Deficiency Analysis

Background

What is a Deficiency Analysis?

The Deficiency Analysis is an analysis that measures how well transportation projects with committed funding over the next 5 years will handle future population and employment growth in 2055. The analysis highlights mobility deficiencies in the region based on projected growth and assists with prioritizing where additional projects may be needed. Thus, the Deficiency Analysis shows staff, the MPO and the public where transportation investments in highways, transit and other modes are needed to address the future mobility demands. It helps to set a baseline that is used in the development and evaluation of the various transportation alternatives that will be considered in a subsequent step of the 2055 MTP development.

What Years are analyzed?

The measures and maps are based on a travel demand model that estimates conditions in two different years:

2029 Existing + Committed- This is the 2029 transportation system of streets, transit, etc., and reflects the existing transportation system plus any projects committed to construction or implementation by 2029.

2055 Growth – This is the estimated growth in population and employment through the year 2055 that uses the Existing + Committed transportation system. While somewhat unrealistic, an analysis of 2055 projected growth and its impact on a transportation system committed to be built by 2029 does help set a baseline for evaluating future mobility investments. This "no build" scenario allows us to see where future mobility deficiencies are to be expected.

Analysis Results

Analysis Visualization

The results of the deficiency analysis is reviewed across several metrics. Congestion and Travel Time are two ways our region looks at mobility for a scenario. A variety of visualization techniques are used to illustrate these mobility metrics:

"Tomato Maps"

Congestion maps, commonly referred to as "Tomato Maps" are visualizations that depict

levels of congestion on the roadway network. These maps show forecasted congestion on specific road segments and can show all day or specific times of day, typically CAMPO will show both peak period and off-peak times for comparison. These types of maps show a comparison of the anticipated volume to the designed capacity of the facility, also known as a "V/C ratio". This ratio is traffic volume divided by the traffic capacity of the road segment. (For example, a volume of 9,000 vehicles on a road that is capable of carrying 10,000 vehicles will produce a V/C of 0.9).

Travel Time Maps

Travel time maps use isochrones, or "contours" to estimate the distance that can be traveled via travel "bands" of 20 minutes (0-20, 20-40, etc.). This analysis uses downtown Raleigh, downtown Durham and Raleigh-Durham International Airport (RDU) to show travel time during peak periods in the Deficiency Analysis scenario and illustrates corridor and small area mobility.

What is the Next Step?

With the MPO's Goals and Objectives in mind, staff will use the deficiency data to create several alternatives to meet the future travel demand. This Alternatives Analysis is the next step after Deficiency Analysis in the development of the 2055 MTP and will be released in the coming months.

