

DURHAM • CHAPEL HILL • CARRBORO

DCHC

METROPOLITAN PLANNING ORGANIZATION

PLANNING TOMORROW'S TRANSPORTATION

2050 Metropolitan Transportation Plan Preferred Option

Andy Henry, andrew.henry@durhamnc.gov, October 13, 2021

Board Directives (from 9-1-21 Board meeting)

- Create two Preferred Options
 - Vision Plan: follow first four years of TIP, then vision that supports MPO Goals
 - Traditional Plan: follow first decade of TIP first, then vision that supports MPO Goals
- VMT and climate change are important, but so are safety, air and water quality, racial equity, and human health and well-being
- Need better performance measures to show project impact
- Be specific about land use expectations

Preferred Option Document

- This presentation is an outline of the Preferred Option components and is designed for discussion
- Preferred Option will be released in a document format

2045 MTP – Draft Preferred Option

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www.bit.ly/DCHC-MTP

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Orange	64,212	107,791	43,579	68%
Total	266,428	468,419	201,991	76%

* Only includes portion of Chatham County in the modeling area.

units, population and
the travel demand model
the 2045 guide totals,
the year 2045, and
tributes the dwelling units
suitability.

methodologies used for the
the projected population
le

ment to calculate the
ation is based on estimates
ent, and the employment
nomics. The employment
USA that is verified and
totals:

Financial Plan

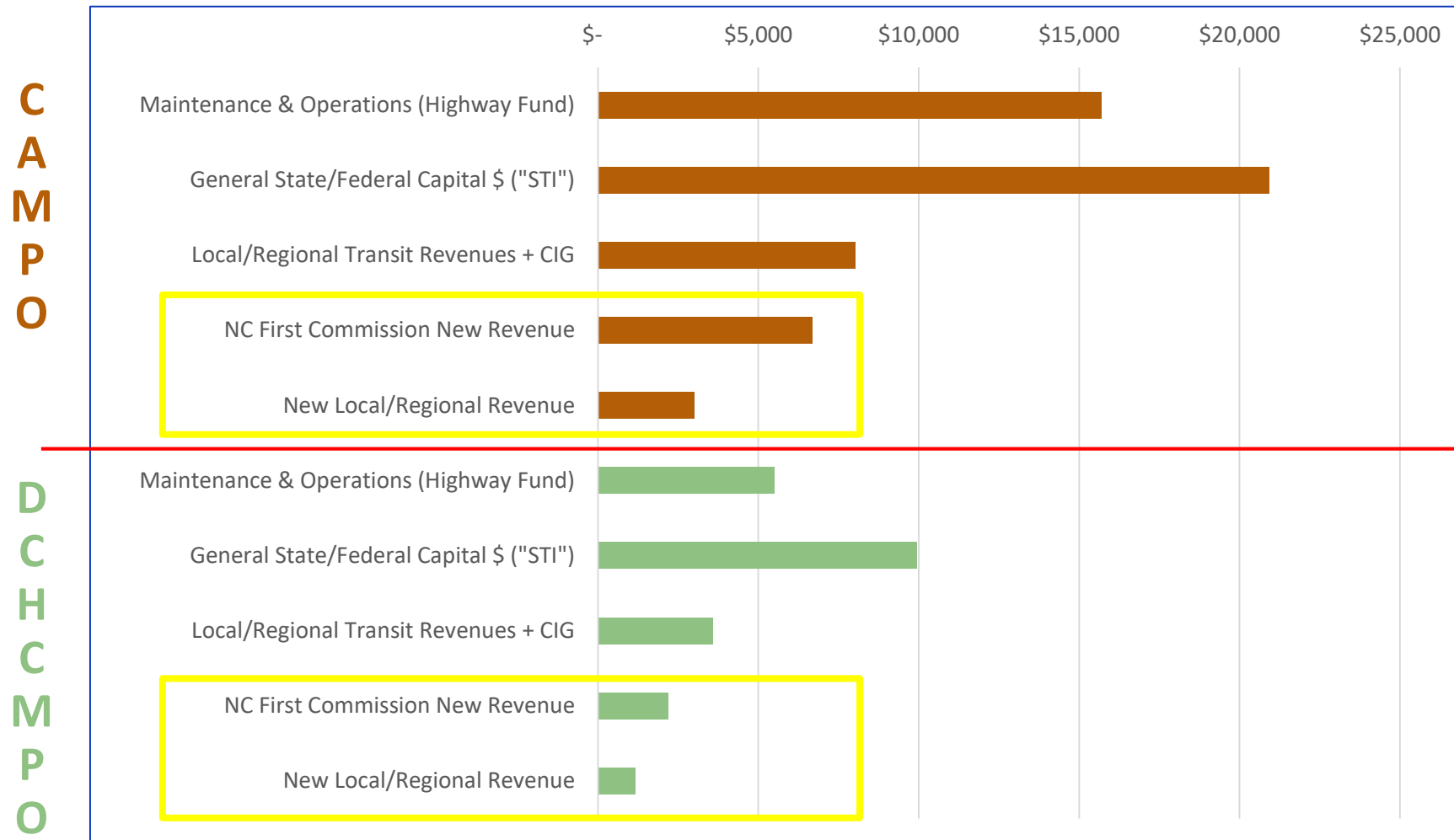
2050 Metropolitan Transportation Plan

Use *All Together* Investment Revenue

1. “Traditional” Revenues (2021-50)
 - ❖ State & federal funds based on current STIP, NC Moves report and STI framework
 - ❖ Continuation of county-level transit sales taxes
 - ❖ Past pattern for other sources (local bonds, developer projects)
2. NC First Commission Additional State Revenues (2031-50)
 - ❖ MPO “fair shares” of recommended amount
3. Additional Local/Regional Revenues (2031-50)
 - ❖ Based on “sales tax equivalent”



