Hillsborough TPO
Transportation
Planning Organization

2050 LRTP Needs Assessment for Congestion Management & Crash Mitigation

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Introduction

2050 Plan Ingredients

Revenue Forecast – Estimated value, thru 2050, of existing funding streams & potential local-option revenue sources

Needs Assessments – *including cost estimates, performance forecasts, and performance-based prioritization*

- Congestion Management & Crash Mitigation – safety treatments and traffic flow treatments

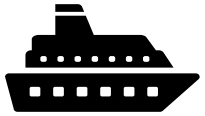
- Good Repair and Resilience – Pavement, bridge, & transit vehicle maintenance, stormwater systems expansion and vulnerable road hardening

Needs Assessments (cont'd)

- Real Choices When Not Driving – Bus and circulator services, paratransit/TD services, trails and sidepaths separated from motor vehicle lanes

- Major Investments for Economic Growth – New or wider highways/ major roads, separated grade interchanges, fixed-guideway transit including BRT, rail, ferry

- Goods Movement & Truck Routes – Major projects as well as lower-cost traffic flow treatments focusing on freight flows

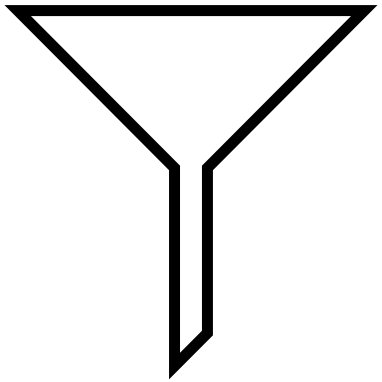


- Equity – Safety treatments, Good Repair & Real Choices projects to address sub-par infrastructure and public health in underperforming areas

The 2050 Plan: Putting the pieces together

Needs Assessments

Revenue Forecast



Various scenarios using potential revenue sources (“cost feasible scenarios”)

Public input

Board consideration of preferred scenario

Methodology

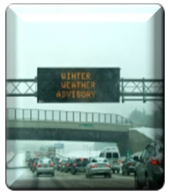
Approach

- Apply the Post-Processor used for 2045 LRTP and apply to 2050 TBRPM output
  - Predicts travel time reliability and crashes
  - Assesses the impact of Transportation Systems Management and Operations (TSMO) strategies and safety treatments
  - Tabulates deployment costs
- Update with most recent data available from FHWA and AASHTO

Reliable travel means that unpredictable circumstances do not cause lengthy, unpredictable, and frustrating delays.

Unpredictable Circumstances…

Inclement Weather



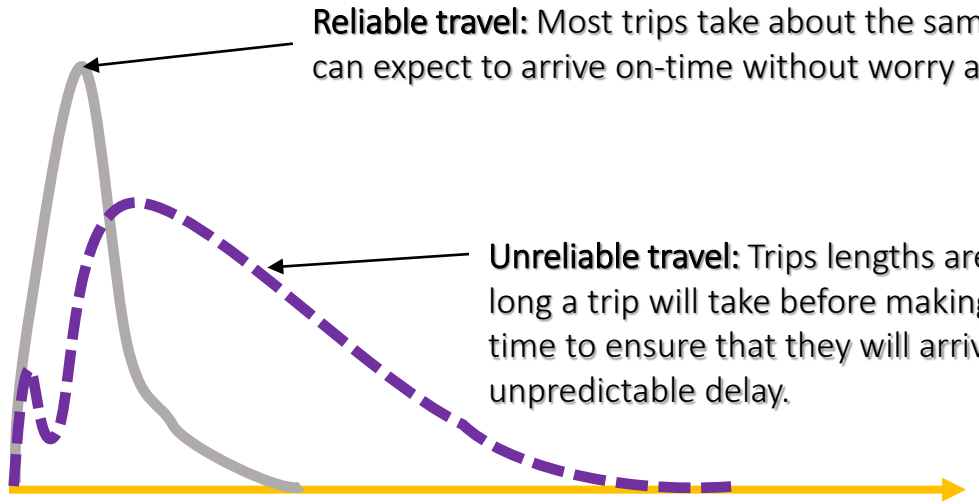
Fluctuations in Demand

Crashes

Work Zones

Poorly Timed Traffic Signals

…Do Not Cause Unpredictable Delays.



