



Advisory Group Meeting #2

June 9, 2021 | 5:30 P.M.

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*** 1. Introductions**

2. Alternatives Analysis Framework
3. Findings from the Alternatives Analysis
4. Next Steps
5. Public Comment

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Meeting Announcements

- This meeting is being held virtually as allowed by Governor Baker's Executive Order Suspending certain provisions of the Open Meeting Law dated March 12, 2020.
- If anyone is having a technical issue, use either the chat box on your screen or call (508) 744-1261 and staff will assist you.
- This meeting is being recorded. The video will be made available on the project website. Please raise your hand now to notify the meeting facilitator if you are also recording this meeting.
- Meeting materials, including today's presentation, may be accessed at www.capecodcommission.org/CapeRailStudy.

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Meeting Announcements

- Participants wishing to speak should click “Reactions” icon on the lower toolbar and then click “Raise Hand” in the dialog box to notify the meeting facilitator. Telephone participants should press *9 to indicate that they wish to speak. Telephone participants may unmute themselves by pressing *6 when they are invited to speak.
- Participants may also use the chat box to provide written comments or feedback during select portions of the agenda.
- Members of the public are asking to kindly hold comments until the ‘Public Comment’ agenda item.

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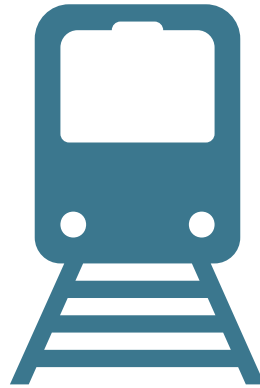
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Opening Remarks

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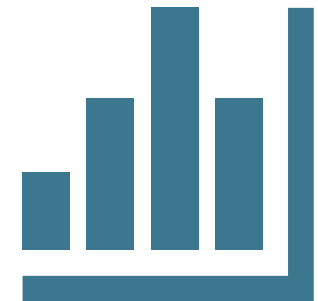
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Review of Study Purpose



Study options to expand passenger rail service to Cape region

Provide the region with data and information about rail options



1. Introductions

* 2. **Alternatives Analysis Framework**

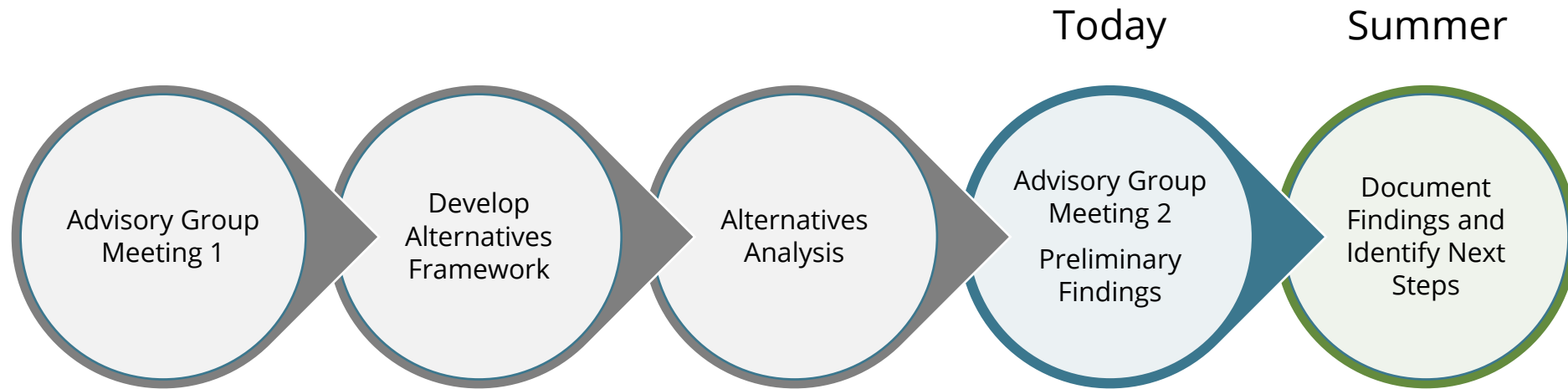
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Update on the Cape Rail Study



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Goals and Objectives

- Provide safe and reliable public transportation options to, from, and within the Cape and surrounding areas
- Reduce automobile usage and greenhouse gas emissions
- Support and strengthen opportunities for economic growth, transit-oriented development, and access to employment in the Boston region for commuters and occasional riders

