# REGIONA L BUSINESS LEADERSHIP

RTA I-40 Partnership 14<sup>th</sup> Annual Meeting

Joint Force Headquarters (JFHQ), Raleigh October 13, 2022

#### **Action Item**

Welcome and Introductions

Joe Milazzo II RTA Executive Director

#### Welcome and Overview

I-40 Partnership Overview

Meredith McDiarmid NCDOT Mobility and Safety

## RTA I-40 Partnership

The I-40 Regional Partnership is a cooperative initiative of the RTA business coalition and NCDOT in concert with other partners.

The I-40 Regional Partnership provides an ongoing focus on Interstate 40 in order to maintain and enhance its viability for travel and commerce, and to improve the travel experience on I-40 and core reliever/alternate routes.

## RTA I-40 Partnership - History

Sep 10, 2021 – Online Meeting

Aug. 11, 2020 – Online Meeting

Oct. 17, 2019 – SAS, Cary

Oct. 18, 2018 – Research Triangle Park Headquarters, RTP

Oct. 25, 2017 – Research Triangle Park Headquarters, RTP

Oct. 24, 2016 – Research Triangle Park Headquarters, RTP

June 18, 2015 – Joint Force Headquarters (JFHQ), Raleigh

June 12, 2014 – Joint Force Headquarters (JFHQ), Raleigh

June 4, 2013 – Joint Force Headquarters (JFHQ), Raleigh

Dec. 20, 2012 – Research Triangle Park Headquarters

June 28, 2012 – Research Triangle Park Headquarters

Dec 6, 2011 – Fidelity Investments, Cary

Sep. 13, 2011 – Cisco Systems, Research Triangle Park

April 26, 2011 – NetApp, Research Triangle Park

Dec. 7, 2010 – Research Triangle Park Headquarters

Sep. 24, 2010 – Fidelity Investments, Durham

June 15, 2010 – NetApp, Research Triangle Park

June 16, 2009 – Research Triangle Park Headquarters

### **Active/Upcoming Construction Projects**

I-40 Widening to Johnston Co.

Brandon Jones
NCDOT Division 5



#### **NORTH CAROLINA**

#### Department of Transportation















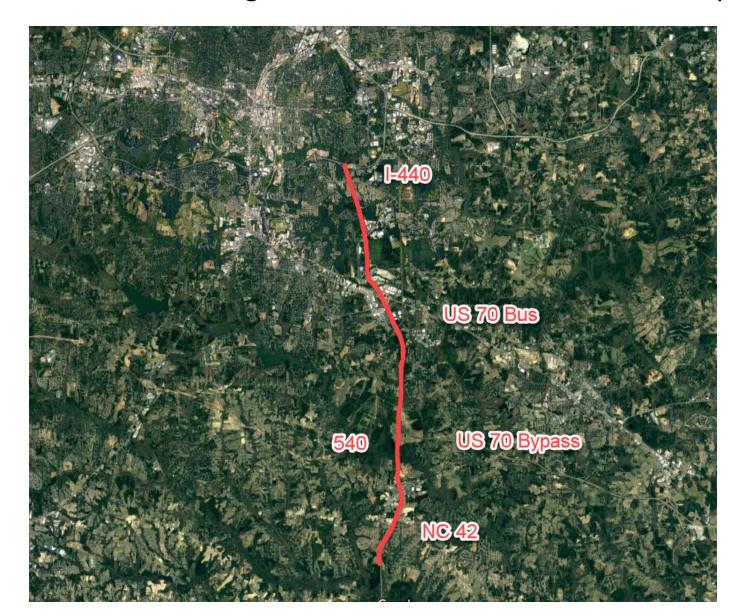


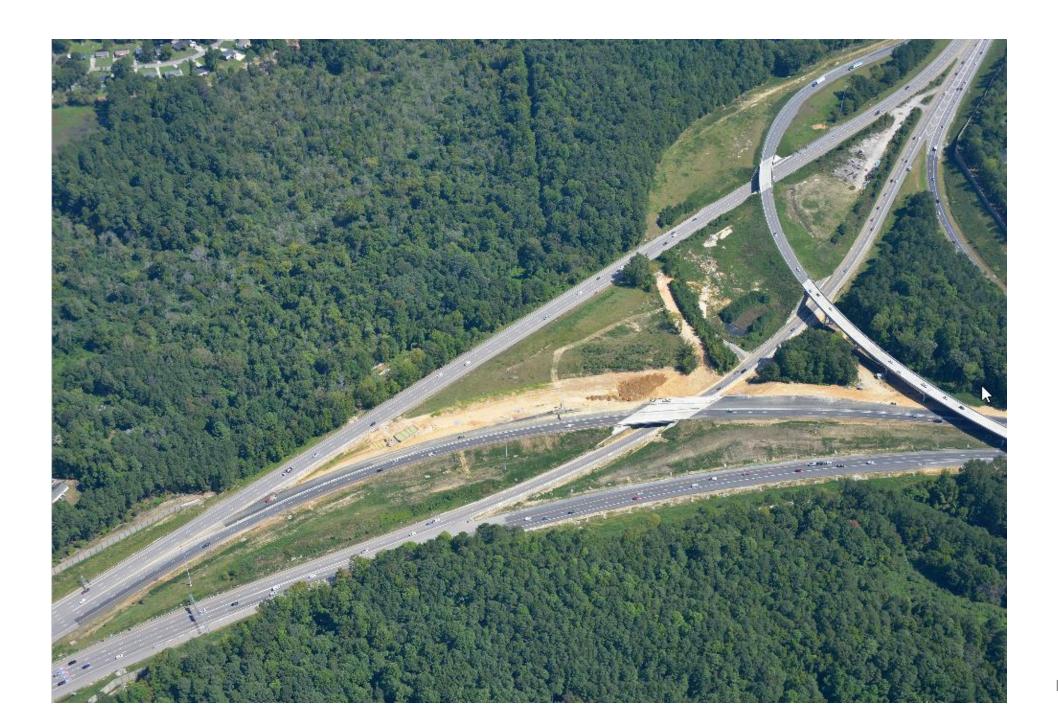


I-40 Regional Partnership

I-5111, I-4739 — I-40 Widening
I-5700 — Airport Blvd Interchange
Brandon Jones, Division Five Engineer
October 2022

