Rte 132                               | Rte 132             | WB L                | 0.7         | 36.8        | D        | 120    | 151    |
|                                       |                     | WB TR               | 0.63        | 20.9        | C        | 276    | 425    |
| Bearse's Way                          | Bearse's Way        | NB L                | 0.71        | 45.9        | D        | 141    | 211    |
|                                       |                     | NB LT               | 0.7         | 44.8        | D        | 137    | 182    |
|                                       |                     | NB R                | 0.05        | 33.7        | C        | 0      | 35     |
| Driveway                              | Driveway            | SB L                | 0.27        | 48          | D        | 14     | 34     |
|                                       |                     | SB TR               | 0.1         | 46.4        | D        | 4      | 28     |
| <b>Intersection</b>                   | <b>0.64</b>         | <b>26.9</b>         | <b>C</b>    |             |          |        |        |

2006 Summer Weekday PM Level of Service – Signalized Intersections

| NAME                                 | APPROACH | MOVEMENT            | V/C         | DELAY       | LOS         | 50th Q      | 95th Q   |
|--------------------------------------|----------|---------------------|-------------|-------------|-------------|-------------|----------|
| <b>Rte 132 &amp; Independence Dr</b> |          |                     |             |             |             |             |          |
| Rte 132                              |          | EB LT               | 1.05        | 52.8        | D           | 272         | 390      |
|                                      |          | EB R                | 0.11        | 26.2        | C           | 32          | 62       |
| Rte 132                              |          | WB TR               | 0.92        | 43          | D           | 300         | 438      |
|                                      |          | NB L                | 0.79        | 63          | E           | 124         | 228      |
| Enterprise Dr                        |          | NB T                | 0.76        | 44.5        | D           | 183         | 312      |
|                                      |          | NB R                | 0.06        | 31          | C           | 0           | 24       |
| Independence Dr                      |          | SB L                | 0.76        | 49.8        | D           | 141         | 220      |
|                                      |          | SB TR               | 0.95        | 67.1        | E           | 266         | 441      |
| <b>Intersection</b>                  |          |                     | <b>0.96</b> | <b>49.5</b> | <b>D</b>    |             |          |
| <b>Rte 28 &amp; Bearses Way</b>      |          |                     |             |             |             |             |          |
| Rte 28                               |          | EB L                | 0.96        | 79.6        | E           | 118         | 246      |
|                                      |          | EB TR               | 0.66        | 27.2        | C           | 140         | 198      |
| Rte 28                               |          | WB L                | 0.73        | 45.2        | D           | 75          | 152      |
|                                      |          | WB TR               | 0.85        | 35.5        | D           | 186         | 242      |
| Bearses Way                          |          | NB L                | 0.91        | 68.8        | E           | 111         | 240      |
|                                      |          | NB TR               | 0.98        | 63.8        | E           | 243         | 434      |
| Bearses Way                          |          | SB L                | 0.95        | 100.3       | F           | 64          | 142      |
|                                      |          | SB T                | 0.98        | 70.5        | E           | 184         | 354      |
|                                      |          | SB R                | 0.12        | 30.1        | C           | 0           | 57       |
|                                      |          | <b>Intersection</b> |             |             | <b>0.96</b> | <b>50.2</b> | <b>D</b> |
| <b>Bearses Way at Enterprise Dr</b>  |          |                     |             |             |             |             |          |
| Enterprise Dr                        |          | WB L                | 0.61        | 17.1        | B           | 91          | 206      |
|                                      |          | WB R                | 0.27        | 23.1        | C           | 10          | 64       |
| Bearses Way                          |          | NB T                | 0.61        | 17.9        | B           | 94          | 212      |
|                                      |          | NB R                | 0.23        | 13.5        | B           | 0           | 53       |
| Bearses Way                          |          | SB L                | 0.24        | 8.1         | A           | 15          | 47       |
|                                      |          | SB T                | 0.37        | 8.3         | A           | 59          | 148      |
| <b>Intersection</b>                  |          |                     | <b>0.6</b>  | <b>14.5</b> | <b>B</b>    |             |          |
| <b>Willow St at Rte 6 WB Ramps</b>   |          |                     |             |             |             |             |          |
| Rte 6 WB Ramps                       |          | WB L                | 0.67        | 25.9        | C           | 114         | 137      |
|                                      |          | WB R                | 0.09        | 0.1         | A           | 0           | 0        |
| Willow St                            |          | NB T                | 0.17        | 4           | A           | 30          | 54       |
|                                      |          | NB R                | 0.36        | 0.6         | A           | 3           | 35       |
| Willow St                            |          | SB LT               | 0.3         | 6.5         | A           | 50          | 89       |
| <b>Intersection</b>                  |          |                     | <b>0.44</b> | <b>9.2</b>  | <b>A</b>    |             |          |
| <b>Willow St at Rte 6 EB Ramps</b>   |          |                     |             |             |             |             |          |
| Rte 6 EB Ramps                       |          | WB L                | 0.51        | 27.8        | C           | 58          | 73       |
|                                      |          | WB R                | 0.08        | 25.2        | C           | 0           | 20       |
| Willow St                            |          | NB T                | 0.34        | 4.5         | A           | 61          | 98       |
|                                      |          | NB R                | 0.4         | 0.8         | A           | 0           | 0        |
| Willow St                            |          | SB LT               | 0.67        | 14.5        | B           | 190         | 211      |
| <b>Intersection</b>                  |          |                     | <b>0.61</b> | <b>10.5</b> | <b>B</b>    |             |          |
| <b>Rte 28 &amp; Yarmouth Rd</b>      |          |                     |             |             |             |             |          |
| Rte 28                               |          | EB L                | 0.93        | 65.4        | E           | 336         | 524      |
|                                      |          | EB TR               | 0.4         | 16.5        | B           | 165         | 210      |
| Rte 28                               |          | WB TR               | 0.96        | 71.4        | E           | 280         | 410      |
| Yarmouth Rd                          |          | NB L                | 0.45        | 32.2        | C           | 73          | 137      |
|                                      |          | NB TR               | 0.64        | 34.3        | C           | 288         | 406      |
| Yarmouth Rd                          |          | SB LT               | 0.85        | 53.9        | D           | 229         | 403      |
|                                      |          | SB R                | 0.3         | 26.6        | C           | 0           | 69       |
| <b>Intersection</b>                  |          |                     | <b>0.9</b>  | <b>43.2</b> | <b>D</b>    |             |          |
| <b>Rte 28 &amp; East Main St</b>     |          |                     |             |             |             |             |          |
| Rte 28                               |          | EB TR               | 0.62        | 11          | B           | 87          | 144      |
| Rte 28                               |          | WB L                | 0.52        | 11.8        | B           | 63          | 153      |
|                                      |          | WB T                | 0.35        | 0.1         | A           | 0           | 0        |
| East Main St                         |          | NE R                | 0.58        | 12.2        | B           | 57          | 134      |
| <b>Intersection</b>                  |          |                     | <b>0.6</b>  | <b>8.7</b>  | <b>A</b>    |             |          |
| <b>Rte 6A &amp; Millway</b>          |          |                     |             |             |             |             |          |
| Rte 6A                               |          | EB LTR              | 0.69        | 12          | B           | 76          | 213      |
| Rte 6A                               |          | WB LTR              | 0.54        | 9.4         | A           | 46          | 134      |
| Hyannis Rd                           |          | NB LTR              | 0.56        | 13.1        | B           | 39          | 128      |
| Millway                              |          | SB LTR              | 0.09        | 9.8         | A           | 5           | 30       |
| <b>Intersection</b>                  |          |                     | <b>0.64</b> | <b>11.4</b> | <b>B</b>    |             |          |

**2006 Summer Saturday Midday Level of Service – Unsignalized Intersections**

| <b>NAME</b>                    | <b>MOVEMENT</b> | <b>V/C</b> | <b>DELAY</b> | <b>LOS</b> |
|--------------------------------|-----------------|------------|--------------|------------|
| Rte 6A & Rte 132               | WB L            | 0.19       | 6.2          | A          |
|                                | NB LR           | 1.27       | 176.2        | F          |
|                                | Intersection    |            | 62.6         | C          |
| Rte 132 & Oak St               | NB L            | 0.07       | 2.2          | A          |
|                                | NE LR           | 0.3        | 15.9         | C          |
|                                | Intersection    |            | 3.3          | B          |
| Rte 6A & Indian Trail Rd       | EB L            | 0          | 0.1          | A          |
|                                | WB L            | 0.2        | 4.7          | A          |
|                                | NB LTR          | 0.47       | 19.5         | C          |
|                                | SB LTR          | 0.04       | 19.7         | C          |
|                                | Intersection    |            | 5.7          | D          |
| Rte 6A & Millway               | EB L            | 0          | 0.1          | A          |
|                                | SE LR           | 0.03       | 18.3         | C          |
|                                | Intersection    |            | 0.2          | A          |
| Rte 6A & Willow St             | WB L            | 0.18       | 4.2          | A          |
|                                | NB LR           | 0.55       | 33.3         | D          |
|                                | Intersection    |            | 6            | D          |
| Independence Dr & Mary Dunn Rd | EB L            | 0.29       | 11           | B          |
|                                | EB R            | 0.01       | 9            | A          |
|                                | NB L            | 0          | 2            | A          |
|                                | Intersection    |            | 5.2          | A          |
| Airport Rotary                 | Rte 132 SB      | 0.586      | 8            | A          |
|                                | Rte 28 EB       | 1.026      | 43.5         | D          |
|                                | Barnstable Rd   | 0.716      | 12.7         | B          |
|                                | Rte 28 WB       | 1.335      | 168.4        | F          |
|                                | Airport Rd      | 0.293      | 20.3         | C          |
|                                | Rotary          | 1.335      | 52.7         | F          |

## 2006 Summer Weekday PM Level of Service – Unsignalized Intersections

| NAME                                      | APPROACH        | MOVEMENT      | V/C   | DELAY | LOS |
|---|-----------------|---------------|-------|-------|-----|
| <b>Rte 6A &amp; Rte 132</b>               | Rte 6A          | WB L          | 0.3   | 7.5   | A   |
|   | Rte 132         | NB LR         | 1.86  | 435.6 | F   |
| <b>Rte 132 &amp; Oak St</b>               | Rte 132         | NB L          | 0.15  | 4     | A   |
|   | Oak St          | NE LR         | 0.44  | 21.3  | C   |
| <b>Rte 6A &amp; Indian Trail Rd</b>       | Rte 6A          | EB L          | 0     | 0.1   | A   |
|   | Rte 6A          | WB L          | 0.18  | 4.7   | A   |
|   | Mary Dunn Rd    | NB LTR        | 0.81  | 34.3  | D   |
|   | Indian Trail    | SB LTR        | 0.05  | 23.9  | C   |
| <b>Rte 6A &amp; Millway</b>               | Rte 6A          | EB L          | 0     | 0     | A   |
|   | Mill Ln         | SE LR         | 0.06  | 20.1  | C   |
| <b>Rte 6A &amp; Willow St</b>             | Rte 6A          | WB L          | 0.19  | 4.5   | A   |
|   | Willow St       | NB LR         | 0.75  | 43.1  | E   |
| <b>Independence Dr &amp; Mary Dunn Rd</b> | Independence Dr | EB L          | 0.7   | 20.3  | C   |
|   |                 | EB R          | 0.01  | 9.1   | A   |
|   | Mary Dunn Rd    | NB L          | 0.02  | 6.3   | A   |
| <b>Airport Rotary</b>                     | Rte 132         | Rte 132 SB    | 0.57  | 7.3   | A   |
|   | Rte 28          | Rte 28 EB     | 0.961 | 28.8  | C   |
|   | Barnstable Rd   | Barnstable Rd | 0.536 | 11.2  | B   |
|   | Rte 28          | Rte 28 WB     | 1.226 | 117.8 | F   |
|   | Airport Rd      | Airport Rd    | 0.38  | 25.1  | C   |
|   |                 | Rotary        | 1.226 | 43.4  | F   |

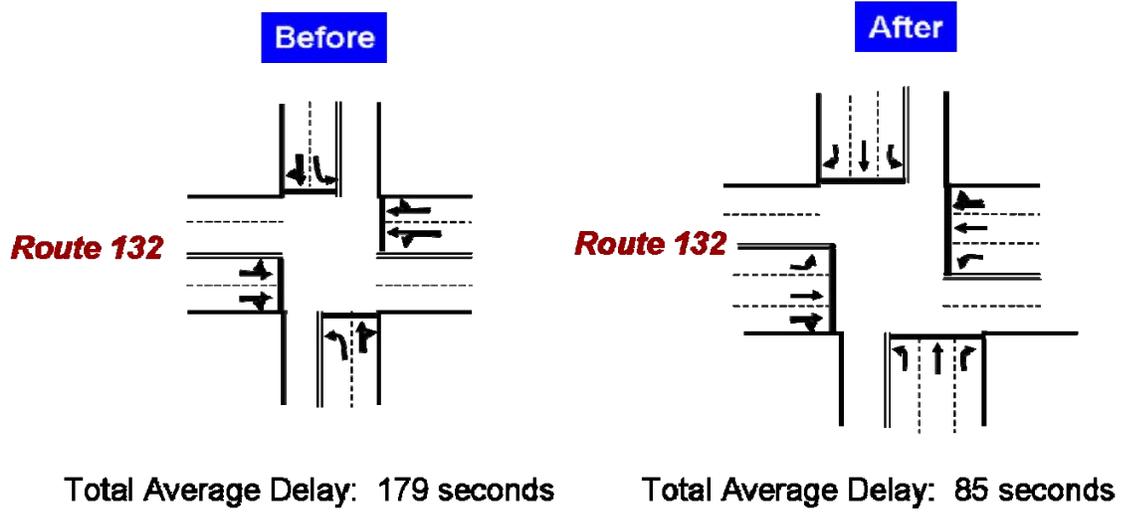
**2006 Summer Saturday Midday Level of Service – Ramp Junctions**

| <b>NAME</b>                          | <b>MOVEMENT</b>        | <b>DENSITY</b> | <b>SPEED<br/>(mph)</b> | <b>LOS</b> |
|--------------------------------------|------------------------|----------------|------------------------|------------|
| <b>Route 6 at Route 132 (Exit 6)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 29.4           | 48.4                   | D          |
|                                      | EB On-Ramp             | 25.1           | 50.3                   | C          |
|                                      | WB Off-Ramp            | 25.7           | 48.7                   | C          |
|                                      | WB On-Ramp             | 24.2           | 50.4                   | C          |
|                                      | WB On-Ramp (rest area) | 25.4           | 50.3                   | C          |
| <b>Route 6 at Willow St (Exit 7)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 25             | 48.9                   | C          |
|                                      | EB On-Ramp             | 24.8           | 50.3                   | C          |
|                                      | WB Off-Ramp            | 26.4           | 48.9                   | C          |
|                                      | WB On-Ramp             | 25.7           | 50.2                   | C          |

**2006 Summer Weekday PM Level of Service – Ramp Junctions**

| <b>NAME</b>                          | <b>MOVEMENT</b>        | <b>DENSITY</b> | <b>SPEED<br/>(mph)</b> | <b>LOS</b> |
|--------------------------------------|------------------------|----------------|------------------------|------------|
| <b>Route 6 at Route 132 (Exit 6)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 22.5           | 48.5                   | C          |
|                                      | EB On-Ramp             | 20.2           | 50.8                   | C          |
|                                      | WB Off-Ramp            | 23.2           | 48.6                   | C          |
|                                      | WB On-Ramp             | 24.3           | 50.4                   | C          |
|                                      | WB On-Ramp (rest area) | 26.2           | 50.2                   | C          |
| <b>Route 6 at Willow St (Exit 7)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 19.7           | 49.0                   | C          |
|                                      | EB On-Ramp             | 23.9           | 50.4                   | C          |
|                                      | WB Off-Ramp            | 23.7           | 48.6                   | C          |
|                                      | WB On-Ramp             | 23.4           | 50.5                   | C          |

Phinneys' Lane before and after the construction project. The total average delay is greatly reduced, but the intersection is expected to still operate at level of service F during the peak periods.



