



New and Emerging Metrics for Roadway Usage

December 19, 2019

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General Study Purpose

The New and Emerging Metrics for Roadway Usage study in the FFY 2018 Unified Planning Work Program was conducted to

- Determine how to maximize capacity through a corridor**
- Conduct multimodal performance monitoring focused on people movement**
- Develop a plan for integration of selected performance metrics**



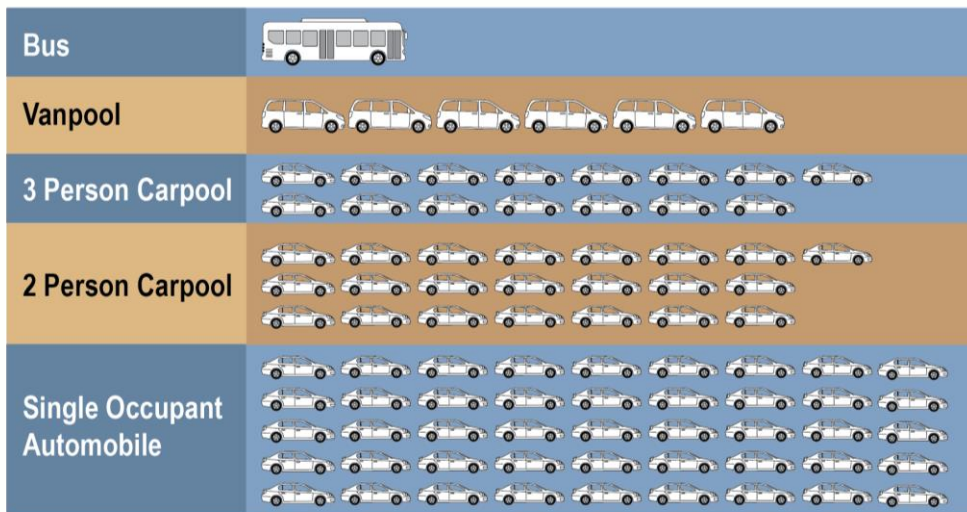
Relationship with MPO Work

- Congestion Management Process monitoring – *Ongoing*
- Pedestrian Report Card Assessment – *FFY 2016*
- Bicycle Level of Service Metric – *FFY 2018*
- Transit monitoring – *Ongoing*
- Freight – *Ongoing*



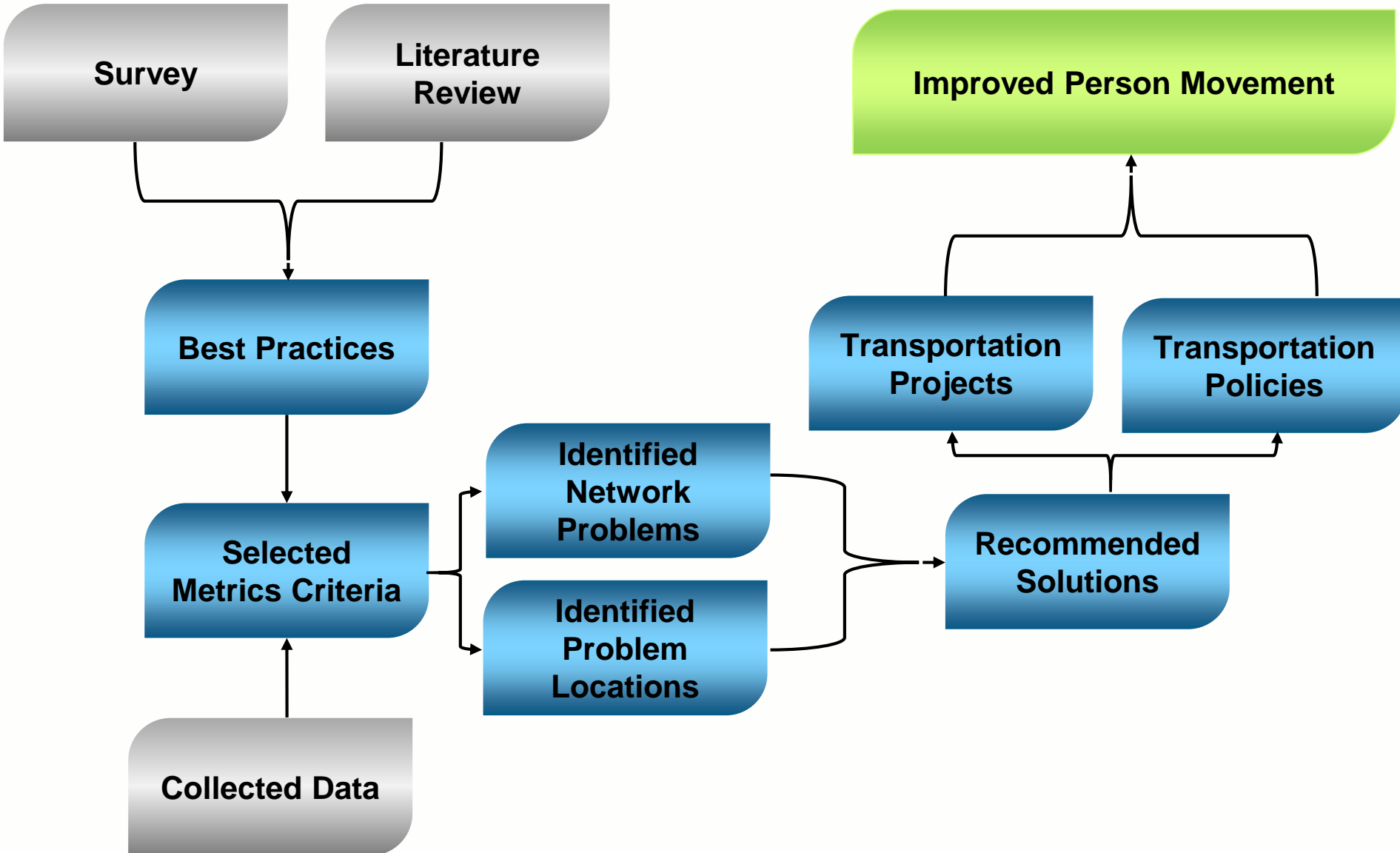
Why focus on moving people?

