



Cape Cod Bridges Program

Bourne, Massachusetts

Appendix 4.22

Assessment of Induced Demand and Induced Development

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1 Purpose of this Memo

This memorandum¹ is to respond to comments on the topic of induced demand and induced development. As described in further detail in the following sections, any induced demand or induced development as result of the Cape Cod Bridges Program (Program) would be insignificant.

2 What is Induced Demand?

Induced demand refers to an increase in vehicle travel that results from an improvement in travel conditions. When travel becomes faster or more reliable, the “cost” of travel decreases, and people may change their travel behavior. In transportation practice, induced demand is typically evaluated through five potential behavioral mechanisms:

- Change in number of trips
- Change in mode
- Change in route
- Change in trip length
- Change in travel time

The Federal Highway Administration’s (FHWA) National Environmental Policy Act (NEPA) guidance underscores the need to distinguish true increases in travel (new trips, longer trips, additional vehicle travel) from redistribution effects (such as shifting trips to different times of day), and to clearly document assumptions in forecasting transportation and land-use impacts.

3 Key Findings from Travel Demand Modeling

The Program’s travel demand models forecast that the 2050 total daily traffic volumes across the Sagamore and Bourne Bridges are equal under the No Build and Build Alternatives.

This finding is meaningful because:

- The models do not cap daily demand based on capacity, meaning demand is not suppressed by congestion.
- Trip-making is driven by population, employment, land use, and visitor travel trends, factors which are already reflected in the socioeconomic inputs.

¹This appendix has been newly prepared for inclusion in the FEIS and was not part of the previously submitted DEIS; therefore, “New Text” formatting has not been applied.

- Discretionary travel is already captured through the socioeconomic and land use inputs.

Therefore, the finding of “no increase” indicates that any potential rise in demand is immaterial and already encompassed within the modeling projections.

Although the Build Alternative improves operations and safety near the bridge approaches, largely through geometric improvements and separation of regional and local movements, it results in no appreciable change in daily cross-canal demand.

4 Evaluation of Induced Travel Mechanisms

4.1 Change in Number of Trips

Trip generation is the most significant potential source of induced demand. However, Program-specific factors limit the likelihood of new trip-making:

- Visitor travel is assumed to grow at a conservative 0.7% per year for the traffic operations analysis, but overall visitor demand is constrained by non-transportation factors, including seasonal rental availability, lodging costs, attraction capacity, and parking constraints, rather than bridge capacity, making demand relatively insensitive to localized operational improvements.
- The Build Alternative traffic analysis indicates only modest travel-time savings (generally up to 10–15 minutes in peak periods and less during off peak times), and some congestion will remain in peak periods/seasons. These limited reductions are generally insufficient to stimulate new trip-making beyond what is already captured in the forecasts.
- For long-distance visitors, bridge-area time savings are a small share of total trip duration. As a result, travel-time improvements are generally shifting route selection or the timing of travel rather than generating new trips.
- Downstream bottlenecks on Cape Cod will continue to govern accessibility, and the Program does not add general-purpose through-travel lanes across Cape Cod Canal or resolve constraints outside of the Project Limits, limiting any mechanism for sustained new trip-making.

These modest time savings are expected to have an insignificant effect on discretionary trip-making, because discretionary trips frequently occur off peak, when operational benefits are smaller. Moreover, temporal shifts (peak “rebalancing”) are a well-documented response to congestion changes and reflect redistribution not new daily trips. For local and regional travelers, some congestion will persist during peak seasons and holidays even under the Build Alternative. Localized improvements alone do not inherently enable additional trip making because induced travel depends on the wider network and land use context.

For these reasons, the Program does not create conditions that would generate new trip making beyond what is reflected in the travel demand forecast. There is no increase in projected traffic volumes based on the 2050 No Build and Build Alternatives.

4.2 Change in Mode of Travel

Induced demand could occur under specific conditions, such as if travelers abandon transit, carpooling, biking, or walking in favor of driving due to improved roadway conditions. In the Cape Cod region, this effect is expected to be insignificant for the following reasons:

- Nearly all cross canal travel is already automobile based.
- Alternative modes are limited, particularly for long-distance regional and tourist travel.
- Operational improvements may improve bus travel times and reliability, making public transportation a more attractive mode of travel.
- Expanded pedestrian and bicycle facilities near the bridges may shift some short trips to non-auto modes.

