Description of Measures of Effectiveness

Portland Area Mainline Alternatives Criteria			
		Criteria	Description
Transportation Measures	A	Safety Benefits on Maine Turnpike	Using a combination of the engineering standard AASHTO Highway Safety Manual and the USDOT Crash modification factor clearing house, Crash Modification Factors were developed for each alternative. These factors are used to determine the anticipated change in crashes as a result of the proposed alternative and includes physical changes as well as changes in volume.
	B	Mainline Turnpike Capacity	Mainline Turnpike Capacity volumes were developed using using the engineering standard USDOT Highway Capacity Manual and calibrated using historical roadway volume information. Each lane is estimated to have a capacity of 1800 vehicles per hour per lane.
	C	Change in Mainline Turnpike Demand	The change in mainline turnpike was calculated as discussed in the alternative write-ups. It involves using a variety of information for calculation including the PACTS Travel Demand Model, planned projects, and desired future improvements. Volumes in this category represent the change in vehicles off the road from NB Exit 46-47 during the PM Peak Hour.
	D	Mainline Turnpike Volume to Capacity Ratio	Resulting peak demands from **Column C** are divided by the estimated capacities in **Column B** to calculation a Volume to Capacity (V/C) ratio. A V/C greater than 1 indicates a road that is over capacity; a V/C between 0.8 and 1.0 indicates a road that is at or nearing capacity; and a V/C less than 0.8 indicates a road that has capacity available.
	E	Regional Off-Turnpike Benefits	The PACTS Travel Demand Model provides a total number of miles (by type and location) that are near or at capacity in the region. This estimation was used to determine the effect of each alternative on roadways in the region so that improvement to the Turnpike was not at the detriment to other local roads and arterials.
	F	Vehicle Miles Traveled (VMT)	The number of miles traveled during the PM Peak in the PACTS region was totaled for this category, Vehicle Miles Traveled (VMT). An increase in VMT could indicate that users are going out of their way to take a more efficient route or that congestion is increasing and users are traveling a greater length to avoid congested routes; a decrease in VMT could indicate more direct routes are being utilized.
	G	Vehicle Hours Traveled (VHT)	The number of hours driven by vehicle during the PM Peak Hour in the PACTS region was totaled for this category, the Vehicle Hours Traveled (VHT). In general, longer VHT times indicate that users are taking a longer time to travel similar routes (i.e. congestion) and shorter times indicate that users are traveling less time.
	H	Change in Transit Ridership	PACTS region users opting to take public transit are totaled in this category. The PACTS Travel Demand Model uses pre-determined demographics and proposed improvements to determine the number of public transit trips that will be taken for each alternative. The increased number of riders during the peak hour is shown in this box.
Environmental Measures	I	Regional Air Quality	The EPA's Motor Vehicle Emission Simulator (MOVES) was used with local data from MaineDOT to obtain air quality emissions data. EPA's Motor Vehicle Emission Simulator (MOVES) is an industry standard emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, greenhouse gases, and air toxics."
	J	Change in Regional Impervious Pavement	The amount of impervious pavement on the roadway was totaled for each alternative and measured in acres. Large increases to impervious pavement can have environmental implications.
	K	Change in Regional Impervious Pavement within Urban Impaired Stream watersheds	The amount of impervious pavement was calculated for each alternative measured in acres within the four watersheds impacted by I-95; Red Brook, Long Creek, Nasons Brook and Capisic Brook. Large increases to impervious pavement within a watershed can have greater environmental implications.
	L	Potential Wetland Impacts	Potential wetland impacts were identified for each alternative based on potential future infrastructure improvements or impervious surface expansion.

Cost/Funding Measures	M	**Initial Capital Cost** (2018 Dollars)	While most projects will take more than a single construction season to reach completion, the cost for each improvement project was calculated in 2018 dollars. This total is the 'construction' cost only to implement each improvement and does not include design or construction engineering in the estimates.
	N	**Capital Funding Viability**	The ability to fund capital cost for each alternative is assessed in this column. If funding has been identified or is readily available it is green, if it is likely funding could be achieved but has not been identified it appears yellow, and finally if there is no funding identified and the Likely Implementing Agency has no plans to fund a project, it appears red.
	O	**O&M Cost** (2018 Dollars)	Operations and maintenance costs are assumed annual operating costs. These are provided in 2018 dollars and are anticipated to grow exponentially through the life of the project.
	P	**O&M Funding Viability**	The ability to fund operations and maintenance for each alternative is assessed in this column. If funding has been identified or is readily available it is green, if it is likely funding could be achieved but has not been identified it appears yellow, and finally if there is no funding identified and the Likely Implementing Agency has no plans to fund a project, it appears red.
	Q	**Potential Toll Revenue Impacts**[5]	With each alternative there is a change in the volume of vehicles serviced. For volume changes that are less than 1% there is little effect on revenue accrued, for changes that are greater, a change in anticipated toll revenue was calculated. In addition, there are several alternatives that alter how tolls are assessed, including congestion tolling and HOV/HOT lanes. The anticipated change in toll for these alternatives was also evaluated. Projected revenue for I-295 in the alternative in which it is tolled is provided for that alternative.
Implementation Measures	R	**Legal/Policy Obstacles**	There are several alternatives proposed in this matrix where legal and policy issues would cause significant hurdles for implementation. The presence of these hurdles is identified in this section.
	S	**Timeframe to Implement**	Many alternatives identified would require time to implement, that timeframe is identified in this column. For instance, land use would require time for adoption and organic implementation; while a travel demand management program could begin increasing its presence immediately.
	T	**Likely Implementation Agency**	A key to the implementation of each alternative is what agency or entity would likely be responsible for implementing that alternative.
Summary Measures	U	**Benefit/Cost**	Using USDOT and CalDOT Benefit-Cost methodology, each alternative is evaluated to determine if the benefit (converted to transportation dollars) is greater than the cost (in dollars) of the alternative. Benefits include safety gains, reductions in volume, increases in capacity, increases in public transit use and more.
	V	**Address Study Purpose**	Is the study purpose addressed using this alternative? While many alternatives have substantial regional and social benefits, it is important that safety and mobility issues on the Maine Turnpike are sufficiently alleviated. If an alternative is shown to relive Turnpike congestion without causing detriment to the region, it is noted in the column in a full or partial form.

PAM STUDY PURPOSE

The Maine Turnpike mainline through the Greater Portland area is an essential component of the regional and statewide transportation system. It provides safe and efficient mobility for regional through-traffic, as well as quick and convenient cross-town access to local businesses, municipalities, and other transportation modes.

The purpose of the Portland Area Mainline (PAM) Study is to assess safety and mobility deficiencies on the Maine Turnpike between Scarborough and Falmouth, Maine and, as needed, recommend practicable solutions that preserve and improve long-term highway mobility for the region in a manner that is consistent with the Sensible Transportation Policy Act, enhances the regional transportation system and meets Maine Turnpike Authority responsibilities and reasonable customer expectations.