**2030 Summer Weekday PM Level of Service – Signalized Intersections**

| NAME                                  | APPROACH | MOVEMENT | V/C         | DELAY<br>(sec/veh) | LOS      | 50th Q<br>(feet) | 95th Q<br>(feet) |
|---------------------------------------|----------|----------|-------------|--------------------|----------|------------------|------------------|
| <b>Rte 132 at Rte 6 WB Ramps</b>      |          |          |             |                    |          |                  |                  |
| Driveway                              |          | EB LT    | 0.3         | 46.6               | D        | 21               | 36               |
|                                       |          | EB R     | 0.08        | 44.8               | D        | 0                | 42               |
| Rte 6 WB Ramps                        |          | WB L     | 0.87        | 45.4               | D        | 283              | 333              |
|                                       |          | WB LT    | 0.86        | 44.9               | D        | 286              | 404              |
|                                       |          | WB R     | 0.21        | 24.9               | C        | 33               | 34               |
| Rte 132                               |          | NB L     | 0.69        | 50.8               | D        | 131              | 180              |
|                                       |          | NB T     | 0.31        | 37.7               | D        | 116              | 163              |
|                                       |          | NB R     | 0.64        | 1.4                | A        | 175              | 291              |
| Rte 132                               |          | SB L     | 0.54        | 57.7               | E        | 18               | 38               |
|                                       |          | SB TR    | 0.63        | 39.1               | D        | 158              | 261              |
| <b>Intersection</b>                   |          |          | <b>0.72</b> | <b>29.7</b>        | <b>C</b> |                  |                  |
| <b>Rte 132 at Rte 6 EB Ramps</b>      |          |          |             |                    |          |                  |                  |
| Rte 6 EB Ramps                        |          | EB L     | 0.62        | 45.9               | D        | 98               | 140              |
|                                       |          | EB R     | 0.41        | 0.7                | A        | 0                | 0                |
| Rte 132                               |          | NB T     | 0.73        | 23.4               | C        | 416              | 576              |
|                                       |          | NB R     | 0.4         | 0.5                | A        | 0                | 0                |
| Rte 132                               |          | SB L     | 0.78        | 33.7               | C        | 116              | 183              |
|                                       |          | SB T     | 0.44        | 3.6                | A        | 96               | 129              |
| <b>Intersection</b>                   |          |          | <b>0.73</b> | <b>12.2</b>        | <b>B</b> |                  |                  |
| <b>Rte 132 at Shootflying Hill Rd</b> |          |          |             |                    |          |                  |                  |
| Shootflying Hill Rd                   |          | EB L     | 0.64        | 58.1               | E        | 72               | 148              |
|                                       |          | EB TR    | 0.19        | 41.7               | D        | 7                | 78               |
| Golf Driveway                         |          | WB LTR   | 0.13        | 41.4               | D        | 7                | 33               |
| Rte 132                               |          | NB L     | 1           | 79.6               | E        | 231              | 249              |
|                                       |          | NB TR    | 0.81        | 7.4                | A        | 135              | 151              |
| Rte 132                               |          | SB L     | 0.86        | 210                | F        | 7                | 19               |
|                                       |          | SB TR    | 1.06        | 60                 | E        | 670              | 803              |
| <b>Intersection</b>                   |          |          | <b>0.98</b> | <b>38.2</b>        | <b>D</b> |                  |                  |
| <b>Rte 132 &amp; Attucks Lane</b>     |          |          |             |                    |          |                  |                  |
| Attucks Ln                            |          | WB L     | 0.05        | 43.2               | D        | 4                | 15               |
|                                       |          | WB R     | 0.48        | 22.6               | C        | 132              | 181              |
| Rte 132                               |          | NB U     | 0.22        | 64.6               | E        | 3                | 3                |
|                                       |          | NB TR    | 1.07        | 49.3               | D        | 705              | 407              |
| Rte 132                               |          | SB L     | 0.87        | 47.2               | D        | 171              | 169              |
|                                       |          | SB T     | 0.51        | 1.5                | A        | 11               | 26               |
| <b>Intersection</b>                   |          |          | <b>0.98</b> | <b>30.1</b>        | <b>C</b> |                  |                  |
| <b>Rte 132 &amp; Phinneys Lane</b>    |          |          |             |                    |          |                  |                  |
| Rte 132                               |          | EB L     | 0.89        | 176.6              | F        | 17               | 37               |
|                                       |          | EB TR    | 1.17        | 118.8              | F        | 505              | 631              |
| Rte 132                               |          | WB L     | 2.47        | 722.4              | F        | 295              | 369              |
|                                       |          | WB TR    | 1.52        | 272.7              | F        | 772              | 1036             |
| Phinney's Ln                          |          | NB L     | 1.91        | 488.2              | F        | 219              | 277              |
|                                       |          | NB T     | 0.59        | 31                 | C        | 181              | 246              |
|                                       |          | NB R     | 0.13        | 45.1               | D        | 0                | 47               |
| Phinney's Ln                          |          | SB L     | 2.8         | 883.1              | F        | 300              | 459              |
|                                       |          | SB T     | 1.17        | 130.3              | F        | 497              | 593              |
|                                       |          | SB R     | 0.04        | 24.3               | C        | 3                | 21               |
| <b>Intersection</b>                   |          |          | <b>1.62</b> | <b>253.4</b>       | <b>F</b> |                  |                  |
| <b>Rte 132 &amp; Bearse's Way</b>     |          |          |             |                    |          |                  |                  |
| Rte 132                               |          | EB L     | 0.79        | 48                 | D        | 23               | 20               |
|                                       |          | EB T     | 0.9         | 57.2               | E        | 277              | 216              |
|                                       |          | EB R     | 0.37        | 0.1                | A        | 0                | 0                |
| Rte 132                               |          | WB L     | 1.03        | 78.7               | E        | 275              | 258              |
|                                       |          | WB TR    | 0.94        | 24.6               | C        | 511              | 450              |
| Bearse's Way                          |          | NB L     | 0.89        | 59                 | E        | 213              | 371              |
|                                       |          | NB LT    | 0.88        | 57.7               | E        | 212              | 305              |
|                                       |          | NB R     | 0.08        | 31.1               | C        | 0                | 46               |
| Driveway                              |          | SB L     | 0.32        | 47.4               | D        | 19               | 44               |
|                                       |          | SB TR    | 0.2         | 46.3               | D        | 10               | 42               |
| <b>Intersection</b>                   |          |          | <b>0.9</b>  | <b>38.4</b>        | <b>D</b> |                  |                  |

**2030 Summer Weekday PM Level of Service – Signalized Intersections**

| NAME                                   | APPROACH | MOVEMENT            | V/C         | DELAY<br>(sec/veh) | LOS         | 50th Q<br>(feet) | 95th Q<br>(feet) |
|--|----------|---------------------|-------------|--------------------|-------------|------------------|------------------|
| <b>Rte 132 &amp; Independence Dr</b>   |          |                     |             |                    |             |                  |                  |
| Rte 132                                |          | EB LT               | 1.99        | 93.2               | F           | 341              | 453              |
|  |          | EB R                | 0.12        | 78.7               | E           | 63               | 87               |
| Rte 132                                |          | WB TR               | 1.16        | 102.5              | F           | 552              | 241              |
|  |          | NB L                | 0.69        | 52.5               | D           | 122              | 206              |
| Enterprise Dr                          |          | NB T                | 1.07        | 111.4              | F           | 236              | 380              |
|  |          | NB R                | 0.22        | 36.3               | D           | 20               | 48               |
| Independence Dr                        |          | SB L                | 0.96        | 82.2               | F           | 176              | 336              |
|  |          | SB T                | 1.26        | 182.4              | F           | 329              | 497              |
|  |          | SB R                | 0.36        | 37.5               | D           | 48               | 78               |
| <b>Intersection</b>                    |          |                     | <b>1.14</b> | <b>99.2</b>        | <b>F</b>    |                  |                  |
| <b>Rte 28 &amp; Bearses Way</b>        |          |                     |             |                    |             |                  |                  |
| Rte 28                                 |          | EB L                | 1.32        | 214.3              | F           | 152              | 279              |
|  |          | EB TR               | 0.78        | 32.6               | C           | 163              | 231              |
| Rte 28                                 |          | WB L                | 1.17        | 162.2              | F           | 108              | 219              |
|  |          | WB TR               | 0.93        | 45.7               | D           | 199              | 292              |
| Bearses Way                            |          | NB L                | 1.31        | 199.9              | F           | 205              | 358              |
|  |          | NB TR               | 1.13        | 104.9              | F           | 405              | 602              |
| Bearses Way                            |          | SB L                | 0.96        | 103.4              | F           | 64               | 142              |
|  |          | SB T                | 1.16        | 123.3              | F           | 339              | 529              |
|  |          | SB R                | 0.14        | 33.3               | C           | 0                | 64               |
| <b>Intersection</b>                    |          |                     | <b>1.16</b> | <b>94.4</b>        | <b>F</b>    |                  |                  |
| <b>Bearses Way at Enterprise Dr</b>    |          |                     |             |                    |             |                  |                  |
| Enterprise Dr                          |          | WB L                | 0.72        | 23.6               | C           | 130              | 267              |
|  |          | WB R                | 0.33        | 26                 | C           | 18               | 79               |
| Bearses Way                            |          | NB T                | 0.73        | 23                 | C           | 146              | 277              |
|  |          | NB R                | 0.26        | 16.1               | B           | 0                | 59               |
| Bearses Way                            |          | SB L                | 0.29        | 9.2                | A           | 20               | 50               |
|  |          | SB T                | 0.51        | 9.7                | A           | 117              | 228              |
| <b>Intersection</b>                    |          |                     | <b>0.72</b> | <b>17.7</b>        | <b>B</b>    |                  |                  |
| <b>Willow St at Rte 6 WB Ramps</b>     |          |                     |             |                    |             |                  |                  |
| Rte 6 WB Ramps                         |          | WB L                | 0.7         | 25                 | C           | 130              | 151              |
|  |          | WB R                | 0.12        | 0.2                | A           | 0                | 0                |
| Willow St                              |          | NB T                | 0.19        | 7.2                | A           | 54               | 84               |
|  |          | NB R                | 0.42        | 0.8                | A           | 18               | 56               |
| Willow St                              |          | SB LT               | 0.42        | 8.3                | A           | 78               | 138              |
|  |          | <b>Intersection</b> |             |                    | <b>0.5</b>  | <b>9.8</b>       | <b>A</b>         |
| <b>Willow St at Rte 6 EB Ramps</b>     |          |                     |             |                    |             |                  |                  |
| Rte 6 EB Ramps                         |          | WB L                | 0.61        | 27.7               | C           | 82               | 100              |
|  |          | WB R                | 0.1         | 23.6               | C           | 0                | 21               |
| Willow St                              |          | NB T                | 0.4         | 5.8                | A           | 82               | 120              |
|  |          | NB R                | 0.42        | 0.8                | A           | 0                | 0                |
| Willow St                              |          | SB LT               | 0.94        | 23.4               | C           | 206              | 232              |
|  |          | <b>Intersection</b> |             |                    | <b>0.87</b> | <b>14.9</b>      | <b>B</b>         |
| <b>Rte 28 &amp; Yarmouth Rd</b>        |          |                     |             |                    |             |                  |                  |
| Rte 28                                 |          | EB L                | 1.15        | 140.5              | F           | 388              | 589              |
|  |          | EB TR               | 0.54        | 23.8               | C           | 246              | 308              |
| Rte 28                                 |          | WB TR               | 1.24        | 166.3              | F           | 435              | 566              |
|  |          | NB L                | 0.6         | 33.2               | C           | 101              | 188              |
| Yarmouth Rd                            |          | NB TR               | 0.67        | 29.7               | C           | 336              | 467              |
|  |          | SB LT               | 1.05        | 91.3               | F           | 362              | 563              |
| Yarmouth Rd                            |          | SB R                | 0.29        | 21.4               | C           | 0                | 56               |
|  |          | <b>Intersection</b> |             |                    | <b>1.12</b> | <b>78.2</b>      | <b>E</b>         |
| <b>Rte 28 &amp; East Main St</b>       |          |                     |             |                    |             |                  |                  |
| Rte 28                                 |          | EB TR               | 0.71        | 13.5               | B           | 126              | 182              |
|  |          | WB L                | 0.64        | 14.8               | B           | 100              | 201              |
| Rte 28                                 |          | WB T                | 0.43        | 0.2                | A           | 0                | 0                |
|  |          | East Main St        | NE R        | 0.65               | 14.2        | B                | 88               |
| <b>Intersection</b>                    |          |                     | <b>0.68</b> | <b>10.3</b>        | <b>B</b>    |                  |                  |
| <b>Rte 6A &amp; Hyannis Rd/Millway</b> |          |                     |             |                    |             |                  |                  |
| Rte 6A                                 |          | EB LTR              | 0.7         | 11.8               | B           | 111              | 298              |
|  |          | WB LTR              | 0.71        | 13.4               | B           | 86               | 249              |
| Hyannis Rd                             |          | NB L                | 0.44        | 15.4               | B           | 33               | 67               |
|  |          | NB TR               | 0.23        | 13.8               | B           | 12               | 51               |
| Millway                                |          | SB LTR              | 0.25        | 19.4               | B           | 13               | 50               |
|  |          | <b>Intersection</b> |             |                    | <b>0.59</b> | <b>13.5</b>      | <b>B</b>         |

**2030 Summer Weekday PM Level of Service – Unsignalized Intersections**

| <b>NAME</b>                               | <b>APPROACH</b> | <b>MOVEMENT</b> | <b>V/C</b> | <b>DELAY<br/>(sec/veh)</b> | <b>LOS</b> |
|---|-----------------|-----------------|------------|----------------------------|------------|
| <b>Rte 6A &amp; Rte 132</b>               |                 |                 |            |                            |            |
|   | Rte 6A          | WB L            | 0.36       | 7.8                        | A          |
|   | Rte 132         | NB LR           | 3.79       | Err                        | F          |
| <b>Rte 132 &amp; Oak St</b>               |                 |                 |            |                            |            |
|   | Rte 132         | NB L            | 0.23       | 5.3                        | A          |
|   | Oak St          | NE LR           | 1.19       | 164.1                      | F          |
| <b>Rte 6A &amp; Indian Trail Rd</b>       |                 |                 |            |                            |            |
|   | Rte 6A          | EB L            | 0.01       | 0.2                        | A          |
|   | Rte 6A          | WB L            | 0.27       | 6                          | A          |
|   | Mary Dunn Rd    | NB LTR          | 1.3        | 185.7                      | F          |
|   | Indian Trail    | SB LTR          | 0.16       | 56.6                       | F          |
| <b>Rte 6A &amp; Millway</b>               |                 |                 |            |                            |            |
|   | Rte 6A          | EB L            | 0          | 0                          | A          |
|   | Mill Ln         | SE LR           | 0.1        | 25.8                       | D          |
| <b>Rte 6A &amp; Willow St</b>             |                 |                 |            |                            |            |
|   | Rte 6A          | WB L            | 0.23       | 5.6                        | A          |
|   | Willow St       | NB LR           | 1          | 100.5                      | F          |
| <b>Independence Dr &amp; Mary Dunn Rd</b> |                 |                 |            |                            |            |
|   | Independence Dr | EB L            | 0.91       | 43.3                       | E          |
|   |                 | EB R            | 0.02       | 9.5                        | A          |
|   | Mary Dunn Rd    | NB L            | 0.04       | 6.3                        | A          |
| <b>Airport Rotary</b>                     |                 |                 |            |                            |            |
|   | Rte 132         | Rte 132 SB      | 1.01       | 68.4                       | E          |
|   | Rte 28          | Rte 28 EB       | 2.12       | 527.0                      | F          |
|   | Barnstable Rd   | Barnstable Rd   | 1.39       | 250.6                      | F          |
|   | Rte 28          | Rte 28 WB       | 0.83       | 29.1                       | C          |
|   |                 | Rotary          | 1.25       | 184.9                      | F          |

**2030 Summer Weekday PM Level of Service – Ramp Junctions**

| <b>NAME</b>                          | <b>MOVEMENT</b>        | <b>DENSITY</b> | <b>SPEED<br/>(mph)</b> | <b>LOS</b> |
|--------------------------------------|------------------------|----------------|------------------------|------------|
| <b>Route 6 at Route 132 (Exit 6)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 48.3           | 25.3                   | C          |
|                                      | EB On-Ramp             | 50.3           | 24.6                   | C          |
|                                      | WB Off-Ramp            | 48.3           | 28.1                   | D          |
|                                      | WB On-Ramp             | 49.8           | 28.3                   | D          |
|                                      | WB On-Ramp (rest area) | 49.3           | 30.7                   | D          |
| <b>Route 6 at Willow St (Exit 7)</b> |                        |                |                        |            |
|                                      | EB Off-Ramp            | 48.9           | 24.8                   | C          |
|                                      | EB On-Ramp             | 49.8           | 28.0                   | D          |
|                                      | WB Off-Ramp            | 48.5           | 28.4                   | D          |
|                                      | WB On-Ramp             | 49.9           | 27.7                   | C          |

**APPENDIX #5  
ADDITIONAL CRASH INFORMATION**

There were a total of 168 crashes on Route 6 in the three year period between 2003 and 2005. The highest number of crashes occurred in the vicinity of Exit 6 at 68 followed by 53 crashes near Exit 7. There were two fatalities, both of which occurred in 2005.