Reliable travel: Most trips take about the same length of time. Under these conditions, users can expect to arrive on-time without worry and without unexpected delay.

Unreliable travel: Trips lengths are highly variable. It is difficult to judge how long a trip will take before making a trip and users often will build in extra time to ensure that they will arrive on-time. These users *expect* there to be unpredictable delay.

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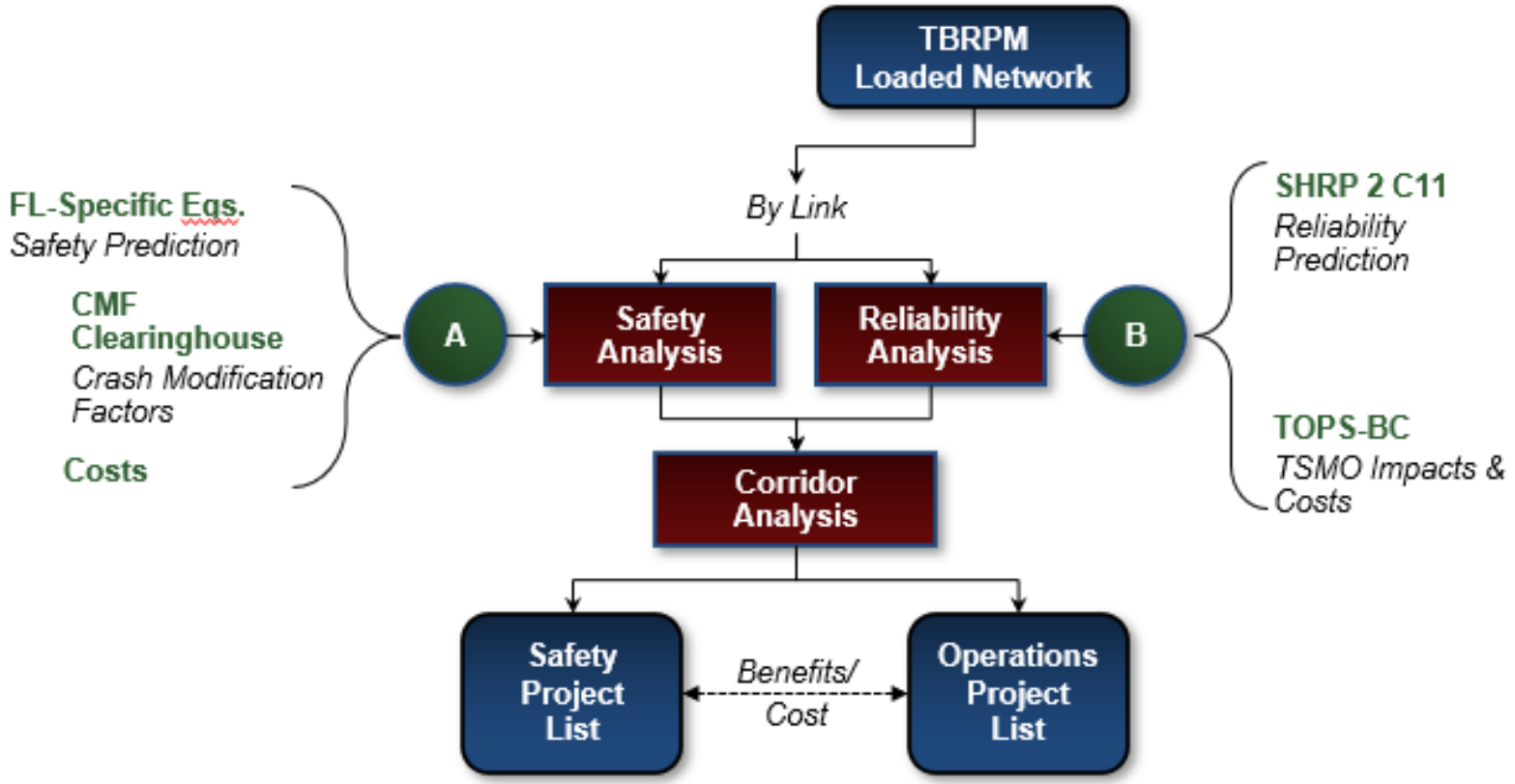
Travel Time Reliability Measures

