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**To:** [Transportation](#)  
**Subject:** Regional Transportation Plan, Cape Cod Canal and Canal Area Mobility  
**Date:** Thursday, April 13, 2023 4:07:34 AM

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Dear Regional Transportation Plan Sub-Committee,

The Cape Cod Canal is a Federal transportation project that divides most of Barnstable County from the remainder of Massachusetts and divides the Town of Bourne in half.

Since construction of the Cape Cod Canal in 1914, the man-made insular nature of Cape Cod has become something of a plus and has been integrated into Cape Cod's strong tourism based economy. However, this regional benefit is a burden for the Town of Bourne which has municipal, cultural, residential and commercial functions divided on both sides of the Canal. 46 percent of the population, plus Town Hall, the community center, police station, main fire station, largest park, DPW, K-2 school, and "Main Street" commercial district are on the north (mainland) side of the Canal. 54 percent of the population, Bourne's grade 3-12 schools, a regional technical high school, the Bourne School Administration building, library, archives and historic center, athletic fields, an Ice Arena and a medical services commercial district are on the south (Cape Cod) side of the Canal.

### **Local Mobility Challenges in the Cape Cod Canal Area**

There are two high-level (135 foot vertical clearance, appx. 150 foot roadway elevation) high-speed highway bridges and one railroad bridge over the Canal. These bridges were built in 1935 approximately when the US government purchased the Canal from its original owner-builder and increased the canal surface width from 150 feet to 600 feet. Each highway bridge has 4 vehicle lanes (2 each direction) plus a sidewalk on one side. Land widths are narrow (10 feet) as was appropriate in 1935. There are no shoulders. Sidewalks (one each bridge) have no horizontal separation from the adjacent travel lane and 12 inch vertical separation via a granite curb. Cars, trucks and trailer trucks, two lanes worth in each direction, travel 40 to 60 mph over the bridges with some outliers at faster speeds and no median divider.

On weekends and Monday mornings from May through September traffic over the bridges and on surrounding roads suffers gridlock due to the large volume of through traffic headed on or off Cape Cod. On all days during the summer and during commuter hours year round there is moderate to heavy congestion on the bridges and surrounding roadways due to through traffic over the bridges.

Frequent and periodic congestion limits local and cross-canal vehicle mobility within the Town of Bourne. For most pedestrians and cyclists at all times, cross-canal mobility is essentially zero due to safety issues of unseparated sidewalks adjacent to narrow-lane freeway speed traffic, excessive length of span of the high-rise bridges (appx 1 mile with approaches), and dangerous traffic on approach interchanges.

Parents forbid school students from crossing the bridges or walking through the interchanges, which leaves teenagers all the more desirous of getting a car and adding to the congestion.

The canal was originally constructed by a private canal company in 1914 as a 150 foot wide “ditch” with two low-height relatively short span highway bridges, a railroad bridge, and a cross-canal passenger ferry midway between the highway bridges. Highway bridges were had a level wood deck with a sidewalk on one side. One of the highway bridges also had a trolley track on the roadway. The original canal fit well into the community and the original owner provided ample cross-canal mobility for all modes of travel ... pedestrian, bicycle, draft animals with or without carriages, cars, trucks, trolleys and full gage rail.

The current high-level high-speed highway bridges provide improved cross-canal connectivity for through traffic, but are inferior for local vehicle mobility and are of very little use for pedestrians and cyclists. If the 1914 low level bridges and cross-canal passenger ferry were available today, there would be greatly increased local mobility and greatly increased used of pedestrian and bicycle modes for local trips. Year round and summer residents, school students, local employees, overnight visitors and day trip tourists would have access to essential functions and amenities on both sides of town. Unfortunately, with the Federally widened canal and the height and width requirements of the ships it carries it is not possible to reproduce the 1914 low-level draw bridges

The Canal has been Federally controlled since 1920 and Federally owned since 1928. The US Army Corps of Engineers (USACE) has managed, operated and maintained the Canal including all associated assets and activities (land, bridges, shore facilities, patrol fleet, dredging, marine traffic control, park rangers, etc.) since approximately 1940.