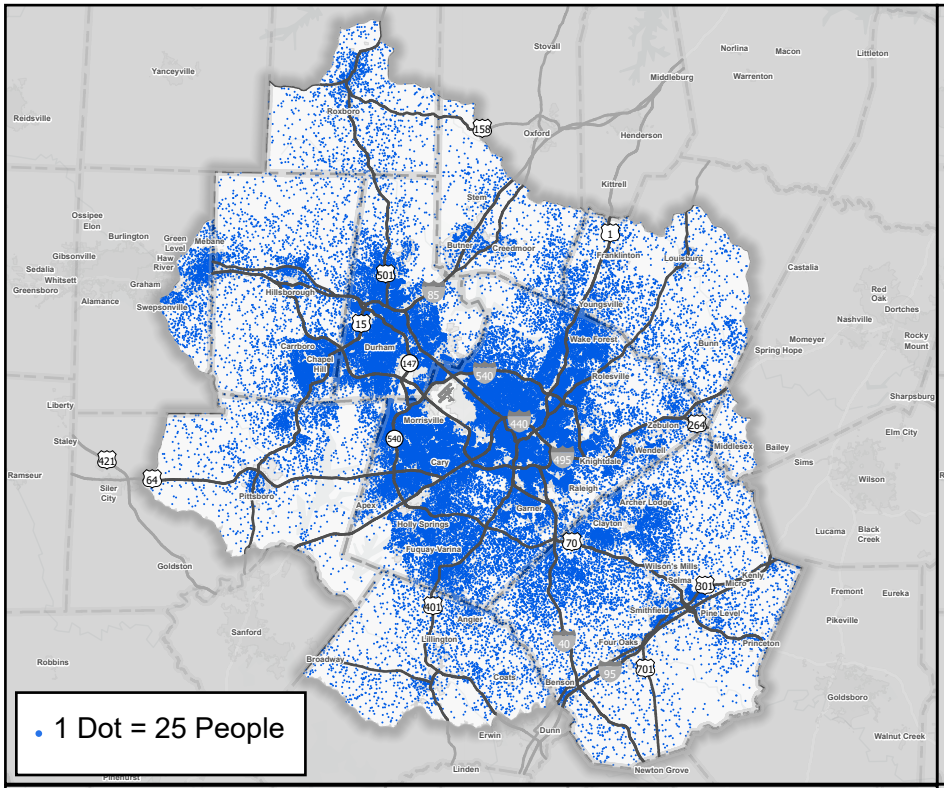
Maps for Deficiency and Needs Analysis – ArcGIS Online or Static PDF			
Model Year	**Primary Data Description**	**Secondary Data Descriptor**	**Interactive or Static Map**
Base Year (2020)	Transit Network		Interactive
Existing + Committed (2055)	Transit Network		Interactive
Base Year (2020)	Household Population (SE Data) by TAZ		Interactive
Deficiency and Needs (2055)	Household Population (SE Data) by TAZ		Interactive
Base Year (2020)	Employment (SE Data) by TAZ		Interactive
Deficiency and Needs (2055)	Employment (SE Data) by TAZ		Interactive
Base Year (2020)	Dot Density – Employment		PDF
Deficiency and Needs (2055)	Dot Density – Household Population		PDF
Base Year (2020)	Congestion (“Tomato” Map) Highway Network		Both
Existing + Committed (2055)	Congestion (“Tomato” Map) Highway Network		Both
Base Year (2020)	Travel Time Isochrone: Inbound during Morning Peak	RDU Airport	Interactive
Base Year (2020)	Travel Time Isochrone: Outbound during Evening Peak	RDU Airport	Interactive
Base Year (2020)	Travel Time Isochrone – Average Daily Peak	RDU Airport	PDF
Existing + Committed (2055)	Travel Time Isochrone: Inbound during Morning Peak	RDU Airport	Interactive
Existing + Committed (2055)	Travel Time Isochrone: Outbound during Evening Peak	RDU Airport	Interactive
Existing + Committed (2055)	Travel Time Isochrone – Average Daily Peak	RDU Airport	PDF
Base Year (2020)	Travel Time Isochrone: Inbound during Morning Peak	Downtown Raleigh	Interactive
Base Year (2020)	Travel Time Isochrone: Outbound during Evening Peak	Downtown Raleigh	Interactive
Base Year (2020)	Travel Time Isochrone – Average Daily Peak	Downtown Raleigh	PDF
Existing + Committed (2055)	Travel Time Isochrone: Inbound during Morning Peak	Downtown Raleigh	Interactive
Existing + Committed (2055)	Travel Time Isochrone: Outbound during Evening Peak	Downtown Raleigh	Interactive
Existing + Committed (2055)	Travel Time Isochrone – Average Daily Peak	Downtown Raleigh	PDF
Base Year (2020)	Travel Time Isochrone: Inbound during Morning Peak	Downtown Durham	Interactive
Base Year (2020)	Travel Time Isochrone: Outbound during Evening Peak	Downtown Durham	Interactive
Base Year (2020)	Travel Time Isochrone – Average Daily Peak	Downtown Durham	PDF
Existing + Committed (2055)	Travel Time Isochrone: Inbound during Morning Peak	Downtown Durham	Interactive
Existing + Committed (2055)	Travel Time Isochrone: Outbound during Evening Peak	Downtown Durham	Interactive
Existing + Committed (2055)	Travel Time Isochrone – Average Daily Peak	Downtown Durham	PDF