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Service Alternatives Development

- The development of two service alternatives incorporates feedback from Advisory Group
- Proposed service alternatives have a range of options across variables, in order to test benefits and impacts of different service components including:
 - Trip purpose
 - Trip time (e.g., peak, off-peak)
 - Station locations
 - Southern terminal location
 - Trip frequency
 - Transfers

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Overview of Service Alternatives

	Alternative 1	Alternative 2
Purpose	Commuter	Commuter + Recreational
Day/Time	Weekday (Peak-Focused) ¹	Weekday ¹
Locations	Existing Stations	Existing Stations
Terminals	Buzzards Bay (North of Canal)	Bourne (South of Canal)
Frequency	Frequency consistent with MBTA <i>Service Delivery Policy</i> ²	Higher Frequency
Transfers	One Transfer on All Trips	No Transfers on Selected Trips (Outside of Normal Weekday Operations)

Notes:

1. Both alternatives assume continuation of Cape Flyer service on weekends.

2. MBTA *Service Delivery Policy* defines expected commuter rail frequencies of 3 trips in the peak direction in the AM Peak, 4 trips in the peak direction in the PM Peak, and every 3 hours in each direction in all other periods.

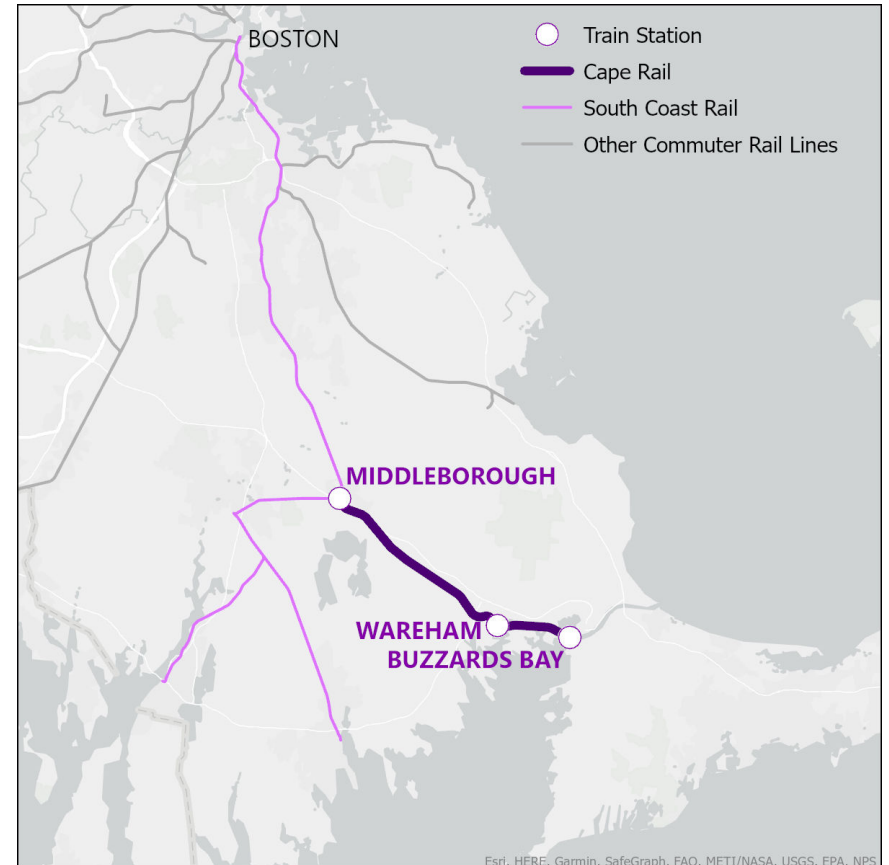
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Alternative 1

- Provides weekday service focused on peak commuting at frequency consistent with MBTA *Service Delivery Policy*
- All trips are between Buzzards Bay and Middleborough, with timed transfer to/from MBTA commuter rail service