#### I-5111/I-4739 — I-40 Widening and NC 42/Cleveland School Rd Improvements

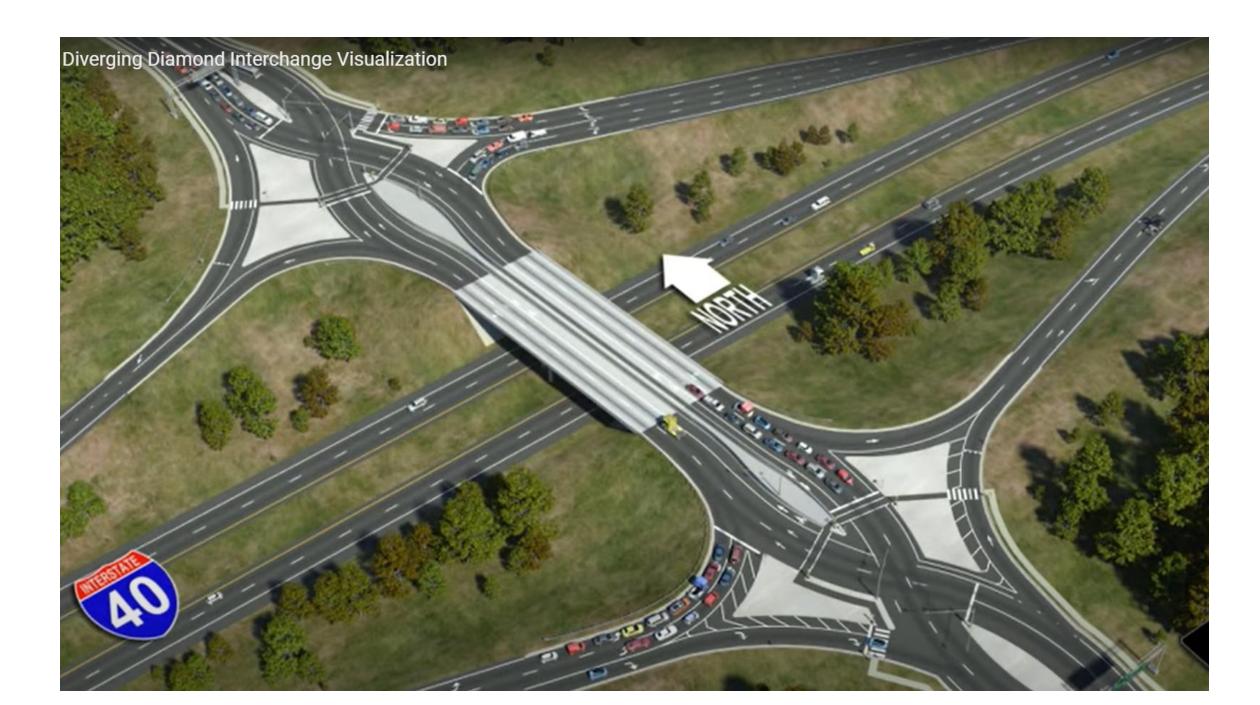








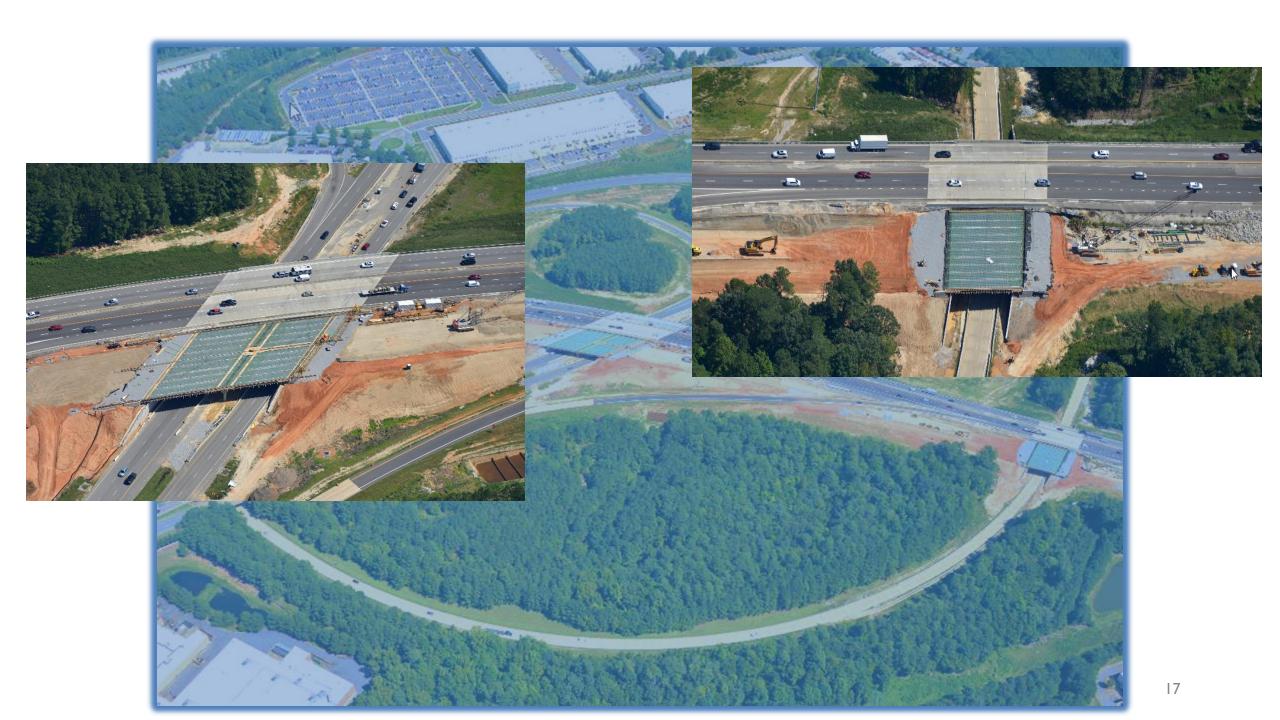




























#### I-5111/I-4739 Next Steps

All lanes open in final pattern from I-440 to US 70 Bypass
May 2023
Cleveland School Road Access opens
Fall 2023
NC 42 DDI opens
Late 2023/Early 2024
Overall Completion Date
August 2024

### **Active/Upcoming Construction Projects**

I-40/ Airport Boulevard interchange area

Brandon Jones
NCDOT Division 5









#### **Active/Upcoming Construction Projects**

I-40 widening in Orange Co Bojan Cvijetic, P.E. NCDOT Division 7 Resident Engineer





















### I-40 Widening Update

Bojan Cvijetic, P.E. NCDOT Division 7 Resident Engineer

October 17, 2022

#### Timeline of Project Activities

August 2021: 13 Mile Project awarded to The Lane Construction Corporation/HDR

Design-Build team

November 2021: W-5707C US 15/US 501 Safety Project ICT #1 Completed

January 2022: Design for entire project currently in progress

September 2022: Construction activities underway

Drainage Pipe Inspection - completed

Shoulder work

•Filling rumble outside lane strips

Installing emergency access pull offs

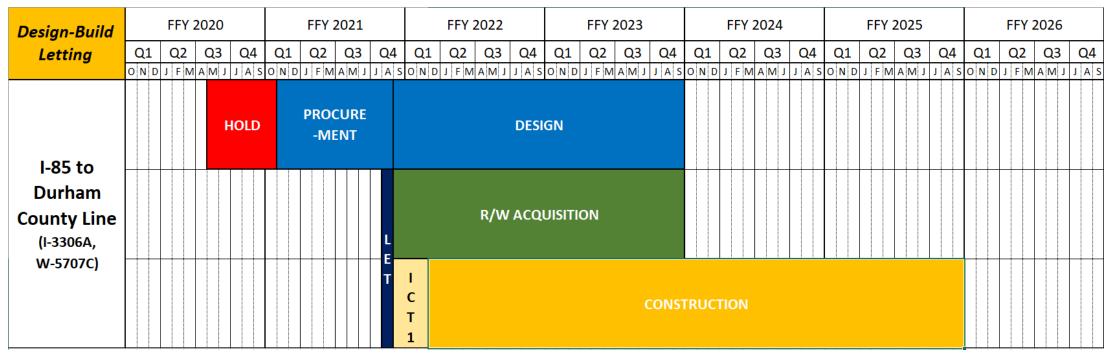
2023 Upcoming Activities:

Traffic Switch to outside

Additional work in median and drainage



#### Schedule



Intermediate Contract Time #1 (ICT1) complete - W-5707C safety project. This includes all signing and pavement marking modifications necessary to temporarily remove the existing I-40 westbound left lane drop near US 15-501 (Exit 270) and convert the I-40 westbound outside through lane (right lane) to an "Exit Only" lane onto US 15-501 exit ramp.

# I-40 studies and initiatives

I-40 managed freeway project Claudia Lee P.E. Project Management Unit



# I-40 Managed Freeways Update

Claudia Lee, PE Project Management Unit

October 13, 2022

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

# Project Background

# What is a managed freeway?

 New concept that pulls together Active Traffic Management strategies that coordinate together and are managed in response to changing conditions

#### - Goals

- Reduce congestion
- Improve travel times
- Improve reliability
- Postpone major infrastructure changes

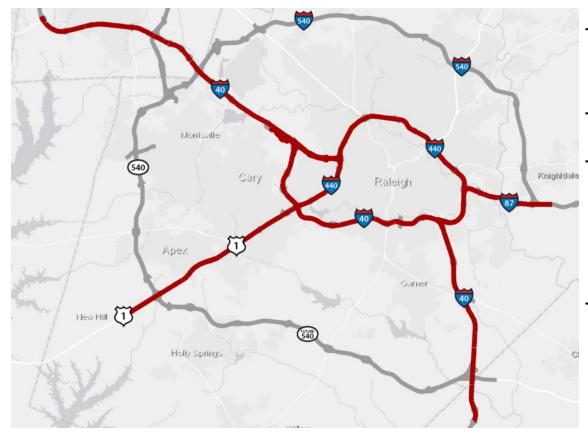
### - Examples

- Signal timing
- Shoulder use
- Ramp metering (coordinated and adaptive)

- Connecting arterial signals to ramp meters

Source: Getty Tarks ble speed limits

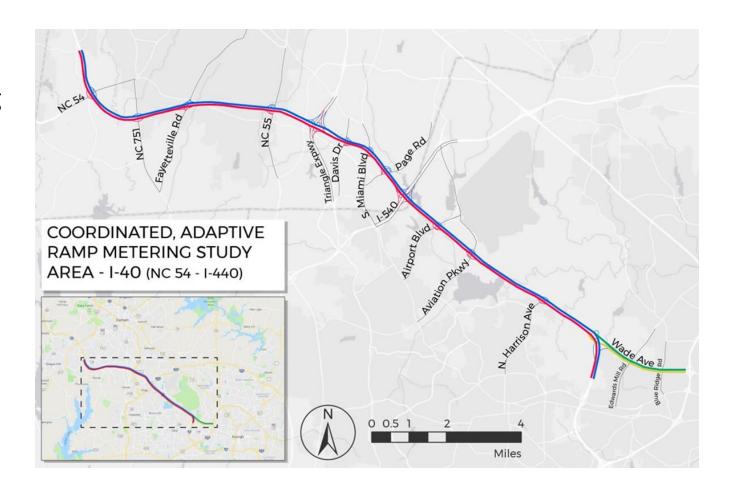




- Potential for managed freeways across the major corridors in Wake County
- Integrated system
  - I-40 from Johnston County through Durham County
    - I-6006
    - I-6101
  - Taking cues from other places that have developed similar systems
    - Australia
    - Denver

**I-6006** 

- STIP Description: "Convert facility to a managed freeway with ramp metering and other ATM/ITS components"
- Recently added Wade Ave. portion to the larger project
- Currently funded for Preliminary Engineering
- ROW scheduled for 2028



# What are ATM/ITS components?

- A system to coordinate and alleviate traffic congestion using real-time data
- Lane control
- Dynamic speed limits
- Dynamic lane assignments/shoulder use
- Coordinated Adaptive Ramp
   Metering
  - CARM





- Ramp metering
  - Wake Forest Rd. and I-540, Wake County
  - Leesville Rd and I-540, Wake County

# **Past Activities**

#### **Pilot Project**

- Feasibility study completed (1/2020)
  - Developed an understanding of needed improvements
  - Model specifically included traffic metering rates
  - Determined that this section is a good candidate for CARM and ATMS
- Addition of Wade Ave. section

An Introduction to CARM

Crash and Volume/Speed Analysis

Modeling of the impact of CARM

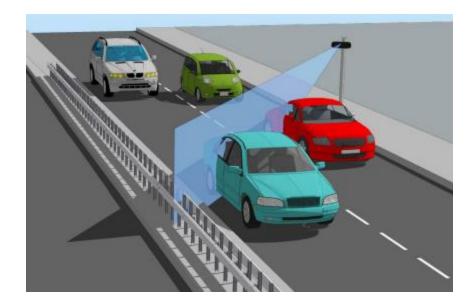
Conceptual Design

Ramp Conditions and Requirements

**Cost Estimates** 

#### **Feasibility Study Conceptual Design**

- No changes to mainline configuration now
  - Might need/want all ramps metered in the future
- Identify ramp storage locations
- Establish mechanism to determine traffic counts
  - Radar Detection
  - Magnetometers
  - Inductive loops
  - Infrared system
  - Video
- Install detection system
- Identify dynamic sign locations (~ 65-75 gantries)
- Operate

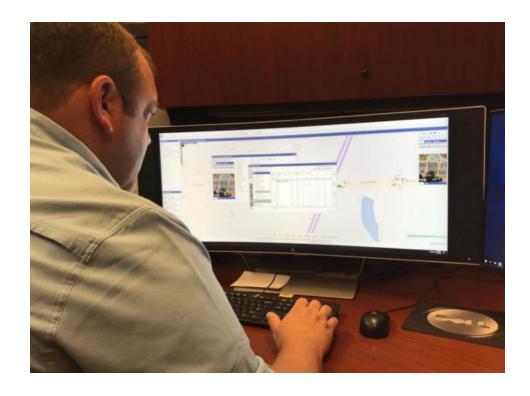




# **Looking Ahead**

#### **Concept of Operations**

- Defines various stakeholders
- Describes how the concept will function
- Documents operational needs
  - Staffing
  - Equipment
  - Software
- Detailed description of system and intended operation
- Proposed scenarios of function
- Refines the implementation approach



#### **Looking Ahead**

- Clarify key terms for ease of discussion
- Continue coordination between stakeholders
  - CAMPO
  - NCDOT
  - RTP
  - Public
- Begin to identify the software needs of the software management system via ConOps
- Establish a phasing/funding schedule via ConOps
- Clearly identify right-of-way needs
- Determine vehicle storage options and public tolerance
- Will be conducting a managed freeways research project to understand the benefits and develop criteria for appropriate locations

Thank you!