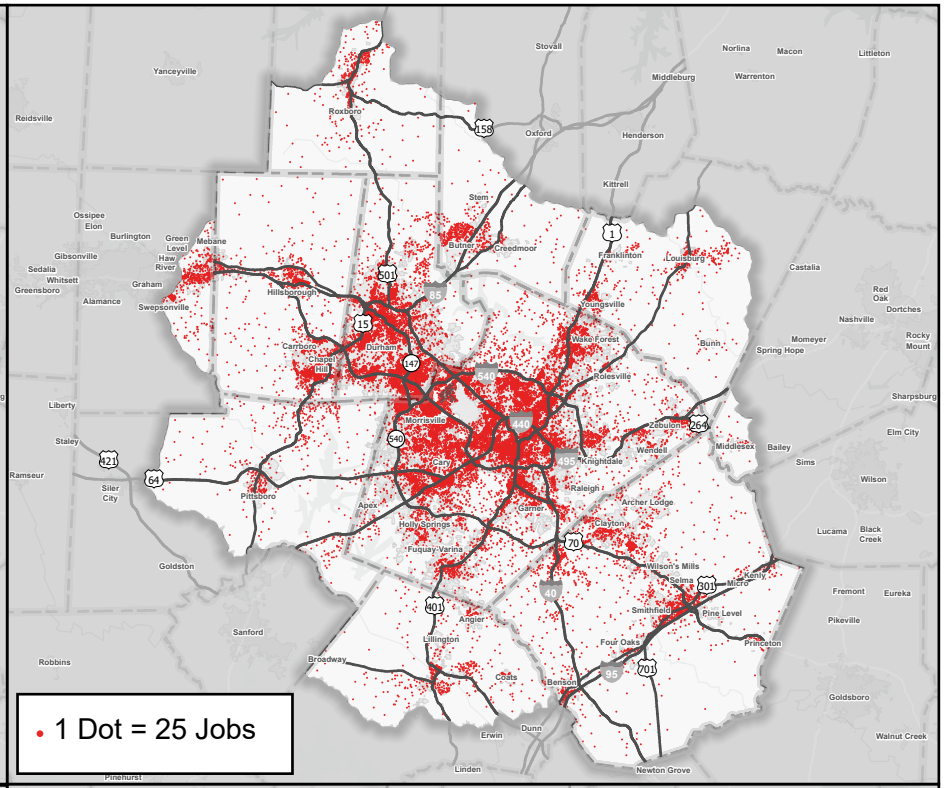
Household Population

Employment

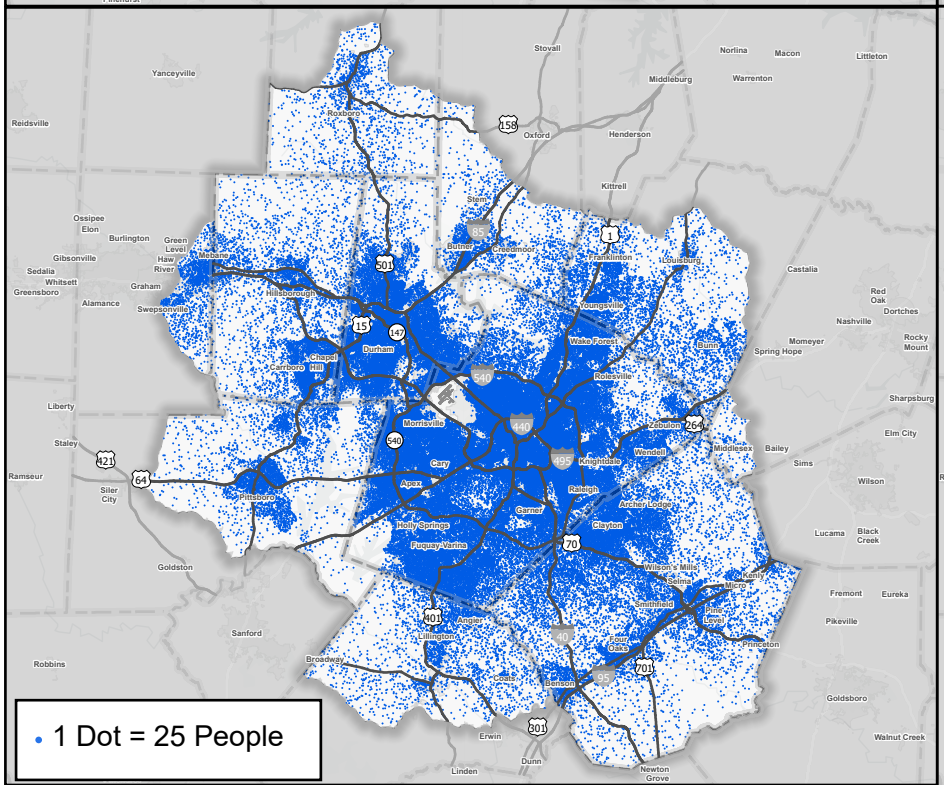
Deficiency and Needs Scenario

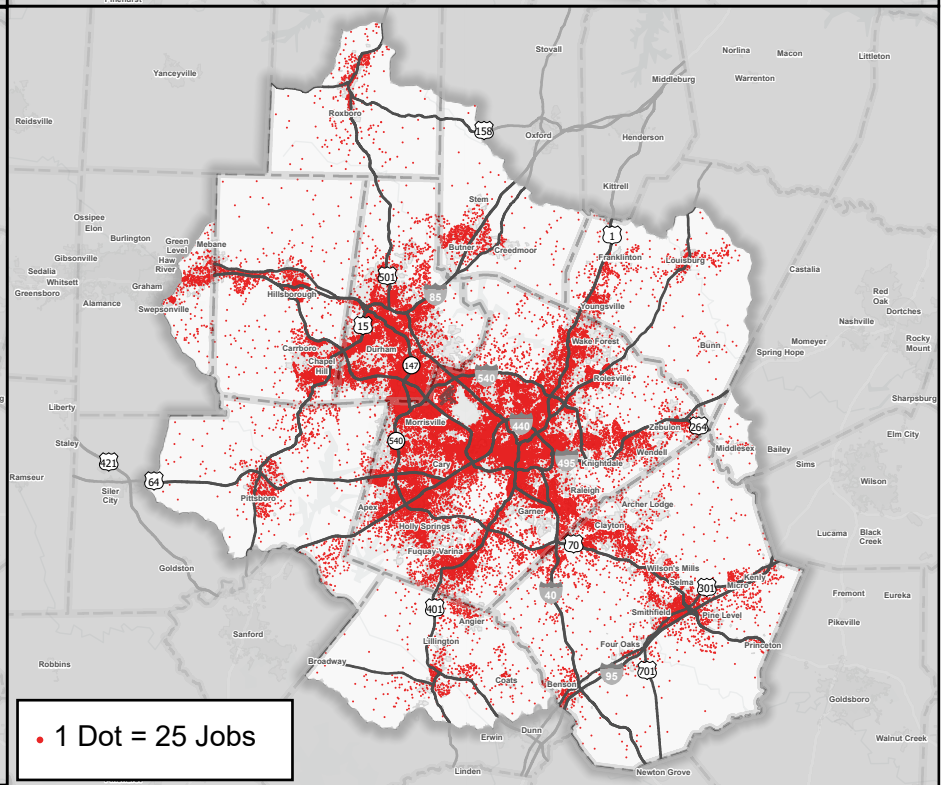
2020





2055





N

0 10 Miles

Vehicle Congestion Regional Forecast

2020 Base Year: Daily Peak Period

TRIANGLE WEST Transportation Planning Organization

CAMPO

Miles

0 5 10

N

Note: The Capital Area Metropolitan Planning Organization, in cooperation with other mapping organizations, is committed to offering its users accurate, useful, and current information about the Region. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sources used to develop the database may be reflected in the map and/or data supplied. The user must be aware of data conditions and bear responsibility for the appropriate use of the information with respect to possible errors, original map scale, collection methodology, currency of data, and other conditions specific to certain data.

Congestion
Volume / Capacity
- 0.00 to 0.80
- 0.80 to 1.00
- 1.00+

Total Daily Volume
# of Vehicles
- 18,750
- 37,500
- 75,000+

Joint MPO Border

Author: CAMPO GIS Staff Date: 4/17/2025 Data: CAMPO, NCDOT, Wake, Harnett, Franklin, Johnston, Chatham, Granville Counties

Vehicle Congestion
Existing + Committed Scenario
Regional Forecast
2055: Daily Peak Period

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
0 5 10

N

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Joint MPO Border

Author: CAMPO GIS Staff Date: 4/17/2025 Data: CAMPO, NCDOT, Wake, Harnett, Franklin, Johnston, Chatham, Granville Counties

Travel Time Forecast RDU
Current Conditions (2020)

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