Connect2050 Preliminary Financials



1st decade from "TIP" and existing sources; new sources applied in 2nd & 3rd decades



Highway Project Selection

Selection of Highway Projects

Vision	Traditional
Projects with funding in first <u>four</u> years of FY 20-29 STIP	Projects with funding in FY 20-29 STIP
Modernization Projects <ul style="list-style-type: none"> Improve operation but do not significantly increase capacity of roadways 	Same as Vision
Provide an advantage for buses, e.g. managed lanes	Same as Vision
"Grid" projects that improve traffic on collector streets <ul style="list-style-type: none"> Improve bicycle, pedestrian and transit access Many of these projects will be built by developers May improve safety Reduce VMT by providing more efficient routes and reduce idling 	Same as Vision
Local or Regional Interest projects <ul style="list-style-type: none"> Projects that do not meet the above criteria but have local and/or regional support (e.g. local elected officials or MPO Board) – Note: These projects are not selected, yet, in this presentation 	Same as Vision

***See attached highway and interchange table for definitions and full list of projects.

Highway Projects -- Vision

- **TIP** -- Match first 4 years of Transportation Improvement Program (TIP) (i.e., 2020 through 2023) ... so include highway projects in Vision that have ROW or construction from 2020 through 2023 in STIP

Project	From	To	Existing Lanes	Proposed Lanes	Improvement	Vision	Traditional	Modernization	Bus Advantage	Grid	Comments	Estimated Cost
East End Connector (EEC)	NC 147	north of NC 98 in Durham	0	4	New Location	Y	Y	N	N	N	Funded before 2020	\$ -
Fayetteville Rd	Barbee Rd	Cornwallis Rd	2	4	Widening	Y	Y	N	N	N	Under construction	\$ -
Lynn Rd/Pleasant Dr Connector	Lynn Rd	Pleasant Dr	0	2	New Location	Y	Y	N	N	Y	Part of East End Connector	\$ 5,111,400
NC 55 (Alston Ave)	Main St	NC 98	2	2	Modernization	Y	Y	Y	N	N	Funded before 2021	\$ -
NC 55 (Alston Ave)	NC 147	Main St	2	4	Widening	Y	Y	N	N	N	Funded before 2020	\$ -
I-40	Durham County line	NC 86	4	6	Widening	Y	Y	N	N	N	First four years of STIP	\$ 68,851,000
I-40	NC 86	I-85	4	6	Widening	Y	Y	N	N	N	First four years of STIP	\$ 107,290,000
Woodcroft Pkwy Ext	Garrett Rd	Hope Valley Rd	0	2	New Location	Y	Y	N	N	Y		\$ 3,793,000

Highway Projects -- Vision

- **Modernizations** – These projects don't add capacity, but they improve safety and/or bike, ped and bus infrastructure
 - Durham has brought several highway widening projects back into the Vision scenario as modernizations (e.g., Fayetteville, NC 54, US 70, US 15-501)
 - Some of these Durham projects in the Vision scenario are conversions to boulevards (e.g., US 15-501 and US 70)
 - Durham added modernization to one section of Northern Durham Parkway that will initially be constructed by developers.

Modernizations do not add vehicle travel lanes: Urban – add bicycle, pedestrian and transit facilities, add turn lanes at intersections; sometimes widen a narrow road, improve curves and sight lines. Rural -- widen a narrow road and shoulder, add turn lanes at intersections; improve curve and sight lines.

Highway Projects -- Vision

- **Bus Advantage** –Managed lane projects add roadway capacity, but they also provide travel advantages to transit buses
- These managed lanes are in the Traditional scenario, but not the Vision scenario

Highway	From	To	Improvement	TIP
I-40 Managed Lane	NC 54	US 15-501	Widening	I-5702A
I-40 Managed Lanes	Wake County Line	NC 147	Widening	I-5702B
I-40 Managed Lanes	NC 147	NC 54	Widening	I-5702A
NC 147 (possible managed lanes)	Future I-885	I-40	Widening	U-5934

Highway Projects -- Vision

• Grid Streets—

These projects provide a grid to support bike, ped and transit trips and access, and reduce VMT. They are mostly developer built.