An evaluation of the crash type data show there were no fatalities at the intersections during the three year period, while Route 6 had two during 2005. In comparing the severity of crashes on Route 6 with crashes at the intersection, Route 6 had a higher percent of non-fatal injury crashes at 33%, while the non-fatal injury crashes on the local street system was 29%. This may be explained by the higher speeds on the highway facility resulting in a greater likelihood of injury in a crash.

The number of crashes by month of year did show a higher number of crashes at the intersections during the summer months. This reflects the greater level of congestion on the surface street system during the peak summer months. The only other observation was a higher number of crashes on Route 6 during December than the other months in the year, reflecting the impact of weather on the higher operating speed facility. In terms of time of day, most of the crashes on Route 6 and at the intersections occurred between 9:00 AM and 3:00 PM.

To identify the existing safety deficiencies, further research was conducted into the types of collisions that occurred at the intersections and on Route 6. Collisions are categorized into several types including rear-end (when a vehicle is struck by another vehicle from the rear), and angular (when two vehicles collide at an angle) to mention the only most significant ones. A large number of rear-end collisions typically occur on congested roadways and intersections. Traffic is usually in a stop-and-go condition under congestion resulting in vehicles continuously having to accelerate and decelerate. This causes differential speeds among vehicles resulting in rear-end collisions. Angular collisions occur either at merge points or at intersections. This collision occurs when a vehicle attempting to join a travel lane does not notice a vehicle already on that lane either due to sight distance restriction or due to the lack of precaution by the driver of the vehicle attempting to join the lane.

The collision types of crashes at intersections differed significantly than those occurring on Route 6. Most of the collisions at intersections were either angle crashes or rear-end crashes. The intersections at Exit 7 and one at Exit 6 as well as the Airport rotary are unsignalized and which have a greater number of angle crashes. High rear-end collision is indicative of traffic congestion. On the other hand, Route 6 had predominantly single vehicle crashes where the motorist lost control of the vehicle and crashed into a roadside object.

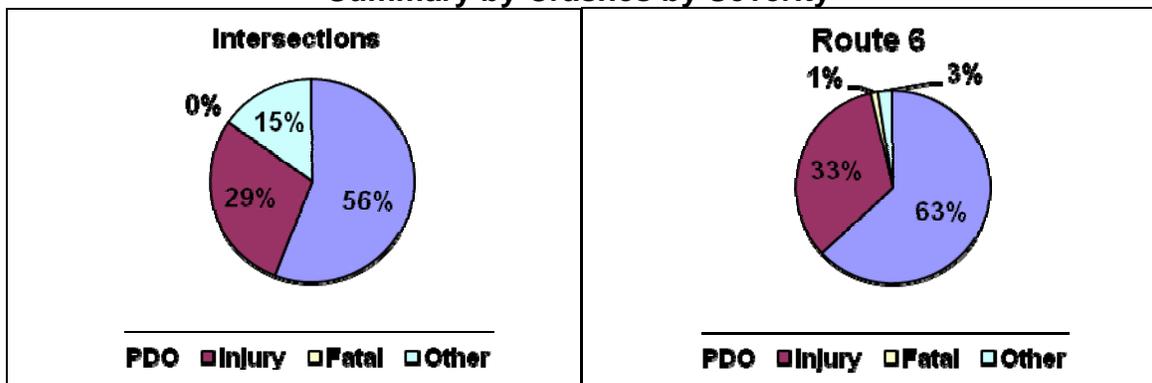
Most of the crashes occurred when the weather was clear. Most of the crashes occurred during the daylight. Finally, most crashes occurred during dry road conditions.

Below is a table on Crashes at Study Intersections and pie charts of crashes by severity and collision type.

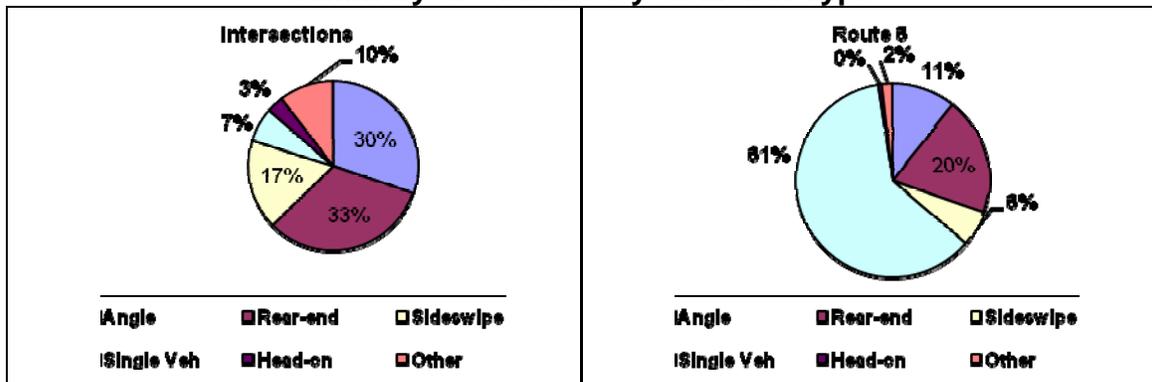
**Crash Summary at Study Intersections: 2003-2005**

| NAME   | TYPE         | 2003 | 2004 | 2005 | TOTAL |
|--|--------------|------|------|------|-------|
| Iyannough Road (Route 132) at Route 6 WB Ramps           | Signalized   | 6    | 8    | 4    | 18    |
| Iyannough Road (Route 132) at Route 6 EB Ramps           | Signalized   | 9    | 5    | 11   | 25    |
| Iyannough Road (Route 132) at Shootflying Hill Road      | Signalized   | 1    | 0    | 2    | 3     |
| Iyannough Road (Route 132) at Phinney's Lane             | Signalized   | 7    | 3    | 6    | 16    |
| Iyannough Road (Route 132) at Bearnse's Way              | Signalized   | 5    | 5    | 5    | 15    |
| Iyannough Road (Route 132) at Independence Drive         | Signalized   | 8    | 6    | 9    | 23    |
| Falmouth Road (Route 28) at Bearnse's Way                | Signalized   | 7    | 8    | 11   | 26    |
| Bearnse's Way at Enterprise Road                         | Signalized   | 4    | 3    | 2    | 9     |
| Willow Street at Route 6 WB Ramps                        | Signalized   | 5    | 6    | 0    | 11    |
| Willow Street at Route 6 EB Ramps                        | Signalized   | 8    | 6    | 3    | 17    |
| Iyannough Road (Route 28) at Yarmouth Road               | Signalized   | 6    | 8    | 11   | 25    |
| Iyannough Road (Route 28) at East Main Street            | Signalized   | 18   | 8    | 14   | 40    |
| Rte 6A (Main Street) at Hyannis Rd/Millway               | Signalized   | 0    | 0    | 1    | 1     |
| Rte 6A (Main Street) at Iyannough Road/Oak Street        | Unsignalized | 2    | 2    | 1    | 5     |
| Rte 6A (Main Street) at Mary Dunn Road/Indian Trail Road | Unsignalized | 0    | 0    | 1    | 1     |
| Rte 6A (Main Street) at Mill Lane                        | Unsignalized | 0    | 4    | 0    | 4     |
| Rte 6A (Main Street) at Willow St/Wharf Lane             | Unsignalized | 9    | 7    | 3    | 19    |
| Mary Dunn Road at Independence Drive                     | Unsignalized | 1    | 0    | 0    | 1     |
| Iyannough Road/Falmouth Road/Barnstable Road             | Rotary       | 12   | 14   | 23   | 49    |

**Summary by Crashes by Severity**



**Summary of Crashes by Collision Type**



**APPENDIX #6**  
**ADDITIONAL TRANSIT INFORMATION**

Demand Response Services

CCRTA provides b-bus paratransit service in addition to fixed-route bus services. The b-bus service is a demand-responsive, dial-a-ride service in which users call by 5PM the day before they wish to travel to make a reservation. The b-bus service is open to the general public, but CCRTA gives priority to disabled and elderly residents on the b-bus. People with disabilities will be given absolute first preference, and can bump a non-disabled passenger. The b-bus service operates seven days per week: 7AM to 7PM Monday through Friday, 9AM to 7PM on Saturdays, and 9AM to 1PM on Sundays.

Currently there are 2,164 registered b-bus riders in Hyannis, of which 640 are considered active riders by CCRTA.<sup>1</sup> Annual ridership on the b-bus service within Hyannis (trips in which Hyannis was both the origin and destination) was approximately 23,900 boardings in FY 2006. An additional 26,000 trips had Hyannis as the destination but originated in other areas. In the same year, annual ridership on the entire b-bus system was nearly 184,000 boardings.

The table below shows the distribution of origins of b-bus trips in which Hyannis was the destination (originating both within Hyannis and in other areas) based on FY 2006 data. As the table indicates, the largest origins for trips destined to Hyannis were Hyannis (internal trips), followed by Yarmouth, Centerville, Sandwich, Dennis, Harwich, and West Barnstable.

**Origins of b-bus Trips with Hyannis as Destination**

| <b>Origin</b>     | <b>Number of Trips</b> |
|-------------------|------------------------|
| Hyannis           | 23,910                 |
| Yarmouth          | 9,383                  |
| Centerville       | 4,372                  |
| Sandwich          | 2,347                  |
| Dennis            | 1,979                  |
| Harwich           | 1,481                  |
| West Barnstable   | 1,332                  |
| Bourne            | 993                    |
| Marstons Mills    | 959                    |
| Falmouth          | 844                    |
| Mashpee           | 650                    |
| Cotuit            | 646                    |
| Osterville        | 637                    |
| All other origins | 430                    |

Three of the largest destinations for b-bus ridership within Hyannis are the Cape Cod Mall, the Cape Cod Hospital, and the Cape Cod Community College. The table below shows the distribution of origins of trips to these locations (originating both within Hyannis and in other areas) based on FY 2006 data.

---

<sup>1</sup> A rider is considered active if they have taken a trip since June 30, 2005.

**Origins of b-bus Trips to Key Destinations within Hyannis**

| Trips to the Cape Cod Mall |                 | Trips to the Cape Cod Hospital |                 | Trips to the Cape Cod Community College |                 |
|----------------------------|-----------------|--------------------------------|-----------------|---|-----------------|
| Origin                     | Number of Trips | Origin                         | Number of Trips | Origin                                  | Number of Trips |
| Hyannis                    | 854             | Hyannis                        | 135             | Hyannis                                 | 180             |
| Centerville                | 289             | Dennis                         | 111             | Mashpee                                 | 37              |
| Yarmouth                   | 253             | Yarmouth                       | 107             | Dennis                                  | 9               |
| Osterville                 | 176             | Centerville                    | 77              |   |                 |
| Mashpee                    | 137             | Harwich                        | 25              |   |                 |
| Harwich                    | 61              | Sandwich                       | 21              |   |                 |
| Dennis                     | 60              | All other origins              | 92              |   |                 |
| Cotuit                     | 54              |                                |                 |   |                 |
| Marstons Mills             | 52              |                                |                 |   |                 |
| All other origins          | 75              |                                |                 |   |                 |

More information on fixed route services

Below shows the total annual and average daily ridership on the fixed routes serving the study area from FY 2002 through FY 2006. As the table indicates, ridership on the Villager, Sealine Breeze, and H2O Breeze routes is roughly equal, at between 40,000 and 50,000 boardings per year, or 120 to 150 boardings per day. Ridership on the Hyannis Beaches Breeze, which only runs during the peak summer months, is considerably lower at about 1,800 boardings per year, or 25 boardings per day.

**Ridership on Relevant CCRTA Fixed-Route Services**

| Route   | Annual Ridership (Boardings)        |        |        |        |        |
|---|-------------------------------------|--------|--------|--------|--------|
|   | FY02                                | FY03   | FY04   | FY05   | FY06   |
| Hyannis and Barnstable Villager Routes (combined) | 44,916                              | 36,972 | 50,689 | 45,574 | 39,059 |
| Hyannis Beaches Breeze - seasonal                 | 3,034                               | 1,838  | 1,847  | 1,527  | 1,723  |
| Sealine Breeze (Blue Line)                        | 42,247                              | 45,352 | 45,726 | 43,573 | 46,743 |
| H2O Breeze (Green Line)                           | 41,625                              | 32,748 | 36,061 | 34,495 | 41,426 |
| Route   | Average Daily Ridership (Boardings) |        |        |        |        |
|   | FY02                                | FY03   | FY04   | FY05   | FY06   |
| Hyannis and Barnstable Villager Routes (combined) | 144                                 | 119    | 159    | 147    | 124    |
| Hyannis Beaches Breeze - seasonal                 | 46                                  | 28     | 25     | 23     | 24     |
| Sealine Breeze (Blue Line)                        | 135                                 | 146    | 143    | 140    | 149    |
| H2O Breeze (Green Line)                           | 133                                 | 105    | 113    | 111    | 132    |

The table below shows typical daily ridership on the CCRTA fixed routes serving the study area: the Villager routes (combined total), the H2O Breeze, and the Sealine Breeze. These figures are based on a one-day count conducted in November 2006, and represent the day's total boardings at each location. As indicated in the table, the Hyannis Transportation Center has by far the most boardings within the study area, at almost 100 daily boardings. The next highest locations are Cape Cod Community College, downtown Hyannis (the Main Street/Winter Street area), the County Courthouse Complex, the Star Market on West Main Street, and the Cape Cod Mall. Boardings on the Hyannis Beaches Breeze are not shown because this service only operates in the summer, but during the peak months this route would increase the ridership figures at the Hyannis Transportation Center, the ferry terminals, and the beaches.

**CCRTA Fixed-Route Boardings by Location (Typical Winter Day)**

| <b>Stop</b>                   | <b>Villager<br/>(combined)</b> | <b>H2O<br/>Breeze</b> | <b>Sealine<br/>Breeze</b> | <b>Total</b> |
|-------------------------------|--------------------------------|-----------------------|---------------------------|--------------|
| Hyannis Transportation Center | 37                             | 23                    | 37                        | 97           |
| Cape Cod Community College    | 14                             |                       |                           | 14           |
| Main St. Hyannis - Winter St. | 10                             |                       |                           | 10           |
| County Courthouse Complex     | 9                              |                       |                           | 9            |
| West Main St – Star Market    | 9                              |                       |                           | 9            |
| Cape Cod Mall                 | 7                              |                       |                           | 7            |
| Barnstable Senior Center      | 4                              |                       |                           | 4            |
| Cape Cod Hospital             | 2                              | 2                     |                           | 4            |
| Capetown Plaza                | 4                              |                       |                           | 4            |
| JFK Museum                    | 3                              |                       |                           | 3            |

**APPENDIX #7**

**OTHER EXIT 6 ½ CONCEPTS**

The following images and paragraphs discuss other concepts which were developed for “Exit 6 ½” but not pursued for various reasons.

