The completion of the 2040 Metropolitan Transportation Plan (MTP) marks nearly 50 years since the first Memorandum of Understanding was adopted to establish a formal transportation planning process for the Charlotte region. Population growth over time has led to the continuous expansion of the Metropolitan Planning Organization boundary, and has increased the demand for transportation investments that are vital to future prosperity.

As you read and review the information in this MTP, consider the importance of transportation as growth continues, and how, together, we can play a role to influence transportation planning for the future benefit of the region.
RESOLUTION


WHEREAS, the Charlotte Regional Transportation Planning Organization (CRTPO) is the duly recognized decision-making body for the 3-C transportation planning process for the Charlotte urbanized area; and

WHEREAS, the CRTPO 2040 Metropolitan Transportation Plan meets the planning requirements of 23 CFR Part 450.322; and

WHEREAS, the CRTPO 2012-2018 Transportation Improvement Program is a direct subset of the 2040 Metropolitan Transportation Plan; and

WHEREAS, the United States Environmental Protection Agency designated the CRTPO as a marginal non-attainment area for the 2008 ozone standard effective on July 20, 2012; and

WHEREAS, the transportation conformity analysis of the CRTPO 2040 Metropolitan Transportation Plan is based on the most recent estimates of population, employment, travel and congestion; and

WHEREAS, the CRTPO 2040 Metropolitan Transportation Plan is financially constrained; and

WHEREAS, there are no transportation control measures in the North Carolina State Implementation Plan (SIP) that pertain to the CRTPO planning area; and

WHEREAS, the most recent vehicle emissions model was used to prepare the quantitative emissions analysis; and

WHEREAS, those project and programs included in the CRTPO 2040 Metropolitan Transportation Plan contribute to annual emissions reductions as shown by the quantitative emissions analysis.

NOW, THEREFORE BE IT RESOLVED that the Charlotte Regional Transportation Planning Organization finds that both the 2040 Metropolitan Transportation Plan and the 2012-2018 Transportation Improvement Program conform to the purpose of the North Carolina State Implementation Plan (or base year emissions, in areas where no State Implementation Plan is approved for found adequate by the EPA) in accordance with the Clean Air Act as Amended and MAP-21 on this the 16th day of April, 2014.

I, Sarah McAulay, Chairwoman of the Charlotte Regional Transportation Planning Organization, do hereby certify that the above is a true and correct copy of an excerpt from the minutes of a meeting of the Charlotte Regional Transportation Planning Organization, duly held on this the 16th day of April, 2014.

Sarah McAulay, Chairwoman

Robert W. Cook, Secretary
RESOLUTION

ADOPTED BY THE CHARLOTTE REGIONAL TRANSPORTATION PLANNING ORGANIZATION APPROVING THE 2040 METROPOLITAN TRANSPORTATION PLAN

WHEREAS, the Charlotte Regional Transportation Planning Organization (CRTPO) and the North Carolina Department of Transportation (NCDOT) are actively involved in transportation planning for the CRTPO planning area; and

WHEREAS, the CRTPO policy board is the duly recognized transportation decision-making body for the 3-C transportation planning process for the Charlotte urbanized area pursuant to 23 CFR Part 134; and

WHEREAS, the CRTPO Technical Coordinating Committee (TCC) and policy board have prepared an update to the 2035 Long Range Transportation Plan for the CRTPO; and

WHEREAS, it is recognized that the proper movement of traffic within and through the CRTPO is a highly desirable element of the 2040 Metropolitan Transportation Plan for the orderly growth and development of the region; and

WHEREAS, after the full study of the updated 2035 Long Range Transportation Plan the policy board of the CRTPO finds that the 2040 Metropolitan Transportation Plan meets the goals and objectives for the CRTPO; and

WHEREAS, after the full study the CRTPO finds that the updated 2040 Metropolitan Transportation Plan meets the requirements of the Moving Ahead for Progress in the 21st Century (MAP-21) act; and

WHEREAS, the 2040 Metropolitan Transportation Plan has at least a 20-year horizon and is fiscally constrained pursuant to 23 CFR Part 450 322; and

WHEREAS, the public has had the opportunity to review and comment on the 2040 Metropolitan Transportation Plan through public meetings and document sharing.

NOW THEREFORE BE IT RESOLVED that the Charlotte Regional Transportation Planning Organization approves and endorses the 2040 Metropolitan Transportation Plan as prepared by the Technical Coordinating Committee, policy board and the North Carolina Department of Transportation on this the 16th day of April, 2014.

I, Sarah McAulay, Chairwoman of the Charlotte Regional Transportation Planning Organization, do hereby certify that the above is a true and correct copy of an excerpt from the minutes of a meeting of the Charlotte Regional Transportation Planning Organization, duly held on this the 16th day of April, 2014.

Sarah McAulay, Chairwoman

Robert W. Cook, Secretary
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Acknowledgements

The Charlotte Regional Transportation Planning Organization (CRTPO) relies on staff from throughout the planning area, with various areas of specialty to contribute to the transportation planning efforts of the Metropolitan Planning Organization (MPO), including the development of the Metropolitan Transportation Plan (MTP). Two committees were formed when work to update the MTP first began, the MTP Advisory Committee and the MTP Steering Committee. The Advisory Committee consists of several Technical Coordinating Committee (TCC) members, as well as staff with expertise in planning disciplines specifically related to content contained in the MTP. The Steering Committee is made up of a core team of principal MPO staff members. Without the efforts of both committees, this 2040 MTP could not be accomplished. For the efforts of those representing both committees, the CRTPO staff is sincerely grateful.

### MTP Steering Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stuart Basham</td>
<td>CRTPO</td>
</tr>
<tr>
<td>Robert Cook</td>
<td>CRTPO</td>
</tr>
<tr>
<td>Anna Gallup</td>
<td>Charlotte DOT</td>
</tr>
<tr>
<td>Curtis Bridges</td>
<td>CRTPO</td>
</tr>
<tr>
<td>Andy Grzymski</td>
<td>Charlotte DOT</td>
</tr>
<tr>
<td>Nick Landa</td>
<td>CRTPO</td>
</tr>
</tbody>
</table>

### MTP Advisory Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loretta Barren</td>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>Chris Matthews</td>
<td>Mecklenburg County Natural Resources</td>
</tr>
<tr>
<td>Neil Burke</td>
<td>Town of Mooresville</td>
</tr>
<tr>
<td>Don Ceccarelli</td>
<td>Mecklenburg County Water Quality</td>
</tr>
<tr>
<td>David McDonald</td>
<td>Charlotte Area Transit System</td>
</tr>
<tr>
<td>Ralph Messer</td>
<td>Town of Matthews</td>
</tr>
<tr>
<td>Phil Collins</td>
<td>City of Statesville</td>
</tr>
<tr>
<td>Ben Miller</td>
<td>Charlotte DOT, Bicycle Division</td>
</tr>
<tr>
<td>Gwen Cook</td>
<td>Mecklenburg County Park &amp; Recreation</td>
</tr>
<tr>
<td>Eric Moore</td>
<td>Mecklenburg County Air Quality</td>
</tr>
<tr>
<td>Scott Correll</td>
<td>Charlotte DOT, Pedestrian Division</td>
</tr>
<tr>
<td>Anil Panicker</td>
<td>NCDOT, Transportation Planning Branch</td>
</tr>
<tr>
<td>Bill Coxe</td>
<td>Town of Huntersville</td>
</tr>
<tr>
<td>Keith Sorensen</td>
<td>Town of Indian Trail</td>
</tr>
<tr>
<td>Bjorn Hansen</td>
<td>Centralina Council of Governments</td>
</tr>
<tr>
<td>Kenneth Tippette</td>
<td>Charlotte DOT, Bicycle Division</td>
</tr>
<tr>
<td>Eldewins Haynes</td>
<td>Charlotte DOT</td>
</tr>
<tr>
<td>Andrew Ventresca</td>
<td>Iredell County Planning</td>
</tr>
<tr>
<td>Katherine Hebert</td>
<td>Town of Davidson</td>
</tr>
<tr>
<td>Jason Wager</td>
<td>Centralina Council of Governments</td>
</tr>
<tr>
<td>David Keelson</td>
<td>NCDOT, Division 12</td>
</tr>
<tr>
<td>Will Washam</td>
<td>Town of Cornelius</td>
</tr>
<tr>
<td>Dennis LaCaria</td>
<td>Charlotte-Mecklenburg Schools</td>
</tr>
<tr>
<td>Jonathan Wells</td>
<td>Charlotte-Mecklenburg Planning</td>
</tr>
<tr>
<td>Joe Lesch</td>
<td>Union County Planning</td>
</tr>
<tr>
<td>Dick Winters</td>
<td>Mecklenburg County Health</td>
</tr>
</tbody>
</table>

### RS&H Architects-Engineers-Planners, Inc.

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy Coons</td>
<td>Ashley Hemmings</td>
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<tr>
<td>Beverly Davis</td>
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<td>Radha Krishna Swayampakala</td>
</tr>
</tbody>
</table>

### Kimley-Horn & Associates

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandy Alles</td>
<td>Jenny Hawkins</td>
<td>Rob Hume</td>
</tr>
</tbody>
</table>
List of Acronyms

AASHTO........... American Association of State Highway and Transportation Officials
BLE................ Blue Line Extension
CAA............... Clean Air Act
CAAA.............. Clean Air Act Amendments
CBD............... Central Business District
CCCEP............. Charlotte Center City Evacuation Plan
CCOG............... Centralina Council of Governments
CDOT.............. Charlotte Department of Transportation
CMAQ.............. Congestion Mitigation and Air Quality
CMEMO............. Charlotte-Mecklenburg Emergency Management Office
CMP............... Congestion Management Process
CMPD.............. Charlotte-Mecklenburg Police Department
CMS............... Charlotte-Mecklenburg Schools
CO₂............... Carbon Dioxide
CO............... Carbon Monoxide
CRAFT............. Charlotte Regional Alliance for Transportation
CRTPO............. Charlotte Regional Transportation Planning Organization
CSA............... Combined Statistical Area
CTP............... Comprehensive Transportation Plan
ECHS.............. Executive Committee for Highway Safety
ECOM.............. Emergency Communications (Animal Control)
EJ.................. Environmental Justice
EMS............... Emergency Medical Services
EOP............... Emergency Operations Plan
EPA............... Environmental Protection Agency
FEMA............... Federal Emergency Management Agency
FHWA............... Federal Highway Administration
FTA............... Federal Transit Administration
GARVEE............ Grant Anticipation Revenue Vehicle (funding)
GHG............... Greenhouse Gas
HIA............... Health Impact Assessment
HOT............... High Occupancy Toll (lanes)
HOV............... High Occupancy Vehicle (lanes)
HSIP............... Highway Safety Improvement Program
ICATS............. Iredell County Area Transportation System
LEP............... Limited English Proficiency
LNRPO............. Lake Norman Rural Planning Organization
LRTP............... Long Range Transportation Plan
MAP-21............ Moving Ahead for Progress in the 21st Century
MOU............... Memorandum of Understanding
MPO............... Metropolitan Planning Organization
MSA............... Metropolitan Statistical Area
MTC............... Metropolitan Transit Commission
MTP............... Metropolitan Transportation Plan
MUMPO............ Mecklenburg-Union Metropolitan Planning Organization
NAAQS............. National Ambient Air Quality Standards
NC DENR.......... North Carolina Department of Environment and Natural Resources
NCDOT.......... North Carolina Department of Transportation
NHS............... National Highway System
NOx............... Oxides of Nitrogen
PIP............... Public Involvement Plan
RPO............... Rural Planning Organization
SAFETEA-LU....... Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SHSP............... Strategic Highway Safety Plan
SIP............... State Implementation Plan
SPOT............... Strategic Planning Office of Transportation
STI............... Strategic Transportation Investments
STIP............... Statewide Transportation Improvement Program
STP-DA............ Surface Transportation Program-Direct Attributable (funding)
STRAHNET....... Strategic Highway Network
TAZ............... Transportation Analysis Zone
TCC............... Technical Coordinating Committee
TIP............... Transportation Improvement Program
TMA............... Transportation Management Area
TOD............... Transit Oriented Development
USDG............. Urban Street Design Guidelines
USDOT.......... United States Department of Transportation
UZA............... Urbanized Area
VMT............... Vehicle Miles Traveled
# Table of Contents

- **Overview**
- **Chapter 1**
  - Introduction
- **Chapter 2**
  - Goals and Objectives
- **Chapter 3**
  - Planning Factors
- **Chapter 4**
  - Public Involvement
- **Chapter 5**
  - Environmental Justice
- **Chapter 6**
  - Safety and Security
- **Chapter 7**
  - Environment
- **Chapter 8**
  - Health Impacts
- **Chapter 9**
  - Population and Land Use
- **Chapter 10**
  - Travel Patterns and Travel Demand Model
- **Chapter 11**
  - Financial Plan
- **Chapter 12**
  - Congestion Management
- **Chapter 13**
  - Streets and Highways
- **Chapter 14**
  - Public Transportation
- **Chapter 15**
  - Bicycle, Pedestrian, and Greenway
- **Chapter 16**
  - Other Transportation Modes
- **Chapter 17**
  - Freight
- **Chapter 18**
  - Conclusion
- **Appendix A**
  - Public Involvement
- **Appendix B**
  - Congestion Management Process
- **Appendix C**
  - Project Evaluation
- **Appendix D**
  - Fiscally Constrained Project Datasheets
List of Figures

1-1 .................. CRTPO Jurisdictions
1-2 .................. Adjacent MPOs/RPOs
5-1 .................. Low Income Population - Fiscally Constrained Projects
5-2 .................. Low Income Population - CATS Corridor System Plan
5-3 .................. Low Income Population - Bicycle, Pedestrian, and Greenway
5-4 .................. Black Population - Fiscally Constrained Projects
5-5 .................. Black Population - CATS Corridor System Plan
5-6 .................. Black Population - Bicycle, Pedestrian, and Greenway
5-7 .................. Hispanic Population - Fiscally Constrained Projects
5-8 .................. Hispanic Population - CATS Corridor System Plan
5-9 .................. Hispanic Population - Bicycle, Pedestrian, and Greenway
5-10 ................. Asian-American Population - Fiscally Constrained Projects
5-11 ................. Asian-American Population - CATS Corridor System Plan
5-12 ................. Asian-American Population - Bicycle, Pedestrian, and Greenway
5-13 ................. American Indian and Alaskan Native Population - Fiscally Constrained Projects
5-14 ................. American Indian and Alaskan Native Population - CATS Corridor System Plan
5-15 ................. American Indian and Alaskan Native Population - Bicycle, Pedestrian, and Greenway
5-16 ................. Limited English Proficiency Population - Fiscally Constrained Projects
5-17 ................. Limited English Proficiency Population - CATS Corridor System Plan
5-18 ................. Limited English Proficiency Population - Bicycle, Pedestrian, and Greenway
5-19 ................. Environmental Justice Degree of Impact Analysis
7-1 .................. Environmental Features
7-2 .................. Air Quality Non-Attainment Area
9-1 .................. Metrolina Modeling Region
9-2 .................. Sub-County Districts
9-3 .................. 2010 Population Density by Sub-County District
9-4 .................. 2040 Population Density by Sub-County District
9-5 .................. Annual Growth Rate - Population Density
9-6 .................. 2010 Employment Density by Sub-County District
9-7 .................. 2040 Employment Density by Sub-County District
9-8 .................. Annual Growth Rate - Employment Density
10-1 ................. Average Commute Time
11-1 ................. Strategic Transportation Investments (STI) Roadway Categories
12-1 .................. CMP Study Area
13-1 ................. Existing and Committed Projects
13-2 ................. Fiscally Constrained Projects - 2015 Horizon Year
List of Figures (continued)

13-3 ................. Fiscal Constraining Projects - 2025 Horizon Year
13-4 ................. Fiscal Constraining Projects - 2030 Horizon Year
13-5 ................. Fiscal Constraining Projects - 2040 Horizon Year
14-1 ................. CATS Existing Bus Routes
14-2 ................. 2030 CATS System Map
15-1 ................. Bike Cycle Stations
15-2 ................. Lake Norman Bike Route
15-3 ................. Funded Bicycle, Pedestrian, and Greenway Projects
15-4 ................. Unfunded Bicycle, Pedestrian, and Greenway Projects
16-1 ................. Other Transportation Modes
17-1 ................. Charlotte CSA Region
17-2 ................. Freight, Rail, and Intermodal Freight Facilities
17-3 ................. Truck Traffic Volume
17-4 ................. Charlotte CSA Region Rail Lines
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-1</td>
<td>Stormwater Regulations by County</td>
<td>7-8</td>
</tr>
<tr>
<td>7-2</td>
<td>Potential Mitigation Strategies</td>
<td>7-13</td>
</tr>
<tr>
<td>9-1</td>
<td>Population and Employment, 2010</td>
<td>9-2</td>
</tr>
<tr>
<td>9-2</td>
<td>Population Projections by County</td>
<td>9-5</td>
</tr>
<tr>
<td>9-3</td>
<td>Population Projections by Sub-County District</td>
<td>9-6</td>
</tr>
<tr>
<td>9-4</td>
<td>Employment Projections by County</td>
<td>9-7</td>
</tr>
<tr>
<td>9-5</td>
<td>Employment Projections by Sub-County District</td>
<td>9-8</td>
</tr>
<tr>
<td>9-6</td>
<td>K-12 School Enrollment by County</td>
<td>9-9</td>
</tr>
<tr>
<td>9-7</td>
<td>K-12 School Enrollment by Sub-County District</td>
<td>9-10</td>
</tr>
<tr>
<td>10-1</td>
<td>2007-2011 Annual Hours of Delay per Auto Commuter</td>
<td>10-5</td>
</tr>
<tr>
<td>10-2</td>
<td>2007-2011 Annual Congestion Costs per Auto Commuter</td>
<td>10-5</td>
</tr>
<tr>
<td>10-3</td>
<td>Number of Traffic Analysis Zones by County</td>
<td>10-6</td>
</tr>
<tr>
<td>10-4</td>
<td>Mecklenburg County Person Trips</td>
<td>10-8</td>
</tr>
<tr>
<td>10-5</td>
<td>Union County Person Trips (CRTPO portion only)</td>
<td>10-8</td>
</tr>
<tr>
<td>10-6</td>
<td>Iredell County Person Trips (CRTPO portion only)</td>
<td>10-8</td>
</tr>
<tr>
<td>10-7</td>
<td>Daily County to County Vehicle Trips</td>
<td>10-9</td>
</tr>
<tr>
<td>10-8</td>
<td>Daily Vehicle Miles Traveled in Mecklenburg County</td>
<td>10-10</td>
</tr>
<tr>
<td>10-9</td>
<td>Daily Vehicle Miles Traveled in Union County (CRTPO portion only)</td>
<td>10-10</td>
</tr>
<tr>
<td>10-10</td>
<td>Daily Vehicle Miles Traveled in Iredell County (CRTPO portion only)</td>
<td>10-11</td>
</tr>
<tr>
<td>10-11</td>
<td>CATS Daily Transit Vehicle Service Miles</td>
<td>10-11</td>
</tr>
<tr>
<td>10-12</td>
<td>CATS Daily Weekday Transit Rides</td>
<td>10-12</td>
</tr>
<tr>
<td>10-13</td>
<td>Roadway Lane Miles in Mecklenburg County</td>
<td>10-13</td>
</tr>
<tr>
<td>10-14</td>
<td>Roadway Lane Miles in Union County (CRTPO portion only)</td>
<td>10-13</td>
</tr>
<tr>
<td>10-15</td>
<td>Roadway Lane Miles in Iredell County (CRTPO portion only)</td>
<td>10-13</td>
</tr>
<tr>
<td>11-1</td>
<td>STI Eligible Projects</td>
<td>11-3</td>
</tr>
<tr>
<td>11-2</td>
<td>Anticipated Total Revenues by Funding Category</td>
<td>11-4</td>
</tr>
<tr>
<td>11-3</td>
<td>Anticipated Revenues by Funding Source 2016-2040 (in millions)</td>
<td>11-11</td>
</tr>
<tr>
<td>11-4</td>
<td>Anticipated Capital Revenues by Mode 2016-2040 (in millions)</td>
<td>11-11</td>
</tr>
<tr>
<td>11-5</td>
<td>Anticipated Federal and State Roadway Revenues by STI Category (in millions)</td>
<td>11-12</td>
</tr>
<tr>
<td>11-6</td>
<td>Anticipated Local Roadway Revenues 2016-2040 (in millions)</td>
<td>11-12</td>
</tr>
<tr>
<td>11-7</td>
<td>Anticipated CATS Transit Expenses and Revenues 2014-2040</td>
<td>11-14</td>
</tr>
<tr>
<td>12-1</td>
<td>CMP Task Force Members</td>
<td>12-5</td>
</tr>
<tr>
<td>12-2</td>
<td>CMP Performance Measures</td>
<td>12-7</td>
</tr>
<tr>
<td>12-3</td>
<td>Existing Conditions Congestion Levels - INRIX Data</td>
<td>12-8</td>
</tr>
<tr>
<td>12-4</td>
<td>Existing and Future Conditions Congestion Levels Travel Demand Model Data</td>
<td>12-9</td>
</tr>
<tr>
<td>12-5</td>
<td>CRTPO Three Year Average Crash Rates (Years 2009-2011)</td>
<td>12-9</td>
</tr>
</tbody>
</table>

2040 Metropolitan Transportation Plan (MTP)
<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-6</td>
<td>Congestion Management Strategies - Freeways</td>
<td>12-12</td>
</tr>
<tr>
<td>12-7</td>
<td>Congestion Management Strategies - Non-Freeways</td>
<td>12-13</td>
</tr>
<tr>
<td>12-8</td>
<td>Congestion Management Strategies - Regional</td>
<td>12-14</td>
</tr>
<tr>
<td>13-1</td>
<td>Maintenance Responsibilities for Roadways</td>
<td>13-2</td>
</tr>
<tr>
<td>13-2</td>
<td>Managed Lanes Projects - Construction Costs and STI Subsidies</td>
<td>13-4</td>
</tr>
<tr>
<td>13-4</td>
<td>Existing and Committed Roadway Projects</td>
<td>13-11</td>
</tr>
<tr>
<td>13-5</td>
<td>Horizon Year 2015 Fiscally Constrained Roadway Projects</td>
<td>13-14</td>
</tr>
<tr>
<td>13-6</td>
<td>Horizon Year 2025 Fiscally Constrained Roadway Projects</td>
<td>13-15</td>
</tr>
<tr>
<td>13-7</td>
<td>Horizon Year 2030 Fiscally Constrained Roadway Projects</td>
<td>13-20</td>
</tr>
<tr>
<td>13-8</td>
<td>Horizon Year 2040 Fiscally Constrained Roadway Projects</td>
<td>13-21</td>
</tr>
<tr>
<td>15-1</td>
<td>Bicycle Initiatives in CRTPO Municipalities</td>
<td>15-7</td>
</tr>
<tr>
<td>15-2</td>
<td>Pedestrian Initiatives in CRTPO Municipalities</td>
<td>15-9</td>
</tr>
<tr>
<td>15-3</td>
<td>Greenway Initiatives in CRTPO Municipalities</td>
<td>15-10</td>
</tr>
<tr>
<td>15-4</td>
<td>Funded Bicycle, Pedestrian, and Greenway Projects</td>
<td>15-14</td>
</tr>
<tr>
<td>15-5</td>
<td>Unfunded Bicycle, Pedestrian, and Greenway Projects</td>
<td>15-15</td>
</tr>
<tr>
<td>17-1</td>
<td>Charlotte CSA Region Freight 2011 and 2040</td>
<td>17-3</td>
</tr>
</tbody>
</table>
List of Charts

7-1 .................. Metrolina Annual Ozone Trend ..............................................................7-3
7-2 .................. Projected Trend of Mecklenburg County VMT, Population, and NOX Emissions ..........7-4
9-1 .................. Population Projections by Sub-County District ........................................9-6
9-2 .................. Employment Projections by Sub-County District .......................................9-8
9-3 .................. K-12 School Enrollment by Sub-County District .........................................9-10
Overview

The 2040 Metropolitan Transportation Plan (MTP) is a long range vision for the Charlotte Urbanized Area (UZA) focusing on transportation needs, demographics, economic indicators, the environment, and challenges that lie ahead. The MTP is prepared by the Charlotte Regional Transportation Planning Organization (CRTPO) and is updated at least every four years. What is particularly noticeable about this plan update is how much the Charlotte region continues to grow and change.

Throughout the development of the MTP, as well as all planning efforts associated with the allocation and implementation of transportation funds, public involvement is a key component. Numerous outreach activities were undertaken throughout the MTP update process. Public engagement is a valuable and necessary part of the process, including specific outreach efforts to engage traditionally underserved populations.
Changes...

Since the last plan update the MPO for the Charlotte region has increased substantially in both population and size, and now includes additional membership that was not part of the MPO process in years past. For the last two decades, the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) was the MPO responsible for long range transportation planning for the Charlotte region, which included only Mecklenburg County and a portion of Union County. Following the 2010 Census, the Charlotte Urbanized Area grew substantially. As a result, the MPO boundary also grew to take in much of Iredell County, to the north of Mecklenburg County, as well as a larger portion of Union County. The CRTPO is now the MPO representing the diverse people, jobs, and land uses contained within the MPO’s geography, which is one of the fastest growing regions in the country, and represents the largest economy in the state of North Carolina.

Along with the changes to the MPO’s structure and geography, both Federal and State transportation legislation have been reformed since the last long range plan update. As a result, the CRTPO has revised many of its goals, objectives, and policies that help guide the transportation planning process and inform decisions regarding transportation funding and project prioritization. Specifically, the CRTPO adopted a project ranking methodology that was used to evaluate candidate projects through a quantitative and qualitative analysis. Revenue assumptions over the 20 year horizon of the plan were also developed to reflect the changes to the State transportation legislation previously referenced. These themes are highlighted by:

- Economic forecasts, based on socio-economic projections;
- Congestion management, including strategies to alleviate congestion;
- Linkages to land use, which will lead to more sustainable transportation investments;
- The environment, with an emphasis on air quality; and
- Health, as it relates to the transportation system.

In addition to the changes already mentioned, the 2040 MTP covers several topics that are important indicators of future trends, potential challenges, and the overarching themes about transportation investment and how it will influence the overall prosperity of the region. These themes are highlighted by economic forecasts (based on socio-economic projections), congestion management (including strategies to alleviate congestion), linkages to land use (which will lead to more sustainable transportation investments), the environment (with an emphasis on air quality), and health (as it relates to the transportation system).
Economy

CRTPo’s population is projected to continue to increase (64 percent by 2040), due in large part to the economic activity in the region. Many employers continue to relocate to the area because of the infrastructure investments that have been made to create a diverse, multi-modal network. Freight movement is also an important aspect of the increasing globalization of the economy. A transportation network that can accommodate the growth of the economy is especially important. Several transportation projects included in the MTP directly impact the movement of goods, including an intermodal facility at Charlotte-Douglas International Airport, the completion of the I-485 loop around Charlotte, the proposed Monroe Connector/Bypass in Union County, and improvements to the interchange of I-40 and I-77 in the City of Statesville, in Iredell County. Also discussed in the MTP are the aviation, rail, and trucking services that accommodate freight movement.

Congestion Management

With the influx of people, and the increase in economic activity projected in CRTPo’s planning area, more congestion is inevitable. Chapter 12 of the MTP addresses congestion management, which discusses goals, objectives, and strategies. While a certain amount of congestion is to be expected in a dense, urban region, it also brings with it commute time inconsistencies, delays in freight movement, and negative environmental impacts. Projects included in the MTP are evaluated using the Congestion Management Process (CMP) developed by CRTPo.
Transportation and Land Use

Some of the strategies identified to deal with congestion include offering other modes of transportation such as bike lanes, sidewalks, and public transit options. It is recognized that a multi-modal system accommodating all types of users will provide improved mobility for the user, and better access to the diverse land uses that exist within the planning area. Investments in transportation that consider the land uses being served is an important element of the planning process, in order to create a sustainable system that will not only contribute to better mobility, but improvements to quality of life.

Environment

Environmental considerations are also part of the MTP, and the project ranking process. In particular, the transportation network impacts air quality. Although overall trends suggest improvements from past decades, the CRTP region is considered a non-attainment area and must still monitor ozone and oxides of nitrogen in order to ensure compliance with federal regulations and to invest in future transportation improvements that do not further degrade air quality. The MTP also outlines potential mitigation activities to reduce environmental impacts stemming from transportation projects. One of the criteria used to rank projects in the MTP awards fewer points to projects that could negatively impact the environment.
Health

An aspect of the 2040 MTP that was not prominently featured in previous long range plan updates is health, and its relationship to transportation. By including a chapter on health in the 2040 MTP, the CRTPO recognizes the importance of creating a transportation system that not only serves to all segments of the population, but does so in a manner that will improve quality of life. Several potential strategies for increasing public health considerations are outlined in the Health Impacts chapter of the MTP. In addition, the Bicycle, Pedestrian, and Greenway chapter of the MTP identifies current conditions, and proposed improvements, to active transportation facilities such as bike lanes and greenway trails. It should be noted, that while these types of improvements are a valuable component of the transportation system, funding challenges exist that could limit the implementation of future projects.

Challenges...

One of the most significant challenges faced by the CRTPO is that anticipated revenues available for all modes of transportation in the CRTPO region will not be adequate to address the many needs that exist. In anticipation of future revenue shortfalls, new strategies have been introduced and pursued. Examples include toll facilities, managed lanes, and public-private partnership investment opportunities. In addition, the CRTPO will be faced with other challenges associated with requirements contained in the federal transportation legislation (Moving Ahead for Progress in the 21st Century) and the state transportation legislation (Strategic Transportation Investments). The MTP addresses these issues in several chapters throughout the document.
Continuing, Cooperative, and Comprehensive …

The nature of the transportation planning process also requires federal, state, regional, and local collaboration and coordination. With the changes to the transportation legislation that have taken place at both the Federal and State levels, the growth the region is experiencing, and the funding challenges that lie ahead, it is now as important as ever for the CRTPo to remain proactive in its approach to transportation planning and the development of the MTP. The 2040 MTP reflects the CRTPo’s willingness to embrace change and its ability to cope with the challenges ahead as it continues to influence and guide investments for a sustainable transportation system that will contribute to the future prosperity of the region.
1. Introduction

The Charlotte metropolitan region, similar to the trend experienced by the state of North Carolina, has grown significantly over the last decade. According to the US Census, the Charlotte Urbanized Area (UZA) grew from a population of 758,927 in 2000 to 1,249,442 in 2010, or a 65 percent increase. This increase in population has led to increased economic activity, as well as rapidly changing, diverse land use patterns. Projections indicate that this growth will continue into the future. With this existing and anticipated growth and the recognition at the federal, state and local levels of the importance of an efficient transportation system to support continued economic vitality, transportation infrastructure improvements have taken on an exceedingly important and prominent role. What has resulted is the introduction of new federal transportation legislation in 2012, known as Moving Ahead for Progress in the 21st Century (MAP-21), and new statewide transportation legislation, referred to as the Strategic Transportation Investment (STI) (North Carolina House Bill 817) that was signed into law in June 2013.

In addition to the changes at the federal and state level, the growth of the Charlotte UZA has led to the expansion of the Metropolitan Planning Organization’s (MPO’s) planning area boundary, and what was formerly the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) is now the new Charlotte Regional Transportation Planning Organization (CRTPO). Information about MAP-21, North
Carolina’s STI and CRTPO’s planning area boundary, membership, policies, and priorities is included in this 2040 Metropolitan Transportation Plan (MTP), along with the many other components that go into planning and developing a comprehensive transportation network for the future.

The 2040 Metropolitan Transportation Plan

This document—CRTPO’s 2040 MTP—defines the policies, programs and projects to be implemented over the next twenty-five years in order to reduce congestion, improve safety, support land use plans, and provide mobility choices in the CRTPO planning area. It also addresses the goals and objectives of the CRTPO, the various components of the transportation planning process, socio-economic and financial assumptions, and transportation-related environmental and health issues.

As the federally designated regional transportation planning entity for all of Mecklenburg County, the western and central, urbanized portions of Union County, and the portion of Iredell County south of the South Yadkin River, the CRTPO is responsible for the long range transportation planning efforts for the region. The CRTPO, in partnership with the federal, state, and local agencies, works collaboratively to address the transportation needs of the region.

The MTP contains recommendations for the following types of surface transportation: streets and roads, transit routes, guideways, greenways, and bicycle and pedestrian facilities. The MTP also contains descriptions and assessments of conditions or factors affecting the surface transportation of persons and/or the movement of freight within CRTPO’s planning area.

Horizon Years

The MTP is divided into horizon years in order to comply with federal requirements for air quality and conformity analysis. Horizon years are defined as calendar years, beginning January 1 and ending December 31, and must not be more than 10 years apart. The horizon years for the 2040 MTP are:

- 2015 (years 2014-2015);
- 2025 (years 2016-2025);
- 2030 (years 2026-2030); and
- 2040 (years 2031-2040).
CRTPO Jurisdictions

The following local governments are voting members of the CRTPO:

- Mecklenburg County, City of Charlotte, and Towns of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville;
- Union County, City of Monroe, and Towns of Fairview, Indian Trail, Marshville, Marvin, Mineral Springs, Stallings, Waxhaw, Weddington, Wesley Chapel, and Wingate; and
- Iredell County, City of Statesville, and Towns of Mooresville and Troutman.

Other communities in western and central Union County (including Hemby Bridge, Lake Park, and Unionville) are in CRTPO’s planning area, but do not participate as voting members of CRTPO. The boundaries of the local jurisdictions that are voting members of CRTPO are shown in Figure 1-1.

The Greater Charlotte region, also referred to as the Metrolina region, encompasses an area much larger than that included within CRTPO’s planning area. The larger, urbanizing region stretches across the North Carolina-South Carolina border, encompassing a dozen counties in an area surrounding the City of Charlotte and Mecklenburg County. There are three other Metropolitan Planning Organizations, in addition to CRTPO, in the Greater Charlotte Region, including the Cabarrus-Rowan MPO, Gaston-Cleveland-Lincoln MPO, and Rock Hill-Fort Mill (South Carolina) Area Transportation Study. There is also one Rural Planning Organization (RPO), the Rocky River RPO (RRRPO).

The boundaries of CRTPO and the adjacent MPOs are shown in Figure 1-2.
Coordination with Federal Transportation Planning Requirements

This MTP is compliant with the Metropolitan Transportation Planning regulations issued by the United States Department of Transportation (Federal Highway Administration and Federal Transit Administration) governing the development of transportation plans and programs for Urbanized Areas.

The MTP was prepared in accordance with federal statute (23 CFR Part 450), which requires the development and update of transportation plans every four years in air quality maintenance and non-attainment areas. Those types of air quality designations are based on comparisons of actual pollutant emissions—not just from motor vehicles but all emissions sources—against the National Ambient Air Quality Standards (NAAQS). As of July 2012, the Environmental Protection Agency (EPA) classified Mecklenburg County, as well as parts of Union, Iredell and other counties in the Greater Charlotte region as a “Marginal” non-attainment area for the 2008 8-Hour Ozone Standard.

CRTPO’s previous conforming long range plan update was approved on May 3, 2010. That 2035 Plan and Conformity Determination will lapse on May 3, 2014. This 2040 Metropolitan Transportation Plan—based on population, employment, and travel projections for the years 2015, 2025, 2030, and 2040—will replace the 2035 Long-Range Transportation Plan and will satisfy the requirements of the federal Clean Air Act Amendments (CAAA).

This plan fulfills conformity requirements for CO and for Ozone. The roadway and transit projects included in this MTP were analyzed and were required to demonstrate conformity with the 8-Hour Ozone Standard and CO Standard.
MAP-21 Requirements

In July 2012, passage of the Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation legislation established new and revised requirements for statewide and metropolitan transportation plans and programs, as well as for the underlying planning processes. Compliance with MAP-21’s new and revised planning provisions is required for new plans. These provisions are set forth in MAP-21, and described more fully in the joint regulation issued by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) (23 U.S.C., Section 134 (h)).

MAP-21 emphasizes key components to be incorporated into the Metropolitan Transportation Plan. These include the establishment of a transparent and accountable framework for identifying multimodal capital projects and project prioritization; establishment of a sound multimodal planning process; and the incorporation of the eight planning factors that remained consistent with the previous legislation (SAFETYA-LU). The CRTPO has developed and applied quantitative criteria in the identification and prioritization of the MTP’s candidate projects, all surface transportation modes are accounted for in the MTP, and the following eight planning factors included in the federal legislation are incorporated into the MTP:

1. Support the economic vitality of the United States, the States, non-metropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity and efficiency.

2. Increase the safety of the transportation system for motorized and non-motorized users.

3. Increase the security of the transportation system for motorized and non-motorized users.

4. Increase the accessibility and mobility of people and freight.

5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight.

7. Promote efficient system management and operation.

8. Emphasize the preservation of the existing transportation system.

In addition, MAP-21 specifies that the MTP should include the identification of transportation facilities (all modes) that are intended to function as an integrated metropolitan planning system with emphasis on those facilities that serve important national and regional interests. Those facilities are identified and described in the contents of this plan.
The CRTPO has developed this 2040 MTP within the federal and state regulatory framework. This plan meets all of the federal requirements, as well as recognizes and is structured to take advantage of the newly created funding structure and project prioritization process adopted by the state.

**Performance Measures**

With the passage of MAP-21, the long range planning regulations and funding categories have been updated. MAP-21 outlines seven performance goals for long range transportation planning (23 U.S.C., Section 150). These goals include a focus on the following:

- Safety;
- Infrastructure Conditions;
- Congestion Reduction;
- System Reliability;
- Freight Movement and Economic Vitality;
- Environmental Sustainability; and
- Reduced Project Delivery Delays.

MAP-21 focuses on a performance driven planning process that includes established, consistent, and relevant performance targets that can be assessed to track progress towards the identified goals and measures. Operational and system management studies are a key element in this focus on performance and should examine the wide range of strategies to address congestion, improve mobility, and develop a sustainable multimodal transportation system.

The metropolitan transportation planning process is required to document performance measures and targets established by the MPO that support the seven national performance goals, and are coordinated to the extent possible with the North Carolina Department of Transportation (NCDOT) and with public transportation providers. In general, the performance standards are established at the national level, and then at the state level, and then at the MPO level. North Carolina is in the process of developing its performance measures and targets, which will then be considered by the MPO for incorporation into its own process for measuring and evaluating performance. Due to the timing of CRTPO’s 2040 MTP update, performance measures will be incorporated into the next plan update.

*Moving Ahead for Progress in the 21st Century (MAP-21), passed on July 2012, federal transportation legislation established new and revised requirements for statewide and metropolitan transportation plans and programs, as well as the underlying planning processes.*
Related Plans and Programs

There are several plans and planning processes that served as precursors to this 2040 Metropolitan Transportation Plan. Some of the most significant ones are described below.

2035 Long Range Transportation Plan (LRTP)
The 2035 LRTP was the CRTPO’s previous long range transportation plan. It was approved in May 2010 and outlined its goals and objectives, and detailed the transportation improvements and policies to be implemented in the previous Mecklenburg-Union MPO planning area over a 20-year minimum horizon. Federal requirements mandate that for non-attainment areas, such as the Charlotte region, the long range plan be updated every four years. This 2040 MTP is the updated long range plan for the former MUMPO, now the CRTPO.

Transportation Improvement Program (TIP)
This program of capital projects describes the region’s and the state’s anticipated investments in transportation over a seven-year period. The TIP is traditionally updated every two years, and must be approved by the CRTPO and then by the North Carolina Board of Transportation. Federal requirements mandate that the Statewide Transportation Improvement Program (STIP) is updated every four years at a minimum.

Unified Planning Work Program (UPWP)
The UPWP is adopted annually by CRTPO and identifies the major transportation planning activities to be undertaken for the coming year. An important element of the UPWP is the continuing update and maintenance of land use, demographic, and travel data needed to apply the regional travel demand model, which projects travel demands based on the population and employment projections and the transportation facilities and services.

Local Area Regional Transportation Plan (LARTP)
The member jurisdictions of the LARTP Group – Marvin, Waxhaw, Weddington and Wesley Chapel – together with the Centralina Council of Governments (CCOG) and the CRTPO, collaborated to create a unified, multi-modal transportation plan for the western portion of Union County to put themselves in a position to proactively account for the pressures of rapid growth associated with being one of the fastest growing counties in the State of North Carolina. The study was funded by the MPO, and was completed in fall of 2009.
Fast Lanes Study

In 2007, multiple transportation agencies in the Charlotte region began an examination of existing and planned major highways throughout a 10-county area to identify where Fast Lanes – high-occupancy vehicle (HOV), high-occupancy toll (HOT), or truck-only toll facilities – could help manage congestion during peak travel periods. The study was broken into a three-phased approach, each subsequent phase building upon research and outreach results from the previous phase. (More information about the Fast Lanes study is provided in the Environment chapter, and the Streets and Highways chapter.)

I-277/I-77 Loop Strategic Plan

The City of Charlotte led an effort to develop the I-277/I-77 Loop (also known as Uptown Loop) in late fall of 2011. This study focused on the evaluation of long-term, cost-effective operational improvements for the I-277/I-77 Loop around Uptown. The CRTPC was an active participant in this study, and also provided the funding. (More information about this study is provided in the Streets and Highways chapter.)

The 2030 Transit System Plan

This 2030 Transit Corridor System Plan was adopted by the Metropolitan Transit Commission (MTC) in November 2006. The plan consists of rapid transit improvements in five corridors (South, Southeast, Northeast, North and West), a series of improvements in uptown Charlotte, streetcar service from I-85 and Beatties Ford Road to the former site of the Eastland Mall, and bus service and facility improvements throughout the region. When completed, the plan will serve four times as many transit riders as the present system, and will include 14 miles of bus rapid transit (BRT) guideways, 21 miles of light rail transit (LRT), 16 miles of streetcar, 25 miles of commuter rail, and an extended network of bus service. The 2030 Transit System Plan built upon the efforts of the former 2025 Integrated Transit/Land-Use Plan, which became the basis for a county-wide referendum on enacting a local sales tax dedicated to support a greatly expanded transit system in Mecklenburg County.

Lake Norman Regional Bike Plan (LNRBP)

The Lake Norman Regional Bicycle Plan is the culmination of years of work to describe a route that would serve as a means for bicyclists to travel around Lake Norman through Mecklenburg, Iredell, Catawba and Lincoln Counties. NCDOT contracted with CCOG in early 2009 to write a regional bicycle plan for the Lake Norman area, which was adopted by NCDOT in 2010. The development of the LNRBP included participation from several communities in the Lake Norman area. (More information about the LNRBP can be found in the Bicycle, Pedestrian, and Greenway chapter.)

CONNECT Our Future

“CONNECT Our Future” is a process in which communities, counties, businesses, educators, non-profits and other organizations work together to grow jobs and the economy, improve quality of life and control the cost of government. This project, which is funded by a US Department of Housing and Urban Development (HUD) grant, will create a regional framework developed through extensive community engagement and built on what communities identify as existing conditions, future plans and needs,
and potential strategies. The CONNECT Our Future three-year process will engage public, private and non-profit organizations across a 14-county, bi-state region that includes the CRTPO's planning area. The CONNECT three-year study overlapped with the development of this 2040 MTP, and will provide valuable information for the CRTPO to build on for future plan updates. More information about the CONNECT study can be found at http://connectourfuture.org/.

**Transportation Policy Boards**

**Charlotte Regional Transportation Planning Organization (CRTPO)**

Under federal law, any Urbanized Area (as defined by the Census Bureau) with a population over 50,000 must establish an MPO whose purpose is to coordinate transportation planning and programming among the member governments. CRTPO includes all of Mecklenburg County and portions of Union, and Iredell counties. Representatives to the CRTPO include:

- Members of the governing boards of Mecklenburg, Union, and Iredell counties, the cities of Charlotte, Monroe and Statesville, and the towns of Cornelius, Davidson, Fairview, Huntersville, Indian Trail, Marshville, Marvin, Matthews, Mineral Springs, Mint Hill, Mooresville, Pineville, Stallings, Troutman, Waxhaw, Weddington, Wesley Chapel and Wingate; and

- The local representatives to the N.C. Board of Transportation for N. C. Divisions 10 and 12, and a representative of the Metropolitan Transit Commission are also voting members of CRTPO; Non-voting representatives from the Iredell County Planning Board, Union County Planning Board, the Charlotte-Mecklenburg Planning Commission and the U.S. Department of Transportation also participate in CRTPO meetings.

The voting structure is based on population, with Charlotte assigned thirty-one votes; Iredell, Mecklenburg and Union counties, two each; Cornelius, Huntersville, Indian Trail, Matthews, Mint Hill, Monroe, Mooresville, and Statesville, two each; Davidson, Fairview, Marshall, Marvin, Mineral Springs, Pineville, Stallings, Troutman, Waxhaw, Weddington, Wesley Chapel, and Wingate, one each; the North Carolina Board of Transportation representative for Division 10 and Division 12, one each; and one vote for a representative of the Metropolitan Transit Commission—for a total of 68 votes.

The MPO is charged with the responsibility of adopting the Metropolitan Transportation Plan, Thoroughfare Plan, and the Comprehensive Transportation Plan; the Transportation Improvement Program for road, transit, bicycle, and pedestrian investments; and the Unified Planning Work Program.

After appropriate planning, engineering, and public input, the CRTPO will adopt specific alignments for proposed thoroughfares and transit guideways (in consultation with the Metropolitan Transit Commission). Local governments will then use these alignments to require land development proposals to conform
to the long-range plan by reserving or donating the land upon which the thoroughfares and transit guideways will be constructed, and by integrating the land development patterns with the transportation system.

**CRTPO Technical Coordinating Committee (TCC)**

The TCC is the staff arm to CRTPO and holds regular monthly meetings. It is composed of representatives of the various municipal and county departments involved in the transportation planning process. Various state and federal staff are also members.

The TCC’s primary responsibility is to carry out the planning tasks described in the Unified Planning Work Program. These include the updates to the Metropolitan Transportation Plan, analyses of operational issues in the thoroughfare system, recommendations for various transportation investment programs, and the public involvement process for the CRTPO. The majority of the technical recommendations to the CRTPO originate at the TCC level.

**Charlotte Regional Alliance for Transportation (CRAFT)**

Four metropolitan planning organizations—the Cabarrus-Rowan Metropolitan Planning Organization, the Charlotte Regional Transportation Planning Organization, the Gaston-Cleveland-Lincoln Metropolitan Planning Organization, and the Rock Hill-Fort Mill (South Carolina) Area Transportation Study—and one Rural Planning Organization - Rocky River - participate in a continuing, cooperative and comprehensive transportation planning process through an entity known as CRAFT. CRAFT’s role is to enhance communication between jurisdictions, promote awareness of regional concerns, and provide a forum in the Charlotte metropolitan bi-state region for addressing significant issues of common interest.

**North Carolina Board of Transportation (BOT)**

The Board of Transportation is charged with setting policies for state-maintained and operated transportation systems regardless of mode. The Governor of the State of North Carolina appoints the Board, which has 19 members and the non-voting Secretary of Transportation. The Board adopts the State’s TIP, the seven-year investment program determining how state and federal transportation funds will be spent statewide.
Metropolitan Transit Commission (MTC)

The Metropolitan Transit Commission was established in 1999 to help implement Mecklenburg County’s half-cent sales tax for transit purposes. Mecklenburg County and the county’s seven incorporated local jurisdictions formed the MTC to act as the policy body to review and approve transit system operations and improvements throughout the county. Two members (the mayor and manager of the governmental unit) represent each jurisdiction, but only one vote is assigned to each of the eight participating governments.

Based on the Memorandum of Understanding (MOU) for the CRTPO, as revised in October 2013, the MTC also represents one vote on the CRTPO Board.

Sources:

23 CFR Parts 450 and 500 and 49 CFR Part 613: Statewide Transportation Planning; Metropolitan Transportation Planning
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List of Figures

1-1 ........................ CRTPO Jurisdictions
1-2 ........................ Adjacent MPOs/RPOs
Legend

- CRTPO Planning Area

Note:
24 of 27 CRTPO jurisdictions are voting members. Hemby Bridge, Lake Park, and Unionville are not voting members.

Figure 1-1

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
2. Goals and Objectives

CRTPO Mission

The mission of the Charlotte Regional Transportation Planning Organization (CRTPO) is to plan for transportation options that ensure mobility, respect the natural and built environment, and strengthen the economic prosperity of CRTPO’s planning area.

Four surface transportation modes — roadway, transit, bicycle and pedestrian — comprise a system designed to foster the safe and efficient movement of people and goods, and support the growth and development of the CRTPO member jurisdictions. Rail lines, intermodal terminals, the Charlotte-Douglas International Airport, and the regional airports in the cities of Monroe and Statesville provide connections for people traveling and goods shipped to and from this area.