Number of Vehicles needed to carry 45 people



- We should reduce demand for motorized vehicle use by moving the most people with the least number of vehicles.
- Typically, lanes occupied by SOVs move the fewest number of people per hour.

Process for Improving Person Movement



Best Practices and Lessons Learned

- **Transportation agencies are minimizing or eliminating automobile level-of-service (LOS) and are promoting the use of monitoring vehicle-miles traveled (VMT).**
- **Many studies provide performance metrics for multiple modes and incorporate a land use component.**
- **There is an agreement that the best way to accurately measure congestion across multiple modes is to determine a way to measure the movement of people (not vehicles).**



Best Practices and Lessons Learned

- Using five or six metrics per travel mode is recommended.
- Both mobility and comfort of travel should be the focus of a multimodal performance monitoring program.
- Using multimodal metric criteria is ideal for corridors between one and five miles in length.
- For the purpose of this study, public transit will be represented by bus transit and freight will be represented by truck traffic.



Purpose of Metrics

- Indicate what problems persist in a corridor, instead of the mere presence of a problem
- Some metrics might hint at a solution to fix existing problems
- 24 metrics were selected for these criteria



Selected Performance Metrics

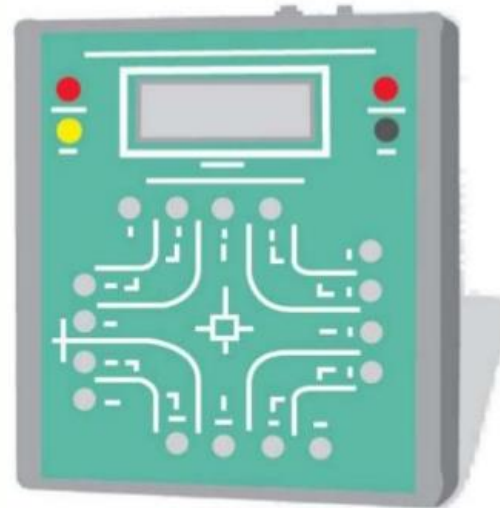
- **Bicycle metrics: focus on connectivity and comfort**
- **Pedestrian metrics: focus on facility presence and safety**
- **Transit metrics: focus on mobility, comfort, and reliability**
- **Trucks metrics: focus on reliability**
- **Vehicles metrics: focus on mobility and reliability**
- **Multimodal metrics: focus on mobility**