... so include these highway projects in Vision and Traditional

Project	From	To	Existing Lanes	Proposed Lanes	Improvement	Vision	Traditional	Comments
Angier Av Ext	US 70	Northern Durham Pkwy	0	2	New Location	Y	Y	To be built by developer; in dev't review in 2021
Angier/Glover Connector	Ellis Rd	Glover Rd	0	2	New Location	N	Y	Durham deleted from Vision
Crown Pkwy/Roche Dr	Page Rd	T.W. Alexander Dr	0	2	New Location	Y	Y	
Danziger Dr Extension	Mt Moriah Rd	E Lakewood Dr	0	2	New Location	Y	Y	
Eno Mountain Rd realignment	Mayo St	Eno Mountain Rd	2	2	New Location	Y	Y	
Freeland Memorial Extension	S Churton St	New Collector Rd	0	2	New Location	Y	Y	
Glover Rd	Angier	US 70	0	2	New Location	Y	Y	
Hebron Rd Extension	Hebron Rd	Roxboro Rd (501 N)	0	2	New Location	Y	Y	
Hopson Rd	Davis Dr	S Miami Blvd (NC 54)	2	4	Widening	Y	Y	Built by developer in 2021
Lake Hogan Farms Rd	Eubanks Rd	Legends Way	0	2	New Location	Y	Y	
Legion Rd Ext	Legion Rd	Fordham Blvd	0	2	New Location	Y	Y	
Lynn Rd Extension	US 70	Existing Lynn Rd	0	2	New Location	Y	Y	
Lynn Rd/Pleasant Dr Connector	Lynn Rd	Pleasant Dr	0	2	New Location	Y	Y	Part of East End Connector
Marriott Way	Friday Center Dr	Barbree Chapel Rd	0	2	New Location	Y	Y	
New Collector Rd	Orange Grove Rd Ext	Becketts Ridge Rd	0	2	New Location	Y	Y	
New Hope Commons Dr Extension	Eastowne Dr	New Hope Commons Dr	0	2	New Location	Y	Y	
Orange Grove Connector	Orange Grove Rd	NC 86	0	2	New Location	Y	Y	
Patriot Dr Extension	S Miami Blvd	Page Rd	0	2	New Location	Y	Y	
Purefoy Rd Ext	Sandberg Ln	Weaver Dairy Rd	0	2	New Location	Y	Y	
Roxboro St	Cornwallis Rd	MLK Pkwy	0	4	New Location	N	Y	Durham deleted from Vision; environmental concerns
S Elliot Rd Ext	Fordham Blvd	Ephesus Church Rd	0	2	New Location	Y	Y	
Southwest Durham Dr	US 15-501							
Woodcroft Pkwy Ext	Business	Mt Moriah Rd	0	4	New Location	Y	Y	
Yates Store Rd Extension	Garrett Rd	Hope Valley Rd	0	2	New Location	Y	Y	
	Yates Store Rd	Wake Rd	0	2	New Location	Y	Y	

Highway Projects -- Vision

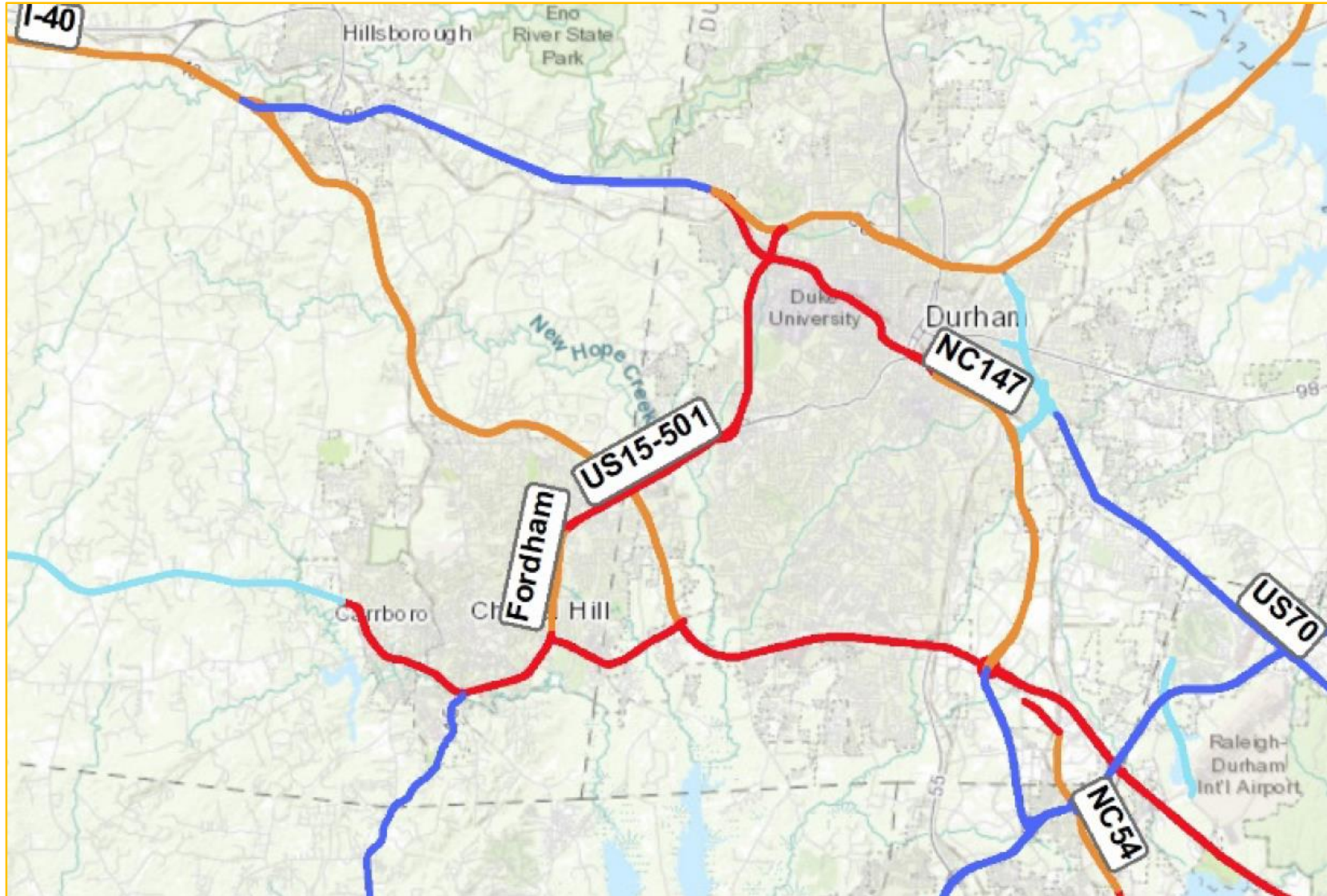
- These projects are not included:

- Orange County has added the following back into the Vision and/or Traditional

- I-85 (in Orange County)
- NC 54 (I-40 to Barbee Ch Rd)
- Old NC 86 (I-40 to Eno River)
- NC 86 (Old NC 10/US 70 Bus)
- NC 86 (US 70 Bypass to NC 57)

Project	From	To	Existing Lane	Proposed Lanes	Improvement	Visible	Traditional	Comments		
Angier/Glover Connector	Ellis Rd	Glover Rd	0	2	New Location	N	Y	Durham deleted from Vision		
I-40 (westbound auxiliary lane)	NC 147	NC 55	6	7	Widening	N	Y			
NC 147 (operational improvements)		East End								
US 70 (freeway)	Hopson Rd	Louis Stephens Dr		Davis Dr	2	4	Widening	N	N	
US 70 (freeway)										
NC 147 (possible managed lanes)	I-40 Managed Lane	NC 54		US 15-501	6	8	Widening	N	Y	Durham deleted from Vision
Fayetteville Rd	I-40 Managed Lanes	NC 147		NC 54	6	10	Widening	N	Y	Durham deleted from Vision
I-85										
NC 54 (widening; superstreet)	I-40 Managed Lanes	Wake County Line		NC 147	8	10	Widening	N	Y	Durham deleted from Vision
US 15-501 (expressway conversion)	I-40/ NC 54 ramp	Farrington Rd.		I-40	0	1	New Location	N	N	
NC 54	Leesville Rd Ext	US 70/Page Rd Ext		Leesville Rd	0	2	New Location	N	Y	Built as part of US 70 (U-5720)
NC 54				Southpoint						Some sections complete, but mostly still two-lane
NC 54	NC 751	NC 54		Auto Park Blvd	2	4	Widening	N	N	
NC 54	Northern Durham Pkwy	I 85 North		Old Oxford Hwy	0	4	New Location	N	N	
NC 54		S Mineral								
NC 751	Sherron Rd	Springs Rd		Stallings Rd	2	4	Widening	N	N	
Falconbridge Rd Connector	Southwest Durham Dr	NC 54		I-40	0	2	New Location	N	N	
Falconbridge Rd Extension				Old Chapel Hill Rd						
Garrett Rd	Southwest Durham Dr	Sawyer Dr			2	4	Widening	N	N	
Garrett Rd	US 15-501 Bypass	MLK Parkway		I-85	4	6	Widening	N	N	
				Wake County Line	2	4	Widening	N	N	
Hope Valley Rd (NC 751)	Wake Forest Hwy (NC 98)	Nichols Farm Dr								
	Eubanks Rd	Millhouse Rd		Rex Rd/Kousa trail	2	4	Widening	N	N	
										Durham deleted from Vision; environmental concerns
	Roxboro St	Cornwallis Rd		MLK Pkwy	0	4	New Location	N	Y	

Bus On Shoulder System (BOSS)



- Include in highway section
- Add to Vision and Traditional scenario

Bus On Shoulder System (BOSS)

Which BOSS can be part of MTP project, and which would need to be added?

BOSS Suitability:

- * Red font – “most suitable”
- * Orange font – “2nd most suitable”
- * Blue font – less suitable

- Cost is \$100,000 per miles, based on recent BOSS study, and assumes that BOSS is part of pavement maintenance project.
- Total cost is \$6,050,000