### Trumpet at Mary Dunn – Restricted Access



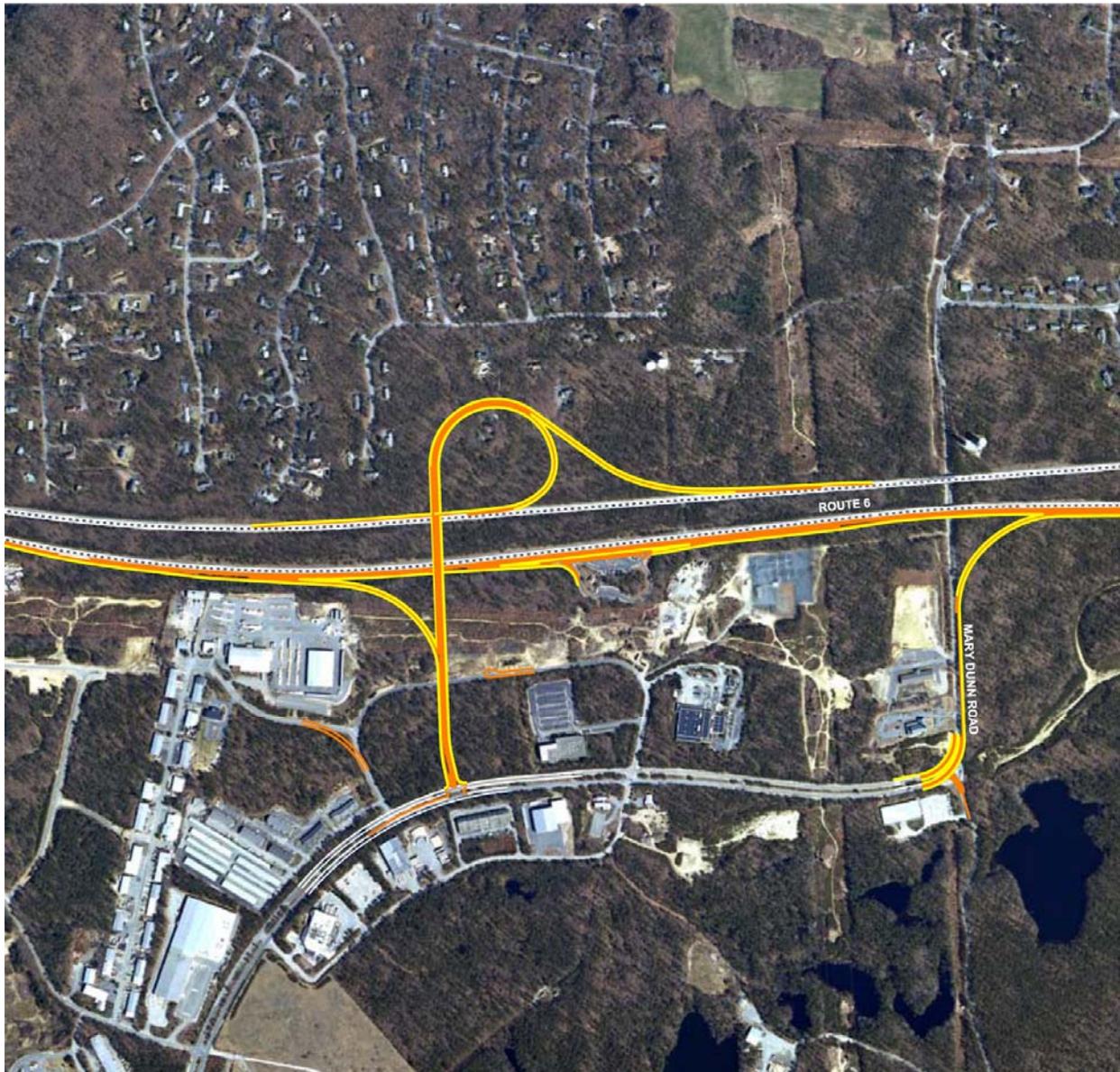
This Exit 6 ½ alternative provides a trumpet interchange at Mary Dunn Road, which would sever Mary Dunn north of the interchange thereby restricting through movements for general traffic. This alternative utilizes the existing bridge opening and the ramps pass beneath Route 6. A collector/distributor road is provided along eastbound Route 6 which allows maintenance of access to the Rest Area on eastbound Route 6. A loop is provided in the northwest quadrant of the interchange. This alternative was eliminated because of the level of impacts to regional mobility. Other negative factors include the requirement for a collector/distributor road and the necessity to widen the eastbound Route 6 bridge over Mary Dunn.

## Trumpet at Mary Dunn – Directional



This Exit 6 ½ alternative provides a trumpet interchange at Mary Dunn Road with a directional westbound on ramp. This alternative utilizes the existing bridge opening and the ramps pass beneath Route 6. A collector/distributor road is provided along eastbound Route 6 and a loop is provided in the northwest quadrant of the interchange. Ramps connect directly to Mary Dunn Road and are aligned to provide movements to and from the south only. Mary Dunn would be rebuilt to include a median. Access to the Rest Area on eastbound Route 6 is maintained via the collector-distributor Road. This alternative was eliminated because the tight turning radius from southbound Mary Dunn Road to the westbound on-ramp would likely not eliminate all traffic from the north creating an unsafe movement to the westbound Route 6 movement. A modified version addressing this condition was developed and included in the developed alternatives.

## Trumpet West of Rest Area



This Exit 6 ½ alternative provides a trumpet interchange west of Mary Dunn Road. This alternative would require a new bridge over Route 6. A collector/distributor road would be provided along eastbound Route 6 to maintain access to the Rest Area. A loop would be provided in the northeast quadrant of the interchange. The eastbound Route 6 on ramp would be located at Mary Dunn Road so that access to the Rest Area on eastbound Route 6 is maintained. The Task Force recommended elimination of this alternative due to the significant property impacts in the industrial park.

## Diamond at Phinney's Lane



The Phinney's Lane location was reviewed as an alternative location for Exit 6 ½ on Route 6. At this location the existing underpass could be utilized and a more circuitous route would likely lead cut-through traffic to the north. This location was rejected for further analysis because it was likely to directly impact a substantial amount of residential properties and structures and it provides less direct access to Independence Drive.

### Other considerations

Task Force members also asked the team to comment on the concept of a half-interchange, which would serve travelers coming from and going to the east only, since the travel demand model determined that the greatest benefit would be to those travelers. The technical team advised first that only a selected number of the alternatives, such as the diamond, would lend themselves to a half-interchange concept. In addition, the technical team advised that the deployment of construction crews and bridge work are significant components of construction costs: Construction costs would not likely be cut in half by doing a half-interchange. The technical team advised that it would be more cost effective to construct the full interchange at the same time, especially if the region were considering the second half of the interchange to be constructed at a later time anyway. EOT and the technical team advised the Task Force to select the interchange concept that it preferred based on all the other evaluation criteria, and if the preferred concept could lend itself to a half-interchange or staged construction, the team would discuss that as an option.

**APPENDIX #8**

**OTHER CONCEPTS FOR THE AIRPORT ROTARY**

## Skewed Intersection



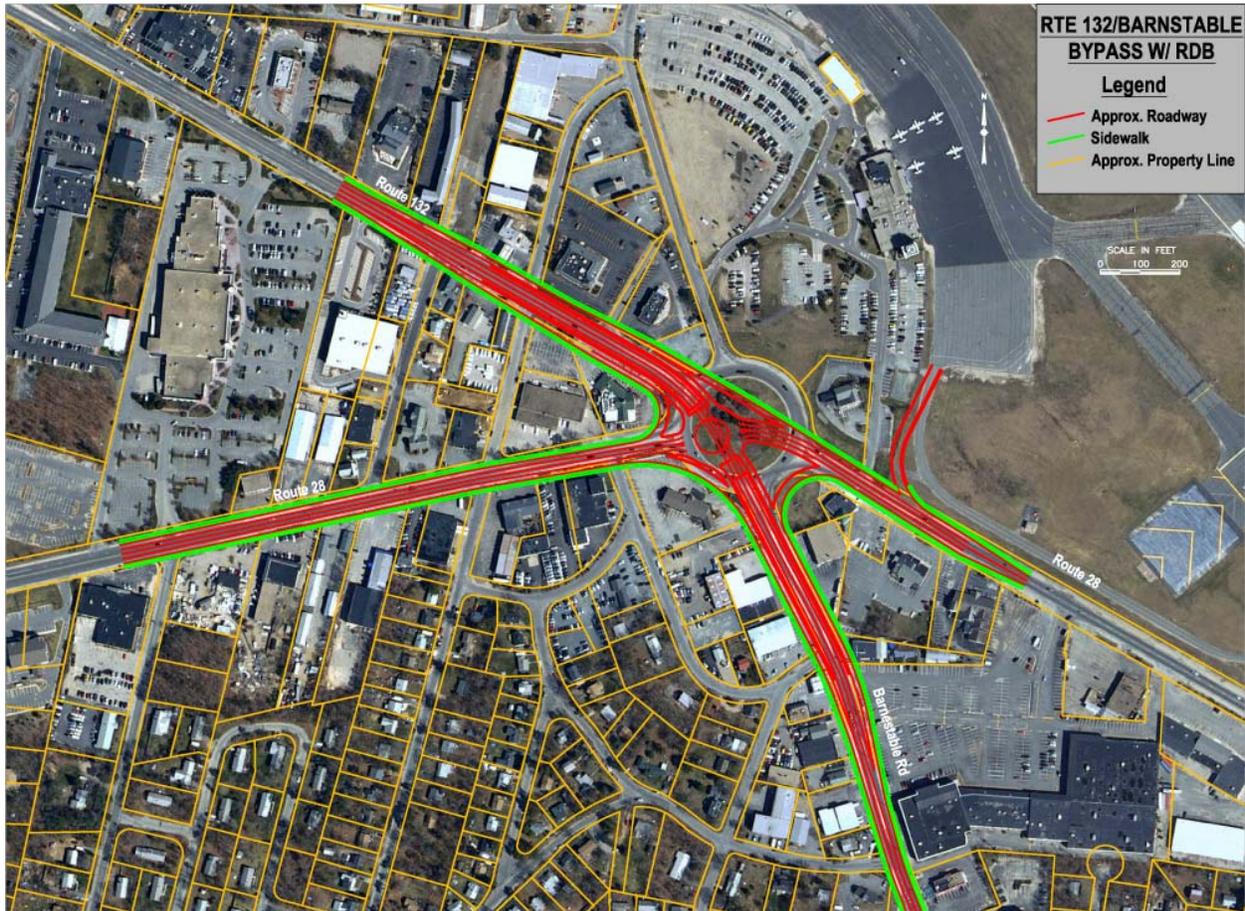
In this alternative, the Airport Rotary is eliminated and four approaches are realigned to create a skewed four legged intersection. Route 132 and Route 28 East are aligned as the main through movement, whereas Route 28 West and Barnstable Road intersect at a skew. This alternative requires double left turn lanes at all approaches. This alternative was eliminated because of its awkward geometry, creating some difficult movements and projected traffic operations when compared to other at-grade intersection alternatives.

## 28 to 28 Underpass with Intersection



This alternative provides a grade-separated bypass for the Route 28 to Route 28 movement with an at-grade four-leg signalized intersection. At-grade bypass lanes are provided for all right turn movements with the exception of the westbound Route 28 to Route 132 movement. The main issue with this alternative (and the other grade-separated intersection concepts) was several access limitations due to the grade-separation and the intersection at-grade. It was also determined that this alternative did not provide enough capacity or provide safe and efficient enough operation given the high construction and maintenance costs.

## 132 to Barnstable Road Underpass with Roundabout



This alternative provides a grade-separated bypass for the Route 132 to Barnstable Road movement with an at-grade four-leg two-lane roundabout at the existing Airport Rotary intersection. At-grade bypass lanes are provided for all right turn movements. A tighter radius is utilized to reduce vehicle speeds entering the roundabout. The Task Force felt strongly that the property impacts, access limitations, and tunnel to downtown area were not reflective of their community interests.

## 132 to Barnstable Road Underpass with Intersection



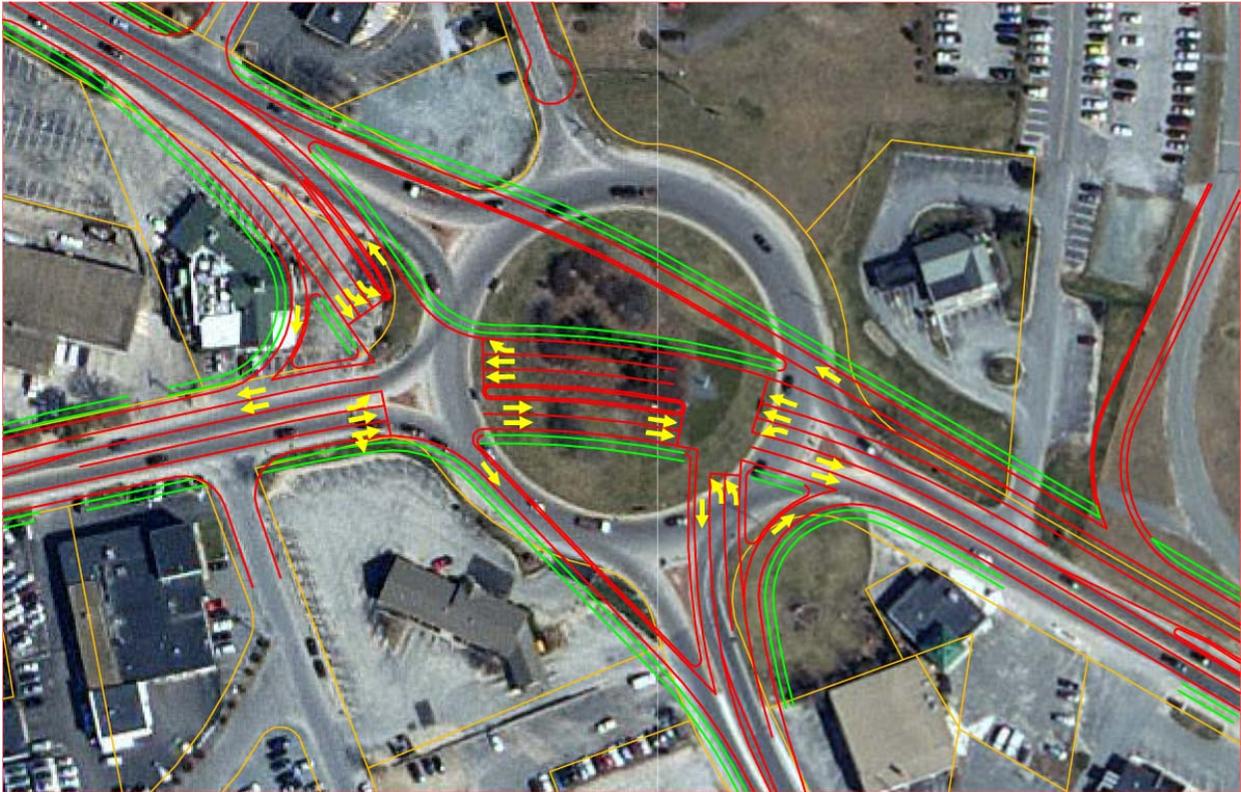
This alternative provides a grade-separated bypass for the Route 132 to Barnstable Road movement with an at-grade four leg signalized intersection. At-grade bypass lanes are provided for all right turn movements with the exception of the westbound Route 28 to Route 132 movement. The main issue with this alternative (and the other grade-separated intersection concepts) was several access limitations due to the grade-separation and the intersection at-grade. It was also determined that this alternative did not provide enough capacity or provide safe and efficient enough operation given the high construction and maintenance costs.