The 2040 Metropolitan Transportation Plan (MTP) describes the programs that carry out CRTPO’s mission. To determine the projects that make up the plan, CRTPO is guided by the goals and objectives contained in the pages of this chapter. The plan is based on an assessment of future travel conditions and a variety of land development and environmental factors described in this document.
Goals and Objectives

1. **Provide, manage and maintain a safe, efficient and sustainable transportation system for all modes, intended to serve all segments of the population.**

   - Designate resources to maintain the existing transportation system.
   - Minimize congestion within the existing transportation system.
   - Develop an efficient street and highway network capable of providing an appropriate level of service for a variety of transportation modes.
   - Encourage design features that minimize crash potential, severity and frequency.
   - Enable all users to choose a convenient and comfortable way to reach their destination, regardless of location, personal mobility level, age or economic status.
   - Promote future opportunities for inter-regional mobility through enhancements to inter-city rail service and the provision of high-speed rail service.

2. **Encourage walking, bicycling and transit options, integrated with motor vehicle transportation, by providing a transportation system that serves the public with mobility choices.**

   - Increase the connectivity of the existing street network, including minimizing barriers and disconnections of the existing roadways, and improving access to activity centers.
   - Improve the transportation system by developing streets and highways that are accessible to, or compatible with, multiple modes of transportation by utilizing design standards consistent with NCDOT’s Complete Streets policy.
   - Include sidewalks and bicycle facilities in the design of roadways to accommodate and encourage pedestrian and bicycle travel, and maximize linkages to off-road facilities and transit services.
   - Support the operation of safe and efficient scheduled transit services that minimize travel times and distances.
   - Encourage programs and incentives that promote ridesharing (or eliminate barriers to ridesharing).
   - Facilitate pedestrian and bicycle safety through public awareness programs.
   - Support the implementation of the Charlotte Area Transit System’s currently adopted Corridor System Plan.
Provide a sustainable transportation system that improves the quality of life for residents, promotes healthy living and is sensitive to significant features of the natural and human environments.

- Encourage the designation of truck routes that minimize exposure to neighborhoods and to historic and cultural resources.
- Plan transportation facilities that protect natural, cultural and historic resources.
- Develop transportation systems and programs that maintain or improve air quality, water quality, safety, and health outcomes.
- Promote transportation facility designs that minimize the impact of traffic noise on surrounding properties.
- Emphasize designing transportation systems and facilities that preserve and complement the area’s natural features.
- Plan transportation facilities that minimize neighborhood disruption and related impacts.

This multi-use path in Charlotte demonstrates the importance the region places on improving quality of life, and promoting transportation modes that enhance neighborhoods.
4 Promote equitable transportation options for low income and minority neighborhoods, as well as the aging population.

- Support opportunities to serve the elderly and transportation-disadvantaged populations with convenient transportation to needed services.
- Provide meaningful opportunities for public involvement in the transportation planning process.

5 Encourage regional collaboration and linkages between transportation and land use planning.

- Develop streets and highways in a manner consistent with adopted land use plans.
- Support context sensitive design standards in order to encourage a transportation system that is compatible with the natural and built environment.
- Encourage land use strategies that maximize the potential for transit patronage and coverage.
- Encourage land use and density criteria for transit centers and corridors.
- Provide linkages for pedestrians and/or bicyclists with neighborhoods, employment centers, services, commercial areas and other business districts, parks, greenways and cultural facilities such as schools and churches.

Rendering that depicts a potential interchange design on I-77 developed by the Town of Cornelius, in collaboration with the NCDOT. Many innovative ideas have been explored in recent years to expand infrastructure while remaining consistent with existing land use plans.
Support economic competitiveness by making investment decisions for transportation modes that make the most efficient use of limited public resources, as well as by pursuing sustainable funding possibilities.

- Develop a transportation system supporting Charlotte’s position as a major distribution center, improving and maintaining access for freight to other markets via a network of highways, railroads and airports.
- Explore opportunities to minimize implementation and operation costs of transportation projects.
- Encourage the development of transportation projects that enhance the local and regional economies.
- Foster innovative financing and partnership opportunities for project development and implementation.
7 Maximize travel and transportation opportunities for the movement of people and goods.

- Promote a freight transportation system that supports the movement of goods.
- Develop regionally significant streets and highways in a manner which manages congestion and minimizes travel times and distances.
- Promote the integration of, or coordination among, different transportation modes by supporting intermodal terminals that facilitate the movement of goods.
- Reserve designated rail and transit corridors for future needs, and identify opportunities to share rail corridors with transit and active transportation.
- Encourage regional efforts to maximize the region’s competitiveness in freight and logistics.
- Support initiatives at international and regional airports that increase the attractiveness of the airport as a major passenger and cargo facility.
- Establish measures to enhance the inter-city, inter-regional and intra-regional capacities of major transportation corridors.
- Encourage land use planning that supports and promotes the movement of freight by railroad.
### 3. Planning Factors

Moving Ahead for Progress in the 21st Century (MAP-21), the federal transportation legislation enacted in 2012, carries on the eight (8) planning factors that were established under the former Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), originally enacted in 2005. Accordingly, the Charlotte Regional Transportation Planning Organization (CRTPO) considers projects and strategies that will address the following planning factors:

- Support the economic vitality of the metropolitan area;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility of people and for freight;
- Protect and enhance the environment, promote energy conservation, and improve the quality of life;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.
Economic Vitality

The CRTPO has worked extensively over the years with the North Carolina Department of Transportation (NCDOT) and other state and federal agencies on transportation projects that enhance the economic prosperity of the area.

A significant development is the formation of a regional transportation alliance involving the four Metropolitan Planning Organizations (MPOs) and one Rural Planning Organization (RPO) in the Charlotte Region. The organization—Charlotte Regional Alliance for Transportation (CRAFT)—is committed to ensuring that the economic growth and vitality of the entire area will be complemented by a transportation system developed in a regional manner.

The alliance marks a coordinated effort to guide the Charlotte region in broader planning to serve the rapidly merging urban areas. The four MPOs in the Charlotte region—Cabarrus-Rowan MPO, Gaston-Cleveland-Lincoln MPO, Rock Hill-Fort Mill MPO and CRTPO—have signed a Memorandum of Agreement to work cooperatively on regional transportation issues and have begun meeting on an adopted quarterly schedule. The RPO – Rocky River – also participates in CRAFT activities. Together, these five organizations formally represent the vast majority of the region.

Also important is the completion of the I-485 loop and widening of I-77 and I-85. These freeways will continue to provide important access to other parts of the country and benefit the CRTPO area economy through improved transportation for people and goods, and increased tourism. In addition, a study was recently completed to evaluate potential improvements to the I-277 loop which provides access to center city Charlotte.

Another significant improvement to the economic vitality of the region is the construction of a large intermodal facility at the Charlotte-Douglas International Airport. The new facility will be able to accommodate air, train, and truck freight movement all in one strategic location. Construction began on the intermodal facility in spring of 2012, and is anticipated to be completed in 2014. The CRTPO area is also served by two regional airports in the cities of Statesville and Monroe, both of which are seeking to improve access roads to the respective airports. One other notable airport improvement that will benefit the region’s economy is the beginning of scheduled commercial service to the Concord Regional Airport, located in the adjacent Cabarrus-Rowan MPO planning area.
The implementation of an efficient transportation system that includes mass transit and bicycle and pedestrian facilities, such as greenways, will preserve the area’s reputation as a desirable place to locate businesses. Examples of capital and planning improvements to the transit, bicycle and pedestrian, and greenway networks include:

- The Blue Line Extension;
- CityLYNX Gold Line;
- Mooresville-Charlotte Trail;
- Carolina Thread Trail; and
- Lake Norman Bicycle Route.

**Safety**

The CRTPO takes a number of measures to increase the safety of the transportation system for all users. Specifically, the CRTPO considers safety as a criterion in both its roadway ranking methodology and its bicycle and pedestrian ranking methodology. In addition, the Charlotte Department of Transportation (CDOT) produces an annual inventory of high accident locations to identify where there may be a need for safety improvements. Projects are then developed to improve the conditions. NCDOT also conducts similar studies and has a safety program to address these needs.

One of the primary goals of the CRTPO is to “Provide, manage, and maintain a safe, efficient and sustainable transportation system for all modes, intended to serve all segments of the population.”
The CRTPO also supports the implementation of other projects to ensure the safety and security of its users. These include:

- The construction of median guard rails on freeways;
- The replacement of deficient bridges and structures;
- Traffic calming strategies and the implementation of road diets;
- Creation of safety standards (updated annually) for implementing safety and security throughout the transit system;
- Installation of crosswalks and signal timing improvements;
- The construction of sidewalks on all non-freeway road projects;
- The addition of bike lanes on roadways; and
- Programs to improve safety at school crossings.

These measures and project implementation strategies are in place to help accomplish one of the primary goals of the CRTPO, to “Provide, manage, and maintain a safe, efficient and sustainable transportation system for all modes, intended to serve all segments of the population.”

**Security**

When MAP-21 became law in 2012, it carried over the planning factors from the former SAFETEA-LU, in which security became a separate planning factor required in the state and metropolitan planning process. The Charlotte region is a large urban area with important infrastructure, facilities, utilities, and population and employment centers essential for security planning.

Securing and managing incidents at these sites is addressed by a range of organizations throughout the region, including transportation and law enforcement agencies. Various safety and security plans address interagency coordination and areas of responsibility, such as:

- The Charlotte Center City Evacuation Plan;
- Union County Multi-Jurisdictional Hazard Mitigation Plan; and
- Iredell County Emergency Operations Plan.

Additionally, transportation plans include strategies to reduce crashes and the transportation impacts of such incidents, while law enforcement and emergency management plans generally focus on managing incidents after they occur, including evacuations and the security of property and people.
Accessibility and Mobility Options

Increasing the accessibility and mobility options available to people and for freight is one of the most important objectives of the CRTPO. This is achieved by:

- Integrating land use and transportation planning;
- Providing the necessary resources to enhance the existing transportation system;
- Expanding the existing transit system;
- Implementing fixed route mass transit options;
- Expanding shipping facilities at Charlotte-Douglas International Airport; and
- Improving access to the multiple airports throughout the region.

Land use and transportation policies such as the Complete Streets policy adopted by the NCDOT in 2009 and the Urban Street Design Guidelines adopted by the City of Charlotte in 2007, are being instituted to support transit ridership, walking, and bicycling—and reduce dependency on the automobile. More compact development patterns at activity centers and along transit corridors will make the transit system more economically self-sustaining. In neighborhoods in Charlotte and in some parts of north Mecklenburg County, transit-oriented development that emphasizes a mix of uses and easy pedestrian access to shopping and services could reduce the need to drive.

The Centralina Council of Governments (CCOG) completed the development of a mobility management program in September 2013 through a grant from the NCDOT. The project study area was the nine-county Centralina region, with the City of Charlotte and Mecklenburg County at its core. The area has a combined population of approximately two million residents that are served by nine separate community transportation systems and four fixed-route systems. Combined, these systems carry in excess of 1.3 million para-transit and demand response trips per year. The overall goal of the mobility management project was to develop a range of strategies to improve mobility services for older adults, persons with disabilities, and veterans. These strategies became the basis of a Mobility Management Agency (MMA) for the nine-county region.

The Charlotte urban area is also a major shipping hub for the Southeast. Continued support of this hub is provided through widening and maintaining the interstate system and improved access to the intermodal facility at Charlotte-Douglas International Airport and other intermodal facilities in the area. Improved access to the other regional airports in Monroe and Statesville remains a priority as well.
Environmental Protection, Energy Conservation, and Sustainable Development

The CRTPO is committed to protecting and enhancing the environment, promoting energy conservation, and prioritizing investments that encourage more sustainable growth patterns. This idea is specifically spelled out in the MTP’s goals and objectives, to “Provide a sustainable transportation system that improves the quality of life for residents, promotes healthy living and is sensitive to significant features of the natural and human environments.”

The member governments within the urban area look to protect their important resources by enacting environmentally sensitive land use policies, developing transportation choices, and promoting air quality education programs. Land use policies include buffers around the rivers and streams, impact fees for runoff caused by impervious surfaces, and roadway designs that mitigate runoff impacts in critical watershed areas. Land use decisions are being made to direct growth to reduce travel demand, which in turn leads to energy conservation and reduced pollutants.
System Integration and Connectivity

The CRTPO has developed and supports programs and projects that enhance the integration and connectivity of a multi-modal transportation system. It is also a goal of the CRTPO to “Encourage regional collaboration and linkages between transportation and land use planning.” The following examples describe how these ideals are carried out within the metropolitan planning area.

- The intermodal facility being constructed at the Charlotte-Douglas International Airport provides a critical link for movement of goods between rail, highway, and air;

- Ambitious transit plans provide opportunities for people to enjoy a more mobile system that allows them to conveniently access many parts of the urban area – specifically, expansion of the platforms of the existing Lynx Blue Line, and expansion of the Blue Line from Center City to the campus of UNC Charlotte;

- Park-and-Ride Lots enable auto commuters to access the current bus and rail system and will be available for the expanding rapid transit system;

- Bicycle racks on buses allow people the flexibility to access bus stops by bike, improving the attractiveness of the system;

- CRTPO’s policy to add sidewalks to non-freeway roadways enables citizens to leave their vehicle at home for short trips;

- Mecklenburg County’s growing greenway system provides connectivity for pedestrians and bicyclists between neighborhoods, schools, shopping areas, and employment centers, and plans are underway to expand the system further north to Mooresville, in Iredell County;

- The Carolina Thread Trail is a regional network of greenways, trails, and blueways that currently accounts for approximately 135 miles across 15 counties, linking people, places, cities, towns, and attractions. Continued efforts to conserve land and expand the Thread Trail are ongoing within CRTPO’s planning area and the surrounding counties; and

- The Lake Norman Bicycle Route will improve roadways around Lake Norman in Catawba, Iredell, Lincoln, and Mecklenburg counties to include safe accommodations for bicyclists.

The City of Charlotte and other CRTPO members also emphasize connectivity between neighborhoods, whether vehicular, bicycle, pedestrian—or a combination of the three– by maintaining collector street plans and land use development policies that require multi-modal connectivity between existing and new land uses. Providing and expanding connectivity creates a linked network that can minimize congestion and reduce unnecessary trips on thoroughfares and freeways.
Efficient System Management and Operations

Federal regulations require that operational and management strategies be implemented that will help improve the performance of existing transportation facilities. It is intended that these strategies will aid in the relief of vehicular congestion and maximize the safety and mobility of people and goods. Along with the CRTPO’s goal to “Maximize travel and transportation opportunities for the movement of people and goods,” the following strategies have been identified within the CRTPO planning area to account for the efficient management and operations of the transportation system:

Traffic Monitoring System
The City of Charlotte assists NCDOT by collecting site-specific information on Highway Performance Management System sample locations. Both the City and the State complete counts at these locations. In addition, the City of Charlotte collects speed and classification automatic traffic counts and performs studies on these data. The City annually updates Uptown’s off-street parking inventory and peak-hour demand for parking. This includes verifying the existing inventory of parking supply, identifying new parking supply and collecting information on parking rates. The City is also implementing a vehicular way-finding system in the Uptown area.

Safety Management System
The Traffic Safety Unit of NCDOT’s Traffic Engineering Branch works to implement safety improvements on the State highway system. In addition, CDOT compiles accident data on all streets within Charlotte, except the urban freeways and interstates. These data are used to identify hazardous locations. Safety improvements as a result of these efforts might include supplemental signing, pavement marking revisions, signal timing changes, turn prohibitions, and pedestrian and traffic safety educational campaigns.

Traffic Operations Plan
The non-capital measures above are complemented by capital improvements to address safety at hazardous intersections, improve high-accident locations and high-congestion locations, and select intersection and safety improvement projects for inclusion in the North Carolina Statewide Transportation Improvement Program (STIP).
Preservation of the Existing System

The CRTPO has worked with NCDOT for many years in establishing and maintaining a transportation planning program that incorporates a standard set of planning principles as recommended by the Federal Aid Highway Act of 1962. The planning principles require the development of a safe and efficient transportation system by:

- Maximizing utilization of the existing facilities;
- Increasing operational efficiency and altering travel demands when appropriate; and
- Minimizing adverse impacts to the natural, social and economic environments.

The preservation of the system includes maintaining or improving both the safety and capacity of the existing system through the use of access management principles. The Transportation Research Board and Institute for Transportation Engineers have published extensive research-based guidelines for access management that are used by local and NCDOT agencies in the review of land development proposals. Efforts are made for early collaboration between the local jurisdiction and NCDOT to ensure that the Comprehensive Transportation Plan / Thoroughfare Plan hierarchies are considered in access approvals.

Examples of collaboration of State and local agencies, as described, can be found in the following activities undertaken by the CRTPO and its member jurisdictions:

- NC 73 Transportation/Land Use Plan (and subsequent NC 73 Council of Planning);
- US 74 Corridor Study in Union County;
- Mooresville to Charlotte Trail; and
- Fast Lanes Study.

Asset management strategies for pavements and bridges have also become an increasingly important funding consideration, especially as many of the interstate highways and arterial roadways near the end of their useful lives. NCDOT maintains the second largest highway system in the nation in terms of centerline lane mileage, coupled with a growing population within North Carolina, the identification of a sustainable funding source to maintain the existing system and add capacity will be a challenge in the coming decades. The NCDOT 2040 Plan has inferred that maintaining the existing funding levels for infrastructure health will drop the percent of pavement miles in good condition from 68 percent to 50 percent by 2017, and bridge performance will drop from 61 percent to 54 percent during this time. Based on what is reported in its 2040 Plan, the NCDOT needs to identify alternative funding sources to continue to maintain its system.
Federal legislation (MAP-21) has required each state to complete a Transportation Asset Management Plan that includes inventory, condition, life cycle cost, and a financial plan to maintain its system. The NCDOT will begin the development of its Transportation Asset Management Plan in 2014. In addition, the ongoing maintenance of other non-roadway (bicycle, pedestrian, transit, aviation) assets needs to be a consideration at the long range planning and project programming levels. The CRTPPO will continue to partner with NCDOT to ensure that infrastructure health is a primary factor in all planning activities.

Sources:

4. Public Involvement

Public involvement is a key component of the transportation planning process. The Charlotte Regional Transportation Planning Organization’s (CRTPO’s) adopted Public Involvement Plan (PIP) states its commitment “to meaningful public involvement in the regional transportation planning process” — and that it “believes public participation is not a simple ‘add-on’ or ‘after thought,’ but a method that guarantees high quality transportation planning.”

This approach guided outreach efforts associated with the preparation of the 2040 Metropolitan Transportation Plan (MTP) and resulted in four key areas where those efforts were focused:

1. Website
2. Expansion of contact lists
3. Brochure
4. Public meetings
Website

The CRTPo views its website (www.crtipo.org) as its “face” to the community. Often people are unable to attend meetings, but the website can be accessed 24 hours a day. CRTPo began updating its website to include information about the MTP in July 2012, and updated it with relevant information as frequently as necessary. Key components of the MTP section of the website include:

- General background information to give the reader basic information about what an MTP is and why it is being updated;
- A link to the previously approved 2035 Long Range Transportation Plan (LRTP) in order to provide greater context;
- Project lists and maps;
- Information regarding MTP-related public meetings (posted in a timely manner prior to each meeting);
- A section entitled “Resources” that includes links to useful MTP-related materials;
- Presentations given to the CRTPo Board; and
- The MTP brochure.

In general, the goal of the website is to provide all pertinent information regarding the MTP, and its development, to allow the public to understand the issues associated with the update.

All correspondence that was produced to inform the community about the update included the CRTPo website address and encouraged visits to the website.

Expansion of Contact Lists

In advance of the work to update the MTP, the CRTPo expended considerable time and effort to ensure that “citizens, affected public agencies, representatives of public transportation employees, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled” (23 CFR 450.316) were included in an updated contact database.

The resulting database includes federal, state, county and city agencies, Environmental Justice and traditionally underserved organizations, cultural and social groups, faith-
based and volunteer organizations, English and non-English speaking groups, advocacy groups, and interested individuals with no specific affiliation. This compiled list of contacts was used to provide information to a wide cross-section of stakeholders in the transportation planning process, including distribution of the CRTPO newsletter and notices for public input opportunities.

**Brochure**

A full-color CRTPO brochure was produced in both English and Spanish. The 11-inch by 17-inch brochure was produced to serve several purposes including:

- Introduce the CRTPO, its Policy Board, and the MTP;
- Provide an outline of the MTP goals and objectives;
- Describe the process for developing the MTP’s fiscally constrained project list, including the roadway ranking methodology and anticipated revenue projections;
- Provide a list and map of the MTP fiscally constrained projects; and
- Identify avenues to obtain additional information about CRTPO activities, including the CRTPO website and MTP hotline number.

The brochure was distributed to attendees at CRTPO-sponsored meetings as well as those sponsored by other groups in which CRTPO attended and provided informational materials. The brochure was also made available at the Charlotte-Mecklenburg Government Center and other town halls throughout the CRTPO planning area, and is posted on the CRTPO website.

*The CRTPO website (www.crtpo.org) is an important public involvement tool, and is updated often to provide current information.*
Public Meetings

Providing the public with an opportunity to learn more about the CRTPO’s plans and programs through staff-sponsored events is an important component of its outreach efforts because it focuses attention on the issue being presented. However, even the best publicized events can result in low turnout due to the difficulty in engaging the public in long-range planning efforts.

For this reason, the CRTPO pursued participation opportunities at meetings and events sponsored by others, in addition to staff sponsored events, in order to provide information about the MTP to a broad cross-section of the general public, as well as a greater number of citizens. Included in these efforts was targeted public outreach to designated Environmental Justice communities throughout the CRTPO planning area. (More information about Environmental Justice efforts can be found in the Environmental Justice chapter.)

MTP Open Houses

- June 24, 2013 – Stallings Civic Building, Town of Stallings
- June 26, 2013 – Charlotte-Mecklenburg Government Center, City of Charlotte
- June 27, 2013 – Charles Mack Citizen Center, Town of Mooresville
The purpose of these open houses was to kick-off the public involvement process for the MTP update by obtaining the public’s input on transportation priorities for the region. A presentation highlighting the purpose, contents, requirements and timeline for the MTP was provided. The open houses also served as an opportunity for the CRTPO’s Consultation partners to discuss the MTP process.

Publicity was generated by a media release to 25 outlets (print, television and radio), an email sent to approximately 375 individuals and groups included in the CRTPO’s databases, an announcement included in the quarterly CRTPO newsletter, and the notice was posted on the CRTPO website.

A variety of information was displayed at the open houses, including:

- Maps showing the 2040 MTP candidate projects and CRTPO planning area;
- Maps providing information about freight volumes in the region;
- Maps displaying information about commuting patterns to/from Mecklenburg County;
- Project lists (candidate projects to be ranked for inclusion in the 2040 MTP);
- MTP goals and objectives;
- Frequently Asked Questions handout;
- Comment form; and
- CRTPO website and contact information.
**Lake Norman Transportation Commission (LNTC)**

Staff provided two presentations to the LNTC, an organization that represents the communities within the vicinity of Lake Norman. The presentations were provided on the following dates:

- August 14, 2013 – Town Hall, Town of Mooresville
- September 11, 2013 – Town Hall, Town of Huntersville

The focus of the initial meeting in August was to describe the purpose of the MTP update, and explain the candidate project evaluation process. A follow up meeting in September allowed for an opportunity to further clarify the project evaluation results and present a draft fiscally constrained project list. Attendees were provided with copies of the CRTPO candidate project list and an accompanying map that showed where the projects are located within the planning area. Approximately 20 people attended each of these meetings.

**Draft Fiscally-Constrained Project List Public Meetings**

The CRTPO held three public meetings throughout the region in the following locations:

- September 24, 2013 – Charles Mack Citizen Center, Town of Mooresville
- September 25, 2013 – Cultural Arts Center, Town of Indian Trail
- September 26, 2013 – Charlotte-Mecklenburg Government Center, City of Charlotte

The purpose of these three meetings was to provide the public with an opportunity to review the draft project lists, discuss them with staff and comment on the draft priorities established by the CRTPO. A Resource Agency opportunity to comment on the lists was also provided on September 26, 2013, at the Charlotte-Mecklenburg Government Center, prior to the scheduled public meeting.

Publicity was generated by a media release to 25 outlets (print, television and radio), an email sent to approximately 375 individuals and groups on CRTPO’s databases. Stories about the meetings aired on WCCB-TV and WSOC-TV, and appeared in print in the Statesville Record & Landmark newspaper.
A variety of information was displayed at the meetings, including:

- Maps depicting the draft fiscally-constrained project lists for the three horizon years of 2025, 2030 and 2040;
- A map depicting projects nominated for inclusion in the MTP, but that could not be included due to the lack of financial resources;
- Project lists (tabular form);
- Comment sheet; and
- CRTPO website and contact information.

**Chamber of Commerce Regional Transportation Committee (RTC)**

The RTC meets quarterly and is comprised of business leaders, elected officials, and key staff members from local and State agencies throughout the region. Approximately 45 people attended this event held at Statesville’s City Hall on Friday, September 27, 2013. Staff was given the opportunity to discuss the MTP update, and highlight key projects proposed for inclusion in the 2040 MTP. Attendees received a copy of the presentation and a project list and map displaying the draft financially feasible project list.

**Regional Freight Forum**

Staff resources were present at a regional freight forum organized by the Centralina Council of Governments on October 15, 2013. The meeting was held at the Cornelius Town Hall. A presentation was provided to participating attendees that outlined the MTP process, and several materials were available for distribution, including the financially feasible project list, FAQs, and CRTPO website and contact information, among others.

**CRTPO Member Jurisdiction Education**

In October 2013, the Memorandum of Understanding for the Charlotte Regional Transportation Planning Organization was officially approved, establishing a new MPO for the Charlotte Urbanized Area (replacing the former Mecklenburg-Union MPO). Staff provided presentations to several member jurisdictions at the following meetings:

- November 14, 2013 – Statesville Airport Commission Meeting
- November 21, 2013 – Mooresville Town Council Retreat
- December 2, 2013 – Marshville Town Council Meeting

These educational meetings provided the first time members to the MPO information on the MTP update process.
Monroe Connector/Bypass Public Hearing
Held at the Union County Agricultural Center in the City of Monroe, this public hearing was sponsored by the North Carolina Department of Transportation (NCDOT) to provide information about a significant project to construct a fully tolled facility that would bypass existing US 74 in Union County. Due to the attention surrounding this project, the public hearing provided a great opportunity for the CRTPO staff to participate by providing information about the MTP update. The meeting was held on December 10, 2013, and approximately 230 people attended. Maps and project lists, among other MTP-related information, were provided.

2040 Draft MTP and Air Quality Conformity Determination
Along with the public outreach efforts already described in this chapter, an official 30-day public comment period was also provided for the public to review and comment on the Draft 2040 MTP and the draft conformity determination report that accompanies the MTP. During the 30-day public comment period, meetings were also held on the following dates, and at the locations listed:

- February 25, 2014 - Charles Mack Center, Town of Mooresville
- March 4, 2014 - Charlotte-Mecklenburg Main Library, City of Charlotte
- March 6, 2014 - Cultural Arts Center, Town of Indian Trail
- March 7, 2014 - Charlotte Chamber/Belk Action Center, City of Charlotte

The public meetings consisted of a presentation highlighting the purpose, contents, requirements and timeline for the MTP, and served as an open house forum for the public to ask questions of CRTPO staff and discuss the MTP process.

Publicity was generated by a media release to 25 outlets (print, television and radio), an email sent to approximately 123 individuals and groups on the CRTPO’s databases, and the notice was posted on the CRTPO website.

A variety of information was posted on the CRTPO website during the 30-day public comment period, and was also made available at the public meetings, including:

- The full Draft 2040 MTP;
- Maps showing the 2040 MTP candidate projects and CRTPO planning area;
- Maps supporting various other components of the MTP;
- Fiscally-constrained MTP project lists;
- Brochure; and
- Comment form.
Other Public Outreach Opportunities

In addition to the public meetings previously outlined in this chapter, other public outreach activities were specifically targeted to cover many different geographies and demographics throughout the CRTPD planning area. Similar information that was provided at other MTP public meetings (see previous page for a description) was available for these events. The dates and times of these supplemental public outreach opportunities were as follows:

Locations Targeted for Public Outreach

1. February 5, 2014 – Charlotte Transportation Center, Uptown Charlotte


3. February 13, 2014 – Central Piedmont Community College (CPCC) Levine Campus, Matthews

4. February 18, 2014 – University of North Carolina Charlotte (UNCC) Student Union, northeast Charlotte

5. February 19, 2014 – South Piedmont Community College (SPCC), Monroe

6. February 20, 2014 – UNCC EPIC Building, northeast Charlotte

7. February 25, 2014 – CPCC Merancas Campus, Huntersville

8. February 26, 2014 – CPCC Central Campus, Midtown Charlotte

9. February 27, 2014 – Mitchell Community College, Statesville
A summary of the public involvement activities, including event descriptions, number of attendees, comments received, responses to comments received, etc. are included in Appendix A of the MTP, along with the following items provided at the various public meetings:

- Open House meeting materials;
- Fiscally constrained project list meeting materials;
- Draft 2040 MTP and conformity determination report meeting materials;
- Brochure;
- Comments received, and responses to those comments, from each meeting; and
- Resource Agency comments and responses.

**Environmental Justice**

Public involvement was also focused in the traditionally underserved communities throughout the CRTPO planning area. More information about Environmental Justice efforts can be found in the Environmental Justice chapter.
5. Environmental Justice

Environmental Justice (EJ) is a process that ensures minority and low-income communities do not bear more than their share of environmental burdens. Historically, residents living within communities that face disproportionately negative impacts from transportation projects, regulations, or activities are often minorities or people of lower income status. Further, these residents and communities have often been excluded from transportation policy-setting or decision-making processes.

The framework for the approach to the social justice movement is found in Title VI of the 1964 Civil Rights Act which states the following:

“No person in the United States shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”
The concept of environmental justice arose in the United States during the early 1980s within Black, Hispanic, and indigenous communities that were disproportionately subjected to pollutants in their neighborhoods. In addition, Federal Executive Order 12898, signed in 1994 to address environmental injustice in minority and low-income communities, states that:

“Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

The Executive Order identifies minority populations as belonging to any of the following groups:

- **Black** – a person having origins from any of the black racial groups of Africa;
- **Hispanic** – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
- **Asian-American** – a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands; and
- **American Indian and Alaskan Native** – a person having origins from any of the original people of North America and who maintain cultural identification through tribal affiliation or community recognition.

The Executive Order defines low-income populations as those whose household incomes are at or below the U.S. Department of Health and Human Services poverty guidelines (e.g. $23,550 annual income for a family of four in 2013).

There are three fundamental environmental justice principles:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.
CRTPO Activities

The Charlotte Regional Transportation Organization’s (CRTPO’s) efforts in the area of environmental justice are found in its adopted Public Involvement Plan (PIP). The PIP states that there is an emphasis on “reaching people who have traditionally not been participants in the transportation planning process.”

The development of this plan incorporates the CRTPO’s commitment to making significant efforts to reach out to environmental justice communities (as defined in Executive Order 12898) throughout its planning area. This effort is intended not merely to satisfy plan preparation requirements, but to ensure that outreach is an ongoing part of the CRTPO’s transportation planning process and that those traditionally left out of the process are brought in as full participants.

The CRTPO approved revisions to its PIP in September 2012, to accomplish the following:

1. Address how minority and low-income communities will be engaged in the metropolitan planning process; and
2. Establish a limited English proficiency (LEP) plan to assist in providing an opportunity for all citizens to participate in the planning process fully, regardless of their proficiency in speaking English.

“The CRTPO’s Public Involvement Plan emphasizes ‘reaching people who have traditionally not been participants in the transportation planning process.’”
In addition, the revision of the existing public outreach plan focuses on an increased number of measures that will be taken to improve public participation. Most importantly, it recommends actions to be taken to achieve the CRTPO’s goals and provides lists of key individuals, organizations, agencies, and institutions within the targeted communities with which relationships should be built and maintained.

In order for the CRTPO to achieve the goals of its Public Involvement Plan, several activities have been identified. Some of these activities have already taken place.

1. The CRTPO staff gathered all pertinent information from the 2010 Census. Figures 5-1 through 5-18 depict the distribution of the environmental justice and low-income populations across the CRTPO’s planning area by Census tracts (for low-income).

2. Environmental Justice impacts were considered as part of the MPO-approved MTP roadway candidate project evaluation process. One of the criteria in the MPO-approved roadway ranking methodology considered environmental justice impacts by overlaying MTP roadway candidate projects on maps depicting 2010 Census information. The intent was to help ensure that environmental justice communities were not adversely impacted by projects proposed for inclusion in the MTP by awarding fewer points to projects with potential right-of-way impacts in such communities.

3. The CRTPO’s MTP roadway projects will be overlaid on maps depicting the 2010 Census information. This will be done to help determine where the MPO is directing its resources relative to roadway projects and to discern whether environmental justice communities are being subjected to unreasonable impacts or being denied the benefits of the planned investments.

4. Information for all other transportation modes was collected from the CRTPO’s transportation planning partners and will be similarly overlaid on the maps depicting the Census information. This will be done to help ensure that all potential transportation modes affecting environmental justice communities have been captured and, as with road projects, to determine if these communities are being subjected to unreasonable impacts or being denied the benefits of the planned investments. The following lists the modal information collected that will be analyzed:
Transit
- Charlotte Area Transit System (CATS): existing and proposed bus routes; existing and proposed rapid transit (including a proposed streetcar line); existing and proposed neighborhood transit centers

Bicycle
- Charlotte Department of Transportation (CDOT): Bicycle Plan
- All other municipalities have provided information on bicycle plans adopted by their communities

Greenways
- Mecklenburg County Parks and Recreation Department: existing and proposed greenways; the Carolina Thread Trail
- Mecklenburg County municipalities have provided information on greenway plans independent of the County's Plan
- Union County municipalities have provided their existing and planned greenway information
- Iredell County municipalities have provided their existing and planned greenway information

Prior to the significant task of updating the MTP, considerable work was done to update the groups within the CRTPO database that work with environmental justice communities. The database continues to be improved and a process is being developed to keep key community contact information up-to-date.

Grassroots leadership and media contacts were identified and interviews initiated to determine their views on environmental justice communities’ awareness of and knowledge about the CRTPO planning processes, distribution of transportation funding, and the impact of specific projects on those communities.

A brochure was produced (in English and Spanish) that provides information about the CRTPO and the MTP, and identifies avenues to obtain more information about CRTPO activities, including the CRTPO website address and staff contact information. As a supplement to the brochure, a hotline was also set up in English, as well as the six languages of French, Gujarati, Mandarin (Chinese), Russian, Spanish, and Vietnamese, representative of the most common non-English speaking populations within the CRTPO planning area. Instructions and the phone number for accessing the hotline are included in the brochure in six different languages in addition to English.
Public Outreach Activities

In addition to the activities and meetings described in the previous Public Involvement chapter, specific activities were focused on EJ-identified communities throughout the planning area. Examples of the types of venues where these public involvement activities took place include local churches, community libraries, and busy local gathering spots. Environmental justice public meetings were scheduled with the intent of presenting information to the communities in convenient and comfortable settings for the target audiences. The following outreach activities were conducted specifically for EJ communities:

Locations Targeted for Environmental Justice Public Outreach
1. January 7, 2014 – Meeting with the Hidden Valley Neighborhood Association

2. January 12, 2014 – Presentation at Greenville Memorial AME Zion Church

3. February 6, 2014 – Presentation at Our Lady of Consolation Catholic Church

4. February 25, 2014 – Radio Interview on WBAV 101.9

5. February 25, 2014 – West Charlotte Recreation Center

6. February 27, 2014 – Union County Public Library, City of Monroe

7. March 3, 2014 – Meeting with the Graham Heights Neighborhood Association

8. March 4, 2014 – Radio Interview on La Raza 106.1

9. March 17, 2014 – Iredell County Public Library, City of Statesville
A summary of the EJ outreach activities, including event descriptions, number of attendees, comments received, responses to comments received, etc. are included in Appendix A of the MTP, along with the following items provided at the various public meetings:

- Brochure (English and Spanish);
- Frequently Asked Questions (English and Spanish); and
- Comments received, and responses to those comments.

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**Initial Findings and Ongoing Efforts**

At the heart of environmental justice considerations is the equitable distribution of environmental impacts, positive and negative, throughout a project area without undue effects on minority and low-income communities. An analysis of transportation investments, initiatives, and plans was completed for the 2040 MTP, and strategies to continue to improve EJ efforts have been identified.

**Findings**

In August 2012, the CRTPA crafted a tool to assess the impact of transportation plans, programs, and projects on environmental justice communities that was based upon a methodology developed by the Delaware Valley Regional Planning Commission. The methodology, referred to as the Degree of Impact analysis, attempts to show decision makers where it may be necessary to conduct further evaluations of the proposed transportation network.
Degree of Impact Analysis

The Degree of Impact analysis is shown in Figure 5-19, and is highlighted by the following:

1. Census and American Community Survey data were used to establish planning area averages for the four EJ population groups (identified on Page 5-2) by dividing the total number of persons in each group by the total planning area population.

2. The population percentage of each of the four groups was then calculated at the Census tract level.

3. Census tracts with EJ populations exceeding the planning area averages were identified and a four-level “EJ Concentration” assessment scale was applied:
   - A tract with 0 groups exceeding regional averages exhibits No Concentration
   - A tract with 1-2 groups exceeding regional averages exhibits Slight Concentration
   - A tract with 3-4 groups exceeding regional averages exhibits Moderate Concentration
   - A tract with 5 groups exceeding regional averages exhibits High Concentration

4. The proposed 2040 MTP transportation network was overlaid on the resulting demographic data and funding expenditure levels, or “Degree of Impact,” was calculated, taking into account the following guidelines:
   - Degree of Impact is quantified by transportation expenditures averaged across the total land area within each EJ Concentration classification;
   - Transportation expenditures account for all transportation projects impacting each of the four EJ Concentration classifications;
   - The full estimated expenditure on a transportation project is attributed to a Census tract which is crossed by, or shares a border with, said project alignment/corridor; and
   - The estimated expenditure on a transportation project is not attributed to a Census tract when said project alignment contacts the Census tract at only a single point along the border.

What the Findings Mean

In order to realize a continuing benefit from the Degree of Impact analysis, the findings must be examined within the context of various planning factors within the region. Some explanation of the particularities of the analysis can help to contextualize these findings.
The Degree of Impact methodology and accompanying analysis has resulted in disproportionately high expenditures per mile in Moderate Concentration census tracts, and more noticeably, in High Concentration tracts. This circumstance was not intended with the MPO’s project programming process, and is in fact the result of multiple historical, cultural, and geographical factors:

1. While the CRTPO planning area is comprised of 312 census tracts, the area contains just 60 Moderate Concentration tracts and 1 High Concentration tract, as identified through the EJ concentration assessment. While this indicates minimal concentrations of EJ populations within the planning area, it also represents relatively small geographical areas – 8.0 percent and 0.2 percent of the total planning area, respectively – within which to distribute transportation expenditures. As a result, the expenditures per square mile are significantly higher for these EJ concentrations.

The single High Concentration tract identified through this process is found on the edge of Uptown Charlotte and is located adjacent to both the LYNX Blue Line Extension ($1.16 billion), and the planned North Corridor Red Line ($452 million). To put this in context, this High Concentration tract accounts for 0.2 percent of CRTPO’s land area, but because of its location, is benefited by 7.1 percent of the transportation expenditures.

2. The urban form of the CRTPO region lends itself toward higher and more frequent expenditures adjacent to specific tracts for multiple reasons:

- Firstly, as is the case with most municipalities nationally, the road network is denser closer to city centers of larger municipalities (e.g. Charlotte, Monroe, and Statesville), and disperses as it transitions to more suburban and rural geographies. As such, many of the transportation expenditures are located in census tracts that are closer to city centers. Similarly, transit projects, which have higher initial project costs, tend to converge at city centers. This is a tenet of efficient transit planning and is certainly the case for CATS rail projects which radiate outwards from Charlotte’s city center.

- Secondly, minority and EJ populations have historically located closer to center city areas in order to access jobs, public transportation, and services. Living closer to center city areas also allows easier walking, bicycling, and commuting distances for those without personal vehicles. This location pattern coincides with center city-focused transportation investments such that numerous transportation projects and investments are located adjacent to higher EJ population concentrations.
3. While urban form has lent itself to more investment in city centers, the opposite is true for suburban and rural geographies. Many of these No Concentration and Slight Concentration tracts see smaller and more infrequent investments in roadway or transit construction.

Suburban and rural areas are often characterized by larger parcels and property sizes. There also tends to be greater separation between land uses in these areas, meaning the roadway network is typically less dense, and many facilities see less vehicular traffic than their city center counterparts. This results in fewer transportation expenditures in both construction and maintenance. Similarly, transit facilities, where available, are more spread out.

The average transportation investments for No Concentration and Slight Concentration tracts in the CRTPC region are roughly $10.4 million per square mile and $15.4 million per square mile, respectively. This is below the average $17.1 million per square mile investment for the entire CRTPC region.

4. From a historical perspective, many of the region’s major highway and roadway corridors were routed through geographies and neighborhoods with lower land values, and subsequent right-of-way costs and tax base impacts. As is the case nationally, many EJ populations – and specifically low income populations – tend to reside in these areas with depressed land values. In the past, construction of projects such as I-77 typically bisected these communities. Today, many of the same populations have remained in place, which results in current projects and expenditures aimed at widening, tolling, and maintaining highways (such as I-77) geographically impacting EJ populations and census tracts with higher than average EJ concentrations.
Conclusions

The assessment shows:

- Transportation projects have been initiated without undue burden of impacts on environmental justice communities;
- With equitable benefit of investments throughout the planning area, including environmental justice communities; and
- With planning considerations intended to distribute future benefits equitably and without consideration of race, ethnicity or income.

This analysis provides a starting point for assessing transportation improvement impacts on environmental justice communities; however, the most accurate assessments of impacts can only be conducted with a detailed analysis of individual projects.
Ongoing Efforts

The CRTPo reached out to EJ communities in various ways, as outlined previously in this chapter. Although some strategies were pursued for the 2040 MTP that have not previously been carried out, there is still room to improve community engagement, especially as it concerns traditionally underserved populations. The following observations have been made to help CRTPo improve its outreach efforts:

1. Environmental justice communities, particularly Hispanic and Black communities, are often unfamiliar with transportation planning processes and, consequently, unaware of the CRTPo’s role in the planning process for specific transportation projects. As a result, those community members have not taken the opportunity to play a role in decision-making processes. One example of CRTPo’s effort to improve the dialogue and encourage participation is to conduct outreach efforts in the communities identified, in venues which are familiar such as churches, libraries, etc.

2. Results from outreach efforts directed toward environmental justice communities indicate that the CRTPo must do a better job of educating and reaching out to low-income and minority communities regarding transportation initiatives. Based on previous responses of the Hispanic and Black communities to the CRTPo efforts, the traditional initiatives, such as ads printed in local newspapers (even when printed in Spanish), community signs advertising community meetings and inserts in utility bills have not provided the desired result. For the 2040 MTP, the CRTPo attempted several nontraditional means for sharing public information with environment justice communities through announcements at churches, conducting an interview with a Hispanic radio station, and providing a hotline that could be called to request information about the MTP in English plus six other languages representative of the populations within the CRTPo planning area.

3. Efforts must be made to work with environmental justice communities to develop methods by which the impacts of transportation investments can be ascertained. The use of print and graphics to “tell CRTPo’s story” in ways that cross ethnic or cultural lines will be key in helping environmental justice communities understand the relevance to their community’s quality of life. While new print documents were created specifically for the environmental justice outreach for the 2040 MTP update, CRTPo continues to explore ways to improve its public outreach efforts.
In conclusion, while the principles of environmental justice have been in place since the 1964 Civil Rights Act, their practice did not have the strength of an Executive Order until 1994. During the sixteen years since Environmental Justice has been a major national initiative, much has changed. Still, communities traditionally excluded from planning processes and unfairly burdened by negative environmental impacts may not be fully informed and involved in the planning process.

The CRTPO has committed to taking the lead in changing that paradigm by:

- Taking a thorough look at the impacts of their transportation plans and processes;
- Evaluating where MPO resources are being directed for projects of all modes to determine if environmental justice communities are being unreasonably burdened, or denied the benefits of transportation investments;
- Designing and implementing a public outreach program that is inclusive and culturally sensitive;
- Developing a process for and practice of connecting with key grassroots leadership, organization and institutions within minority and low-wealth communities to insure effective public outreach in those communities; and
- Standardizing these processes and practices for duplication and use in future CRTPO projects.
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List of Figures

5-1 ................. Low Income Population - Fiscally Constrained Projects
5-2 ................. Low Income Population - CATS Corridor System Plan
5-3 ................. Low Income Population - Bicycle, Pedestrian, and Greenway
5-4 ................. Black Population - Fiscally Constrained Projects
5-5 ................. Black Population - CATS Corridor System Plan
5-6 ................. Black Population - Bicycle, Pedestrian, and Greenway
5-7 ................. Hispanic Population - Fiscally Constrained Projects
5-8 ................. Hispanic Population - CATS Corridor System Plan
5-9 ................. Hispanic Population - Bicycle, Pedestrian, and Greenway
5-10 ............... Asian-American Population - Fiscally Constrained Projects
5-11 ............... Asian-American Population - CATS Corridor System Plan
5-12 ............... Asian-American Population - Bicycle, Pedestrian, and Greenway
5-13 ............... American Indian and Alaskan Native Population - Fiscally Constrained Projects
5-14 ............... American Indian and Alaskan Native Population - CATS Corridor System Plan
5-15 ............... American Indian and Alaskan Native Population - Bicycle, Pedestrian, and Greenway
5-16 ............... Limited English Proficiency Population - Fiscally Constrained Projects
5-17 ............... Limited English Proficiency Population - CATS Corridor System Plan
5-18 ............... Limited English Proficiency Population - Bicycle, Pedestrian, and Greenway
5-19 ............... Environmental Justice Degree of Impact Analysis
Figure 5-1

Low Income Population as Percentage of Census Tract Population

- 0% - 10%
- 11% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts
Low Income Population
Bicycle, Pedestrian, and Greenway

Legend

- CRTPO Planning Area
- Funded Improvement
  - Bike
  - Greenway
  - Multi-Use
  - Sidewalk

Low Income Population as Percentage of Census Tract Population

- 0% - 10%
- 11% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Figure 5-3

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Black Population Fiscally Constrained Projects

Legend

- CRTPO Planning Area

- Intersection
- Grade Separation
- Interchange
- Widening/New Location

2025 (2016-2025) Roadway Projects
- Intersection
- Grade Separation
- Interchange
- Widening/New Location

2030 (2026-2030) Roadway Projects
- Widening/New Location

2040 (2031-2040) Roadway Projects
- Widening/New Location

Black Population as Percentage of Census Tract Population

- 0% - 10%
- 11% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Figure 5-4

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
LEGEND

- CRTPO Planning Area
- LYNX Blue Line (Existing)
- CityLYNX Gold Line (Phase I Under Construction)
- LYNX Blue Line (Under Construction)
- North Corridor Red Line (Proposed)

Black Population as Percentage of Census Tract Population

- 0% - 10%
- 11% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Figure 5-5
Hispanic Population as Percentage of Census Tract Population

0% - 10%  
11% - 20%  
21% - 30%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Figure 5-7
Asian-American Population
Bicycle, Pedestrian, and Greenway

Legend
- CRTPO Planning Area
- Funded Improvement:
  - Bike
  - Greenway
  - Multi-Use
  - Sidewalk
- Asian-American Population as Percentage of Census Tract Population:
  - 0% - 1%
  - 2% - 20%
  - 21% - 30%
  - 31% - 40%
  - 41% - 60%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Figure 5-12
American Indian and Alaskan Native Population CATS Corridor System Plan

Legend
- CRTPO Planning Area
- LYNX Blue Line (Existing)
- CityLYNX Gold Line (Phase I Under Construction)
- LYNX Blue Line (Under Construction)
- North Corridor Red Line (Proposed)

American Indian/Alaskan Native Population as Percentage of Census Tract Population
- 0% - 1%
- 2% - 5%
- 6% - 10%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Figure 5-14
Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Figure 5-15

American Indian and Alaskan Native Population as Percentage of Census Tract Population

Legend

CRTPC Planning Area

Funded Improvement

- Bike
- Greenway
- Multi-Use
- Sidewalk

American Indian/Alaskan Native Population as Percentage of Census Tract Population

- 0% - 1%
- 2% - 5%
- 6% - 10%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Limited English Proficiency Population
CATS Corridor System Plan

Legend
- CRTPO Planning Area
- LYNX Blue Line (Existing)
- CityLYNX Gold Line (Phase I Under Construction)
- LYNX Blue Line (Under Construction)
- North Corridor Red Line (Proposed)

Limited English Proficiency Population as Percentage of Census Tract Population
- 0% - 1%
- 2% - 5%
- 6% - 10%
- 11% - 20%
- 21% - 30%
- 31% - 45%

Source: US Census 2012 ACS 5-Yr Estimates for Census Tracts

Figure 5-17
Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Environmental Justice
Degree of Impact Analysis

Legend
- CRTPO Planning Area

Degree of Impact
- No Concentration (26%) (0 Groups Exceeding Regional Average)
- Slight Concentration (54%) (1-2 Groups Exceeding Regional Average)
- Moderate Concentration (19%) (3-4 Groups Exceeding Regional Average)
- High Concentration (.32%) (5 Groups Exceeding Regional Average)

- Intersection
- Grade Separation
- Interchange
- Widening/New Location

2025 (2016-2025) Roadway Projects
- Intersection
- Grade Separation
- Interchange
- Widening/New Location

2030 (2026-2030) Roadway Projects
- Widening/New Location

2040 (2031-2040) Roadway Projects
- Widening/New Location

Source: US Census 2012 ACS 5-Yr Estimates

No Concentration Expenditures  $10,443,598 per square mile
Slight Concentration Expenditures  $15,396,145 per square mile
Moderate Concentration Expenditures  $47,851,520 per square mile
High Concentration Expenditures  $739,796,493 per square mile

Figure 5-19
Prepared by Charlotte-Mecklenburg Planning Department, April 2014
6. Safety and Security

New transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21), enacted in 2012, continues the use of the same eight (8) planning factors from the previous Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Safety and security are two of the eight factors identified as follows:

- Increase the safety of the transportation system for motorized and non-motorized users; and
- Increase the security of the transportation system for motorized and non-motorized users.