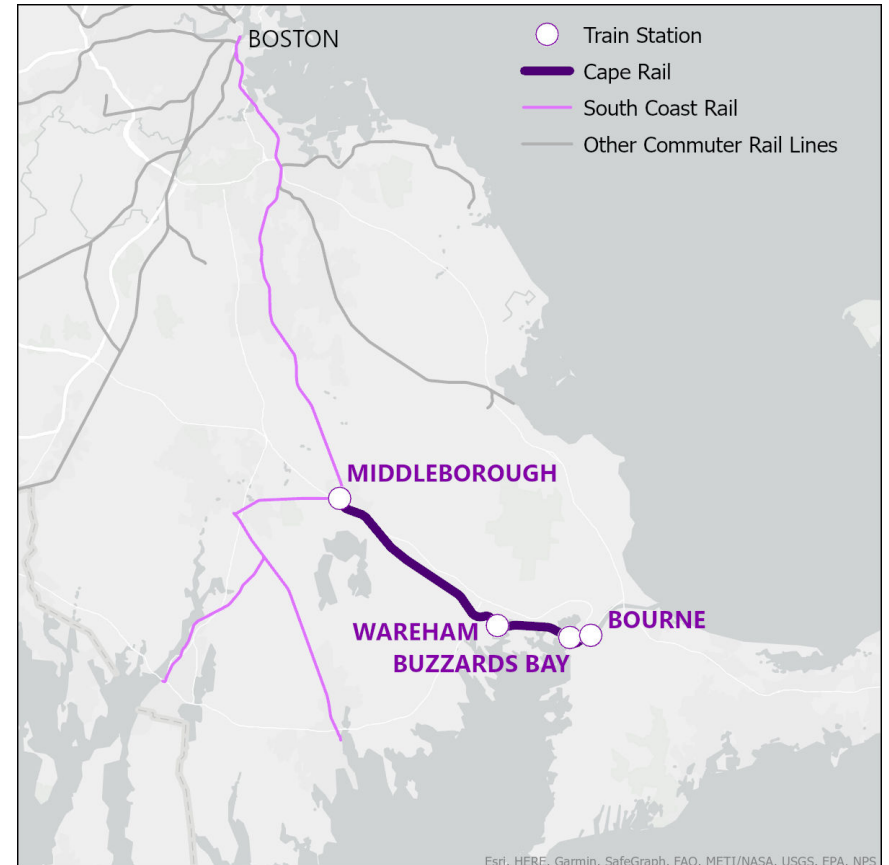


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Alternative 2

- Compared to Alternative 1, Alternative 2 adds service:
 - South of the Canal, to Bourne
 - Trips outside of the traditional commute peaks
 - Directly to/from Boston on selected trips