## **Contact Us**

Claudia Lee cwlee2@ncdot.gov 919-707-6132







in NCDOT



► NCDOTcommunications



(f) @NCDOT

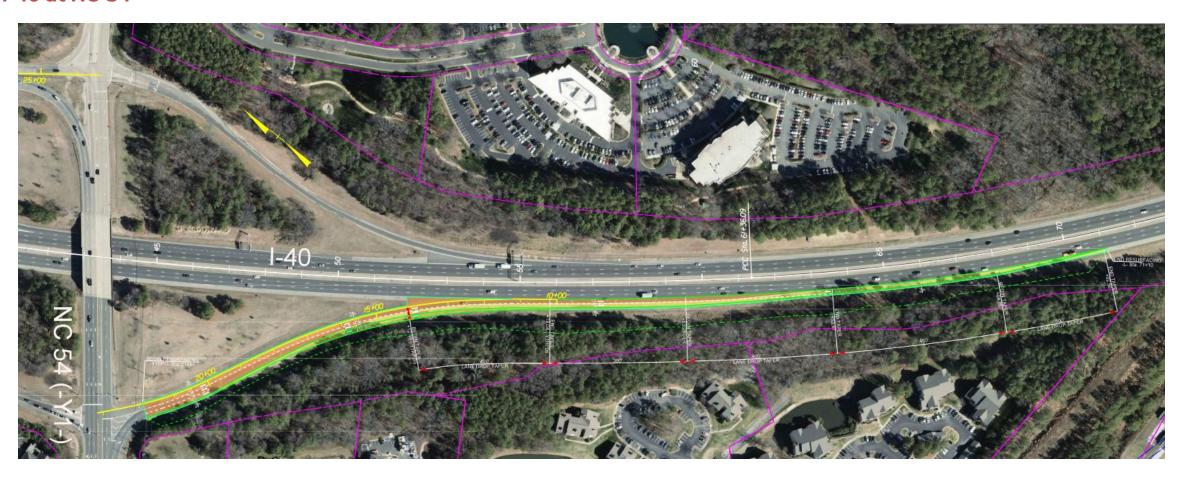


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#### I-40 at NC-54



### I-40 at Miami Blvd.



Conceptual 57

### I-40 at Page Rd.



#### I-40 at NC-55



Conceptual

#### I-40 at Harrison Ave.



### **Ramp Metered Eastbound Lanes**

Eastbound	Ramp Location	Existing Lanes at Proposed Stop Bar	Proposed Discharge Lanes at Stop Bar	Proposed Ramp Configuration	
	NC 54	1	3	2 Lanes + Full Shoulder	
	NC 751	2	2	2 Lanes	
	Fayetteville Road	1	2	1 Lane + Full Shoulder	
	NC 55	1	2	1 Lane + Full Shoulder	
	Triangle Expressway NB	No Meter Proposed for Phase I			
	Triangle Expressway SB	No Meter Proposed for Phase I			
	Davis Drive	1	2	1 Lane + Full Shoulder	
	S Miami Blvd	1	2	1 Lane + Full Shoulder	
	Page Road	1	2	1 Lane + Full Shoulder	
	I-540 SB	No Meter Proposed for Phase I			
	I-540 NB	No Meter Proposed for Phase I			
	Airport Blvd	1	2	1 Lane + Full Shoulder	
	Aviation Pkwy SB	1	2	1 Lane + Full Shoulder	
	Aviation Pkwy NB	1	2	1 Lane + Full Shoulder	
	N Harris Ave	1	2	1 Lane + Full Shoulder	
	Wade Ave	No Meter Proposed for Phase I			

### **Ramp Metered Westbound Lanes**

Westbound	Ramp Location	Existing Lanes at Proposed Stop Bar	Proposed Discharge Lanes at Stop Bar	Proposed Ramp Configuration	
	Wade Ave	No Meter Proposed for Phase I			
	N Harris Ave	1	2	1 Lane + Full Shoulder	
	Aviation Pkwy	1	2	1 Lane + Full Shoulder	
	Airport Blvd	1	2	1 Lane + Full Shoulder	
	I-540 NB	No Meter Proposed for Phase I			
	I-540 SB	No Meter Proposed for Phase I			
	Page Road	1	2	1 Lane + Full Shoulder	
	S Miami Blvd	1	2	1 Lane + Full Shoulder	
	Davis Drive	1	2	1 Lane + Full Shoulder	
	Triangle Expressway SB	No Meter Proposed for Phase I			
	Triangle Expressway NB	No Meter Proposed for Phase I			
	NC 55	1	2	1 Lane + Full Shoulder	
	Fayetteville Road	1	2	1 Lane + Full Shoulder	
	NC 751	1	2	1 Lane + Full Shoulder	
	NC 54	1	2	1 Lane + Full Shoulder	