## Split Intersection (Compressed)



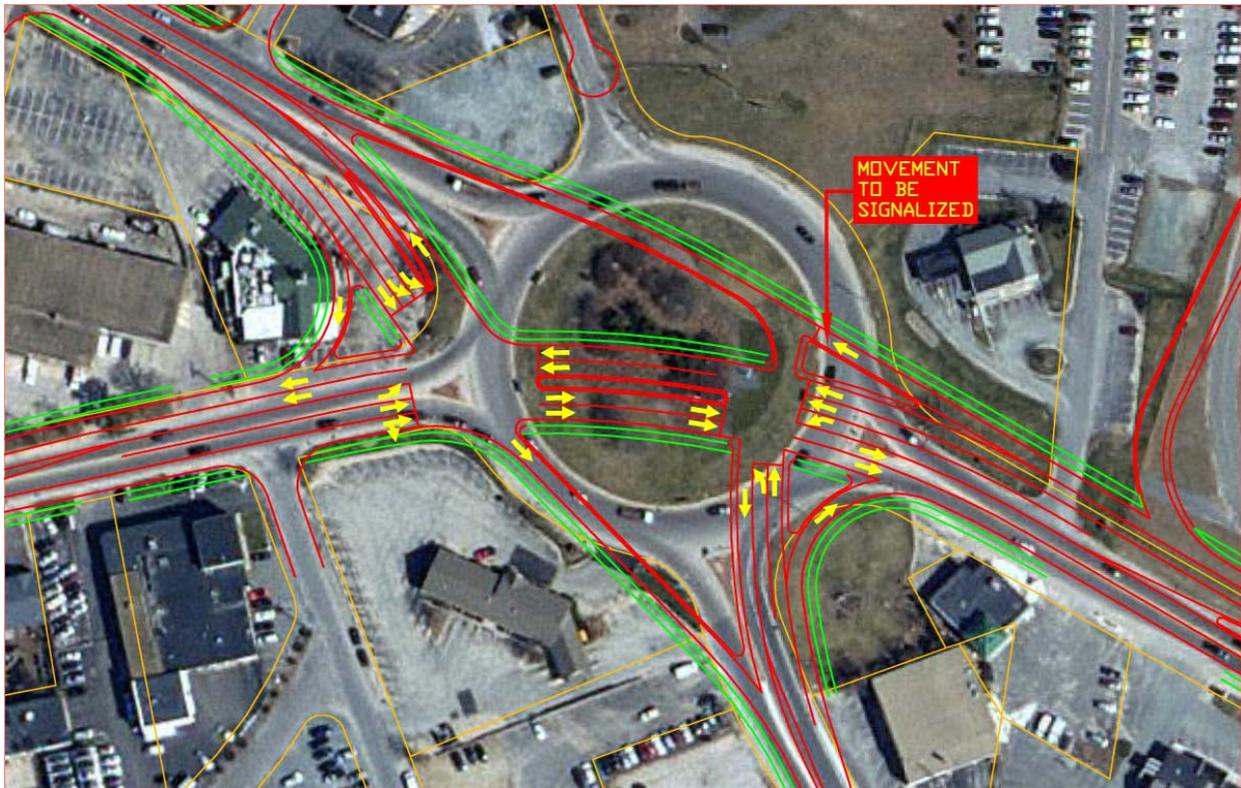
This alternative provides a split intersection at the airport rotary location. The roadways are realigned as two offset intersections with coordinated signals. Route 28 is the through movement while Barnstable Road and Route 132 are offset approximately 175 feet. Bypass lanes are provided for the Route 132 to Route 28 westbound and the Barnstable Road to Route 28 eastbound movements. All through movements are required to pass through both intersections with the exception of the Route 132 to Barnstable Road through movement. This alternative was eliminated because the close distance between the two intersections reduces vehicle storage and increases the likelihood of queue buildup impacting adjacent intersection operations.

## Split Intersection (Compressed) with Bypass Lane 1



This alternative was developed in an attempt to make the split intersection operate with a better level of service. An at-grade bypass lane was provided for the westbound Route 28 to Route 132 traffic. This alternative was rejected because it did not remove enough volume from the two intersections to provide adequate levels of service for all movements, nor did it solve the queue storage problem. It also introduced safety and access issues at the merge point on Route 132.

## Split Intersection (Compressed) with Bypass Lane 2



This alternative was developed in an attempt to make the split intersection operate with a better level of service. A signalized at-grade bypass lane was provided for the westbound Route 28 to Route 132 traffic. Additionally, the Barnstable Road to Route 132 movement is provided a through access to the bypass lane. This alternative was rejected because it did not remove enough volume from the two intersections to provide adequate levels of service for all movements, nor did it solve the queue storage problem. Also, the access to the westbound Route 132 bypass lane at the eastern intersection created safety concerns as there is no physical barrier to prohibit movements other than the intended movement.

## Split Intersection (Spread) with Bypass Lane



This alternative provides a widened split intersection at the airport rotary location. Route 28 is the through movement while Barnstable Road and Route 132 are offset approximately 400 feet. The roadways are realigned as two offset intersections with coordinated signals. Bypass lanes are provided for all right turns with the exception of the eastbound Route 28 to Barnstable Road movement. All through movements are required to pass through both intersections with the exception of the Route 132 to Barnstable Road through movement. This alternative was eliminated because the bypass lane was determined to provide minimal operational improvements while introducing additional safety concerns.

**APPENDIX #9**  
**OTHER DEVELOPED ALTERNATIVES**  
**for the**  
**YARMOUTH ROAD/ROUTE 28 INTERSECTION**

## Yarmouth Road/Route 28 Roundabout



This alternative was developed to analyze a two lane roundabout at the existing Yarmouth Road and Route 28 intersection. Although this alternative provides right turn bypass lanes in all four quadrants, it was rejected due to lack of adequate level of service, significant property impacts, and conflicts with the adjacent rail crossing.

## Yarmouth Road Concepts

A consultant for the Town of Barnstable developed a concept for a bypass road that ran roughly parallel to Yarmouth Road. This concept was developed before the Hyannis Access Study. As part of the Hyannis Access Study, EOT Planning sought to determine the likelihood of this project. Based on discussions with the Town and a letter from the Massachusetts Aeronautics Commission which outlined disadvantages of the concept and the impacts on the airport property on which a portion of it was aligned, this concept was dropped.

Prior to analysis of the intersection of Yarmouth Road and Route 28, the technical team and the Town of Barnstable discussed other concepts for addressing the capacity and queueing issues along Yarmouth Road. Analysis of the area revealed that issues along the corridor would be addressed to a large degree by improvements to the intersection. Therefore, corridor concepts were not pursued in this study.



# The Town of Barnstable Growth Management Department

367 Main Street, Hyannis, MA 02601

Office: 508-862-4678  
Fax: 508-862-4782

Patty Daley  
Interim Director



## MEMORANDUM

TO: Adriel Edwards  
FROM: Patty Daley  
DATE: May 5, 2008  
RE: Response to Hyannis Access Study Question Regarding  
Development Potential in the IND and IND Limited Zoning Districts,  
Town of Barnstable

---

At the last Hyannis Access Study meeting, there was a suggestion that the Town provide additional information regarding development potential in the area that may be directly impacted by a new Exit 6 ½ interchange off of the Mid Cape Highway. The area most directly affected by an Exit 6 ½ would be the area located within the Town's IND and IND Limited zoning districts. It is my belief that the assumptions used in the model are reasonable for the purposes of the study, which is to identify immediate, short and long term options for improving the Hyannis roadway system.

The Town is in the process of completing a ten year update to its comprehensive plan. At the same time, the town has been methodically studying and revising zoning for different areas with a goal of putting smart growth principals into place. We began our work with the Downtown Hyannis Growth Incentive Zone (GIZ). This is the area we have identified as the most appropriate area for new development and redevelopment within the town. The GIZ is served by municipal water and sewer and contains our historic Main Street.

The Town Council has created a Route 132 study committee to analyze land uses and potential zoning changes in the area along Route 28 and Route 132 from Phinney's Lane to the Airport Rotary. The work of this study committee is on-going and we anticipate planning and zoning recommendations to improve vehicular access (by closing curb cuts and creating additional commercial parcel vehicle interconnections) and improving landscaping and design in this area.

The IND and IND Limited zoning districts area is identified in the comprehensive plan update as a strategic planning area slated for future planning analysis. It is premature to estimate the nature of the development or the ultimate development potential of this area prior to the completion of this strategic planning effort. Consequently, the assumptions used by the EOT in the Hyannis Access Study models provides a reasonable basis for the Study in terms of identifying needed transportation infrastructure improvements.

**APPENDIX #11**  
**IMPACTS**  
**of the**  
**AIRPORT ROTARY ALTERNATIVES**

## UPDATED ROTARY

The following figures depict an Updated Rotary Alternative for the intersection of Route 28, Route 132 and Barnstable Road (Airport Rotary) in Hyannis, MA.

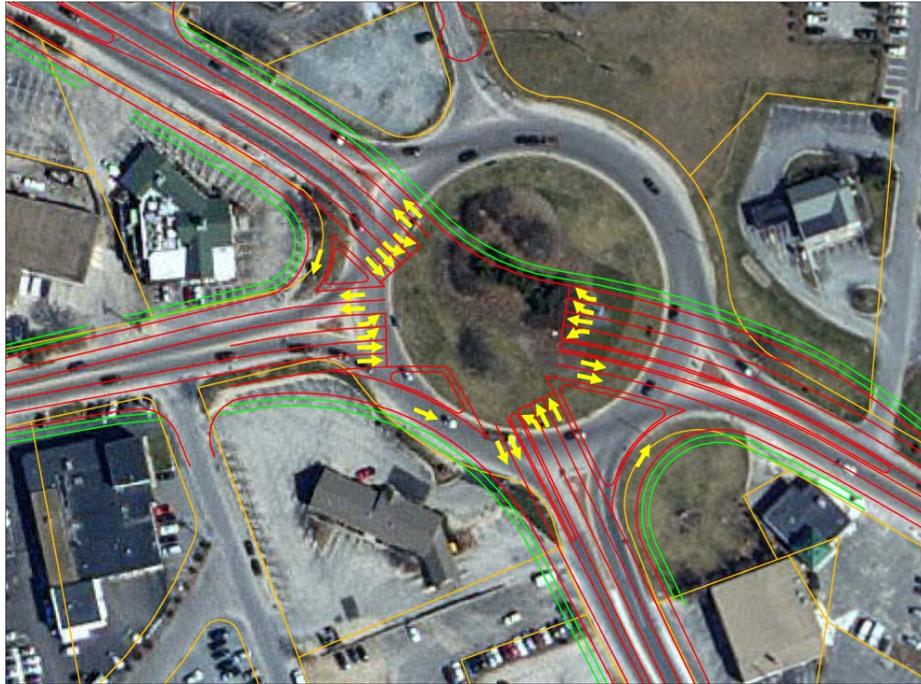


The figure shown below indicates potential minimum property impacts associated with this alternative.



## Four Leg Intersection

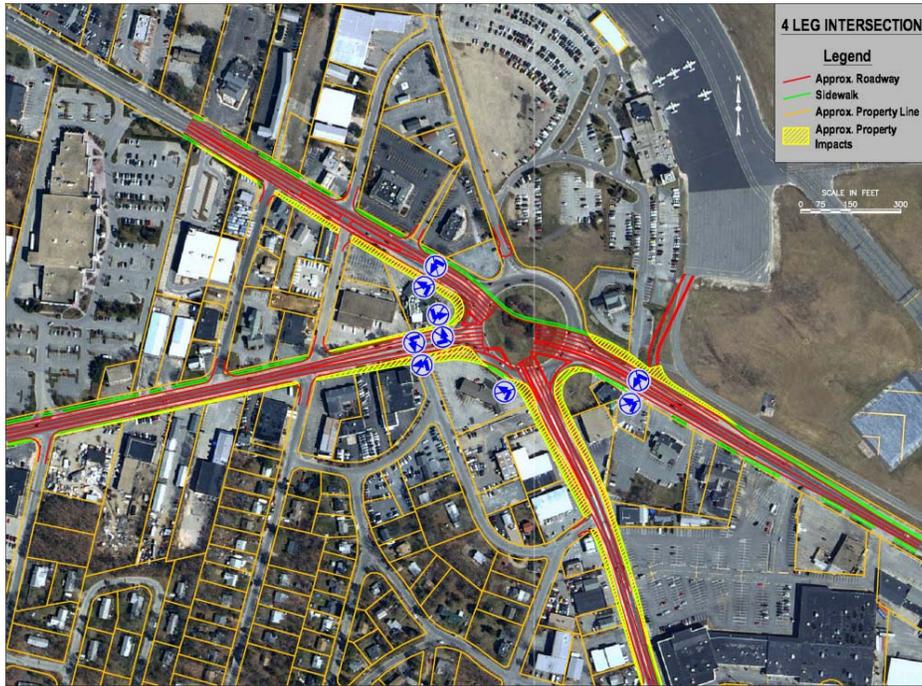
The following figures depict a Four Leg Intersection Alternative for the intersection of Route 28, Route 132 and Barnstable Road (Airport Rotary) in Hyannis, MA.



The figure shown below indicates potential minimum property impacts associated with this alternative.



The following figure depicts likely driveway access restrictions associated with this alternative.



## SPLIT INTERSECTION

The following figures depict a Split intersection Alternative for the intersection of Route 28, Route 132 and Barnstable Road (Airport Rotary) in Hyannis, MA.



The figure shown below indicates potential minimum property impacts associated with this alternative.

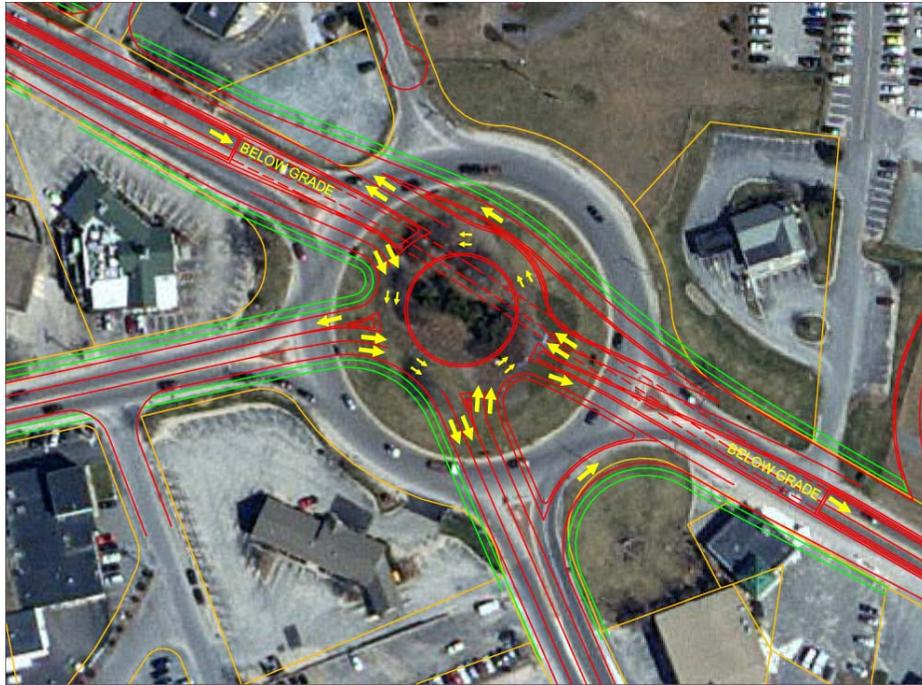


The following figure depicts several locations where driveway access will likely be restricted.



## ROUTE 132 TO ROUTE 28 UNDERPASS

The following figures depict a Grade-Separated Route 132 to Route 28 Underpass Alternative for the intersection of Route 28, Route 132 and Barnstable Road (Airport Rotary) in Hyannis, MA.