Reliability performance measures the variability in travel times over the course of a year

- Primary measure: the Planning Time Index (PTI)
  - Technically, it's the 95th percentile travel time that occurs for a trip for a peak period over a year
  - PTI = 1.0 means there is no variability in travel times for the trip
  - PTI = 2.0 means that for one weekday of a month, the peak period travel time is twice the uncongested travel time
    - For freeways, if uncongested travel time is 60 mph, then the speed for this one weekday is 30 mph

Post-Processor Structure



Improvement Scenarios

- Reliability: TSMO/Operations Improvements
  - Revenue constraint: None
  - Only sections which have congested forecasted peak period conditions get treatment
    - For freeways, where average hourly speeds are < 45 mph
  - Strategies
    - Freeways: Ramp Metering and Hard Shoulder Running
    - Arterials: Computerized Signal Control and Timing

Improvement Scenarios (cont.)

- Safety Improvements
  - Revenue constraint: $504,000,000 over 20 years ($25,200,000 per year)
  - Arterials and Collectors only
    - Safety bundle developed from treatments identified in Hillsborough Vision Zero Plan
      - Bike Lanes
      - Pedestrian Cross-Walks and Beacons
      - Convert TWLTL to raised median (undivided only)
      - Reduce Driveway Density (access management)
      - Speed Control/Enforcement
      - Traffic Calming

Unit Costs: TSMO Improvements

	Costs	
	Basic	
Improvement	**Capital**	**Operations and Maintenance**
Ramp Metering	$55,000 per ramp	$6,700 per ramp per year
Loop Detection	$40,000 per ramp	$2,000 per ramp per year
Part-Time Shoulder Use	$300,000 per mile	$10,000 per mile per year
Central Signal Control	$25,000 per signal + $1M areawide	$11,000 per signal per year

Unit Costs: Safety Improvements

- Bike lanes – $55,000 per mile
- Pedestrian crosswalks and beacons – $140,000 per signal
- Intersection lighting -- $60,000 per signal
- Convert TWLTL to raised median – $90,000 per mile
- Traffic calming – $100,000 per mile
- 10 mph reduction in speed limit – $20,000 per mile.

Impact of TSMO Improvements

Highway Type	Avg. Travel Time	TTI	Daily Delay (hours)	20-Year Cost
Collector	-8.1%	-16.9%	-39.5%	$2,898,000
Divided Arterial	-2.4%	-6.3%	-22.6%	$1,212,000
Undivided Arterial	-1.9%	-5.0%	-19.6%	$595,000
Interstate/Freeway	-14.8%	-26.8%	-48.6%	$21,018,000
Total	-8.1%	-16.7%	-39.4%	$24,262,000

TTI here is 95th percentile TTI

Impact of TSMO Improvements (cont.)

	Annual User Cost Savings (PM Peak Period)		
Highway Type	Due to Average Travel Time	Due to Reliability	Total User Cost Savings
Collector	$26,375,000	$4,972,000	$31,347,000
Divided Arterial	$15,136,000	$1,429,000	$16,565,000
Undivided Arterial	$2,639,000	$242,000	$2,881,000
Interstate/ Freeway	$50,396,000	$15,103,000	$65,498,000
TOTAL	$94,546,000	$21,746,000	$116,292,000

Impact of Safety Improvements

ANNUAL CRASHES							
	Miles	Total Crashes		Pedestrian Crashes		Fatal Crashes	
Highway Type	Improved	Base	Improved	Base	Improved	Base	Improved
Divided Arterial	565	21,508	14,571	1,893	405	129	87
Undivided Arterial	220	3,926	2,249	345	74	24	13
Collector	0	8,766	8,766	771	771	53	53
Total	1,741	34,200	25,586	3,010	1,250	206	154
Crash Reduction			25.20%		58.50%		25.10%

Future Enhancements

- Create “user grade” post-processor software for other Florida MPOs
  - FDOT Central office is considering this
- Account for synergies between safety and capital expansion/operations projects
- Consider all congestion relief projects simultaneously: operations. Capital expansion, demand management, transit

Recommended Action:

Approve the 2050 Plan Needs Assessment for Congestion Management and Crash Mitigation and forward to the TPO Board for consideration

Questions/Comments

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