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Schedule Development

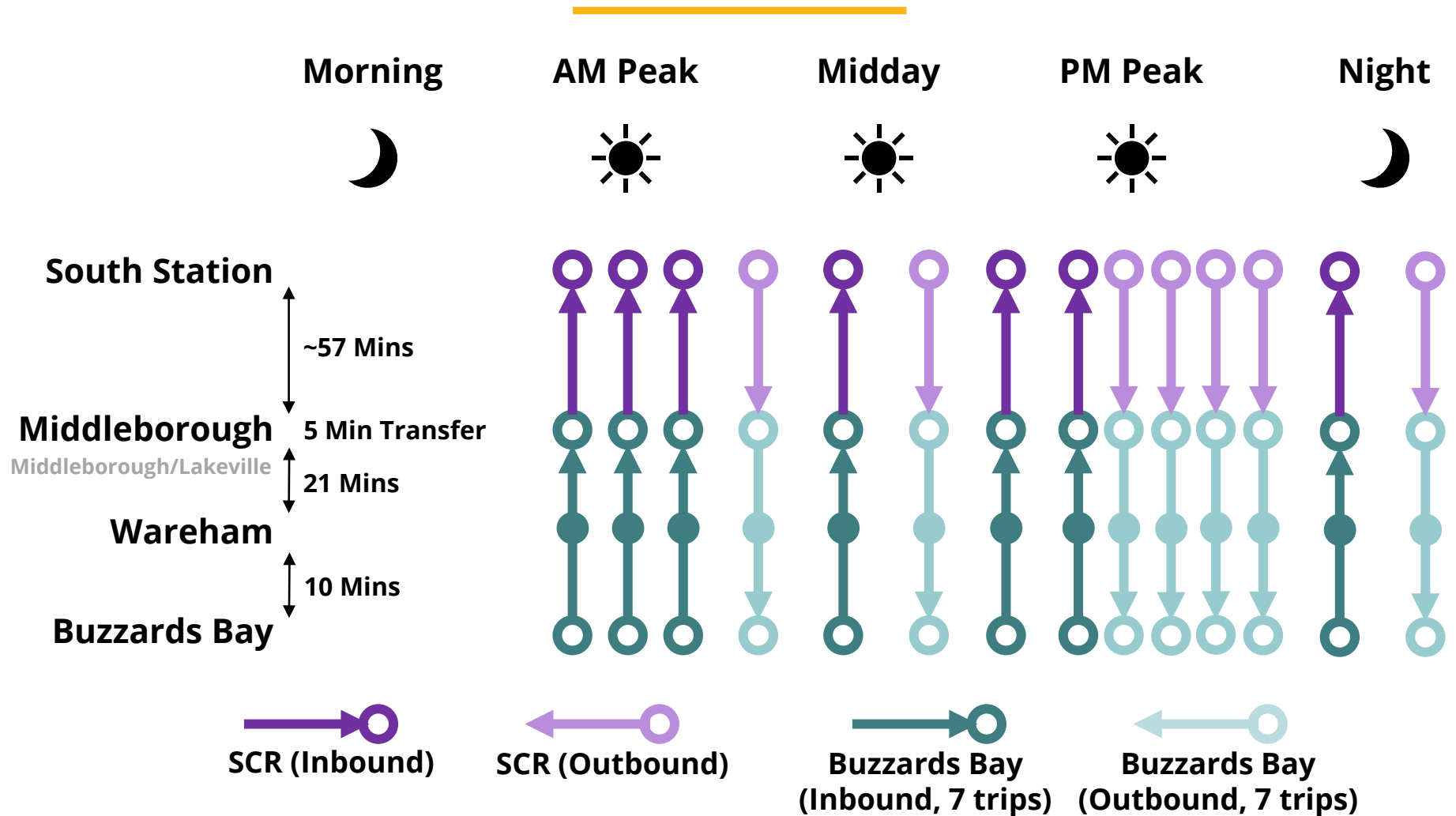
- Proposed schedules built to interface with schedules for South Coast Rail (New Bedford and Fall River service via Middleborough)
 - Trips with a transfer are timed to South Coast Rail trip times
 - Trips without a transfer are dependent on available operating windows between Middleborough and Boston
- Proposed schedules developed for the purposes of the study to:
 - Understand travel times
 - Provide inputs into the ridership modeling
 - Identify potential equipment needs
 - Identify potential infrastructure needs
 - Provide inputs into the O&M cost modeling

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Proposed Alternative 1 Schedule



Notes: Service would meet MBTA Service Delivery Policy. One trip would have a transfer longer than five minutes.

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Alternative 1 Operations Findings

- Meets the MBTA's current *Service Delivery Policy*
- Travel times:
 - Buzzards Bay – Middleborough: 31 minutes
 - Buzzards Bay – Boston: ~93 minutes¹
- Uses single track right-of-way
 - Existing siding track north of Buzzards Bay used for staging of trains
- Would use three trainsets to operate service²

Notes:

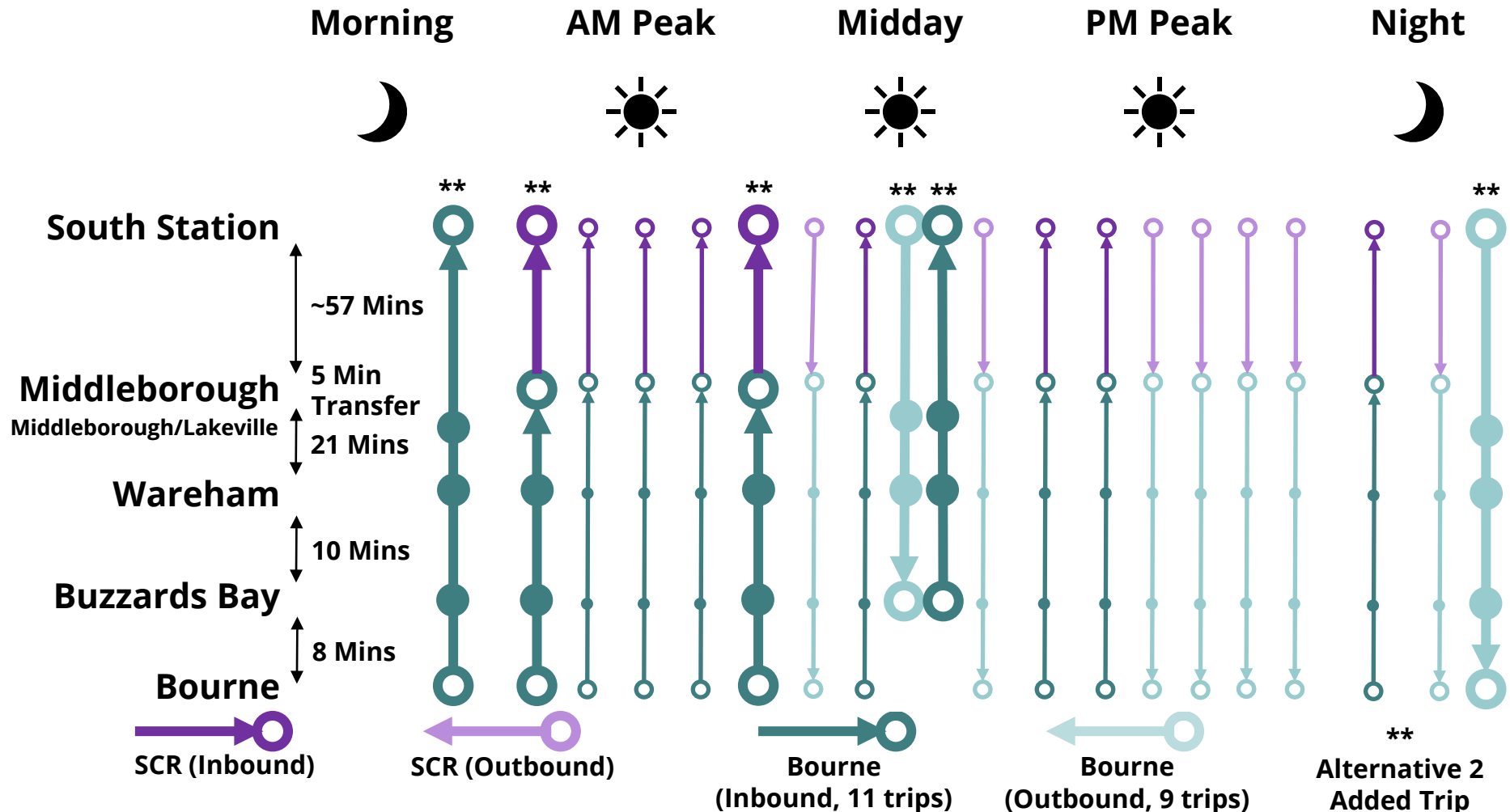
1. Includes 5 minute timed transfer for all but one trip (outside of the peak), where transfer is under 20 minutes. Total travel times vary based on scheduled time for SCR trip.
2. Does not include spare fleet required to support service

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Proposed Alternative 2 Schedule



***Notes:** Service would meet or exceed MBTA *Service Delivery Policy*. Three trips would have a transfer longer than 5 minutes. 8 minute travel time between Bourne and Buzzards Bay includes 3 minutes to account for potential bridge delays.

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Alternative 2 Operations Findings

- Exceeds the MBTA's current *Service Delivery Policy* in some periods
- Travel times:
 - Buzzards – Middleborough: 31 minutes
 - Bourne – Boston: ~101 minutes¹ (includes small bridge delay buffer)
- One-seat ride windows available before service (leaving Bourne around 4 AM), after service (arriving at Bourne around 1:30 AM), and during midday (to Buzzards Bay only)
- Uses single track right-of-way
 - Existing siding track north of Buzzards Bay used for staging of trains
 - Existing siding track in Wareham used for non-revenue trains to wait while revenue trains pass
- Would use five trainsets to operate service²

Notes:

1. Includes 5 minute timed transfer for all but three trips (outside of the peak) that have transfer at Middleborough, where transfer is under 20 minutes. Total travel times vary based on scheduled time for SCR trip. One-seat ride trip times vary between 87 and 102 minutes.
2. Does not include spare fleet required to support service.

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Ridership Modeling

- Ridership projections developed using CTPS Statewide Travel Demand Model for 2030 future conditions^{1,2}, and increased to account for:
 - **Induced demand** (10 percent increase, consistent with ridership modeling in East-West Passenger Rail Study)³
 - **Recreational ridership** (up to 70 trips per day, or approximately 15 percent of weekend Cape Flyer ridership per trip)⁴
- Key factors informing projected ridership include:
 - Land use, including projected changes to 2030
 - Existing travel patterns
 - Travel times on rail and on other modes
 - Trip frequencies
 - Station locations

Notes:

1. Ridership modeling assumes Zone 9 fares at Wareham, Buzzards Bay, and Bourne.
2. Ridership modeling assumes free, unconstrained parking at Wareham, Buzzards Bay, and Bourne.
3. Induced demand does not include new trips due to demographic shifts, but rather travelers who previously would not have made a trip but could do so because of the introduction of a new or improved mode that improves the transportation network as a whole and not just rail.
4. Recreational ridership adjustment assumes 70 trips per day are split proportionally between Bourne and Buzzards Bay in Alternative 2 based on CTPS Statewide Model results, and that the recreational trips included in Alternative 2 at Buzzards Bay also apply in Alternative 1.