Given the limited non-auto modal share today, improved roadway performance is unlikely to cause a shift toward additional vehicle travel.

4.3 Change in Route or Trip Length

Some roadway projects create new routes or open previously inaccessible destinations, which could affect demand. This outcome is not projected to occur on the Program due to the following factors:

- Sagamore and Bourne Bridges are the only two roadway crossings of Cape Cod Canal, and the Program does not add any new crossings.
- The Program does not introduce new regional connections or open new corridors.
- Trip lengths are constrained by Cape Cod's peninsular geography and limited access points.

While some travelers may choose either Sagamore or Bourne Bridge for convenience, the total number of daily trips remains unchanged, confirming that route choice changes do not generate new demand. These bridge-selection preferences are already incorporated in the traffic projections for the Build Alternative.

4.4 Change in Time of Travel

Temporal redistribution, or "peak rebalancing," is a well-documented response to improved travel conditions. It alters when trips occur, but not how many trips are made over the course of a day.

- When congestion lessens, some travelers, especially those making discretionary trips, shift into peak periods because the penalties associated with peak hour travel diminish.
- Historically, travelers on Cape Cod have engaged in "peak spreading," shifting away from the most congested periods during summer weekends to avoid long delays.
- Under the Build Alternative, improved operations may allow travelers to depart at more preferred times, reducing the incentive to avoid the peak period.

This behavior may concentrate trips into a shorter peak period, resulting in more travel occurring during the peak hour and fewer trips immediately before and after it; however, it does not increase the total daily travel, as confirmed by the Program’s travel demand model outputs.

5 What is Induced Development?

Induced development refers to the changes in land use patterns, such as new housing, commercial spaces, or employment centers, which emerge as a result of a transportation investment or improvement. When access to an area becomes faster, easier, or more reliable, the “cost” of locating there decreases, and households, businesses, and developers may alter their location decisions.

6 Assessment of Induced Development Potential

Induced development can lead to additional travel when a project substantially shifts growth patterns. Regional data show that the Program would not create such changes, and any resulting new development would be insignificant and already captured in future projections.

6.1 Regional Demographic Outlook

UMass Donahue Institute’s population and household projections are as follows:

- Barnstable County: 17.4% population decline and 12.7% household decline by 2050
- Dukes and Nantucket Counties: modest growth followed by a plateau or decline
- Overall regional population growth appears to be declining

A sensitivity analysis of population, household and employment growth contained in the UMass Donahue Institute projections allows for potential effects of improved operations attributable to the Program. However, it shows only minimal effects on the regional totals depicted in [Table 1](#) and Table 2, respectively. Under any foreseeable scenario, population, households, and jobs are projected to be less in 2050 than they were in the 2019 base year. Therefore, any incremental travel time savings of the Build Alternative would not change conditions affecting the built or natural environment compared to those in the base year.

Table 1. Population Projections, 2019-2050

Geographic Area	2019	2030	2040	2050	Change 2019-2050	Change 2030-2050	Change 2040-2050
Barnstable County	212,990	216,048	190,000	176,007	-17.4%	-18.5%	-7.4%
Dukes County	17,332	20,923	19,975	19,793	14.2%	-5.4%	-0.9%
Nantucket	11,399	15,873	14,000	12,212	7.1%	-23.1%	-12.8%

Source: Estimates are from UMass Donahue Institute V2024 Population Projections, May 2024.

Table 2. Number of Households, Projections 2019-2050

Geography	2019	2030	2040	2050	Change 2019-2050	Change 2030-2050	Change 2040-2050
Barnstable County	94,323	100,263	86,173	82,313	-12.7%	-17.9%	-4.5%
Dukes County	6,765	9,085	9,170	9,359	38.3%	3.0%	2.1%
Nantucket	3,713	6,026	5,875	4,780	28.7%	-20.7%	-18.6%

Source: Estimates are from UMass Donahue Institute Population, Household, and Employment Projections 2010 – 2050, Statewide Model Run 97, July 2023.