The USACE manages the Federal property surrounding the Canal as public open space and allows public use of its service roads as shared-use paths and recreational fishing from the banks of the canal. To support this public use the USACE maintains a staff of a few year round plus several seasonal park rangers and provides several recreation areas with public parking. The service road paths run along the north and south banks from east end of the Canal land cut to the railroad bridge near the west end. The Canal shared-use paths are beautifully maintained and well used. The banks of the Canal are one of the most popular and productive recreational fishing spots in New England.

The USACE does not allow launching, landing or docking vessels or picking up or discharging passengers along the banks of the Canal. Personal cross-canal transport is not possible within the length of the canal land cut.

### **Impact of Proposed Replacement Bridges on Local Mobility**

The 1935 bridges are nearing 90 years old. The railroad bridge had a major rehabilitation completed in 2003 and is supposed to remain useful past 2050.

The USACE and the Massachusetts Department of Transportation (MassDOT) entered into a Memorandum of Understanding in 2018 that they would work together towards improving cross-canal mobility. The USACE conducted a Major Rehabilitation Evaluation of the highway bridges and released its report (MRER) in 2019, concluding that replacement of the bridges is preferable to rehabilitation. The USACE and MassDOT entered into another MOU in 2020 establishing the anticipated roles of the USACE and MassDOT to work toward

replacement of the two highway bridges.

MassDOT initiated a Cape Cod Canal Area Transportation Study in 2016. The study's final report, issued in 2019, recommended improvements to cross-canal and local area mobility including roadway and multi-modal improvements throughout the Cape Cod Canal area.

In December, 2019, MassDOT with the USACE as a partner initiated the Cape Cod Canal Area Transportation Improvement Program, sometimes called the Cape Cod Bridges Program, for the purpose of planning, design and construction to improve cross-canal and local mobility in the Cape Cod Canal Area including bridge replacement and multi-modal transportation improvements throughout the area. Program planning documents incorporated recommendations of the previous study as well as the USACE MRER. As recommended by the study, The Canal Area Program's mission, scope and objectives included special attention to projects that could be initiated ahead of bridge construction and projects of independent utility to improve local mobility. The Program's public involvement included Public Information Meetings (Webinars), public participation via public comment, and promise of a stakeholder advisory group and individual or paired meetings with a wide variety of other stakeholders.

In September, 2021, MassDOT prepared a Public Information Plan for the Canal Area Program which eliminated the Stakeholder Advisory Group and reduced the scope and breadth individual stakeholder meetings. In a November, 2021, Public Information Meeting MassDOT stated that the Program scope would focus on cross-canal vehicular mobility and would not include multi-modal projects remote from the bridge crossing locations, although project documents maintained the original statement of Canal area objectives.

In May, 2022, the USACE with MassDOT as a partner applied for Federal design and construction funding under the MEGA grant program. Although the application did not explicitly state the newly established vehicular focus, the program as described in the application was not particularly strong on multi-modal and local mobility improvements. Estimated total program cost per the MEGA application was 3.96 billion dollars.

In December, 2022, the Federal Highway Administration (FHWA) replaced the USACE as the lead Federal agency for the Program, presumably while also retaining the FHWA role of oversight of the Program. The FHWA and MassDOT entered into a review of the program's Public Involvement Plan during which MassDOT claimed it could not share the program's Public Involvement Plan with the public, but promised a new, improved Plan would be available when the review was complete.

In January, 2023, the MEGA grant application was denied for one of the several funding opportunities covered by the MEGA application. In March, 2023, the grant application was denied for remaining grant opportunities of the MEGA application program.

As of March, 2023, MassDOT and the public almost exclusively use the Cape Cod Bridges Program name for what was previously known as the Cape Cod Canal Area Transportation Improvement Program. FHWA review of the Public Involvement Plan is not yet complete. MassDOT has published an interim Public Involvement Plan which includes a stakeholder advisory group with limited role, but avoids describing the plan as interim and has not indicated whether the interim plan has FHWA or other approval.

MassDOT and its contractors HNTB and Stantec continue to hold approximately quarterly Public Information Meeting webinars while proceeding to develop the preliminary conceptual designs for replacement bridges and bridge access interchanges. MassDOT is targeting conceptual design to be completed in June, 2023, 100% design for at least one bridge and its interchanges to be completed in 2025 and construction to begin in late 2025 or early 2026.

