

Triangle Strategic Tolling Study

Capital Area Metropolitan Planning Organization
Executive Board
August 1, 2019



Study Background

- The Triangle Region is growing rapidly and to stay competitive with other regions, a study was conducted to:

Evaluate the regional transportation network

Determine if express toll lanes may be beneficial to the Triangle Region

Use study findings in project development process for MTP updates

Study Overview

- ▶ The study began in June 2017
- ▶ Stakeholder engagement has included:

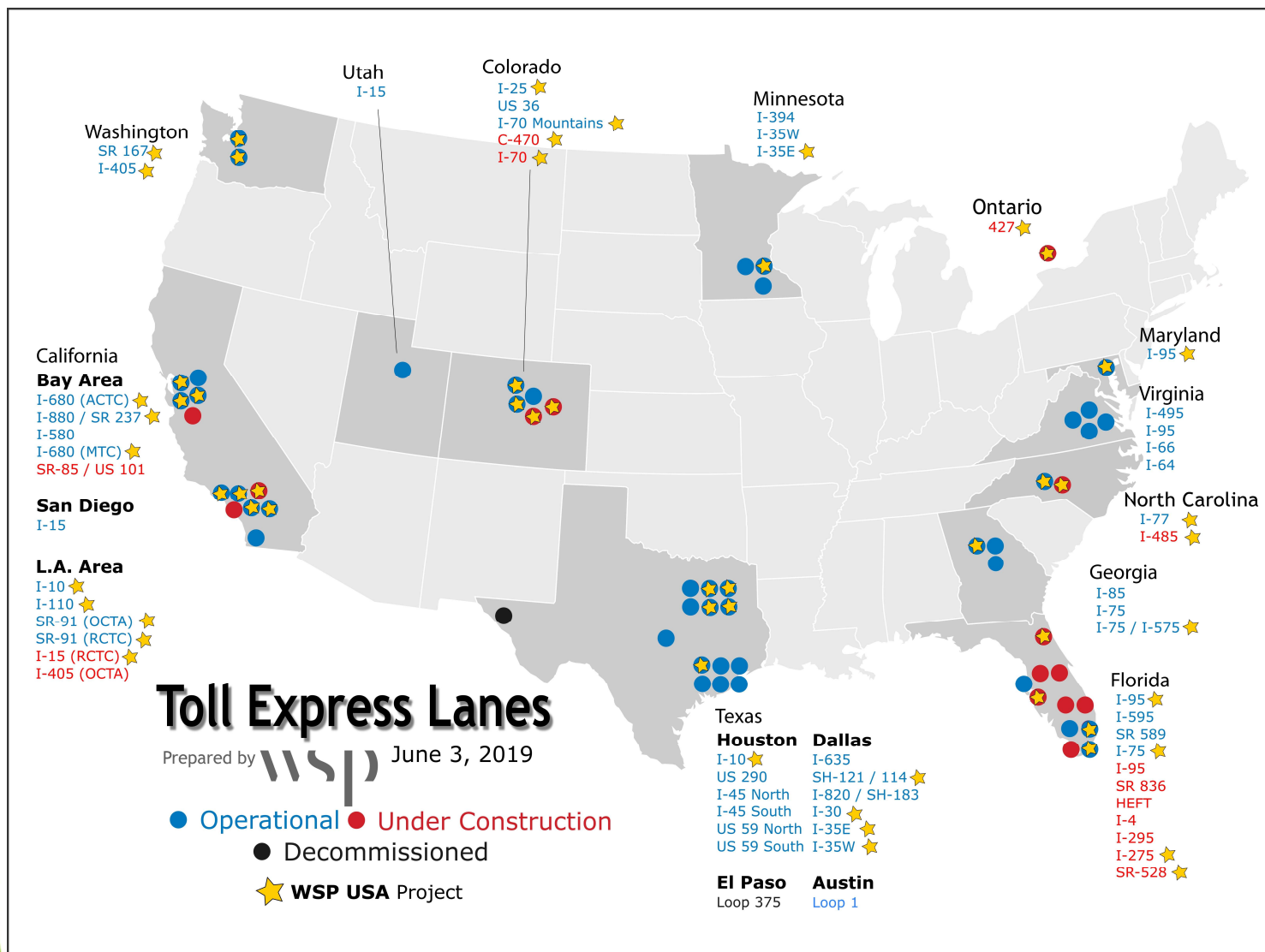
Four Core
Technical Team
(CTT) Meetings

23 Stakeholders
Interviewed

Three Stakeholder
Oversight Team
(SOT) Meetings

- ▶ CAMPO staff attended CTT & SOT meetings
- ▶ Study briefings at joint CAMPO & DCHC MPO Board meetings in October 2018 and May 2019