## I-40 studies and initiatives

I-40/RTP modernization express design Andrew Bell HNTB



# I-40 Express Design Research Triangle Park





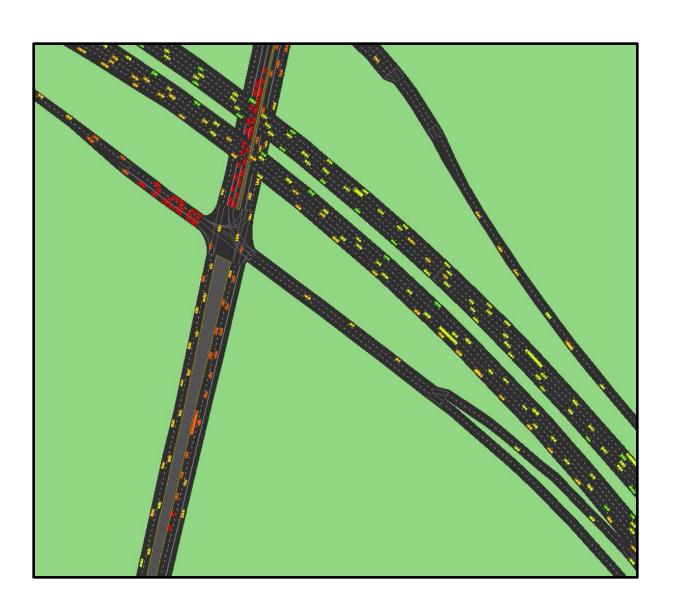
October 13, 2022



Andrew Bell, PE, PTOE Project Manager, HNTB aabell@hntb.com 919-424-0485 Derrick Lewis, PE
Manager, NCDOT
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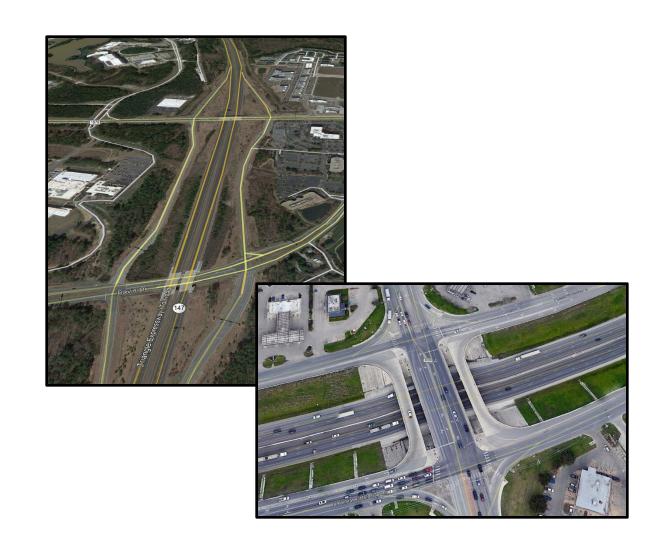


## Project Objectives:

- Increase safety along I-40
- Improve mobility to and from I-885/NC-885, I-540/NC-540, Page Rd, Miami Blvd, and Davis Dr
- Reduce congestion along I-40 and its interchanges
- Enhance multi-modal options
- Coexist with Managed Freeways concept
- Build in flexibility for later changes and improvements

### Major Project Elements:

- One-Way Frontage Roads on each side of I-40
- Service Interchange Reconfiguration
- Slip Ramps between I-40 and Frontage Roads
- Free-Flow Frontage Road U-Turns
- Wide inside shoulder for flexible use (Express Bus use during peak hours)
- Bus connectivity to transit hubs, bus stops along frontage roads
- Bike/ped accommodations, including connection to Triangle Bikeway
- Additional lanes on I-40 mainlanes limited to auxiliary lanes between ramps



### Stakeholder/Patner Outreach:

- DCHCMPO and Durham City/County (MTP)
- GoTriangle (Bus Service and Commuter Rail)
- RTA (I-40 Partnership)
- RTP (The Hub, other developments)
- McAdams (Triangle Bikeway)
- WSP (Managed Freeways)
- NC Turnpike Authority
- Multiple NCDOT Units











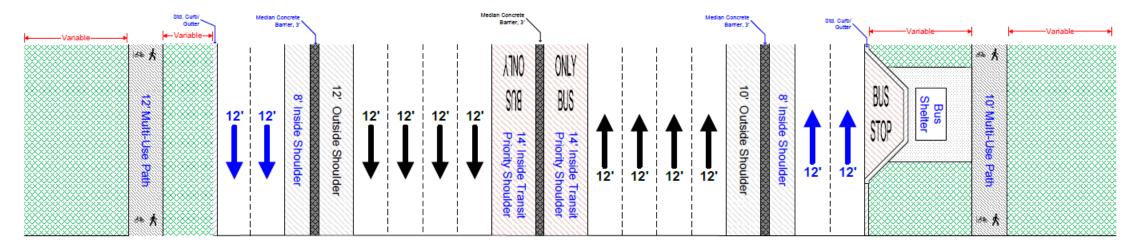




## Input from Stakeholder Outreach:

- Braided slip ramps to improve connectivity/mobility
- Targeted development access to/from frontage roads
- Bike/ped accommodations along frontage roads

- Bus stops/transit connectivity along I-40 and frontage roads
- Maintain all connections at system interchanges
- Convey concept more clearly to stakeholders and the public



# Questions?

Andrew Bell, PE, PTOE Project Manager, HNTB aabell@hntb.com 919-424-0485 Derrick Lewis, PE
Manager, NCDOT
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## I-40 studies and initiatives

Bus On Shoulder System (BOSS) and Transit Priority Shoulder Vinson Hines GoTriangle