In addition, MAP-21 established seven national goals, one of which is safety. This Metropolitan Transportation Plan (MTP) specifically addresses each factor, but consolidates the safety and security components into a single chapter. The following chapter addresses safety and security within the Charlotte Regional Transportation Planning Organization (CRTPO) area.
Safety

Safety has previously been a primary concern of transportation system management, maintenance, and system expansion. MAP-21 places an emphasis on safety at the Metropolitan Planning Organization (MPO) level which makes it a priority for the CRTPA.

One way this emphasis is reflected is through linkages to the North Carolina Highway Safety Improvement Program (HSIP) and the North Carolina Strategic Highway Safety Plan (SHSP). North Carolina has found that regardless of the continuous enhancements made in the area of highway safety, there is still a need to better address the issues. To further reduce fatalities and better coordinate with agencies outside of North Carolina’s Department of Transportation (NCDOT), the North Carolina Executive Committee for Highway Safety (ECHS) has been charged to identify, prioritize, promote, and support all emphasis areas in the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan. The ECHS is comprised of experts in all disciplines related to highway safety.

The ultimate goal of the ECHS is to develop and implement short and long term sustainable strategies that will reduce the number of fatalities and injuries on North Carolina highways. In 2008, the ECHS agreed to adopt a 2.5 percent reduction in annual fatalities each year over the next 20 years as the new goal (2012 HSIP Annual Report). North Carolina continues to make progress to achieve this goal.

In addition, a “5 Percent Report” has been developed to provide an overview of the intersections identified as potentially hazardous (for motorized and non-motorized transportation) by the HSIP. The higher ranked locations were listed in the 2012 North Carolina HSIP report which is available on the NCDOT website.

North Carolina’s HSIP and the potentially hazardous locations identified are integrated into the SHSP. As noted in the SHSP report, the North Carolina ECHS has developed Working Groups to tackle such safety issues as lane departure, incident management, older driver safety, and bicycle and pedestrian safety. The Traffic Safety Systems Section of NCDOT has also developed location listings and safety data related to older driver crashes, utility pole crashes, closed loop signal systems, roadway departures and other key emphasis areas in support of the SHSP. Furthermore, as projects are developed, elements from the SHSP are incorporated by using “access management strategies” to preserve capacity and enhance safety. Some typical access management strategies include shared curb cuts, use of medians, and paved shoulders.
The CRTPO and its member governments are aware of the value of the strategies outlined in NCDOT’s SHSP, and seek to include them in projects wherever possible. In addition, the CRTPO formally considers safety in its updated MTP highway project ranking methodology (approved March 2013) and in its amended bicycle and pedestrian ranking methodology (amended January 2013).

**Highway Safety**

The goal of the SHSP is to reduce the number of fatalities and to decrease the economic impact from highway-related accidents. This goal is incorporated in this 2040 MTP as highlighted in the following goals and objectives:

- Provide, manage, and maintain a safe, efficient, and sustainable transportation system for all modes, intended to serve all segments of the population;
- Encourage design features that minimize crash potential, severity and frequency; and
- Facilitate bicycle and pedestrian safety through public awareness programs.

Strategies for addressing highway safety issues are discussed in the following three categories.

**Speed and Safety**

Segments of roads identified as a result of higher-than-average accident rates may be included in CRTPO or NCDOT project development lists. The types of improvements implemented vary from small-scale steps, such as installation of signs and/or markings, to intersection improvements, and roadway corridor projects.

NCDOT also implements a safety program through coordination between Division 10 and Division 12, the Incident Management Assistance Patrols (IMAP), law enforcement, and CRTPO member communities. Improvements recommended as a result of these collaborative efforts are reflected in the Transportation Improvement Program (TIP), as well as in the day-to-day work of field forces.

At a local level, the Charlotte Department of Transportation (CDOT) conducts a Speeding Awareness Campaign. CDOT also identifies speed-related crash corridors and works to raise awareness of this initiative and the identified corridors.

*The CRTPO and its member governments are aware of the value of the strategies outlined in NCDOT’s SHSP, and seek to include them in projects wherever possible.*
Congestion Management

The recently-approved CRTPO Congestion Management Process (CMP) examines the current and planned future roadway network, identifies causes of congestion, and explores options for reducing congestion. In addition to examining capacity constraints, it identifies methodologies for improving system efficiency and providing modal choices. Additional information about the Congestion Management Process is included in Chapter 12.

Traffic Safety Reporting

A Traffic Safety Report that summarizes collisions which occur within the Charlotte city limits is produced annually. The data that is collected is used to develop programs and projects to identify patterns and ultimately reduce crash rates. The report does not include collision data on the interstate highways (I-77, I-85, I-485 and I-277).

Bicycle and Pedestrian Safety

The CRTPO addresses the infrastructure and safety needs of bicyclists and pedestrians through several municipal bicycle, pedestrian, and greenway plans. In addition, the City of Charlotte completed a Pedestrian Safety Action Plan in May 2013, focused on reducing the citywide per capita rate of pedestrian crashes, injuries, and fatalities, while encouraging walkability.

Together, these plans analyze the area’s needs and include recommendations and action steps to enhance the safety of bicyclists and pedestrians. Actions taken to date include:

- Implementation of prioritized sidewalk projects and bicycle routes;
- Establishment of engineering, education, enforcement and evaluation principles for Pedestrian projects;
- Bicycle and sidewalk improvements included in local and state roadway projects;
- Detailed recording and analysis of bicycle and pedestrian accidents;
- Local government/MPO participation in bicycle and pedestrian safety;
- Bicycle and pedestrian draft CTP maps; and
- Approval of a bicycle and pedestrian ranking methodology (amended as of January 2013), which considers safety as an evaluation criteria.
Several member jurisdictions of the CRTPO have approved bicycle and/or pedestrian plans to help implement the measures previously identified. A complete listing can be found in Tables 15-1, 15-2 and 15-3 in the Bicycle, Pedestrian, and Greenway chapter.

Transit Safety

Mecklenburg County

The Charlotte Area Transit System (CATS) Office of Safety and Security is committed to providing safe and secure transit service. Safety and security are primary concerns that affect all aspects of planning, design, construction, operation, and maintenance of the transit system. The CATS staff, contractors, and consultants are charged with the responsibility of ensuring the safety and security of passengers, employees, and the public.

The following is a list of activities in which CATS is involved to ensure the safety of the transit system. This list includes the most important safety activities, but is not inclusive of every safety measure currently in place:

- Creation of safety standards (which are updated annually) for implementing safety and security throughout the transit system;
- Oversight and review of safety standards for major capital improvements including the LYNX Blue Line Extension (BLE), the LYNX Blue Line Capacity Expansion (BLCE), the CityLYNX Gold Line, as well as other capital projects;
- Participation in a safety and security certification process required by the Federal Transit Administration (FTA) and NCDOT;
- Compliance with the NCDOT State Rail Oversight Rule for rail incidents / accidents (49 CFR 659) and the US Department of Homeland Security Rule that affects transit systems (49 CFR 1580);
- Creation of a comprehensive Emergency Response Plan (ERP) to guide activity and response during a system emergency or community event. Two emergency drills are held annually;
- Adoption of the Incident Command System (ICS) structure and National Incident Management System (NIMS) to respond to and manage an emergency event; and
- Cooperation with law enforcement and municipal safety committees throughout the CRTPO planning area.
**Union County**

The Union County Public Transportation System (UCPTS) is the public transit system in Union County primarily involved in human-services delivery, with passengers picked up on a demand-response basis. In 2012, the UCPTS adopted the Union County Transportation Safety and Security Program Plan (SSPP), which was an update to its previous safety plan in order to comply with state and federal regulations.

Comprised of multiple sections that address policies and procedures of the department and the county, the SSPP addresses the following:

- Driver and employee selection;
- Driver and employee training;
- Safety and data acquisition;
- Drug and alcohol abuse program; and
- Vehicle maintenance program.

**Iredell County**

The Iredell County Area Transportation System (ICATS) is a ridesharing public transportation system that enables routes and schedules to be structured to transport multiple passengers to multiple destinations. Service is provided curb-to-curb unless door-to-door service is requested for special populations. Providing safe, efficient transportation services to the citizens of Iredell County is one of the goals of ICATS.

**Rail Safety**

At the state and local levels, rail safety is a concern due to the many active passenger and freight rail lines throughout the state of North Carolina. The NCDOT maintains a statewide rail safety program called BeRailSafe that provides information and education to inform the public about rail safety. Highlights of the program include crossing safely, walking safely, sports and recreation safety, and child safety initiatives. A Rail Safety Facts brochure is also published on the website.

Specifically, in the CRTPO planning area, rail traffic is significant and there are many at-grade crossings. The Charlotte Railroad Improvement and Safety Program (CRISP) is a partnership among freight and transit providers and state and local agencies that are involved with freight and passenger rail transportation planning and implementation. Some of the objectives of CRISP include modernizing existing track infrastructure, improving safety and efficiency, and improving the environment and local quality of life.
Security

The CRTPO has an extensive network of important infrastructure facilities, utilities, and population and employment centers and security planning is essential. Securing and managing incidents at these identified sites is addressed collaboratively by a range of organizations throughout the region, including transportation and law enforcement agencies. Their relevant plans and responsibilities are described in detail in the following sections.

Highways

The Strategic Highway Network (STRAHNET) system of public highways provides access, continuity, and emergency transportation of military personnel and equipment. The 61,000 mile system, designated by the Federal Highway Administration in partnership with the Department of Defense, comprises about 45,400 miles of Interstate and defense highways and 15,600 miles of other highways. STRAHRNET is complemented by about 1,700 miles of connectors — additional highway routes linking more than 200 military installations and ports to the network. Most large military convoys use the Strategic Highway Network.

STRAHNET roadways are designated for use in times of rapid mobilization and deployment of armed forces. In the CRTPO planning area, there are six (6) STRAHRNET routes and no connectors. The STRAHRNET routes include I-77, I-85, I-485, I-40, I-277 and US 74 from Center City Charlotte east into Union County. Any incident response strategies for these facilities are covered in the NCDOT SHSP, although these incident response strategies are not specific to STRAHRNET facilities.

Disaster Preparedness

Mecklenburg County Emergency Management Office

Charlotte-Mecklenburg Emergency Management Office (CMEMO) is a local governmental agency which coordinates large-scale emergency situations in Charlotte and Mecklenburg County. The agency assists emergency response departments with specialized needs and provides detailed planning procedures for incidents requiring multi-agency participation.

The CMEMO operates as a division of the Charlotte Fire Department, and develops and maintains disaster plans for the area. It also works to prepare residents, businesses, industries, and governmental agencies for all types of hazards and emergencies.

Disaster plans for the area are developed in coordination with transportation, law enforcement, and operational agencies. These plans address issues such as evacuation, containment, and first-responder actions, and are grouped under the heading of the Mecklenburg County Multi-Jurisdictional Hazard Mitigation Plan.
This plan has identified critical facilities and transportation system elements for inclusion in the plan and its strategies for appropriate response to incidents.

The CMEMO does not have an evacuation plan covering the entire county with designated routes and operational control of the designated routes. The CMEMO has analyzed its transportation network and other evacuation plans and determined that an evacuation is not adversely affected if citizens simply use all available routes to vacate an area. The CMEMO approach is to close off the affected area and instruct citizens to leave the area.

The specific section of the Hazard Mitigation Plan most relevant to this MTP is the Mitigation Action Plans, several of which are focused on transportation-related initiatives, such as marking detours during hazard events, coordinating efforts to minimize roadway closures, and developing evacuation routes that are not adversely impacted by flooding. CDOT is identified as the Lead Agency responsible for the aforementioned mitigation measures.

**Union County Office of Emergency Management**

The Office of Emergency Management (OEM) has many of the same roles and responsibilities as the Charlotte-Mecklenburg Emergency Management Office. They conduct regular disaster exercises with area emergency management agencies, in coordination with the Federal Emergency Management Agency (FEMA). An Emergency Operations Center (EOC), equipped with the necessary apparatuses is located within the agency.

Union County has an Emergency Operations Plan, adopted in 2004. This plan is maintained by the OEM and includes checklists for media contacts, inter-agency coordination, and command and control. It is tested at least tri-annually through table top or practical exercises, and is currently in the process of being updated.

Emergency situations may require evacuation of all or part of the County. Small-scale, localized evacuations may be needed as a result of a hazardous materials incident, major fire or other incident. Large-scale evacuation may be needed in the event of an impending hurricane. The OEM evaluation process has identified several highway routes allowing evacuation from various parts of the county, including US 74, US 601, NC 16, NC 84, NC 200 and NC 218, among others. The OEM expects the majority of residents to drive private vehicles during an evacuation, but Union County Transportation and Union County Public Schools will provide limited public transportation during emergency incidents.

Union County also serves as a “host” county to the Catawba Nuclear Site, located in York County, South Carolina. Should an accident occur at the Catawba Site, residents within a 10-mile radius of the site would be evacuated to “host” areas.

Union County also adopted a Multi-Jurisdictional Hazard Mitigation Plan in 2013, focused on minimizing the impact of hazards upon the built environment. The Plan recommends specific actions to combat the forces of nature and protect its
residents from losses to those hazards that pose the greatest risk. It considers mitigation actions, local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities, including transportation planning and improvements.

Iredell County Office of Emergency Management

The Iredell County Office of Emergency Management (OEM), was established in 1975 primarily to promote community preparedness and disaster management by creating and delivering various projects and programs with special emphasis placed upon disaster preparedness, prevention, response, and recovery. Iredell County OEM's role is to promote emergency preparedness and planning as a way to reduce the impact of a disaster if one occurs.

Coordination with local, regional, state and federal response agencies is practiced in order to provide necessary response and recovery efforts. The office is staffed by an Emergency Management Coordinator, a Deputy Emergency Management Coordinator, and a Program Assistant during normal business hours. In addition, on-call personnel are available during nights, weekends, and holidays; and, Assistant Emergency Management Coordinators from other Emergency Services divisions such as Animal Control, Emergency Communications (ECOM), Emergency Medical Services (EMS), and the Fire Marshal's Office have also been appointed to supplement disaster response and recovery capability.

Specific responsibilities of the Iredell County OEM include:

- Serving as a warning point for citizens and visitors of Iredell County;
- Reporting hazardous chemical incidents that may occur during transportation or at fixed facilities;
- Providing a radiological response program in support of the McGuire Nuclear Station;
- Serving as a clearinghouse for grants that address specific emergency management issues such as Homeland Security, hazardous materials response, hazard identification and planning, etc.; and
- Maintaining a current and comprehensive Emergency Operations Plan (EOP) that describes agency roles and responsibilities (most recently updated in 2012).
City of Charlotte

The City of Charlotte restricts access to design drawing plans, aerial photography, and similar documentation of public infrastructure to only those individuals and organizations that require this information in the conduct of their business with the City and upon demonstration of such need. Public infrastructure includes water and sanitary sewer systems, storm water systems, public buildings, roadways and roadway bridges, telecommunication and data communication networks, and public security plans. The NCDOT observes a similar infrastructure data policy.

Charlotte-Mecklenburg Police Department

The Charlotte-Mecklenburg Police Department (CMPD) has developed a Charlotte Center City Evacuation Plan (CCCEP) for the Charlotte Central Business District (CBD). This plan was created in 2004, and is currently being updated to reflect the recent addition of the CATS light-rail line. CATS and CDOT are both participating in the update. This plan currently identifies routes to use for an evacuation out of Center City. Evacuees may drive or walk out of Center City. There are identified assembly areas on the perimeter of the CBD for pick-up by CATS and Charlotte-Mecklenburg Schools’ (CMS) buses. The buses would then deliver evacuees to designated shelters.

Disaster Preparedness Recommendations

1. Continue use of incident management patrols, coordination with law enforcement agencies, and implementation of safety and mobility projects by the City of Charlotte, Iredell County, Mecklenburg County, Union County and the NCDOT to respond to safety trends and issues.

2. Address roadway operational issues on routes receiving significant freight movement, including roadway geometry, intersection configurations and capacity.

3. Encourage appropriate agency participation in any disaster exercises to strengthen communication and coordination protocols.

4. Work closely with the NCDOT Rail Division on planning studies and project development activities for rail safety projects, including rail grade separations at targeted locations.

5. Transportation and operational agencies should continue to coordinate consistently with the recommendations of the Mecklenburg County Multi-Jurisdictional Hazard Mitigation Plan, Union County Emergency Operations Plan, Iredell County Emergency Operations Plan, and Charlotte Center City Evacuation Plan.

6. Transportation agencies should ensure evacuation signage is consistent with current plan recommendations.
Sources:

North Carolina Department of Transportation Rail Division Rail Safety Brochure
http://files.berailsafe.gethifi.com/resources/BeRailSafe_brochure_single_d06.pdf


North Carolina Department of Transportation Strategic Highway Safety Plan, 2007
https://www.ite.org/safety/stateprograms/NorthCarolina_SHSP.pdf

North Carolina Department of Transportation BeRailSafe, 2012
http://www.berailsafe.org/

Charlotte Regional Transportation Planning Organization Metropolitan Transportation Plan, Roadway Ranking Methodology, 2013


Charlotte Area Transit System – System Safety Program Plan, 2009

Charlotte-Mecklenburg Police Department Center City Evacuation Plan, undated

Mecklenburg County Multi-Jurisdictional Hazard Mitigation Plan, 2010

Iredell County Emergency Operations Plan, 2012

Union County Emergency Operations Plan, 2004

Union County General Operations Guidelines in Support of the Catawba Nuclear Site, 2004

Union County Transportation Emergency and Security Plan for Transit Vehicles, 2009

Union County Transportation Safety and Security Program Plan, 2012

Union County Multi-Jurisdictional Hazard Mitigation Plan, 2013
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7. Environment

The Charlotte Regional Transportation Planning Organization (CRTPO) planning area is a diverse region, ranging from the dense urban core of center city Charlotte, to increasingly suburban areas of Mecklenburg, Union, and Iredell counties, to rural communities containing landscapes that have changed minimally in the past century. One unifier in this diverse region is the need for an efficient transportation network that serves a variety of demands. It is the CRTPO’s responsibility to ensure that such a network is provided, but in a way that protects the natural and human environment.

The CRTPO adopted goals and objectives include a goal that commits the organization to providing:

“A sustainable transportation system that improves the quality of life for residents, promotes healthy living, and is sensitive to significant features of the natural and human environments.”
The following chapter addresses the environmental issues that the CRTPD currently faces. It is organized by environmental issue, current measures / efforts to improve the issue, mitigation activities, and other notable issues for the CRTPD planning area.

**Air Quality**

Air quality is the environmental issue that the CRTPD addresses most directly. The Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The Charlotte region does not meet federal air quality standards for ground-level ozone pollution. A map of this area is shown in Figure 7-2. The CAA requires the CRTPD to demonstrate that its MTP does not harm air quality. The process by which the CRTPD demonstrates that the Metropolitan Transportation Plan (MTP) will not lead to the region exceeding established ozone standards is referred to as “conformity.” Transportation conformity is required by the 1990 federal Clean Air Act Amendments (CAA) (section 176(c), 42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with (“conform to”) the air quality goals established by a state air quality implementation plan (SIP). Conformity affects the CRTPD because it is required to demonstrate that it conforms to the SIP.

**History**

**1995**

The EPA designated Mecklenburg County a maintenance area for 1-hour ozone and carbon monoxide NAAQS. A maintenance area is an area that was formerly deemed to be classified as non-attainment for a specific pollutant, but is now in compliance with EPA air quality standards.

Improvements in emission controls have resulted in significant reductions in carbon monoxide (CO) emissions from motor vehicles; therefore, attaining the air quality standard for CO has become easier over the past twenty years. An important result of emission improvements is that the entire CRTPD region has air that meets the current CO air quality standard. The CO maintenance period is scheduled to end in 2015 which means that CO will cease to be a factor in this transportation planning process. In addition, on June 15, 2005 the 1-hour ozone standard was repealed.
April 2004
Most of what is now the CRTPO planning area was part of a multi-county region designated by EPA as a non-attainment area for the 8-hour ozone NAAQS of (effectively) 84 parts per billion (ppb).

March 2008
The EPA revised this 8-hour ozone NAAQS standard downward to 75 ppb. However, the 2008 ozone NAAQS was not fully implemented until July 20, 2012. One result of the change was that the designated non-attainment area for the 2008 NAAQS was slightly reduced from the 1997 standard, with part of eastern Union County being removed from non-attainment status. The non-attainment area now includes all of Mecklenburg County, and parts of Cabarrus, Gaston, Iredell, Lincoln, Rowan and Union, as shown in Figure 7-2.

Today
Most of the CRTPO planning area is classified as marginal non-attainment for ozone; however, air quality in the region has steadily improved over the past 30 years for all pollutants, including ozone. Chart 7-1 shows the downward trend of 8-hour ozone from 1997 to 2012.

Note: The 2012 value includes ozone measurements through September 30, and has not been fully validated by the NC Division of Air Quality.

Source: Charlotte Department of Transportation.
Ozone emissions have been in a downward trend since 1997, and technological improvements over the past decade have had a positive impact on Oxides of Nitrogen (NOx) emissions. Many new federal and state controls should continue to reduce emissions from autos and light duty trucks, in addition to emissions from heavy-duty diesel vehicles and point sources.

While the region has experienced air quality improvements, it should be noted that by 2035, the emission reductions from technology improvements with equipment designed to reduce formation of ozone precursors such as NOx and volatile organic compounds (VOC) are at risk of being overcome by rapid growth and increases in vehicle miles of travel (VMT). These three trends are shown for Mecklenburg County in Chart 7-2.

![Chart 7-2: Projected Trend of Mecklenburg County VMT, Population, and NOx Emissions](chart)

Source: Charlotte Department of Transportation.

A third pollutant of specific importance to the Charlotte area is the 2.5-micron particulate matter (PM2.5) standard. In October 2009, US EPA designated the Charlotte region as an “attainment” area for the 2006 24-hour PM2.5 NAAQS. Emission controls on light and heavy-duty diesel vehicles and continued flue gas emission control improvements at surrounding coal-fired power plants have been key factors in addressing ongoing pollution concerns and preserving the Charlotte-region’s PM2.5 attainment designation.

**Over the past decade, ozone emissions have been in a downward trend and technological improvements have had a positive impact on Oxides of Nitrogen (NOx) emissions.**
Local Measures to Improve Air Quality

The North Carolina Department of Environment and Natural Resources (NCDENR), the CRTPO, and the local jurisdictions in the region are taking other proactive measures to improve air quality in the CRTPO area.

- **The NC Air Awareness Program**: This NC DENR program was created to educate the public about air pollution and the individual actions that can make a positive difference during forecasted high ozone days.

- **The Centralina Clean Fuels Coalition**: The mission of the Coalition is to reduce petroleum dependence, improve air quality, and expand alternative fuel use and technology. The program promotes, accelerates, and expands the use of alternative fuels in the transportation sector.

- **Southeast Diesel Collaborative**: This effort is a voluntary, public-private partnership involving leaders from federal, state, and local government, the private sector, and other stakeholders throughout the southeast working to reduce diesel emissions. The Southeast Diesel Collaborative is part of the Environmental Protection Agency’s National Clean Diesel Campaign.

- **Congestion Mitigation and Air Quality (CMAQ)**: This US Department of Transportation (USDOT) program seeks to provide funding to transportation projects with air quality benefits in non-attainment and maintenance areas. CRTPO’s CMAQ project selection methodology is heavily weighted toward those projects that demonstrate maximum emissions reductions.

- **CONNECT Our Future**: This effort is focused on creating a regional growth framework. Its Air Quality/Climate Change Work Group is responsible for assessing the current status of climate change impact planning in the region and to complete a technical planning study to establish a process for black-carbon emissions reductions.

- **Grants to Replace Aging Diesel Engines (GRADE) Program**: This program specifically targets reducing NOx emissions from non-road sources that contribute to the ozone problem in the Charlotte region. This program is particularly effective because non-road equipment historically has not had emission controls on its engines, and emits many times the pollution of similarly powered on-road vehicles. The CRTPO has allocated substantial amounts of its CMAQ funds to the GRADE program.
- **Vehicles Miles Traveled (VMT) Reduction**: These strategies encourage higher vehicle occupancy and lower VMT which are also part of the CRTPO’s plans to improve air quality. These commitments include:
  - The construction of major rapid transit projects;
  - Extensive expansion of local and express transit services;
  - Construction of high-occupancy vehicle lanes; and
  - Continued integration of land use and transportation planning

**Water Quality**

The transportation system also affects water quality. Runoff from the road surfaces is a major source of water pollution. Rainwater running off of roads picks up gasoline, motor oil, heavy metals, trash and other pollutants. De-icing chemicals, salt, and sand can run off into roadsides, contaminate groundwater, and pollute surface waters. Acid rain results from a chemical reaction that takes place when auto emissions are released into the air. The precursors of acid rain formation result from both natural sources and man-made sources, primarily emissions of sulfur dioxide (SO₂) and NOx. This type of rain is brought about when the emissions rise in the atmosphere and react when mixed with water, oxygen, and other compounds. The result is the formation of acidic pollutants, or acid rain. Human activities, such as industrial and vehicle emissions, are the main causes of acid rain.

**Local Measures to Improve Water Quality**

**CRTPO**

The CRTPO’s roadway project ranking methodology includes a natural resources impact criterion that seeks to assess the environmental impact of each project nominated for inclusion in the MTP. The purpose of this criterion is to determine the level of potential impact that candidate projects could have on surrounding natural resources. This is a GIS-based assessment, where GIS data are used to locate natural resources, such as streams, wetlands, ponds, floodplains, and threatened and endangered species. Candidate projects are then assessed for their proximity to these resources.

- **Mecklenburg County** has taken a proactive role in establishing buffers around creeks, streams, and rivers. Particular attention has been paid to protecting the drinking water supply by addressing development issues in sensitive watershed areas.
- **Union County**, in “Vision 2020,” has committed to build infrastructure that promotes commercial, industrial, and agricultural growth and supports residential development while producing a sustainable living environment.

- **Iredell County**, through its Soil and Water Conservation District, promotes the wise use and management of natural resources: soil, water, air, plants, and animals. The District administers and supports local, state, and federal programs which improve water quality and reduce non-point source pollution on both agricultural and non-agricultural lands.

- Local and county governments are working with the Centralina Council of Governments (CCOG) and the North Carolina Ecosystem Enhancement Program to develop a local watershed plan (LWP) for the Goose Creek and Crooked Creek watersheds. This is an especially important project because of the proximity of the Monroe Connector-Bypass corridor. The Goose Creek watershed supports populations of a federally endangered freshwater mussel, the Carolina heelsplitter. The CRTPC staff has been involved with the process due to the effects the transportation system can have on watersheds and water quality. In 2013, the stakeholders in this LWP coverage area, including local governments, participated in implementation activities related to highly ranked projects that emerged from prior planning work. This effort is funded through a grant managed by CCOG and seeks to create a platform for action and discussion in these watersheds going forward.

**Phase II Stormwater Regulations**

Phase II stormwater permitting programs were established under the federal Clean Water Act and then delegated to the NC Division of Water Quality (DWQ) for implementation. The Phase I stormwater program began in 1990 and applies to local governments that had populations of 100,000 or more at that time (Charlotte, Durham, Fayetteville/Cumberland County, Greensboro, Raleigh and Winston-Salem). Each subject local government now implements a stormwater management program that includes public education, illicit discharge detection and elimination, and water quality monitoring. The Phase II stormwater program automatically applies to local governments in Census-designated urbanized areas.

A summary of the Phase II water quality regulations within the covered area is provided in Table 7-1.

The efforts to lower air pollution from the transportation system will have positive impacts on water quality. The integration of land use and transportation will benefit water quality by ensuring that proposed transportation facilities are balanced to the appropriate level of development in sensitive watershed areas.
<table>
<thead>
<tr>
<th>Water Quality Regulation</th>
<th>Jurisdiction(s)</th>
<th>Major Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goose Creek Watershed Site Specific Water Quality Management Program (SSWQMP)</td>
<td>Union County Charlotte Mint Hill</td>
<td>Best Management Practices (BMPs) and buffer requirements</td>
</tr>
<tr>
<td>Catawba River Riparian Buffer Rules</td>
<td>Meck. County Iredell County Charlotte Cornelius Davidson Huntersville Mooresville</td>
<td>Buffers: 50-ft along Catawba River</td>
</tr>
<tr>
<td>Watershed Rules</td>
<td>Meck. County Union County Iredell County Charlotte Cornelius Davidson Huntersville Troutman</td>
<td>BMPs, buffers and built-upon area (BUA) caps</td>
</tr>
<tr>
<td>Post-Construction</td>
<td>Meck. County Union County Iredell County Charlotte Cornelius Davidson Indian Trail Lake Park Matthews Mint Hill Mooresville Pineville Stallings Statesville Troutman</td>
<td>BMPs</td>
</tr>
<tr>
<td>Low Impact Development (LID) / Post-Construction</td>
<td>Huntersville</td>
<td>BMPs and buffers</td>
</tr>
</tbody>
</table>

Source: Mecklenburg County Water Quality Program; Union County Public Works; Iredell Soil and Water Conservation District (SWCD).
Future Water Quality Issues

As land development activities continue, there will be a decrease in the natural cover of the land and an increase in built-up area (BUA) including structures, paved surfaces, etc. During storm events, this increase in BUA causes additional volume and flow of runoff to enter streams that would normally (under undeveloped conditions) not be discharged to the stream.

Ninety percent (90%) of rainfall events in the planning area produce less than one inch of rain. During a one-inch rain event, an undeveloped Piedmont forest (such as exists in the planning area) will not generate any runoff due to infiltration and evapo-transpiration. However, if this Piedmont forest is cut down and replaced with BUA, a one-inch rain event will produce over 27,000 gallons of runoff per acre of land. With development, a stream that normally does not receive any runoff during 90 percent of the rain events, could now receive stormwater runoff during nearly every rain event. This increase in volume of stormwater runoff causes stream banks to erode and the streams to cut to accommodate the additional flow of stormwater. This causes sediment to be deposited into streams, which negatively affects water quality and stream habitat.

As streams continue to degrade, the NCDWQ will require all contributors to stream degradation to restore stream conditions through the Total Maximum Daily Load program. This program involves the assigning of pollutant loads to each contributor and could involve the contributors retrofitting stormwater treatment best management practices (BMPs) to meet their load restrictions. The EPA recognizes that increased flow of stormwater is a major contributor to stormwater pollution. In 2006, the National Research Council recommended to the EPA that “Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality” and “Stormwater controls measures that harvest, infiltrate, and evapo-transpirate stormwater are critical to reducing the volume and pollutant loading of small storms”. Reducing the volume of stormwater runoff from new transportation projects can greatly reduce the impact to surface water bodies and reduce potential costs of restoring streams in the future.
Consultation

Section 23 CFR 450.322g of the metropolitan planning regulations states:

“The MPO shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. The consultation shall involve, as appropriate: (1) comparison of transportation plans with State conservation plans or maps, if available; or (2) comparison of transportation plans to inventories of natural or historic resources, if available.”

The following steps were taken in order to ensure that the appropriate agencies were given ample opportunity to provide input on the content of the MTP:

- The database of all federal, state, and local agencies with responsibilities in the areas mentioned in the planning regulations was updated. The database was first prepared during development of the 2035 Long Range Transportation Plan, and includes a range of agencies that exceeds the regulations' requirements.

- The Advisory Committee formed at the beginning of the MTP development process included representatives from a wide range of agencies associated with the Consultation process. While not every possible agency was a committee member, the committee’s makeup was such that the majority of the issues and disciplines were represented.

- Agency representatives were contacted in early 2013 to notify them of the start of the MTP development process.

- New CRTPO goals and objectives were developed at the start of the MTP development process. Agency representatives were requested to review and comment on the draft goals and objectives.

- All agencies in the CRTPO’s database were invited to attend the three MTP kick-off meetings held in June 2013.

- All agencies in the CRTPO’s database were invited to attend three meetings held in September 2013 to obtain public input on the draft fiscally constrained roadway project list. In addition, a separate meeting was scheduled before the September 26, 2013 meeting held at the Charlotte-Mecklenburg Government Center in order to provide the agencies with an opportunity to meet one-on-one with CRTPO staff to discuss the projects on the draft fiscally constrained list, as well as other issues of concern to the agencies.

- All agencies in the CRTPO’s database were invited to attend a meeting held on December 12, 2013 to review the fiscally-constrained MTP project list overlaid on the environmental features map created for the MTP. This meeting was held to provide an additional opportunity for resource agencies to comment prior to the completion and release of the draft MTP. Two agencies attended the meeting, the Carolina Thread Trail and Mecklenburg County Park and Recreation.

- Each CRTPO governing body agenda includes a detailed update on the MTP development process. The agenda distribution list includes all agencies in the Consultation database, thus ensuring additional opportunities to stay informed about the MTP’s progress and key milestones.
Mitigation

Section 23 CFR 450.322f7 of the metropolitan planning regulations states that Metropolitan Transportation Plans must include:

“a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan. The discussion may focus on policies, programs, or strategies, rather than at the project level. The discussion shall be developed in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies. The MPO may establish reasonable timeframes for performing this consultation.”

The CRTPo’s regional perspective — combined with the 20-year planning horizons required of Metropolitan Transportation Plans — does not permit project-level discussion of environmental mitigation. Instead, the information presented discusses existing activities that seek to mitigate environmental impacts, potential mitigation activities, and the mitigation-related challenges faced by the CRTPo at a systems level.

Current Efforts

The CRTPo has in place a series of efforts that will assist in future project development through the early identification of potential environmental constraints. Continued employment of these activities can result in actions such as project scope changes that will result in the avoidance of resources at the planning level, thereby limiting the need for, and the expense of, design changes and/or environmental mitigation efforts.

- The development of the CRTPo’s fiscally-constrained roadway project list began with the nomination of approximately 270 projects for possible inclusion in the MTP. Each submittal was required to provide information on potential environmental constraints. The purpose of the request was to assist in the project review process and to aid in the development of a project database that included potential constraints. Each project was evaluated using the CRTPo’s project ranking process that includes a natural resources impacts criterion. The criterion’s objective is to assess the anticipated effect a nominated project may have on the natural environment. Figure 7-1 shows major environmental features as well as fiscally constrained projects in the CRTPo planning area.

- The CRTPo regularly conducts analyses of projects on its Thoroughfare Plan/ Comprehensive Transportation Plan to determine if the proposed alignments are viable. These analyses include an environmental screening component to identify potential constraints that may have to be addressed at the project development stage. In some cases, the result has been a modification to the Thoroughfare Plan when the screening has determined that the constraints are significant enough to warrant such action. In addition, the CRTPo’s local governments conduct similar analyses that include an environmental screening. These activities have also resulted in Thoroughfare Plan modifications.
The CRTPo uses its involvement in the preparation of feasibility studies and project environmental documents to inform the North Carolina Department of Transportation (NCDOT) officials about the presence of potential environmental constraints associated with individual projects.

Various agencies within the CRTPo’s planning area also play a significant role in mitigation-related activities:

- Local municipalities have taken a proactive role in establishing buffers around creeks, streams, and rivers. Particular attention has been paid to protecting the drinking water supply by addressing development issues in critical watershed areas.

- The Catawba Lands Conservancy and the Davidson Land Conservancy have augmented the government efforts mentioned above by working to conserve environmentally sensitive land and preserving open space. In addition, Farmland Preservation Programs help limit impervious areas. Iredell County, for example, has over 17,000 acres in farmland preservation.

- Local municipalities implement stormwater management programs for redevelopment and new development. Some jurisdictions manage their own programs including Watershed Protection programs, Post-Construction Programs, and Goose Creek Watershed Site Specific Water Quality Management Plan.

In addition to activities of the CRTPo and its local partners, the North Carolina Ecosystem Enhancement Program (EEP) implements off-site mitigation projects for NCDOT where on-site mitigation is not possible. NCDOT is responsible for implementing on-site mitigation projects.

**Potential Mitigation Activities**

Listed below are potential reasons why mitigation might be necessary on a project, along with possible activities that could be considered when a project faces environmental constraints. The list below should not be considered an exhaustive list of mitigation activities. Also, project mitigation strategies must be based on the unique characteristics of each project and the location where the mitigation is to be implemented.

Several potential mitigation strategies are listed in Table 7-2. If on site mitigation is not feasible, off site mitigation can occur by working with local land use agencies, park departments, land conservancies, etc.
<table>
<thead>
<tr>
<th>Environmental Feature</th>
<th>Potential Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological</td>
<td>Conduct archaeological excavations to ensure artifacts are not lost</td>
</tr>
<tr>
<td></td>
<td>Realign and/or relocate the project to avoid the affected resource</td>
</tr>
<tr>
<td>Community Impacts</td>
<td>Construct a bridge to help maintain community cohesiveness</td>
</tr>
<tr>
<td></td>
<td>Construct sidewalks and bike lanes</td>
</tr>
<tr>
<td></td>
<td>Install traffic calming devices</td>
</tr>
<tr>
<td></td>
<td>Construct sound barriers</td>
</tr>
<tr>
<td>Farmland</td>
<td>Work with local land conservancies or the North Carolina Agricultural Development</td>
</tr>
<tr>
<td></td>
<td>Farmland Preservation Trust Fund to determine ways to preserve the resource</td>
</tr>
<tr>
<td>Fragmented Animal Habitats</td>
<td>Build overpasses with vegetation or underpasses to allow animals to cross safely</td>
</tr>
<tr>
<td></td>
<td>Realign and/or relocate projects to avoid impacted habitats</td>
</tr>
<tr>
<td>Historic Sites</td>
<td>Realign and/or relocate the project to avoid the affected site</td>
</tr>
<tr>
<td></td>
<td>Install landscaping to reduce visual impacts</td>
</tr>
<tr>
<td></td>
<td>Relocation</td>
</tr>
<tr>
<td>Noise</td>
<td>Erect noise barriers</td>
</tr>
<tr>
<td></td>
<td>Depress the facility</td>
</tr>
<tr>
<td></td>
<td>Install landscaping to reduce impacts.</td>
</tr>
<tr>
<td>Threatened and Endangered</td>
<td>Realign and/or relocate the project to avoid the affected species</td>
</tr>
<tr>
<td>Species</td>
<td>Enhance or restore degraded habitat</td>
</tr>
<tr>
<td></td>
<td>Create new, off-site habitats</td>
</tr>
<tr>
<td>Stream and Lake Buffers</td>
<td>Re-vegetate disturbed areas with native planting</td>
</tr>
<tr>
<td></td>
<td>Ensure diffuse stormwater flow provided through the buffer from storm drain pipes</td>
</tr>
<tr>
<td></td>
<td>Install stormwater treatment structures as mitigation either on-site or off-site</td>
</tr>
<tr>
<td></td>
<td>Pay impact fees to jurisdictions</td>
</tr>
</tbody>
</table>

7. Environment
Challenges to Mitigation

Rapid growth is a key challenge to mitigation activities. The CRTPO is located in one of the fastest growing regions of the nation, resulting in a rapidly shrinking inventory of locations where effective mitigation activities can be located.

Limited financial resources are a further challenge. Effective mitigation efforts are always difficult to fund, but as overall resources become more limited, the willingness to implement mitigation projects may become harder.

Other Issues

Climate Change

Climate change is an increase in the near surface temperature of the earth most often as a result of increased Greenhouse Gas (GHG) emissions from the following:

- Transportation sources;
- Natural and man-made waste decomposition processes;
- Air conditioning refrigerants; and
- Electric energy generation units.

According to the American Meteorological Society (AMS) in 2012:

“Warming of the climate system now is unequivocal, according to many different kinds of evidence. Observations show increases in globally averaged air and ocean temperatures, as well as widespread melting of snow and ice and rising globally averaged sea level.”

The official Statement of the AMS also notes:

“It is clear from extensive scientific evidence that the dominant cause of the rapid change in climate of the past half century is human-induced increases in the amount of atmospheric greenhouse gases (GHG), including carbon dioxide (CO2), chlorofluorocarbons, methane, and nitrous oxide. The most important of these over the long term is CO2, whose concentration in the atmosphere is rising principally as a result of fossil-fuel combustion and deforestation.”

Climate change is commonly thought of as an increase in the near surface temperature of the earth, but also manifests itself as more frequent extreme weather events such as heavy rain, droughts, and severe storms.

Minimum temperatures are increasing in many urban areas. These minimum temperature trends are significant, but are not linked to the broader global warming trend. Similar trends are not seen at rural locations, suggesting that the observed changes in minimum temperatures are associated with urbanization. Changing the materials that cover our land surface changes the thermal properties of the land from material that has significant moisture levels and lower heat release (vegetation) to material that provides little moisture and has a high heat release
(non-vegetative surfaces such as roads, roofs, etc.). Several other observational and modeling studies in NC and elsewhere confirm this analysis; the changes to land use patterns are much more closely linked to local-scale changes in minimum temperatures than any broader global warming.

Climate change can be addressed in transportation planning with mitigation and adaption efforts. According to a report published by the Federal Highway Administration (FHWA):

“Mitigation of climate change means reducing the major causes of climate change: GHG released by human activity. Adaptation to climate change means minimizing the potential impacts on the transportation system from climate changes such as rising temperatures, increased intensity of storms, rising sea levels and increases in overall climate variability.”

Many federal, state, and local transportation agencies are incorporating climate change issues in their various plans and processes. The FHWA has identified four primary strategies to reduce GHG emissions from transportation. These four strategies include:

1. Improve system and operational efficiencies – traffic flow, fuel efficiency, and maintenance, etc;
2. Reduce growth in VMT – land use strategies, high occupancy vehicle (HOV) lanes, transit options, connectivity, pedestrian and bicycle facilities, etc;
3. Transition to fuels with lower GHG emissions – biodiesel, natural gas, plug-in electric, and propane; and
4. Improve vehicle technologies – more fuel efficient-vehicles, such as hybrids, Corporate Average Fuel Economy (CAFE) standards.

The CRTPO and its partners have already employed a number of noteworthy activities which would reduce GHG emissions, several of which are described below:

**Charlotte Region Fast (Managed) Lanes Study**

The three-phased Fast (Managed) Lanes Study, initiated in 2007, was a multi-county evaluation of the feasibility of implementing managed lanes, including HOV and high occupancy toll (HOT) lanes, throughout the CRTPO planning area, as well as the adjacent Metropolitan Planning Organization (MPO) and Rural Planning Organization (RPO) planning areas. The study was initiated in part because of the public’s acceptance of the HOV lanes along ten miles of I-77 between Charlotte and Huntersville. HOV and HOT lanes emphasize person movement rather than vehicle movement, thereby improving a roadway’s ability to transport more people in fewer vehicles.
Since the completion of the study in June 2013, the CRTPO area has advanced several managed lanes projects.

- I-77 North: The existing HOV lanes are proposed to be converted to HOT lanes and extended to NC 150 (Exit 36) in Mooresville. The project is proposed to be augmented with a second HOT lane in each direction between I-277 (Brookshire Freeway) and the Catawba Avenue interchange (Exit 28);

- I-485: Planning is now underway for an express toll lane on I-485 between US 74 and I-77 in southern Mecklenburg County; and

- Independence Boulevard: Planning is now underway to implement HOT lanes on Independence Boulevard from center city Charlotte to I-485 in Matthews. The existing bus only lane will be converted to HOT lanes.

**Charlotte Urban Street Design Guidelines (USDG)**

The Charlotte City Council adopted the USDG in 2007. The USDG are built upon the “complete streets” philosophy, which emphasizes that the transportation network should be multi-modal, thereby making alternative modes more viable and lessening the community’s reduction on every trip requiring the use of a car.

**NC Complete Streets Policy**

The NCDOT adopted a “Complete Streets” policy in July 2009. The policy directs the Department to consider and incorporate several modes of transportation when building new projects or making improvements to existing infrastructure. The Complete Streets Policy is discussed in more detail in the Bicycle, Pedestrian, and Greenway chapter.

**Connectivity Policy**

Several CRTPO jurisdictions have established a road connectivity policy that emphasizes a system of streets providing multiple routes and connections between origins and destinations. Connectivity is important because a highly connected street network can greatly reduce trip lengths, thereby reducing VMT which in turn results in reduced emissions.

**Transit Planning**

Mecklenburg County adopted a 1/2 cent sales tax for transit in 1998 to support a vision outlined in the 2025 Integrated Transit/Land Use Plan. The result has been the opening of North Carolina’s first light rail line in 2007, with an extension of the line to the UNC-Charlotte campus scheduled to open in 2017. In addition, there have been increases in bus service (including regional service to outlying cities), and strong efforts to promote transit-oriented development (TOD) at existing and future rapid transit stations. The emerging transit system, and the concurrent land use planning efforts, will provide residents with options to traditional transportation and land use patterns.
Congestion Mitigation and Air Quality (CMAQ) Funds

The CRTPO member jurisdictions have used CMAQ funds for a variety of purposes that will result in a reduced use of GHG fuels. Examples of those CMAQ funded projects include:

- Intersection improvements implemented to help reduce congestion and idling;
- Street connectivity plans designed to reduce trip length;
- A bus replacement policy intended to purchase vehicles that are more fuel efficient;
- Traffic signal priority system for mass transit which decreases travel time for buses, thereby making transit a more viable transportation option;
- Implementing diesel engine retrofits that are designed to eliminate old, highly-polluting engines from off-road construction vehicles; and
- Developing greenways to promote alternative forms of transportation.

This plan does not include a quantitative assessment of greenhouse gases. However, as more consistent methods to measure GHG emissions are developed, and as legislative and regulatory mandates emerge, the CRTPO will address them accordingly.

Endangerment Finding and Cause or Contribute Finding

In December 2009, the EPA issued two findings that will have an impact on the CRTPO’s transportation planning process in the future: an Endangerment Finding and a Cause or Contribute Finding. These findings are discussed below.

Endangerment Finding

The mix of atmospheric concentrations of six, well-mixed greenhouse gases threatens both the public health and the public welfare, both now and in the future. The EPA states that these greenhouse gases in the atmosphere constitute “air pollution” and that they threaten the public health and welfare. This finding is called the “Endangerment Finding”. The six greenhouse gases are:

- Carbon dioxide (CO2);
- Methane (CH4);
- Nitrous oxide (N2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF6).
Cause or Contribute Finding

The combined greenhouse gas emissions from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change. This finding is called the “Cause or Contribute Finding.”

The greenhouse gas emissions from the six sources mentioned above account for just over 23 percent of total U.S. greenhouse gas emissions. Greenhouse gas emissions from on-road vehicles are the second largest greenhouse gas emissions source in the United States, behind the electricity generating sector. The EPA’s determination treats the emissions of the six key greenhouse gases collectively as an “air pollutant” under the Clean Air Act and paves the way for regulating emissions from cars.

