

DURHAM • CHAPEL HILL • CARRBORO

**DCHC**

METROPOLITAN PLANNING ORGANIZATION

PLANNING TOMORROW'S TRANSPORTATION

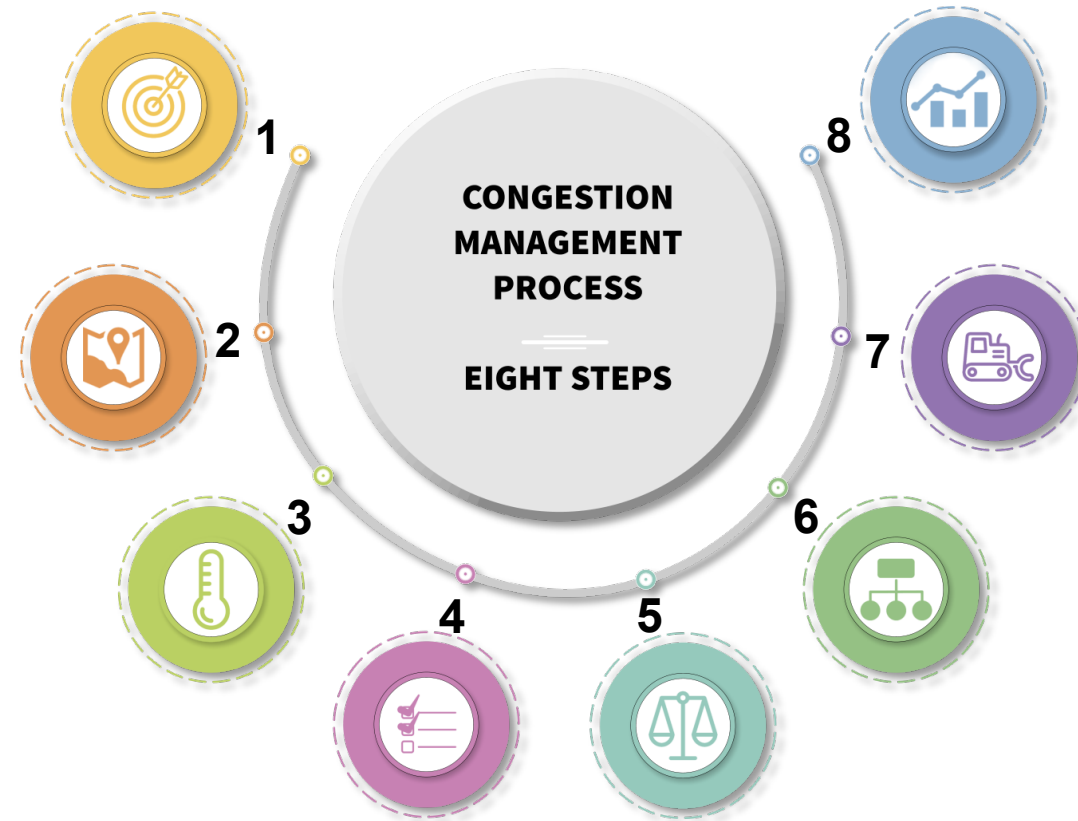
# **Congestion Management Process (CMP) – Mitigation Strategy & Corridor Ranking**