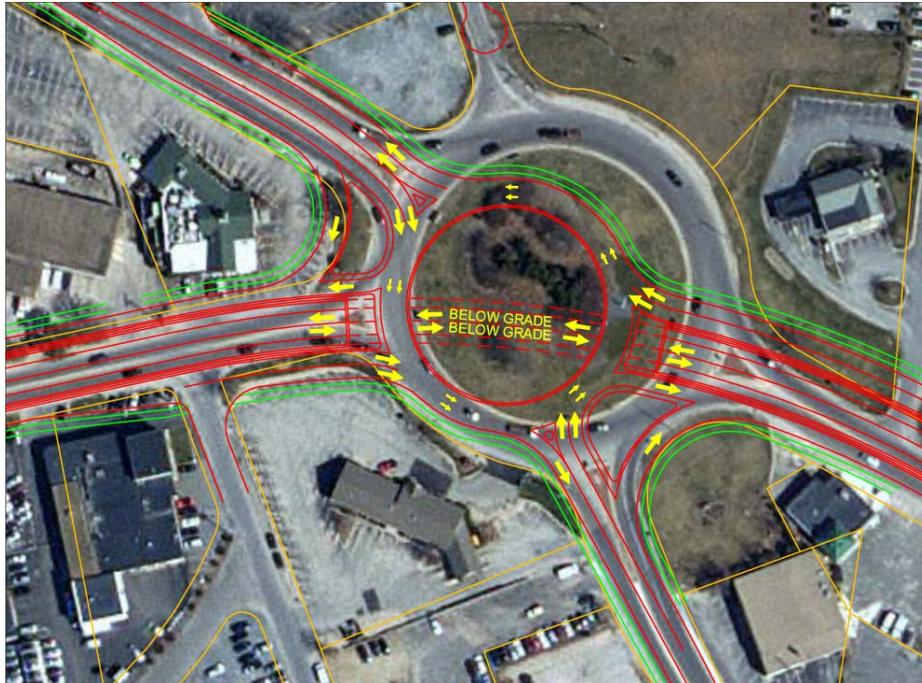


Anticipated property impacts and access limitations associated with this alternative are shown in the following figure.



## ROUTE 28 TO ROUTE 28 UNDERPASS

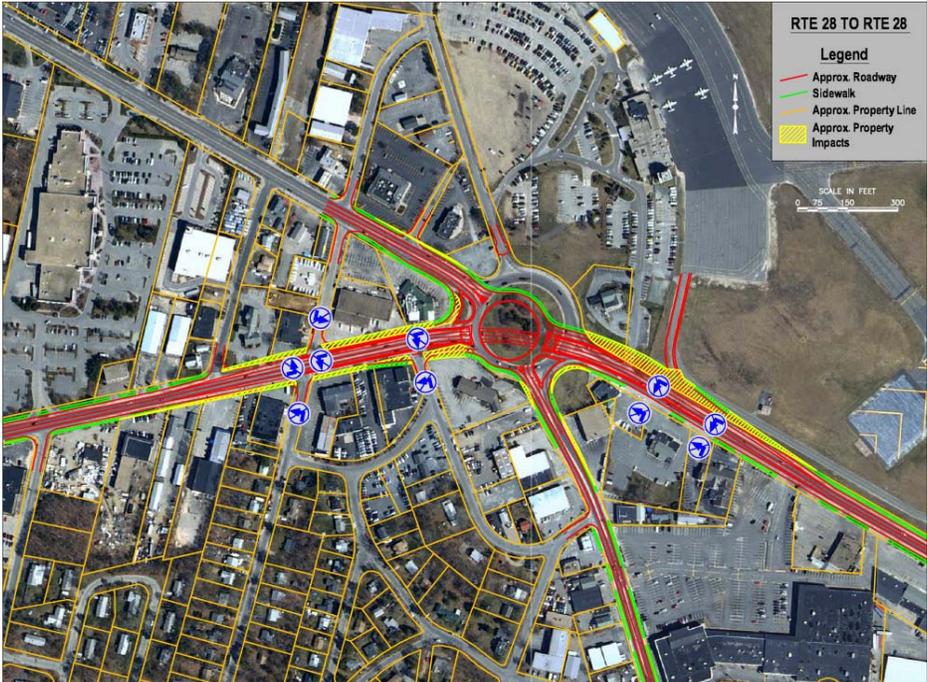
The following figures depict a Grade-Separated Route 28 Bypass Alternative with Roundabout for the intersection of Route 28, Route 132 and Barnstable Road (Airport Rotary) in Hyannis, MA.



The following depicts potential property impacts associated with construction of this alternative.



The following depicts likely driveway access restrictions associated with this alternative.



**APPENDIX #12**  
**ALTERNATIVE IMPACTS**  
**YARMOUTH ROAD/ROUTE 28 INTERSECTION**

## YARMOUTH ROAD/ROUTE 28 INTERSECTION (EAST)

The following figures depict an alternative to widen and reconstruct the intersection of Route 28 and Yarmouth Road in Hyannis, MA by roughly holding the western edge of pavement along Route 28.



The following depicts potential property impacts associated with construction of this alternative.



## YARMOUTH ROAD/ROUTE 28 INTERSECTION (WEST)

The following figures depict an alternative to widen and reconstruct the intersection of Route 28 and Yarmouth Road in Hyannis, MA by roughly holding the eastern edge of pavement along Route 28.



The following depicts potential property impacts associated with construction of this alternative.



**APPENDIX #13**  
**Letters exchanged regarding**  
**A potential bike path along the**  
**Railroad right-of-way**



THE COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF TRANSPORTATION  
MASSACHUSETTS HIGHWAY DEPARTMENT

**EOT**

DEVAL L. PATRICK  
GOVERNOR

TIMOTHY P. MURRAY  
LIEUTENANT GOVERNOR

BERNARD COHEN  
SECRETARY

LUISA PAIEWONSKY  
COMMISSIONER

February 15, 2008

George R. Allaire, Yarmouth Director of Public Works  
Mark Ells, Barnstable Public Works Director  
Joseph Rodricks, Dennis Town Engineer  
c/o Town of Yarmouth  
1146 Route 28  
South Yarmouth, MA 02664-4492

Gentlemen:

Thank you for your recent letter regarding the railroad right-of-way owned by the Executive Office of Transportation and Public Works (EOTPW) parallel to Yarmouth Road in Barnstable. Your letter requested EOTPW's guidance on the issue of proceeding with design plans for a shared-use path within this active right-of-way in order to extend the Cape Cod Rail Trail (CCRT) to the Hyannis Transportation Center. Your letter also requested guidance on a proposed bridge over Willow Street and the active EOTPW right-of-way in order to extend the CCRT westward.

EOTPW supports the extension and linkages of bicycle trails statewide, including municipal efforts to increase the interconnectivity of the state's transportation network. Providing links between regional bicycle trail systems and transit centers such as the Hyannis Transportation Center give travelers more options and incentives to leave their cars behind. Encouraging and facilitating both bicycle and transit travel promotes our common goals of reducing congestion and improving air quality.

You indicated in your letter and with the accompanying materials, that use of EOTPW's active rail right-of-way for this extension is the Towns' favored option at this time, citing the constraints of the Yarmouth Road corridor and the desire to extend the trail west as well as south. As you acknowledge in your letter, EOTPW has safety concerns with this favored option, given that the rail line is active. In general, EOTPW has not allowed bicycle travel in its active corridors due to these safety concerns.

Given the safety concerns, and given that each corridor and its line is unique, EOTPW has not defined specific safety measures or other requirements for shared use – including bicycle travel – of its active rail lines. Potential shared use of the rail line in the Yarmouth Road corridor would need to be further examined regarding potential impacts to the rail operator, federal guidance and documentation, and other states' experience with similar corridors.

In addition, as part of the Hyannis Access Study, options for reconfiguration of the intersection at Yarmouth Road and Route 28 are being explored. The reconfiguration of the intersection may offer an opportunity to provide a better crossing for bicycles and pedestrians in this vicinity. The study has also highlighted some local access issues along the length of Yarmouth Road. Although addressing these access issues is beyond the scope of that study, a more detailed examination of these access issues and potential solutions may offer additional opportunities for bike connections between the section planned for the Higgins Crowell area and the Hyannis Transportation Center.

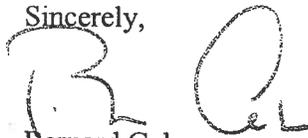
Regarding the proposed shared-use path bridge over both the EOTPW right-of-way and Willow Street, grade separation between paths, roadways, and active rail tracks is usually a desirable objective, when numerous factors such as sight distance, traffic volumes and speeds, rail movements, path flows, and other factors are found to be favorable. For any new bridges in this corridor, proximity to flight paths for the Barnstable Airport may also need to be considered. Additional preliminary designs would be needed to fully examine the compatibility of any such proposed bridge with the geometric and safety needs of the roadway and railroad below.

Although the towns have provided some information related to the currently favored option, a wider range of alternatives does not seem to have been developed. There are a number of issues and opportunities that should be further considered before finalizing any plans – and before any potential endorsement by EOTPW.

Therefore, I would encourage the Towns to collaborate and conduct a comprehensive study of the corridor as a whole, taking into consideration the input of various stakeholders, including but not limited to: the rail operator, the Barnstable Municipal Airport, business owners along the corridor, the Cape Cod Commission, bicycle groups, and other community organizations. EOTPW would also like to be involved in the study effort. The recommendations of the Hyannis Access Study should also be considered as well.

Thank you again for writing regarding this important transportation issue. We look forward to continuing to work with you as your towns seek the best solution for linking its regional bicycle trail system with its regional transportation center. If you have any questions regarding further study of all the issues involved, please contact David Mohler, Deputy Secretary for Planning, at (617) 973-7844. If you need additional information regarding potential use of railroad right-of-way for shared use path purposes, please contact Timothy Doherty, Director of Rail, at (617) 973-7840. Thank you for your continued interest in and support for improved bicycle and pedestrian safety and mobility on Cape Cod.

Sincerely,



Bernard Cohen  
Secretary



# TOWN OF YARMOUTH

1146 ROUTE 28 SOUTH YARMOUTH MASSACHUSETTS 02664-4492

Telephone (508) 398-2231, Ext. 271, 270 — Fax (508) 398-2365

BOARD OF  
SELECTMEN

TOWN  
ADMINISTRATOR

Robert C. Lawton, Jr.

Mr. Bernard Cohen, Secretary  
Executive Office of Transportation and Public Works  
10 Park Plaza, Room 3170  
Boston, MA 02116

December 13, 2007

RE: Cape Cod Rail Trail Extension to Hyannis Transportation Center

Dear Secretary Cohen:

We are writing with regards to EOTPW's rail right-of-way, which runs parallel to Yarmouth Road in Barnstable. The purpose of this correspondence is to request your agency's support for and guidance on proceeding with design plans for a bicycle/pedestrian path within this right-of-way. (Please see the attached map.) This proposed shared-use facility would connect the existing Cape Cod Rail Trail to the Hyannis Transportation Center. The rail line (alongside which the proposed path would be) is active, and understandably, EOTPW may have safety concerns. However, the Towns of Barnstable, Dennis, and Yarmouth feel that this route to the intermodal center is the best available choice and would like to work with EOTPW to make this facility a reality.

As background information, with the help of a \$3 million SAFETEA-LU earmark, the DPWs of Yarmouth and Dennis have successfully been extending the existing Cape Cod Rail Trail from its terminus at Route 134 in Dennis, through the towns of Dennis and Yarmouth. For example, Yarmouth completed an 1 mile segment from a point near Station Avenue (Exit 8 off RT 6) to Higgins Crowell Road 5 years ago. The ultimate objective is to connect this highly popular and heavily used facility to the intermodal center in Hyannis, from where a number of other transportation connections may be made. These efforts have broad public support. In addition, State Senator O'Leary strongly supports our efforts to extend this important transportation facility and tourist attraction, and will attempt to include funds in the most recent transportation bond bill to continue these efforts.

The Town of Barnstable encloses a report prepared for them by Vanasse, Hangen and Brustlin, Inc. (VHB) indicating that the Town of Barnstable not only wishes to extend the trail south to the intermodal center but also west through the Fish and Wildlife land and eventually onto the Service Road at Exit 6 of Route 6, which is also the Claire Saltonstall Bike Route. The second proposal would require a safe crossing of Willow Street and the EOTPW rail right-of-way in close proximity of the Route 6 Exit 7 ramps, where traffic volumes are high. Therefore, the report calls for a bridge over Willow Street and the EOTPW rail right-of-way, for which the Towns would also like support and guidance.

Due to the tight constraints of the Willow Street/Yarmouth Road corridor, as depicted in the attached map, and the need for the bridge described above for the proposed east-west shared use



facility, the report recommends the EOTPW rail right-of-way for the path to the intermodal center. The right-of-way is approximately 80 feet in width for most of the stretch except for a neck down near Route 28 with a single track in place.

Although there is not a strong precedent in Massachusetts for shared use paths alongside active rail lines, there are many such examples nationwide.

The Towns of Barnstable, Dennis, and Yarmouth would like to proceed with feasibility studies and design plans for this important transportation connection and recreational facility with your agency's support. It would be very helpful to our efforts if we had clear support for this project in writing, along with the specific safety measures and any other requirements that would need to be met. We also understand that the operator of the railroad would need to be actively involved and supportive of any design and implementation plans. Our intention is that your agency's response, and the continuous active involvement of both your agency and the rail operator would help guide our design efforts.

Please let us know if there is anything else that we may do to facilitate this effort. We look forward to your response.

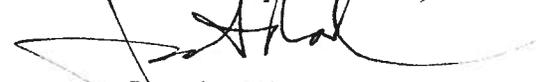
Yarmouth Representative;

  
George R. Allaire  
Director of Public Works

Barnstable Representative;

  
Mark Ells  
Public Works Director

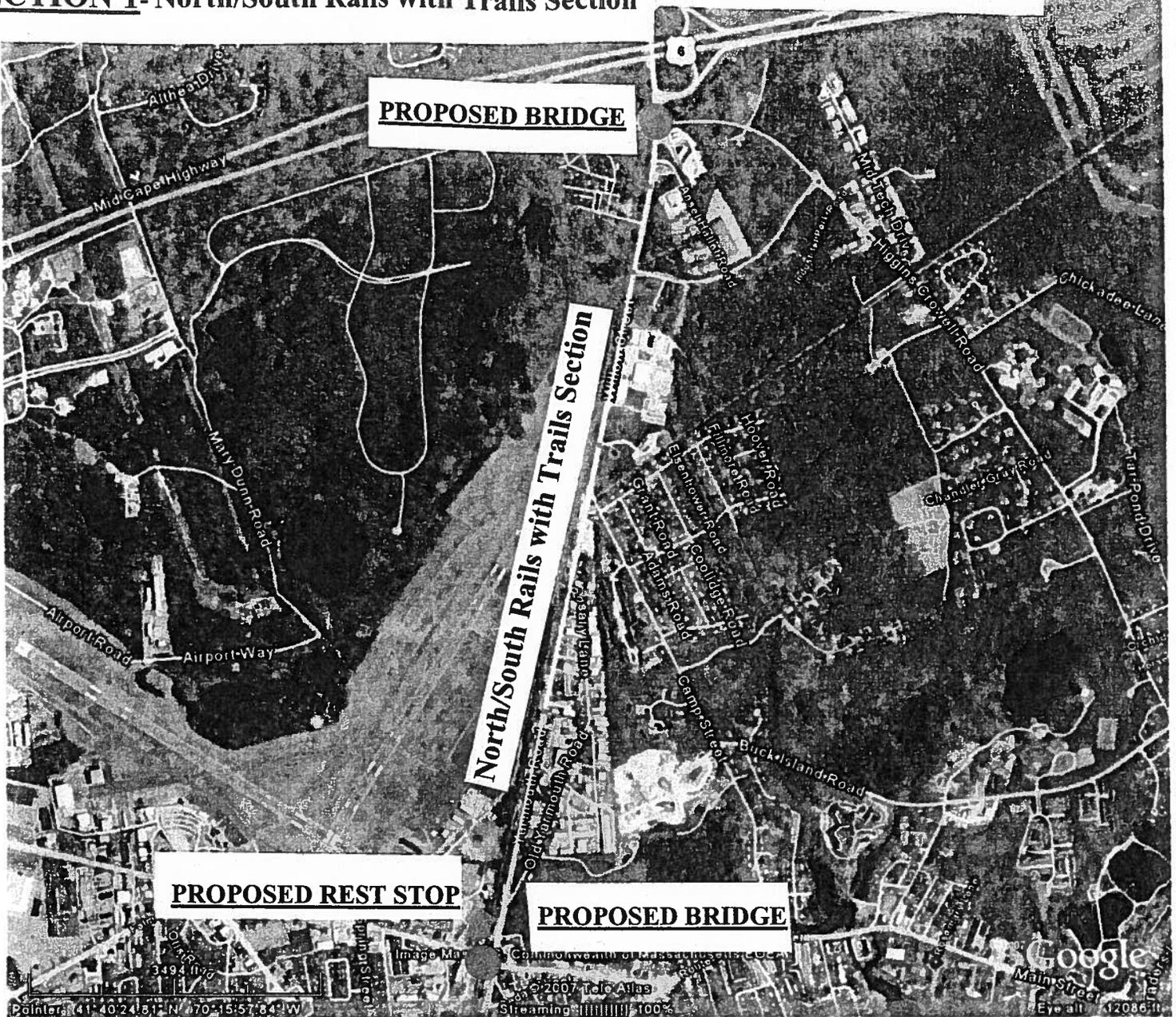
Dennis Representative;

  
Joseph Rodricks  
Town Engineer

Xc: Thomas S. Cahir, Deputy Secretary for Programs  
David J. Mohler, Acting Deputy Secretary for Planning  
Adriel Edwards, Manager of the Hyannis Access Study

**SECTION 1- North/South Rails with Trails Section**

**TOTAL DISTANCE = 10,325 FT**



**APPENDIX #14**  
**William Griswold Park-and-Ride Study**

85 Pine Tree Drive  
Centerville MA 02632-3178

27 August 2007

Susan Rohrbach  
432 Main Street  
Centerville MA 02632

Re: Barnstable Park-And-Ride Lot

Dear Susan Rohrbach:

In a recent newspaper article, your office is reported as participating in the effort to improve the availability of parking at Exit 6 on Route 6. Clearly there is a problem. What is less clear is how to solve the problem.