Project	Vision	Cost
I-40 – I-85/US 15-501	part of widening	\$0
I-40 Managed Lane – US 15-501/NC 54	interim to widening	\$290,000
I-40 Managed Lane – NC 54/Wake Co.	interim to widening	\$980,000
NC 147 – I-85/W Chapel Hill St	no roadway improvements	\$410,000
NC 147 – W Chapel Hill St/I-885	interim to modernization	\$350,000
NC 147 – I-885/I-40	interim to widening	\$490,000
I-85 – NC 147/I-40 (Orange County)	interim to widening	\$800,000
I-85 – US 70/NC 147	no roadway improvements	\$580,000
NC 54 – Old Fayetteville Rd/NC 86	no roadway improvements	\$310,000
US 15-501 – NC 86/NC 54	part of modernization	\$0
US 15-501 – NC 54/E Franklin St	part of modernization	\$0
US 15-501 – E Franklin St/I-40	part of modernization	\$0
US 15-501 – I-40/US 15-501 Bypass	no roadway improvements	\$200,000
US 15-501 – US 15-501/I-85	no roadway improvements	\$480,000
NC 54 – US 15-501/Barbee Chapel	part of modernization	\$160,000
NC 54 – Barbee Chapel/I-40	interim to widening	\$160,000
NC 54 – Davis Dr/Miami Blvd	no roadway improvements	\$90,000
NC 54 – Slater Rd/Wake Co	no roadway improvements	\$120,000
US 70 I-885/Wake County	interim to widening	\$630,000