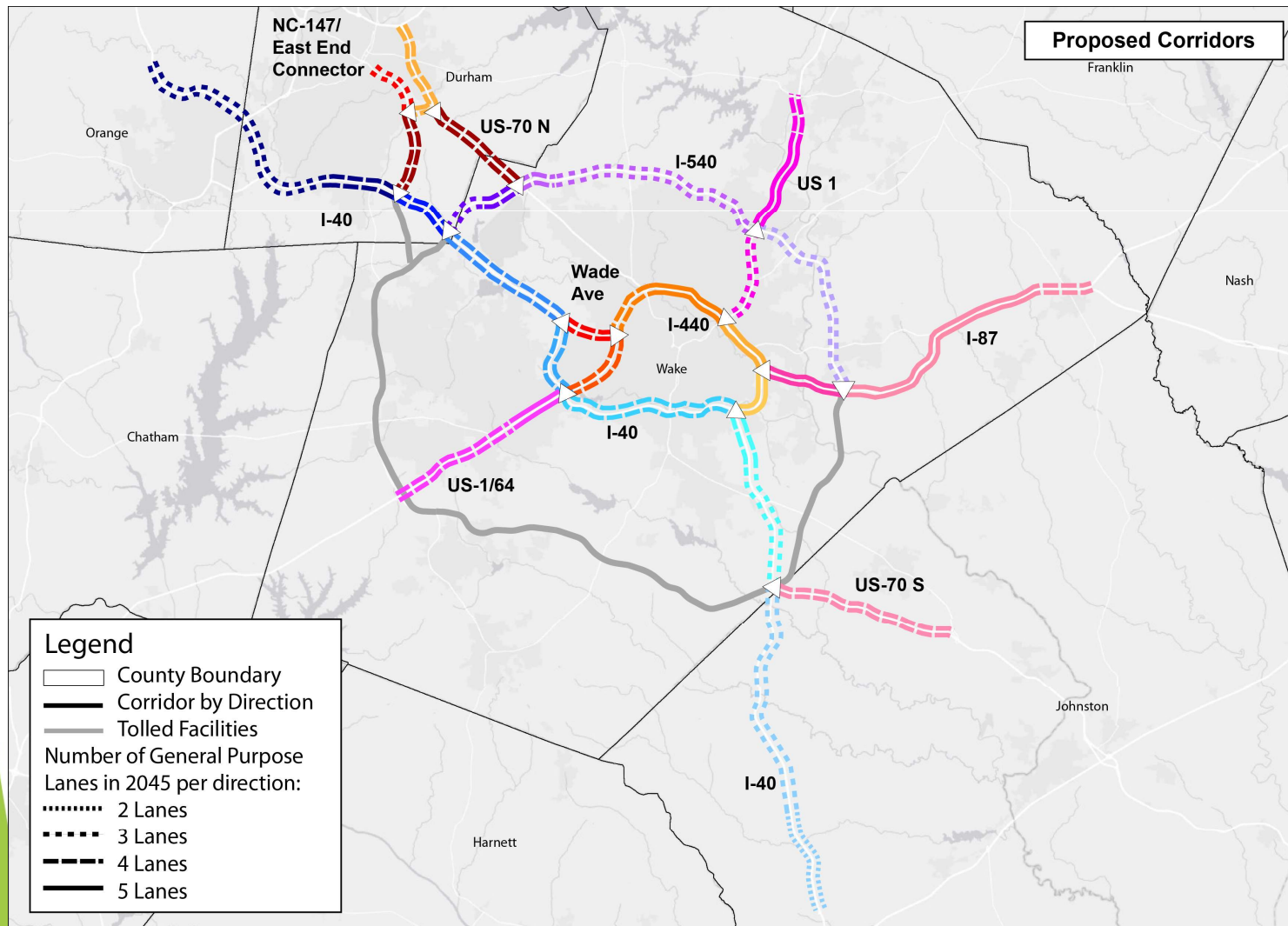
TRIANGLE STRATEGIC
TOLLING STUDY



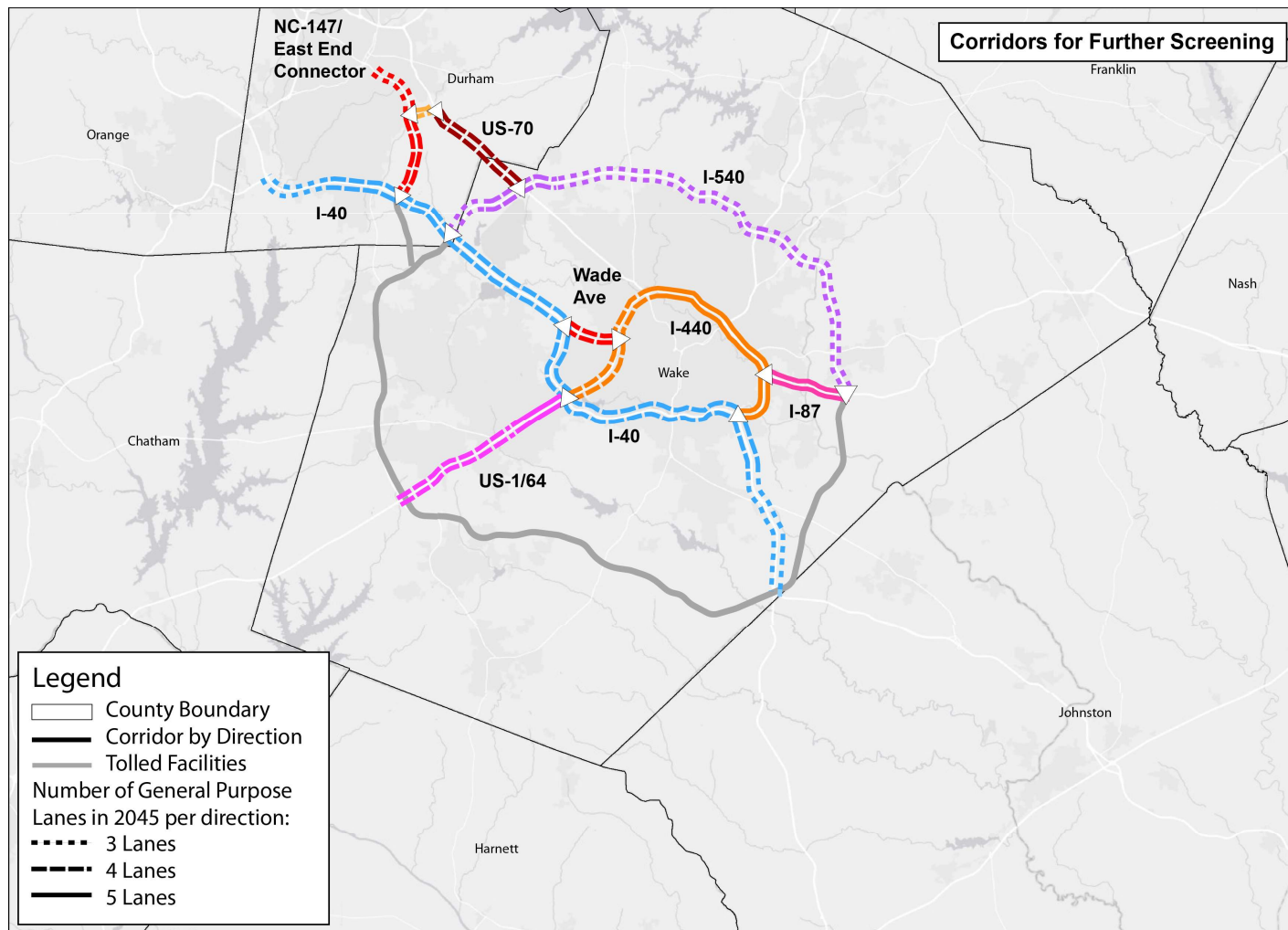
Corridor Screening

- ▶ Estimated 2045 peak-period congestion levels and speeds using Triangle Regional Model
- ▶ Examined current PM peak hour congestion using Google
- ▶ Used Triangle Regional Model to generate demand volumes for projected express toll lane network (assuming 2045 Metropolitan Transportation Plan build-out)
- ▶ Applied ECONorthwest's Toll Optimization Model[®] using regional model outputs to test future performance of express toll lane facilities