Current (March/April 2023) preliminary designs include replacement bridges with wider lanes, higher speeds, longer approach slopes extending further inland, and more complex access interchanges than the existing bridges. Proposed bridges will have two travel lanes and one “on-ramp lane” in each direction, plus a separated pedestrian bicycle shared use path on one side of the travel lanes. The program area, which once included all the area within two miles of the Canal, has been reduced to two small irregular shaped areas which are the minimum necessary to capture the bridge and interchanges at the two bridge crossings.

Features included in the current concept would likely provide significant improvement for through traffic, but are not likely to provide net improvement for local vehicle mobility. For pedestrian and bicycle modes, the proposed shared-use paths on the bridges are necessary and will improve safety while on the bridge, but the extreme length of spans, complex interchanges at each end of each bridge, and greater distance inland to bridge access points will likely negate any advantage gained. The limited and “focussed” scope of the program does not include sub-projects of independent utility to improve area mobility away from the bridges or mitigate negative impacts.

MassDOT’s Cape Cod Canal Area Transportation Study recommended transportation improvements to provide multi-modal cross-canal and local area mobility as well as improved through traffic connectivity. Now MassDOT’s bridge replacement program envisions replacing the Cape Cod Canal’s functionally obsolete high-level bridges with higher, longer, faster bridges and complex, expansive interchanges at each end of each bridge. It is unfortunate for the Canal Area that the proposed improvements do not include projects of independent utility to improve local area mobility.

### **Opportunities to Improve Canal Area Mobility**

Here are three projects of independent utility which would increase local area mobility, reduce reliance on motorized vehicular modes, and improve community coherence and quality of life.

**1. Cross-Canal Water Taxi:** Introducing water-taxi service at one or more targeted crossing locations within the Canal would be a tremendous improvement towards connecting the two sides of the Canal and regaining the walkability enjoyed by the Bourne community prior to federal widening of the Canal. Crossing distance for such a service would be approximately 700 feet, which would allow frequent trips and high transport capacity using a relatively small water taxi with relatively small per trip passenger capacity. The short crossing time, approximately 2 to 4 minutes each way, would allow economical use of battery electric power for the water taxi vessel. Purpose built landings may be required at some or all landing points.

USACE expertise at operating the current fleet of Canal Patrol boats and managing the Canal grounds with as a public serving park make the USACE well qualified to operate such a service. Alternatively, the service could be operated by the Cape Cod Regional Transit Authority with approval of or in conjunction with the USACE, or by a private carrier such as HyLine Onset Bay Cruises which currently operates scenic excursion boats on the Canal.

Businesses in Buzzard's Bay and Sagamore on the mainland side of the Canal might particularly benefit from their location at the debarking point for cross-canal trips. Desirability of campsites in the The Bourne Recreation Authority's Scenic Park campground on the north (mainland) side of the Canal near the Bourne Bridge would be greatly enhanced by increased pedestrian and bicycle access to Cape Cod side destinations provided by a water taxi service in the area near the Bourne Bridge and/or Railroad Bridge.

More details and benefits of cross-canal water taxi service are described in the attached description, "Cape Cod Canal Water Taxi Concept, Details and Community Benefits".

**Longer distance water taxi:** Canal Area pedestrian and bicycle mobility could also be enhanced by a water taxi or small passenger ferry operating on a slightly longer route around the end of the Canal land cut, for example from the Bourne Town Marina at Monument Beach to the Bourne Town Marina in Buzzard's Bay and/or to Wareham's Onset Bay Town Pier which is the base of operations for Onset Bay Cruises and adjacent to the Buzzard's Bay Coalition's Onset Bay Center. This longer route service would enhance pedestrian and bicycle mobility over a wider area connecting Buzzard's Bay and Wareham with southern parts of Bourne. The pier to pier distance from Monument Beach to Onset is 3 miles in relatively sheltered water, which would allow crossing times of 15 to 20 minutes depending upon the vessel employed. This crossing time is comparable to or less than the low traffic automotive travel time via Canal bridge for the the same trip, and significantly less than the peak demand vehicle travel time.

**2. Connector Paths leading to the Canal Service Road:** Connector paths leading to the canal service road shared use paths would greatly increase the utility of the Canal paths by increasing the area served. Connector paths leading to the canal paths, plus cross-canal water-taxi service would reconnect Barnstable County regions on both sides of the canal with safe, convenient non-motorized transportation and increase shared enjoyment of cultural and natural resources. Combined water taxi crossing and Cape Cod side path connections would allow day trip and overnight visitors from off-Cape to access to the Upper-Cape area without taking a car across the bridge and would increase the attraction of the Upper Cape area as a green tourism destination.