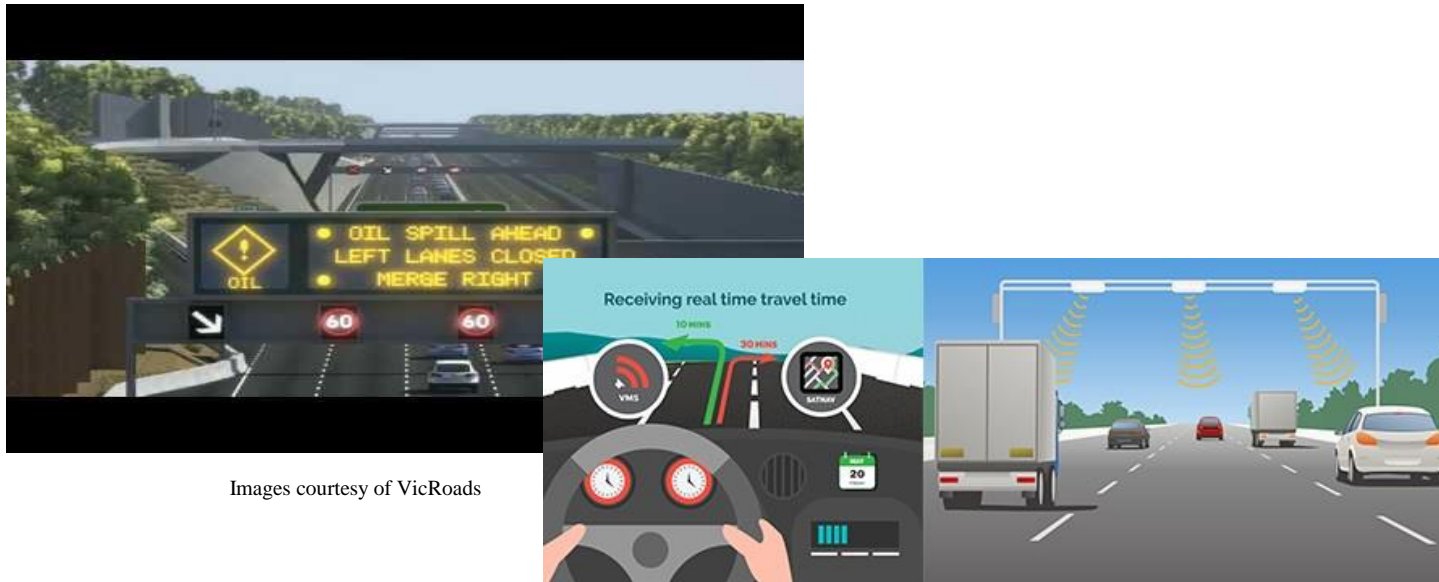
Managed Roadways

Included in Vision scenario as type of modernization

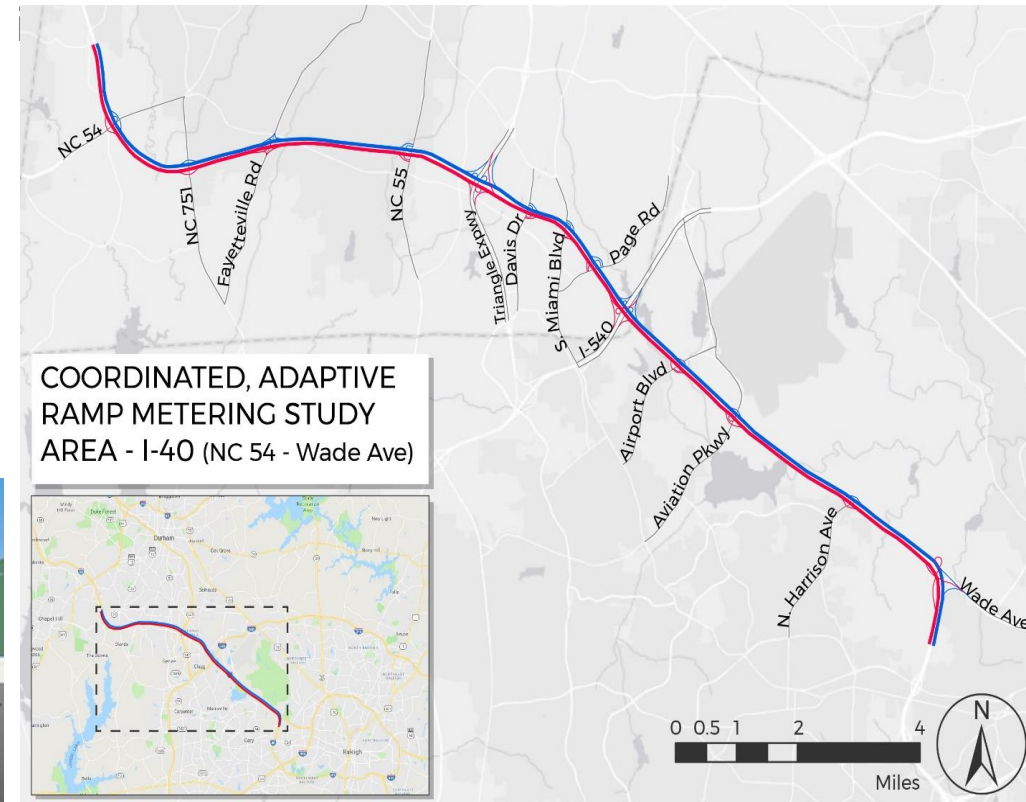
What is a Managed Roadway?

- Synchronizes flow of vehicles entering a freeway to available capacity on the freeway
- Provides real time demand management to manage traffic
- Interchanges coordinate with one another to prevent excessive wait times and queuing for all interchanges, metering rates differ for each ramp
- Future infrastructure to vehicle communications
- Better coordination with transit priority

- I-6006, I-40 from NC 54 in Durham to Wade Ave in Raleigh. ~\$54 million. ROW and construction in 2028 and 2029, respectively,



Images courtesy of VicRoads



Other Investments

Electric Vehicle Charging Stations

- Identified often in public comments and supports MPO Goals
- Staff working to identify cost. Great variability in equipment costs and quantity estimates
- Could be policy statement

Travel Demand Management (TDM)

- Marketing, outreach, program to support carpool, vanpool, telecommuting, transit, bicycling and walking
- Staff need to calculate the funding amount

Transportation System Management (TSM)

- Relative low-cost projects to improve efficiency and safety of current roadways
- Staff need to calculate the funding amount

Intelligent Transportation System (ITS)

- Programs and projects from Triangle Regional ITS Strategic Deployment Plan Update (June 2020) that use sensing devices and data to improve roadway operations management
- Staff need to calculate the funding amount

Transit, Bike-Ped, and Complete Streets

Transit

Transit projects are mostly the same for both the **Vision** and **Traditional** options except as noted.

Green font = Vision
Blue font = Traditional
Black font = both

When the transit network is completed, staff will create an interactive map and identify the funding.

Transit Element	2030	2040	2050
CRT –Triangle Commuter Rail	...	W. Durham to Clayton; 8-2-8-2	Hillsborough to Selma; 12-8-12-8
BRT - Chapel Hill North-South	BRT: Eubanks to Southern Village	no change	no change
BRT - Durham/Chapel Hill (via US 15-501): UNC Healthcare to downtown Durham to NCCU	...	BRT with bus-only lane	no change
BRT - Durham/RTP (via NC 147)	...	BRT using managed lane	BRT using managed lane
BRT - Chapel Hill/RTP (via NC 54)	BRT with bus-only lane
Bus – frequency, coverage and connection improvements, especially major corridors	Yes	Yes	Yes
Bus - amenity and access improvements	Yes	Yes	Yes
BOSS – bus on shoulder improvements to highways	See highway plan	See highway plan	See highway plan
Express Bus - Durham/Butner (via I-85)	Enhanced bus service
Express Bus - White Cross/UNC	...	Enhanced bus service	Enhanced bus service
Express Bus - Chapel Hill/Hillsborough	...	Enhanced bus service	Enhanced bus service
Express Bus - Chapel Hill/ Pittsboro	...	Enhanced bus service	Enhanced bus service

Bicycle and Pedestrian

The level of bicycle and pedestrian facility investment is based on a review of the MPO's local government plans.

- 175 miles of sidewalk per decade
- 70 miles of shared use paths per decade
- 80 miles of protected bike lanes per decade
- 20 miles of bicycle boulevards per decade
- Bicycle and pedestrian projects are usually not listed or mapped in the MTP
- Report appendix will list regional routes. (because SPOT awards regional points)
- \$292m in costs in 2045 MTP