Initial Corridors



Corridors for Detailed Evaluation



Detailed Corridor Evaluation

- ▶ Evaluated seven corridors & divided I-40 into 3 segments
- ▶ Analyzed express lane performance using seven factors:
 - Projected revenue collection
 - Travel time savings
 - Trip dependability
 - Construction costs
 - Transit supportive
 - Impacts on low income residents
 - Access to jobs

Projected Revenue Collection

- ▶ Forecasted by ECONorthwest's Toll Optimization Model[©]
 - Has been in use for over 20 years
 - Reflect prices at various times & under different circumstances
- ▶ Supplied with TRM demand forecasts to test future performance of toll facilities
- ▶ Revenue assumptions are:
 - Future year of 2045
 - All express lane users pay
 - Buses & vanpools use the express lane for free

Projected Travel Time Savings

- ▶ Difference between travel times in the general purpose & express lanes along the same corridor
- ▶ Estimated by Toll Optimization Model[©] using Triangle Regional Model inputs
- ▶ Projected travel time savings of half-minute per mile along longer corridors for express lanes indicates of lane success

Trip Dependability

- ▶ Used FHWA's Buffer Time measure
- ▶ Buffer time is extra time allowed to ensure on-time arrival during times of high traffic.
 - Trip to work when being late could mean job loss
 - Trip to airport when being late means a missed flight
 - Trip to daycare when being late incurs a penalty
- ▶ Express lanes have lower buffer times than general purpose lanes (more travel time certainty)

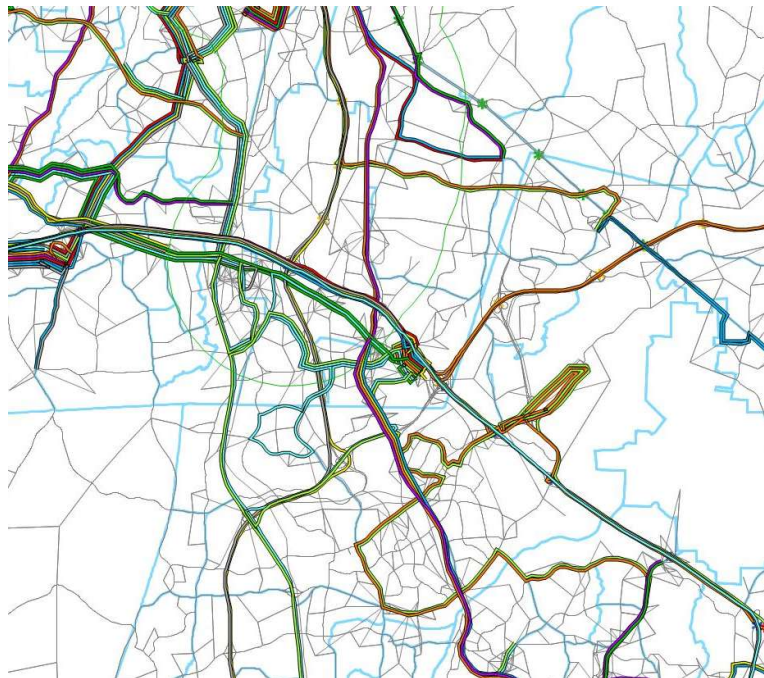
Cost Estimate Assumptions

- ▶ “Constrained” Typical Section (lower cost)
 - Fits within existing typical section
 - May include Design Exceptions for lane and shoulder widths and sight distance
 - Reduces area for storm water runoff in median
 - Reduced property & utility impacts
- ▶ “Full Feature” Typical Section (higher cost)
 - Improved safety
 - Provides shoulder widths for breakdowns & enforcement vehicles
 - Increases footprint of roadway
 - Higher likelihood of bridge and interchange reconstruction



