



Portland Area Mainline Needs Assessment

DRAFT

Alternative 2 – New/Expanded Transportation Demand Management (TDM) Programs

HNTB Corporation
April 2018

Table of Contents

2.1 Overview2-1

2.2 Key Assumptions2-1

2.2.1. Rideshare Programs2-1

2.2.2. Park and Ride Lots.....2-1

2.2.3. Work from Home Trends2-1

2.3 Estimate of Reduced Travel Demand for Rideshare2-2

2.4 Estimate of Reduced Travel Demand for Work at Home.....2-3

2.5 Capital and Operating Costs.....2-4

2.6 Findings2-4

2.6.1. Key Benefits.....2-4

2.6.2. Key Impacts2-4

2.1 Overview

Transportation Demand Management (TDM) programs provide tools to commuting travelers to reduce the demand for transportation, i.e., reduce the number of vehicles on the road. These tools include ride share programs, park and ride lots (which can support rideshare programs), and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether. In this Alternative, these programs will be evaluated to determine the following:

- Estimate the impacts on travel demand by enhancing or implementing new rideshare programs such as increased employer incentivization, expanding or constructing new park and ride facilities, increasing rideshare advertisement, and expanding ride share services.
- Estimate how the current trend in working from home may impact travel demand and traffic volumes between now and the year 2040.

2.2 Key Assumptions

This alternative will examine local and national programs and trends in rideshare usage and identify estimates of reduced travel demand with expanded rideshare programs to determine practicable improvements to support vehicle trip reduction on the Maine Turnpike. Descriptions of the key assumptions and methods follow.

2.2.1. Rideshare Programs

Rideshare data was collected from rideshare services such as GoMaine¹ as well as from major employers. This information, along with Cumberland County Census data², was used to estimate ride share utilization based on current carpool/vanpool use. Increased rideshare utilization was estimated from a review of the potential benefits identified in a literature search of successful areawide TDM programs.

2.2.2. Park and Ride Lots

Historic utilization data for the PACTS area park and ride lots provided by the MTA and MaineDOT³ was analyzed to determine the capacity for additional carpool/vanpool use. Park and ride lots with greater than 50% utilization were identified for possible expansion opportunities.

2.2.3. Work from Home Trends

Data from the US Census⁴ and the United States Department of Labor was gathered and analyzed to determine trends in the portion of the workforce that is working from home. Data was specifically gathered for Cumberland County to provide a baseline and future trend for the percentage of workforce

¹ GoMaine is the State of Maine rideshare program currently sponsored by MaineDOT and the Maine Turnpike Authority, www.gomaine.org.

² Cumberland County Census Data, American Community Survey 5-Year Estimates, <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml>

³ Maine Department of Transportation Park n' Ride Utilization Study, 2011.

⁴ United States Census Data, American Community Survey 5-Year Estimates, https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

that is working from home. Additional research was conducted to validate Census trends and used to determine the impacts of working from home on the peak hour traffic demand.

2.3 Estimate of Reduced Travel Demand for Rideshare

For this alternative, it was assumed that the reduction in traffic from the Maine Turnpike would be based on the potential to increase the number of people who would participate both in an enhanced areawide and in an employer-based TDM program. The first step in estimating this increase was to understand the existing level of workforce in carpools or vanpools. Based on 2016 US Census data, 8.3% of the Cumberland County workforce population carpools, vanpools or uses some level of rideshare program. This rideshare population includes both regular and semi-regular users.

Next, an estimate of the additional percentage of the workforce that could shift to carpool and vanpool through a new or enhanced rideshare program was determined using data from studies summarized by the Federal Highway Administration (FHWA). This data indicated that successful commuter programs in similar regions (low transit density areas with free parking options) that offer alternative commuter services such as park and ride facilities and vanpools as well as financial incentives to employers can increase rideshare usage. Programs with strong support and marketing were shown to achieve an *additional* commuter vehicle volume reductions ranging 3-7%⁵.

Based on this, a mid-range quantity of 5% of additional commuter vehicle reduction was selected as a reasonable value. An historic rideshare vehicle occupancy and the percentage of additional rideshare users that travel during the peak period was then calculated. Table 2-1 provides a summary of additional vehicles removed with assumed new or enhanced rideshare programs from the peak hour traffic on the Maine Turnpike in the Portland Area. As can be seen from the table, hourly reductions range from 25-52 vehicles per hour, or about one percent of the total traffic.

Table 2-1: Traffic Reduction Estimates from Enhanced TDM

Location	Northbound PM		Southbound AM	
	2040 Design Hourly Traffic	Traffic Reduction	2040 Design Hourly Traffic	Traffic Reduction
Exit 42-44	5,195	54	3,526	37
Exit 44-45	3,434	36	2,360	25
Exit 45-46	3,968	41	3,221	34
Exit 46-47	4,917	52	4,566	48
Exit 47-48	4,587	47	4,218	44
Exit 48-52	4,147	43	3,931	41
Exit 52-53	3,446	36	3,482	36

⁵ U.S. Department of Transportation, Federal Highway Administration, *Integrating Demand Management into the Transportation Planning Process; A Desk Reference* (August 2012).

Achieving these numbers will require a combination of measures, such as expanding existing park and ride facilities, working closely with large employers to increase employee rideshare, and promoting carpooling and vanpooling opportunities within the state through increased and enhanced rideshare marketing and financial incentives. Further evaluation of these measures will be required to identify the optional results.

2.4 Estimate of Reduced Travel Demand for Work at Home

The general perception is that the number of people working from home is increasing. In order to determine if the current trend in the percent of the workforce of people that work from home is growing faster than traffic growth, U.S. census data⁶ for 2000-2016 was reviewed. The objective of this review was to estimate any additional reduction in travel demand that should be considered in the Year 2040.