Yanping Zhang

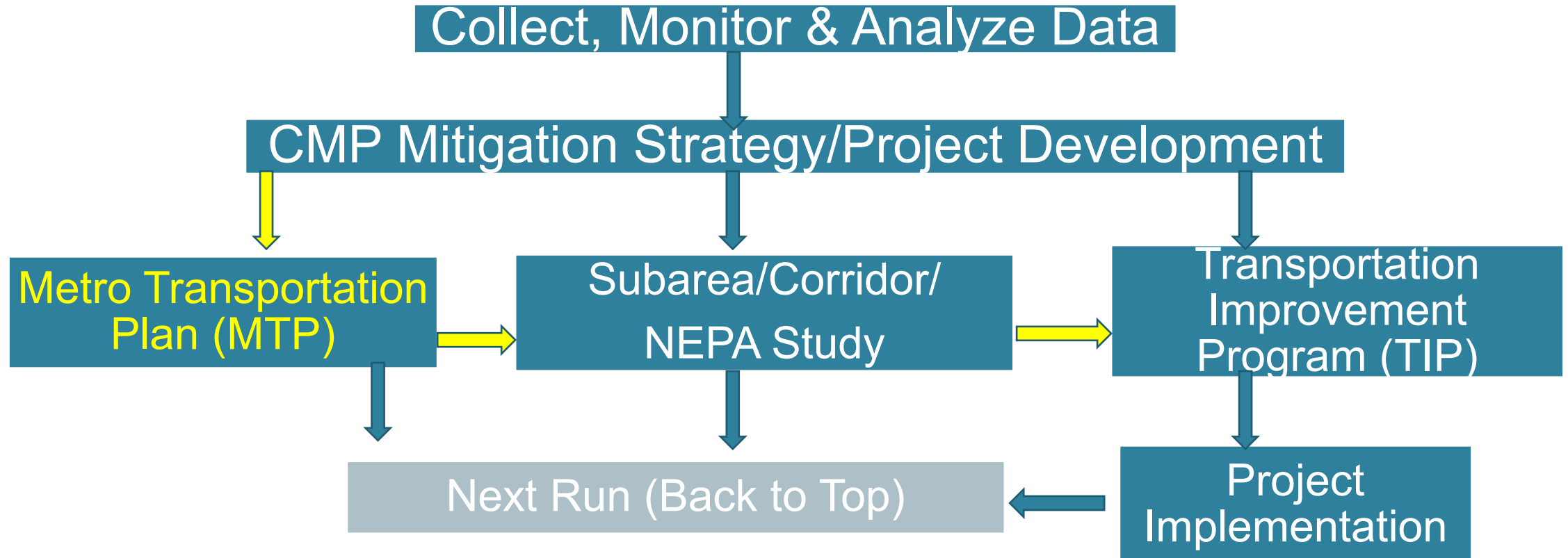
Feb. 10<sup>th</sup>, 2024

# Congestion Management Process Steps and Progress

1. **Develop Objectives** (Completed)
2. **Define Study Areas** (Completed)
3. **Performance Measures** (Completed)
4. **Collect, Monitor & Analyze Data**  
(Data Collection completed & Process ongoing)
5. **Evaluation of Problems** (Ongoing)
6. **Selection of Strategies** (Ongoing)
7. **Program Implementation**
8. **Evaluate Strategies**