Prior to this announcement, the EPA announced in May 2009, that it would coordinate with the US DOT to set the first ever federal emissions standards for greenhouse gases by proposing standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. These vehicle categories are responsible for almost 60 percent of all U.S. transportation-related greenhouse gas emissions.

The EPA and the National Highway Traffic Safety Administration (NHTSA) finalized standards to extend the light-duty vehicle GHG National Program for model years 2017-2025. Furthermore, the agencies have adopted first-ever GHG regulations for heavy-duty engines and vehicles.

Sources:

EPA’s Office of Transportation and Air Quality (OTAQ), 2013

Southeast Regional Climate Center


FHWA’s Integrating Climate Change into the Transportation Planning Process, July 2008
List of Figures

7-1 .................. Environmental Features
7-2 .................. Air Quality Non-Attainment Area
Figure 7-1

Legend

Significant Natural Heritage Areas (SNHA)
- Exceptional
- Very High
- High
- Moderate
- General
- Unranked

Land Trust Conservation Properties
Local Historic Properties
Local Historic Districts
National Historic Buildings & Structures

National Historic Districts
Historic Cemeteries
Steep Slopes (Greater than 25%)

Mecklenburg Co SWIM Buffers
100 Year Floodplain
Water Supply Watersheds
Targeted Watershed

Roadway Projects
- Intersection
- Interchange
- Grade Separation
- Widening/New Location

8. Health Impacts

Public health is a community concern that requires a collaborative approach, integrating policy-making and programming across numerous disciplines. The North Carolina Department of Transportation (NCDOT) recently expanded its mission to integrate public health considerations into initiatives, plans, and policies, as well as to explore the use of health impact assessments (HIAs) for specific projects. The Charlotte Regional Transportation Planning Organization (CRTPO) is following NCDOT's lead by incorporating public health into its vision statement and the Metropolitan Transportation Plan (MTP). This will be the first time that health related information has been included in the region’s transportation plan.

A notable accomplishment in incorporating health into this transportation planning effort is the Red Line Regional Rail HIA which was completed in November 2012. This report summarized the health status of residents in Mecklenburg and Iredell Counties, the two counties in which the project will be located, and examined the potential health impacts of converting existing rail lines to accommodate additional freight travel and commuter train service. The health impacts which were considered included the following:

- Physical activity levels and safety of those walking or biking around stations;
- Impacts on air pollution and respiratory disease;
Economic impacts of additional housing opportunities surrounding the stations and reduced travel expenses;

- Increased rail traffic and reduced time in traffic; and

- Mental health impacts of possible displacement.

**The Relationship Between Public Health and Transportation**

When considering the intersection between public health and transportation, experts in health and the built environment commonly consider three things:

- Promoting alternative forms of transportation, particularly active ones such as walking and bicycling which result in increases in physical activity levels and associated health benefits;

- Promoting safety and injury reduction, especially for the more vulnerable groups of pedestrians and bicyclists; and

- Reducing negative environmental health impacts like air pollution and diseases affected by air pollution or ozone, including asthma, other respiratory diseases, heart disease, and heat stroke.

Other health considerations when analyzing transportation networks include:

- Health equity, mobility, and access to public transit, especially for those individuals who cannot afford a vehicle or are unable to drive because of age, health status; or abilities;

- Mental health as it relates to road rage and stressful commuting;

- Social isolation and limited independence, especially of the elderly with reduced mobility and children who are dependent on their parents for transportation;

- Perception of safety at all times of day, especially for pedestrians, bicyclists, and transit users; and

- Time spent in a vehicle versus time that could be committed to other health-promoting activities.
Strategies for Increasing Public Health Considerations in Transportation Planning

Implementation

This chapter on health has been added to the CRTPO Metropolitan Transportation Plan to begin identifying health, and health impacts, as a contributing factor in the transportation planning process.

Implementation

CRTPO amended its Public Involvement Plan in 2012 to more comprehensively account for environmental justice communities, including the adoption of a limited English proficiency (LEP) plan.

I. Overarching Principles, Goals and Vision Statement

- Identify the built environment as being a major factor in determining health and revise the visions and plans to include promoting the health and well-being of citizens and all transportation system users.
- Consider the different needs of older adults, children, minorities, low-income populations, persons with limited English proficiency (LEP), people with physical and cognitive disabilities and other vulnerable and disadvantaged populations when planning for the future.
  - Map the location of these population groups and highlight areas where additional attention or investment may be needed.
  - Use multiple forms of communication and activities to engage these populations in the planning process (i.e. have information available in multiple languages, make social media input a possibility, make sure meeting locations and times are accessible for those with disabilities or unusual work schedules, offer childcare, etc.)
- Develop processes and procedures for evaluating and monitoring health impacts of recommendations within transportation plans.
  - Gather baseline health information including identifying rates of chronic diseases and potential health inequities. Possible sources of data include the Community Health Assessment, the Behavioral Risk Factor Surveillance System, and the Youth Risk Behavioral Survey.
Implementation

The inclusion of a health chapter in the CRTPO’s 2040 MTP is a first step to address health impacts. It is intended that the next MTP would build on these efforts and incorporate the results of a health impact assessment.

- Conduct a health impact assessment of the plan or on major projects if warranted.
- Consider partnering with local health departments to gather health-related data during typical transportation surveys or studies such as bicycle and pedestrian facilities assessments, motor vehicle accident reports, and transportation mode surveys.

- Collaborate with health professionals and identified stakeholders to develop and review plans, policies and projects.
  - Include representation of health professionals on advisory committees.
  - Provide an overview of the planning process so health professionals and stakeholders will know when information is available and feedback will be timely.

- Provide data and assistance to health studies that rely on the transportation network such as: route analysis to parks and recreation opportunities; crash data for vulnerable populations, or in at risk communities; access to healthy and affordable food sources; access to health services; or, safe routes to school programs.

Implementation

CRTPO expanded its Technical Coordinating Committee membership to not only include a Health Planner as a voting member, but also added as voting members representatives of each active transportation mode/facility – pedestrian/sidewalk, bicycle and greenway.
Implementation

One of the 2040 MTP goals is to “Encourage walking, bicycling and transit options, integrated with motor vehicle transportation, by providing a transportation system that serves the public with mobility choices.”

II. Active Living

- Transportation (and land use) projects support active living or physical activity as part of residents’ daily routines.
- Recognize the need to have safe and convenient places for activity with connections to destinations (e.g. home, work, school, food, healthcare).
- Prioritize the transportation needs of vulnerable and disadvantaged populations (e.g. older adults, children, persons with disabilities, low-income residents, etc.).
  - Refer to urban street design guidelines related to pedestrian, bicycle, and transit access that support active transport modes for people of all abilities.

Implementation

The CRTPO, and the NCDOT, have embraced Complete Street Design Guidelines, and the City of Charlotte approved Urban Street Design Guidelines in 2007.
Implementation

A plan was recently completed to analyze station areas for the funded Blue Line Extension in Charlotte, in which transit oriented development (TOD) zoning is being implemented.

- Establish a standard that promotes pedestrian activity (walkability) and use pedestrian overlay zones to promote walking in commercial areas and transit station areas.
- Extend and connect the greenway/multi-use trail network for walking and bicycling that can be used by people of all abilities.
- Improve street connectivity to provide multiple routes and connections both within residential areas as well as between residential neighborhoods and destinations, such as schools and retail shops.
- Incorporate traffic calming measures (e.g. re-orient streets, lower speed limits).

Implementation

A plan that was funded by the CRTPO was recently completed to evaluate potential connections in the existing Iredell and Mecklenburg County greenway systems to create a 30-mile Mooresville to Charlotte Trail.

Implementation

Street diets have been implemented within the CRTPO planning area, including the reduction of vehicle travel lanes to accommodate bicycle lanes and pedestrian refuges.
Implementation

One of the 2040 MTP objectives is to “Encourage land use strategies that maximize the potential for transit patronage and coverage.”

- Support increased access to public transportation by encouraging greater use.
- Connect existing and proposed active transportation facilities.
- Support Safe Routes to School and other mechanisms that encourage youth of all abilities to walk and bicycle to and from school.

III. Environmental Health

- Support increased access to public transit, active transportation, and ridesharing to reduce dependency on single occupancy vehicles.
- Address storm water runoff from streets to improve water quality and reduce the risk of flooding.
- Evaluate local sources of air pollution and track bad ozone days. Work with local health professionals to compare this data to emergency room visits for asthma and other ozone related conditions.

IV. Mobility and Health Equity

- Work with major employers to offer rideshare programs and safe routes to places of employment.
- Increase affordable public transit options (routes and times) so that low-income populations and those who are unable to drive due to age or ability will have a means of transportation.
- Provide shuttles to grocery stores and farmers markets to increase access to healthy food, especially in populations with low mobility options.
- Partner with social services and healthcare providers to increase transit access especially for older adults and low-income populations.
Implementation

One of the 2040 MTP objectives is to “Provide linkages for pedestrians and/or bicyclists with neighborhoods, employment centers, services, commercial areas and other business districts, parks, greenways and cultural facilities such as schools and churches.”

V. Congestion Mitigation and Mental Health

- Reduce congestion on main thoroughfares to reduce the time spent in vehicles which can contribute to acute stress and road rage.

- Provide opportunities for alternative forms of transportation (public transit, rideshare programs, and active transportation) to reduce dependency on single occupancy vehicles and congestion and allow for time to be spent doing other activities (e.g. reading while riding transit, getting physical activity while bicycling and walking, and talking while carpooling). Reduced congestion, increased physical activity, and opportunities to socialize can reduce stress and improve mental health.

Sources:

http://www.nap.edu/catalog.php?record_id=13229

Hebert, K. Health Impact Assessment: Red Line Regional Rail. Davidson, NC; 2012
9. Population and Land Use

Overview of Existing Socio-Economic Conditions

The Charlotte Regional Transportation Planning Organization (CRTPO) planning area includes all of the local governments in Mecklenburg County, western and central portions of Union County, and the southern portion of Iredell County. Located in the Piedmont region of south central North Carolina, the CRTPO area serves as the demographic and economic focal point of the eleven-county, Metrolina modeling region. The modeling region is the area included in the travel demand model which forecasts growth and travel based on socio-economic projections.

In 2010, the Metrolina modeling region included nearly 2.2 million people. The CRTPO’s planning area accounts for 55 percent of the Metrolina modeling region’s population, with just over 1.2 million people and close to 69 percent of the region’s estimated 1.2 million jobs. The Metrolina modeling region and the CRTPO planning area are shown in the map in Figure 9-1. The 2010 population and employment data for the Metrolina modeling region, the CRTPO, and the counties that comprise the CRTPO are included in Table 9-1.
Table 9-1: Population and Employment, 2010

<table>
<thead>
<tr>
<th>Area</th>
<th>2010 Population</th>
<th>2010 Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrolina Modeling Region</td>
<td>2,257,000</td>
<td>1,205,500</td>
</tr>
<tr>
<td>CRTPO</td>
<td>1,249,000</td>
<td>830,000</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>919,500</td>
<td>690,000</td>
</tr>
<tr>
<td>Union County (partial)</td>
<td>184,000</td>
<td>71,500</td>
</tr>
<tr>
<td>Iredell County (partial)</td>
<td>145,500</td>
<td>68,500</td>
</tr>
</tbody>
</table>

Note: The numbers included in this table have been rounded to the nearest 500s.

Mecklenburg County (which includes Charlotte, the largest city in the Carolinas) contains a large majority of both people (41%) and jobs (57%) in the Metrolina modeling region. Charlotte remains the economic engine not just of the CRTPO planning area, but of the broader region as well.

Population growth in the planning area has been driven by strong economic growth. As stated in the Metrolina Regional Demographic and Economic Data and Data Forecasts document,

“Charlotte has a diverse economy with at least three independent drivers. It is: a banking industry headquarters center with its related support services, a regional goods and service distribution center serving the Southeast’s Piedmont region and, to a lesser extent, the entire Southeast, and a center of old and new economy manufacturing.”
Socio-Economic Projections

Overview

Socio-economic projections are the basis for estimating future travel demand in an area. The number and distribution of jobs, people, and schools play a key role in what transportation facilities are used, when they are used, and who uses them. This chapter outlines the process, assumptions, and outcomes of these socio-economic projections for both the CRTPA area as a whole as well as by the 15 districts that comprise the CRTPA.

The local governments in the Metrolina region worked to project county-level growth in each of the counties in the Metrolina Regional Travel Demand Model (Metrolina Model), which is the travel demand model for the region. CRTPA members then worked from late 2012 through early 2013 to collectively determine how much growth would occur in each of the districts and individual Transportation Analysis Zones (TAZs) throughout the three counties. The work for Iredell County was conducted with the former Lake Norman Rural Planning Organization (LNRO), which performed transportation planning activities for the county until mid-2013, when it was incorporated into CRTPA. Similarly, the projections for Mecklenburg and Union counties were completed by the former Mecklenburg-Union Metropolitan Planning Organization (MUMPO) which previously served as the responsible transportation planning organization for the Charlotte Urbanized Area.

2040 Socio-Economic Projection Process

As a result of the 2010 Census, the CRTPA area includes three counties, 1.249 million people, and 829,800 jobs in 1,351 square miles. To effectively analyze this large area for travel behavior, future transportation needs, and air pollutants emitted by the motor vehicles used in the region, the study area is broken into 1,768 TAZs. Each of these TAZs includes over a dozen independent pieces of information about the travel behavior of that particular geography.

The CRTPA is required to develop projections for the following variables:

- Total Population
  - Population in households
  - Population in group quarters (dormitories, group homes, etc.)
- Total Jobs
  - Industrial jobs
  - High-traffic Industrial jobs
  - Retail jobs
  - High-Traffic Retail jobs
- Low-Traffic Service jobs
- High-Traffic Service jobs
- Education jobs
- Office and Government jobs

- Student Enrollment
  - K-8
  - 9-12
  - College

The CRTPO develops projections for each of these variables for each horizon year in the Metropolitan Transportation Plan (MTP) -2015, 2025, 2030, and 2040 - for each of the individual TAZs. This means there are over 21,000 data points for each decade, or over 80,000 individual data points that must be provided to properly model travel demand between 2010 and 2040. These projections were endorsed in early 2013 by the governing boards for the former LNRPO and MUMPO. Both of these agencies are now represented by the CRTPO, and the data are maintained by the Charlotte Department of Transportation (CDOT).

In order to evaluate and analyze this data in a manner consistent with a similar socio-economic projection process completed in 2002 (following the 2000 Census), sub-county districts defined during the 2002 process were used in the analysis of the 2040 MTP data described in this chapter. The districts, shown in Figure 9-2, are used throughout this chapter in tables and charts and are defined later in the chapter. The districts are aggregates of the TAZs, representing different geographies throughout the CRTPO planning area.
Population Projections

Although the CRTPO's population is anticipated to grow by 62 percent between 2010 and 2040, this growth is not evenly distributed throughout the planning area. Figures 9-3 and 9-4 show the district level population density (residents per square mile) for 2010 and 2040, respectively. In 2010, the Central Charlotte and University districts have the highest population densities. The majority of the other Mecklenburg County districts have population densities above 1,000 residents per square mile. Most of the districts in Union and Iredell Counties have lower population densities.

In 2040, the population density pattern for the CRTPO planning area is anticipated to look relatively the same; however, the densities will be much higher than in 2010. Table 9-2 shows population projections by county, and Chart 9-1 and Table 9-3 show population projections by sub-county district. For example, Central Charlotte will continue to have one of the highest population densities. Figure 9-5 illustrates the population density growth rate (2010-2040). The districts with the highest growth rate annually (3.01% - 3.50%) are the North Mecklenburg Towns and Steele Creek, which will see significant greenfield development, particularly in single-family homes. The districts with the lowest growth rates (less than 1.5%) are South Charlotte, East Charlotte / South Towns, and Statesville.

Table 9-2: Population Projections by County

<table>
<thead>
<tr>
<th>County</th>
<th>2010</th>
<th>2040</th>
<th>Absolute Growth (2010-2040)</th>
<th>Percent Growth (2010-2040)</th>
<th>Annual Average Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mecklenburg</td>
<td>919,600</td>
<td>1,491,900</td>
<td>572,300</td>
<td>62%</td>
<td>2.07%</td>
</tr>
<tr>
<td>Union (partial)</td>
<td>183,900</td>
<td>311,000</td>
<td>127,100</td>
<td>69%</td>
<td>2.30%</td>
</tr>
<tr>
<td>Iredell (partial)</td>
<td>145,400</td>
<td>223,800</td>
<td>78,400</td>
<td>54%</td>
<td>1.80%</td>
</tr>
<tr>
<td>Total</td>
<td>1,248,900</td>
<td>2,026,700</td>
<td>777,800</td>
<td>62%</td>
<td>2.08%</td>
</tr>
</tbody>
</table>

Note: The numbers included in this table have been rounded to the nearest 100s.
Table 9-3: Population Projections by Sub-County District

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Charlotte</td>
<td>130,100</td>
<td>235,200</td>
<td>105,100</td>
<td>81%</td>
<td>2.69%</td>
</tr>
<tr>
<td>North Meck Towns</td>
<td>85,600</td>
<td>171,700</td>
<td>86,100</td>
<td>101%</td>
<td>3.35%</td>
</tr>
<tr>
<td>Brookshire</td>
<td>85,900</td>
<td>149,200</td>
<td>63,300</td>
<td>74%</td>
<td>2.46%</td>
</tr>
<tr>
<td>Mallard Creek</td>
<td>88,300</td>
<td>153,200</td>
<td>64,900</td>
<td>73%</td>
<td>2.45%</td>
</tr>
<tr>
<td>University</td>
<td>56,400</td>
<td>85,200</td>
<td>28,800</td>
<td>51%</td>
<td>1.70%</td>
</tr>
<tr>
<td>Steele Creek</td>
<td>75,400</td>
<td>147,900</td>
<td>72,500</td>
<td>96%</td>
<td>3.21%</td>
</tr>
<tr>
<td>South Charlotte</td>
<td>238,500</td>
<td>330,900</td>
<td>92,400</td>
<td>39%</td>
<td>1.29%</td>
</tr>
<tr>
<td>East CLT / South Towns</td>
<td>159,400</td>
<td>218,600</td>
<td>59,200</td>
<td>37%</td>
<td>1.24%</td>
</tr>
<tr>
<td>Central Union</td>
<td>61,200</td>
<td>94,300</td>
<td>33,100</td>
<td>54%</td>
<td>1.80%</td>
</tr>
<tr>
<td>Northwest Union</td>
<td>110,200</td>
<td>195,000</td>
<td>84,800</td>
<td>77%</td>
<td>2.57%</td>
</tr>
<tr>
<td>South Union (partial)</td>
<td>6,500</td>
<td>11,500</td>
<td>5,000</td>
<td>77%</td>
<td>2.56%</td>
</tr>
<tr>
<td>East Union</td>
<td>6,000</td>
<td>10,200</td>
<td>4,200</td>
<td>70%</td>
<td>2.33%</td>
</tr>
<tr>
<td>Statesville</td>
<td>59,300</td>
<td>78,700</td>
<td>19,400</td>
<td>33%</td>
<td>1.09%</td>
</tr>
<tr>
<td>Troutman</td>
<td>25,600</td>
<td>45,700</td>
<td>20,100</td>
<td>79%</td>
<td>2.62%</td>
</tr>
<tr>
<td>Mooresville</td>
<td>60,500</td>
<td>99,400</td>
<td>38,900</td>
<td>64%</td>
<td>2.14%</td>
</tr>
</tbody>
</table>

Note: The numbers included in this table have been rounded to the nearest 100s.
Employment Projections

The distribution of additional employment in the CRTPA area will also be widespread, but similarly to population, Central and Southern Charlotte will see the highest absolute increases in number of employees. Figures 9-6 and 9-7 provide the district level employment density (employees per square mile) for 2010 and 2040, respectively. The Central Charlotte district has an employment density close to 5,000 in 2010, and Mallard Creek has the next highest density of 1,516 employees per square acre. Employment densities taper off based on the distance from the dense Charlotte city center. A similar pattern is shown in Figure 9-7 for the projected 2040 employment densities. The increase in number of employees will slightly lag the increase in population, as the increased percentage of retirees will impact overall workforce participation rates. Employment projections by county are shown in Table 9-4, and employment projections by sub-county district are shown in Chart 9-2 and Table 9-5.

Figure 9-8 illustrates the employment growth rate for each district. The growth rates range from 1.37% (Statesville) to close to 4.42% (Troutman). It is important to note that while the Troutman district has the highest growth rate (4.42%) its absolute growth is 7,300 employees, which is much lower than the more urban districts.

### Table 9-4: Employment Projections by County

<table>
<thead>
<tr>
<th>County</th>
<th>2010</th>
<th>2040</th>
<th>Absolute Growth (2010-2040)</th>
<th>Percent Growth (2010-2040)</th>
<th>Annual Average Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mecklenburg</td>
<td>689,800</td>
<td>1,080,100</td>
<td>390,300</td>
<td>57%</td>
<td>1.89%</td>
</tr>
<tr>
<td>Union (partial)</td>
<td>71,300</td>
<td>113,000</td>
<td>41,700</td>
<td>58%</td>
<td>1.95%</td>
</tr>
<tr>
<td>Iredell (partial)</td>
<td>68,700</td>
<td>111,800</td>
<td>43,100</td>
<td>63%</td>
<td>2.09%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>829,800</td>
<td>1,304,900</td>
<td>475,100</td>
<td>57%</td>
<td>1.91%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 100s.*
# Chart 9-2: Employment Projections by Sub-County District

The chart above illustrates the projected employment growth in different sub-county districts of a region. The data is represented for the years 2010 and 2040.

# Table 9-5: Employment Projections by Sub-County District

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Charlotte</td>
<td>230,200</td>
<td>364,700</td>
<td>134,500</td>
<td>58%</td>
<td>1.95%</td>
</tr>
<tr>
<td>North Meck Towns</td>
<td>39,900</td>
<td>61,200</td>
<td>21,300</td>
<td>53%</td>
<td>1.78%</td>
</tr>
<tr>
<td>Brookshire</td>
<td>36,300</td>
<td>55,000</td>
<td>18,700</td>
<td>52%</td>
<td>1.72%</td>
</tr>
<tr>
<td>Mallard Creek</td>
<td>65,300</td>
<td>98,700</td>
<td>33,400</td>
<td>51%</td>
<td>1.70%</td>
</tr>
<tr>
<td>University</td>
<td>19,300</td>
<td>32,400</td>
<td>13,100</td>
<td>68%</td>
<td>2.26%</td>
</tr>
<tr>
<td>Steele Creek</td>
<td>113,500</td>
<td>172,600</td>
<td>59,100</td>
<td>52%</td>
<td>1.74%</td>
</tr>
<tr>
<td>South Charlotte</td>
<td>146,100</td>
<td>229,700</td>
<td>83,600</td>
<td>57%</td>
<td>1.91%</td>
</tr>
<tr>
<td>East CLT /South Towns</td>
<td>39,200</td>
<td>65,800</td>
<td>26,600</td>
<td>68%</td>
<td>2.26%</td>
</tr>
<tr>
<td>Central Union</td>
<td>34,000</td>
<td>53,300</td>
<td>19,300</td>
<td>57%</td>
<td>1.89%</td>
</tr>
<tr>
<td>Northwest Union</td>
<td>33,200</td>
<td>53,500</td>
<td>20,300</td>
<td>61%</td>
<td>2.04%</td>
</tr>
<tr>
<td>South Union (partial)</td>
<td>700</td>
<td>1,200</td>
<td>500</td>
<td>71%</td>
<td>2.38%</td>
</tr>
<tr>
<td>East Union</td>
<td>3,400</td>
<td>5,000</td>
<td>1,600</td>
<td>47%</td>
<td>1.57%</td>
</tr>
<tr>
<td>Statesville</td>
<td>33,300</td>
<td>47,000</td>
<td>13,700</td>
<td>41%</td>
<td>1.37%</td>
</tr>
<tr>
<td>Troutman</td>
<td>5,500</td>
<td>12,800</td>
<td>7,300</td>
<td>133%</td>
<td>4.42%</td>
</tr>
<tr>
<td>Mooresville</td>
<td>29,900</td>
<td>52,000</td>
<td>22,100</td>
<td>74%</td>
<td>2.46%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 100s.*
K-12 School Enrollment Projections

K-12 school enrollment projections typically correlate with household population growth. The assumptions for student growth also varied by county, with Union and Iredell Counties expecting continued strong growth in their public, private, and charter school populations. Mecklenburg County also projected strong growth, but assumed that the growth rate of students enrolled by district would remain equal through 2040, as the school district assumed they would revise school enrollment boundaries as necessary to balance growth pressures with capacity at nearby schools. Table 9-6 shows school enrollment projections by county, and Chart 9-3 and Table 9-7 show school enrollment projections by sub-county district.

<table>
<thead>
<tr>
<th>County</th>
<th>2010</th>
<th>2040</th>
<th>Absolute Growth (2010-2040)</th>
<th>Percent Growth (2010-2040)</th>
<th>Annual Average Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mecklenburg</td>
<td>155,000</td>
<td>251,600</td>
<td>96,600</td>
<td>62%</td>
<td>2.08%</td>
</tr>
<tr>
<td>Union (partial)</td>
<td>40,400</td>
<td>67,200</td>
<td>26,800</td>
<td>66%</td>
<td>2.21%</td>
</tr>
<tr>
<td>Iredell (partial)</td>
<td>24,500</td>
<td>36,500</td>
<td>15,500</td>
<td>49%</td>
<td>1.63%</td>
</tr>
<tr>
<td>Total</td>
<td>219,900</td>
<td>355,300</td>
<td>135,400</td>
<td>62%</td>
<td>2.05%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 100s.*
Chart 9-3: K-12 School Enrollment by Sub-County District

Table 9-7: K-12 School Enrollment by Sub-County District

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Charlotte</td>
<td>25,600</td>
<td>41,600</td>
<td>16,000</td>
<td>63%</td>
<td>2.08%</td>
</tr>
<tr>
<td>North Meck Towns</td>
<td>17,900</td>
<td>29,100</td>
<td>11,200</td>
<td>63%</td>
<td>2.09%</td>
</tr>
<tr>
<td>Brookshire</td>
<td>11,100</td>
<td>18,000</td>
<td>6,900</td>
<td>62%</td>
<td>2.07%</td>
</tr>
<tr>
<td>Mallard Creek</td>
<td>15,300</td>
<td>24,800</td>
<td>9,500</td>
<td>62%</td>
<td>2.07%</td>
</tr>
<tr>
<td>University</td>
<td>3,800</td>
<td>6,200</td>
<td>2,400</td>
<td>63%</td>
<td>2.11%</td>
</tr>
<tr>
<td>Steele Creek</td>
<td>9,900</td>
<td>16,000</td>
<td>6,100</td>
<td>62%</td>
<td>2.05%</td>
</tr>
<tr>
<td>South Charlotte</td>
<td>45,800</td>
<td>74,300</td>
<td>28,500</td>
<td>62%</td>
<td>2.07%</td>
</tr>
<tr>
<td>East CLT/South Towns</td>
<td>25,600</td>
<td>41,600</td>
<td>16,000</td>
<td>63%</td>
<td>2.08%</td>
</tr>
<tr>
<td>Central Union</td>
<td>15,100</td>
<td>24,200</td>
<td>9,100</td>
<td>60%</td>
<td>2.01%</td>
</tr>
<tr>
<td>Northwest Union</td>
<td>23,100</td>
<td>39,000</td>
<td>15,900</td>
<td>69%</td>
<td>2.29%</td>
</tr>
<tr>
<td>South Union (partial)</td>
<td>900</td>
<td>2,000</td>
<td>1,100</td>
<td>122%</td>
<td>4.07%</td>
</tr>
<tr>
<td>East Union</td>
<td>1,300</td>
<td>2,000</td>
<td>700</td>
<td>54%</td>
<td>1.79%</td>
</tr>
<tr>
<td>Statesville</td>
<td>8,800</td>
<td>11,600</td>
<td>2,800</td>
<td>32%</td>
<td>1.06%</td>
</tr>
<tr>
<td>Troutman</td>
<td>3,400</td>
<td>6,700</td>
<td>3,300</td>
<td>97%</td>
<td>3.24%</td>
</tr>
<tr>
<td>Mooresville</td>
<td>12,300</td>
<td>18,200</td>
<td>5,900</td>
<td>48%</td>
<td>1.60%</td>
</tr>
</tbody>
</table>

Note: The numbers included in this table have been rounded to the nearest 100s.
District Descriptions and Land Use Trends

As mentioned previously in this chapter, sub-county districts have been identified in order to evaluate and analyze data which is used to develop future year projections for population, which impacts land use trends within the CRTPO planning area. A total of 15 districts have been defined, including eight in Mecklenburg County, four in Union County and three in Iredell County. Following is a description of each district, as well as information about current and anticipated land use trends within each district.

Mecklenburg County

District Name: Central Charlotte

Central Charlotte is the most urbanized area in the Charlotte metropolitan region, containing Charlotte’s Central Business District (CBD) as well as its older and more compactly-developed neighborhoods. This area is characterized by a mixture of land uses that are typical of urban centers of large cities. Land in the area is nearly fully developed with the exception of some sites that are currently undergoing redevelopment. The area is fully served by public infrastructure as well as bus and light rail public transit service.

Typical of the center core of a healthy city, this area has seen significant redevelopment during the 1990s and 2000s. A resurgence of both office and residential markets has been experienced in the CBD with establishment of a number of arts and cultural districts in several key locations, containing museums, galleries, restaurants, theatres, entertainment venues, and other special destinations. Three key developments have been the sports facilities: Bank of America (football) stadium, Time-Warner Cable (basketball and hockey) arena, and the BB&T (baseball) field (currently under construction). There has been a similar resurgence in the appeal of many of the residential districts in this area as well, notably along the Blue Line light rail line (opened in 2008), North Davidson Street, and Central Avenue.

In the period between 2000 to 2010, this area has experienced less than one percent population growth due in large part to the absence of large tracts of easily-developable land and the fact that newly-developed urban-style housing appeals principally to singles and small families. By 2040, it is expected that this area will experience incremental growth, with reinvestment seen in the West, Wilkinson, and Freedom corridors. It is expected that the Independence and North Tryon corridors will benefit from revitalization associated with public investments in transit system-related infrastructure. The North Graham corridor is envisioned as an “innovation” corridor that will benefit from proximity to both the business center and major university. Given the urban context, it is expected that much of this new development will contain a mixture of higher-density uses (particularly in the centers and corridors). Land use plans and policies support this higher density/mixture of uses, while preserving lower density existing residential neighborhoods in key “wedge” areas, particularly those within designated historic districts.
District Name: North Mecklenburg Towns

This district encompasses the three north Mecklenburg towns of Cornelius, Davidson, and Huntersville. All three towns are served by I-77 bisecting the area north/south and bordering Mountain Island Lake and Lake Norman to the west. Each town retains its own identity, characterized at least in part by their three distinct downtown areas located along NC 115 which runs parallel to the interstate. The towns each contain a mixture of land uses. They are primarily residential, but have significant commercial districts located principally at or near I-77 interchanges. Limited industrial uses are situated in key locations. The eastern edge of all three towns is primarily rural in nature.

While each town has its own separate development ordinances, there are several land use characteristics they have in common:

- Eastern portions of the towns are principally rural, due to topography, absence of utilities and roadways, and a number of land conservation covenants in effect;
- Central portions of towns (the corridor roughly defined by NC 115 on the east and I-77 on the west) are fairly well-developed, with much development activity and public infrastructure investment (some significant commercial and retail nodes exist in this area, primarily at or near the interstate interchanges); and
- Western portions in closest proximity to the lakes, whose land use development is governed by the popularity of lake living and by watershed protection regulations, is principally residential.

Given the popularity of "suburban" living, the attractiveness of living in proximity to the lakes, and the availability of developable land, this area has seen impressive growth, with a 73 percent increase in population during the 2000s. While much of the available land is developed, the area's potential for future growth is significant. The towns' development ordinances focusing upon compact and higher-density development at specific locations will provide impetus for future growth. These locations include, but are not limited to, the historic towns' downtown areas, the areas surrounding the proposed sites of the future stations for the Red Line commuter rail public transit that is proposed to traverse the area north/south paralleling I-77 and NC 115, and to link Center City Charlotte to the south with the Town of Mooresville in Iredell County to the north. The new land development anticipated by 2040 will complement – and be complemented by – the investment made in public transit.

The rural nature of the eastern portion of the district has been primarily affected by sewer improvements made during the past five years. Roadway transportation plans and land use planning will set the course for future lower-intensity development with a focus on preservation of natural features and recognition of unique topographic and historic characteristics of the area.
**District Name: Brookshire**

This northwestern Charlotte area of the region has exhibited some interesting development patterns, with land development following two corridors radiating out from the center city: NC 16 (Brookshire Boulevard) and I-77. These two development corridors (specifically defined by NC 27/Mt. Holly Road and NC 16/Brookshire Boulevard in the case of the NC 16 corridor and US 21/Statesville Road and Beaties Ford Road in the case of the I-77 corridor) have incrementally grown outward from Charlotte’s center since World War II and contain a mixture of land uses. With that said, these areas remain predominantly residential in nature. The generous rail and interstate access enjoyed by the northwest area has given rise to the industrial parks in the Toddville and Oakdale areas, the areas along Mt. Holly Road, and Perimeter Woods along West W. T. Harris Boulevard at I-77. This district is also the home of Northlake Mall located at the northwest corner of I-77 and West W. T. Harris Boulevard.

In between these growth corridors lie two regions that have been relatively unaffected by development pressure and therefore still exhibit fairly rural land use characteristics. These areas are in the Oakdale Road/Sunset Road area and in an area between Mt. Holly Road and Wilkinson Boulevard. The former area is affected by the absence of a well-developed roadway network while the latter area is impacted by topographical features and more stringent watershed development restrictions. A renewed development interest in the Mt. Holly/Wilkinson area seems to have occurred following the completion of the nearby Whitewater Center in the mid-2000s.

The area has recently seen impressive growth with a population increase of 66 percent in the 2000s. The areas in close proximity to major amenities, such as the airport, interstates, and to Mountain Island Lake, will likely continue to be attractive for development through 2040. Several major development proposals (including the Belmeade Whitewater development off of Mt. Holly Road) are proof that interest in this area for future development, particularly for lower-density residential housing, will remain strong.

The proposed “Reventure” development, a unique public-private venture which is intended to create employment opportunities in environmentally sustainable disciplines, is located at the western edge of this area along Catawba River. The site of this development is environmentally contaminated which will be mitigated. Reventure represents a significant focus for the future of this area.
**District Name: Mallard Creek**

Among the various districts within Mecklenburg County, this area has seen the most significant development and increase in population during the past 20 years. It includes such diverse areas and communities as the historic Derita, Nevin, and Croft communities, the massive Highland Creek “planned” community initiated in the early 1990s (and largely built out), the University City area (including the 2,200-acre University Research Park), and the unique Prosperity Village area. To accommodate this growth, public investments, such as roadway improvements and public schools, have been constructed.

While the area has developed primarily with residential use, there is a fairly diverse land use pattern, ranging from commercial (neighborhood-serving retail centers) to institutional/industrial (University Research Park, Twin Lakes Business Park, and other business parks along W. T. Harris Boulevard), to numerous open spaces (Mallard Creek Community Park and Greenway, Clarks Creek Greenway, Nevin Park, and Davis Farm Park).

The popularity of living and doing business in this area is evidenced by the recent population change. This area experienced a 74 percent growth in the 2000s. This growth will likely continue through 2040, fueled in part by the completion of the final leg of Charlotte’s I-485 outer loop (currently under construction through this area between I-85 and NC 115) and its interchange areas, notably at Mallard Creek Road and Prosperity Church Road. The proposed Red Line commuter rail is also planned to be built through this area with three stations that will serve as catalysts to anticipated mixed-use development and redevelopment in proximity to the stations at Derita, Harris Boulevard, and Eastfield Road. Certain key areas (such as the business parks and older retail centers) will likely also undergo incremental redevelopment to respond to new economic demands.
**District Name: University**

This diverse area stretches from the older urban neighborhoods off of Sugar Creek Road to the brand new residential communities adjacent to I-485 near the county line. It contains the campus (and environs) of the University of North Carolina at Charlotte (UNCC) and the aging commercial strip along North Tryon Street. Many of the viable businesses have relocated from older urban centers such as Tryon and North Park Malls to newer quarters along Harris Boulevard or near the University campus. There are vestiges of the area’s rural history characterized by a number of larger vacant tracts in the Rocky River Road, Caldwell Road, and Back Creek Church Road areas. Some of these areas are being used for agricultural and horticultural purposes.

This area increased in population by 30 percent between 2000 and 2010. Specifically, the university has undertaken a significant capital investment effort to upgrade the campus, adding both academic and athletic facilities. These additions have translated into an increased number of academic programs, higher enrollment, and greater prestige. New residential tracts have developed further to the east, close to the County line. Also, older neighborhoods, such as Hidden Valley, have organized their residents to work toward common community goals.

This area will be a major beneficiary of the Blue Line Extension (BLE) light rail, scheduled to commence construction in 2014 and offer service beginning in 2017. This will be an extension of the original Blue Line and will link Center City Charlotte with the University campus, and all the communities in-between. The line will run approximately 9.3 miles out North Tryon Street with seven stations in this area. Future land development in proximity to these stations will be required to follow design guidelines which combine a mixture of uses, orient to the stations, and are walkable in nature. This project will be complemented by installation of public infrastructure (roadway connections, pedestrian facilities, utilities improvements, and the like) that will serve as a catalyst for future TOD opportunities.

Meanwhile, more suburban development will likely continue to consume many of the large remaining vacant tracts, notably in the eastern portion of this district. These areas will remain attractive due principally to their proximity to the University and to I-485.
**District Name: Steele Creek**

This district is the location of Charlotte’s largest industrial center (located along Westinghouse Boulevard) as well as the Charlotte-Douglas International Airport. The area also contains several large residential communities, such as Berewick, Palisades, and Planter’s Walk, and mixed-use centers, such as Ayrshire. Open space is provided by facilities, such as McDowell Nature Preserve and Berewick Park. A significant amount of vacant and undeveloped property is located in this area. Long referred to as “Charlotte's last frontier,” this area began a transformation in the early – mid 2000s when I-485 and public utilities were added.

Development in the area has been somewhat hampered by topographic challenges present near Lake Wylie, that forms the western boundary of the area. Ironically, proximity to the lake has also proven to be one of the area's primary attractions from a development standpoint. Segments of the area have been resistant to new development due to their proximity to the airport and the noise impacts inherent in airport operations. However, emerging aircraft technology, sound attenuation efforts, and recognition of the convenience of proximity to the airport as a community amenity are beginning to change this pattern.

Construction will conclude in 2014 on an Intermodal Facility on airport property to facilitate the movement of goods and materials between and among transportation modes to serve national and world-wide markets. Additionally, the planned infrastructure investment west of the airport will serve as a catalyst for new business development that could benefit from proximity to this planned transportation hub.

The area has enjoyed significant growth during the 2000s having increased in population by 64 percent. Given the amount of remaining developable land coupled with increased attractiveness of this area, future development (both residential and non-residential) is expected to continue through 2040, concentrated along the I-77 corridor and within the industrial and mixed-use centers.
**District Name: South Charlotte**

The area designated as the South Charlotte district also contains the Town of Pineville and a portion of the Town of Matthews. The area is largely low to medium density residential with commercial developments including South Park and Carolina Place Malls (regional shopping destinations) as well as a sprinkling of other neighborhood and community-serving retail centers (located principally at major intersections or interstate interchanges). There are also several business centers and corporate parks in the area. The southern segment of the Blue Line light rail traverses the western edge of the area, and terminates near I-485.

The area is nearly fully built-out, with much of the open space provided by several private golf courses as well as County owned McAlpine Creek Greenway, and Park Road, Ballantyne, and William Davie Parks. Development during the past decade has occurred by a combination of greenfield development south of Interstate 485 and “infill” development and redevelopment within existing communities. This has resulted in a moderate population increase in the 2000s of 23 percent.

This area will likely be somewhat impacted by the proposed future development of the Silver Line Southeast Corridor rapid transit line that will parallel Independence Boulevard near the district’s eastern edge, serving as a catalyst for transit oriented development (TOD) at or near the prescribed transit stations. These developments should bring residential and commercial densities that are greater than elsewhere in the district and will be expected to be well-designed and amenable to access by a variety of transportation modes. Similarly, the Blue Line light rail traversing South Boulevard will continue to attract high-quality mixed-use developments on key sites at or near transit stations. Further development opportunities exist in a limited number of remaining development sites in the area, but greater potential lies in continuing infill development activities that began in the 1990s and will likely continue through 2040.
**District Name: East Charlotte/South Towns**

Numerous communities in eastern Charlotte as well as the majority of the southern Mecklenburg towns of Matthews and Mint Hill comprise this area. The land use patterns are largely low to medium density suburban residential in nature and contain key business corridors such as Albemarle Road and Central Avenue. Commercial nodes, including the Matthews and Mint Hill downtown areas, newer retail centers, such as Windsor Square in Matthews, the Bridges at Mint Hill (a one million square foot planned retail center), the Clear Creek Business Park and rail corridor, and the center at the Harrisburg Road / I-485 interchange are notable as well. Much of the development in this area has occurred since the 1950s, and more rapid development was slowed by several factors that are all inter-related:

- Until very recently, eastern portions of the area were underserved by public utilities, including sewer;
- Significant tracts of land have been held by interests whose focus is agriculture rather than development; and
- Environmental concerns over preserving endangered species habitat have somewhat stymied development interest.

Therefore, while a large percentage of this area has recently undergone a large amount of development, a significant amount of vacant land still exists. Some of this land has been designated for recreation and preservation purposes, such as the Reedy Creek Nature Preserve.

Nonetheless, the amount of growth and development in this area has been impressive, spurred on by the completion of the southeastern leg of the I-485 loop during the past 15 years. The area population has increased by 21 percent in the period from 2000 to 2010 as urbanization and public infrastructure continued to extend south and eastward. Some of the commercial areas – notably along Central, Independence, and Albemarle – are experiencing signs of stress as retail interests gravitate from more central locations to the interstate interchange areas and beyond in order to appeal to more regional markets. This in turn has resulted in development of more aggressive economic redevelopment strategies for these areas which involve strategic infrastructure investment and public-private partnerships. Key activities will be the Eastland Mall redevelopment and the Silver Line Southeast Corridor rapid transit development.

The most significant future changes in land use patterns in this district can be expected in the two following areas:

- The 1970s and 1980s type retail will be replaced by well-designed mixed-use development along the aging business corridors. It is expected that some of this development will be targeted at the area's increasingly diverse population; and
- Improved access to infrastructure will make the areas outside I-485 more attractive for development, especially low density residential.
Union County

District Name: Central Union

This area in Union County contains Monroe, the county seat. Traversing the Central Union district is also US 74, the primary east-west thoroughfare in the County. In addition, the proposed Monroe Bypass toll facility will begin at the current junction of I-485 and US 74 just over the county line, and will continue east of Monroe terminating at US 74 between the towns of Wingate and Marshville. These factors contribute to a concentration of employment in this district only equaled by the Northwest Union district. Employment is also expected to nearly double in this area by 2040 as business growth is expected to continue to occur due to access to US 74 and the Charlotte-Monroe Executive Airport, and its close proximity to Charlotte and Mecklenburg County.

The development density is the highest in the county, as it includes the CBD for Monroe, with a significant amount of multi-family and small-lot single family housing. Much of the county’s industrial and more intense employment land uses are found in this district as well. This concentration of higher-density residential and non-residential land uses are expected to continue into the future.

Population in the Central Union district is also currently the second highest of the four districts that comprise Union County. In the 30 year horizon, population in the Central Union district is expected to grow from approximately 60,000 persons to over 94,000 by 2040.

District Name: Northwest Union

The Northwest Union district is characterized by the dramatic residential growth it has experienced since 1990 and is the most populated district in the county. The district is home to the growing communities of Indian Trail, Marvin, Waxhaw, and Weddington. Additionally, this district is expected to continue its strong growth throughout the planning period due to the proximity to Mecklenburg County and good schools. Much of this area is served by public water and sewer and, since it is adjacent to southern Mecklenburg County, has become a classic bedroom community.

Part of this district also includes the western most part of US 74 where several business parks exist and employment is expected to grow. In fact, employment in the Northwest Union district equals that of the Central Union district now, and will continue to do so through 2040. Much of the growth will be retail and service-oriented land uses that have followed residential growth in the area. The proposed Monroe Bypass toll facility will also pass through the western portion of this district, beginning just over the county line where I-485 and US 74 intersect and continuing south and east through Stallings and Indian Trail.
**District Name: East Union**

The East Union portion of Union County is a rural/agricultural area, with large-lot single family residential development scattered throughout the district. The Town of Marshville is located in this district near the eastern terminus of the proposed Monroe Bypass. There are few subdivisions, and all multi-family and small-lot residential development is in and around Marshville. Most economic activity is focused on the US 74 corridor, as it is the only multi-lane road in the district. Population is expected to grow, as it is in all of Union County, but at a pace similar to the South Union district.

Employment growth will also be slow in the East Union district, with what little there is primarily located near Marshville. Agriculture, retail, light manufacturing, and food processing are the predominant employment options in the area.

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**District Name: South Union**

The South Union district is the third most populous district at 11 percent of the County’s 2010 total. There are no incorporated municipalities in this part of Union County. It is expected to grow in areas near Waxhaw and Monroe but at a much slower pace than the county as a whole. Large-lot single family homes will comprise the majority of residential growth. The South Union district will remain a mostly rural area dominated by agriculture. There is little access to public utilities so slow growth is projected through 2040.

Employment in this area is sparse and the lowest of all districts in the county. This trend is expected to continue, with agriculture and small light industrial operations being the predominant employment options in the area.
Iredell County

District Name: Statesville

Statesville’s economy was built around the junctions of two interstates and two rail lines, which are still active today. For many years, manufacturers and distributors have seen the value in Statesville’s transportation network, and as a result, Statesville has several industrial parks in close proximity to the numerous I-40 and I-77 interchanges in the area. Current or future business parks that may accommodate future industrial growth are: Stamey Farm Road, the I-40/I-77 interchange, Deer Ridge Business Park and others off Taylorsville Highway along the Alexander Railroad, Northside Drive, Crawford Road, the Statesville Regional Airport area, and Statesville Business Park off NC 70.

In 2010, about 40 percent of Statesville workers were employed in manufacturing or warehousing. This share is expected to decrease by 2040 as the office/government and retail employment sectors increase at higher rates. These non-industrial jobs will be added east of Statesville and in the proposed Larkin development area. It is anticipated that almost no new jobs will be added west of Stamey Farm Road.

The population of Statesville’s established urbanized area decreased by 1,100 residents from 2000-2010. Future population growth is not expected to occur near the inner city. Growth will occur first at the proposed Larkin development area and radiate east. There will be a cluster of activity at the Statesville-end of Triplett Road which provides easy access to both Statesville and Mooresville and has a significant amount of vacant land. Growth will also occur at Lookout Lake on Iredell County’s western border, primarily near the shore and moving further inland as the lake lots are built out.

While the Statesville area is projected to grow through 2040, it is expected to grow at a slower rate compared to the southern parts of the county. Higher growth pressures will continue to occur in areas adjacent to Mecklenburg County and the Mooresville area.
District Name: Troutman

Many retirees are drawn to Troutman because of the town’s proximity to both Charlotte and Lake Norman as well as its small-town feel. The area is characterized by large-lot rural housing, an established downtown in Troutman, and scattered single-family subdivisions in the southern portion of the area. The Troutman area has, and will, continue to grow faster than the Statesville and Mooresville areas in terms of percentage growth, but will have lower absolute growth. In 2013, Troutman approved close to 700 new homes, which is a significant increase over the past several years. Developers have discussed marketing a portion of these new homes to the 55-and-older demographic. Population growth over the next thirty years will occur along Lake Norman, adjacent to the town center, and near the I-77 interchanges.

Due to access to I-77, Troutman has commercial employment located adjacent to the highways. Exit 42, a typical interstate interchange serving travelers and shoppers, serves as a primary access point to Troutman from the I-77 freeway. Troutman has a low proportion of in-town service and office establishments such as dentists, repair persons, and accountants. By 2040, the prevalence of commercial jobs located in proximity to a highway and the scarcity of low-traffic service jobs are expected to diminish, indicating a more diversified economy. Employment growth will occur near Exit 42, Ostwalt Amity Road, downtown Troutman, Murdock Road, and Barium Springs.

Although Troutman could be considered a Charlotte suburb, it is not presently characterized by a large number of commuters to Charlotte. This likely will not change in the future due to the fact that Mooresville, located between Troutman and Charlotte, is projected to add a significant number of new jobs. Reducing congestion and maintaining a small-town charm, while also recruiting new industry, will likely be Troutman’s challenge over the next several decades.