**3. Increased access to the south (Cape Cod) side Canal path:** An active rail line runs along the south side of the Canal and limits pedestrian and bicycle access to the Canal and the south side Canal path. Creating safe, officially recognized pedestrian rail crossings at high value access points (near schools, recreation facilities, library, medical district, museums) would greatly enhance path utility and quality of life for families, public school students and school faculty and staff, fisherman and tourists.

Recognition of presently used and MassDOT advertised pedestrian rail crossings at Keene Street in Bourne village, at the Bourne Bridge Recreation Area and at the USACE's service crossing near the Sagamore Bridge as public crossings would provide great benefit to the community. Recognition of an additional crossings at the Gallo Ice Arena would improve access to the Arena and to the Upper Cape Regional Technical High School.

**4. Canal area pedestrian-bicycle-water transit system:** Any of the above improvements alone or in tandem with one other would provide great improvements to Canal area mobility. A complete system including all of the above improvements would have the greatest total benefit and quite likely the greatest benefit per dollar expended.

Thank you for highlighting forward looking regional projects in the Regional Transportation Plan and for the inspiration provided by successful transportation projects throughout Barnstable County that were promoted through previous plans.

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## **Cape Cod Canal Water Taxi Concept, Details and Community Benefits:**

### **Deficiencies of Existing and Proposed Cross Canal Bridges**

Will proposed replacement bridges and interchanges improve local mobility? The increased length of the new bridges combined with complex interchanges are designed primarily to support hassle free through traffic. There is very little in their design that would improve local mobility. A local trip by car from one side of the Canal to the other will be at higher speed, but longer distance than the present trip as one speeds along 1000 foot on ramps and across the proposed mile long bridge roadway from interchange to interchange. In peak times, the interchange will be congested and the trip will include waiting in traffic just as it does today.

Do the proposed shared use path over the proposed high-level bridges meet the standard of safe, comfortable and convenient pedestrian crossings for all user groups? Will the longer spans plus longer walks through complex interchanges, be more or less walkable than the existing unsafe but shorter walk?

Neither the existing Bourne Bridge sidewalk nor the proposed Bourne Bridge shared-use path meet the standard of safe, comfortable, convenient pedestrian crossings of the Canal. The safe, comfortable, convenient standard must be met for all pedestrian user groups. The existing Sagamore Bridge sidewalk and proposed Sagamore Bridge path are slightly better because the bridge length is shorter.

An additional standard is that replacement bridges must provide equal or improved level of service for pedestrians when compared to the bridges they replace. There is no wiggle room in Federal standards for a replacement with reduced level of service.

Neither the existing bridges nor the proposed bridges meet the safe, comfortable, convenient standard for at least three reasons:

1. **Length:** Due to the length of bridge span plus approach span required for high-rise, high speed bridges, trip distance for typical pedestrian crossings are several times greater than the direct line distance. Two miles is commonly used as a threshold for maximum “walkable distance”. Other measure use one mile or one half mile as the longest distance an average person would bother to walk. The straight line distance across the canal from shared-use path to shared-use path is 700 feet. Bridge sidewalk access points are located at the inland end of the approach roads, well inland from the canal. A pedestrian desiring to cross from the path on one side of the canal to the path on the other side via the existing Bourne Bridge must travel over 1 1/2 miles to do so. If the point of origin and/or destination along the path is laterally distant from the bridge, the combined lateral distance of each end must be quite short, less

than 1/4 mile each end, for the trip to be “walkable”.

The proposed replacement bridges are higher speed and slightly higher elevation than the existing bridges. The necessity or motivation for higher speed is not apparent in any of the stated goals or scope of the current planning program. The 3 to 5 foot higher elevation is required to provide an allowance for sea level rise due to global warming.

The proposed speed requires lesser slope on the approach spans and therefore longer approach distances. The proposed bridge slope (“grade” in highway terminology) is 4% for the Sagamore Bridge and 4 1/2 % for the Bourne Bridge. The combination of 25 to 30% reduced grade and 3% greater elevation compared to existing bridges requires significantly longer approach spans and increased inland distance from canal to bridge sidewalk access points. Canal path to canal path walking distance for the proposed replacement Bourne Bridge is beyond the 2 mile walkability threshold.