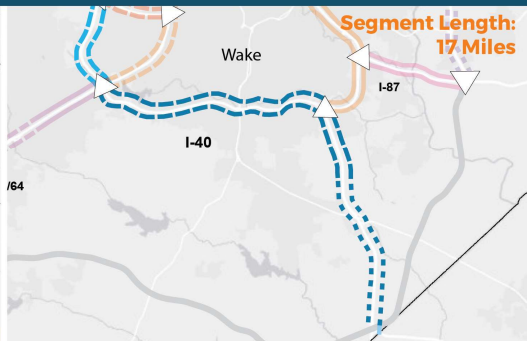
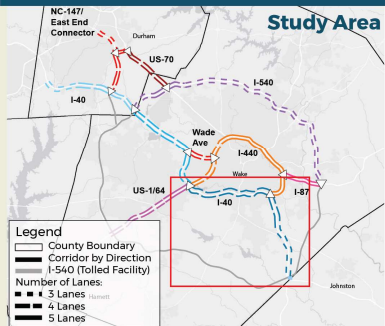
Transit Supportive

- Used Triangle Regional Model 2045 transit routes
- Identified transit routes using a significant portion of the corridor
- Identified peak and off-peak hours of operation and frequency
- Calculated number of buses in peak, off-peak, and daily



TRIANGLE STRATEGIC TOLLING STUDY

I-40: US 1 - US 70



2045 Peak Travel Time Savings General Purpose vs Express Lanes



	AM Peak	PM Peak
East Bound	0.9 Min/Mile	0.1 Min/Mile
West Bound	0.1 Min/Mile	1.2 Min/Mile



2045 Annual Toll Revenues

East Bound	\$695,000/mile
West Bound	\$630,000/mile



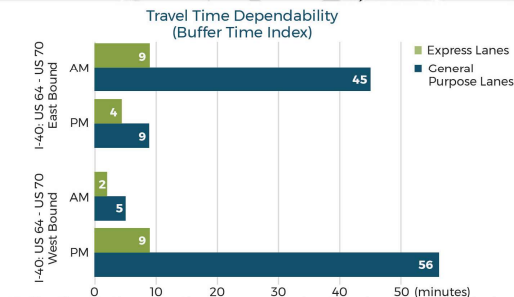
Estimated Construction Cost

**\$8 - \$12
million/mile**

2045 Employees by Employment Type*

**230,000
TOTAL EMPLOYEES**

Industry Service Office Retail



Buffer time is the extra time you must plan for when traveling during times of high traffic to make sure you arrive on time. This could be a trip to work, the airport for a flight, or picking up your child from daycare to avoid the penalty for arriving late. If a trip would take 20 minutes with no traffic, and the buffer time is 30 minutes, you should leave 50 minutes before needing to arrive. Using buffer time, you may arrive early, but it is a way of making sure bad traffic won't make you late.

Routes with high buffer times are less predictable than routes with lower buffer times. The fact that express lanes usually have less buffer time than general purpose lanes shows that express lanes have greater certainty in how it will perform from day to day. This is one of the key features of express lanes.



Percent of the
Population Below
the Poverty Level*

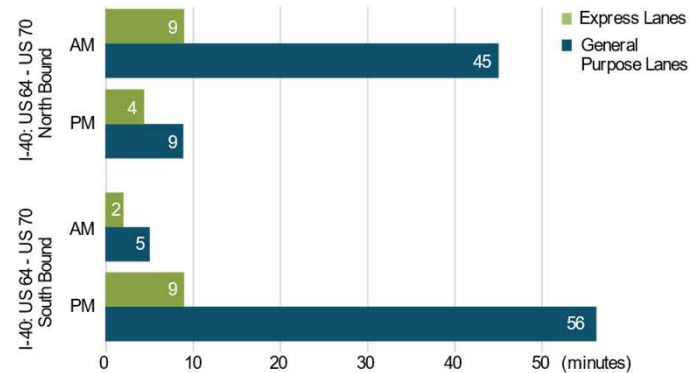
25%



Future Year
Daily Buses**

12

Travel Time Dependability (Buffer Time Index)



2045 Annual Toll Revenues

NB: **\$695,000/mile**

SB: **\$630,000/mile**



Transit
Supportive -
Future Year
Daily Buses: **12**

**TRIANGLE STRATEGIC
TOLLING STUDY**

* Within a 2 mile buffer from selected corridor based off the Triangle Regional Model
** Routes that are along some segment of the corridor