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Projected Daily Boardings

- Alternative 1:
 - 1,710 daily boardings¹
 - Reduces over 800 vehicle trips per day
- Alternative 2:
 - 2,540 daily boardings¹
 - Additional daily boardings between Middleborough and South Station due to additional service (from one-seat ride)
 - Reduces nearly 1,200 vehicle trips per day
 - Shift in some ridership from Buzzards Bay to Bourne
 - Increase of over 800 daily boardings from Alternative 1 to Alternative 2 is due to the addition of Bourne station and higher frequency

Station	Alt. 1	Alt. 2
Middleborough (Cape Service)	840	1,270 ²
Wareham	240	230
Buzzards Bay	630	390
Bourne	-	650
Total	1,710	2,540

Notes:

1. Boardings include adjustments to account for induced demand and recreational ridership.
2. Includes 30 boardings at existing Middleborough/Lakeville station on one-seat ride trips.

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Order-of-Magnitude Capital Costs

- Built based on costs from South Coast Rail and escalated to 2021\$¹
- Cost elements include:
 - Track resurfacing and tie replacement or track reconstruction
 - Cab signaling, Positive Train Control (PTC), and communications
 - Interlocking improvements
 - Grade crossing improvements
 - Second platform at Middleborough²
 - Cape Cod Canal Railroad Bridge signal interfacing (Alt. 2 only)
- Costs do not include fleet requirements (assumes use of surplus fleet)

Note:

1. Includes soft costs, administrative costs, and contingencies. Does not escalate costs to year of construction.
2. Capital costs assume continued use of existing station infrastructure at Wareham, Buzzards Bay, and Bourne.

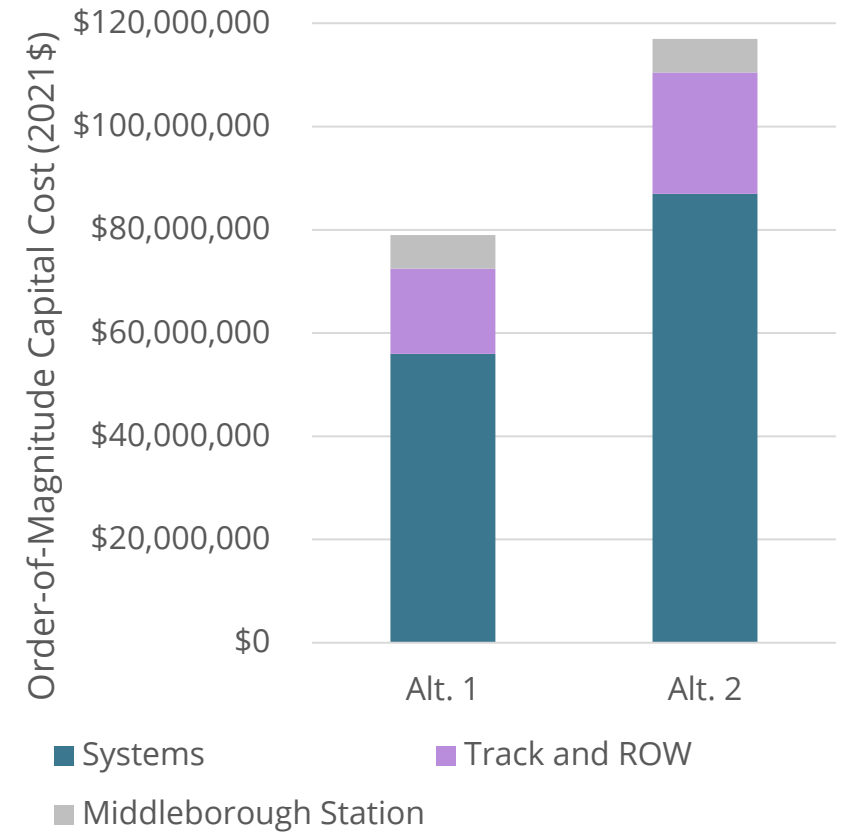
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Order-of-Magnitude Capital Costs