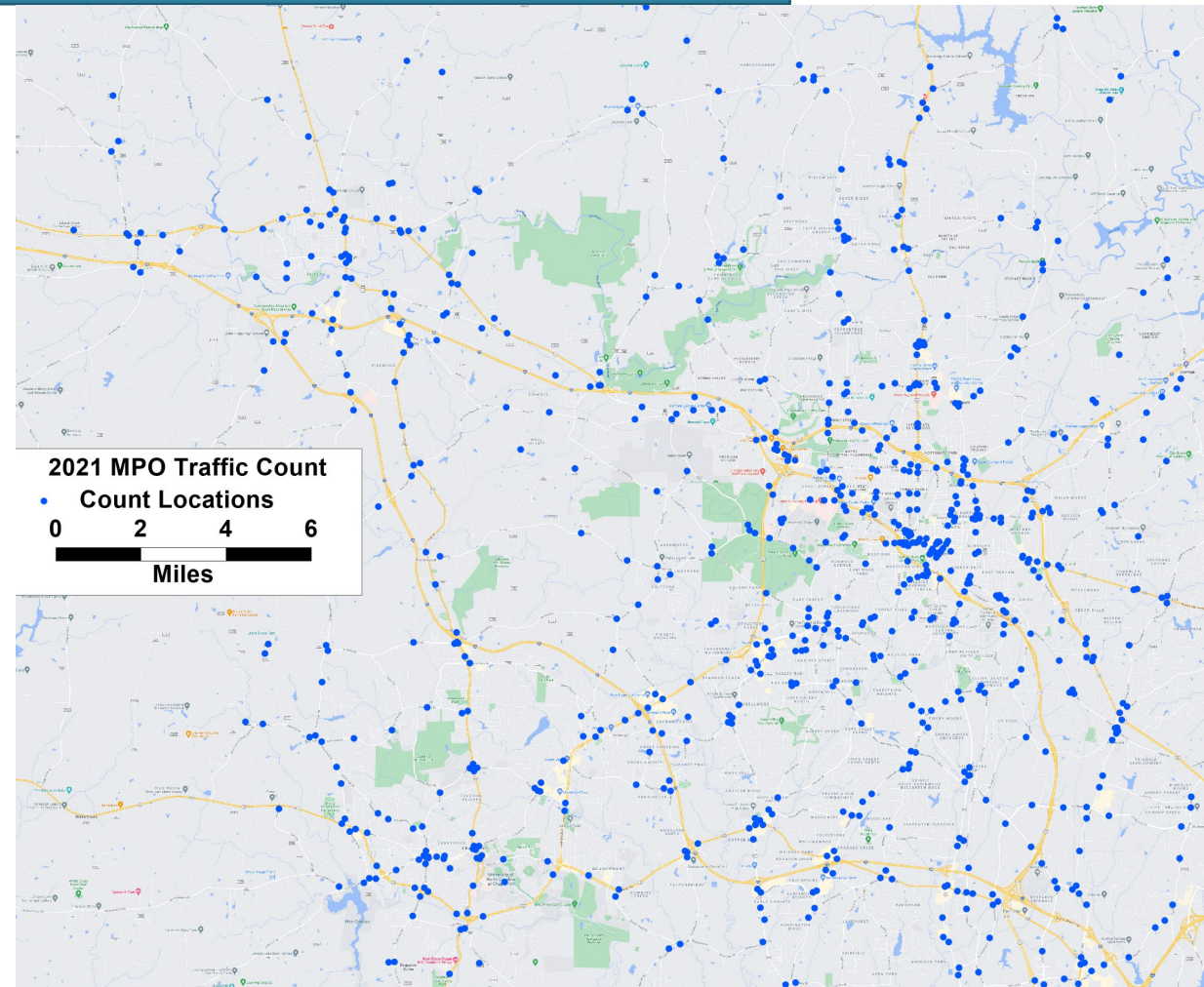
# Integration with Planning Process



# Data Collection and Process

## Completed Data Items

- ❖ NCDOT Average Daily Traffic (AADT): 820 Locations from NCDOT
- ❖ Average Weekday Traffic (AWDT): 779 Locations completed by MPO
- ❖ Bike & Pedestrian Counts: 175 Locations
- ❖ 2017-2022 Crash Data
- ❖ Turning Movement Counts: 205 Locations
- ❖ Intersection Signal Plan and files
- ❖ Transit Net & Ridership Data by Routes
- ❖ Transit National Transit Database by Agency
- ❖ Travel Time Reliability Data
- ❖ Intersection Level of Service Analysis
- ❖ Transit Ridership Data by Stops