District Name: Mooresville

After completion of I-77 in the late 1970s, connecting southern Iredell County with Charlotte via a high-speed interstate, Mooresville has experienced a sustained multi-decade construction boom marked by intense activity in residential lakefront construction, retail development along major corridors, and traditional subdivision development. Mooresville now serves as an employment center for surrounding area residents. Unlike many similar high-growth areas surrounding Charlotte, the Mooresville area has a healthy balance between workers and available jobs, such as at the Lowe’s corporate headquarters and area motorsports racing team shops and supporting industry. This strong employment base is expected to continue growing through 2040.

Compared to the rest of Iredell County, Mooresville has fewer jobs in agriculture, manufacturing, warehousing and storage, but the proportion is expected to grow by 4 percent by 2040. In 2010 the Mooresville area
remained the third-highest in the region in retail employment and high-traffic industrial (i.e. construction) although both industries were debilitated by the 2005 housing market collapse. By 2040, high-traffic industrial (construction) employment is expected to decrease from its current share at 16 percent, to 8 percent, reflecting a gradual decline in construction jobs.

Regarding population growth, the fastest growing area in Iredell County in the past decade was the Brawley School Road peninsula. It is largely built out, and thus will not see much additional population growth through 2040. Likewise, the NC 150 corridor will likely build out over the next two decades, resulting in a shifting of growth in the third decade to adjacent areas. Over time, Mooresville will grow first near Faith Road and Shearers Road, then along the NC 3 and NC 115 south corridors, and lastly, by 2040, crossing into Rowan County. The Iredell-Mecklenburg County border will experience equal growth pressure as Davidson pushes north and Mooresville pushes south. The Mecklenburg County border was the fastest growing census tract from 2000 to 2010 and will continue to be a fast-growing area. The projections for the area assume that the East-West Connector and Red Line Commuter Rail projects will be completed before 2030, and additional growth (less than 500 housing units) is projected for the areas immediately surrounding the stations.

Future employment growth will occur at the proposed Langtree at the Lake Development at the I-77 and Langtree Road interchange (Exit 31) and at the Mooresville Business Park, which currently has over 1 million square feet of light industrial industry. A 3 million square foot expansion of the Mooresville Business Park is planned east of NC 801, with build out anticipated within the next decade. To help accommodate growth, the town is developing a Cornelius-Mazeppa Connector (included in the 2025 Horizon Year of the 2040 MTP fiscally-constrained project list) to facilitate truck traffic and enhance the town’s economic development potential as well. In addition, a proposed interchange is recommended for I-77 and Cornelius Road (not included in the 2040 MTP fiscally-constrained project list) in several of the Town’s plans. The proposed interchange and connector road would provide a consistent corridor for heavy trucks between I-77 and the Mooresville Business Park.

Sources:

Metrolina Regional Demographic and Economic Data and Data Forecasts by Stephen J. Appold, Ph.D. and Paul R. Voss, Ph.D. (both with the University of North Carolina at Chapel Hill).

2012-2020 Iredell County Demographic Forecast and Projections
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List of Figures

9-1 .................. Metrolina Modeling Region
9-2 .................. Sub-County Districts
9-3 .................. 2010 Population Density by Sub-County District
9-4 .................. 2040 Population Density by Sub-County District
9-5 .................. Annual Growth Rate - Population Density
9-6 .................. 2010 Employment Density by Sub-County District
9-7 .................. 2040 Employment Density by Sub-County District
9-8 .................. Annual Growth Rate - Employment Density
Figure 9-1

Legend
- CRTPO Planning Area
- Metrolina Modeling Region
Sub-county districts were defined in 2002 based on US 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.
Sub-county districts were defined in 2002 based on the 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.
The image is a map titled "2040 Population Density by Sub-County District." It displays various sub-county districts within the Mecklenburg County area, color-coded by population density ranges from 0 to 10,000 per square mile. The map includes a legend that categorizes population density from 0 to 250, 251 to 500, 501 to 1,000, 1,001 to 2,500, 2,501 to 5,000, 5,001 to 10,000, and notes the population density is in units of people per square mile.

The districts are color-coded according to the density ranges shown. Some districts listed in the map include:
- Mooresville (1,070)
- Troutman (478)
- Statesville (378)
- Central Charlotte (5,031)
- South Charlotte (3,271)
- Steele Creek (1,856)
- Brookshire (2,407)
- North Meck Towns (1,666)
- Mallard Creek (3,556)
- University (3,826)
- East Charlotte South Towns (2,410)
- NorthMeck Union (1,539)
- Northwest Union (1,253)
- Central Union (391)
- East Union (257)

The map is accompanied by a source note: "Sub-county districts were defined in 2002 based on US 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area." The map is prepared by Charlotte-Mecklenburg Planning Department, April 2014.
Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Figure 9-5

Legend

- CRTPO Planning Area
- Annual Growth Rate
- Population Density (2010-2040)

- 0% - 1.50%
- 1.51% - 2.00%
- 2.01% - 2.50%
- 2.51% - 3.00%
- 3.01% - 3.50%

(XX) Annual Growth Rate - Population Density
Source: Metrolina Travel Demand Model
Sub-county districts were defined in 2002 based on US 2000 Census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.
Figure 9-6

Legend

CRTPO Planning Area

Employment Density 2010

0 - 250
251 - 500
501 - 1,000
1,001 - 1,500
1,501 - 2,500
2,501 - 5,000

(XX) 2010 Employment Density (Employment per Square Mile)

Source: Metrolina Travel Demand Model

Sub-county districts were defined in 2002 based on US 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
2040 Employment Density by Sub-County District

Legend

0 - 250
251 - 500
501 - 1,000
1,001 - 2,500
5,001 - 10,000

Employment Density 2040

Source: Metrolina Travel Demand Model

Sub-county districts were defined in 2002 based on US 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.

Figure 9-7

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Figure 9-8
Legend

<table>
<thead>
<tr>
<th>Annual Growth Rate</th>
<th>Employment Density (2010-2040)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0% - 1.50%</td>
<td>Source: Metrolina Travel Demand Model</td>
</tr>
<tr>
<td>1.51% - 1.75%</td>
<td>Sub-county districts were defined in 2002 based on US 2000 census. These districts are aggregates of the Transportation Analysis Zones (TAZs) representing different geographies throughout the CRTPO planning area.</td>
</tr>
<tr>
<td>1.76% - 2.00%</td>
<td></td>
</tr>
<tr>
<td>2.01% - 3.00%</td>
<td></td>
</tr>
<tr>
<td>3.01% - 5.00%</td>
<td></td>
</tr>
</tbody>
</table>

(XX) Annual Growth Rate - Employment Density

Source: Metrolina Travel Demand Model

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
10. Travel Patterns and Travel Demand Model

Travel Patterns

Similar to other areas in the southeastern US, the Charlotte region has experienced significant growth in population and employment over the past decades. The economic vitality of the region has been the catalyst for this growth, along with a housing supply that is able to meet the demands of the increased population. In combination with this growth, the region has developed a dynamic, multimodal transportation system that has greatly contributed to continued economic prosperity.

The majority of trips for residents in the region are to access places of employment. The home-to-work commute trip is a primary contributor to the congestion found on some of the major arterials, particularly in the AM and PM peak periods. Based on the 2011 US Census Longitudinal Employer-Household Dynamics (LEHD) data, the Worker Residential Location Density map on the following page illustrates where workers live in the two US Census-designated Metropolitan Statistical Areas (MSAs) that the Charlotte Regional Transportation Planning Organization (CRTPO) spans. As shown in the Worker Residential Location Density map, the largest residential density is primarily concentrated in the City of Charlotte, with dense pockets found within and around the I-277 Loop. The Employment Location Density map on the
Following page shows where workers are employed in the Charlotte-Gastonia-Rock Hill and Statesville-Mooresville MSAs, with the primary employment centers found within the City of Charlotte, and the Employment Location Density within the City of Charlotte map depicts the distribution of employment centers in Charlotte. Employment is very highly concentrated in Charlotte’s city center due to the higher density of government offices and corporate headquarters. Various medical facilities, office parks, and shopping districts contain other employment locations outside of the city center.

According to the American Community Survey (ACS), which is a five year estimate developed from census data collected between 2006 and 2010, the City of Charlotte has experienced a slight decrease in average travel time for several travel modes. In 2000, the Census Transportation Planning Package (CTPP) reported that the mean travel time to work for those who drove alone was 23.9 minutes, and the 2006-2010 ACS reported the commute time to be 22.9 minutes. Similarly, the average carpool travel time to work decreased from 27.3 minutes in 2000 (CTPP) to 26.5 minutes (ACS 2006-2010 update).

According to the 2006-2010 ACS for the City of Charlotte, the vast majority (80 percent) of workers drive alone to work, followed by 11 percent that carpool, 3 percent that ride transit, 3 percent who work at home, and 1.4 percent who walk to work. A comparison of the 2000 US Census Transportation Planning Package information to the 2006-2010 ACS shows that approximately 1 percent of Charlotte workers shifted away from driving alone, 1.5 percent shifted away from carpooling, 1 percent of workers shifted to utilizing public transportation, 0.4 percent started walking, and 1 percent started working from home.
Employment Location Density (Jobs per Square Mile)

Employment Location Density within the City of Charlotte (Jobs per Square Mile)
Land Use and Employment Centers

As discussed in the Population and Land Use chapter, the land use patterns across the CRTPC planning area differ widely from the dense Charlotte city center, to newer suburban residential and strip shopping developments typically with unconnected transportation networks, to rural areas in Union and Iredell Counties that have remained virtually unchanged over the last few decades. These land use patterns have a significant effect on travel patterns, including number of trips, trip length and time, and the choice of mode.

The majority of the longer trips are taken to access employment centers as well as to carry out other daily activities such as shopping and household errands, dropping off / picking up children at school, and dining out. There are numerous large activity and employment centers located throughout the planning area that attract trips, with several of the larger, regional centers generating significant amounts of traffic.

The map in Figure 10-1 shows the average commute times for CRTPC residents in each Census Tract. These commute times are broken down in the following manner: 0-10 minutes, 11-20 minutes, 21-30 minutes, 31-45 minutes, and 46-53 minutes. As noted in the section above, the majority of the commute times are within the 21-30 minute range. Shorter commute times are reported for areas closer to the City of Charlotte and the City of Statesville. There are two census tracts for which this information was not available. The northern tract contains the Charlotte-Douglas International Airport, and the southern tract appears to be primarily commercial.

Congestion

In order to gauge congestion and its costs, travel metrics, such as “Delay per Auto Commuter” and “Annual Congestion Costs per Auto Commuter” are often used. The Delay per Auto Commuter metric measures the number of person-hours spent annually by private vehicle drivers and passengers. The Annual Congestion Costs per Auto Commuter metric measures the economic impacts of congestion.

The Texas Transportation Institute (TTI) utilizes these metrics, as well as several other indicators, to measure congestion for 101 metropolitan areas ranging in size from small to very large. This information is published annually in the TTI Annual Urban Mobility Report. The annual hours of delay per auto commuter and the annual costs of congestion for the City of Charlotte, other large cities in the US (defined as urbanized areas with a population of 1 to 3 million), and the US as a whole are shown in Tables 10-1 and 10-2 below.

According to Urban Mobility Report data from 2007 to 2011, the average delay per Charlotte auto commuter has hovered around nearly 40 hours, slightly above both the average for the large cities and the US as a whole.
The Urban Mobility Report dataset was also used to calculate the monetary costs of this congestion, which is determined through the loss of time, cost of excess gasoline, and other factors. Charlotte has an average annual congestion cost of $904 which is slightly above that of other large cities ($787) and the US ($805) as a whole.

Table 10-1: 2007 – 2011 Annual Hours of Delay per Auto Commuter

<table>
<thead>
<tr>
<th>Year</th>
<th>Charlotte</th>
<th>Large Cities</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>42</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>2008</td>
<td>41</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>2009</td>
<td>41</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>2010</td>
<td>39</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>2011</td>
<td>40</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Average</td>
<td>41</td>
<td>38</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: Texas Transportation Urban Mobility Report

Table 10-2: 2007 – 2011 Annual Congestion Costs per Auto Commuter

<table>
<thead>
<tr>
<th>Year</th>
<th>Charlotte</th>
<th>Large Cities</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$925</td>
<td>$833</td>
<td>$858</td>
</tr>
<tr>
<td>2008</td>
<td>$907</td>
<td>$771</td>
<td>$782</td>
</tr>
<tr>
<td>2009</td>
<td>$907</td>
<td>$771</td>
<td>$782</td>
</tr>
<tr>
<td>2010</td>
<td>$883</td>
<td>$782</td>
<td>$785</td>
</tr>
<tr>
<td>2011</td>
<td>$898</td>
<td>$780</td>
<td>$818</td>
</tr>
<tr>
<td>Average</td>
<td>$904</td>
<td>$787</td>
<td>$805</td>
</tr>
</tbody>
</table>

Source: Texas Transportation Urban Mobility Report

**Travel Demand Model**

**Importance of the Travel Demand Model**

The Metrolina Regional Travel Demand Model, which is the model employed in the CRTPO region, is an important tool that facilitates rigorous analysis of travel patterns and supplements the analysis of the population, employment, travel trends and patterns discussed above. The model contains the geographic distribution of land uses, including the locations of residences, jobs, schools, and other community facilities. Also represented in the model are the roads and transit routes that individuals use to travel between activity locations. In order to understand the travel patterns at an appropriate scale, the model divides the region into smaller transportation analysis zones (TAZs). The TAZs, connected by the road and transit networks, are assigned socioeconomic data representing elements such as population, employment, households, median income, and other attributes that contribute to the travel patterns.
With the recent expansion of the CRTPO planning area, the number of TAZs has increased from 1,487 to 1,816 to incorporate the additional geographic area. This is an addition of 338 TAZs. Table 10-3 shows the number of TAZs prior to the planning area expansion, as well as the current number of TAZs, by CRTPO County.

<table>
<thead>
<tr>
<th></th>
<th>Number of TAZs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prior to Expansion</td>
</tr>
<tr>
<td>Mecklenburg</td>
<td>1,057</td>
</tr>
<tr>
<td>Union</td>
<td>352</td>
</tr>
<tr>
<td>Iredell</td>
<td>78</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,487</strong></td>
</tr>
</tbody>
</table>

*Source: Metrolina Travel Demand Model*

The model is designed to characterize the current travel conditions, roadway traffic, and transit ridership. In addition, it quantifies future travel demand based on future projections of population and employment as well as incorporating any improvements to the transportation system. With this existing data and future projections, the model enables the analysis of transportation investment alternatives in the region. In addition, travel demand modeling also provides quantitative information useful for ensuring the set of planned transportation projects does not interfere with the state’s plans to improve air quality.

**Four Step Modeling Process**

The Metrolina Regional Travel Demand model is referred to as a four step model. The four steps include trip generation, trip distribution, mode choice, and trip assignment. The first step, trip generation, takes the amount of population, employment, and other attributes of each TAZ to predict the number of trips that originate or terminate in the zone. The second step of trip distribution matches the “from” and “to” trips together. The third step is for each trip to identify the mode of transportation, which includes, but is not limited to, driving alone, carpooling, walking to a local bus, driving to an express bus, or walking or driving to light rail transit. Finally, in the fourth step, after identifying the trips origin and destination and the travel mode, the trip is assigned to a specific route given the options and conditions.

**Model Updates**

The model’s ability to represent travel depends in large part on surveys of the travel behavior of real people. In 2012, a household travel interview survey was administered to update the trip generation and trip distribution models and to modify the treatment of different times of day. Other updated data was also used from the 2010 Census, including from the Public Use Microdata Sample (PUMS) and the 2005-2011 American Community Survey (ACS). Data was also collected in 2013 from a non-freeway component of the External Travel Survey.
Types of Trips

In the regional travel demand model, trips are classified by trip purpose. Broadly, trips can be grouped into three purposes:

- **Home-Based Work**: These trips are from home to work and from work back to home. They occur more heavily in peak hours and are a large component of congestion.

- **Home-Based Other**: These trips begin or end at home and cover the range of other trips that people make – those to or from school, shopping, visiting friends, or appointments.

- **Non-Home-Based**: These are the trips made while people are out of their residence, either at work (e.g. a trip to lunch), or between stops while running errands (e.g. a trip from the grocery store to the cleaners). Generally, given their nature, non-home-based trips are shorter than home-based trips and are often made at off-peak travel times.

Trips can be made on highways, either driving alone or carpooling/vanpooling with others; by riding transit; or by biking or walking. Two other major groups of travelers use the highway system and include commercial vehicle and truck trips, and external/internal trips. External/internal trips are those that start in the region and end outside the region, or conversely, those that start outside of the region and end at a destination inside of the region. These trips also include those that pass through without stopping.

There are a number of indicators that can be used to help measure the efficiency of the transportation system and how well the mobility needs of the traveling public are met. These indicators include trip related information as well as infrastructure related data. Utilizing these indicators can assist in the identification of deficiencies and steps to help address the identified deficiencies. These indicators include person trips, vehicle trips, roadway lane miles, daily vehicle miles of travel and transit vehicle service miles. Details and data for each of these indicators are provided in the following tables.

**Person Trips**

A person trip is made by any person traveling on any of the highway or transit modes that exist or are projected to exist within CRTPO’s planning area. Tables 10-4, 10-5 and 10-6 show the growth in the number of person trips for Mecklenburg County, the portion of Union County within CRTPO, and the portion of Iredell County within CRTPO, respectively.
### Table 10-4: Mecklenburg County Person Trips

<table>
<thead>
<tr>
<th>Mecklenburg County</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home-based Work</td>
<td>466,000</td>
<td>523,500</td>
<td>611,000</td>
<td>647,500</td>
<td>731,000</td>
</tr>
<tr>
<td>Home-based Other</td>
<td>2,102,500</td>
<td>2,330,500</td>
<td>2,783,000</td>
<td>3,007,500</td>
<td>3,463,500</td>
</tr>
<tr>
<td>Non-home-based</td>
<td>969,500</td>
<td>1,073,500</td>
<td>1,294,500</td>
<td>1,399,500</td>
<td>1,613,000</td>
</tr>
<tr>
<td>Commercial/Truck</td>
<td>559,500</td>
<td>619,000</td>
<td>720,500</td>
<td>763,000</td>
<td>865,000</td>
</tr>
<tr>
<td>Internal-External</td>
<td>33,000</td>
<td>37,000</td>
<td>44,000</td>
<td>47,000</td>
<td>53,500</td>
</tr>
<tr>
<td><strong>Total Trips</strong></td>
<td>4,130,500</td>
<td>4,583,500</td>
<td>5,453,000</td>
<td>5,864,500</td>
<td>6,726,000</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td>--</td>
<td>2.2%</td>
<td>1.9%</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 500s.*

*Source: Metrolina Travel Demand Model*

### Table 10-5: Union County Person Trips (CRTPO portion only)

<table>
<thead>
<tr>
<th>Union County (CRTPO Portion Only)</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home-based Work</td>
<td>102,000</td>
<td>118,000</td>
<td>139,000</td>
<td>147,500</td>
<td>167,500</td>
</tr>
<tr>
<td>Home-based Other</td>
<td>427,500</td>
<td>489,500</td>
<td>592,000</td>
<td>643,000</td>
<td>742,000</td>
</tr>
<tr>
<td>Non-home-based</td>
<td>138,000</td>
<td>157,000</td>
<td>186,000</td>
<td>202,500</td>
<td>232,000</td>
</tr>
<tr>
<td>Commercial/Truck</td>
<td>69,000</td>
<td>81,000</td>
<td>93,500</td>
<td>99,500</td>
<td>112,500</td>
</tr>
<tr>
<td>Internal-External</td>
<td>22,000</td>
<td>26,000</td>
<td>31,000</td>
<td>33,500</td>
<td>38,000</td>
</tr>
<tr>
<td><strong>Total Trips</strong></td>
<td>758,500</td>
<td>871,500</td>
<td>1,041,500</td>
<td>1,126,000</td>
<td>1,292,000</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td>--</td>
<td>3.0%</td>
<td>2.0%</td>
<td>1.6%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 500s.*

*Source: Metrolina Travel Demand Model*

### Table 10-6: Iredell County Person Trips (CRTPO portion only)

<table>
<thead>
<tr>
<th>Iredell County (CRTPO Portion Only)</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home-based Work</td>
<td>73,000</td>
<td>79,000</td>
<td>90,000</td>
<td>95,500</td>
<td>109,500</td>
</tr>
<tr>
<td>Home-based Other</td>
<td>297,000</td>
<td>321,000</td>
<td>374,500</td>
<td>405,500</td>
<td>469,500</td>
</tr>
<tr>
<td>Non-home-based</td>
<td>124,500</td>
<td>137,500</td>
<td>166,000</td>
<td>179,500</td>
<td>207,500</td>
</tr>
<tr>
<td>Commercial/Truck</td>
<td>61,000</td>
<td>69,000</td>
<td>81,000</td>
<td>85,000</td>
<td>95,500</td>
</tr>
<tr>
<td>Internal-External</td>
<td>29,000</td>
<td>31,500</td>
<td>35,000</td>
<td>36,500</td>
<td>41,500</td>
</tr>
<tr>
<td><strong>Total Trips</strong></td>
<td>584,500</td>
<td>638,000</td>
<td>746,500</td>
<td>802,000</td>
<td>923,500</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td>--</td>
<td>1.8%</td>
<td>1.7%</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded to the nearest 500s.*

*Source: Metrolina Travel Demand Model*
Vehicle Trips

In addition to the person trip tables shown above, the Metrolina travel demand model also provides information about the number of vehicle trips. Table 10-7 shows the total number of vehicle trips across a 16 county area, to and from the counties within CRTPO’s planning area. Unlike the tables on the previous pages that are broken out by trip purpose, these vehicle trips include all trip purposes. It is interesting to note that the highest number of trips start and end in Mecklenburg County. The most trips between two different counties occur between Mecklenburg and Cabarrus counties, followed by trips between Mecklenburg and Union counties.

Table 10-7: Daily County to County Vehicle Trips

<table>
<thead>
<tr>
<th>County</th>
<th>2010 Daily Vehicle Trips</th>
<th>2040 Daily Vehicle Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Iredell</td>
<td>Mecklenburg</td>
</tr>
<tr>
<td>Cabarrus</td>
<td>13,570</td>
<td>236,660</td>
</tr>
<tr>
<td>Cleveland</td>
<td>5,930</td>
<td>17,510</td>
</tr>
<tr>
<td>Lancaster</td>
<td>3,270</td>
<td>56,000</td>
</tr>
<tr>
<td>Gaston</td>
<td>1,570</td>
<td>137,280</td>
</tr>
<tr>
<td>York</td>
<td>510</td>
<td>172,950</td>
</tr>
<tr>
<td>Iredell</td>
<td>421,570</td>
<td>83,720</td>
</tr>
<tr>
<td>Lincoln</td>
<td>8,500</td>
<td>32,930</td>
</tr>
<tr>
<td>Mecklenburg</td>
<td>83,720</td>
<td>2,845,870</td>
</tr>
<tr>
<td>Rowan</td>
<td>170</td>
<td>800</td>
</tr>
<tr>
<td>Stanly</td>
<td>240</td>
<td>7,320</td>
</tr>
<tr>
<td>Union</td>
<td>730</td>
<td>279,990</td>
</tr>
</tbody>
</table>

* These are internal trips within each respective county

Source: Metrolina Travel Demand Model
Daily Vehicle Miles of Travel

Roadway usage is best measured by the number of vehicle miles traveled (VMT). VMT is the sum of all miles of vehicular trips made over all segments of the roadway system. Tables 10-8, 10-9, and 10-10 show the estimates of average daily VMT in Mecklenburg County, the CRTPO portion of Union County, and the CRTPO portion of Iredell County, respectively.

Table 10-8: Daily Vehicle Miles Traveled in Mecklenburg County

<table>
<thead>
<tr>
<th>Mecklenburg County</th>
<th>Vehicle Miles Traveled (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Interstate</td>
<td></td>
</tr>
<tr>
<td>Other Freeway /Expressway</td>
<td>6,892</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td></td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>4,438</td>
</tr>
<tr>
<td>Collector</td>
<td></td>
</tr>
<tr>
<td>Local Street (estimated)</td>
<td>4,438</td>
</tr>
<tr>
<td>Managed Lane¹</td>
<td></td>
</tr>
<tr>
<td>Total VMT (000)</td>
<td></td>
</tr>
<tr>
<td>Annual Pct. Change</td>
<td></td>
</tr>
</tbody>
</table>

¹The Managed Lane category includes HOV, HOT and Express Toll lanes

Source: Metrolina Travel Demand Model

Table 10-9: Daily Vehicle Miles Traveled in Union County (CRTPO portion only)

<table>
<thead>
<tr>
<th>Union County (CRTPO Portion Only)</th>
<th>Vehicle Miles Traveled (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Interstate</td>
<td></td>
</tr>
<tr>
<td>Other Freeway /Expressway</td>
<td>119</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td>842</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>548</td>
</tr>
<tr>
<td>Collector</td>
<td>1,780</td>
</tr>
<tr>
<td>Local Street (estimated)</td>
<td>2,147</td>
</tr>
<tr>
<td>Managed Lane¹</td>
<td></td>
</tr>
<tr>
<td>Total VMT (000)</td>
<td>5,436</td>
</tr>
<tr>
<td>Annual Pct. Change</td>
<td></td>
</tr>
</tbody>
</table>

¹The Managed Lane category includes HOV, HOT and Express Toll lanes

Source: Metrolina Travel Demand Model
Table 10-10: Daily Vehicle Miles Traveled in Iredell County (CRTPO portion only)

<table>
<thead>
<tr>
<th>Iredell County (CRTPO Portion Only)</th>
<th>Vehicle Miles Traveled (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Interstate</td>
<td>722</td>
</tr>
<tr>
<td>Other Freeway /Expressway</td>
<td>0</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td>124</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>241</td>
</tr>
<tr>
<td>Collector</td>
<td>460</td>
</tr>
<tr>
<td>Local Street (estimated)</td>
<td>660</td>
</tr>
<tr>
<td>Managed Lane¹</td>
<td>0</td>
</tr>
<tr>
<td>Total VMT (000)</td>
<td>2,207</td>
</tr>
<tr>
<td>Annual Pct. Change</td>
<td>--</td>
</tr>
</tbody>
</table>

¹The Managed Lane category includes HOV, HOT and Express Toll lanes

Source: Metrolina Travel Demand Model

Transit Vehicle Service Miles

Improvements to the transit system are an important component of the MTP. The Charlotte area has long had traditional fixed route bus service, and began exploring premium transit service within the last few decades; light rail service began in Charlotte in 2007. Ridership has been strong, and the Charlotte Area Transit System (CATS) plans to extend the light rail line and open a commuter rail as well as a streetcar line during the next 25 years. In addition to building new premium transit lines, CATS will continue to expand the bus system that serves other areas and supports the premium lines. More details of these transit planning improvements can be found in the Public Transportation chapter.

Vehicle service miles – the miles traveled by transit buses and trains operating on routes picking up or dropping passengers – is a standard measure of estimating the level of transit service. Table 10-11, below, shows the daily vehicle service miles, by transit mode, projected to be provided during the period of this MTP. Table 10-12 shows the number of passengers estimated to use the transit services during each average weekday.

Table 10-11: CATS Daily Transit Vehicle Service Miles

<table>
<thead>
<tr>
<th>CATS Transit Vehicle Miles</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Rail</td>
<td>1,606</td>
<td>1,606</td>
<td>3,194</td>
<td>3,194</td>
<td>3,194</td>
</tr>
<tr>
<td>Streetcar</td>
<td>0</td>
<td>0</td>
<td>618</td>
<td>1,585</td>
<td>1,585</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>0</td>
<td>0</td>
<td>1,056</td>
<td>1,056</td>
<td>1,056</td>
</tr>
<tr>
<td>Regional Express Bus</td>
<td>2,084</td>
<td>1,604</td>
<td>1,531</td>
<td>1,531</td>
<td>1,531</td>
</tr>
<tr>
<td>Express Bus</td>
<td>6,213</td>
<td>5,620</td>
<td>6,200</td>
<td>6,199</td>
<td>6,195</td>
</tr>
<tr>
<td>Feeder Bus</td>
<td>3,385</td>
<td>3,887</td>
<td>3,440</td>
<td>3,966</td>
<td>3,966</td>
</tr>
<tr>
<td>Local Bus</td>
<td>26,879</td>
<td>30,442</td>
<td>29,140</td>
<td>25,650</td>
<td>25,649</td>
</tr>
<tr>
<td>Total Vehicle Service Miles</td>
<td>40,167</td>
<td>43,159</td>
<td>45,179</td>
<td>43,181</td>
<td>43,176</td>
</tr>
<tr>
<td>Annual Pct. Change</td>
<td>--</td>
<td>1.5%</td>
<td>0.5%</td>
<td>-0.9%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Metrolina Travel Demand Model
### Table 10-12: CATS Daily Weekday Transit Rides

<table>
<thead>
<tr>
<th>CATS Total Riders</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Rail</td>
<td>13,500</td>
<td>15,000</td>
<td>34,000</td>
<td>38,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Streetcar</td>
<td>0</td>
<td>0</td>
<td>4,500</td>
<td>17,000</td>
<td>19,500</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>0</td>
<td>0</td>
<td>8,000</td>
<td>9,500</td>
<td>11,500</td>
</tr>
<tr>
<td>Regional Express Bus</td>
<td>2,500</td>
<td>3,000</td>
<td>4,500</td>
<td>5,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Express Bus</td>
<td>5,000</td>
<td>5,500</td>
<td>6,500</td>
<td>7,000</td>
<td>7,500</td>
</tr>
<tr>
<td>Feeder Bus</td>
<td>3,500</td>
<td>4,000</td>
<td>4,000</td>
<td>5,500</td>
<td>6,500</td>
</tr>
<tr>
<td>Local Bus</td>
<td>38,500</td>
<td>46,000</td>
<td>55,500</td>
<td>51,000</td>
<td>59,000</td>
</tr>
<tr>
<td><strong>Total Daily Riders</strong></td>
<td><strong>63,000</strong></td>
<td><strong>73,500</strong></td>
<td><strong>117,000</strong></td>
<td><strong>133,000</strong></td>
<td><strong>155,000</strong></td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td>--</td>
<td>3.3%</td>
<td>5.9%</td>
<td>2.7%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

*Note: The numbers included in this table have been rounded.*

*Source: Metrolina Travel Demand Model*

#### Roadway Lane Miles

In order to keep pace with the projected growth in person trips, more highway and transit capacity will need to be provided. The location and amount of capacity added will determine how many trips can be served adequately by highways or transit.

The projects listed in the Streets and Highways chapter will add freeway and thoroughfare capacity to the network. The best way to measure the quantity of capacity provided by these projects is by the statistic of lane miles. Lane miles are the length of a street segment multiplied by the number of lanes. By measuring lane miles, both new facilities and road widening projects (adding lanes) are reflected in the totals.

Tables 10-13, 10-14, and 10-15 show the projected growth in lane miles in CRTP O’s planning area that were modeled for the Metropolitan Transportation Plan (MTP).
### Table 10-13: Roadway Lane Miles in Mecklenburg County

<table>
<thead>
<tr>
<th>Mecklenburg County</th>
<th>Roadway Lane Miles¹</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td></td>
<td>458</td>
<td>462</td>
<td>462</td>
<td>462</td>
<td>467</td>
</tr>
<tr>
<td>Other Freeway / Expressway</td>
<td></td>
<td>357</td>
<td>427</td>
<td>429</td>
<td>436</td>
<td>446</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td></td>
<td>689</td>
<td>709</td>
<td>759</td>
<td>776</td>
<td>795</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td></td>
<td>732</td>
<td>747</td>
<td>791</td>
<td>794</td>
<td>798</td>
</tr>
<tr>
<td>Collector</td>
<td></td>
<td>698</td>
<td>726</td>
<td>746</td>
<td>746</td>
<td>748</td>
</tr>
<tr>
<td>Managed Lane³</td>
<td></td>
<td>15</td>
<td>15</td>
<td>152</td>
<td>173</td>
<td>173</td>
</tr>
<tr>
<td><strong>Total Lane Miles</strong></td>
<td></td>
<td>2,949</td>
<td>3,086</td>
<td>3,339</td>
<td>3,387</td>
<td>3,427</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td></td>
<td>--</td>
<td>0.9%</td>
<td>0.8%</td>
<td>0.3%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Source: Metrolina Travel Demand Model

### Table 10-14: Roadway Lane Miles in Union County (CRTPO portion only)

<table>
<thead>
<tr>
<th>Union County (CRTPO Portion Only)</th>
<th>Roadway Lane Miles¹</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other Freeway / Expressway²</td>
<td></td>
<td>7</td>
<td>7</td>
<td>74</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td></td>
<td>123</td>
<td>123</td>
<td>126</td>
<td>132</td>
<td>132</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td></td>
<td>127</td>
<td>127</td>
<td>140</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>Collector</td>
<td></td>
<td>540</td>
<td>597</td>
<td>618</td>
<td>625</td>
<td>630</td>
</tr>
<tr>
<td>Managed Lane³</td>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Lane Miles</strong></td>
<td></td>
<td>797</td>
<td>854</td>
<td>960</td>
<td>973</td>
<td>978</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td></td>
<td>--</td>
<td>1.4%</td>
<td>1.2%</td>
<td>0.3%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Source: Metrolina Travel Demand Model

### Table 10-15: Roadway Lane Miles in Iredell County (CRTPO portion only)

<table>
<thead>
<tr>
<th>Iredell County (CRTPO Portion Only)</th>
<th>Roadway Lane Miles¹</th>
<th>2010</th>
<th>2015</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td></td>
<td>200</td>
<td>200</td>
<td>202</td>
<td>202</td>
<td>210</td>
</tr>
<tr>
<td>Other Freeway / Expressway</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td></td>
<td>74</td>
<td>74</td>
<td>78</td>
<td>78</td>
<td>87</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td></td>
<td>163</td>
<td>163</td>
<td>171</td>
<td>179</td>
<td>179</td>
</tr>
<tr>
<td>Collector</td>
<td></td>
<td>385</td>
<td>394</td>
<td>405</td>
<td>405</td>
<td>405</td>
</tr>
<tr>
<td>Managed Lane³</td>
<td></td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total Lane Miles</strong></td>
<td></td>
<td>822</td>
<td>831</td>
<td>870</td>
<td>878</td>
<td>895</td>
</tr>
<tr>
<td><strong>Annual Pct. Change</strong></td>
<td></td>
<td>--</td>
<td>0.2%</td>
<td>0.5%</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

¹Lane Miles = length of roadway segment, multiplied by number of lanes
²For Union County, Other Freeway/Expressway includes the proposed Monroe Connector/Bypass toll facility
³The Managed Lane category includes HOV, HOT and Express Toll lanes

Source: Metrolina Travel Demand Model
In addition to the capacities of thoroughfare miles, many miles of local streets are added annually through the land development process. The local street system serves primarily to connect parcels/sites with the thoroughfare system.

Sources:

2012 Metrolina Regional Household Travel Survey Final Report

Metrolina Regional Travel Demand Model Technical Documentation, 2006

http://mobility.tamu.edu/ums/

http://quickfacts.census.gov/qfd/states/37/3712000.html


http://download.ctpp.transportation.org/profiles_2012/transport_profiles.html
List of Figures

10-1 .................. Average Commute Time
11. Financial Plan

Federal regulations require a financial plan as an element of the Charlotte Regional Transportation Planning Organization’s (CRTPO’s) 2040 Metropolitan Transportation Plan (MTP). The purpose of the financial plan is to demonstrate that proposed investments are reasonable in the context of anticipated future revenues over the life of the plan, and for future years – 2025, 2030, and 2040. Meeting this requirement is called “fiscal constraint.”

The MTP is fiscally constrained based on an in-depth analysis of revenues and costs. The transportation investments proposed to meet metropolitan transportation needs over the planning period are consistent with revenue forecasts. This chapter provides an overview of the forecasted revenue and cost assumptions, along with the detailed research results used to derive these values. Anticipated revenues include funding from federal, state and local sources. The following sections provide more detailed assumptions regarding revenue, capital costs, maintenance costs, and future revenue needs.

Existing Revenue Forecasts

The Strategic Transportation Investments (STI) bill (H8817), which was signed into law on June 26, 2013, changed the way that the State of North Carolina, through the North Carolina Department of Transportation (NCDOT), allocates federal and
state transportation funds. The STI categorizes all projects, regardless of mode into the following three functional categories:

- Statewide Mobility;
- Regional Impact; and
- Division Needs.

These categories are discussed in more detail below. Figure 11-1 classifies roadways in the CRTPA planning area into these three categories.

### How the Strategic Transportation Investments Work

<table>
<thead>
<tr>
<th>40% of Fund = $6B</th>
<th>30% of Fund = $4.5B</th>
<th>30% of Fund = $4.5B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statewide Mobility</strong></td>
<td><strong>Regional Impact</strong></td>
<td><strong>Division Needs</strong></td>
</tr>
</tbody>
</table>

**Focus → Address Significant Congestion and Bottlenecks**
- Eligible Projects
- Statewide Type Projects (such as Interstates)

**Focus → Improve Connectivity within Regions**
- Eligible Projects
- Projects Not Selected in Statewide Mobility Category
- Regional Projects (NC and US routes)
- Funding based on population of Region

**Focus → Address Local Needs**
- Eligible Projects
- Projects Not Selected in Statewide or Regional Categories
- Division Projects (SR Routes)
- Funding based on equal share for each Division

### Statewide Mobility

- Projects of statewide significance will receive 40 percent of the available revenue, totaling $6 billion over 10 years.

- The project selection process will be 100 percent data-driven, meaning the NCDOT will base its decisions on hard data and information such as crash statistics and traffic volumes. Factors such as economic competitiveness and freight movement will be taken into consideration to help support and enhance logistics and economic development opportunities throughout the state.

### Regional Impact

- Projects of regional significance will receive 30 percent of the available revenue, equaling $4.5 billion over a decade based on regional population. Projects on this level compete within specific regions made up of two NCDOT Transportation Divisions.

- NCDOT will select applicable projects for funding using two weighted factors. Data will comprise 70 percent of the decision-making process and local points allocated by area planning organizations and the NCDOT Transportation Divisions will round out the remaining 30 percent at this level.
**Division Needs**

- Projects that address local concerns such as safety, congestion and connectivity will receive 30 percent of the available revenue, or $4.5 billion shared equally over NCDOT’s 14 Transportation Divisions.

- The Department will choose projects based 50 percent on data and 50 percent on local point allocations.

**Table 11-1: STI Eligible Projects**

<table>
<thead>
<tr>
<th>Highway</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstates and Future Interstates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routes on the NHS as of July 1, 2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routes on Department of Defense Strategic Highway Network (STRAHNET)</td>
<td>Other US and NC Routes</td>
<td></td>
<td>All Secondary Roads (SR) Routes</td>
</tr>
<tr>
<td>Appalachian Development Highway System Routes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncompleted Intrastate projects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designated Toll Facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aviation</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Commercial Service Airports; Funding not to exceed $500K per airport project per year</td>
<td>Other Commercial Service Airports not in Statewide category; Funding not to exceed $300K per airport project per year</td>
<td></td>
<td>All Airports without Commercial Service; Funding not to exceed $18.5M for airports within this category</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bicycle-Pedestrian</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>All routes (using non-State funds)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Public Transportation</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Service spanning two or more counties and serving more than one municipality; Funding amounts not to exceed 10 percent of regional allocation</td>
<td></td>
<td>Service not included in Regional category; Multimodal terminals and stations serving passenger transit system</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ferry</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>State maintained routes, excluding replacement vessels</td>
<td></td>
<td>Replacement of vessels</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail</th>
<th>Statewide</th>
<th>Regional</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Capacity Service on Class I Railroad Corridors</td>
<td>Pass. &amp; Freight Rail service spanning two or more counties not included in Statewide category</td>
<td></td>
<td>Pass. &amp; Freight Rail service not included in Statewide or Regional categories</td>
</tr>
</tbody>
</table>

*Source: STI Legislation*

A more thorough explanation of the Strategic Transportation Investments legislation can be found at: [http://www.ncdot.gov/strategictransportationinvestments](http://www.ncdot.gov/strategictransportationinvestments)
Funding Regions

Currently, the NCDOT divides the State into 14 Divisions. Mecklenburg County and Union County of the CRTPA are covered under Division 10, whereas Iredell County falls under Division 12.

For funding allocations, the NC Legislation paired two divisions into a region, and thus formed seven regions (Regions A through G). The Division 10 portion of the CRTPA is part of Region E, and the Division 12 portion of the CRTPA is covered under Region F.

Based on the formulas described previously in this chapter, amounts shown in Table 11-2 are assumed for total potential annual revenues for each category. These funding amounts are derived from the NCDOT estimates of funding for State Fiscal Years 2016-2025, which range from $15 to $18 billion.

Table 11-2: Anticipated Total Revenues by Funding Category

<table>
<thead>
<tr>
<th>Funding Category</th>
<th>Annual Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statewide</td>
<td>$675 million</td>
</tr>
<tr>
<td>Region E (consisting of Div. 8 &amp; 10)</td>
<td>$100 million</td>
</tr>
<tr>
<td>Region F (consisting of Div. 11 &amp; 12)</td>
<td>$55 million</td>
</tr>
<tr>
<td>Division 10</td>
<td>$36 million</td>
</tr>
<tr>
<td>Division 12</td>
<td>$36 million</td>
</tr>
</tbody>
</table>

Source: STI Legislation

North Carolina Department of Transportation’s numbered Divisions, as well as its paired alphabetical Funding Regions (color-coded) are depicted on the map above.
**CRTPO Share by Funding Category**

After identifying the overall State, Regional and Division funding expectations, the next step was to estimate the total dollar amount that the CRTPO could reasonably expect based on each of these categories. Staff reviewed several potential methods to determine CRTPO’s potential share of the funding. Among the methods discussed included percentage of population, percentage of lane-miles, and percentage of Vehicle Miles Traveled (VMT). The inconsistency of data made it difficult to calculate the percentage of lane-miles and VMT across the three different funding categories. Population proved to be the most consistent data source and is also thought to be a good representation of where the transportation needs are located. Therefore, population was chosen as the method for determining anticipated revenues across the Statewide, Regional, and Division categories.

**CRTPO Share of Statewide Funds**

As the previous section noted, $675 million/year is expected to be available statewide based on the State’s STI legislation. CRTPO’s planning area represents approximately 13 percent of North Carolina’s population. Using that population figure, which is based on the most recent decennial Census (2010), 13 percent of $675 million = $87.8 million/year in expected revenues in the Statewide category. The CRTPO is assuming that these funds will be spent exclusively on highway projects because there are very few types of non-roadway projects eligible for funding in the Statewide category under the STI legislation.
CRTPO Share of Region E Funds

CRTPO’s planning area is located within two different funding regions (Region E and Region F). In Region E, which consists of NCDOT Divisions 8 and 10, CRTPO accounts for approximately 56.3 percent of the population. This region includes the Mecklenburg and Union County portions of the CRTPO planning area. As was done for the Statewide category, using 56.3 percent as the population figure, and $100 million as the anticipated revenue for Region E (based on the STI), $56.3 million/year is CRTPO’s anticipated share of revenue in this category. It was also assumed that 15 percent of the amount available be programmed for non-roadway projects ($8.4 million) that are also eligible in the Regional category. The legislation indicates that a minimum of 4 percent of the total available funds will be allocated to non-roadway projects, which are limited to a select amount of aviation, rail and transit projects for the Regional category. It was assumed that a greater portion of the total non-roadway funds would be allocated to the dense, urban Metropolitan Planning Organizations (MPOs), which includes CRTPO. In addition, the MPO has a history of spending funds on non-roadway projects. Based on these assumptions, the anticipated revenue for Region E would be divided as follows:

- $47.9 million/year for allocation to roadways
- $8.4 million/year for allocation to non-roadway projects
**CRTPO Share of Region F Funds**

CRTPO covers 13 percent of the population in Region F, which consists of NCDOT Divisions 11 and 12. This region includes the Iredell County portion of CRTPO's planning area. Following the same methodology as described for the previous funding categories, 13 percent of $55 million = $7.2 million/year. For Region F, it was assumed that 10 percent of the anticipated revenue be available for non-roadway projects ($0.7 million) eligible in the Regional category. The assumed percentage of funds for non-roadway projects in Region F is slightly lower because Region F represents a more rural portion of the MPO’s overall planning area. Based on these assumptions, the funding for Regional F would be divided as follows:

- $6.5 million/year for allocation to roadways
- $0.7 million/year for allocation to non-roadway projects
CRTPO Share of Division 10 Funds
Each NCDOT Division is expected to receive $36 million per year, based on the equal share distribution across Divisions described in the STI. The CRTPO and Cabarrus-Rowan Metropolitan Planning Organization (CRMPO) are also direct recipients of Surface Transportation Program-Direct Attributable (STP-DA) funds. These funds are included as a part of each Division’s STI allocation. Since both MPOs are in Division 10, the STP-DA funds (CRTPO - $14 million and CRMPO - $6 million) are subtracted from the $36 million allocated to Division 10, leaving $16 million.

CRTPO contains approximately 76.5 percent of the population in Division 10. By taking 76.5 percent of $16 million (the amount available without the STP-DA funds), $12.2 million per year can be expected. The CRTPO’s $14 million STP-DA allocation was then added back to the $12.2 million, resulting in $26.2 million/year. As described in the previous Regional categories, there are a variety of non-roadway projects eligible for funding in the Division category as well, so 20 percent of the anticipated revenue amount is set aside to be programmed for non-roadway projects ($5.2 million). The amount set aside for the Division category is slightly higher (20 percent) because the types of non-roadway projects eligible in the Division category is greater than that of the Regional category, including a wider variety of aviation, rail and transit projects, as well as bicycle and pedestrian projects (although certain limitations apply). Based on this breakdown, the following funding amounts are available for this category:

- $21.0 million/year for allocation to roadways
- $5.2 million/year for allocation to non-roadway projects

*CRTPO contains 77% of Region Division 10’s total population
CRTPG Share of Division 12 Funds

As described for the previous Division category, a $36 million/year equal share is also available for Division 12. CRTPG assumes $2 million/year in STP-DA funds to be available for the Division 12 portion of its planning area, and unlike Division 10, no other MPO in Division 12 receives STP-DA funds. Accounting for approximately 19.6 percent of the population in Division 12, and using the remaining $34 million available (minus STP-DA), $6.7 million/year is the assumed revenue to be available to CRTPG for this funding category. As was done for Division 10, the $2 million STP-DA allocation was added to the $6.7 million of Division funds, for a total of $8.7 million/year. Of that total amount, 20 percent was assumed for the non-roadway projects eligible for Division category funds ($1.7 million) as described in the Division 10 share of funds. The funds available for this category are divided as follows:

- $7.0 million/year for allocation to roadways
- $1.7 million/year for allocation to non-roadway projects
**State Roadway Maintenance Revenues**

State roadway maintenance funds are expected to equal anticipated expenditures based on previous levels of revenues and expenses dedicated for this purpose. State road maintenance costs are based on historical NCDOT funding from 2005 to 2015 in the CRTPO area. A 2.0 percent growth factor was applied to forecast revenues through 2040. This growth factor is consistent with what is assumed by the NCDOT.

Based on these assumptions, the following are the anticipated funds for roadway maintenance in the CRTPO planning area:

- Horizon Year 2016-2025 - $130 million
- Horizon Year 2026-2030 - $80 million
- Horizon Year 2031-2040 - $180 million
- Total of all Horizon Years - $390 million

**Total of All Assumed Revenues by Funding Source**

Table 11-3 summarizes the major funding sources for transportation and includes both the capital and the maintenance costs. The major capital sources of federal and state funds were derived based on the STI formula. In addition, the CRTPO will receive the STP-DA funds previously mentioned, as well as Transportation Alternative (TA) funds. The TA funds can be used for programs and projects defined as transportation alternatives, including:

- On- and off-road pedestrian and bicycle facilities;
- Infrastructure projects for improving non-driver access to public transportation and enhanced mobility;
- Community improvement activities;
- Environmental mitigation;
- Safe routes to school projects; and
- Projects for planning, designing, or constructing boulevards and other roadways, largely in the right-of-way of former Interstate System routes or other divided highways.