- Alternative 1:
 - Track and ROW: **\$16.5M**
 - Middleborough Station: **\$6.5M**
 - Systems: **\$56M**
 - *Installation of signal and PTC systems drives the total cost of \$79M*
- Alternative 2:
 - Track and ROW: **\$23.5M** (↑\$7M)
 - Middleborough Station: **\$6.5M**
 - Systems: **\$87M** (↑\$31M)
 - *Additional \$38M cost mainly due to additional segment (track reconstruction and systems installation, including interfacing with the bridge)*



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Order-of-Magnitude O&M Costs

- Built using the MBTA's 2019 unit costs as submitted to the National Transit Database (NTD) and escalated to 2021\$
- Costs include:
 - Vehicle operations (e.g., operating crew, fuel)
 - Vehicle maintenance (e.g., staff and materials)
 - Facility maintenance (e.g., staff and materials, including building, structures, and track maintenance)
 - General administration (e.g. MBTA and contractor management and support)
- MBTA commuter rail systemwide O&M costs were **\$384 million** in 2019
 - 436 maximum vehicles in service
 - Nearly 25 million service miles
 - Over 800,000 service hours

Notes:

1. Estimates use unit costs from MBTA systemwide operations, but actual operating costs may differ due to a number of factors, including the operator of the service.

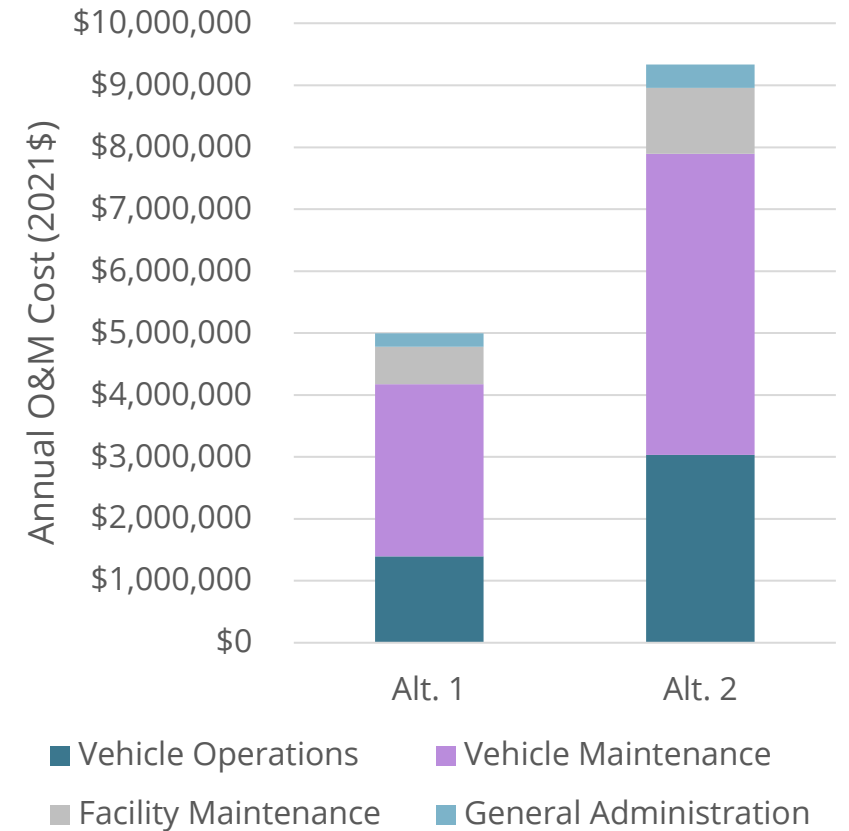
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Order-of-Magnitude O&M Costs

- **Alternative 1: \$5.0M/Year**
 - 3 train consists in service (each with loco + 3 coaches)
 - Over 19 miles and 30 minutes per one-way trip
- **Alternative 2: \$9.3M/Year**
 - 5 train consists in service
 - Extends service to Bourne
 - Increases frequency
 - Adds a one-seat ride



Notes:

1. Estimates use unit costs from MBTA systemwide operations, but actual operating costs may differ due to a number of factors, including the operator of the service.