# Approved Goals and Objectives

CMP Goals	CMP Objectives
<b>Reliability and Efficiency</b>	1) Maintain reasonable person-trip and freight <b>mobility</b> , and corridor/system <b>reliability</b> for all transportation modes 2) Increase <b>efficiency</b> of existing transportation corridor/system through strategies such as <b>Transportation Demand Management (TDM)</b> , <b>Intelligent Transportation Systems (ITS)</b> 3) Improve <b>Incident Management</b> by reducing incident clearance times on the transit, arterial and Protecting the Human and throughway networks through improved traffic incident detection and response
<b>Safety</b>	Achieve <b>zero deaths and serious injuries</b> on our transportation system
<b>VMT Reduction &amp; Transportation Choices</b>	1) <b>Reduce VMT by Direct Strategies</b> , such as Encouraging telecommuting policies, parking/price management, transit subsidies and so on 2) Provide all residents with active transportation choices 3) Enhance transit services, amenities and facilities 4) Improve bicycle and pedestrian facilities 5) Increase utilization of affordable Non-Single Occupancy Vehicle (Non-SOV) modes
<b>Connectivity</b>	1) Increase mobility options for all communities -- particularly communities of concern 2) Achieve zero disparity of access to jobs, education, and other important destinations by race, income, or other marginalized groups 3) Enhance connectivity of the transportation system, across and between modes for people and freight



# Policy Board Member's Responses

- MPO Policy Board Members
  - 2 Responses
- Responses from MPO Policy Board Members
  - One Response on
    - (i) Removing the strategy of adding general purpose lane for freeway and 4+ lane arterial
    - (ii) Moving “Mobility Hubs” to low priority for 2-4 lane arterial
  - One Response to suggest on conducting the survey for MPO TC members

# TC Member's Responses - 2

## MPO Technical Committee Members - 7 Responses

### Freeway

- “G. Accel/Decel Lanes” is split, low(4)/high(2)/removal(1), [Change it to Lowest Group.](#)
- “I. Add General Purpose Lane” is split, low(4)/removal(3), [Change it to Lowest Group.](#)
- “K. Modify Interchange” is split, high(3)/low(3)/removal(1), [Change it to Lowest Group.](#)

### 4+ Lane Arterial

- “H. Median Improvements” is split high(3)/low(4), [Change it to Medium Group.](#)

### 2-4 Lane Arterial

- “H. Roundabout” is split, high(4)/low(3), [Keep it as the high priority group w/o change.](#)

### High Crash/Delay Locations

- “D. Add/Lengthen Turn Lanes” is split, general(3)/railX(3)/removal(1) – initially in general location group, [may consider to add it to rail crossing location group as well.](#)
- “G. Improve Bike/Ped crossing” is split, general(3)/railX(4) – initially in General location group, [may consider to add it to rail crossing location group as well..](#)
- “I. Relocate Rail” is split, railX(4)/general(1)/removal(2) – initially in rail crossing group.