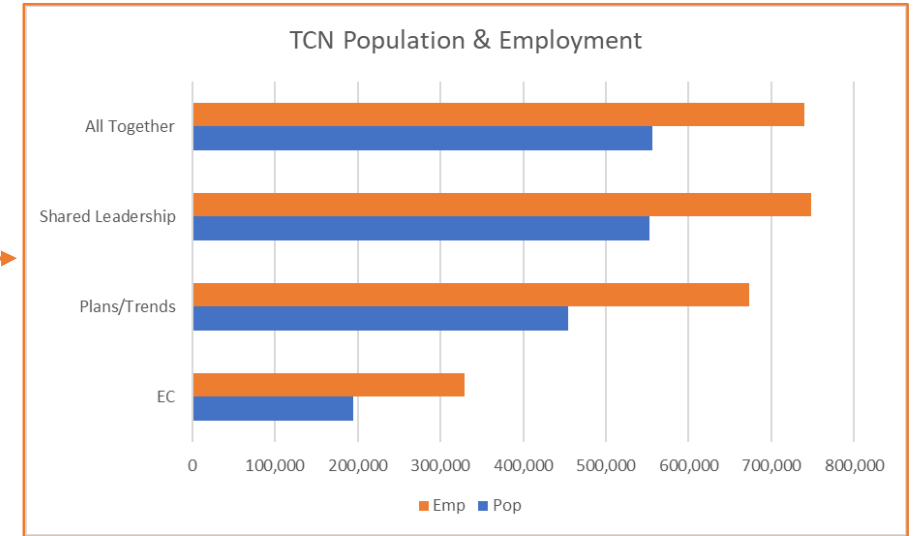
Bike/Ped Costs for 2050 MTP			
	Length (mi)	Unit Cost (ft)	Total Cost (\$millions)
Sidewalk	525	\$ 250	\$ 693
Shared Use Path/Sidepath	210	\$ 500	\$ 554
Protected bike lane (both sides)	240	\$ 1,200	\$ 1,521
Bicycle Boulevard	60	\$ 10	\$ 3
Total			\$ 2,771

Performance Measures

Performance Measures

Staff identified additional PMs for Preferred Option:

- Population and jobs near frequent transit (Travel Choice neighborhoods)
- Jobs within 20 and 40 minutes by auto and transit



TRM output moves in right direction, but moves very little, e.g., VMT, VHT, travel time, mode share

Policy Changes



Are there other models that support DCHC MPO policy changes?

Rapid Policy Assessment Tool (RPAT)

- Used to assess what types of smart growth development are most suitable for given areas
- Input different smart growth scenarios and estimate the effect on regional travel, sprawl, energy-reduction, and carbon footprints.
- Based on model results that have been experienced in U.S. cities as a result of policy changes.
- DCHP MPO help FHWA develop RPAT in 2016

Now called **VisionEval** (www.visioneval.org)

Policy Changes

RPAT was validated against results from the Triangle Region Model (TRM) using four RPAT scenarios in 2016

2040 MTP (Base)	Vehicle Miles Traveled	Vehicle Hours Traveled	Total Transit Trips	Total Vehicle Trips
RPAT	66,367,265	1,623,893	223,402	8,894,594
TRM	63,920,021	1,707,586	227,878	8,919,982
Difference (%)	3.83%	-4.90%	-1.96%	-0.28%

Policy Changes

RPAT Tested 7 Scenarios in Triangle:

1. **2040 MTP** - Baseline
2. **E+C**: 18% Reduction of Roadway Construction
3. **Hwy**: 9.8% Increase of Roadway Construction
4. **TRN**: 276% Rail Mile Increase, 12% Bus mile Reduction and 9.4% Reduction of roadway construction
5. **ITS20**: 20% Road lane mile with ITS treatment.
6. **MTPx20DA**: Shift 20% Growth to Dense Areas
7. **MTPx20DAwITS**: Shift 20% Growth to Dense Areas with 20% lane mile ITS treatment

Transit

Land Use

Two scenarios depict DCHC MPO policy changes: fewer roads, more transit, more centralized development

Policy Changes

RPAT Test Scenario Results:

Transit

Land Use

%Diff to Baseline	Scenario	E+C	Hwy	TRN	xITS	yG20toDA	zG20toDA&ITS
Output	Vehicle Trips	0.14%	0.19%	-1.07%	0.00%	-0.80%	-0.80%
	Transit Trips	-35.97%	-40.09%	16.45%	0.00%	11.55%	11.55%
	Walking Trips	-71.93%	-57.85%	113.53%	0.00%	163.12%	163.12%
	VMT	0.93%	1.55%	-1.79%	0.00%	-3.29%	-3.29%
	VHT	2.64%	1.84%	-3.10%	0.7%	-3.53%	-4.10%
	Greenhouse Gas Emission	0.52%	1.24%	-0.55%	-1.44%	-0.13%	-1.56%
	Accident Number	0.93%	1.55%	-1.79%	0.00%	-3.29%	-3.29%
	Hwy Construction Cost	-18.36%	9.44%	-0.77%	0.00%	0.00%	0.00%

Proposed Policy Assessments

TRIANGLE REGIONAL MODEL (TRM)

- Parking – Increase parking price 50% and reduce 2050 parking capacity 30%
- Land Use – 50% of rural and suburban growth moved to urban area
- Transit – Free transit fare
 - (bus, BRT, CRT, etc.)

MPO will use the Preferred Option – Vision scenario – for the TRM policy assessments.

Note: For sake of expediency, MPO will use Opportunity Places from All Together scenario for policy assessments. Updated Opportunity Places will be used for Preferred Option.