I am enclosing a copy of a study of the Barnstable Park-And-Ride Lot. which I completed in June. This shows that cars parked are divided into two distinct groups:

184 cars (56%) parked for one day only; but,  
143 cars (44%) parked for an average of six days.

Some of these cars were parked for two, three and even four weeks.

Because of unfavorable land contours, building more parking spaces will be comparatively difficult and relatively expensive. Whatever solution you are able to come up with, this solution should include a time limit on parking at the Barnstable Park-And-Ride Lot. For example, as shown in Exhibit 2, a parking limit of 8 days would free up 32 spaces for use by others. This can be implemented quite inexpensively. In contrast, construction of 32 additional spaces on adjacent Conservatory land could cost up to \$ 500,000.

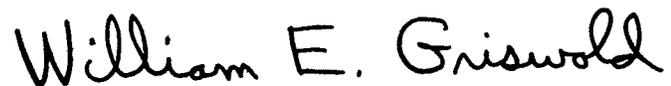
Assume that each parking space was painted with a number. Each person parking a car could enter their space number on a machine at the bus stop. After 9 days, the machine would compile a list of cars which had stayed in the same spot for more than 8 days. This listing would then be completed each day. An attendant, spending 30 minutes per day, could ticket the offending cars. (This could be the same person who currently tickets cars which are parked in unmarked spaces.)

Susan Rohrbach  
27 August 2007  
Page Two

At the Hyannis Transportation Center, operated by CCRTA, there is currently a 30 day limit on parking. In Lebanon NH, Dartmouth Coach imposes a 14 day parking time limit. At Newburyport MA, C. & J. Trailways enforces a 28 day parking time limit. But, at the Barnstable Park-And-Ride Lot, the law of the jungle still applies.

In your deliberations on the future of the Barnstable Park-And-Ride Lot, please consider some sensible time limit on parking, as a part of the solution.

Sincerely,

A handwritten signature in black ink that reads "William E. Griswold". The signature is written in a cursive, slightly slanted style.

William E. Griswold

cc: Clay Schofield

## MEMORANDUM

TO: Clay Schofield  
Cape Cod Commission

DATE: June 18, 2007

FROM: William E. Griswold  
Centerville MA

SUBJECT: Commuter Parking At Exit 6  
On Route 6 - Revisited

### The 2002 Cape Cod Park And Ride Study

In the Spring of 2002, you completed the Cape Cod Park And Ride Study, covering both the Sagamore Lot, near the north end of the Sagamore Bridge, and the Barnstable Lot at Exit 6 on Route 6. At that time, on most weekdays, the number of cars being parked at the Barnstable Lot exceeded the number of available marked parking spaces. On a regular basis, a dozen or more cars were being parked beyond the end of the marked rows, in the aisles and on the grass.

In an effort to address the problem of overcrowding, in the Summer of 2001, 62 new parking spaces had been added to the Barnstable Lot. This increased the number of paved parking spaces from 295 to the current total of 357 (Exhibit 1). Even so, within a few months, cars were once again being parked beyond the end of the rows, in the aisles and on the grass.

To combat the problem of "creative" parking, and to preserve vehicle access, signs were posted requiring that cars be parked only in marked parking spaces. From that point forward, cars not parked in a marked parking space risked receiving a parking ticket. Personnel from the Town of Barnstable now regularly patrol the Barnstable Lot in the midmorning. Cars parked beyond the end of the rows, in the aisles or on the grass receive a \$ 25. parking ticket, for their failure to park in a marked space. Even in the face of this disincentive, the Town of Barnstable still tickets 3 - 4 illegally parked cars almost every morning. This underscores the fact that, when all of the marked spaces are already occupied, a commuter arriving at the Barnstable Lot, just in time to catch a bus, has relatively few options. In many cases he must either park illegally, or miss the bus.

Exhibit 1

THE NUMBER OF LINED PARKING SPACES AT EXIT 6 ON ROUTE 6  
As Of May 2007

Let the parking area with no bus shelter be the West area;  
Let the parking area with two bus shelters be the East area.  
These two areas are separated by a cross driveway.

In the West area, call the parking row closest to the Mobil station Row 1;  
In the West area, call the parking row furthest from the Mobil station Row 7.

In the East area, call the parking row furthest from the Burger King Row 1;  
In the East area, call the parking row closest to the Burger King Row 4.

Then the number of lined parking spaces is:

|                       |       | <u>Spaces</u> |
|-----------------------|-------|---------------|
| West Area             | Row 1 | 52            |
|                       | Row 2 | 48            |
|                       | Row 3 | 45            |
|                       | Row 4 | 42            |
|                       | Row 5 | 39            |
|                       | Row 6 | 28            |
|                       | Row 7 | 34            |
| East Area             | Row 1 | 32            |
|                       | Row 2 | 10            |
|                       | Row 3 | 10            |
|                       | Row 4 | <u>17</u>     |
| Total Parking Spaces: |       | 357           |

Numbers were assigned to each parking space. The first space in Row 1 in the West Area was numbered W101. The last space in Row 7 in the West Area was numbered W734 etc.

At the Barnstable Lot, you recorded 383 Cape Cod license numbers (Exhibit 2.1.1). Through the Registry of Motor Vehicles, you identified the town in which each vehicle was registered. Of the 383 vehicles in the sample, 320 vehicles or 74% of the sample were registered in towns in the corridor extending from Barnstable to Provincetown. This is logical, because Route 6 is the principal highway used to access the Barnstable Lot.

Your 2002 study also identified the fact that 14% of the license numbers in the sample were registered to addresses on Martha's Vineyard (Exhibit 2.1.1; page 8). One could hypothesize that these are cars whose owners took a car ferry from Martha's Vineyard to Hyannis, drove to the Barnstable Lot to park their car, and then took the bus to Boston. However, since there is no car ferry service between Martha's Vineyard and Hyannis, this is an unlikely scenario. A more likely hypothesis is that these cars belong to individuals who have their primary residence off-Cape, but who have a second home on Martha's Vineyard. These individuals register at least one car to their address on Martha's Vineyard. This practice is possibly illegal, but it has the great advantage of giving the car owner a significant reduction in his car insurance premium. The premiums for towns on Martha's Vineyard are much less than the premiums in urban areas elsewhere in the state. Under this hypothesis, the car owner drives from off-Cape, parks free at the Barnstable lot, and then takes a taxi to the ferry dock. Net of the taxi fare, this driver saves \$ 50. per week or \$ 280. per month

#### The 2007 Barnstable Park And Ride Study

In the five years since 2002, very little has changed in the supply and demand equation at the Barnstable Lot. On many weekdays, especially on Monday, Tuesday and Wednesday, commuters arriving for the P. & B. bus departures at 8:40, 9:10 and 9:40 a.m. find that there are no parking spaces available.

As a means of updating the information contained in your 2002 Park And Ride Study, I have recently completed a 100% license plate survey, covering all cars which were parked at the Barnstable Lot on Monday, May 14th. The license number (and state) of each car parked at the Barnstable Lot on May 14th was recorded, together with the number of the parking space in which that car was parked. This survey was made each day in the midmorning. On subsequent days, and continuing until June 12th, the license plate number of cars which remained in their original numbered parking space was recorded.

## Average Length Of Stay

The results show that cars parked at the Barnstable Lot were divided into two distinct groups:

- 184 cars (56%) parked for one calendar day only; and,
- 143 cars (44%) parked for multiple calendar days.

On Monday, May 14th, there were 327 cars parked at the Barnstable Lot. Together with the observed total of 30 empty parking spaces, this matches the total of 357 available parking spaces. Exhibit 2 on the next page compares the above two groups.

Using the weighted average method, Exhibit 2 shows that the 143 cars in the second group had an average length of stay of 6.1 calendar days. In contrast, the 184 cars in the first group had an average length of stay of 1.0 calendar days. The first group consists of cars parked by daily commuters. The second group consists of cars parked by passengers who are going to Logan Airport, as well as cars parked by passengers who are going to the Island ferries.

## Opportunities For Expanding The Number Of Available Parking Spaces

Given the recurring overcrowding of the Barnstable Lot on weekdays, I think there is general agreement that anything which could be done to increase the number of available parking spaces should be given serious consideration. However, there are physical constraints which would make any expansion of the present Barnstable parking area quite expensive. The geological contour adjacent to the West Area consists of a steep down slope. The geological contour adjacent to the East Area consists of a steep up slope. Given the amount of grading and fill which would be required, it seems unlikely that a surface level expansion beyond the present 357 spaces would be practical.

Since 2002, there has been recurring discussion of the idea of constructing a second level parking structure over the existing Barnstable Lot. To date, nothing has been done. This is most probably because of the high capital cost of a parking structure, especially if it being built to serve an area where parking is free. I can't think of an existing parking structure which offers free parking.

WEIGHTED AVERAGE LENGTH OF STAY  
FOR CARS PARKED FOR TWO OR MORE CALENDAR DAYS  
AT THE BARNSTABLE LOT AT EXIT 6 ON ROUTE 6  
May 14 - June 12, 2007

| <u>Date</u> | <u>Day</u> | <u>Cars Remaining<br/>From May 14</u>  | <u>Car<br/>Days</u>                            |
|-------------|------------|--|--|
| May 14      | 1          | 327 car license numbers were recorded on May 14;<br>327 - 143) = <u>184 cars stayed for one day.</u> |  |
| May 15      | 2          | 143  | 35 cars stayed for 2 days (35 x 2) = 70        |
| May 16      | 3          | 108  | 23 cars stayed for 3 days (23 x 3) = 69        |
| May 17      | 4          | 85   | 17 cars stayed for 4 days (17 x 4) = 68        |
| May 18      | 5          | 68   | 20 cars stayed for 5 days (20 x 5) = 100       |
| May 19      | 6          | 48   | 8 cars stayed for 6 days (8 x 6) = 48          |
| May 20      | 7          | 40   | 5 cars stayed for 7 days (5 x 7) = 35          |
| May 21      | 8          | 35   | 3 cars stayed for 8 days (3 x 8) = 24          |
| May 22      | 9          | 32   | 4 cars stayed for 9 days (4 x 9) = 36          |
| May 23      | 10         | 28   | 9 cars stayed for 10 days (9 x 10) = 90        |
| May 26      | 13         | 19   | 6 cars stayed for 13 days (6 x 13) = 65        |
| May 28      | 15         | 14   | 8 cars stayed for 15 days (8 x 15) = 120       |
| June 4      | 22         | 6  | 4 cars stayed for 22 days (4 x 22) = 88        |
| June 12     | 30         | 2  | 2 cars stayed for 30 days (2 x 30) = <u>60</u> |

Total Car Days: 873

Between May 14 and June 12, the set of cars 143 cars which parked for two or more calendar days accumulated a total of 873 car days. The weighted average length of stay for this group of 143 cars is (873 divided by 143) = 6.1 calendar days

## Changes In The Way Parking Spaces Are Managed

In your memo dated May 22nd, you suggest a ban on overnight parking at the Barnstable Lot, so as to divert long term parking to the Hyannis Transportation Center. After a grace period of two calendar days, these cars would pay \$ 10. per calendar day. Implementation of this plan would require some major changes in the way the CCRTA manages the Hyannis Lot, something which the CCRTA has not been willing to do.

Diverting all long term parking from the Barnstable Lot to the Hyannis Lot would impose a noticeable inconvenience on P. & B.'s airport passengers. For passengers living along Route 6 east of Barnstable, exiting at Exit 7 to go to the Hyannis Lot, and then riding the P. & B. bus to Exit 6 would inject an additional home to Exit 6 trip time of about 30 minutes, compared with the present direct trip time on Route 6, from home to Exit 6. This is bound to have a measurable impact on P. & B.'s airport revenues.

A second possibility would be to limit parking at the Barnstable Lot to eight calendar days. This is a step which can be implemented fairly easily, improving access for commuters while inconveniencing only a small percentage of airport and ferry passengers, and at the same time reducing the number of cars crossing the Sagamore Bridge.

## The Principle Of Relative Inconvenience

When an airport passenger, who wants to stay for more than eight days, knows in advance of leaving home that he can not park at the Barnstable Lot for more than eight calendar days, this passenger has several available options:

- He can ask a friend or relative to drop him off at the Barnstable Lot;
- He can take a taxi to the Barnstable Lot;
- He can park at a hotel near Logan Airport which offers free parking for up to 10 days, in exchange for a one night stay at that hotel.

The point to be emphasized here is that this passenger knows, in advance of leaving home, that he will not be able to park at the Barnstable Lot, without exceeding the new time limit. This passenger has ample time before his departure, to plan in advance to make other arrangements.

In contrast, when an airport passenger or a commuter, who wants to stay for eight days or less, arrives at the Barnstable Lot only to find that all of the available parking spaces are already occupied, this passenger has a number of options, all of which are less than satisfactory:

- He can drive to the Sagamore parking lot;
- If Sagamore is full, he can drive to the Plymouth parking lot;
- If Plymouth is full, he can drive to the Braintree MBTA parking lot.

Parking at the MBTA's Kingston Station is usually not an option due to the very infrequent midmorning train departure schedule: 8:36 a.m., 10:51 a.m., 1:20 p.m., etc. More importantly, the whole point of driving to the Barnstable Lot is to avoid having to drive back and forth over the Sagamore Bridge. If a commuter has to drive 20 to 50 miles to find parking, then any saving in trip cost from using the bus is all but eliminated.

#### The Principle Of Traffic Management

With the Sagamore Bridge, at the junction of Routes 3 and 6, providing the principal congestion point for traffic onto and off of Cape Cod, any step which will reduce the number of vehicle trips across the bridge should be viewed as an important priority. When a car parks at the Barnstable Lot for five calendar days, this car avoids two trips across the bridge, one trip off Cape and one trip on Cape. If, at an adjacent space, five cars are parked for one calendar day each, taken together these cars avoid 10 trips across the bridge, five trips off Cape and five trips on Cape. Thus, in terms of the overall goal of reducing vehicle traffic over the Sagamore Bridge, a parking management plan which favors shorter stays over longer stays has the best chance of contributing to a reduction in traffic congestion.