# Strategy Toolbox: Freeways

## High Priority Strategies



**A. ITS/Integrated Corridor Management**



**B. Ramp Metering**



**C. Bus Rapid Transit/ Bus On Shoulder**



**D. Park & Ride**



**E. Hard Shoulder Running**

## Lower Priority Strategies



**F. Modernize Ramps**



**H. Auxiliary Lanes**

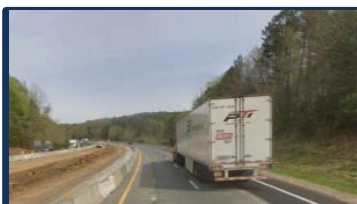


**J. Add Managed Lanes**

## Lowest Priority Strategies



**G. Lengthen Accel/Decel**



**I. Add General Purpose Lanes**



**K. Modify Interchange**

# Toolbox: 4+ Lane Divided Arterials

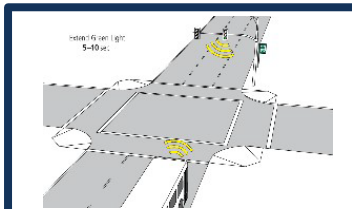
## High Priority Strategies



**A. Adjust Signal Timing/Phasing\***



**B. ITS/Integrated Corridor Management**



**C. Transit Improvements\*\***



**D. Shared Use Paths**

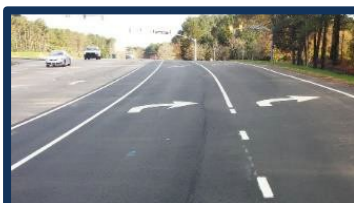


**E. Park & Ride**



**F. Mobility Hubs**

## Medium Priority Strategies



**G. Add/Lengthen Turn Lanes**



**H. RCIs/Median Improvements**



**J. Add Interchange**

## Low Priority Strategies

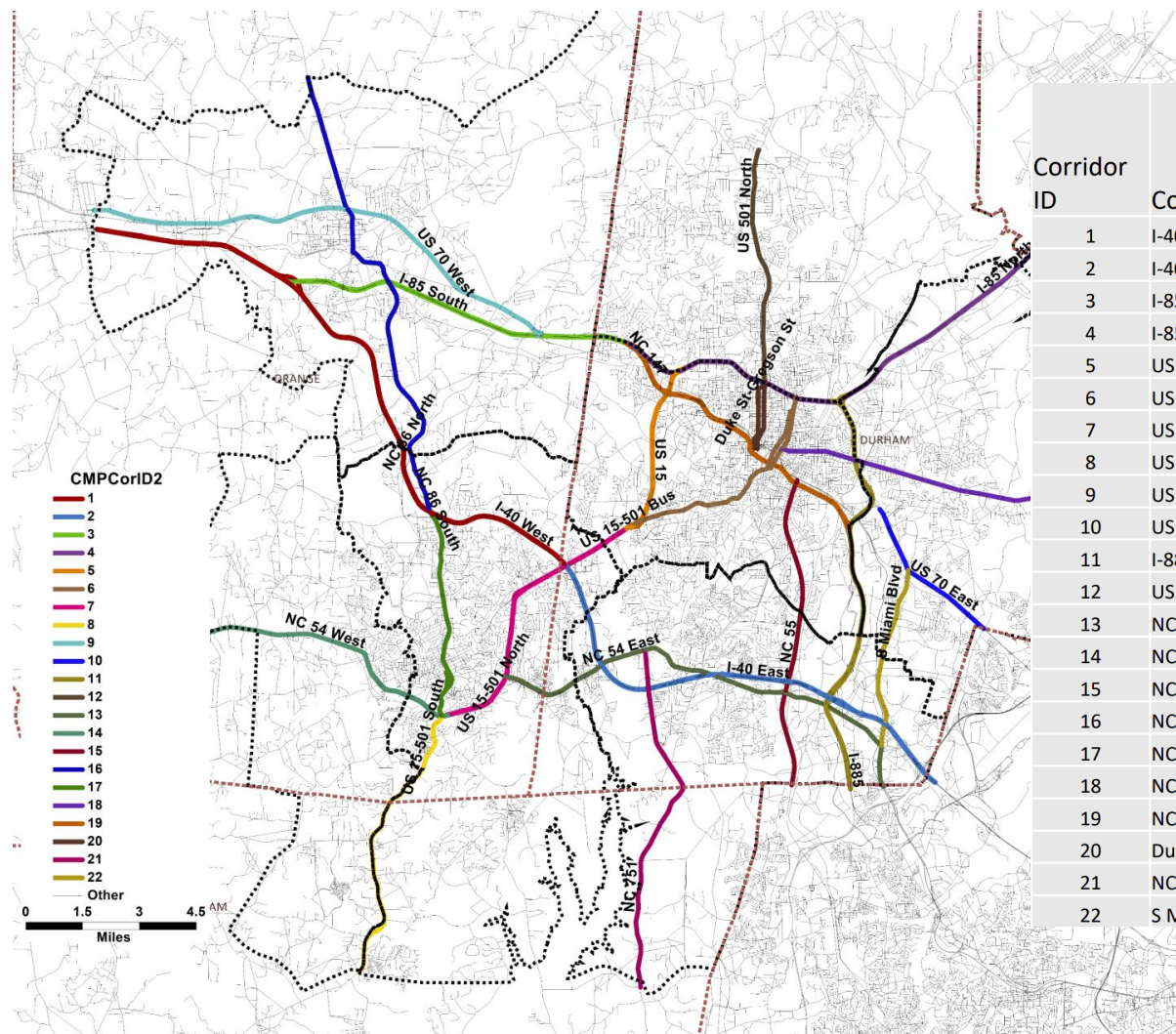


**I. Add General Purpose Lanes**

\* Adjust Signal for multi-modal trips

\*\*Transit Improvements may include, but not limited to, BRT, service frequency increase, and transit priority corridor