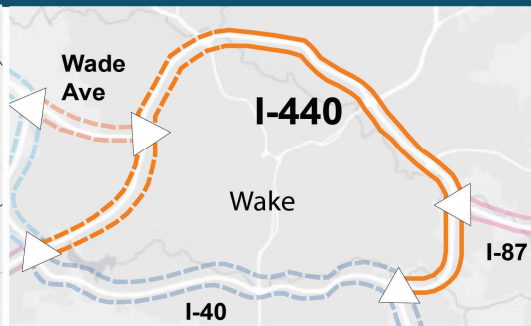
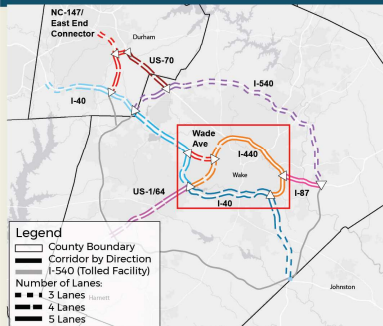
DCHC
Durham-Chapel Hill-Carrboro
Metropolitan Planning Organization

CAMPO
Central Area Metropolitan Planning Organization



TRIANGLE STRATEGIC TOLLING STUDY

I-440



2045 Peak Travel Time Savings General Purpose vs Express Lanes



	AM Peak	PM Peak
East Bound	0.2 Min/Mile	0.7 Min/Mile
West Bound	0.7 Min/Mile	0.3 Min/Mile



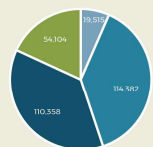
2045 Annual Toll Revenues

East Bound	\$375,000/mile
West Bound	\$470,000/mile



Estimated Construction Cost

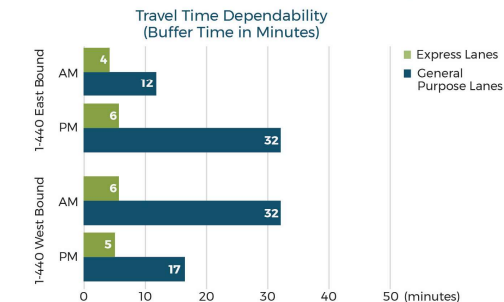
**\$10 - \$24
million/mile**



2045 Employees by Employment Type*

**300,000
TOTAL EMPLOYEES**

■ Industry ■ Service
■ Office ■ Retail



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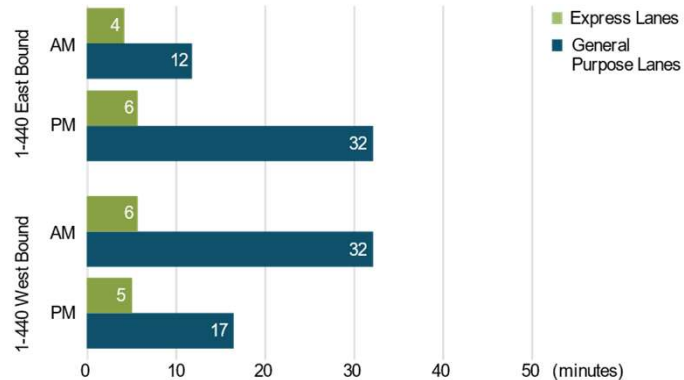
19%



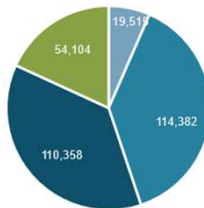
Future Year
Daily Buses**

100

Travel Time Dependability (Buffer Time Index)