## I-40 studies and initiatives

Triangle Bikeway
Kenneth Withrow
CAMPO

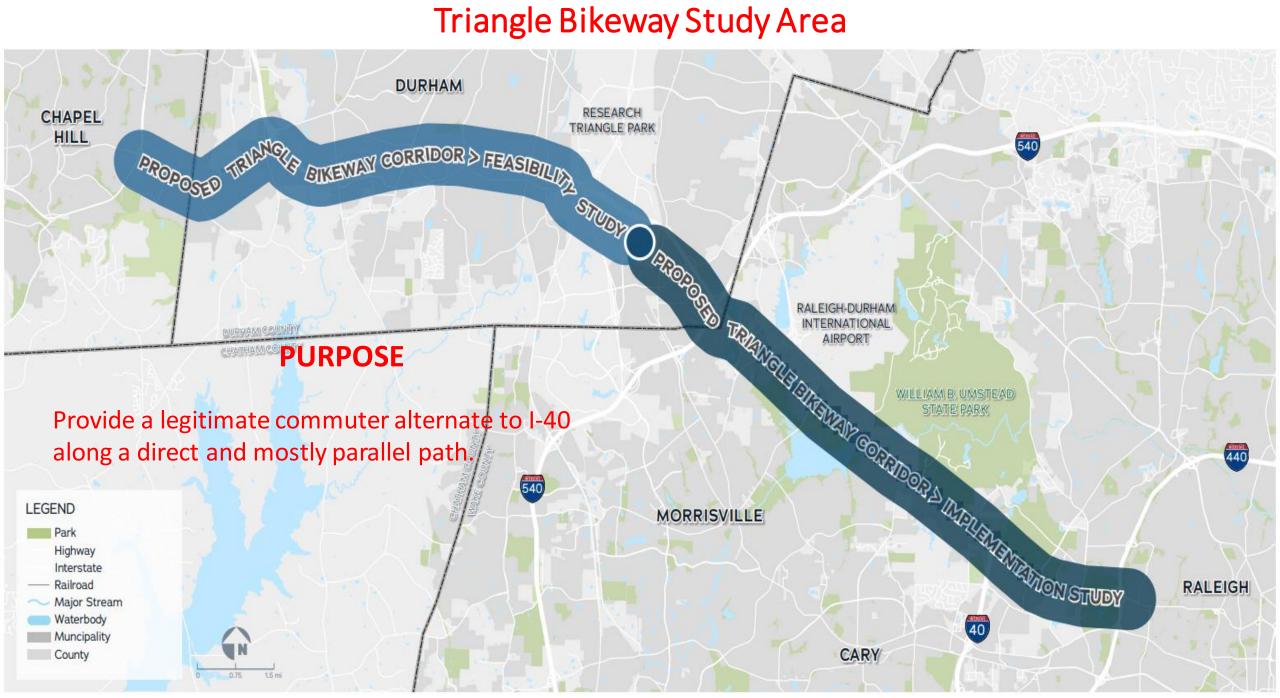


I-40 Regional Partnership Annual Meeting

October 13, 2022



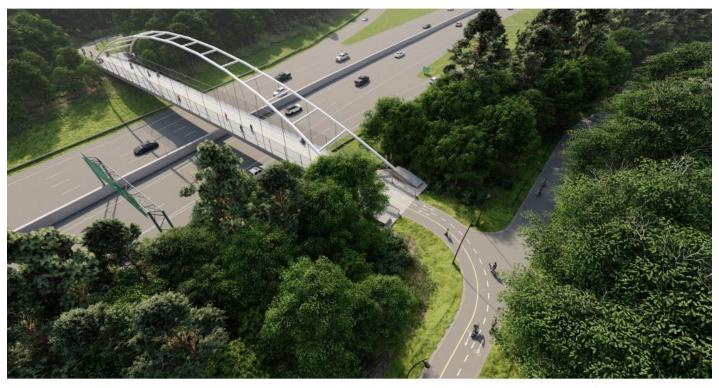
### Triangle Bikeway Study Area



### Milestones







Study Period – March 30, 2020 to Dec 31, 2021

Endorsed by both MPOs – Spring 2022

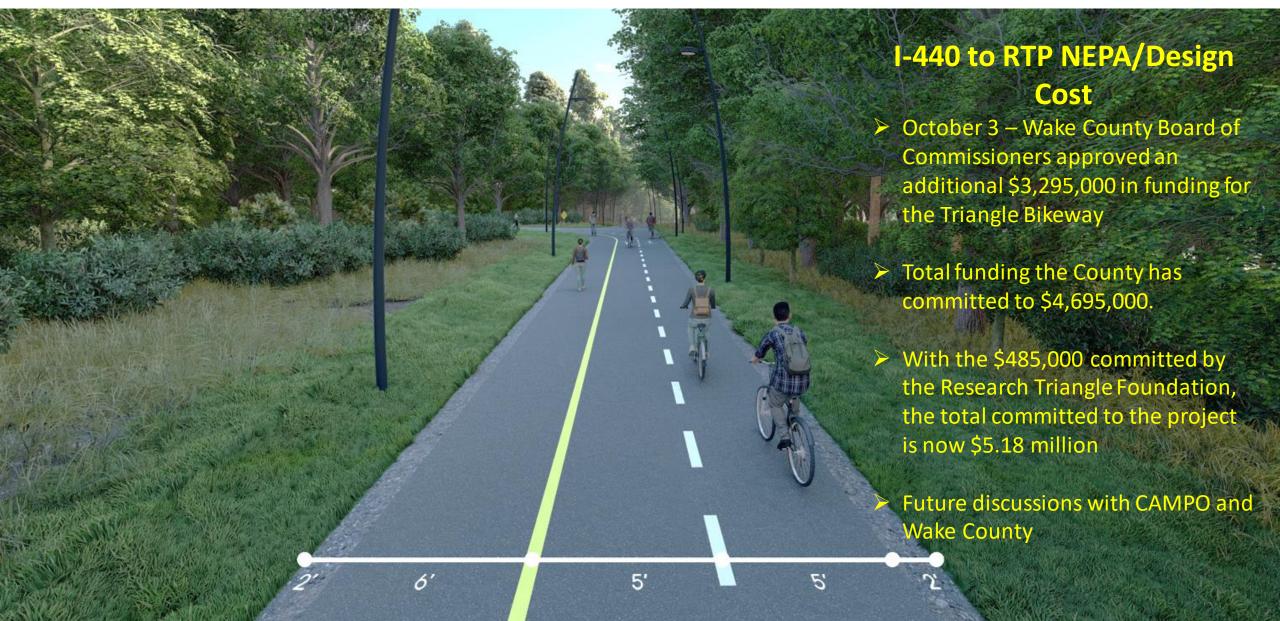
Project now managed through TJCOG, and coordination under the Triangle Bikeway Regional Advisory Committee – March 25, 2022













**Contact Information** 

Kenneth Withrow CAMPO kenneth.Withrow@campo-nc.us

Dale McKeel
DCHC MPO
Dale.McKeel@durhamnc.gov







# Legislative and funding updates

2022 legislative update / funding implications Chris Peoples NCDOT



#### **NORTH CAROLINA**

#### Department of Transportation

















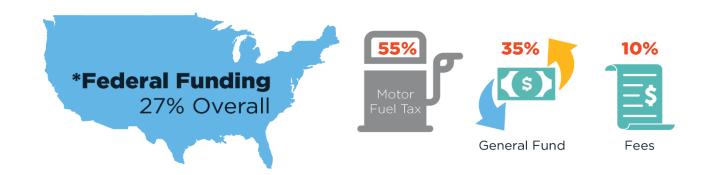


# Revenue Update

Chris Peoples, Chief Engineer October 13, 2022

### Revenue Update





\* IIJA's USDOT FHWA and FTA FFY 2022-23 Allocations

### Sales Tax Transfer

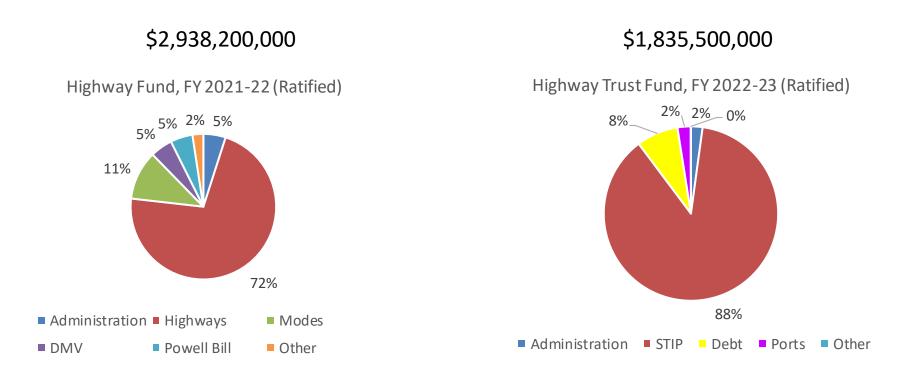
State Sales and Use Tax Transfer (%)							
	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27		
Highway Fund	2.0%	1.0%	1.5%	1.5%	1.5%		
Highway Trust Fund	0.0%	3.0%	4.5%	4.5%	4.5%		

State Sales and Use Tax Transfer (\$)							
	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27		
Highway Fund	\$193.1	\$102.4	\$157.4	\$161.5	\$166.5		
Highway Trust Fund	\$0	\$307.0	\$472.0	\$484.6	\$499.6		