**2. Safety:** Sidewalks over the existing bridges are unsafe due to lack of separation between sidewalk and the narrow highway travel lane and 12 inch vertical drop from sidewalk to roadway. However, from accident data it is clear that approach roadways and interchanges of these bridges are more dangerous for pedestrians than the bridge sidewalks.

Increasing the distance inland to bridge sidewalk access points and increasing access interchange complexity as is proposed for replacement bridges will increase exposure to risk and intensity of risk for pedestrians accessing the bridges via existing roadways from points in the surrounding community. Most significantly, the proposed interchange on the south side of the Bourne Bridge will increase hazards (number of roadway crossings, proximity to complex vehicle traffic patterns, confusion of proper or preferred pedestrian route, greater distance of travel through high-threat features) for pedestrian traffic to and from Bourne Intermediate, Middle and High Schools (students, faculty, parents, staff, etc., of 3/4 of all Bourne Public Schools), the Bourne Public Schools Administration Building, Upper Cape Cod Regional Technical High School, the Cape Cod Baseball League Bourne Braves Field and the Gallo Ice Arena which is the practice and competition venue of Bourne High School, Upper Cape Tech and Sandwich High School hockey teams and the host of Bourne Skating Club’s skating classes, shows and competitions.

**Comfort:** See all of above comments on length and safety.

### **How many pedestrian crossings do we need?**

We need at least three. Two would be whatever the high elevation bridges have to offer. The third would be at least one that is safe, comfortable and convenient. The original canal, under private control and ownership and through the first decade of Federal control, had three safe, comfortable and convenient pedestrian crossings. Two were low elevation, relatively short span roadway bridges with sidewalks, one at Sagamore and one at Bourne. The third was a small, cross-canal passenger ferry at Bournedale.

In the modern world, the Gordie Howe Memorial Bridge spanning the Detroit River from Detroit, Michigan to Windsor, Ontario, a 9 billion dollar project now nearing completion, includes a high quality shared-use path on the bridge plus passenger ferry service across the river below the bridge. This dual service was deemed necessary to provide functional service for pedestrian cross-river commuters as well as international multi-day bicycle trekkers and

everyone else in between.

### **The Modern Water Taxi**

The US Army Corps of Engineers owns, staffs and operates a fleet of canal patrol boats and provides dock space and shore facilities to support that fleet. Boats for a cross-canal water-taxi style passenger ferry service would be fewer and similar to or smaller than the USACE's patrol boats. The USACE maintains canal service road shared use paths and grounds surrounding the Canal as public park space with year round and seasonal park ranger staff. The USACE has the management, logistical and staffing experience necessary to operate a public oriented cross-canal water taxi service, either year round or as a spring-summer-fall seasonal service.

### **Water Taxi Operator**

There are many reasons why it be good that the operator of such a service be the USACE, including maintaining all Canal operations under the auspices of the USACE as is current practice under federal law. Alternatively, water taxi service could be provided by the CCRTA with approval of or as a joint venture with the USACE, or by a private operator. In any case, cross-canal trips would count as transit passenger trips for calculation and distribution of Federal transportation funding.

### **Uniting the Community**

With such a service, walking distance from the Bourne Intermediate School, Middle School and High School to Town Hall or the Bourne Memorial Community Building would be approximately 1/2 mile plus a cross-canal water taxi ride. Water taxi transit time would be 2 to 4 minutes. Walking distance from the Bourne Schools Administration Building or the Jonathan Bourne Public Library to Town Hall would be less than 1/2 mile plus a 2 to 4 minute water taxi ride. All of these walking distances are approximately 2 miles via the existing Bourne Bridge and would be well over 2 miles via the proposed replacement bridge.

In addition to municipal facilities and services, there are numerous residences, commercial establishments, and cultural resources on both sides of the Canal that come within easy "walkable" distance with the same water taxi service. Many of these residences are multi-unit residences. Providing transit service to multi-unit residences is a stated goal for Federal and state transportation projects.

### **Connecting Multi-Unit Housing to Commuter Rail**

The Town of Bourne is currently pondering how to meet the Massachusetts transit requirement to include a requisite number of multi-unit housing units within a two mile radius of a potential rail transit stop. Limitations of the walkable catchment area due to the Canal barrier make it difficult or impossible to meet the requirement. The Town is left pondering which side of the canal to locate a transit stop to capture the largest number of housing units. A cross-canal water taxi service would double the catchment area for a rail transit stop on either side of the Canal.