Figure 2-1 presents the historic percent of the workforce population that work from home, both for the United States and Cumberland County. Similar trend lines exist for both United States Data and Cumberland County data.

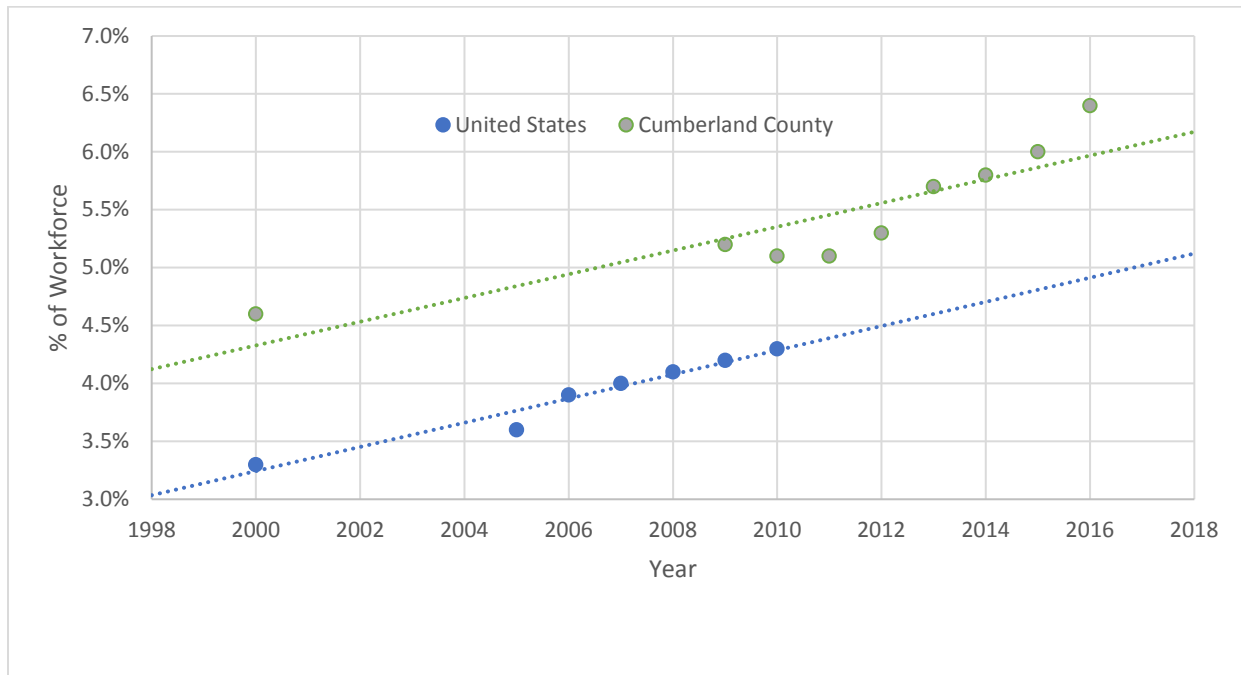


Figure 2-1: Historic Regional and National Percentage in Work from Home Workforce

As seen in Figure 2-1, the Cumberland County percent of workforce that works from home has averaged an approximate 1.9% increase per year since 1998. This growth is consistent with historic annual traffic growth seen on the Maine Turnpike. If this trend increases over time, the increase in work from home workforce may reduce overall future traffic demand. This trend should be carefully monitored in the future to assess changes in overall traffic demand.

⁶ Base Condition Data is from the U.S. Census, American Community Survey 1 and 5-Year Estimate & Decennial Census. Identifies percentage of workforce who reported “work at home” on a question about how they “usually” commute to work.
<https://www2.census.gov/library/publications/2012/demo/p70-132.pdf>
<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

2.5 Capital and Operating Costs

The capital costs to enhance and expand TDM programs was estimated to be approximately \$3 million in 2018 dollars. This estimate is based upon an assumed doubling of the GoMaine program funding and adding capacity to highly utilized park and ride facilities within the PACTS region.

Operation and maintenance (O&M) costs for the enhanced and expanded TDM programs was estimated to be approximately \$1.35 million in 2018 dollars. These increased O&M costs are based on similar assumptions – expansion of the GoMaine program and increased park and ride facility size.

2.6 Findings

Implementing new or expanded rideshare program is anticipated to reduce peak hour travel demand on the Maine Turnpike by up to 52 vehicles in 2040. While this provides some relief to the Maine Turnpike corridor between Exits 44 and 53, the resulting demand would still exceed the capacity of the roadway ($v/c=1.35$).

This alternative was evaluated against several Measures of Effectiveness (MOEs) which are summarized in the Alternatives Evaluation Matrix, dated April 12, 2018. The key findings from that matrix for this alternative are as follows:

2.6.1. Key Benefits

The key benefits of Alternative 2 – New/Expanded TDM are the following:

- Anticipated crash rate reduction of 1% along the Maine Turnpike between Exits 44 and 53;
- 52 vehicle peak hour reduction along the Maine Turnpike between Exits 44 and 53;
- 0.5% reduction in regional vehicle miles traveled (VMT);
- 0.3% reduction in regional vehicle hours traveled (VHT);
- Reduction in NO_x (-0.5%) and HC (-0.4%), improving air quality;
- New or Expanded TDM programs can be readily implemented with available funding;
- No legal or policy obstacles to implementation;
- Can be implemented in a short timeframe; and
- Has a Benefit/Cost ratio of 14.6.

2.6.2. Key Impacts

The key impacts and challenges of Alternative 2 –New/Expanded TDM are the following:

- Little relief to Maine Turnpike capacity constraint (Year 2040 $v/c = 1.35$);
- Potential wetland impacts; and
- Potential loss of revenue for Maine Turnpike.