- Sales tax revenues associated with "transportation goods and services" businesses are not directly transferred. Instead, a percentage of total state sales and use tax revenues are transferred.
- Local sales and use tax revenues are not impacted, only state sales and use tax revenues that are deposited in the General Fund.
- Transportation Goods and Services revenues are collected from companies that identify themselves as:
  - Motor vehicle, motorcycle, and bicycle dealers
  - Service stations or garages
  - Automotive supply stores
  - Oil and petroleum products dealers
  - Tire dealers, recappers, and repairers
  - Mobile home dealers

### FFY 2022-23 Budgeted Expenditures

Total \$4,773 million



### Revenue Update

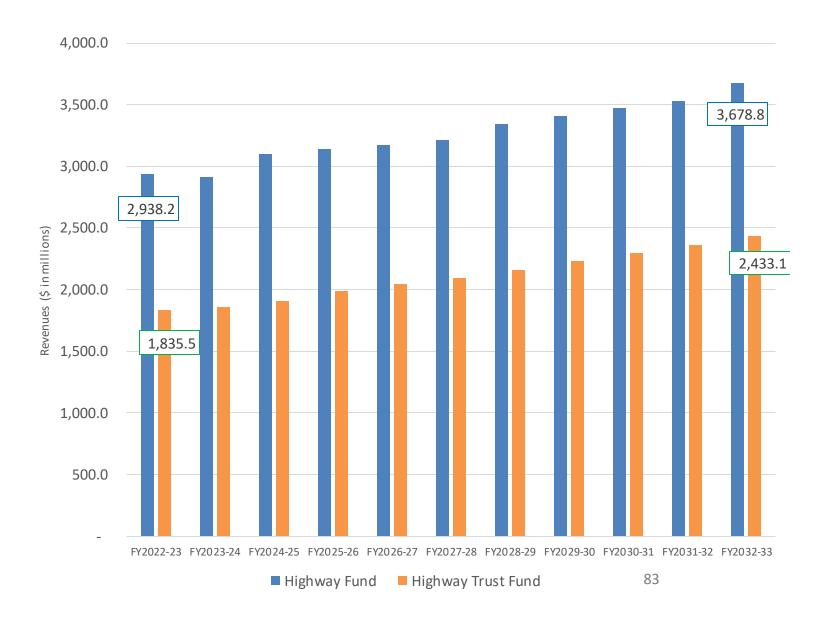
#### Revenues are increasing due to:

- Annual Motor Fuel Tax Rate Adjustment
- Quadrennial Adjustment in DMV Fees
- Population Increases
- Increased Vehicle Miles Travelled
- Vehicle Cost Inflation

#### But the tax base is shrinking due to:

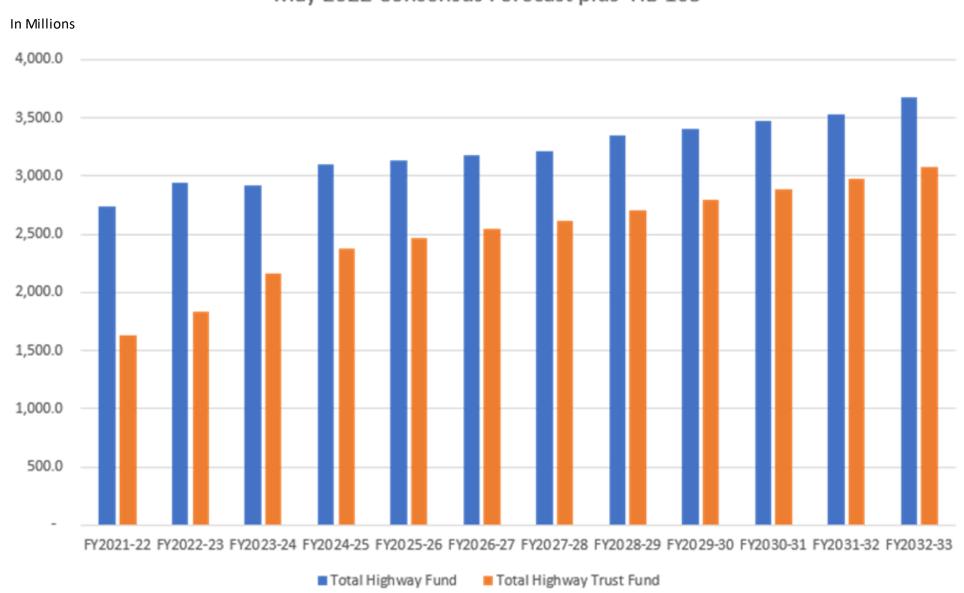
- Increased Fuel Efficiency
- Electric Vehicles
- Buying Power

#### **Revenue Forecast, FY 2022-23 – FY 2032-33**



### **Budget and Revenue Forecast**

May 2022 Consensus Forecast plus HB 103



# Legislative and funding updates

Spot mobility status and opportunities
John Grant
NCDOT



#### **NORTH CAROLINA**

Department of Transportation



















# Spot Mobility Status and Opportunities

John Grant, PE Regional Traffic Engineer Capital Region

October 13, 2022



### STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

ROY COOPER GOVERNOR JAMES H. TROGDON, III SECRETARY

February 28, 2018

TO:

Joint Legislative Transportation Oversight Committee

Representative Kelly E. Hastings, Co-Chair Representative Frank Iler, Co-Chair Representative John A. Torbett, Co-Chair

Senator Jim Davis, Co-Chair

FROM:

J. Kevin Lacy, PE, CPM

State Traffic Engineer
Director, Transportation Mobility & Safety Division

SUBJECT: Spot Mobility Program

The Appropriations Act of 2017 (Senate Bill 257 / Session Law 2017-57, Section 34.7.(a)) appropriated \$20 million to establish the Spot Mobility Program. Managed by the State Traffic Engineer of the North Carolina Department of Transportation, the purpose of the Spot Mobility Program is to provide funding for small projects that will reduce traffic congestion and vehicular delay times. The North Carolina Department of Transportation has developed a process to systematically identify, develop, analyze, prioritize, select, and evaluate projects or programs that reduce congestion across the state of North Carolina.

Under Section 34.7.(d), the North Carolina Department of Transportation was directed to complete a report detailing the formulas eveloped to select projects, type of projects funded, and total amount of funding allocated to each project. The report is to be submitted to the North Carolina General Assembly's Joint Legislative Transportation Oversight Committees by March 1, 2018. The requested information is contained in this memorandum and the attached Mobility Program Report to Legislature and Spot Mobility Program Guidelines.

#### Spot Mobility Index

NCDOT has developed the Spot Mobility Program Index as a quantitative, evidence-based formula used in selecting projects to receive funding under the program.