The STP-DA and TA funds are directly allocated to the CRTPO, and the CRTPO has the authority to determine how these funds are expended.
Table 11-3: Anticipated Revenues by Funding Source 2016-2040 (in millions)

<table>
<thead>
<tr>
<th>Funding Sources</th>
<th>2016-2025</th>
<th>2026-2030</th>
<th>2031-2040</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Transportation</td>
<td>$1,524</td>
<td>$902</td>
<td>$2,095</td>
<td>$4,521</td>
</tr>
<tr>
<td>Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Matching</td>
<td>$381</td>
<td>$226</td>
<td>$524</td>
<td>$1,131</td>
</tr>
<tr>
<td>Transportation Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STP-DA Funds</td>
<td>$178</td>
<td>$105</td>
<td>$244</td>
<td>$527</td>
</tr>
<tr>
<td>TA Funds</td>
<td>$16</td>
<td>$8</td>
<td>$16</td>
<td>$40</td>
</tr>
<tr>
<td>Local Transportation</td>
<td>$88</td>
<td>$--</td>
<td>$--</td>
<td>$88</td>
</tr>
<tr>
<td>Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>$2,187</td>
<td>$1,241</td>
<td>$2,879</td>
<td>$6,307</td>
</tr>
</tbody>
</table>

Note: Numbers are rounded.

Total of All Assumed Capital Revenues by Mode

To develop the fiscally-constrained roadway project list, the CRTPO determined how much funding would be available for roadway projects. Based on the methodology described in the previous sections, the percentage of funds available to be allocated for roadway projects was determined, with the remainder assumed for allocation to non-roadway projects. These annual amounts were escalated using a reasonable growth rate agreed upon by the CRTPO and are shown in Table 11-4.

In order to determine the growth rate, research was conducted to identify what other MPOs throughout the state assumed as a growth rate. Rates ranged from 1.5 percent to 5 percent. The growth rate for the previous CRTPO long range plan fell in the middle of the range identified for other MPOs throughout the state. For consistency, it was determined to assume a 2.5 percent growth rate for the first ten years of the 2040 MTP, and a 2 percent growth rate for the remaining years of the MTP through the year 2040.

Table 11-4: Anticipated Capital Revenues by Mode 2016-2040 (in millions)

<table>
<thead>
<tr>
<th>Capital</th>
<th>2016-2025</th>
<th>2026-2030</th>
<th>2031-2040</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway</td>
<td>$1,904</td>
<td>$1,127</td>
<td>$2,617</td>
<td>$5,648</td>
</tr>
<tr>
<td>Non-Roadway</td>
<td>$195</td>
<td>$114</td>
<td>$262</td>
<td>$571</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>$2,099</td>
<td>$1,241</td>
<td>$2,879</td>
<td>$6,219</td>
</tr>
</tbody>
</table>
The anticipated federal and state revenues for roadway projects are shown in Table 11-5 by the STI funding categories. These amounts were then used to develop the fiscally-constrained roadway project list shown in the Streets and Highways chapter of the MTP – based upon these anticipated revenues, and project eligibility, for each category.

### Table 11-5: Anticipated Federal and State Roadway Revenues by STI Category (in millions)

<table>
<thead>
<tr>
<th>STI Category</th>
<th>2016-2025</th>
<th>2026-2030</th>
<th>2031-2040</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statewide</td>
<td>$983</td>
<td>$582</td>
<td>$1,351</td>
<td>$2,916</td>
</tr>
<tr>
<td>Regional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Div. 10</td>
<td>$536</td>
<td>$317</td>
<td>$737</td>
<td>$1,590</td>
</tr>
<tr>
<td>Div. 12</td>
<td>$72</td>
<td>$43</td>
<td>$99</td>
<td>$215</td>
</tr>
<tr>
<td>Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Div. 10</td>
<td>$235</td>
<td>$139</td>
<td>$323</td>
<td>$698</td>
</tr>
<tr>
<td>Div. 12</td>
<td>$78</td>
<td>$46</td>
<td>$107</td>
<td>$230</td>
</tr>
<tr>
<td>ROADWAY TOTAL</td>
<td>$1,904</td>
<td>$1,127</td>
<td>$2,617</td>
<td>$5,649</td>
</tr>
</tbody>
</table>

### Local Funding

In certain situations, local municipalities within the CRTPO planning area elect to provide funding for priority projects. This funding can be set aside as the result of a voter approved bond referendum. Several projects on the fiscally constrained project list for the 2040 MTP are proposed to be funded by local means. The local funding amounts are listed in Table 11-6 below.

### Table 11-6: Anticipated Local Roadway Revenues 2016-2040 (in millions)

<table>
<thead>
<tr>
<th>Municipality</th>
<th>2016-2025</th>
<th>2026-2030</th>
<th>2031-2040</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charlotte</td>
<td>$72.7</td>
<td>$0</td>
<td>$0</td>
<td>$72.7</td>
</tr>
<tr>
<td>Indian Trail</td>
<td>$10</td>
<td>$0</td>
<td>$0</td>
<td>$10</td>
</tr>
<tr>
<td>Matthews</td>
<td>$5.2</td>
<td>$0</td>
<td>$0</td>
<td>$5.2</td>
</tr>
<tr>
<td>CAPITAL SUBTOTAL</td>
<td>$87.9</td>
<td>$-</td>
<td>$-</td>
<td>$87.9</td>
</tr>
</tbody>
</table>

The Town of Mooresville also anticipates a bond referendum in 2014, which is expected to be approved after the writing of this MTP.
Project Cost Escalation

Federal regulations require that project costs be escalated to the year of expenditure for each horizon year, prior to the application of fiscal constraint (similarly, the revenue assumptions are escalated based on the assumed growth rate endorsed by the MPO as described previously in this chapter). A more detailed explanation of how the cost escalation is applied, as well as a complete listing of highway projects, can be found in the Streets and Highways chapter of the MTP. An escalated cost for each project is also provided.

Managed Lanes Toll Revenue

Highway projects that include a managed lane, or toll lane, component will yield revenues in future years. Several projects with managed lanes are included on the fiscally constrained project list for the MTP (a complete listing can be found in the Streets and Highways chapter). These projects are still in the design and development stages which makes it difficult to predict the amount of revenues to be expected once the projects are open to traffic, not to mention how those revenues will be applied (e.g. operations, maintenance, additional travel lanes, etc.). As these managed lanes projects continue to progress and more information becomes available, revenue assumptions will be made by CRTPO to supplement the other anticipated revenues outlined in this chapter.

Transit Funding

Additional funding, not subject to the STI formula, is available for transit projects in the CRTPO region. These funds are typically directly allocated to the Charlotte Area Transit System (CATS), whose policy decisions, work plans and budgets are approved by the Metropolitan Transit Commission (MTC). More information about CATS and the MTC are included in the Public Transportation chapter of the MTP. Such transit investments include capital expansion projects like the LYNX Blue Line light rail extension to smaller projects, such as the replacement of bus engines. The primary funding source for these capital projects are a combination of federal and state grants in addition to local matching funds from the half-percent sales and use tax dedicated to transit within Mecklenburg County. Operations and maintenance activities are primarily funded by the half-percent sales and use tax, and the maintenance of effort funds provided by Mecklenburg County, the City of Charlotte, and the Town of Huntersville. Additionally, service reimbursements, advertising and other miscellaneous revenues are utilized to advance the transit plan and provide ongoing operations and maintenance expenses for the organization. Table 11-7 provides the revenues, expenditures and transit balance for each horizon year of the 2040 MTP.
### Table 11-7: Anticipated CATS Transit Expenses and Revenues 2014-2040

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fares, Service Reimbursements,</td>
<td>$70,734,374</td>
<td>$752,780,655</td>
<td>$661,168,545</td>
<td>$1,763,401,689</td>
</tr>
<tr>
<td>Interest and Other Revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance of Effort</td>
<td>$38,871,292</td>
<td>$312,562,463</td>
<td>$240,018,234</td>
<td>$611,254,767</td>
</tr>
<tr>
<td>Sales Tax (1/2%)</td>
<td>$135,241,392</td>
<td>$837,148,963</td>
<td>$539,785,474</td>
<td>$1,402,516,536</td>
</tr>
<tr>
<td>State Maintenance Assistance</td>
<td>$23,786,000</td>
<td>$122,967,789</td>
<td>$67,766,701</td>
<td>$142,406,955</td>
</tr>
<tr>
<td>Operating Revenues Sub-Total</td>
<td>$268,633,058</td>
<td>$2,025,459,870</td>
<td>$1,508,738,954</td>
<td>$3,919,579,947</td>
</tr>
<tr>
<td><strong>Operating Expenses</strong></td>
<td>$222,446,494</td>
<td>$1,784,991,059</td>
<td>$1,373,500,235</td>
<td>$3,635,392,875</td>
</tr>
<tr>
<td><strong>OPERATING BALANCE</strong></td>
<td>$46,186,564</td>
<td>$240,468,811</td>
<td>$135,238,719</td>
<td>$284,187,072</td>
</tr>
<tr>
<td><strong>Capital Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal/State/Local/Other</td>
<td>$436,520,866</td>
<td>$1,929,377,477</td>
<td>$773,010,910</td>
<td>$1,926,863,848</td>
</tr>
<tr>
<td>CATS Operating Balances</td>
<td>$46,186,565</td>
<td>$240,468,811</td>
<td>$135,238,720</td>
<td>$284,187,072</td>
</tr>
<tr>
<td>Net Debt Proceeds</td>
<td>$167,112,056</td>
<td>$940,944,035</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Capital Revenues Sub-Total</td>
<td>$649,819,487</td>
<td>$3,110,790,322</td>
<td>$908,249,630</td>
<td>$2,211,050,920</td>
</tr>
<tr>
<td><strong>Capital Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus, Rail, Facilities</td>
<td>$73,167,551</td>
<td>$354,385,035</td>
<td>$181,688,385</td>
<td>$681,074,836</td>
</tr>
<tr>
<td>Acquisitions &amp; Other General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Outlays</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2035 Transit Corridor System</td>
<td>$595,460,891</td>
<td>$1,816,483,821</td>
<td>$-</td>
<td>$-</td>
</tr>
<tr>
<td>Plan Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt Service Expense</td>
<td>$48,023,751</td>
<td>$878,283,105</td>
<td>$651,273,473</td>
<td>$1,236,721,277</td>
</tr>
<tr>
<td>Capital Expenses Sub-Total</td>
<td>$716,652,193</td>
<td>$3,049,151,961</td>
<td>$832,961,858</td>
<td>$1,917,796,113</td>
</tr>
<tr>
<td><strong>CAPITAL BALANCE</strong></td>
<td>($66,832,706)</td>
<td>$61,638,362</td>
<td>$75,287,772</td>
<td>$293,254,807</td>
</tr>
<tr>
<td><strong>CUMULATIVE BALANCE</strong></td>
<td>$232,075,833</td>
<td>$293,714,194</td>
<td>$369,001,966</td>
<td>$662,256,773</td>
</tr>
</tbody>
</table>

Revenues and expenditures are escalated and shown in future year dollars.

Source: CATS
Sources:

40 CFR, 93.108

https://connect.ncdot.gov/projects/planning/Pages/ResourcesMPO-RPO.aspx
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List of Figures

11-1.................. Strategic Transportation Investments (STI) Roadway Categories
12. Congestion Management Process

The Charlotte Regional Transportation Planning Organization's (CRTPO) Congestion Management Process (CMP) is the application of strategies to improve performance and reliability of the transportation system. It assists regional stakeholders in assessing congestion-related metrics, formulating decisions aimed at relieving congestion, and communicating congestion metrics to the general public and public officials.

The CMP incorporates several valuable features, including:

- Consistency with the CRTPO’s Metropolitan Transportation Plan (MTP) and other planning processes;
- A “toolbox” of congestion management strategies that can be applied to various improvement needs;
- A process to filter strategies and confirm if widening is needed; and
- A recommended framework to assess, report, and monitor congestion.
Legislative Requirements

In the early 1990s, the CMP was first introduced as a Congestion Management System (CMS). The CMS was first introduced by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and continued under the successor law, the Transportation Equity Act for the 21st Century (TEA-21) in 1998. In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), introduced a change in nomenclature from Congestion Management System (CMS) to Congestion Management Process (CMP). This change reflects a shift in perspective and practice to address congestion management through a comprehensive process with enhanced linkages to the Metropolitan Planning Organization (MPO) planning process and the environmental review process; as well as cooperatively developed travel demand reduction and operational management strategies, and capacity increases. The most recent transportation authorization act, Moving Ahead for Progress in the 21st Century (MAP-21), signed into law by President Obama on July 6, 2012, made essentially no change in the requirements for a CMP.

Federal regulations require that MPOs with a population over 200,000 are designated as Transportation Management Areas (TMA). The MPO is required to develop and have in place a process for managing congestion. This CMP must provide recommendations for the effective management of congested facilities and efficient mobility, and ensure that all potential alternatives to address congestion have been examined for identified projects that include additional roadway capacity.

With a population of 1.12 million as defined by the 2010 Census, the CRTPD is designated as a TMA. As described in federal regulations (23 CFR 450.320) and guidance, the CMP should be a systematic process that “provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities...” Additionally, since a portion of the CRTPD region is designated non-attainment for ozone, the CMP takes on a greater significance.

For TMAs designated as ozone or carbon monoxide non-attainment areas pursuant to the Clean Air Act (CAA), federal law prohibits projects that significantly increase carrying capacity for single occupant vehicles (SOVs), unless the project is addressed in a CMP meeting federal requirements. Essentially, federal funds may not be programmed for capacity-adding SOV projects unless the project is included in a CMP that provides an analysis of reasonable travel demand reduction and operational management strategies. If the additional capacity and SOV capacity is warranted, then the CMP must identify strategies to manage the SOV facility safely and effectively, along with other travel demand reduction and operational management strategies appropriate for the corridor.
CMP Development

Development Steps
There are five key steps in the development of the CRTPO CMP. These steps include:

- Identification of the Study Area and Congested Area;
- Development of Goals, Objectives and Performance Measures;
- Evaluation of System Performance;
- Identification of Strategies; and
- Development of the Implementation Plan.

This development process is structured within the framework of the federal legislative and regulatory requirements, including the Federal Highway Administration (FHWA) guidance entitled Congestion Management Process: A Guidebook, 2011. The tasks completed for the CRTPO CMP align with the eight elements outlined within FHWA’s guidelines, which provide a general approach for the development of a CMP. The illustration from the Guidebook, shown below, demonstrates the elements of the CMP.

Prior to development of the CRTPO CMP, a Congestion Management Framework Guide was prepared in February 2012. This framework generally utilized the federal CMP guidebook to suggest a potential framework for the CRTPO CMP. The resulting CMP focuses on selected components of that framework guide.
Study Area

In consultation with the FHWA, the proposed CMP Study Area was identified, as shown in Figure 12-1. The CMP Study Area represents the MPO planning area as of 2012, as well as Mooresville, located in Iredell County, and a portion of Gaston County located within the Charlotte urbanized area (UZA). The MPO planning area included in the CMP Study Area is part of the Charlotte UZA and includes 22 jurisdictions within Mecklenburg and Union counties. Mooresville was part of the air quality non-attainment area. Over one mile of NC 16 in Gaston County is also included in the CMP Study Area. It should be noted that at the time of CMP development, the MPO was referred to as the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) and Iredell County had not yet been incorporated into the MPO planning area. Since the completion of the CMP, the MPO planning area has been expanded into Iredell County.

Planning Process

The CMP was developed through a collaborative, regional effort and provides a means to achieve the region’s vision and goals in coordination with the other planning efforts. The CMP is a dynamic document that serves as a mechanism for implementing strategies to achieve regional mobility, livability, emissions reduction, and the integration of transportation and land use.

The development of the CMP was guided by a task force created by the MPO’s Technical Coordinating Committee (TCC). The task force provided input and guidance for the development of the CMP goals and objectives, the definition of congestion, and the identification of specific strategies to address congestion. This task force met five times over the course of the CMP development; these meetings occurred on the following dates:

- April 24, 2012;
- June 8, 2012;
- July 24, 2012;
- September 18, 2012; and
- December 18, 2012.

The members of the task force are listed in Table 12-1.
### Table 12-1: CMP Task Force Members

<table>
<thead>
<tr>
<th>Agency</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charlotte Department of Transportation (CDOT)</td>
<td>Anna Gallup</td>
</tr>
<tr>
<td>(Travel Demand Model Staff)</td>
<td>Martin Kinnamon</td>
</tr>
<tr>
<td>CDOT</td>
<td>Norm Steinman</td>
</tr>
<tr>
<td>CDOT (Bike &amp; Ped)</td>
<td>Ken Tippette</td>
</tr>
<tr>
<td>Charlotte Area Transit System (CATS)</td>
<td>Jason Lawrence</td>
</tr>
<tr>
<td></td>
<td>David McDonald</td>
</tr>
<tr>
<td>City of Charlotte, Engineering and Property Management</td>
<td>Jim Keenan</td>
</tr>
<tr>
<td>North Carolina Department of Transportation (NCDOT) – Division 10</td>
<td>Scott Cole</td>
</tr>
<tr>
<td>NCDOT - Intelligent Transportation Systems (ITS)</td>
<td>Ann Lorscheider</td>
</tr>
<tr>
<td>FHWA</td>
<td>Loretta Barren</td>
</tr>
<tr>
<td></td>
<td>Joe Geigle</td>
</tr>
<tr>
<td>Indian Trail</td>
<td>Scott Kaufhold, CMP</td>
</tr>
<tr>
<td></td>
<td>Task Force Chair</td>
</tr>
<tr>
<td>Huntersville</td>
<td>Bill Coxe</td>
</tr>
<tr>
<td>Lake Norman Rural Planning Organization (LNRO)</td>
<td>Neil Burke</td>
</tr>
<tr>
<td>TCC chairman; and Town of Mooresville (expansion area representative)</td>
<td></td>
</tr>
<tr>
<td>CRTPO Staff Support</td>
<td>Bob Cook</td>
</tr>
</tbody>
</table>
Goals and Objectives

A draft version of the CMP Goals and Objectives was developed collaboratively by the task force. This draft was presented to the CRTPC TCC and the MPO in November 2012. Based on comments received from members of the task force, the TCC and the MPO, the Goals and Objectives were refined and presented to the TCC and MPO again in January 2013 for endorsement and approval. The overall goal for the CMP was identified as managing congestion within the CRTPC region, which was supported by four CMP objectives.

The CRTPC CMP Goal and Objectives are as follows:

Goal:

- Manage congestion within the CRTPC Region

Objectives:

- Develop congestion management measures;
- Reduce non-recurring congestion duration;
- Consider the full range of congestion management strategies; and
- Improve the resiliency, redundancy, and reliability of the transportation network.

These objectives are influenced by national, state and regional planning processes and requirements. From a national perspective, these objectives are consistent with the intent of the latest transportation legislation (MAP-21) and related regulations guiding statewide and regional planning processes. From a regional perspective, these objectives are consistent with the CRTPC’s overall MTP goals and objectives. Finally, the CRTPC CMP objectives address the multimodal nature of transportation, as well as the need to address both recurring and non-recurring congestion. With an understanding of the dynamic nature of congestion within the national, state, regional and local context, the task force continues to meet periodically to review the process and make further refinements as needed to address changing conditions.
Methodology and Evaluation

The methodology for evaluating congestion as part of the CMP focuses on the development of performance measures. These performance measures have been identified to quantify the CMP’s objectives and provide a means for assessing and analyzing congestion. Table 12-2 depicts the established performance measures, the data needed for the analysis, and how each performance measure aligns with the four (4) CMP objectives.

Table 12-2: Congestion Management Process (CMP) Performance Measures

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Definition</th>
<th>Data Source</th>
<th>CMP Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Roadway Miles at a Travel Time Index (TTI)</td>
<td>A measure of congestion intensity that is calculated as the ratio of travel time during the peak period to the time it takes to make the same trip at free flow speeds.</td>
<td>INRIX - GPS based travel time information</td>
<td>Develop congestion management measures</td>
</tr>
<tr>
<td>% of Roadway Miles at a Level of Service (LOS)</td>
<td>A qualitative measure that characterizes operational conditions within a traffic stream, and the perception by motorists and passengers.</td>
<td>Travel demand model</td>
<td></td>
</tr>
<tr>
<td>Crash Rates</td>
<td>The No. of crashes per 100 million vehicle miles of travel (MVMT) related to the statewide average.</td>
<td>NCDOT</td>
<td>Reduce non-recurring congestion duration</td>
</tr>
<tr>
<td>Were all reasonable techniques and strategies considered?</td>
<td>Determines whether or not capacity-adding SOV projects can be included in the CRTPO MTP, and ultimately in the CRTPO Transportation Improvement Program (TIP).</td>
<td>CMP Strategies for freeways and non-freeways</td>
<td>Consider full range of congestion management strategies</td>
</tr>
<tr>
<td>Extract data from INRIX and use Buffer, or other indices such as % of Roadway Miles at a Planning Time Index (PTI)</td>
<td>PTI represents the total time that should be planned for trips with near-worst case travel. It is a measure of travel reliability, addressing both intensity and variability of congestion. It is calculated as the ratio of the 95th percentile TTI, or specifically, the ratio of the travel time for the worst weekday of the month to free flow travel time.</td>
<td>INRIX - GPS based travel time information</td>
<td>Improve the resiliency, redundancy, and reliability of the transportation network</td>
</tr>
</tbody>
</table>
CMP Data
The data collection effort for the CRTPO CMP focused on travel time data, crash data, and information from the regional travel demand model.

The North Carolina Department of Transportation (NCDOT) and the Charlotte Department of Transportation (CDOT) acquired INRIX travel time data, a Global Positioning System (GPS) based real-time travel time information dataset. This dataset was identified by the task force as the most appropriate to use to measure and identify those facilities with existing congestion. INRIX monitors interstates and other major roadways across the nation in real time, 24 hours a day, seven days a week. With this information, it is possible to estimate travel speed and times by time of day. Using the INRIX data, a travel time index (TTI) was calculated for the roadways within the CMP Study Area. Travel time index is calculated as the ratio of travel time during the peak period to the time it takes to make the same trip at free flow speeds.

The identification of future congested conditions was accomplished using traditional Level of Service (LOS) measures. These LOS measures were calculated from the Metrolina Regional Travel Demand Model. The travel demand model utilizes socioeconomic (SE) input data, in addition to geographic roadway and transit network data from various sources and produces estimated (forecasted) traffic volumes for the transportation network. The 2035 congestion levels were determined using the 2035 Long Range Transportation Plan (LRTP), which contains the CRTPO’s planned short and long-range transportation improvement projects.

The crash data utilized for the CRTPO CMP was obtained from NCDOT for the years 2009 through 2011. This information was used to calculate crash rates for Mecklenburg, Union, and Iredell Counties, as well as a statewide average.

Data Analysis and Evaluation
As described above, a travel time index was calculated to identify the facilities with existing congestion based on the INRIX data. Facilities with a travel time index of 1.00 to 1.19 were identified as minimally congested; 1.20 to 1.49 as moderately congested; and 1.50 or greater as heavily congested. This information is shown in Table 12-3.

Table 12-3: Existing Conditions Congestion Levels – INRIX Data

<table>
<thead>
<tr>
<th>Congestion Level</th>
<th>No. of Miles (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Congestion (TTI 1.00 to 1.19)</td>
<td>971 (49%)</td>
</tr>
<tr>
<td>Moderate Congestion (TTI 1.20 to 1.49)</td>
<td>793 (40%)</td>
</tr>
<tr>
<td>Heavy Congestion (TTI &gt; 1.49)</td>
<td>213 (11%)</td>
</tr>
</tbody>
</table>

*Source: INRIX Realtime Traffic Data, City of Charlotte*
To identify future congested conditions, the traditional LOS analysis was used. Facilities with LOS A through D were identified as minimally congested; LOS E as moderately congested; and LOS F as heavily congested. These levels of congestion were defined by the task force and presented to the TCC and MPO for review and comment before their acceptance. Table 12-4 depicts the existing and future levels of congestion in the CRTPO study area.

### Table 12-4: Existing and Future Conditions Congestion Levels
#### Travel Demand Model Data

<table>
<thead>
<tr>
<th>Congestion Level</th>
<th>No. of Miles (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010 Conditions</td>
</tr>
<tr>
<td>Minimal Congestion (LOS A to D)</td>
<td>1,355 (73%)</td>
</tr>
<tr>
<td>Moderate Congestion (LOS E)</td>
<td>115 (6%)</td>
</tr>
<tr>
<td>Heavy Congestion (LOS F)</td>
<td>382 (21%)</td>
</tr>
</tbody>
</table>

*Source: Metrolina Travel Demand Model*

The results of the crash analysis are found in Table 12-5. Based on an analysis of total crash rates, Mecklenburg and Union Counties resulted in higher total crash rates (274 and 292, respectively) than the statewide average (272), while Iredell County resulted in a lower total crash rate (211). For fatal crash rates, however, Mecklenburg and Iredell Counties revealed lower crash rates (0.64 and 0.94, respectively) than the statewide average (1.2), while Union County resulted in a comparable crash rate (1.3) to the statewide average (1.2).

### Table 12-5: CRTPO Three Year Average Crash Rates (Years 2009–2011)

<table>
<thead>
<tr>
<th>Three Year Averages</th>
<th>Mecklenburg County</th>
<th>Union County</th>
<th>Iredell County</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Crash Rate</td>
<td>274</td>
<td>292</td>
<td>211</td>
<td>272</td>
</tr>
<tr>
<td>Fatal Crash Rate</td>
<td>0.64</td>
<td>1.26</td>
<td>0.94</td>
<td>1.20</td>
</tr>
<tr>
<td>Crash Frequency (Hours)</td>
<td>0.30</td>
<td>2</td>
<td>2</td>
<td>0.00</td>
</tr>
<tr>
<td>Fatality Frequency (Hours)</td>
<td>127</td>
<td>431</td>
<td>424</td>
<td>7</td>
</tr>
</tbody>
</table>

*Note: Crash rate is the number of crashes per 100 million vehicle miles of travel (MVMT)*

*Note: Frequency indicates how often a crash has occurred historically in the respective area/region/jurisdiction (i.e. an average time between two consecutive crashes in the respective area)*

*Source: NCDOT Traffic Safety Unit*
Congestion Management Strategies

The use of performance measures focuses on ensuring the full range of congestion management strategies are considered in the CRTPO’s development of the plans and programs. As single occupancy vehicle widening projects are considered for the MTP and the NCDOT State Transportation Improvement Program (STIP), the determination must be made whether or not all reasonable congestion management techniques and strategies were considered. Projects that considered these strategies are eligible for inclusion in the MTP and STIP accordingly.

To ensure that all reasonable techniques and strategies are considered for a facility, the CMP features a process of assessing (“filtering”) all possible strategies that could improve the facility, without widening. This process considers congestion management strategies in relation to the highway improvement needs identified in the CRTPO’s Comprehensive Transportation Plan (CTP), and confirms if widening is needed.

This assessment of reasonable congestion management strategies as alternatives to widening meets the federal requirement for project funding. Federal funds may not be programmed for capacity-adding single occupancy vehicle projects unless the projects are included in a CMP that provides an analysis of reasonable travel demand reduction and operational management strategies. The CRTPO CMP is shown in the graphic below.

Graphical illustration of CMP with other MPO Planning Processes
To help the CRTPC achieve its goal of managing congestion, a comprehensive “toolbox” of CMP strategies has been identified and summarized in Tables 12-6 through 12-8. Using United States Department of Transportation (USDOT) guidance, a full range of potential congestion management strategies were identified for fully controlled access facilities (Table 12-6), no/partially controlled access facilities (Table 12-7) and the overall region (Table 12-8). These strategies were originally developed for the CMP Framework Guide, prepared and approved by the MPO in February 2012. These strategies were then discussed by the task force in 2012 to determine their applicability and potential public acceptance in the Charlotte region. Many of the strategies listed are either currently being used or there are plans for their use within the CRTPC region. The strategies are grouped into four major categories:

- Demand Management;
- Alternative Mode Promotion;
- Traffic Operations; and
- Land Use.

Additionally, these techniques are summarized in relation to:

- Term effectiveness (short, mid, long);
- Congestion type (recurring, non-recurring or both); and
- Public acceptance (low, medium, high).
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Currently In Use</th>
<th>Term Effectiveness</th>
<th>Congestion Type</th>
<th>Public Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demand Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOV Lanes</td>
<td>Yes</td>
<td>L</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>Variable Priced Lanes</td>
<td>Possible Future</td>
<td>L</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>Congestion Pricing (HOT)</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>L</td>
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<tr>
<td>Bridge Tolling</td>
<td>NA</td>
<td>L</td>
<td>R</td>
<td>L</td>
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<tr>
<td>Electronic Payment Systems</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td><strong>Alternative Mode Promotion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Park-and-Ride Lot Improvements</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td>Use of shoulders for Transit Vehicles during Peak Periods</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td><strong>Traffic Operations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imaging for Surveillance and Detection</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Work Zone Management</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
<td>H</td>
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<tr>
<td>Service Patrols (e.g. IMAP)</td>
<td>Yes</td>
<td>M</td>
<td>N</td>
<td>H</td>
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<tr>
<td>Reversible Lanes or Movable Medians</td>
<td>Possible Future</td>
<td>M</td>
<td>RN</td>
<td>M</td>
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<tr>
<td>Spot Safety Improvements</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
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<tr>
<td>Freeway Ramp Metering</td>
<td>Possible Future</td>
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<td>RN</td>
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<tr>
<td>Variable speed Limits</td>
<td>Possible Future</td>
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<td>RN</td>
<td>M</td>
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<tr>
<td>Variable Message Signs (VMS)</td>
<td>Yes</td>
<td>S</td>
<td>RN</td>
<td>H</td>
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<tr>
<td><strong>Land Use</strong></td>
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<tr>
<td>Transportation-Land Use Plans with Locals Governments</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>H</td>
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</tbody>
</table>

*Symbol Legend: Term Effectiveness: (S)hort, (M)id, (L)ong, Congestion Type: (R)ecurring, (N)on-Recurring, or Both (RN), Public Acceptance: (L)ow, (M)edium, (H)igh*
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Currently In Use</th>
<th>Term Effectiveness</th>
<th>Congestion Type</th>
<th>Public Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demand Management</strong></td>
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<td></td>
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<tr>
<td>Access Management Program</td>
<td>Yes</td>
<td>M</td>
<td>RN</td>
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<td>HOV Lanes</td>
<td>Possible Future</td>
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<td>R</td>
<td>L</td>
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<td>Congestion Pricing</td>
<td>Possible Future</td>
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<td>R</td>
<td>L</td>
</tr>
<tr>
<td>Bridge Tolling</td>
<td>NA</td>
<td>L</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td><strong>Alternative Mode Promotion</strong></td>
<td></td>
<td></td>
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<tr>
<td>Transit Signal Priority systems</td>
<td>Yes</td>
<td>M</td>
<td>R</td>
<td>H</td>
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<tr>
<td>Park-and-Ride Lot Improvements</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
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<tr>
<td>Addition of Bicycle racks at Public Transit Stations / Stops</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
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<td>Bicycles and Pedestrian access to Transit Improvement</td>
<td>Yes</td>
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<td>R</td>
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<td>Sidewalk Gap Closure Program</td>
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<td>R</td>
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<tr>
<td>Improve Pedestrian Facilities at Intersections</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
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<tr>
<td>Creation of new Bicycle and Pedestrian Facilities</td>
<td>Yes</td>
<td>M</td>
<td>R</td>
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<tr>
<td>Bike Sharing Programs</td>
<td>Yes</td>
<td>M</td>
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<td>Enhance Transit Amenities</td>
<td>Yes</td>
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<td>Use of shoulders for Transit Vehicles during Peak Periods</td>
<td>Possible Future</td>
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<td>Safe Routes to School Initiatives</td>
<td>Yes</td>
<td>M</td>
<td>R</td>
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<td>Bicycle / Pedestrian Education Program</td>
<td>Yes</td>
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<td>Bicycle and/or Pedestrian Corridor Safety Studies and Implementation</td>
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<td><strong>Traffic Operations</strong></td>
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<tr>
<td>Imaging for Surveillance and Detection</td>
<td>Yes</td>
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<td>N</td>
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<tr>
<td>Traffic Signal Timing</td>
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<td>S</td>
<td>R</td>
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<tr>
<td>Red-Light Camera Enforcement</td>
<td>Possible Future</td>
<td>S</td>
<td>N</td>
<td>M</td>
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<td>Dynamic Traffic Signal Systems</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Service Patrols (e.g. IMAP)</td>
<td>Yes</td>
<td>M</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Emergency Management Systems (EMS)</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Work Zone Management</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Turn Lane Construction and Extension</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td>Roundabout Constructions</td>
<td>Yes</td>
<td>S</td>
<td>RN</td>
<td>M</td>
</tr>
<tr>
<td>Reversible Lanes or Movable Medians</td>
<td>Yes</td>
<td>M</td>
<td>RN</td>
<td>M</td>
</tr>
<tr>
<td>SPOT Safety Improvements</td>
<td>Yes</td>
<td>S</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Variable speed Limits</td>
<td>Possible Future</td>
<td>S</td>
<td>RN</td>
<td>H</td>
</tr>
<tr>
<td>Variable Message Signs (VMS)</td>
<td>Yes</td>
<td>S</td>
<td>RN</td>
<td>H</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation-Land Use Plans with Locals Governments</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td>Develop Overlay Districts to manage Development Densities and Form</td>
<td>NA</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
</tbody>
</table>

Symbol Legend: Term Effectiveness: (S)hort, (M)id, (L)ong, Congestion Type: (R)ecurring, (N)on-Recurring, or Both (RN), Public Acceptance: (L)ow, (M)edium, (H)igh
### Table 12-8: Congestion Management Strategies - Regional

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Currently In Use</th>
<th>Term Effectiveness</th>
<th>Congestion Type</th>
<th>Public Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demand Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ridematching services</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>Vanpooling</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>Parking cash-out or carpool parking incentives</td>
<td>Yes</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Alternative Commute Subsidy Program</td>
<td>NA</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Telecommuting Promotion</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Compressed/Flexible Workweeks</td>
<td>Possible Future</td>
<td>S</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Employer Outreach/Mass Marketing</td>
<td>Possible Future</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Cordon Pricing</td>
<td>NA</td>
<td>M</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td><strong>Alternative Mode Promotion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvements/Added Capacity to Regional Rail &amp; Bus Transit</td>
<td>Yes</td>
<td>ML</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td>Service Coordination (Buses/Trains sharing real-time information)</td>
<td>Yes</td>
<td>M</td>
<td>RN</td>
<td>H</td>
</tr>
<tr>
<td><strong>Traffic Operations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Management Centers (TMCs)</td>
<td>Yes</td>
<td>M</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Service Patrols (e.g. IMAP)</td>
<td>Yes</td>
<td>M</td>
<td>N</td>
<td>H</td>
</tr>
<tr>
<td>Parking Management and Information Systems</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td>511 Traveler Information</td>
<td>Yes</td>
<td>S</td>
<td>RN</td>
<td>H</td>
</tr>
<tr>
<td>Highway Advisory Radio (HAR)</td>
<td>No</td>
<td>S</td>
<td>RN</td>
<td>H</td>
</tr>
<tr>
<td>Transit Information Systems</td>
<td>Yes</td>
<td>S</td>
<td>R</td>
<td>H</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage Regional Activity Centers</td>
<td>Yes</td>
<td>M</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Live-Work Proximity Incentives</td>
<td>NA</td>
<td>L</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Require MPO review for Regional Scale Developments</td>
<td>NA</td>
<td>L</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>Growth Management Restrictions</td>
<td>NA</td>
<td>L</td>
<td>R</td>
<td>M</td>
</tr>
</tbody>
</table>

**Symbol Legend:** Term Effectiveness: (S)hort, (M)id, (L)ong, Congestion Type: (R)ecurring, (N)on-Recurring, or Both (RN), Public Acceptance: (L)ow, (M)edium, (H)igh
Implementation and the Metropolitan Transportation Plan

As previously noted, the identified congestion management strategies are applied to projects in order to determine if the needed level of improvement can be accomplished without widening. Before a widening project is recommended for inclusion in the MTP and ultimately the STIP, these projects are assessed for any other congestion management strategies that might improve the facility in lieu of widening.

The CRTPO is applying these strategies to all of the Existing plus Committed (E+C) projects not under construction; this group of projects includes those with committed funding. In addition, the congestion management strategies are also applied to the 2025 horizon year projects that are proposed to add capacity, in order to determine if widening the facility is the only option for improving the congestion. The results of this evaluation are summarized in Appendix B and the project assessment was coordinated with all of the participating jurisdictions.

This on-going process for managing congestion within the region, and for moving congestion management strategies into the funding and implementation stages, is fully coordinated with the other planning functions of the CRTPO and the development of the MTP and STIP. The CMP provides recommendations for the effective management of congested facilities and efficient mobility; and ensures that all potential alternatives to address congestion have been examined for identified projects that include additional roadway capacity. The CMP is required to be developed, established and implemented as part of the metropolitan transportation planning process.
Sources:

USDOT, FHWA, Office of Planning, Environment, & Realty (HEP), http://www.fhwa.dot.gov/planning/congestion_management_process/

Public Law No: 112-141: In some cases, a UZA represented by a MPO with less than 200,000 residents may also be designated as a TMA, upon request from the State Governor and MPO representatives.

A non-attainment area is an area designated by the U.S. Environmental Protection Agency (EPA) that does not meet the National Ambient Air Quality Standards (NAAQS). In early 2012, EPA announced that the Charlotte area’s final designation under the new 2008 ozone standard was a “marginal non-attainment” area. This marginal non-attainment area includes all of Mecklenburg County and portions of Cabarrus, Gaston, Iredell, Lincoln, Rowan, and Union Counties.

Congestion Management Process: A Guidebook, USDOT, FHWA, April 2011—North Carolina General Statute 136-66.2 requires each municipality or MPO, with the cooperation of the NCDOT, to develop a Comprehensive Transportation Plan (CTP) serving present and anticipated travel demand in and around the municipality or MPO.
List of Figures

12-1 .................. CMP Study Area
The CMP Study Area represents the MPO planning area as of 2012, as well as Mooresville located in Iredell County, and a portion of Gaston County located within the Charlotte Urbanized Area (UZA).
13. Streets and Highways

The Charlotte Regional Transportation Planning Organization (CRTPO) planning area consists of a broad network of roadway corridors, ranging from local streets serving neighborhood needs to multi-lane freeways and expressways serving national and regional trip purposes.

This network is the primary means by which people and goods are transported within and through the region. The network includes close to 6,874 total miles, with approximately 53 percent (3,625 miles) maintained by municipalities in the urban area. Maintenance responsibilities for these roads are listed in Table 13-1.
### Table 13-1: Maintenance Responsibilities for Roadways

<table>
<thead>
<tr>
<th>Maintenance Responsibility</th>
<th>Roadway Classification</th>
<th>CRTPO</th>
<th>Mecklenburg</th>
<th>Union</th>
<th>Iredell</th>
<th>Total Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCDOT</td>
<td>Interstates</td>
<td>165</td>
<td>116</td>
<td>-</td>
<td>62</td>
<td>178</td>
</tr>
<tr>
<td></td>
<td>US Routes</td>
<td>165</td>
<td>53</td>
<td>53</td>
<td>85</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>NC Routes</td>
<td>304</td>
<td>152</td>
<td>138</td>
<td>86</td>
<td>376</td>
</tr>
<tr>
<td></td>
<td>Secondary Routes</td>
<td>2,615</td>
<td>658</td>
<td>1,461</td>
<td>1,328</td>
<td>3,447</td>
</tr>
<tr>
<td></td>
<td>Total State-Maintained</td>
<td>3,249</td>
<td>979</td>
<td>1,652</td>
<td>1,561</td>
<td>4,192</td>
</tr>
<tr>
<td>Other</td>
<td>State Parks Routes</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Municipal Routes</td>
<td>3,617</td>
<td>2,984</td>
<td>342</td>
<td>298</td>
<td>3,624</td>
</tr>
<tr>
<td></td>
<td>Total Non-State</td>
<td>3,625</td>
<td>2,984</td>
<td>342</td>
<td>306</td>
<td>3,632</td>
</tr>
<tr>
<td></td>
<td>Maintained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Mileage</td>
<td>6,874</td>
<td>3,963</td>
<td>1,994</td>
<td>1,867</td>
<td>7,824</td>
</tr>
</tbody>
</table>

Source: NCDOT Management Systems and Assessments Unit (MSAU) using the 2013 4th Quarter Road Characteristics and 2012-2013 Powell Bill Mileage

Note: The figures above for Union and Iredell Counties represent each respective county in its entirety, whereas the figures for CRTPO represent only those portions of Union and Iredell Counties within the MPO planning area. As a result, there are discrepancies between the CRTPO mileage and the total mileage for the counties.

### Street and Highway Planning

The CRTPO’s approach to planning for highways and streets has been to balance competing interests when deciding how or when to expand or extend the existing thoroughfare network.

The underlying premise of this approach is that it is not financially or politically feasible to build our way out of congestion by constructing more through lanes along every congested roadway. The best way to respond to the increasing demand on the road network is to look at options from a network perspective, recognizing that changes to one part of the network will have positive or negative impacts on other portions of the network.
Relationship to the Thoroughfare Plan and Comprehensive Transportation Plan

Thoroughfare Plan

A roadway system for the CRTPO has been identified that, in conjunction with local streets, is expected to serve the area’s future traffic levels. The Mecklenburg-Union Thoroughfare Plan, which was adopted in November 2004 and subsequently amended several times, identifies the future major roadways within the former Mecklenburg-Union Metropolitan Planning Organization’s planning area, including alignments of major roadways based on facility type. In addition, the City of Statesville adopted a Thoroughfare Plan in 1997. Iredell County, and the Towns of Mooresville and Troutman have Comprehensive Transportation Plans that were recently adopted or updated in 2013. At the writing of this Metropolitan Transportation Plan (MTP), these various plans each serve to represent the current and future roadway networks of the different geographies for which they were adopted.

Comprehensive Transportation Plan (CTP)

North Carolina General Statute 136-66.2 requires each municipality or Metropolitan Planning Organization (MPO), with the cooperation of the North Carolina Department of Transportation (NCDOT), to develop a CTP serving present and anticipated travel demand. The CTP is North Carolina’s multi-modal transportation plan which includes community consensus on future transportation needs required to support anticipated growth and development. As stated, the CTP considers all modes, and is intended to strengthen the connections between an area’s transportation plan, adopted local land development plan, and community vision. It will be mutually adopted by the state and the CRTPO.

With the MPO expansion due to the 2010 Census, a CTP will be adopted that will replace the Mecklenburg-Union and Statesville Thoroughfare Plans and merge the existing CTPs from Iredell County, Mooresville, and Troutman into one CTP for the entire CRTPO planning area. The CRTPO, in cooperation with NCDOT, is currently in the process of developing the CRTPO Comprehensive Transportation Plan. It is expected to be finished in 2014.

Implementation of a region-wide CTP is accomplished through federal, state, or local roadway construction projects, or by directing private interests to fund or build improvements through the land development process. Larger scale projects are most often built by the public sector, with the private sector building smaller scale projects. Local funding is typically used on streets that are part of a local network, with federal and state funds being the primary source for improvements to the major roadways maintained by the NCDOT.
Managed Lanes

Another strategy of the CRTPO is the implementation of managed lanes. Managed Lanes are defined by the FHWA as offering “enhanced operational conditions within separated lanes, which result in outcomes such as greater efficiency free-flow speeds or reduced congestion.” There are different types of managed lanes including high occupancy toll (HOT) lanes, which require a toll for single occupant vehicles, or express lanes with limited entrances and exits, among others. The Fast Lanes Study, a three phased study that began in 2007 and concluded in 2013, was conducted to determine the viability and acceptance of managed lanes in the region. The study looked at several corridors where the implementation of managed lanes could provide potential benefits. Public outreach was a significant component of the study, specifically the public’s perceived acceptance of managed lanes. Based on the data collected during the study, the potential corridors were prioritized, and projects that include a managed lanes component are now being proposed. Several of these projects are included in this 2040 Metropolitan Transportation Plan (MTP) and are listed in Table 13-2.

Table 13-2: Managed Lanes Projects - Construction Costs and STI Subsidies

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Name</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D=A-C</th>
<th>E=A*Cost Escalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>I-485 from I-77 to Independence Blvd (US 74)</td>
<td>$201.3</td>
<td>$201.3</td>
<td>$100.0</td>
<td>$101.3</td>
<td>$297.9</td>
</tr>
<tr>
<td>144</td>
<td>I-77 from I-485 (Exit 1) to Woodlawn Rd (Exit 6)</td>
<td>$328.2</td>
<td>$164.1</td>
<td>$82.0</td>
<td>$246.2</td>
<td>$695.8</td>
</tr>
<tr>
<td>145</td>
<td>I-77 from Woodlawn Rd (Exit 6) to I-277 (Belk Fwy) (Exit 9)</td>
<td>$282.1</td>
<td>$141.1</td>
<td>$70.0</td>
<td>$212.1</td>
<td>$417.5</td>
</tr>
<tr>
<td>148</td>
<td>Independence Blvd (US 74) from Idlewild Rd to Sardis Rd North</td>
<td>$114.6</td>
<td>$57.3</td>
<td>$28.0</td>
<td>$86.6</td>
<td>$169.6</td>
</tr>
<tr>
<td>189</td>
<td>Independence Blvd (US 74) from Sardis Rd North to I-485</td>
<td>$136.1</td>
<td>$68.0</td>
<td>$34.0</td>
<td>$102.1</td>
<td>$201.4</td>
</tr>
</tbody>
</table>

A - Estimated Construction Cost of the Entire Project (in 2012 $ millions)
B - Estimated Construction Cost Managed Lanes Portion Only (in 2012 $ millions). If the project involves only Managed Lanes, this is the same as A. If the project involves both General Purpose Lanes and Managed Lanes, this is half of A.
C - Managed Lanes Construction Cost STI Subsidy (in 2012 $ millions): Subsidy is estimated as half of B, or a maximum of $100 million
D - Revised Construction Cost for Fiscal Constraint Analysis (in 2012 $ millions)
E - Estimated Construction Cost of the Entire Project (in future $ millions)
**Roadway Project Evaluation**

The Thoroughfare Plan and CTPs referenced represent the primary inventory of roadway projects evaluated for construction prioritization, and serve as the starting point from which the CRTPO begins the process of determining which roadways require upgrades over the next ten to twenty years. There is no funding associated with the projects in the Thoroughfare Plans and CTPs; however, the 2040 MTP is required to be financially feasible, or “fiscally constrained” (see the Financial Plan chapter for details). In order to determine which projects will be included in the MTP, a project evaluation process must be undertaken.

CRTPO member jurisdictions were given the opportunity to submit candidate projects for consideration in the 2040 MTP. Of the 268 candidate projects submitted for evaluation, only those deemed to be financially feasible are included in the MTP. Table 13-3 identifies the total cost of all candidate projects submitted, versus the anticipated roadway revenues over the horizon of the MTP. The estimated cost of all the candidate projects submitted outweighs anticipated revenues, so a project ranking methodology was used to determine which priority projects to include in the MTP.

<table>
<thead>
<tr>
<th>CRTPO Roadway Projects</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Candidate Project Cost</td>
<td>$7,498,544,000</td>
</tr>
<tr>
<td>Anticipated Revenues</td>
<td>$5,648,000,000</td>
</tr>
<tr>
<td>Shortfall</td>
<td>$1,850,544,000</td>
</tr>
</tbody>
</table>

*Note: Estimated project costs are in 2012 base year dollars.*

The project ranking methodology used to develop the 2040 MTP was adopted by the CRTPO in March 2013, and establishes project construction priorities in both the local and NCDOT construction programs. The adopted methodology differs from the MPO’s previous evaluation process in order to be more consistent with criteria used by the State. Both quantitative and qualitative criteria were considered using the CRTPO’s newly adopted, two-tiered methodology, which is highlighted by the graphic below. A detailed explanation of the project ranking methodology is provided in Appendix C, along with a list of scores given to each roadway candidate project.
The two-tiered ranking methodology evaluated all candidate projects using the Tier I criteria. Based on project scores and the available anticipated revenues, a threshold was established. Projects that scored high enough to meet the threshold advanced and were scored using the Tier II criteria. As a result of the project evaluation process, based on final project scores and anticipated revenues, 84 of the original 268 roadway candidate projects were determined to be eligible for inclusion in the 2040 MTP. In addition, projects already funded or under construction are included in the plan.

Programmed Roadway Projects

Several highway and roadway projects, now in various stages of implementation (planning, design, land acquisition, and construction), will provide additional capacity to meet the continuing growth projected for the CRTPO. These committed projects will help meet intra-regional and interstate travel demand generated by the population, employment, and travel growth expected in upcoming years.

The roadway projects for which funding has been committed through 2025 are shown in Table 13-4 (shown at the end of this chapter) and Figure 13-1. Minor intersection and safety projects are not included in this list because those projects are not regionally significant projects within the context of the 2040 MTP.