# Corridors



Corridor ID	Corridor Name	From	To	Length (miles)
1	I-40 West	US 15-501 (Exit 270)	MPO Boundary in Mebane (Exit 157)	17.3
2	I-40 East	US 15-501 (Exit 270)	MPO Boundary near Airport (Exit 283)	12.8
3	I-85 South	NC 147 near Durham-Orange County Line (Exit 172)	I-40 (Exit 163)	9.2
4	I-85 North	NC 147 near Durham-Orange County Line (Exit 172)	MPO Boundary at Durham-Granville County Line	12.7
5	US 15	US 15-501 Business (Exit 105)	I-85 (Exit 108)	4.8
6	US 15-501 Bus	US 15-501	I-85 (Exit 177)	6.9
7	US 15-501 North	US 15-501 Business (Exit 105)	NC 86 in Chapel Hill	7.7
8	US 15-501 South	NC 54 in Chapel Hill	MPO Boundary in Chatham County	7.6
9	US 70 West	I-85 (Exit 170)	MPO Boundary in Mebane	13.1
10	US 70 East	I-885 (Exit 288)	MPO Boundary at Durham-Wake County Line	4.3
11	I-885	I-85 (Exit 178)	MPO Boundary at Durham-Wake County Line	11.3
12	US 501 North	I-85 (Exit 176)	Bywood Dr in North Durham	6.2
13	NC 54 East	US 15-501 in Chapel Hill	MPO Boundary at Durham-Wake County Line	14.5
14	NC 54 West	NC 86 in Chapel Hill	MPO Boundary in Carrboro	7.5
15	NC 55	NC 147 (Exit 2)	MPO Boundary at Durham-Wake County Line	8.2
16	NC 86 North	I-40 (Exit 266)	MPO Boundary in North Hillsborough	12.7
17	NC 86 South	I-40 (Exit 266)	US 15-501 / NC 54 in Chapel Hill	6.2
18	NC 98	North Roxboro St in Downtown Durham	MPO Boundary at Durham-Wake County Line	10.9
19	NC 147	I-885	I-85	7.8
20	Duke St-Gregson St	NC 147 in Downtown Durham	I-85 (Exit 176)	1.9
21	NC 751	NC 54 in Durham	MPO Boundary in Chatham County	9.4
22	S Miami Blvd	NC 54 in Durham	US 70	4.8

# Safety Priority

Corridor ID	Corridor Name	Fatal Crashes (2017-2021)	A Type Injury Crashes (Disabling) (2017-2021)	B Type Injury Crashes (Evident) (2017-2021)	C Type Injury Crashes (Possible) (2017-2021)	Total Fatal and Injury Crashes (2017-2021)	Severe Crash Rate (2017-2021) (Crashes per Million VMT)	Safety Priority Score	Safety Priority Ranking
1	I-40 West	8	11	91	329	439	0.46	4	LOW
2	I-40 East	5	24	206	489	724	0.59	4	LOW
3	I-85 South	5	21	56	173	255	0.80	3	LOW-MEDIUM
4	I-85 North	7	16	120	280	423	0.70	3	LOW-MEDIUM
5	US 15	3	3	38	97	141	0.71	3	LOW-MEDIUM
6	US 15-501 Bus	1	10	99	321	431	3.67	1	HIGH
7	US 15-501 North	2	9	84	402	497	2.03	1	HIGH
8	US 15-501 South	3	4	41	92	140	0.48	4	LOW
9	US 70 West	5	10	50	122	187	1.09	2	HIGH-MEDIUM
10	US 70 East	7	18	64	190	279	1.24	2	HIGH-MEDIUM
11	I-885	4	10	55	97	166	0.37	4	LOW
12	US 501 North	9	9	90	311	419	1.69	1	HIGH
13	NC 54 East	3	22	106	315	446	1.17	2	HIGH-MEDIUM
14	NC 54 West	1	5	24	42	72	0.53	4	LOW
15	NC 55	8	21	138	282	449	1.58	1	HIGH
16	NC 86 North	1	9	39	110	159	0.82	3	LOW-MEDIUM
17	NC 86 South	2	5	34	143	184	1.38	2	HIGH-MEDIUM
18	NC 98	11	20	143	293	467	2.01	1	HIGH
19	NC 147	5	8	78	223	314	0.96	3	LOW-MEDIUM
20	Duke St-Gregson St	3	4	44	116	167	5.09	1	HIGH
21	NC 751	1	7	31	56	95	0.51	4	LOW
22	S Miami Blvd	4	7	65	123	199	1.18	2	HIGH-MEDIUM