Estimated Construction Cost:
\$10-\$24 million/mile



Access to Jobs:
300,000 total employees

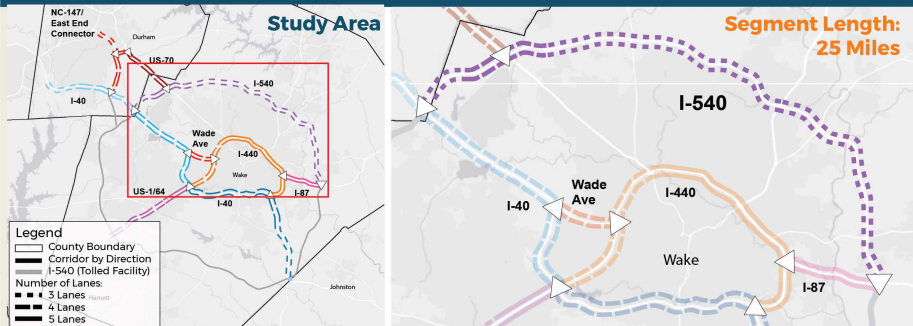
■ Industry
■ Office
■ Service
■ Retail

**TRIANGLE STRATEGIC
TOLLING STUDY**

* Within a 2 mile buffer from selected corridor based off the Triangle Regional Model
** Routes that are along some segment of the corridor

TRIANGLE STRATEGIC TOLLING STUDY

I-540



2045 Peak Travel Time Savings General Purpose vs Express Lanes



	AM Peak	PM Peak
East Bound	0 Min/Mile	0.6 Min/Mile
West Bound	0.6 Min/Mile	0 Min/Mile

2045 Annual Toll Revenues



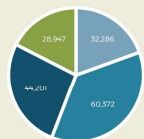
East Bound	\$200,000/mile
West Bound	\$225,000/mile

Estimated Construction Cost

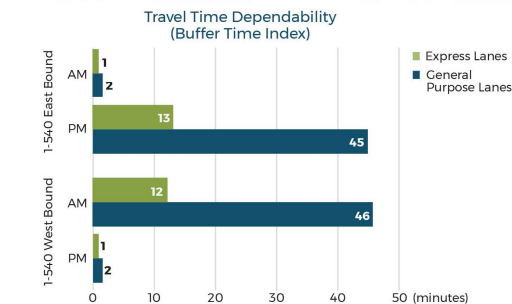


\$4 - \$17
million/mile

2045 Employees by Employment Type*



Industry Service
Office Retail



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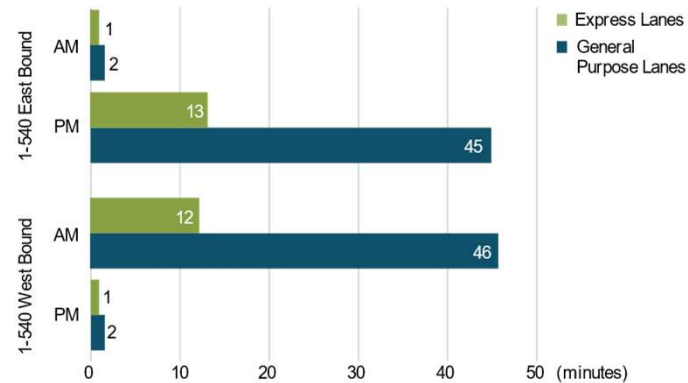
8%



Future Year
Daily Buses**

18

Travel Time Dependability (Buffer Time Index)



2045 Annual Toll Revenues

NB: \$200,000/mile

SB: \$225,000/mile



Transit
Supportive -
Future Year
Daily Buses: 18

TRIANGLE STRATEGIC
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** Routes that are along some segment of the corridor

DURHAM - CARRBORO
DCHC
Durham-Chapel Hill
Planning Southern Transportation

CAMPO
Metropolitan Planning Organization



Updating Partners & Stakeholder Groups

- ▶ Closing the Loop on Study Outcomes (May & June)
- ▶ Presentations to date:
 - NCTA Board of Directors (May 2nd)
 - NCDOT/NCTA/FHWA Staff Leadership (May 16th)
 - MPO Boards - Joint CAMPO & DCHC MPO Board Meeting (May 29th)
 - DCHC MPO Executive Board (June 12th)
- ▶ Upcoming Presentations:
 - NCDOT Board of Transportation (Local Members)
 - NCDOT Local Divisions Staff & Others
 - WakeUP Wake County
 - Regional Transportation Alliance

Triangle Strategic Tolling Study

The Triangle Strategic Tolling Study Report and as has been available for public review and comment from July 1 to July 31, 2019.

A public hearing will be scheduled for the August 21 Executive Board meeting.

Requested Action:

That the Executive Board consider endorsement of the Triangle Strategic Tolling Study.