6.2 Structural Development Constraints

Cape Cod faces long-standing constraints, unrelated to bridge access, that fundamentally limit the scale and location of future development due to:

- Limited developable land
- Strict wastewater and water-supply limitations
- High construction and infrastructure costs
- Limited municipal service capacity
- Persistent existing roadway bottlenecks beyond the bridge approaches

These factors collectively restrict the region’s ability to accommodate additional growth, meaning improved bridge operations alone would not alter regional development patterns.

6.3 Quantified Induced Development Effect

The Program’s socioeconomic analysis indicates that the Build Alternative would yield negligible development attributable to travel time and other operational improvements of the Build Alternative:

- Approximately 21 additional jobs are estimated to occur across Cape Cod and the Islands by 2050 as a direct and indirect consequence of improved transportation operations.
- At approximately 500 square feet per job, this equates to roughly 10,500 square feet of new development, assuming this growth resulted in new development rather than expansion of existing businesses.
- In Barnstable County, this represents approximately 0.039% of existing commercial space, making any land-use impacts negligible.

Refer to the Final Environmental Impact Statement **Section 4.5, Socioeconomics, Appendix 4.5, Socioeconomics Technical Report** for further details on regional growth trends and the conclusion that induced development effects would be insignificant.

7 Conclusion

Transportation projects can influence how people travel and how communities grow. For the Program, two types of potential effects were reviewed:

- **Induced demand:** Whether better travel conditions would cause more people to drive across Cape Cod Canal.
- **Induced development:** Whether improved access would lead to new housing, businesses, or other growth that otherwise would not occur.

Induced demand and induced development both describe how transportation investments can influence behavior and growth, but they operate at different scales and through different mechanisms. Induced demand reflects behavioral changes by travelers, typically occurring in the short term. Induced development reflects structural shifts by households, employment, and developers, often unfolding over the medium to long term.

The Program does not expect any significant increase in total daily cross-canal traffic in 2050 under the Build Alternative relative to No Build Alternative, indicating that the Build Alternative's benefits stem from operational and geometric changes, not from generating new cross-canal trips. This conclusion is supported by the following:

1. **No change in daily Average Annual Daily Traffic:** Significant differences in daily cross-canal volumes are not expected between the Build and No Build Alternatives.
2. **Localized operational improvements:** Travel time and reliability benefits are concentrated at the bridges and immediate interchanges (i.e., operational and geometric upgrades), which represent a small share of total trip duration for most regional travelers.
3. **Geographic constraints:** Route choice and trip length are bounded by Cape Cod Canal's geography and the presence of only two roadway crossings (Sagamore and Bourne Bridges). The Program replaces these crossings, but it does not add new regional connections.
4. **Minimal mode shift potential:** Cross-canal travel is overwhelmingly auto based with limited feasible non-auto alternatives for canal crossings.
5. **Temporal redistribution, not new trips:** Any behavioral change is expected to manifest primarily as peak rebalancing (i.e., time of day shifts) rather than added daily trips, consistent with the literature on peak spreading and with FHWA's expectations to distinguish redistribution from new demand.

The Build Alternative alone is not expected to generate new development on Cape Cod beyond what is already forecasted. Although transportation projects can sometimes influence growth, this Program does not change regional access, open new land for development, or create new travel corridors. Cape Cod's broader trends and constraints limit the potential for additional development regardless of transportation improvements. These include:

1. **Declining population and household forecasts:** Long-term projections show fewer residents and households in Barnstable County by 2050, reducing pressure for new development.

2. **Strong development limits:** Wastewater and water supply constraints, limited buildable land, high construction costs, and limited infrastructure capacity all restrict growth more than travel conditions.
3. **No new access to support growth:** The Program replaces existing crossings and does not expand the transportation network in a way that encourages major new development.
4. **Very small estimated secondary growth:** Only about 21 additional jobs are projected as a result of improved operations — equivalent to roughly 10,500 square feet of new commercial space, a negligible increase.

Therefore, the Build Alternative improves safety and reliability while not generating increases in daily cross-canal vehicle travel beyond what is already reflected in future forecasts.