Scores are based on crash rate quartile

# Traffic/Reliability Priority

Corridor ID	Corridor Name	Average 2019 V/C Ratio	LOS Priority Score	LOS Priority Ranking	LOTTR 2019 Worst Peak	2019 Unreliable Miles, %	LOTTR Priority Score	LOTTR Priority Ranking	Traffic Priority Score	Traffic Priority Ranking
1	I-40 West	0.74	1	HIGH	1.13	1.4%	4	LOW	3.0	LOW-MEDIUM
2	I-40 East	0.97	1	HIGH	1.68	40.2%	1	HIGH	1.0	HIGH
3	I-85 South	0.60	2	HIGH-MEDIUM	1.07	11.3%	4	LOW	3.0	LOW-MEDIUM
4	I-85 North	0.58	3	LOW-MEDIUM	1.04		4	LOW	4.0	LOW
5	US 15	0.62	2	HIGH-MEDIUM	1.08		4	LOW	3.0	LOW-MEDIUM
6	US 15-501 Bus	0.48	4	LOW	1.37	19.0%	2	HIGH-MEDIUM	3.0	LOW-MEDIUM
7	US 15-501 North	0.76	1	HIGH	1.45	24.5%	2	HIGH-MEDIUM	2.0	HIGH-MEDIUM
8	US 15-501 South	0.69	2	HIGH-MEDIUM	1.29	1.1%	4	LOW	3.0	LOW-MEDIUM
9	US 70 West	0.51	4	LOW					4.0	LOW
10	US 70 East	0.64	2	HIGH-MEDIUM	1.43	38.6%	1	HIGH	2.0	HIGH-MEDIUM
11	I-885	0.60	3	LOW-MEDIUM	1.22	28.4%	2	HIGH-MEDIUM	3.0	LOW-MEDIUM
12	US 501 North	0.69	1	HIGH	1.32	3.7%	4	LOW	3.0	LOW-MEDIUM
13	NC 54 East	0.70	1	HIGH	1.43	19.2%	2	HIGH-MEDIUM	2.0	HIGH-MEDIUM
14	NC 54 West	0.41	4	LOW	1.21	0.5%	4	LOW	4.0	LOW
15	NC 55	0.56	3	LOW-MEDIUM	1.39	17.3%	3	LOW-MEDIUM	3.0	LOW-MEDIUM
16	NC 86 North	0.52	3	LOW-MEDIUM					3.0	LOW-MEDIUM
17	NC 86 South	0.44	4	LOW	1.25	24.8%	2	HIGH-MEDIUM	3.0	LOW-MEDIUM
18	NC 98	0.49	4	LOW	1.38	15.9%	3	LOW-MEDIUM	4.0	LOW
19	NC 147	0.72	1	HIGH	1.55	20.3%	2	HIGH-MEDIUM	2.0	HIGH-MEDIUM
20	Duke St-Gregson St	0.52	4	LOW					4.0	LOW
21	NC 751	0.57	3	LOW-MEDIUM					3.0	LOW-MEDIUM
22	S Miami Blvd	0.69	2	HIGH-MEDIUM	1.40	16.3%	3	LOW-MEDIUM	3.0	LOW-MEDIUM