Required Data for Applied Metrics

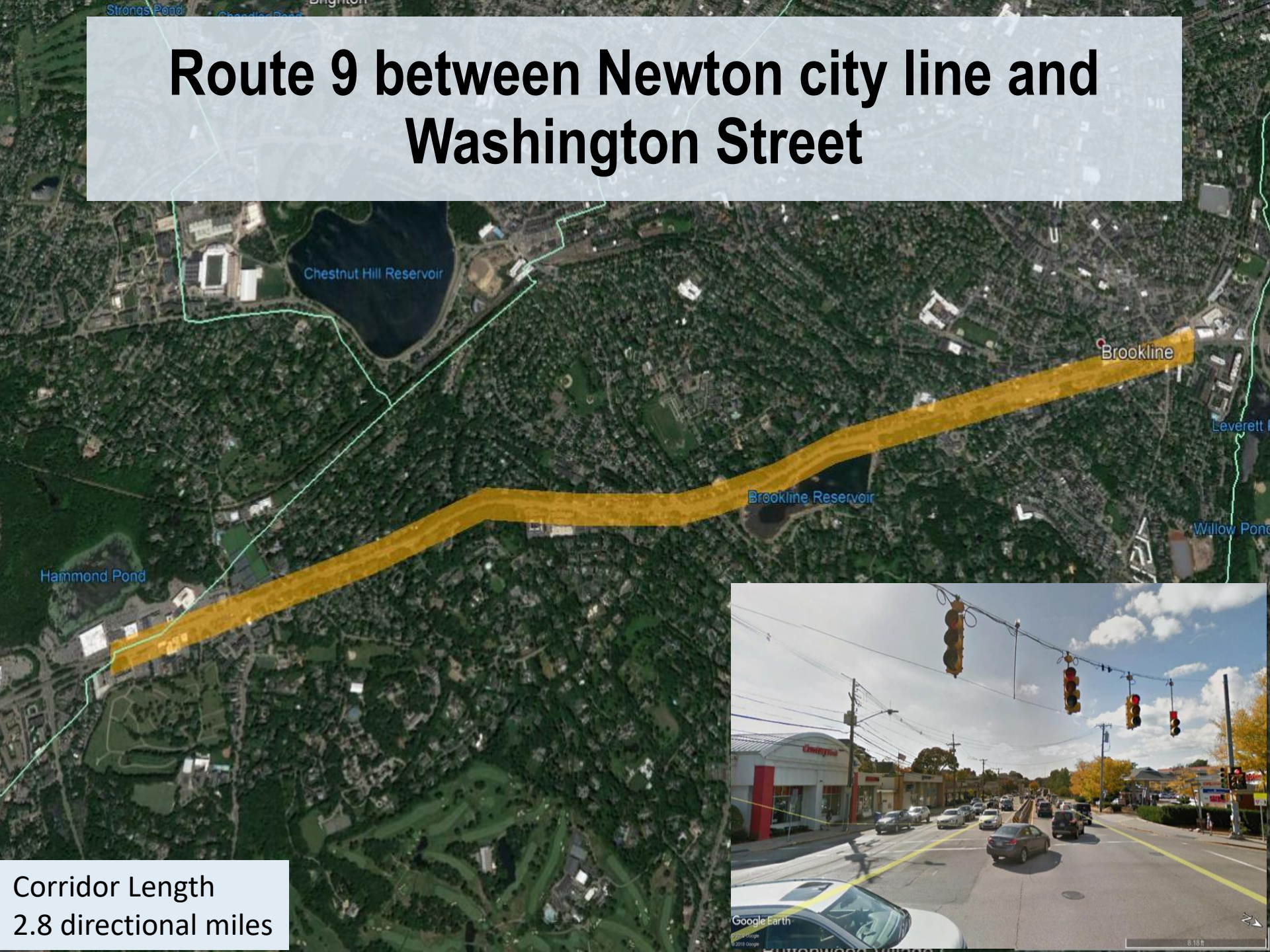
- **Crash data (bike and pedestrian)**
- **Vehicle pedestrian buffer**
- **Bicycle parking**
- **Crosswalk location and length**
- **Presence of bike lanes and trails**
- **Signal timings**
- **Sidewalk presence and condition**
- **Bus loads and travel times**
- **All vehicles/truck travel speeds**
- **Duration of roadway congestion**
- **Vehicle volumes (all modes)**
- **Vehicle occupancies (all modes)**

Field Surveys

- Two days of survey visits per corridor
- Survey time was between 8:00 AM and 9:00 AM
- Data was supplemented from other sources, such as functional design reports and corridor studies



Route 9 between Newton city line and Washington Street



Corridor Length
2.8 directional miles

Example Metrics Results

	Performance Metric	Route 9 Eastbound	Route 9 Westbound
Bicycle Metrics	Bicycle facility continuity	40% coverage	0% coverage
	Proximity to bike network	Partial connection	No connection
Pedestrian Metrics	Safe crosswalks per mile	5.0 per mile	5.0 per mile
	Vehicle-pedestrian buffer	1 foot	6 feet
Transit Metrics	Transit time index	1.27	1.35
	Person hours of delay per bus trip	4.03 hours	0.49 hours
Freight Metrics	Truck travel time reliability index	2.45	2.38
	AM total hours of daily truck buffer time	63.25 hours	34.55 hours
Roadway Metrics	Duration of congestion	35 minutes per hour	23 minutes per hour
	Travel time index	2.59	2.01
Multimodal Metrics	Peak hour roadway lane density	716 people per lane per hour	826 people per lane per hour

Good

Average

Poor

Route 9 Corridor Summary

- This corridor is average to poor for bikers and pedestrians.
- Bus riders are experiencing too much delay along this corridor.
- Businesses will need to allocate contingency time to meet delivery deadlines.
- This corridor is moderately successful in moving a large number of PEOPLE per travel lane (as many as 826 people per hour).
- Many of these problems can be alleviated by improving the mobility and comfort of transit.

Recommendations

- These criteria can be used to supplement evaluation criteria for different studies and programs.
- These criteria can help determine an appropriate transportation project or policy that can help relieve congestion by better facilitating people movement.



Next Steps

- Refine performance metrics if necessary
- Conduct outreach
- Use criteria to supplement corridor studies
- Determine if these criteria are suitable for supporting other MPO activities, such as the Congestion Management Process, Long-Range Transportation Plan, and Transportation Improvement Program



Thank You!

Questions/Comments?

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