It is interesting to note that the previous cross-canal passenger ferry at Bournedale was operated to connect residents of Bournedale on the north side of the Canal with the



Bournedale rail station on the south side of the Canal.

### **Recreation and Tourism**

The USACE's canal paths receive several million visits each year as two separated paths. Some of these users are utilitarian pedestrians and cyclists, but most are recreational users and fishermen. Water taxi service would enhance the fishing, recreation, tourism benefit of canal paths by providing convenient and enjoyable access to both sides of the canal for all paths users, and would allow recreational day trips from off cape to upper cape towns without car travel across the bridge. The position of the Buzzard's Bay downtown district as the embarking point for upper-cape day trips would improve prospects for restaurants and other recreation oriented businesses in the downtown district.

### **Emission Free Service**

The extremely short cross-canal distance, approximately 700 feet, makes battery electric propulsion a practical choice for a cross-canal water taxi. The USACE maintains a testing facility near the north end of the Canal Railroad Bridge for hydro-kinetic renewable energy systems. Hydro-kinetic renewable energy is readily available for recharging an electric renewable energy water taxi. A Cape Cod Canal renewable energy water taxi would provide emission free local transportation with superior performance in terms of travel time and travel time reliability compared to bridge based automotive or pedestrian modes.

### **Benefit to USACE**

A water-taxi service would also provide easier access to both sides of the canal for USACE park rangers who manage the public presence on the canal paths and surrounding grounds. Who better to provide and operate a renewable energy waterborne transportation demonstration project than our nation's engineers, whose mission is focused on waterborne transportation projects?

### **Qualifying for Funding**

To date, construction funding applications for the Cape Cod Canal Area Transportation Improvement Program have been denied. The program currently offers very little to meet multi-modal and local mobility scope and objectives stated in the program's mission and required and encouraged by granting authorities who have rejected the program's construction grant applications. Program funding applications have also been vague about incorporation of innovative technology in proposed solutions, another requirement for Federal transportation funding.

Including user targeted renewable energy water taxi service in the proposed Canal Area transportation system would allow this project to meet stated program objectives and Federal and state requirements which the program currently fails to meet, and to provide the exceptional level of service that will be and should be required to receive funding in the current competitive environment of Federal transportation projects.

The USACE and MassDOT may choose to proceed without including waterborne transit in this program. To do so would fail to meet stated program objectives, would fail to meet Federal and state transportation requirements, and would fail to provide sufficient local area

mobility as is required of MassDOT by its mission and the USACE as manager and operator of this Federally owned and constructed Canal.

### **Transportation Options and Independent Utility**

The existing bridges do not meet the standard of safe or convenient pedestrian crossings. Maintenance of the existing bridges' vehicle roadways and lack of snow clearing from existing sidewalks causes periodic sidewalk closures. Proposed bridge replacement construction will cause additional travel lane and sidewalk closures as well as disruptions to use of canal paths and local area roadways. Cross-canal water taxi service available now and during Canal Area Program construction activity would mitigate these disturbances and would provide a superior alternate mode of cross-canal mobility for all users during intervals between roadway disturbances.

The Canal Area Program's statement of scope includes prioritizing projects with immediate independent utility and prioritizing projects that may be initiated prior to completion of bridge replacement. Establishment of water taxi service as a project of independent utility is within the Program's stated mission, scope and structure. Initiating water-taxi service prior to completion of bridge replacement is within the Program's stated and preferred methodology. Existing capabilities to operate a water taxi exist within the USACE and the Cape Cod RTA. Provision of water taxi service would be of great benefit to the host community, and would greatly enhance the Program's competitive position for Federal funding.

### **Simply the Best**

There is no other means by which MassDOT, the FHWA and the USACE could provide the level of service for local area mobility that would be provided by a water taxi.

### **Emission Reduction Targets**

The above discussion is concerned primarily with mobility. There are also Federal and state requirements and targets for greenhouse gas emissions reduction. The likelihood of meeting climate based emission reduction targets is small or zero with the Canal Area Transportation Improvement Program's currently envisioned and proposed solutions. Zero emission program elements that provide superior system performance should be embraced by program leadership.