# Multimodal+Complete Streets Priority

Corridor ID	Corridor Name	Estimated Transit Passenger Flow in 2020	Multimodal Score	Annual Transit Boardings and Alightings and Ped-Bike Trips in 2019	Complete Streets Score	Multimodal/Complete Streets Score	Multimodal/Complete Streets Ranking
1	I-40 West	500	3			3	LOW-MEDIUM
2	I-40 East	2200	1			1	HIGH
3	I-85 South	200	4			4	LOW
4	I-85 North	100	4			4	LOW
5	US 15	1800	1			1	HIGH
6	US 15-501 Bus	1400	2	98,617	2	2	HIGH-MEDIUM
7	US 15-501 North	3700	1	13,344	3	2	HIGH-MEDIUM
8	US 15-501 South	600	3	12,220	3	3	LOW-MEDIUM
9	US 70 West	50	4	838	4	4	LOW
10	US 70 East	600	3	11,752	4	4	LOW
11	I-885	1400	2			2	HIGH-MEDIUM
12	US 501 North	300	3	44,392	3	3	LOW-MEDIUM
13	NC 54 East	3000	1	198,961	1	1	HIGH
14	NC 54 West	1300	2	157,560	1	2	HIGH-MEDIUM
15	NC 55	400	3	97,038	2	3	LOW-MEDIUM
16	NC 86 North	200	4	861	4	4	LOW
17	NC 86 South	3000	1	3,291,736	1	1	HIGH
18	NC 98	1000	2	181,058	1	2	HIGH-MEDIUM
19	NC 147	2000	1	9,772	4	3	LOW-MEDIUM
20	Duke St-Gregson St	1200	2	48,138	2	2	HIGH-MEDIUM
21	NC 751	100	4			4	LOW
22	S Miami Blvd	300	3			3	LOW-MEDIUM

Scores are based on three measure quartiles

# Implementation Priority

Corridor ID	Corridor Name	Safety Priority Score	Traffic Priority Score	Multimodal/ Complete Streets Score	Overall Score (weighted)	Overall Ranking
1	I-40 West	4	3	3	4	LOW
2	I-40 East	4	1	1	3	LOW-MEDIUM
3	I-85 South	3	3	4	3	LOW-MEDIUM
4	I-85 North	3	4	4	3	LOW-MEDIUM
5	US 15	3	3	1	3	LOW-MEDIUM
6	US 15-501 Bus	1	3	2	2	HIGH-MEDIUM
7	US 15-501 North	1	2	2	1	HIGH
8	US 15-501 South	4	3	3	4	LOW
9	US 70 West	2	4	4	3	LOW-MEDIUM
10	US 70 East	2	2	4	2	HIGH-MEDIUM
11	I-885	4	3	2	3	LOW-MEDIUM
12	US 501 North	1	3	3	2	HIGH-MEDIUM
13	NC 54 East	2	2	1	2	HIGH-MEDIUM
14	NC 54 West	4	4	2	4	LOW
15	NC 55	1	3	3	2	HIGH-MEDIUM
16	NC 86 North	3	3	4	3	LOW-MEDIUM
17	NC 86 South	2	3	1	2	HIGH-MEDIUM
18	NC 98	1	4	2	2	HIGH-MEDIUM
19	NC 147	3	2	3	3	LOW-MEDIUM
20	Duke St-Gregson St	1	4	2	2	HIGH-MEDIUM
21	NC 751	4	3	4	4	LOW
22	S Miami Blvd	2	3	3	2	HIGH-MEDIUM
	<b>WEIGHTS</b>	<b>60</b>	<b>20</b>	<b>20</b>		

Rounded weighted-average of the above three scores

Questions & Comments?  
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