The planned roadway projects are funded either by NCDOT, Federal Highway Administration (FHWA), or the local municipalities in the planning area. Funding for roadway projects is described in more detail in the Financial Plan chapter of the MTP. Some roadway improvements, such as expansion of the local/collector street system, will continue to be accomplished by developers through the rezoning, subdivision, and permitting processes within the various CRTPO jurisdictions.
Horizon Year Recommendations

Federal law requires that projects in the MTP be categorized in financially constrained horizon years in order to comply with requirements for air quality and conformity analysis. Horizon years are no more than ten years in length. It is important to note that the years are based on calendar years, beginning January 1, rather than fiscal years.

The projects recommended for implementation in this MTP respond directly to projected travel demand, the CRTPO policy decisions, and available funding. In the following pages, tables with detailed information about each roadway project are presented for each of the four horizon years – 2015, 2025, 2030 and 2040 – as well as a map that highlights the location of each major roadway.

The following sections of this chapter highlight the four horizon years and specific roadway projects proposed to be accomplished within each timeframe.

2015 Roadway Network

The 2015 network includes all of the existing major streets and highways, and approximately 13 roadway widening and new construction projects that will be completed and open for traffic by December 31, 2015 (see Figure 13-2). Projects completed between January 1, 2014 and December 31, 2015 are included in the 2015 Horizon Year. Most of these projects have been, or will be fully or partially funded by the 2012-2018 State Transportation Improvement Program (STIP). The remainder of the projects will have funds appropriated from the NCDOT, the City of Charlotte, private developers, or other local governments, to complete them prior to the end of 2015. Table 13-5 (included at the end of this chapter) provides information about each project. Notable projects for Horizon Year 2015 include:

- Completion of I-485, from NC 115 to I-85 near Concord Mills;
- Widening of I-485 loop in the south Charlotte area;
- I-77/West Catawba Avenue interchange;
- US 21/Gilead Road intersection improvements;
- City Boulevard Extension from Mallard Creek Road to US 29/NC 49; and
- Potter Road/Pleasant Plains Road intersection improvements.

2025 Roadway Network

The roadway projects in the 2025 network include several projects that have either existing or committed funding. In addition, there are over 60 roadway widening and new construction projects in NCDOT Divisions 10 and 12 that are proposed for completion between January 1, 2016 and December 31, 2025, which is the 2025 Horizon Year (see Figure 13-3). Revenues anticipated from federal, state and local
sources will be used to fund these projects. Table 13-6 (included at the end of this chapter) summarizes information on each project. Selected notable projects are:

- Further conversion of Independence Boulevard (US 74) to an expressway from Conference Drive to I-485, including several frontage roads that will be constructed in conjunction with the project to provide local access;

- Widening of John Street/Old Monroe Road from Trade Street in Matthews to Wesley Chapel Road in Indian Trail;

- Widening of NC 150 in the western portion of Iredell County to I-77 in Mooresville;

- Completion of the Monroe Connector/Bypass from I-485 to Wingate;

- Widening of Steel Creek Road (NC 160) from I-485 to the South Carolina state line;

- Improvements to the I-40/I-77 Interchange; and

- NC 51 widening from Matthews Township Parkway to Lawyers Road.

2030 Roadway Network

The 2030 network includes 13 roadway widening and new construction projects proposed for completion between January 1, 2026, and December 31, 2030, which is the 2030 Horizon Year (see Figure 13-4). All of these projects will be funded by anticipated revenue from federal, state, and local sources. Table 13-7 (included at the end of this chapter) summarizes project-related information for the 2030 network. Notable projects include:

- Widening of Main Street (US 21/NC 115) in Troutman from Cedar Lane to Moose Club Road;

- Widening of NC 84 from Twelve Mile Creek Road to Waxhaw-Indian Trail Road; and

- NC 73 widening from the Lincoln County line to Vance Road Extension.

2040 Roadway Network

The 2040 network includes 16 roadway widening and new construction projects proposed for completion between January 1, 2031, and December 31, 2040, which is the 2040 Horizon Year (see Figure 13-5). All of these projects will be funded by anticipated revenue from federal, state and local sources. Project-related information for the 2040 network is provided in Table 13-8 (included at the end of this chapter). Notable projects include:

- Proposed improvements to the Belk and Brookshire Freeways of the I-277 loop around Center City Charlotte (resulting from the I-277/I-77 Uptown Loop Study);

- Widening of Billy Graham Parkway from Josh Birmingham Parkway to I-85 near the Charlotte-Douglas International Airport;

- Construction of the proposed Garden Parkway from I-485 to the Gaston County Line; and

- Lawyers Road widening in Stallings from I-485 to Stevens Mill Road
Project Cost Considerations

Cost Escalation

All of the projects listed for each horizon year (those that are not existing and committed) are given a cost estimate based on 2012 costs, which is then escalated based on the project’s year of expenditure (23 CFR 450.322). Based on national trends and local information, it was determined to use an annual rate of 4 percent for cost escalation. The midpoint of each horizon year range was assumed to be the year of expenditure for projects within each respective horizon year. For example, for the 2016 to 2025 timeframe, the rate of escalation for the year 2020 would be used for the entire timeframe. The rate of escalation was applied to the 2012 cost to derive the cost used in the MTP fiscally-constrained project list.

Managed Lanes

Included in the projects outlined for each horizon year, there are a number of projects proposed to be widened using managed lanes, including the use of HOT lanes. For more information about managed lanes, refer to page 13-4 of this chapter.

Two of the proposed managed lanes projects are significant widening projects proposed in the I-77 corridor. One project proposes to widen Interstate 77 from Center City Charlotte to Mooresville in Iredell County, and a second project proposes to widen the I-77 corridor south of Center City Charlotte to I-485. Following is general information and a few of the specific elements of each project.

I-77 Widening North (from 5th Street in Charlotte to NC 150 in Mooresville)

This project is programmed in the 2025 Horizon Year of the MTP as a funded and committed project. The entire scope of this project includes widening I-77 from Center City Charlotte north to NC 150 in Mooresville. This project will create a total of two (2) managed lanes, in this case HOT lanes, between I-277 (Brookshire Freeway) and Catawba Avenue (Exit 28 in Cornelius) and one (1) HOT lane in each direction from Catawba Avenue to approximately NC 150 in Mooresville (Exit 36). The project will also provide a direct connection from the HOT lanes on I-77 to the I-277 loop around Uptown Charlotte. All HOT lanes proposed for the project will be HOT 3+, requiring three (3) or more passengers in a vehicle to utilize the lanes toll free. The widening of this portion of I-77 has long been considered a major priority for the region, and the CRTPO has for several years endorsed the concept of managed lanes as a means of accomplishing these improvements. Other widening projects, to add additional capacity on I-77 further north to I-40 in Statesville are also proposed, but not funded. Currently, the interchange of I-77 and I-40 is being improved.
I-77 Widening South (from I-277 to I-485 in Charlotte)

Similar to I-77 north of Uptown Charlotte, the I-77 corridor to the south is also highly congested. A project to widen the I-77 south corridor, from the I-277 loop to I-485, and ultimately south into South Carolina, is proposed. This project is programmed in two segments in the MTP, which breaks the project at Woodlawn Avenue. The project segment from I-277 to Woodlawn Avenue is programmed in the 2025 Horizon Year, and the segment from Woodlawn Avenue to I-485 is in the 2030 Horizon Year. The purpose of breaking this project into segments is both to achieve fiscal constraint in the MTP, but also because the State legislation caps how much funding can be applied in one corridor for projects authorized after fiscal year 2015, which includes this project. Although the project is divided into two segments, the intent is to complete a comprehensive environmental assessment for the entire project corridor, evaluating the possibility of adding capacity. Considerations will also have to be made about the timing for improving the I-277/Belk Freeway interchange where it intersects with I-77. The NCDOT, the CRTPC, and the City of Charlotte will work together to determine the most appropriate manner in which to accomplish these proposed improvements, in compliance with the federal conformity determination requirements.
### Table 13-4: Existing and Committed Roadway Projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions</th>
<th>Imp. Type</th>
<th>Status</th>
<th>Project Cost</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horizon Year 2015 (2014-2015)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-77/West Catawba Ave</td>
<td>271</td>
<td>I-4733</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Interstate</td>
<td>Cor</td>
<td>Imp Ex Intc</td>
<td>E+C</td>
<td>$8.4</td>
<td>Interchange improvements-convert existing interchange to diverging diamond interchange</td>
</tr>
<tr>
<td>I-485/I-85 North of Charlotte</td>
<td>273</td>
<td>R-2123CE</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt</td>
<td>N Intc</td>
<td>E+C</td>
<td>$92.2</td>
<td>Construct freeway on new location, including new interchange</td>
</tr>
<tr>
<td>I-485 (Western Outer Loop)</td>
<td>274</td>
<td>R-2248E</td>
<td>NC 115 to I-85 N</td>
<td>6.2</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$139.5</td>
<td>New 8 lane freeway</td>
</tr>
<tr>
<td>I-485</td>
<td>275</td>
<td>R-4902</td>
<td>I-77 S of Charlotte to Rea Rd</td>
<td>6.6</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt &amp; Pin</td>
<td>W</td>
<td>E+C</td>
<td>$83.3</td>
<td>Widen from 4 to 6 lanes</td>
</tr>
<tr>
<td>North Community House Rd/I-485</td>
<td>281</td>
<td>U-5519</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Unclassified</td>
<td>Clt</td>
<td>N Grd Sep</td>
<td>E+C</td>
<td>$8.6</td>
<td>Extension of roadway and new grade separated bridge over I-485 (no access to I-485)</td>
</tr>
<tr>
<td>City Blvd Extension</td>
<td>282</td>
<td>R-2420A</td>
<td>Relocated Mallard Creek Rd to Neal Rd</td>
<td>0.8</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$10.8</td>
<td>New 4 lane roadway with median</td>
</tr>
<tr>
<td>US 21/Gilead Rd</td>
<td>283</td>
<td>U-5114</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Hnt</td>
<td>Ints Imps</td>
<td>E+C</td>
<td>$4.5</td>
<td>Intersection improvements</td>
</tr>
<tr>
<td>Prosperity Church Rd (NW Arc)</td>
<td>284</td>
<td>U-5507</td>
<td>I-485 to Prosperity Church Rd</td>
<td>0.5</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Major Collector</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$7.1</td>
<td>Widen from 2 to 4 lanes and new 2 lane roadway</td>
</tr>
<tr>
<td>NC 51/Idlewild Rd</td>
<td>286</td>
<td>U-5115</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Principal Arterial - Other</td>
<td>Mat &amp; Mnt</td>
<td>Ints Imps</td>
<td>E+C</td>
<td>$1.6</td>
<td>Intersection improvements</td>
</tr>
<tr>
<td>McKee Rd Extension</td>
<td>295</td>
<td>U-4713B</td>
<td>Campus Ridge Rd to E John St</td>
<td>0.3</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Mat</td>
<td>N Loc</td>
<td>E+C</td>
<td>$2.0</td>
<td>New 2 lane roadway with paved shoulders on 4 lane ROW</td>
</tr>
<tr>
<td>Potter Rd/ Pleasant Plains Rd</td>
<td>296</td>
<td>U-5112</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Major Collector</td>
<td>Stg</td>
<td>Ints Imps</td>
<td>E+C</td>
<td>$2.8</td>
<td>Intersection improvements</td>
</tr>
<tr>
<td>West Catawba Ave/ Westmoreland Rd</td>
<td>304</td>
<td>C-4956</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Cor</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$0.6</td>
<td>Add a left turn lane</td>
</tr>
<tr>
<td><strong>Horizon Year 2025 (2016-2025)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Northcross Dr Extension</td>
<td>272</td>
<td>U-5108</td>
<td>Northcross Dr to Westmoreland Rd</td>
<td>1.2</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Cor</td>
<td>N Loc</td>
<td>E+C</td>
<td>$7.2</td>
<td>New 3 lane roadway</td>
</tr>
<tr>
<td>I-485 (Western Outer Loop)/ Oakdale Rd</td>
<td>276</td>
<td>R-2248G</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt</td>
<td>N Intc</td>
<td>E+C</td>
<td>$3.3</td>
<td>New interchange</td>
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<tr>
<td>I-77</td>
<td>277</td>
<td>I-3311C</td>
<td>N of I-277/NC 16 (Brookshire Freeway) to N of I-85</td>
<td>2.6</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt</td>
<td>W</td>
<td>E+C</td>
<td>^#</td>
<td>Add 2 HOT lanes in each direction with direct connection to I-277</td>
</tr>
<tr>
<td>Project Name</td>
<td>Project ID</td>
<td>TIP No.</td>
<td>From / To</td>
<td>Project Length</td>
<td>Regional Significance</td>
<td>Exempt</td>
<td>STI Category</td>
<td>Functional Class</td>
<td>Jurisdictions -</td>
<td>Imp. Type -</td>
<td>Status</td>
<td>Project Cost</td>
<td>Project Description</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>-------------</td>
<td>-------------------------------------------------------------------------------------</td>
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<tr>
<td>I-77</td>
<td>279</td>
<td>I-5405</td>
<td>I-277 (Brookshire Freeway) to W Catawba Ave (Exit 28)</td>
<td>17.0</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt, Hnt &amp; Cor</td>
<td>Widen Manag</td>
<td>E+C</td>
<td>$550.0</td>
<td>Add 2 HOT lanes in each direction (includes conversion of existing HOV lane)</td>
</tr>
<tr>
<td>I-77</td>
<td>280</td>
<td>I-750 AA</td>
<td>W Catawba Ave (Exit 24) to NC 150 (Exit 16)</td>
<td>7.8</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Clt, Dav, Ird Co, Mor</td>
<td>Widen Manag</td>
<td>E+C</td>
<td>^^</td>
<td>Add 1 HOT lane in each direction</td>
</tr>
<tr>
<td>Mallard Creek Rd Connector</td>
<td>287</td>
<td>U-2507 A</td>
<td>Sugar Creek Rd to WT Harris Blvd (NC 24)</td>
<td>1.8</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$26.5</td>
<td>Widen from 2 to 4 lanes and new 4 lane roadway with median and bike lanes</td>
</tr>
<tr>
<td>IBM Dr Connector</td>
<td>288</td>
<td>U-2507 AA</td>
<td>Mallard Creek Rd to IBM Dr</td>
<td>0.3</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Unclassified</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$1.8</td>
<td>New 2 lane roadway with sidewalks and bike lanes</td>
</tr>
<tr>
<td>Sugar Creek Rd/ NC RR Xing</td>
<td>289</td>
<td>U-5008</td>
<td>/</td>
<td></td>
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<td></td>
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<tr>
<td>Independence Blvd (US 74)</td>
<td>290</td>
<td>U-2098</td>
<td>Albermarle Rd to Idlewild Rd</td>
<td>1.4</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>W</td>
<td>E+C</td>
<td>$111.2</td>
<td>Roadway functionality improvements</td>
</tr>
<tr>
<td>Dixie River Rd</td>
<td>291</td>
<td></td>
<td>Dixie River Rd to Sadler Rd</td>
<td>2.5</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$13.5</td>
<td>Widen from 2 to 3 lanes, including new alignment</td>
</tr>
<tr>
<td>Garrison Rd Extension</td>
<td>292</td>
<td></td>
<td>Dixie River Rd to Old Dawson Rd</td>
<td>4.4</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$32.2</td>
<td>New 3 lane roadway and widen existing roadway from 2 to 3 lanes</td>
</tr>
<tr>
<td>Eastern Circumferential Rd</td>
<td>293</td>
<td></td>
<td>University City Blvd (NC 49) to Back Creek Church Rd</td>
<td>1.0</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Unclassified</td>
<td>Clt</td>
<td>N Loc</td>
<td>E+C</td>
<td>$12.0</td>
<td>New 4 lane roadway, with median and bike lanes</td>
</tr>
<tr>
<td>NC 51/ Matthews Mint Hill Rd</td>
<td>294</td>
<td>U-5511</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Principal Arterial</td>
<td>Ints Imps</td>
<td>E+C</td>
<td>$0.7</td>
<td>Intersection improvements (superstreet design)</td>
<td></td>
</tr>
<tr>
<td>Monroe Connector/ Bypass</td>
<td>297</td>
<td>R-3329/ R-2559</td>
<td>I-485 (Charlotte Outer Loop) to US 74 between Wingate and Marshville</td>
<td>19.7</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Principal Arterial - Other - Freeway</td>
<td>Mat, Stg, Ind, Mon, Un Co</td>
<td>N Loc</td>
<td>E+C</td>
<td>$813.5</td>
<td>New 4 lane toll freeway, to provide alternative to US 74 in Union County</td>
</tr>
<tr>
<td>US 21/Catawba Ave</td>
<td>298</td>
<td></td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Principal Arterial</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$2.0</td>
<td>Convert existing intersection to a roundabout</td>
<td></td>
</tr>
<tr>
<td>Shopton Rd/ Beam Rd</td>
<td>300</td>
<td>C-5533</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Major Collector</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.5</td>
<td>Convert existing intersection to a roundabout</td>
</tr>
<tr>
<td>Tuckasegee Rd/ Berry Hill Rd/ Thrift Rd</td>
<td>301</td>
<td>C-5538</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Major Collector</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$2.6</td>
<td>Convert existing intersection to a roundabout</td>
</tr>
<tr>
<td>NC 115/David Cox Rd</td>
<td>302</td>
<td>C-5228</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Principal Arterial</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.8</td>
<td>Add left turn lanes to all approaches</td>
</tr>
<tr>
<td>NC 16/ Ballantyne Commons Pkwy</td>
<td>303</td>
<td>C-5534</td>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Principal Arterial</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.5</td>
<td>Add left turn lane on Ballantyne Commons Pkwy and NC 16</td>
</tr>
</tbody>
</table>
### Table 13-4: Existing and Committed Roadway Projects (continued)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions *</th>
<th>Imp. Type –</th>
<th>Status</th>
<th>Project Cost</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-40/I-77</td>
<td>299</td>
<td>I-3819A</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Sta &amp; Ird Co</td>
<td>Imp Ex Intc</td>
<td>E+C</td>
<td>$11.0</td>
<td>Construct new multi-level interchange</td>
</tr>
<tr>
<td>NC 150/Talbert Rd</td>
<td>305</td>
<td>C-5328</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Collector</td>
<td>Mor</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$0.4</td>
<td>Add right turn lane to the southbound approach</td>
</tr>
<tr>
<td>NC 115/Faith Rd- Campus Ln</td>
<td>306</td>
<td>C-5329</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Mor &amp; Ird Co</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.3</td>
<td>Realign Faith Rd and add turn lanes to all approaches</td>
</tr>
<tr>
<td>NC 150/NC 115</td>
<td>307</td>
<td>C-5200</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Principal Arterial</td>
<td>Mor</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.3</td>
<td>Add a 400' shared through-lane and a 200' right turn lane to the southbound approach</td>
</tr>
</tbody>
</table>

**Jurisdiction Key:**
- Clt: Charlotte
- Car: Carrolus
- Dsc: Davidson
- Hts: Huntersville
- Ind: Indian Trail
- Ind Co: Iredell County
- N C: Union County
- Wd: Weddington

**Improvement Type (Imp. Type) Key:**
- Imp Ex Intc: Improve Existing Interchange
- N Loc: New Location
- Ints Improv: Improvement
- Wd: Widening
- N Crd Sep: New Corde Separation
- Wd: Widening with Managed Lanes
- N Intc: New Interchange

**Note:**
- E+C (Existing + Committed) represents projects which are either currently under construction or projects with committed funding. Because of this, the funding listed in the table for E+C projects represents "2012 SM" (not "Future SM")
- **Y** - 40 CFR 93.126. Exempt projects
- **Y** - 40 CFR 93.127. Projects exempt from regional emissions analyses
- **A** - Project costs for I-340 TC and I-475/AA are included in Project Costs for I-3405
| Project Name                                      | Project ID | TIP No. | From / To          | Project Length | Regional Significance | Exempt | STI Category | Functional Class | Jurisdictions ¹ | Imp. Type – E+C | Total Score | Project Rank | Project Cost | Project Description                                                                 |
|--------------------------------------------------|------------|---------|-------------------|----------------|----------------------|--------|--------------|------------------|-----------------|----------------|-------------|--------------|--------------|--------------|----------------------------------|
| I-77/West Catawba Ave                            | 271        | I-4733  | N/A               | N/A            | N                    | Y**    | N/A          | Interstate       | Car             | Imp Ex Intc | E-C         | $5.4        |             | Interchange improvements-convert existing interchange to diverging diamond interchange |
| I-485/I-85 North of Charlotte                   | 273        | R-2123CE| N/A               | N/A            | Y                    | N      | N/A          | Interstate       | Clt             | N Intc        | E-C         | $92.2      |             | Construct freeway on new location, including new interchange                            |
| I-485 (Western Outer Loop)                      | 274        | R-2248E | NC 115 to I-85 N  | 6.2            | Y                    | N      | N/A          | Interstate       | Clt             | N Loc         | E-C         | $139.5     |             | New 8 lane freeway                                                                       |
| I-485                                            | 275        | R-4902  | I-77 S of Charlotte to Rea Rd | 8.1            | Y                    | N      | N/A          | Interstate       | Clt & Pin        | W             | E-C         | $83.3      |             | Widen from 4 to 6 lanes                                                              |
| North Community House Rd/I-485                   | 281        | U-5519  | N/A               | N/A            | N                    | Y**    | N/A          | Unclassified     | Clt             | N Grd Sep    | E-C         | $8.6       |             | Extension of roadway and new grade separated bridge over I-485 (no access to I-485) |
| City Blvd Extension                              | 282        | R-2420A | Relocated Mallard Creek Rd to Neal Rd | 0.8            | N                    | N      | N/A          | Minor Arterial   | Clt             | N Loc         | E-C         | $10.8      |             | New 4 lane roadway with median                                                        |
| US 21/Gilead Rd                                  | 283        | U-5114  | N/A               | N/A            | N                    | Y**    | N/A          | Minor Arterial   | Hnt             | Ints Imps     | E-C         | $4.5       |             | Intersection improvements                                                            |
| Prosperity Church Rd (NW Arc)                    | 284        | U-5507  | I-485 to Prosperity Church Rd | 0.5            | N                    | N      | N/A          | Major Collector  | Clt             | N Loc         | E-C         | $7.1        |             | Widen from 2 to 4 lanes and new 2 lane roadway                                        |
| NC 51/Idlewild Rd                                | 286        | U-5115  | N/A               | N/A            | N                    | Y**    | N/A          | Principal Arterial - Other | Mat & Mnt       | Ints Imps     | E-C         | $1.6       |             | Intersection improvements                                                            |
| McKee Rd Extension                               | 295        | U-4713B | Campus Ridge Rd to S John St | 0.3            | N                    | N      | N/A          | Local            | Mat             | N Loc         | E-C         | $2.0        |             | New 2 lane roadway with paved shoulders on 4 lane ROW                                  |
| Potter Rd/Pleasant Plains Rd                     | 296        | U-5112  | N/A               | N/A            | N                    | Y**    | N/A          | Major Collector  | Stg             | Ints Imps     | E-C         | $2.8        |             | Intersection improvements                                                            |
| West Catawba Ave/Westmoreland Rd                 | 304        | C-4966  | N/A               | N/A            | N                    | Y**    | N/A          | Minor Arterial   | Car             | Ints Imps     | E=C (CMAQ) | $0.6        |             | Add a left turn lane                                                                  |

**+ Jurisdiction Key:**
- Clt: Charlotte
- Car: Cornelius
- Hct: Huntersville
- Mat: Matthews
- Mt: Mint Hill
- Ptn: Pineville
- Twp: Weddington

**~ Improvement Type (Imp. Type) Key:**
- Imp Ex Intc: Improve Existing Interchange
- Imp N Loc: New Location
- Ints Imps: Intersection Improvements
- W: Widening
- N Grd Sep: New Grade Separation
- Wid Mng Wdg: Widening with Managed Lanes
- N Intcs: New Interchanges

**Note:**
1. E+C, Existing + Committed, represents projects which are either currently under construction or projects with committed funding. Because of this, the funding listed in the table for E+C projects represents "2012 SM" (not "Future SM").
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions *</th>
<th>Imp. Type –</th>
<th>Total Score</th>
<th>Project Rank</th>
<th>Project Cost (Future $M)</th>
<th>Project Description</th>
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<tbody>
<tr>
<td>University Pointe Blvd - IBM Dr Bridge</td>
<td>147</td>
<td></td>
<td>University Pointe Blvd to IBM Dr</td>
<td>1.0</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Local</td>
<td>N Loc</td>
<td>E+C</td>
<td>145</td>
<td>33</td>
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<td>New 2 lane roadway, with bike lanes and sidewalks</td>
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<tr>
<td>Northcross Dr Extension</td>
<td>272</td>
<td>U-5108</td>
<td>Northcross Dr to Westmoreland Rd</td>
<td>1.2</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Cor</td>
<td>N Loc</td>
<td>E+C</td>
<td>3.2</td>
<td>$7.2</td>
<td>New 3 lane roadway</td>
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<tr>
<td>I-485 (Western Outer Loop)/Oakdale Rd</td>
<td>276</td>
<td>R-2248G</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Cty</td>
<td>N Intc</td>
<td>E+C</td>
<td>3.3</td>
<td>$3.3</td>
<td>New interchange</td>
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<tr>
<td>I-77</td>
<td>277</td>
<td>I-3311C</td>
<td>N of I-277/NC 16 (Brookshire Freeway) to N of I-485</td>
<td>2.6</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Cty</td>
<td>W</td>
<td>E+C</td>
<td>^^</td>
<td>Add 2 HOT lanes in each direction with direct connection to I-277</td>
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<tr>
<td>I-77</td>
<td>279</td>
<td>I-5405</td>
<td>I-277 (Brookshire Freeway) to W Catawba Ave (Exit 28)</td>
<td>17.0</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Cty, Hnt &amp; Cor</td>
<td>Widen, Manag</td>
<td>E+C</td>
<td>$550.0</td>
<td>Add 2 HOT lanes in each direction (includes conversion of existing HOV lane)</td>
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<td>I-77</td>
<td>280</td>
<td>I-4750A</td>
<td>W Catawba Ave (Exit 28) to NC 150 (Exit 36)</td>
<td>7.8</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Interstate</td>
<td>Cty, Dav, Ird Co, Mar</td>
<td>Widen, Manag</td>
<td>E+C</td>
<td>^^</td>
<td>Add 1 HOT lane in each direction</td>
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<td>Mallard Creek Rd Connector</td>
<td>287</td>
<td>U-2507A</td>
<td>Sugar Creek Rd to WT Harris Blvd (NC 24)</td>
<td>1.8</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Cty</td>
<td>N Loc</td>
<td>E+C</td>
<td>$26.5</td>
<td>Widen from 2 to 4 lanes and new 4 lane roadway with median and bike lanes</td>
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<tr>
<td>IBM Dr Connector</td>
<td>288</td>
<td>U-2507AA</td>
<td>Mallard Creek Rd to IBM Dr</td>
<td>0.3</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Unclassified</td>
<td>Cty</td>
<td>N Loc</td>
<td>E+C</td>
<td>$1.8</td>
<td>New 2 lane roadway with sidewalks and bike lanes</td>
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</tr>
<tr>
<td>Sugar Creek Rd/ NC RR Xing</td>
<td>289</td>
<td>U-5008</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Cty, N Grd Sep</td>
<td>E+C</td>
<td>$30.4</td>
<td>Construct grade separation of North Carolina Railroad and Sugar Creek Road</td>
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<tr>
<td>Independence Blvd (US 74)</td>
<td>290</td>
<td>U-209B</td>
<td>Albemarle Rd to Idlewild Rd</td>
<td>1.4</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Principal Arterial - Other</td>
<td>Cty</td>
<td>W</td>
<td>E+C</td>
<td>$111.2</td>
<td>Roadway functionality improvements</td>
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<tr>
<td>Dixie River Rd</td>
<td>291</td>
<td></td>
<td>Dixie River Rd to Sadler Rd</td>
<td>2.5</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Cty</td>
<td>N Loc</td>
<td>E+C</td>
<td>$13.5</td>
<td>Widen from 2 to 3 lanes, including new alignment</td>
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<tr>
<td>Garrison Rd Extension</td>
<td>292</td>
<td></td>
<td>Dixie River Rd to Old Dowd Rd</td>
<td>4.4</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Local</td>
<td>Cty</td>
<td>N Loc</td>
<td>E+C</td>
<td>$32.2</td>
<td>3 new lane roadway and widen existing roadway from 2 to 3 lanes</td>
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<tr>
<td>Eastern Circumferental Rd</td>
<td>293</td>
<td></td>
<td>University City Blvd (NC 49) to Oak Creek Church Rd</td>
<td>1.0</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Unclassified</td>
<td>Cty</td>
<td>N Loc</td>
<td>E+C</td>
<td>$12.0</td>
<td>New 4 lane roadway, with median and bike lanes</td>
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<tr>
<td>NC 51/Matthews Mint Hill Rd</td>
<td>294</td>
<td>U-5511</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Principal Arterial</td>
<td>Mat, Ints Imps</td>
<td>E+C</td>
<td>$0.7</td>
<td>Intersection improvements (superstreet design)</td>
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<td></td>
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<tr>
<td>Monroe Connector/ Bypass</td>
<td>297</td>
<td>R-3328/ R-2559</td>
<td>I-485 (Charlotte Outer Loop) to US 74 between Wingate and Marshall</td>
<td>19.7</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
<td>Principal Arterial - Other - Freeway</td>
<td>Mat, Stg, Ind, Mon, Un Co</td>
<td>N Loc</td>
<td>E+C</td>
<td>$813.5</td>
<td>New 4 lane toll freeway, to provide alternative to US 74 in Union County</td>
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<tr>
<td>US 21/Catawba Ave</td>
<td>298</td>
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<td>N/A</td>
<td>N/A</td>
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<td>Y**</td>
<td>N/A</td>
<td>Principal Arterial</td>
<td>Cty, Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$2.0</td>
<td>Convert existing intersection to a roundabout</td>
<td></td>
<td></td>
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<tr>
<td>Project Name</td>
<td>Project ID</td>
<td>TIP No.</td>
<td>From / To</td>
<td>Project Length</td>
<td>Regional Significance</td>
<td>Exempt</td>
<td>STI Category</td>
<td>Functional Class</td>
<td>Jurisdictions *</td>
<td>Imp. Type – Total Score</td>
<td>Project Rank</td>
<td>Project Cost (Future $M)</td>
<td>Project Description</td>
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<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Shopton Rd/Beam Rd</td>
<td>300</td>
<td>C-5533</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N</td>
<td>N**</td>
<td>N/A Major Collector</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.5</td>
<td>Convert existing intersection to a roundabout</td>
<td></td>
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<tr>
<td>Tuckaseeege Rd/Berry Hill Rd/Thrft Rd</td>
<td>301</td>
<td>C-5538</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N</td>
<td>N**</td>
<td>N/A Major Collector</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$2.6</td>
<td>Convert existing intersection to a roundabout</td>
<td></td>
</tr>
<tr>
<td>NC 115/David Cox Rd</td>
<td>302</td>
<td>C-5228</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N/A Principal Arterial</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.8</td>
<td>Add left turn lanes to all approaches</td>
<td></td>
</tr>
<tr>
<td>NC 16/Ballantyne Commons Pkwy</td>
<td>303</td>
<td>C-5534</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N/A Principal Arterial</td>
<td>Clt</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.5</td>
<td>Add left turn lane on Ballantyne Commons Pkwy and NC 16</td>
<td></td>
</tr>
<tr>
<td>Catawba Ave</td>
<td>68</td>
<td>R-2555B</td>
<td>Jetson Rd to NC 73</td>
<td>2.4</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Cor</td>
<td>W 143 38</td>
<td>$35.8</td>
<td>Widen from 2 lanes to 4 lanes, with 10 ft. multi-use path</td>
<td></td>
</tr>
<tr>
<td>Statesville Rd (US 21)</td>
<td>70</td>
<td></td>
<td>Northcross Center Court to Westmoreland Rd</td>
<td>1.2</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Cor &amp; Hnt</td>
<td>W 147 31</td>
<td>$34.9</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
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<tr>
<td>Old Statesville Rd (NC 115)</td>
<td>71</td>
<td></td>
<td>Washam Potts Rd to Sam Furr Rd (NC 73)</td>
<td>2.6</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Cor &amp; Hnt</td>
<td>W 128 71</td>
<td>$37.4</td>
<td>Widen from 2 lanes to 4 lanes, with 10 ft. multi-use path</td>
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<tr>
<td>Statesville Rd (US 21)</td>
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<td>Gilead Rd to Holly Point Dr</td>
<td>2.2</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Hnt</td>
<td>W 147 29</td>
<td>$33.4</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
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<tr>
<td>Sam Furr Rd (NC 73)</td>
<td>81</td>
<td></td>
<td>W Catawba Ave to Northcross Dr</td>
<td>1.1</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Hnt</td>
<td>W 145 35</td>
<td>$43.2</td>
<td>Widen from 3/4 lanes to 6 lanes, with median, wide outside lanes and sidewalks</td>
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<tr>
<td>NC 73</td>
<td>96</td>
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<td>Vance Rd Ext to W Catawba Ave</td>
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<td>Y</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Hnt</td>
<td>W 173 7</td>
<td>$25.3</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
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<td>I-77/Gilead Rd</td>
<td>97</td>
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<td>N/A</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Statewide</td>
<td>Minor Arterial</td>
<td>Hnt</td>
<td>Imp Ex Intc 145 33</td>
<td>$15.4</td>
<td>Interchange improvements-convert existing interchange to diverging diamond interchange</td>
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<tr>
<td>Statesville Rd (US 21)</td>
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<td>WT Harris Blvd (NC 24) to Gilead Rd</td>
<td>4.5</td>
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<td>Region</td>
<td>Minor Arterial</td>
<td>Clt &amp; Hnt</td>
<td>W 143 39</td>
<td>$77.1</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
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<tr>
<td>Airport Entrance Rd</td>
<td>107</td>
<td></td>
<td>Scott Futrell Dr to Wilkinson Blvd (US 29)</td>
<td>0.2</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Clt</td>
<td>N Loc 139 49</td>
<td>$11.4</td>
<td>New 6 lane roadway to provide improved access to C-D Airport</td>
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<td>Brookshire Blvd (NC 16)</td>
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<td>Idaho Dr to I-85</td>
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<td>N</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>W 137 55</td>
<td>$3.0</td>
<td>Widen from 4 lanes to 6 lanes</td>
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<td>WT Harris Blvd</td>
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<td>Reames Rd to I-485</td>
<td>0.6</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>W 136 56</td>
<td>$6.7</td>
<td>Widen from 4/5 lanes to 6 lanes, with median, bike lanes and sidewalks</td>
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<td>I-277 (Belk Fwy)/I-77</td>
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<td>Y</td>
<td>N</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Imp Ex Intc 161 14</td>
<td>$83.5</td>
<td>Interchange improvements and grade separation to improve operation</td>
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<td>I-277 (Brookshire Fwy)/I-77</td>
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<td>Y</td>
<td>N</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Imp Ex Intc 152 21</td>
<td>$26.2</td>
<td>Interchange improvements including widening several interchange ramps to improve operations</td>
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<td>Project ID</td>
<td>TIP No.</td>
<td>From / To</td>
<td>Project Length</td>
<td>Regional Significance</td>
<td>Exempt</td>
<td>STI Category</td>
<td>Functional Class</td>
<td>Jurisdictions *</td>
<td>Imp. Type – Total Score</td>
<td>Project Rank</td>
<td>Project Cost (Future $M)</td>
<td>Project Description</td>
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<td>Independence Blvd (US 74)</td>
<td>114</td>
<td>U-5526</td>
<td>Sharon Amity Rd to I-277 (Brookshire Fwy)</td>
<td>4.2</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Principal Arterial - Other - Freeway</td>
<td>Clt</td>
<td>Widen Manag 162</td>
<td>13</td>
<td>$22.2</td>
<td>Convert bus lanes to managed lanes</td>
<td></td>
</tr>
<tr>
<td>I-485</td>
<td>113</td>
<td>I-5507</td>
<td>I-77 to Independence Blvd (US 74)</td>
<td>17.0</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Clt, Mat &amp; Pin</td>
<td>Widen Manag 149</td>
<td>26</td>
<td>$297.9</td>
<td>Widen from 4/6 lanes to 8 lanes, including managed lanes and median improvements</td>
<td></td>
</tr>
<tr>
<td>I-77</td>
<td>143</td>
<td></td>
<td>I-277 (Belk Fwy) (Exit 9) to I-277 (Brookshire Fwy) (Exit 11)</td>
<td>1.8</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Clt</td>
<td>Widen Manag 175</td>
<td>6</td>
<td>$30.0</td>
<td>Widen from 8 lanes to 10/12 lanes, interchange improvements, and installation of a collector-distributor road to improve operations</td>
<td></td>
</tr>
<tr>
<td>I-77 *</td>
<td>145</td>
<td></td>
<td>Wooldawn Rd (Exit 6) to I-277 (Belk Fwy) (Exit 9)</td>
<td>3.5</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Clt</td>
<td>Widen Manag 180</td>
<td>3</td>
<td>$417.5</td>
<td>Widen from 6 lanes to 10 lanes, including managed lanes and median improvements</td>
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<tr>
<td>Independence Blvd (US 74)</td>
<td>148</td>
<td>U-2509A</td>
<td>Idlewild Rd to Sardis Rd N</td>
<td>3.1</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 142</td>
<td>42</td>
<td>$169.6</td>
<td>Widen from 4/6 lanes to 6/8 lanes, including managed lanes and median improvements</td>
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</tr>
<tr>
<td>Krefeld Dr Ext</td>
<td>151</td>
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<td>Krefeld Dr to Sardis Rd N</td>
<td>0.5</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Clt</td>
<td>N Loc</td>
<td>40</td>
<td>$14.2</td>
<td>New 2 lane roadway, with bike lanes and sidewalks</td>
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<tr>
<td>North University Research Park Bridge</td>
<td>161</td>
<td></td>
<td>Louis Rose Pl to Doug Mayer Pl</td>
<td>0.4</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Local</td>
<td>Clt</td>
<td>N Loc</td>
<td>20</td>
<td>$9.3</td>
<td>New 2 lane roadway, with bike lanes and sidewalks</td>
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</tr>
<tr>
<td>Old Statesville Rd</td>
<td>164</td>
<td>U-115</td>
<td>Center City Blvd</td>
<td>2.3</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 131</td>
<td>64</td>
<td>$29.7</td>
<td>Widen from 2 lanes to 4 lanes, with bike lanes and sidewalks</td>
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<tr>
<td>South Tryon St (NC 49)</td>
<td>170</td>
<td></td>
<td>I-77 to Yorkmont Rd</td>
<td>0.3</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 127</td>
<td>76</td>
<td>$7.3</td>
<td>Widen from 4 lanes to 6 lanes, with bike lanes and sidewalks</td>
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<tr>
<td>Steele Creek Rd</td>
<td>172</td>
<td></td>
<td>Shopton Rd W to S Tryon St (NC 49)</td>
<td>4.2</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 139</td>
<td>50</td>
<td>$58.3</td>
<td>Widen from 2 lanes to 4 lanes, with bike lanes and sidewalks</td>
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<tr>
<td>Steele Creek Rd</td>
<td>173</td>
<td></td>
<td>S Tryon St (NC 49) to S Carolina State Line</td>
<td>2.2</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 133</td>
<td>61</td>
<td>$36.9</td>
<td>Widen from 2 lanes to 4 lanes, with bike lanes and sidewalks</td>
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</tr>
<tr>
<td>University City Blvd (NC 49)</td>
<td>175</td>
<td></td>
<td>John Kirk Dr to I-485</td>
<td>1.2</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>Widen Manag 134</td>
<td>59</td>
<td>$37.4</td>
<td>Widen from 4 lanes to 6 lanes, with bike lanes and sidewalks</td>
<td></td>
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<tr>
<td>Arequipes Dr/ Northeast Pkwy</td>
<td>186</td>
<td></td>
<td>Margaret Wallace Rd to Sam Newell Rd</td>
<td>1.4</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Clt, Mat</td>
<td>N Loc</td>
<td>32</td>
<td>$18.5</td>
<td>New 2 lane roadway, with median, bike lanes and sidewalks</td>
<td></td>
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<tr>
<td>Krefeld Dr/ Independence Pointe Pkwy</td>
<td>188</td>
<td></td>
<td>Crowpoint Executive Dr to Sam Newell Rd</td>
<td>0.9</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Clt, Mat</td>
<td>N Loc</td>
<td>67</td>
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<td>New 2 lane roadway, with bike lanes and sidewalks</td>
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<tr>
<td>Independence Blvd (US 74)</td>
<td>189</td>
<td>U-2509B</td>
<td>Sardis Rd N to I-485</td>
<td>3.6</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Principal Arterial - Other</td>
<td>Clt, Mat</td>
<td>Widen Manag 122</td>
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<td>$201.4</td>
<td>Widen from 4 lanes to 6 lanes or 6 lanes to 8 lanes, including managed lanes and median improvements</td>
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<tr>
<td>Old Monroe Rd</td>
<td>190</td>
<td>U-4714C</td>
<td>Waxhaw-Indian Trail Rd to Wesley Chapel Rd</td>
<td>2.4</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Ind</td>
<td>Widen Manag 144</td>
<td>37</td>
<td>$37.3</td>
<td>Widen from 2 lanes to 4 lanes, with median, bike lanes and sidewalks</td>
<td></td>
</tr>
<tr>
<td>Project Name</td>
<td>Project ID</td>
<td>TIP No.</td>
<td>From / To</td>
<td>Project Length</td>
<td>Regional Significance</td>
<td>Exempt</td>
<td>STI Category</td>
<td>Functional Class</td>
<td>Jurisdictions *</td>
<td>Imp. Type - Total Score</td>
<td>Project Rank</td>
<td>Project Cost (Future SM)</td>
<td>Project Description</td>
<td></td>
</tr>
<tr>
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<td>----------------------------------------</td>
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<td>----------------------</td>
<td>--------------</td>
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<td>--------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Northeast Pkwy</td>
<td>193</td>
<td></td>
<td>Overcash Dr to Matthews-Mint Hill Rd</td>
<td>0.9</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Local</td>
<td>Mat</td>
<td>N Loc</td>
<td>133</td>
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<td>$7.8</td>
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<tr>
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<td>Fullwood Ln to Weddington Rd</td>
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<td>N</td>
<td>N</td>
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<td>Minor Arterial</td>
<td>Mat</td>
<td>W</td>
<td>182</td>
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<td>$10.1</td>
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<td>Independence Pointe Pkwy</td>
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<td>Sam Newell Rd to Matthews Township Pkwy (NC 51)</td>
<td>0.9</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Mat</td>
<td>N Loc</td>
<td>128</td>
<td>75</td>
<td>$28.1</td>
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<tr>
<td>Independence Pointe Pkwy</td>
<td>196</td>
<td></td>
<td>Matthews Township Pkwy (NC 51) to Campus Ridge Rd</td>
<td>1.8</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Mat</td>
<td>N Loc</td>
<td>131</td>
<td>65</td>
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<tr>
<td>Matthews Township Pkwy (NC 51)</td>
<td>198</td>
<td></td>
<td>Sardis Rd to Monroe Rd/E John St</td>
<td>0.7</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Mat</td>
<td>W</td>
<td>126</td>
<td>83</td>
<td>$8.1</td>
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<td>East John St</td>
<td>199</td>
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<td>Trade St to I-485</td>
<td>1.2</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Major Collector</td>
<td>Mat</td>
<td>W</td>
<td>150</td>
<td>25</td>
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<tr>
<td>Matthews-Mint Hill Rd (NC 51)</td>
<td>210</td>
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<td>Matthews Township Pkwy to Lawyers Rd</td>
<td>4.1</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Mnt</td>
<td>W</td>
<td>142</td>
<td>43</td>
<td>$51.7</td>
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<tr>
<td>Idlewild Rd</td>
<td>213</td>
<td>U-4913</td>
<td>I-485 to Stevens Mill Rd</td>
<td>0.8</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Major Collector</td>
<td>Mat &amp; Stg</td>
<td>W</td>
<td>157</td>
<td>16</td>
<td>$10.5</td>
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<tr>
<td>Old Monroe Rd</td>
<td>228</td>
<td>U-4714B</td>
<td>I-485 to Waxhaw - Indian Trail Rd</td>
<td>3.0</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Ind, Mat &amp; Stg</td>
<td>W</td>
<td>176</td>
<td>5</td>
<td>$45.4</td>
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<tr>
<td>Rea Rd/Marvin School Rd (NC 84)</td>
<td>247</td>
<td>U-3467A/B</td>
<td>NC 16 to Twelve Mile Creek Rd</td>
<td>2.0</td>
<td>N</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Wed</td>
<td>N Loc</td>
<td>144</td>
<td>36</td>
<td>$30.3</td>
<td></td>
</tr>
<tr>
<td>Providence Rd S (NC 16)</td>
<td>249</td>
<td></td>
<td>Rea Rd to Cuthbertson Rd</td>
<td>4.0</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Mar, Wax, Wed</td>
<td>W</td>
<td>132</td>
<td>63</td>
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<td>Charlotte Ave</td>
<td>261</td>
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<td>Seymour St to Dickerson Blvd (NC 200)</td>
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<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Mon</td>
<td>W</td>
<td>126</td>
<td>80</td>
<td>$6.5</td>
<td></td>
</tr>
</tbody>
</table>

Division 12

| I-40/I-77                             | 299        | I-3819A | N/A                  | N/A            | Y                     | N      | N/A          | Interstate     | Sta & 3rd Co     | Imp Ex Intc | E+C                      | $11.0                                                                                                                                  |
|NC 150/Talbert Rd                      | 305        | C-5528  | N/A                  | N/A            | N                     | Y**    | N/A          | Minor Collector | Mor              | Ints Imps | E+C (CMAQ)                  | $0.4                                                                                                                                  |

**Note:** The table includes project descriptions such as widening lanes, improving intersections, and constructing new roadways. The projects involve various types of infrastructure improvements, including road expansions, bridge construction, and lane additions, all aiming to enhance transportation services and accommodate increased traffic volumes.
### Table 13-6: Horizon Year 2025 Fiscally Constrained Roadway Projects (continued)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions *</th>
<th>Imp. Type - Total Score</th>
<th>Project Rank</th>
<th>Project Cost (Future $M)</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC 115/Faith Rd-Campus Ln</td>
<td>306</td>
<td>C-5529</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Minor Arterial</td>
<td>Mor &amp; Ird Co</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.3</td>
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</tr>
<tr>
<td>NC 150/NC 115</td>
<td>307</td>
<td>C-5200</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>Y**</td>
<td>N/A</td>
<td>Principal Arterial</td>
<td>Mor</td>
<td>Ints Imps</td>
<td>E+C (CMAQ)</td>
<td>$1.3</td>
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<tr>
<td>Murdock Rd</td>
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<td>N Main St (US 21/NC 115) to Amity Hill Rd</td>
<td>2.5</td>
<td>N</td>
<td>Y**</td>
<td>Division</td>
<td>Local</td>
<td>Ird Co &amp; Tre</td>
<td>W</td>
<td>61</td>
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<tr>
<td>River Hwy (NC 150)</td>
<td>26</td>
<td>R-2307</td>
<td>Waddell Rd to Perth Rd</td>
<td>1.4</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial-Other</td>
<td>Ird Co &amp; Mor</td>
<td>W</td>
<td>172</td>
<td>8</td>
<td>$16.9</td>
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<tr>
<td>Cornelius Rd/Mazeppa Rd</td>
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<td>NC 115 to US 21</td>
<td>0.8</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Ird Co &amp; Mor</td>
<td>N Loc</td>
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<tr>
<td>River Hwy (NC 150)</td>
<td>43</td>
<td>R-2307</td>
<td>Perth Rd to Ervin Rd</td>
<td>1.2</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial-Other</td>
<td>Ird Co &amp; Mor</td>
<td>W</td>
<td>155</td>
<td>19</td>
<td>$22.6</td>
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<tr>
<td>River Hwy/W Plaza Dr (NC 150)</td>
<td>44</td>
<td>R-2307</td>
<td>Ervin Rd to I-77 (Exit 34)</td>
<td>0.8</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial-Other</td>
<td>Mor</td>
<td>W</td>
<td>171</td>
<td>10</td>
<td>$13.6</td>
</tr>
<tr>
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<td>I-77 (Exit 36) to US 21</td>
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<td>N</td>
<td>Region</td>
<td>Principal Arterial-Other</td>
<td>Mor</td>
<td>W</td>
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<td>46</td>
<td>R-3333C</td>
<td>Talbert Rd to US 21</td>
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<td>Y**</td>
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<td>Interstate</td>
<td>Mor</td>
<td>Imp Ex Intc</td>
<td>141</td>
<td>46</td>
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</tr>
<tr>
<td>Midnight Ln/Oates Rd</td>
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<td>1.0</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Collector</td>
<td>Mor</td>
<td>N Grd Sep</td>
<td>155</td>
<td>18</td>
<td>$14.2</td>
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<tr>
<td>Williamson Rd</td>
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<td>Brawley School Rd to NC 150</td>
<td>0.7</td>
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<td>N</td>
<td>Division</td>
<td>Major Collector</td>
<td>Mor</td>
<td>W</td>
<td>141</td>
<td>45</td>
<td>$7.3</td>
</tr>
</tbody>
</table>

---

### Jurisdiction Key:
- Cho: Charlotte, Cor: Cornelius, Dav: Davidson, Hgt: Huntersville, Ind: Indian Trail, Ird Co: Iredell County
- Mar: Marvin, Mat: Matthews, Mnt: Mint Hill, Mor: Mooresville, Mor: Marvin, Mon: Monroe, N: Nc, N: Nc

### Improvement Type (Imp. Type) Key:
- Imp Ex Intc: Improve Existing Interchange
- Ints Imps: Intersection Improvements
- N Loc: N Location
- N: N Interstate
- N Grd Sep: New Grade Separation
- W: Widening
- Wn Int: New interchange

### Note:
- E-C (Existing = Committed): represents projects which are either currently under construction or projects with committed funding. Because of this, the funding listed in the table for E-C projects represents “2012 MTP” (not “future $M”).
- Y**: 40 CFR 91.126: Exempt projects
- Y**: 40 CFR 91.127: Projects exempt from regional emissions analysis
- *: The projects to be built during the timeframe of this MTP are described in the Highway Chapter.
- **: This table shows one way, in which the projects for the entire corridor could be funded and built.
- **: Project costs for I-441 TC and I-470 CA are included in Project Costs for I-441.