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Change in VMT and Auto Emissions

- Ridership modeling projected auto diversions
 - Existing auto trips → drive access + rail trip
 - Existing auto trips → non-drive (e.g., walk) access + rail trip
- VMT savings estimated from auto diversions and their respective approximate trip lengths
- Congestion Mitigation and Air Quality Improvement (CMAQ) Air Quality Analysis Worksheet converts auto VMT savings to auto emission savings
- Note that results project reduction in auto VMT and auto emissions, but do not include increase in rail VMT and emissions

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Change in VMT and Auto Emissions

Daily Change in	Alternative 1	Alternative 2
Auto VMT	-42,718	-65,675
Summer VOC (kg)	-1.28	-1.97
Summer NOx (kg)	-3.89	-5.98
Winter CO (kg)	-75.48	-116.05
Summer CO2 (kg)	-13,628	-20,952

- Alternative 1 mode shift could save **over 10 million VMT** and over **3,400 metric tons of CO2** annually.¹
 - Reduces over 800 vehicle trips per day
- Alternative 2 mode shift could save **over 16 million VMT** and over **5,200 metric tons of CO2** annually.¹
 - Reduces nearly 1,200 vehicle trips per day

Note:

1. Values shown for VMT reductions and CO2 savings are for auto travel only and do not include increase in train VMT or CO2 emissions.

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Summary

	Alternative 1	Alternative 2
Terminal	Buzzards Bay	Bourne
Total One-Way Trips	14	20 ¹
Travel Time to Boston	~93 Minutes ²	~101 Minutes ²
Projected Daily Boardings	1,710 ³	2,540 ³
OOM Capital Costs (2021\$)	\$79M ⁴	\$117M ⁴
OOM O&M Costs/Year (2021\$)	\$5.0M/Year	\$9.3M/Year
Daily Vehicle Trip Reduction	Over 800	Nearly 1,200
Daily Auto VMT Savings	42,718	65,675
Daily Savings in CO2 from Auto Travel	13,628 kg	20,952 kg

Notes:

- 1. One trip would start in Buzzards Bay and one trip would end in Buzzards Bay.
- 2. Travel times include 5 minute timed transfer at Middleborough for most trips. Total travel times vary based on scheduled time for SCR trip. One-seat ride trip times in Alternative 2 vary between 87 and 102 minutes.
- 3. Projected daily boarding values reflect boardings at Pilgrim Junction (southbound), the existing Middleborough/Lakeville station (Alternative 2 only), Wareham, Buzzards Bay, and Bourne (Alternative 2 only). Projected daily boardings include both inbound and outbound boardings.
- 4. Costs do not include fleet requirements (e.g., new fleet procurement or existing fleet overhaul).

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Discussion

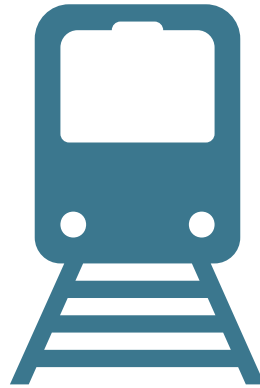
- Do you have any questions about the approach?
- What are your key takeaways from the results?

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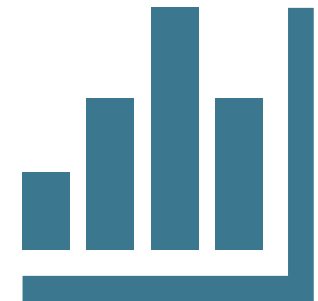
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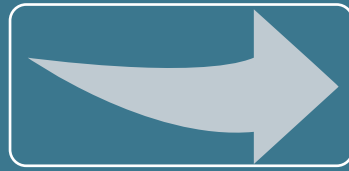


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Implementation Considerations



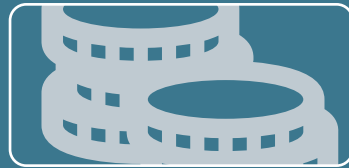
Systemwide Changes

- Forging Ahead
- Rail Transformation



Governance

- Operations and Maintenance
- Cape Cod Canal Railroad Bridge



Financial Case

- Funding Sources and Opportunities – Capital and O&M
- Economic Benefits



Other Considerations

- Fare Structure
- Parking

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Cape Rail Study Next Steps

- Document findings
- Draft and final report will be posted to www.capecodcommission.org/CapeRailStudy
- Update to the MPO board

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Thank You

- For more information, contact:

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- For project materials, please visit the project website:
www.capecodcommission.org/CapeRailStudy