The Spot Mobility Index is:

Spot Mobility Index (MI) = 0.35MBC + 0.30LP + 0.20TTR + 0.05PI + 0.10SAP

MBC - Mobility Benefit Cost Factor

LP - Local Priority Factor

TTR - Travel Time Reliability Factor

PI - Programmatic Identification Factor

SAP - School Access Preference Factor

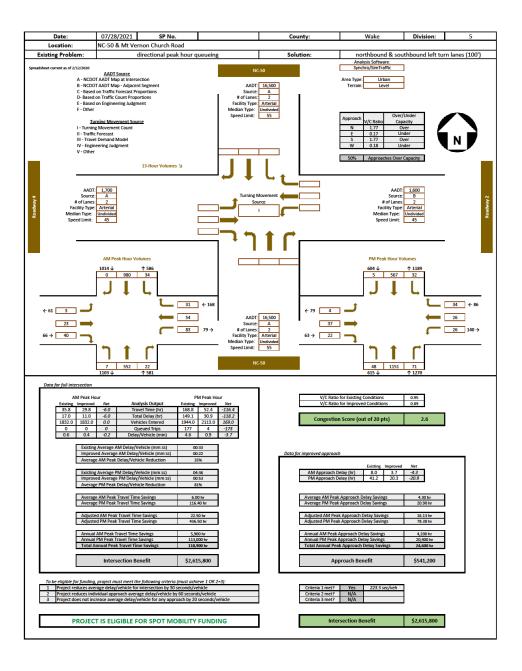
### NCDOT Safety and Mobility Programs

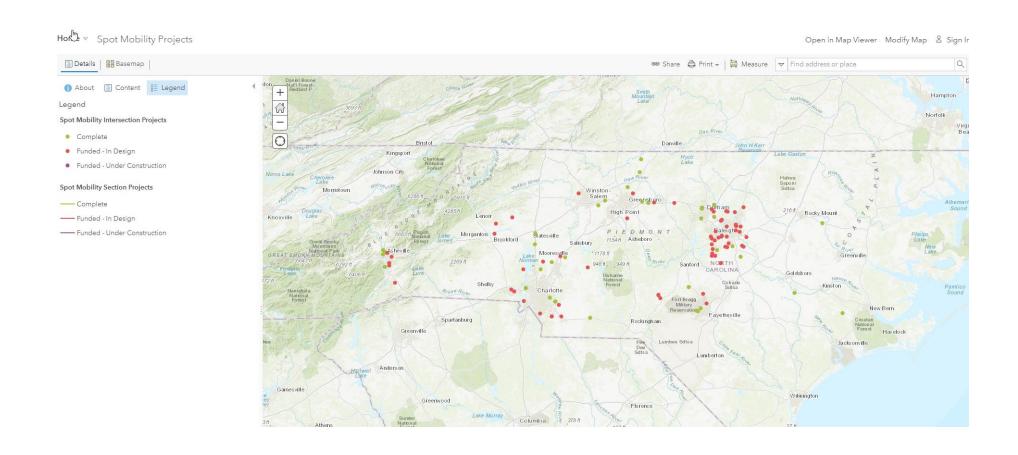
### **Three Project Funding Sources**

HSIP	Spot Safety	Spot Mobility	
\$65M Per Year	\$12.1M Per Year	\$16.6M Per Year	
Federal Funds	State Funds	State Funds	
Soft cap of \$1M per project (Projects above \$1M require advanced authorization from the State Traffic Engineer)	\$400K cap per project	\$750K cap per project	
B/C based prioritization and systemic investments	Prioritization is based on the <b>Spot Safety Index</b>	Prioritization is based on the <b>Spot Mobility Index</b>	
Selected quarterly	Selected quarterly	Selected quarterly	

### **Spot Mobility Program**

- The focus of this program is to address intersections and sections of roadway that are experiencing significant reoccurring congestion/delay.
- Projects are evaluated by the Congestion Management group in Garner. If a project meets the minimum criteria, the Regional Traffic Staff develops a project (scope, estimate, B/C sheets, etc.) and submits the project to headquarters for consideration.
- Projects are scored and ranked primarily on the Mobility Benefit/Cost Ratio. The benefit used in the calculation is the estimated overall delay savings for once the improvement is implemented.





https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=af5150835e db4502a26762e966cb5dfa

# Discussion of the future of I-40

Summery of I-40 projects, plans and studies David Keilson NCDOT



# I-40 Studies, Projects, and Plans

David Keilson, PE NCDOT Division 5 Planning Engineer

October 13, 2022

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

- STIP
- 2050 CAMPO & DCHC MTP/CTP
- Regional ITS Plan
- Commuter Corridors Study
- Triangle Tolling Study
- BOSS Study
- FAST Study

- Joint CAMPO/DCHC guiding principles
- I-40 Managed Lanes FS
- Congestion Management Process
- TDM Oversight Committee
- Triangle Regional Freight Plan
- I-40 RTP area service roads study

#### Under construction:

I-3306: Widening from I-85 to US 15-501 with NC 86 interchange improvements, ITS

I-5700: Interchange improvements at Airport Blvd with auxiliary lanes

I-5111/I-4739: Widening from I-440 to NC 42/Cleveland Rd

### Draft STIP - committed (subject to change/swaps):

I-5707: Aux lane WB from I-885 to NC 55 ROW FY '24

I-5966: Aux lanes EB/WB from Aviation Pkwy to Harrison Ave ROW FY '27

I-5703: I-40/I-440/US1/US64 interchange D-B let FY '26

I-5701: Widening from I-440/US1/US64 to Lake Wheeler Rd D-B let FY '26

<sup>\*</sup> Does not include maintenance projects

#### • Draft STIP – PE only:

U-6067: Interchange improvements at US 15-501

U-5774F: Interchange improvements at NC 54 (exit 273)

I-6006: Managed freeway from NC 54 (exit 273) to Wade Ave

U-6118: Upgrade ramp terminals at NC 55 interchange

#### Draft STIP – not funded:

U-6101: Managed freeway from Wade Ave. to NC 42

<sup>\*</sup> Descriptions shown reflect only the I-40 portions of the project

#### ncdot.gov

- MTPs, 2030 horizon: all 2030 projects are in the draft/current STIP
- MTPs, 2040 horizon:

Interchange improvements at Wade Ave.

Widening from US 1/64 to Wade Ave.

New interchange at White Oak Road

Widening from NC 42 to CAMPO boundary

Managed lanes from Johnston County to CAMPO boundary

• MTPs, 2050 horizon:

Managed lanes from Durham County to Johnston County

Operational improvements submitted in P6.0

RTP area frontage roads

Ramp improvements at Davis Dr

Modify/add aux lanes near NC 54 & Cary Towne Blvd, improve ramps at Cary Towne Blvd

Interchange improvements at Rock Quarry Rd

Managed freeway from NC 42 to NC 210

### **Contact Us**

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in NCDOT



► NCDOTcommunications



(f) @NCDOT



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## Discussion of the future of I-40

Future of I-40 in the Triangle –Interactive discussion Doug Plachinski and Alex Rickard DCHC MPO CAMPO

# Discussion of the future of I-40 Potential Topics

- Implications of work from home/anywhere
- Funding limitations
- Regional growth
- Multimodal freeways
- Freeway And Street-based Transit (FAST)
- Interface with regional passenger rail
- Managed freeways
- Future configuration options

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