0 5 10

N

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Peak Period Travel Time

Minutes (AM Inbound)

- 20.00
- 20.01 - 40.00
- 40.01 - 60.00
- 60.01 - 80.00
- Base Year 2020 Road Network

Author: CAMPO GIS Staff Date: 4/17/2025 Data: CAMPO, NCDOT, Wake, Harnett, Franklin, Johnston, Chatham, Granville Counties

Travel Time Forecast RDU
Existing + Committed Scenario
2055 Horizon

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
0 5 10

N

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AM Inbound Travel Time

Minutes

- 20.00
- 20.01 - 40.00
- 40.01 - 60.00
- 60.01 - 80.00
- 2055 Horizon Road Network

Author: CAMPO GIS Staff Date: 4/21/2025 Data: CAMPO, NCDOT, Wake, Harnett, Franklin, Johnston, Chatham, Granville Counties

Travel Time Forecast Raleigh Current Conditions (2020)

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
0 5 10

N

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Travel Time Forecast Raleigh
Existing + Committed Scenario
2055 Horizon

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
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Author: CAMPO GIS Staff Date: 4/21/2025 Data: CAMPO, NCDOT, Wake, Harnett, Franklin, Johnston, Chatham, Granville Counties

Travel Time Forecast Durham
Current Conditions (2020)

TRIANGLE WEST
Transportation Planning Organization

CAMPO

Miles
0 5 10

N

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Travel Time Forecast Durham
Existing + Committed Scenario
2055 Horizon

TRIANGLE WEST
Transportation Planning Organization

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Miles
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