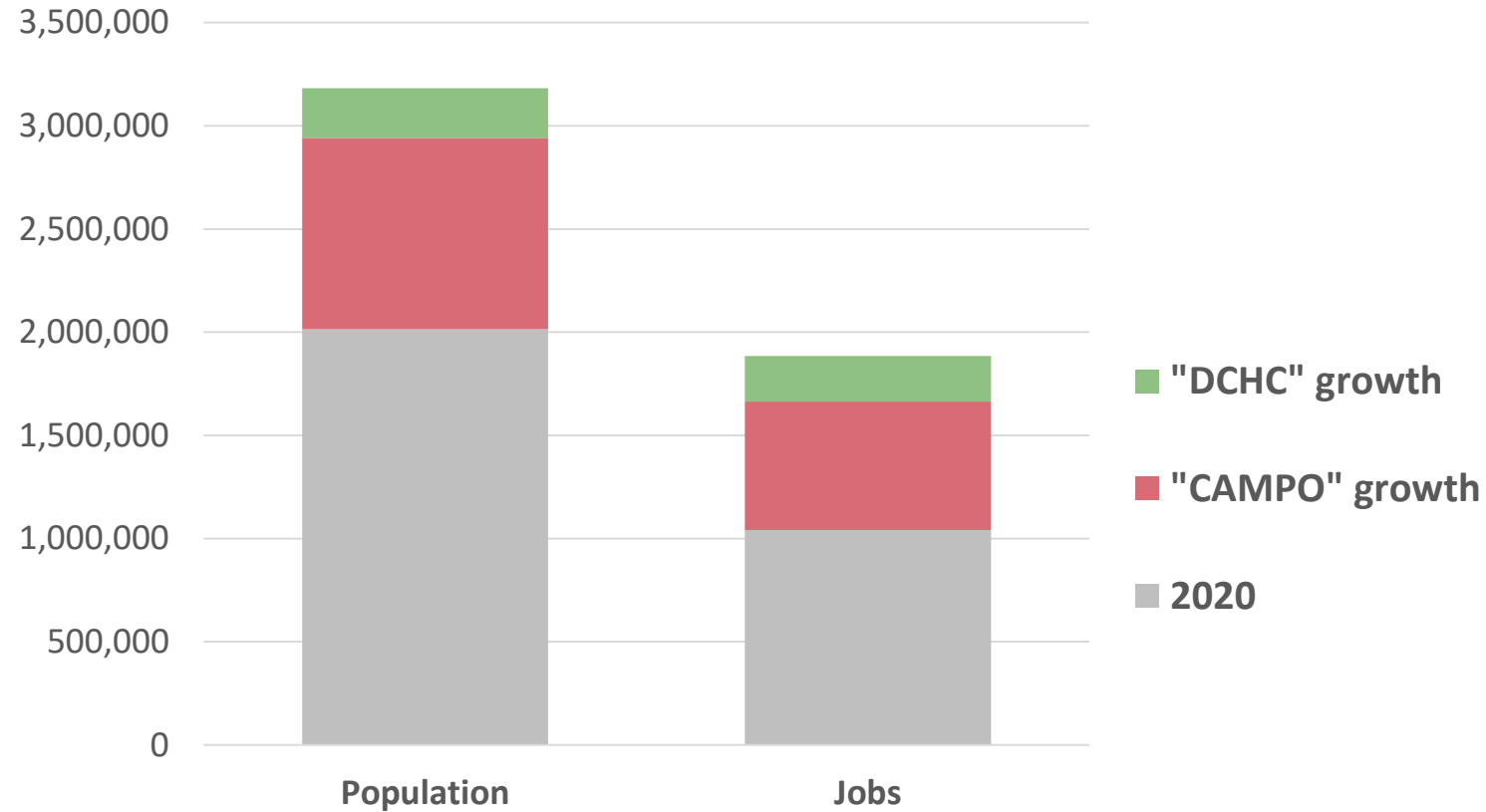
RPAT

- Commute – Employees work from home 2 days per week.

Land Use

2020-2050 Growth Guide Totals

(modeled area; larger than MPO boundaries)



Within “modeled area:”

- 2020-50 added population: 1,160,000
- 2020-50 added jobs: 840,000

Opportunity Places Land Use

- ❖ 4 changes from *Community Plans* land use:
 - ❑ 20% more net growth asserted on Anchor Institution campuses – adding 5,000 jobs combined over and above existing plans
 - ❑ Multi-family affordable housing asserted at publicly controlled sites that meet physical criteria: 10,000 units over 30 years
 - ❑ Increased capacity for growth at 22 activity hubs
 - ❑ Increased capacity for transit-oriented mixed-use development along frequent transit lines



Schedule

- Release Preferred Option -- by October 27
- Conduct public hearing on Preferred Option -- November 10
- Approve Preferred Option for 2045 MTP;
Release full 2050 MTP report, including SE Data and
Triangle Regional Model -TRM;
Release Air Quality Conformity Determination report --
December 8
- Adopt by resolution the 2050 MTP (adoption includes SE
Data and TRM), and Air Quality Conformity Determination --
January 12 or February 9, 2022

The DCHC MPO Public Involvement Plan:

- minimum 42-day public comment period for major MTP decision points such as the Preferred Option;
- minimum 21-day public comment period for Air Quality Conformity Determination.