#### The Effect Of A Parking Time Limit Of Eight Calendar days

From the survey in Exhibit 2, it can be seen that 32 cars stayed for nine or more calendar days (at May 22). This is less than 10% of the total number of cars which were parked on May 14, but it is still a significant number. A ban on parking for more than eight calendar days would be expected to free up about 32 parking spaces for shorter term use. During the May 14 to June 12 survey period, there were two weekdays when no spaces were available. The average number of empty spaces on a weekday was 20. On weekdays, an average of 94% of the 357 spaces were occupied. Freeing up 32 additional spaces would raise the average percentage of empty spaces from 6% to 15%. This provides a far better margin of error, to account for day to day variations in demand.

## Implementation

Establishing a parking time limit of eight calendar days will impose little or no inconvenience on most people who park long term, since 90% of these people park for eight days or less. Yet, freeing up 32 spaces for use by commuters will provide a major convenience for people who are now prevented from parking on peak weekdays. Providing 32 new parking spaces by means of new construction would be expected to cost \$ 500,000. or more. Providing 32 new parking spaces from better parking management can be achieved for \$ 25,000. or less.

Assume that a ticket issuing machine can be installed at the entrance to the Barnstable Lot. Each driver would be required to press a button, and take a ticket from the machine. The ticket would read "Not Valid For Parking After Midnight On (Insert date)." The date printed on the ticket would be seven days in advance of today's date. Thus, a car which parked on May 14 would receive a ticket valid until midnight on May 21. Including both May 14 and May 21, this is eight calendar days. The driver would be required to display this parking ticket on the dashboard. Note that all parking at the Barnstable Lot remains free. Only a time limit has been imposed.

The Town of Barnstable already has someone who patrols the Barnstable Lot in the midmorning on weekdays. This person places \$ 25. parking tickets on cars which are parked beyond the ends of rows, in the aisles or on the grass. An average of 3 - 6 tickets per day are issued. Some cars receive multiple tickets, if they are parked illegally for two or more days. The same parking personnel would be in a position to identify and ticket cars which stayed for more than eight calendar days. At \$ 25 per ticket, with the possibility of ticketing an additional 5 - 6 cars per day for staying over the time limit could more than pay for the added cost of the Town personnel needed to write the tickets. . At the present time, ticketing some cars, while at the same time retaining free parking, seems like a more workable option than would be implementing a parking fee for all cars. As I understand it, a solution which retains free parking is preferred by MassHighway.

Of course, I am available to discuss any of the above with you. After five years of indecision, it is time to come up with something which can relieve the chronic overcrowding at the Barnstable Lot. At this point, it would be better to implement something, and then see what happens, rather than implementing nothing, while continuing to study.

Exhibit 3 and Exhibit 4 provide some ancillary information based on my May 14 - June 12 survey at the Barnstable Lot.

CARS REMAINING IN PLACE FOR NINE CALENDAR DAYS AND LONGER  
May 14 - June 4, 2007

| Cars Remaining May 22<br>Parked 9 Calendar Days |                       | Cars Remaining May 28<br>Parked 15 Calendar Days |                      | Cars Remaining June 4<br>Parked 22 Calendar Days |                      |
|---|-----------------------|--|----------------------|--|----------------------|
| <u>Space</u>                                    | <u>License Plate</u>  | <u>Space</u>                                     | <u>License Plate</u> | <u>Space</u>                                     | <u>License Plate</u> |
| W-106   | 58KV58                |  |                      |  |                      |
| W122  | 3032BJ                |  |                      |  |                      |
| W-139   | 17EL80                |  |                      |  |                      |
| W-143   | CGC258 (VT)           | W-143  | CGC258 (VT)          |  |                      |
| W-207   | 8359HA                |  |                      |  |                      |
| W-210   | 970AVG                | W-210  | 970AVG               |  |                      |
| W-213   | 510CKX                | W-213  | 510CKX               | W-213  | 510CKX               |
| W-234   | CI814V                |  |                      |  |                      |
| W-244   | GJ2232 (IN)           |  |                      |  |                      |
| W-302   | 42WB64                |  |                      |  |                      |
| W-303   | 35JG69                |  |                      |  |                      |
| W-308   | 4765MO                | W-308  | 4765MO               | W-308  | 4765MO               |
| W-309   | M312182 (MD)          |  |                      |  |                      |
| W-317   | 15KZ06                | W-317  | 15KZ06               |  |                      |
| W-319   | 944ZRH                |  |                      |  |                      |
| W-323   | 828ZGY (UT)           | W-323  | 828ZGY (UT)          | W-323  | 828ZGY (UT)          |
| W-328   | CI52SM                |  |                      |  |                      |
| W-330   | 39SG53                | W-330  | 39SG53               |  |                      |
| W-343   | 2580 KI               |  |                      |  |                      |
| W-412   | 8376HO                |  |                      |  |                      |
| W-504   | 934NIF                | W-504  | 934NIF               |  |                      |
| W-507   | 35464                 | W-507  | 35464                | W-507  | 35464                |
| W-513   | HXH449 (MN)           | W-513  | HXH499 (MN)          | W-513  | HXH499 (MN)          |
| W-521   | ERYN                  | W-521  | ERYN                 |  |                      |
| W-522   | 7P49236 (CA)          | W-522  | 7P49236 (CA)         |  |                      |
| W-524   | 14EL89                |  |                      |  |                      |
| W-619   | 45RG09                |  |                      |  |                      |
| W-713   | 332YSI                |  |                      |  |                      |
| E-112   | 457JXP                | E-112  | 457JXP               |  |                      |
| E-401   | KCWI                  |  |                      |  |                      |
| E-406   | 85YJ33                | E-406  | 85YJ33 = 14          | E-406  | 85YJ33 = 6           |
| E-409   | UOOIVP (FL) = 32 cars |  | cars                 |  | cars                 |

**APPENDIX #15**  
**Progress Print of Airport Improvement Project**



**PROPERTY TAKING CHART**

| PARCEL | TAKING LIST | OWNER              | DESCRIPTION | ACRES      | DATE OF TAKING | REMARKS |
|--------|-------------|--------------------|-------------|------------|----------------|---------|
| 1      | 143-001     | BARNSTABLE AIRPORT | 143-001     | 278,277.24 | 07/27/05       |         |
| 2      | 143-002     | BARNSTABLE AIRPORT | 143-002     | 85,800.00  | 07/27/05       |         |
| 3      | 143-003     | BARNSTABLE AIRPORT | 143-003     | 85,800.00  | 07/27/05       |         |
| 4      | 143-004     | BARNSTABLE AIRPORT | 143-004     | 85,800.00  | 07/27/05       |         |
| 5      | 143-005     | BARNSTABLE AIRPORT | 143-005     | 85,800.00  | 07/27/05       |         |
| 6      | 143-006     | BARNSTABLE AIRPORT | 143-006     | 85,800.00  | 07/27/05       |         |
| 7      | 143-007     | BARNSTABLE AIRPORT | 143-007     | 85,800.00  | 07/27/05       |         |
| 8      | 143-008     | BARNSTABLE AIRPORT | 143-008     | 85,800.00  | 07/27/05       |         |
| 9      | 143-009     | BARNSTABLE AIRPORT | 143-009     | 85,800.00  | 07/27/05       |         |
| 10     | 143-010     | BARNSTABLE AIRPORT | 143-010     | 85,800.00  | 07/27/05       |         |

**PARKING LOT CHART**

| LOT | TYPE     | SPACES |
|-----|----------|--------|
| 1   | STANDARD | 100    |
| 2   | STANDARD | 100    |
| 3   | STANDARD | 100    |
| 4   | STANDARD | 100    |
| 5   | STANDARD | 100    |
| 6   | STANDARD | 100    |
| 7   | STANDARD | 100    |
| 8   | STANDARD | 100    |
| 9   | STANDARD | 100    |
| 10  | STANDARD | 100    |
| 11  | STANDARD | 100    |
| 12  | STANDARD | 100    |
| 13  | STANDARD | 100    |
| 14  | STANDARD | 100    |
| 15  | STANDARD | 100    |
| 16  | STANDARD | 100    |
| 17  | STANDARD | 100    |
| 18  | STANDARD | 100    |
| 19  | STANDARD | 100    |
| 20  | STANDARD | 100    |
| 21  | STANDARD | 100    |
| 22  | STANDARD | 100    |
| 23  | STANDARD | 100    |
| 24  | STANDARD | 100    |
| 25  | STANDARD | 100    |
| 26  | STANDARD | 100    |
| 27  | STANDARD | 100    |
| 28  | STANDARD | 100    |
| 29  | STANDARD | 100    |
| 30  | STANDARD | 100    |
| 31  | STANDARD | 100    |
| 32  | STANDARD | 100    |
| 33  | STANDARD | 100    |
| 34  | STANDARD | 100    |
| 35  | STANDARD | 100    |
| 36  | STANDARD | 100    |
| 37  | STANDARD | 100    |
| 38  | STANDARD | 100    |
| 39  | STANDARD | 100    |
| 40  | STANDARD | 100    |
| 41  | STANDARD | 100    |
| 42  | STANDARD | 100    |
| 43  | STANDARD | 100    |
| 44  | STANDARD | 100    |
| 45  | STANDARD | 100    |
| 46  | STANDARD | 100    |
| 47  | STANDARD | 100    |
| 48  | STANDARD | 100    |
| 49  | STANDARD | 100    |
| 50  | STANDARD | 100    |
| 51  | STANDARD | 100    |
| 52  | STANDARD | 100    |
| 53  | STANDARD | 100    |
| 54  | STANDARD | 100    |
| 55  | STANDARD | 100    |
| 56  | STANDARD | 100    |
| 57  | STANDARD | 100    |
| 58  | STANDARD | 100    |
| 59  | STANDARD | 100    |
| 60  | STANDARD | 100    |
| 61  | STANDARD | 100    |
| 62  | STANDARD | 100    |
| 63  | STANDARD | 100    |
| 64  | STANDARD | 100    |
| 65  | STANDARD | 100    |
| 66  | STANDARD | 100    |
| 67  | STANDARD | 100    |
| 68  | STANDARD | 100    |
| 69  | STANDARD | 100    |
| 70  | STANDARD | 100    |
| 71  | STANDARD | 100    |
| 72  | STANDARD | 100    |
| 73  | STANDARD | 100    |
| 74  | STANDARD | 100    |
| 75  | STANDARD | 100    |
| 76  | STANDARD | 100    |
| 77  | STANDARD | 100    |
| 78  | STANDARD | 100    |
| 79  | STANDARD | 100    |
| 80  | STANDARD | 100    |
| 81  | STANDARD | 100    |
| 82  | STANDARD | 100    |
| 83  | STANDARD | 100    |
| 84  | STANDARD | 100    |
| 85  | STANDARD | 100    |
| 86  | STANDARD | 100    |
| 87  | STANDARD | 100    |
| 88  | STANDARD | 100    |
| 89  | STANDARD | 100    |
| 90  | STANDARD | 100    |
| 91  | STANDARD | 100    |
| 92  | STANDARD | 100    |
| 93  | STANDARD | 100    |
| 94  | STANDARD | 100    |
| 95  | STANDARD | 100    |
| 96  | STANDARD | 100    |
| 97  | STANDARD | 100    |
| 98  | STANDARD | 100    |
| 99  | STANDARD | 100    |
| 100 | STANDARD | 100    |

**MARK PARKING CHART**

| MARK | TYPE     | SPACES |
|------|----------|--------|
| 1    | STANDARD | 100    |
| 2    | STANDARD | 100    |
| 3    | STANDARD | 100    |
| 4    | STANDARD | 100    |
| 5    | STANDARD | 100    |
| 6    | STANDARD | 100    |
| 7    | STANDARD | 100    |
| 8    | STANDARD | 100    |
| 9    | STANDARD | 100    |
| 10   | STANDARD | 100    |
| 11   | STANDARD | 100    |
| 12   | STANDARD | 100    |
| 13   | STANDARD | 100    |
| 14   | STANDARD | 100    |
| 15   | STANDARD | 100    |
| 16   | STANDARD | 100    |
| 17   | STANDARD | 100    |
| 18   | STANDARD | 100    |
| 19   | STANDARD | 100    |
| 20   | STANDARD | 100    |
| 21   | STANDARD | 100    |
| 22   | STANDARD | 100    |
| 23   | STANDARD | 100    |
| 24   | STANDARD | 100    |
| 25   | STANDARD | 100    |
| 26   | STANDARD | 100    |
| 27   | STANDARD | 100    |
| 28   | STANDARD | 100    |
| 29   | STANDARD | 100    |
| 30   | STANDARD | 100    |
| 31   | STANDARD | 100    |
| 32   | STANDARD | 100    |
| 33   | STANDARD | 100    |
| 34   | STANDARD | 100    |
| 35   | STANDARD | 100    |
| 36   | STANDARD | 100    |
| 37   | STANDARD | 100    |
| 38   | STANDARD | 100    |
| 39   | STANDARD | 100    |
| 40   | STANDARD | 100    |
| 41   | STANDARD | 100    |
| 42   | STANDARD | 100    |
| 43   | STANDARD | 100    |
| 44   | STANDARD | 100    |
| 45   | STANDARD | 100    |
| 46   | STANDARD | 100    |
| 47   | STANDARD | 100    |
| 48   | STANDARD | 100    |
| 49   | STANDARD | 100    |
| 50   | STANDARD | 100    |
| 51   | STANDARD | 100    |
| 52   | STANDARD | 100    |
| 53   | STANDARD | 100    |
| 54   | STANDARD | 100    |
| 55   | STANDARD | 100    |
| 56   | STANDARD | 100    |
| 57   | STANDARD | 100    |
| 58   | STANDARD | 100    |
| 59   | STANDARD | 100    |
| 60   | STANDARD | 100    |
| 61   | STANDARD | 100    |
| 62   | STANDARD | 100    |
| 63   | STANDARD | 100    |
| 64   | STANDARD | 100    |
| 65   | STANDARD | 100    |
| 66   | STANDARD | 100    |
| 67   | STANDARD | 100    |
| 68   | STANDARD | 100    |
| 69   | STANDARD | 100    |
| 70   | STANDARD | 100    |
| 71   | STANDARD | 100    |
| 72   | STANDARD | 100    |
| 73   | STANDARD | 100    |
| 74   | STANDARD | 100    |
| 75   | STANDARD | 100    |
| 76   | STANDARD | 100    |
| 77   | STANDARD | 100    |
| 78   | STANDARD | 100    |
| 79   | STANDARD | 100    |
| 80   | STANDARD | 100    |
| 81   | STANDARD | 100    |
| 82   | STANDARD | 100    |
| 83   | STANDARD | 100    |
| 84   | STANDARD | 100    |
| 85   | STANDARD | 100    |
| 86   | STANDARD | 100    |
| 87   | STANDARD | 100    |
| 88   | STANDARD | 100    |
| 89   | STANDARD | 100    |
| 90   | STANDARD | 100    |
| 91   | STANDARD | 100    |
| 92   | STANDARD | 100    |
| 93   | STANDARD | 100    |
| 94   | STANDARD | 100    |
| 95   | STANDARD | 100    |
| 96   | STANDARD | 100    |
| 97   | STANDARD | 100    |
| 98   | STANDARD | 100    |
| 99   | STANDARD | 100    |
| 100  | STANDARD | 100    |

**Edwards and Kelcey**  
 343 CONGRESS STREET OFFICE: 617-542-9232  
 BOSTON, MA 02210 FAX: 617-542-9824



**PROGRESS PRINT**  
 OCTOBER 20, 2005  
 NOT TO SCALE

**CONSTRUCTION OF BARNSTABLE MUNICIPAL AIRPORT TERMINAL BUILDING AND ATTUCKS LANE EXTENSION HYANNIS, MASSACHUSETTS**