---

13. Streets and Highways

2040 Metropolitan Transportation Plan (MTP)
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions *</th>
<th>Imp. Type – Total Score</th>
<th>Project Rank</th>
<th>Project Cost (Future $M)</th>
<th>Project Description</th>
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<td>Hnt</td>
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<td>129</td>
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<td>0.3</td>
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<td>Principal Arterial – Other - Freeway</td>
<td>Clt</td>
<td>W</td>
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<td>87</td>
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<td>Y</td>
<td>N</td>
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<td>Clt</td>
<td>W</td>
<td>126</td>
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<td>I-77 *</td>
<td>144</td>
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<td>I-485 (Exit 1) to Woodlawn Rd (Exit 6)</td>
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<td>Mallard Creek Church Rd to Breezewood Dr</td>
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<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Clt</td>
<td>W</td>
<td>150</td>
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<td>I-485 to Steele Creek Rd (NC 160)</td>
<td>4.4</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial – Other</td>
<td>Clt</td>
<td>W</td>
<td>138</td>
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<td>Potter Rd</td>
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<td>Old Monroe Rd to Pleasant Plains Rd</td>
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<td>N</td>
<td>Division</td>
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<td>Stg</td>
<td>W</td>
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<td>Twelve Mile Creek Rd to Waxhaw – Indian Trail Rd</td>
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<td>N</td>
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<td>Minor Arterial</td>
<td>Wed &amp; Wes</td>
<td>W</td>
<td>129</td>
<td>70</td>
<td>$39.6</td>
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<tr>
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<td>Cuthbertson Rd to Waxhaw Wisey</td>
<td>1.7</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Wax</td>
<td>W</td>
<td>128</td>
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<td>Charlotte Ave</td>
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<td>Concord Ave to Church St</td>
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<td>N</td>
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<td>Mon</td>
<td>W</td>
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<td>Roosevelt Blvd (US 74)</td>
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<td>Hanover Dr to Rocky River Rd</td>
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<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Principal Arterial – Other</td>
<td>Mon</td>
<td>W</td>
<td>128</td>
<td>73</td>
<td>$58.9</td>
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<td></td>
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<td></td>
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<td>Main St/Shelton Ave (US 21/NC 115)</td>
<td>13</td>
<td></td>
<td>Cedar Ln to Moose Club Rd</td>
<td>2.2</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Tro</td>
<td>W</td>
<td>194</td>
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<td>Wilkesboro Hwy (NC 115)</td>
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<td></td>
<td>I-40 to Sullivan Farm Rd</td>
<td>2.0</td>
<td>Y</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Sta &amp; Ind Co</td>
<td>W</td>
<td>139</td>
<td>52</td>
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</table>

** Jurisdiction Key:**
- Cht: Charlotte
- Hnt: Huntersville
- Ia Co: Iredell County
- Man: Monroe
- Sta: Statesville
- Stall: Stallings
- W: Waxhaw
- WEst: West Waxhaw
- WWest: West Waxhaw – Chapel

** Improvement Type (Imp. Type) Key:**
- W: Widening
- Widen: Widening
- Widen Manag: Widening with Managed Lanes

**Note:**
* The projects to be built during the timeframe of this MTP are described in the Highway Chapter. This table shows one way in which the projects for the entire corridor could be funded and built.
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project ID</th>
<th>TIP No.</th>
<th>From / To</th>
<th>Project Length</th>
<th>Regional Significance</th>
<th>Exempt</th>
<th>STI Category</th>
<th>Functional Class</th>
<th>Jurisdictions *</th>
<th>Imp. Type –</th>
<th>Total Score</th>
<th>Project Rank</th>
<th>Project Cost (Future $M)</th>
<th>Project Description</th>
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<tr>
<td>South Main St (NC 115)</td>
<td>58</td>
<td></td>
<td>Washam Potts Rd to Potts St</td>
<td>1.3</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Minor Arterial</td>
<td>Cor</td>
<td>W</td>
<td>120</td>
<td>93</td>
<td>$22.6</td>
<td>Widen from 2 lanes to 3 lanes, with 10 ft. multi-use path</td>
</tr>
<tr>
<td>I-77</td>
<td>72</td>
<td></td>
<td>W Catawba Ave (Exit 28) to NC 150 (Exit 16)</td>
<td>8.0</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Cor &amp; Mor</td>
<td>W</td>
<td>148</td>
<td>28</td>
<td>$430.8</td>
<td>Widen from 4 lanes to 6 lanes</td>
</tr>
<tr>
<td>Davidson-Concord Rd (NC 73)</td>
<td>74</td>
<td></td>
<td>Davidson-Concord Rd (SR 2693) to Poplar Tent Rd (SR 2424)</td>
<td>2.5</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Dav &amp; Hnt</td>
<td>W</td>
<td>124</td>
<td>85</td>
<td>$61.4</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
</tr>
<tr>
<td>Gilead Rd</td>
<td>76</td>
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<td>Statesville Rd (US 21) to Old Statesville Rd (NC 111)</td>
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<td>N</td>
<td>Division</td>
<td>Major Collector</td>
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<td>W</td>
<td>141</td>
<td>47</td>
<td>$17.0</td>
<td>Widen from 3 lanes to 4 lanes, with bike lanes and sidewalks</td>
</tr>
<tr>
<td>Ballantyne Commons Pkwy</td>
<td>109</td>
<td></td>
<td>Annalaex Ln to Williams Pond Ln</td>
<td>1.7</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Minor Arterial</td>
<td>Clt</td>
<td>W</td>
<td>142</td>
<td>41</td>
<td>$49.9</td>
<td>Widen from 2 lanes to 4 lanes, with bike lanes and sidewalks</td>
</tr>
<tr>
<td>Billy Graham Pkwy</td>
<td>110</td>
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<td>Josh Birmingham Pkwy to I-85</td>
<td>1.2</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Clt</td>
<td>W</td>
<td>121</td>
<td>91</td>
<td>$67.5</td>
<td>Widen from 4 lanes to 6 lanes, with median, to provide improved access to C-D airport</td>
</tr>
<tr>
<td>Garden Pkwy</td>
<td>125</td>
<td>U-3321</td>
<td>I-485 to Gaston County Line</td>
<td>1.9</td>
<td>Y</td>
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<td>Statewide</td>
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<td>Clt</td>
<td>N Loc</td>
<td>147</td>
<td>30</td>
<td>$573.1</td>
<td>New 4 lane toll roadway, with median, to provide alternative to I-85</td>
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<tr>
<td>I-277 (Belk Fwy)</td>
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<td>McDowell St to Independence Blvd (US 74)</td>
<td>1.0</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Clt</td>
<td>W</td>
<td>130</td>
<td>66</td>
<td>$162.4</td>
<td>Widen from 6 lanes to 9/10 lanes, median and interchange improvements, and grade separation to improve operation</td>
</tr>
<tr>
<td>I-277 (Brookshire Fwy)</td>
<td>134</td>
<td></td>
<td>I-77 to Independence Blvd (US 74)</td>
<td>2.0</td>
<td>Y</td>
<td>N</td>
<td>Statewide</td>
<td>Interstate</td>
<td>Clt</td>
<td>W</td>
<td>168</td>
<td>12</td>
<td>$283.5</td>
<td>Widen from 6/8 lanes to 8/10 lanes, median and interchange improvements, and grade separation to improve operation</td>
</tr>
<tr>
<td>Old Concord Rd</td>
<td>163</td>
<td></td>
<td>WT Harris Blvd (NC 249) to University City Blvd (NC 49)</td>
<td>1.3</td>
<td>N</td>
<td>N</td>
<td>Division</td>
<td>Major Collector</td>
<td>Clt</td>
<td>W</td>
<td>156</td>
<td>17</td>
<td>$39.3</td>
<td>Widen from 2 lanes to 4 lanes, with bike lanes and sidewalks</td>
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<tr>
<td>Pineville-Matthews Rd (NC 51)</td>
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<td>I-485 to Rea Rd</td>
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<td>N</td>
<td>Region</td>
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<td>Clt &amp; Pin</td>
<td>W</td>
<td>148</td>
<td>27</td>
<td>$177.7</td>
<td>Widen from 4/5 lanes to 6 lanes, with bike lanes and sidewalks</td>
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<tr>
<td>University City Blvd (NC 49)</td>
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<td>N Tryon St (US 29) to John Kirk Dr</td>
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<td>Y</td>
<td>N</td>
<td>Statewide</td>
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<td>Clt</td>
<td>W</td>
<td>124</td>
<td>86</td>
<td>$62.5</td>
<td>Widen from 4 lanes to 6 lanes, with bike lanes and sidewalks</td>
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<td>Lawyers Rd</td>
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<td>N</td>
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<td>Major Collector</td>
<td>Stg</td>
<td>W</td>
<td>129</td>
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<td>$9.2</td>
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<td>Idlewild Rd</td>
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<td>Stevens Mill Rd to Faith Church Rd</td>
<td>3.1</td>
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<td>N</td>
<td>Division</td>
<td>Major Collector</td>
<td>Ind &amp; Hem</td>
<td>W</td>
<td>140</td>
<td>48</td>
<td>$133.9</td>
<td>Widen from 2 lanes to 4 lanes, with median, wide outside lanes and sidewalks</td>
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<td>Project Name</td>
<td>Project ID</td>
<td>TIP No.</td>
<td>From / To</td>
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<td>Project Cost (Future $M)</td>
<td>Project Description</td>
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<td>N</td>
<td>Division</td>
<td>Principal Arterial - Other</td>
<td>Sta</td>
<td>W</td>
<td>158</td>
<td>15</td>
<td>$111.0</td>
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<td>3.1</td>
<td>Y</td>
<td>N</td>
<td>Region</td>
<td>Principal Arterial - Other</td>
<td>Mar</td>
<td>W</td>
<td>141</td>
<td>44</td>
<td>$82.9</td>
<td>Widen from 2/4 lanes to 4/6 lanes, with median, wide outside lanes and sidewalks</td>
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<table>
<thead>
<tr>
<th>Jurisdiction Key:</th>
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<td>Meck.Moreheads</td>
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<table>
<thead>
<tr>
<th>Improvement Type (Imp. Type) Key:</th>
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<tr>
<td>N: Loc. New Location</td>
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List of Figures

13-1 ................. Existing and Committed Projects
13-2 ................. Fiscally Constrained Projects - 2015 Horizon Year
13-3 ................. Fiscally Constrained Projects - 2025 Horizon Year
13-4 ................. Fiscally Constrained Projects - 2030 Horizon Year
13-5 ................. Fiscally Constrained Projects - 2040 Horizon Year
**Existing and Committed Projects**

Legend

- CRTPO Planning Area

- Interchange
- Grade Separation
- Intersection
- Widening/New Location

### 2025 (2016-2025) Roadway Projects
- Interchange
- Grade Separation
- Intersection
- Widening/New Location

Figure 13-1

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Figure 13-3

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
14. Public Transportation

Existing System

Fixed-route transit service in the Charlotte Regional Transportation Planning Organization (CRTPO) area is available primarily within Mecklenburg County. The only fixed-route, fixed-schedule transit service in Union County is one express route connecting Uptown Charlotte and Monroe. There is currently no fixed-route, fixed-schedule transit service in Iredell County. However, both Union and Iredell Counties do operate demand-response public transportation systems as described in this chapter.

Mecklenburg County Public Transportation

Mecklenburg County voters passed a half-cent sales tax in 1998 to fund both long- and short-range improvements to transit service in the region. The Charlotte Area Transit System (CATS) was formed in 2000 as a result.
The CATS mission is to enhance the quality of life by “providing outstanding community-wide public transportation services, while proactively contributing to progressive, sustainable regional growth and development.”

CATS is a department of the City of Charlotte, but its policy board is the Metropolitan Transit Commission (MTC). The MTC is comprised of the chief elected official of each member jurisdiction and the Board of Transportation member from NCDOT’s Division 10. The MTC sets policy, approves CATS’ detailed work plans and budgets, and prioritizes transit projects for the system.

The following services are provided by CATS:

- Light rail rapid transit service;
- Fixed-route local, express and regional express bus services;
- Paratransit service;
- Community/neighborhood-based shuttle services; and
- Multi-county vanpool program for work trip origins/destinations in Mecklenburg County.

**Light Rail Service**

The LYNX Blue Line began revenue service in November 2007, and runs the length of a 9.6 mile corridor that includes 15 total stations extending from Uptown Charlotte south to I-485/South Boulevard in Pineville.

Ridership quickly exceeded first-year projections of 9,600 passengers per day, with 16,000 passengers per day for several months during the first year of operation. Total ridership in Fiscal Year (FY) 2013 was approximately 4.9 million, with the average weekday riders exceeding 15,000 per day. Service is available between 5:00 a.m. and 2:00 a.m. daily, and fares are equivalent to local bus service.

Funding has been identified to expand the LYNX Blue Line service, extending the line from its current terminus in Uptown Charlotte (7th Street) to the UNC Charlotte campus approximately 9.4 miles northeast of center city. Service is expected to begin on the Blue Line Extension (BLE) in late 2016 – early 2017. Additional information about the BLE is provided in this chapter.

**Fixed-Route Bus Service**

The fixed-route bus service operated by CATS includes 49 local routes, 14 express routes, and 5 regional commuter routes. Ridership in FY 2013 was approximately 20.7 million with an average weekday ridership exceeding 64,000 riders per day.
The fixed routes operated by CATS—local and express—are shown on the CATS Existing System Map (Figure 14-1). Regional Express bus service during weekday periods is provided to Cabarrus, Gaston, Union, and York counties.

According to the annual report, in FY 2012, the transit fleet included the following:

- 164 forty-foot buses;
- 91 over the road buses;
- 48 shuttle buses;
- 20 trolley buses;
- 87 paratransit shuttles/vans;
- 99 vanpool vans; and
- 23 light rail / vintage trolley.

Additionally, buses for the local and express route services are accessible (low floor or lifts) and are equipped with bicycle racks. Services are available every day, in varying frequencies, from about 5:00 a.m. to 2:00 a.m. Current one-way fares are $2.00 for local service, $2.75 for express service, and $4.00 for out-of-county commuter service.

**Sprinter Service**

Sprinter is an enhanced bus service that provides a direct connection from Charlotte’s city center to the Charlotte-Douglas International Airport. Enhanced bus service includes several passenger amenities such as frequent service (20 minutes on weekdays, 30 minutes on nights and weekends), efficient stop locations, and signature shelters. The service uses specially-designed hybrid fueled buses and is branded as a specialized service with a different logo and paint scheme.

*Total ridership for the LYNX Blue Line in 2013 was approximately 4.9 million, with the average weekday riders exceeding 15,000 per day.*
Paratransit Service

Paratransit service to qualified disabled residents in Mecklenburg County is provided by CATS Special Transportation Services (STS). Ridership in FY 2013 was over 235,000, with the average weekday ridership equaling 971 riders per day.

STS is a demand-response service, aided by mobile data terminals (MDTs), Automatic Vehicle Location (AVL), and computer dispatching and scheduling software. The active fleet includes 85 vehicles, and provides the paratransit service required by the Americans with Disabilities Act (ADA) of 1990. The ADA requires that paratransit service be provided to people who request pickups and drops-offs within three-quarters of a mile of all local bus routes during the same days and times that local buses operate. All requests for rides within Mecklenburg County beyond the ADA requirements are provided as capacity allows.

STSII is an expansion of the Special Transportation Service that provides limited service to the Towns of Cornelius, Davidson, Huntersville, and Mint Hill, and the unincorporated areas of Mecklenburg County with reduced operating hours and a premium fare.

STSII is a supplemental service to that of STS, and therefore not regulated by the Americans with Disabilities Act (ADA). STSII is provided as capacity allows, as ride requests falling under STS have priority over those provided by STSII.

Community Circulators

CATS provides several services to cover smaller geographic areas with fixed-route or demand-response options, including shuttle routes and the North Meck Village Rider routes. There are seven shuttle routes that serve as major transfer points between community circulators and longer fixed route bus service. These shuttles serve the general area around designated transit centers in the service area, as well as targeted neighborhoods located in between the traditional line haul routes. The designated transit centers are the following:

- Charlotte Transportation Center;
- Eastland Station;
- South Park Station; and
- Rosa Parks Place Station.
In addition, there are three North Meck Village Rider routes serving the northern Mecklenburg County towns and surrounding area. The one-way fare for all of these services is currently $0.80.

The Gold Rush Circulator is a no-fare shuttle service that is served by rubber-wheeled trolley vehicles in Uptown Charlotte.

Vanpool Program
CATS Vanpool Program coordinates approximately 77 vanpools serving a 100-mile radius around Charlotte, with an approximate fiscal year 2013 ridership exceeding 233,000 riders. These vanpools operate seven days a week and provide service to patrons working first through third shifts. In FY 2013, the Vanpool Program eliminated an estimated 12.5 million commuter miles from the regional roadway system. It has a database that allows customers to identify vanpools and potential carpool matches by cross-referencing home and work locations and matching those with similar origins and destinations. This feature is described in more detail at www.sharetheridenc.com.
**Union County Public Transportation**

Transportation services are available for residents of Union County that are eligible to receive services from local Human Service Transportation (HST) agencies. The Union County HST agencies include the Union County Division of Social Services, the Arc of Union County, and the Vocational Rehabilitation and Veterans services. Limited transportation service is also available to residents of Union County who are not eligible for HST.

To be eligible, Union County residents must meet at least one of the following requirements:

- Senior citizen at least 60 years of age;
- Developmentally or physically disabled;
- Medicaid client;
- Veteran eligible for medical treatment at a VA hospital or clinic;
- Able to pay required fares; or
- Willing to work with existing schedules, space, and time availability.

According to the most recent information (FY 2012-2013), Union County operates 24 vehicles and made approximately 84,600 trips over the last reporting year. Union County provided approximately 728,665 total service miles and 44,712 vehicle service hours.

In FY 2012-13, Union County had total expenses of $1,378,917, with revenues of approximately $1,092,894. It was also reported that $286,023 in local funds were utilized to cover increased expenses over the last reporting year.

**Iredell County Public Transportation**

Iredell County operates a demand-response public transportation system for the residents of Iredell County through the Iredell County Area Transportation System (ICATS). Transportation services are provided to the clients of contracting human service agencies such as the Department of Social Services, the Department of Mental Health, the Council on Aging, and the Vocational Rehabilitation and Veterans services. The eligibility requirements are similar to those in Union County.
Clients sponsored by a human service agency pay no fare. Residents are able to request service from 7 a.m. to 4:30 p.m., Monday through Friday.

Limited transportation is also available to residents of Iredell County who are not eligible for transportation service through a human service agency. This is called Rural General Public (RGP) transportation. Such service is available from 7 a.m. to 5 p.m., Monday through Friday. Current fares range from $2 to $4 for a one-way trip within Iredell County.

According to the most recent information (FY 2012-2013), Iredell County operates 28 vehicles and carries approximately 91,000 passengers per year. Iredell County provided more than 702,000 total service miles accounting for an excess of 41,000 vehicle service hours. These figures are similar to prior year totals.

In FY 2012-13, Iredell County had total expenses of $1,440,109, with revenues of approximately $1,423,109. Both of these figures were higher than prior year totals, and the $17,250 deficit was covered by a fund balance.

As a supplement to the services already mentioned, ICATS and the Town of Mooresville began the Mooresville Main fixed route circulator bus in the summer of 2013. The bus serves the areas in and around downtown Mooresville, including hospital and retail locations along NC 150. One ICATS light transit vehicle (LTV) with a carrying capacity of 15 passengers and wheelchair accessibility is currently being utilized. Both ICATS and the town contribute to the cost of the service, which is also offset by rider paid fees.

Public Transportation Planning

Expansion of public transportation within the CRTPO planning area continues to be a high priority. Increases in service of varying modes, both short- and long-term, are being studied and implemented in the plans described below.

Comprehensive Corridor System Plan

Completed in 2002 and revised in 2006 (with a financial plan update in 2012), this plan calls for the development of enhanced transit service in the five corridors defined in the 2025 Integrated Transit/Land Use Plan. These services come in the form of light rail (South and Northeast), commuter rail (North), bus rapid transit or light rail (Southeast), and streetcar (West). In addition, the plan calls for development of the CityLYNX Gold Line streetcar system, to serve transit and circulation needs in Charlotte’s Uptown, as well as along some of the city’s most used transit routes – Central Avenue, Trade Street and Beatties Ford Road.

The City of Charlotte and other Mecklenburg County municipalities have used land use regulations to help implement the 2025 Integrated Transit/Land Use Plan, primarily through transit oriented development (TOD) zoning classifications along the South Corridor light rail line. The northern Mecklenburg County communities of Cornelius, Davidson, and Huntersville have also implemented zoning regulations that support dense, walkable development near future commuter rail stations.
The 2013-2017 Countywide Transit Services Plan (CTSP)

Approved by the MTC in February 2012, the 2013-2017 CTSP provides CATS with a five-year bus service improvement plan for Mecklenburg County, as well as the limited service areas in adjacent counties. The recommendations include a substantial restructuring of service in the Northeast Corridor in anticipation of the operation of the BLE light rail service. Other recommendations were also presented for the rest of the service area. The recommendations are subject to the availability of budget and capital resources.

In terms of the Blue Line Extension Bus/Rail Coordination, the MTC directed CATS to progress the Northeast Corridor/lynx BLE through the Federal Transit Administration (FTA) project development process. The BLE is an extension of the successful LYNX Blue Line light rail service. The 9.4-mile BLE alignment extends from Ninth Street in Center City through the North Davidson (NoDa) and University areas, terminating on the UNC Charlotte campus. The line is scheduled to begin operations in late 2016 or early 2017.

In order to provide a seamless transition for Northeast Corridor customers, CATS has developed bus route proposals that coincide with the LYNX BLE proposed implementation. The Bus/Rail Integration Plan has been modified and is included as part of the CTSP.

Programmed Projects

The following series of projects have been included in the 2012-2018 Transportation Improvement Program (TIP) to carry out the Charlotte Area Transit System’s commitment to the implementation of both the 2025 Integrated Transit/Land Use Plan and Corridor System Plan. Funding for these projects is anticipated from the Section 5307 Urban Allocation, Section 5309 Capital Program, NCDOT Full Funding Grant Agreements, statewide earmarks, and other funding sources. Following is a summary of the various types of projects included in the TIP.

Facility Improvements

CATS continues to invest in the planning, design and construction of numerous bus facility improvements. This work ranges from coordinating new stop and shelter installations through the land development/capital improvement process, to the installation of new signs, shelters and other passenger amenities through CATS’ Transit Amenities program and the upgrade/expansion of maintenance facilities.
Intelligent Transportation Systems

CATS proposes the installation of various Intelligent Transportation System components, including automated interactive voice response systems, customer information technology at transit hubs, trip planning software, and other software licenses to improve the operating efficiency of the system.

Fare System Upgrade & Radio Upgrade

CATS is pursuing the purchase and installation of a new fare collection system and digital radio system upgrade for bus operations, as well as replacement of ticket vending machines at station locations along the LYNX line.

Miscellaneous Equipment

This includes the purchase of support equipment including shop, maintenance and office equipment; schedule racks; and, materials necessary for the upkeep of the Davidson Street bus garage.

Neighborhood Transit Centers

CATS’ Development Section works closely with Operations to monitor and assess changing market demands and service needs for new Neighborhood Transit Centers. The Neighborhood Transit Centers are larger and nicer bus stop locations that also serve as transfer points between a limited number of routes. Examples include East-West, Billingsley and Midtown at the Metropolitan. This ongoing program provides funding to continue the planning, design, and construction of these neighborhood transit centers identified in the Countywide Transit Services Plan. Funding to continue the implementation of these Neighborhood Transit Centers has been programmed.

Park and Ride Lots

CATS monitors the travel demand and market for drive approach passengers to determine park and ride needs and locations. CATS’ goal is to implement park and ride lots at locations that provide a high capture rate for choice riders and minimize travel time and operational costs to the transit system. The cost of this program is reflected in the capital portion of CATS’ long range financial plan.
Charlotte Gateway Station

The terminus of the North Transit Corridor project in Charlotte is the planned site of a joint-use multimodal facility that will include a CATS bus transfer facility, Amtrak service and inter-city bus service. The Charlotte Gateway station will be located at Graham, 4th and West Trade streets in Center City Charlotte. Construction of the Charlotte Gateway Station is a collaborative effort between the City of Charlotte and the State of North Carolina.

In addition to the above activities, CATS also provides funds for the protective purchase of future transit corridors, the lease or purchase of existing rail rights-of-way, and participation in public-private joint developments.

Horizon Year Recommendations

As noted in the Streets and Highways chapter, federal law requires that projects in the Metropolitan Transportation Plan (MTP) be categorized in financially constrained horizon years for air quality analysis. Horizon years are no more than ten years apart (and are based on calendar years, beginning January 1, rather than fiscal years).

This 2040 MTP uses the horizon years 2015, 2025, 2030, and 2040. The transit service improvements for these horizon years are based on the updated financial plan for the MTC-adopted 2030 Transit Corridor System Plan.

The 2007-2009 economic recession dramatically reduced CATS' primary revenue source, the half-percent sales tax in Mecklenburg County. Although the sales tax has begun to recover, it has still not reached pre-recession revenue levels. This has resulted in significant delays in the implementation of the 2030 Transit Corridor System Plan. The following represents the transit projects that CATS believes it can achieve under the current financial conditions.
2015 and 2025 Transit Improvements

- **Corridor System Planning and Design**: CATS will continue to advance the planning of the Transit Corridor System Plan and the design of the LYNX BLE and the planned North Corridor Red Line through the 2015 and 2025 Horizon Years. In addition, studies to advance the Streetcar and to re-evaluate the rapid transit technology for the Southeast Corridor will be completed. However, budget constraints will prevent the completion of another Rapid Transit Corridor in the 2025 Horizon Year unless additional funding is identified in the near future.

- **LYNX Blue Line Extension (BLE)**: The LYNX Blue Line Extension project was awarded a federal full funding grant agreement in October 2012 and is currently under construction. The project extends the current LYNX light rail line from 7th Street in Center City Charlotte northeast to UNC Charlotte’s main Campus. The project will be complete and open for revenue service by 2017.

- **Blue Line Capacity Expansion (BLCE)**: The Blue Line Capacity Expansion project will upgrade the traction power for the existing LYNX Blue Line and lengthen platforms to accommodate three-car trains. The project is being funded with a Transportation Investment Generating Economic Recovery (TIGER) grant and is part of an ongoing program to expand the original LYNX Blue Line platforms to three-car capacity to handle the existing and future demand.

- **North Corridor Red Line**: The Red Line is planned as a commuter rail service that will use the Norfolk Southern “O” line from the Charlotte Gateway Station on West Trade Street in Uptown Charlotte (central business district) to a station serving southern Iredell County. This project is slated for revenue service to begin in the 2025 Horizon Year.

- **CityLYNX Gold Line (Phase One and Two)**: This project will be completed in two phases and is slated to begin revenue service by 2025. Phase One will include the construction of a modern streetcar system on Trade Street from Charlotte Transportation Center to Presbyterian Hospital. Phase Two will be an extension of Phase One west to Johnson C. Smith University and east to Sunnyside Ave.
Bus Fleet: CATS will continue to enhance and optimize fixed route bus transit service throughout the region. Current plans call primarily for the replacement of older buses that have reached their useful life as regulated by federal standards. Expansions will be made as needed to meet system demand.

State of Good Repair: In order to keep both bus and rail operations at maximum operating efficiency, CATS will maintain and expand its infrastructure as needed using available federal funding sources.

2030 Transit Improvements

CityLYNX Gold Line (Phase Three): Phase Three of the LYNX Gold Line includes completing the modern streetcar service eastward along Central Avenue to Eastland Community Transit Center, westward from Johnson C. Smith University north along Beatties Ford Road to the Rosa Parks Place Community Transit Center. This project is slated to begin revenue service by 2030.

Bus Fleet: CATS will continue to enhance and optimize fixed route bus transit service throughout the region. Current plans call primarily for the replacement of older buses that have reached their federal useful life and expansions as needed to meet system demand.

State of Good Repair: In order to keep both bus and rail operations at maximum operating efficiency, CATS will maintain and expand its infrastructure as needed using available federal funding sources.
2040 Transit Improvements

- **Bus Fleet:** CATS will continue to enhance and optimize fixed route bus transit service throughout the region. Current plans call primarily for the replacement of older buses that have reached their useful life as regulated by federal standards. Expansions will be made as needed to meet system demand.

- **State of Good Repair:** In order to keep both bus and rail operations at maximum operating efficiency, CATS will maintain and expand its infrastructure as needed using available federal funding sources.

![Bus at a stop](image)

Project Identification and Prioritization

CATS, Union County public transportation, and ICATS do not submit projects for evaluation against traditional road projects in the MTP development process. All three typically operate through their own respective public transportation funding systems, and approve projects through their respective governing boards. CATS submits smaller-scale projects that are eligible for funding through Congestion Management and Air Quality (CMAQ), Job Access and Reverse Commute (JARC), and New Freedom (NF) Funds, which require CRTPO endorsement.

Sources:

CATS Annual Report, 2012

Iredell County Community Transportation Services Plan
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List of Figures

14-1 ................. CATS Existing Bus Routes
14-2 ................. 2030 CATS System Map
CATS Existing Bus Routes

Legend

- CRTPO Planning Area
- CATS Bus Routes
  - Route Type
    - Regional Express
    - Express
    - Goldrush
    - Village Rider
    - Neighborhood Shuttle
    - Local

Source: CATS
(Routes subject to change)

Figure 14-1

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
2030 CATS System Map

Legend
- CRTPO Planning Area
- LYNX Blue Line Station (Existing)
- LYNX Blue Line (Existing)
- CityLYNX Gold Line Station (Phase I Under Construction)
- CityLYNX Gold Line (Phase I Under Construction)
- LYNX Blue Line Station (Under Construction)
- LYNX Blue Line (Under Construction)
- North Corridor Red Line Station (Proposed)
- North Corridor Red Line (Proposed)

Source: CATS

Figure 14-2

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
15. Bicycle, Pedestrian, and Greenway

Historically, city streets throughout the country have been designed and built primarily for motorized transportation, and the needs of bicyclists and pedestrians have been inadequately addressed. While the urban cores of cities and towns often contain more bicycle and pedestrian-friendly environments, rapid suburban growth has often resulted in sprawling, disconnected street networks. The result has been the creation or extension of suburban and semi-rural roads that do not contain sufficient infrastructure and/or connectivity for bicyclists and pedestrians.

In the Charlotte Regional Transportation Planning Organization (CRTPO) region, significant strides have been made during the last decade to re-establish an interconnected, bicycle and pedestrian-friendly network. Some of the most desirable neighborhoods in the housing market are older communities designed during the heyday of the trolley and bus system when street connectivity and sidewalk accessibility were essential. In recent years, most communities in the CRTPO area have responded to the incomplete transportation systems by requiring new sidewalks to be provided as development occurs. Sidewalk construction programs using available funds (i.e. general funds, grants, and Powell Bill funds) have also commenced. Additionally, the adoption of the Charlotte-Mecklenburg Bicycle Transportation Plan in 1999 signaled a change in attitudes that bicycles are
a viable (and desirable) transportation option. Greenways have also been identified nationally and regionally as a necessary infrastructure component to help address transportation and recreational challenges. Greenways can also serve as a stimulus for new development.

The CRTPo recognizes the importance of biking and walking as part of the regional transportation system. And as stated in the Goals and Objectives chapter, Goal 2 emphasizes CRTPo's interest in creating a multi-modal transportation system:

Encourage walking, bicycling and transit options, integrated with motor vehicle transportation, by providing a transportation system that serves the public with mobility choices.

The remainder of this chapter addresses the state, regional, and municipal policies and initiatives related to bicycle, pedestrian, and greenway infrastructure and programs. Funding mechanisms for these initiatives, as well as a list of current projects, are summarized at the end of this chapter.

State and Regional Policies

Statewide Bicycle/Pedestrian Policy

The State of North Carolina has had a long tradition of planning for bicycle and pedestrian transportation, beginning with the creation of the nation’s first statewide bicycle program in 1974 with the passage of the Bicycle and Bikeway Act. The bicycle program eventually became the North Carolina Department of Transportation (NCDOT) Division of Bicycle and Pedestrian Transportation, which leads and supports various planning, programming, and engineering efforts throughout the state, including a statewide complete streets policy described below.

Statewide Complete Streets Policy

In July 2009, the North Carolina Board of Transportation adopted its Complete Streets Policy. The policy specifically states that the NCDOT is committed to providing a multi-modal transportation network that meets the access, mobility, and safety needs of motorists, transit users, bicyclists, and pedestrians of all ages and abilities. The graphic below provides an example of a complete street.

This policy also requires that NCDOT’s planners and designers will consider and incorporate multimodal alternatives in the design and improvement of all appropriate transportation projects within a growth area of a town or city unless exceptional circumstances exist. Routine maintenance projects may be excluded from this requirement if an appropriate source of funding is not available.
CRTPO Policy

While State support for active transportation modes is critical to their success, providing facilities for pedestrians and bicyclists is often viewed as a local responsibility. However, the CRTPO has made the expectation clear that providing a multi-modal transportation system is both a regional and local priority and responsibility for both the CRTPO and the municipalities. Among the objectives listed in the Goals and Objectives chapter of this plan, many relate to pedestrian and bicycle facilities and programs, including:

- Enable all users to choose a convenient and comfortable way to reach their destination, regardless of location, personal mobility level, age or economic status.
- Improve the transportation system by developing streets and highways that are accessible to, or compatible with, multiple modes of transportation by utilizing design standards consistent with NCDOT’s Complete Streets policy.
- Include sidewalks and bicycle facilities in the design of roadways to accommodate and encourage pedestrian and bicycle travel, and maximize linkages to off-road facilities and transit services.
- Facilitate pedestrian and bicycle safety through public awareness programs.
- Provide linkages for pedestrians and/or bicyclists with neighborhoods, employment centers, services, commercial areas and other business districts, parks, greenways and cultural facilities such as schools and churches.

**MTP Goal 2 - Encourage walking, bicycling and transit options, integrated with motor vehicle transportation, by providing a transportation system that serves the public with mobility choices.**
In addition, the CRTPo has an adopted bicycle and pedestrian project ranking methodology and application (amended in January 2013) which is used to evaluate proposed projects and establish funding priorities. This program aligns with similar project evaluation efforts at the state level. CRTPo’s approved bicycle and pedestrian ranking methodology and application can be found in Appendix C of the Metropolitan Transportation Plan (MTP).

Both state and regional policies have been translated into tangible initiatives and projects, as is summarized next.

**Statewide Initiatives**

**Statewide Bicycle and Pedestrian Plan**

The State of North Carolina is addressing walking and bicycling through WalkBikeNC, the first statewide pedestrian and bicycle plan. Following the 2012 adoption of NCDOT’s Complete Streets Guidelines, WalkBikeNC is a resource guide that provides a comprehensive view of what it means to have walkable and bikable communities in North Carolina. The draft report was completed in fall, 2013. The effort to finalize the report is still on-going.

The WalkBikeNC plan is being developed by the NCDOT with support and funding from many statewide partners. The draft recommendations of WalkBikeNC are organized around five main principles that are already central to local planning efforts to encourage livable communities. These principles are:

- Improving mobility;
- Promoting safety;
- Contributing to improved public health;
- Maximizing economic competitiveness; and
- Being good stewards of the environment.

The plan identifies a number of issues and recommendations relevant to the MTP. In particular, the NCDOT has identified a statewide total of $770 million in bicycle and pedestrian needs through 2040 in order to meet acceptable Levels of Service. The draft WalkBikeNC identifies a number of objectives and performance measures that pertain to the work of the CRTPo, which are in alignment with the adopted goals and objectives of CRTPo’s 2040 MTP.
CRTPO Initiatives

Many municipalities within the CRTPO planning area have increased their efforts to accommodate pedestrians and bicyclists through transportation planning initiatives. Ways in which this has been accomplished include adopting pedestrian and bicycle related plans, policies or regulations, and creating a budget for sidewalk improvements.

The CRTPO works with NCDOT to incorporate sidewalk construction, wide outside lanes, and bike lanes where appropriate, as a matter of standard practice on NCDOT projects within the urban area. Currently, NCDOT offers to construct sidewalks if municipalities fund a portion (or all) of the cost and the municipality also agrees to maintain the sidewalks once they are completed. The CRTPO has also taken a strong stance to ensure that new roadway construction projects include pedestrian and bicycle facilities, and at the very least, provide room for future pedestrian and bicycle improvements and do not create barriers to the future provision of non-motorized transportation infrastructure. Some examples of this commitment include:

- Adoption of the Charlotte-Mecklenburg Bicycle Transportation Plan (most recently updated in 2008);
- Adoption of the Transportation Action Plan (TAP) by the City of Charlotte, its first comprehensive planning document addressing multiple transportation modes, including sidewalks and bicycling, and their integration with land use; and
- Continued advocacy of pedestrian and bicycle accommodations as a part of CRTPO’s goals, objectives and policies, applied throughout the planning area.

Greenway trail development is also viewed as an important component of the non-motorized transportation network within the CRTPO planning area. Greenways accommodate both bicyclists and pedestrians in a manner that separates the user from traffic, while providing a natural setting. In past decades, greenway trails have primarily been developed within Mecklenburg County. And it is important to note that Mecklenburg County has one of the oldest greenway systems in North Carolina (e.g. Upper McAlpine Creek Greenway, with granular pavement, opened in 1978). As Union and Iredell County continue their
greenway planning and development effort, significant regional connectivity can be achieved. Examples include:

- A two-state trail being planned by Union County to connect with Lancaster County in South Carolina – which will be the first of its kind;

- The Mooresville to Charlotte trail, which is a planned 30-mile trail that will connect existing and future greenways from downtown Mooresville, in Iredell County, to Uptown Charlotte, in Mecklenburg County; and

- Continued planning efforts of the Carolina Thread Trail. This is an effort that engages 15 counties to connect greenways and trails within, and beyond, the CRTPA planning area, creating an extensive system of over 1,500 total miles.

Additionally, other communities within the CRTPA have also adopted their own planning documents supporting pedestrian and bicycle transportation. These documents consist of standalone plans, or as elements of wider comprehensive plans, and can be found in Tables 15-1, 15-2 and 15-3 in the bicycle, pedestrian, and greenway initiatives sections that follow.
## Bicycle Initiatives

### Table 15-1: Bicycle Initiatives in CRTPO Municipalities

<table>
<thead>
<tr>
<th>County</th>
<th>Jurisdiction</th>
<th>Existing Bicycle Plan</th>
<th>Goals or Policies for Bicycle Facilities</th>
<th>Advocate for Bicycle Facilities</th>
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<tr>
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<td>Davidson</td>
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<tr>
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<td></td>
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<td>No</td>
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<tr>
<td>Union</td>
<td>Indian Trail</td>
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<td>Yes</td>
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<td>Statesville</td>
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<td></td>
<td>Troutman</td>
<td>No</td>
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</tbody>
</table>

The City of Charlotte launched a limited bike share program in 2012, which it plans to expand in 2014.
In addition to the plans outlined in Table 15-1, the following bicycle initiatives are also underway in the CRTPo region:

**Charlotte B-Cycle**

North Carolina’s first bike-share system, Charlotte B-Cycle, began operations in August 2012. The 20-station (Figure 15-1), 200-bicycle system was launched through a public, private and non-profit partnership, and is funded through private sponsorships. The primary sponsors to date are Blue Cross Blue Shield of North Carolina, Carolina Healthcare System and Verizon Wireless.

Since opening, the bike-share system has accommodated over 32,000 trips within the first year of operations, and enrolled over 400 annual members. Charlotte B-Cycle frequently receives requests for system expansion, and currently has plans to add additional stations in 2014.

**Lake Norman Bike Route and Regional Bicycle Plan**

In 2009, NCDOT contracted with the Centralina Council of Governments to produce a regional bicycle plan for the Lake Norman area. The Lake Norman Regional Bicycle Plan (LNRBP) began with a mission to identify and lay out in detail the means of creating a Lake Norman Regional Bicycle Route, which would be developed over time, and provide strategies and priorities for implementing the route in phases. The intent was to create a more comprehensive route that would provide connections to various destinations of interest, and be a safe and attractive transportation and recreation resource for a wide range of users. Participating communities within CRTPo’s planning area involved in the LNRBP include Cornelius, Davidson, Huntersville, Iredell County, Mecklenburg County, Mooresville and Troutman. See Figure 15-2 for a map of the Lake Norman Regional Bicycle Route.
### Pedestrian Initiatives

#### Table 15-2: Pedestrian Initiatives in CRTPO Municipalities

<table>
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<tr>
<th>County</th>
<th>Municipality</th>
<th>Existing Pedestrian Plan</th>
<th>Goals or Policies for Pedestrian Facilities</th>
<th>Advocate for Pedestrian Facilities</th>
<th>Sidewalk Construction Program</th>
<th>Use Powell Bill Funds to Build Sidewalks</th>
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<td></td>
<td>Mooresville</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Statesville</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Troutman</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Greenway Initiatives

Table 15-3 outlines initiatives by various partnering communities in the CRTPO planning area.

Table 15-3: Greenway Initiatives in CRTPO Municipalities

<table>
<thead>
<tr>
<th>County, Agency or Initiative</th>
<th>Total Planned Gwy Miles</th>
<th>Constructed Gwy Miles (paved)</th>
<th>Constructed Gwy Miles (unpaved)</th>
<th>% Planned Gwy Miles Constructed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mecklenburg</td>
<td>234.2</td>
<td>37.2</td>
<td>3.0</td>
<td>17%</td>
</tr>
<tr>
<td>Union</td>
<td>109.7</td>
<td>0.3</td>
<td>3.0</td>
<td>3%</td>
</tr>
<tr>
<td>Iredell</td>
<td>160.2</td>
<td>4.6</td>
<td>10.3</td>
<td>9%</td>
</tr>
<tr>
<td>Carolina Thread Trail</td>
<td>1464.0</td>
<td>74.6</td>
<td>44.8</td>
<td>8%</td>
</tr>
<tr>
<td>Mooresville to Charlotte Trail</td>
<td>30.0</td>
<td>0.7</td>
<td>0.0</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>1998.1</td>
<td>117.4</td>
<td>61.1</td>
<td>9%</td>
</tr>
</tbody>
</table>

In addition to the information presented in the table above, the following greenway initiatives are also underway in the CRTPO region:

Carolina Thread Trail

The Carolina Thread Trail is a 15-county regional network of trails and greenways for walking, biking, commuting and recreation. The organization will create a permanent legacy of trails and conservation for more than two million people by linking communities and attractions across North and South Carolina. The Carolina Thread Trail will continue to be a catalyst for economic development, land preservation, and healthier communities.

The Carolina Thread Trail ("The Thread") links trails across 15 counties while preserving natural areas.

Photo Courtesy: Nancy Pierce, www.carolinathreadtrail.org
Master planning of the Carolina Thread Trail has been completed in 14 counties as communities have adopted their trail plans and worked with neighbors to target points of connection. The Thread concept map provides a vision for the project, but will change as conceptual lines become actual trails.

Currently, Anson, Cabarrus, Catawba, Cherokee, Chester, Cleveland, Gaston, Iredell, Lancaster, Lincoln, Mecklenburg, Stanly, Union and York counties have adopted county-wide greenway master plans designating corridors for the Carolina Thread Trail or initial plans that can be expanded in time. The planning process is also underway in Rowan County.

Other

Mecklenburg County citizens have consistently supported Park and Recreation bonds targeting both land acquisition and facility development, including several that were voter-approved. There are greenway projects currently planned, funded, under design or in construction in almost all areas of Mecklenburg, Union and Iredell counties, which are shown in Figures 15-3 and 15-4.

In addition, discussions with the adjacent Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO), to the west of CRTPO, have been initiated to determine the feasibility of a pedestrian project connecting Gaston and Mecklenburg counties across the Catawba River. The intent is to enhance an existing facility, or construct a new facility, in order to allow pedestrian connectivity from the Town of Mt. Holly (Gaston County) to a location to be determined near the U.S. National Whitewater Center (Mecklenburg County).
Funding and Projects

Funding for Bicycle and Pedestrian Transportation

Funding for bicycle, pedestrian and greenway projects has come from a variety of government sources, including dedicated federal/state programs and grants, as well as local government programs. Bicycle, Pedestrian and infrastructure can be funded as stand-alone projects, or as elements of a larger transportation project. Within the CRTPo region, most improvements in bicycle/pedestrian infrastructure have been achieved through larger roadway projects, re-allocation of roadway space during routine maintenance, and local government projects.

Federal Funding for Bicycle, Pedestrian, and Greenway Projects

In past years, CRTPo has programmed Federal Surface Transportation Program-Direct Attributable (STP-DA) funds and Congestion Mitigation and Air Quality (CMAQ) funds for stand-alone bicycle/pedestrian projects. The Transportation Alternatives (TA) program will also be a funding source for these types of projects. A portion of these federal funding sources will continue to be available for stand-alone bicycle/pedestrian projects.

State Funding for Bicycle, Pedestrian, and Greenway Projects

Funding for bicycle, pedestrian and greenway projects was impacted by the Strategic Transportation Investments (STI), the transportation legislation that became law in North Carolina in June 2013. These changes do not affect federal dollars, but all funding for future bicycle and pedestrian projects has been limited to the Division category of available funds (see Financial Plan chapter of this MTP for more information about the STI). With the recent transportation legislation, the full extent of these funding impacts is yet to be determined.

Local Funding for Bicycle, Pedestrian, and Greenway Projects

As detailed in this chapter, jurisdictions in the CRTPo region fund bicycle and pedestrian initiatives to varying degrees. General operating revenue or capital improvement bonds can be used to fund ongoing pedestrian and bicycle programs or provide infrastructure.

Since 2000, the counties of Iredell and Mecklenburg have received over $700,000 in private donations for trails and related amenities to use in combination with local public funding for trails and destinations along planned corridors. In addition, Mecklenburg County has received significant donations of land needed for its greenway system.

The jurisdictions within CRTPo have received over $18 million in federal, state and Metropolitan Planning Organization (MPO) funding since the year 2000, mostly matched with local dollars at some level for expediting the planning and development of greenways for bicycle and pedestrian use.
As the collaboration grows for regional connectivity of bicycle, pedestrian, and off-road greenways, the need for connectivity through an integrated system of non-motorized transportation becomes more evident. The jurisdictions within the CRTPO are making a considerable effort to create meaningful connections at their borders for the benefit of users in all jurisdictions. Local transportation entities understand the importance of insuring connections to their sidewalk and bicycle corridors, including passage along creeks, which is critical to the greenway systems. This effort will continue and can be expedited with federal and state funding support through NCDOT and CRTPO, as well as local funding initiatives. The following section includes examples of specific projects covered via these funding mechanisms.

**Projects**

*Funded Bicycle, Pedestrian, and Greenway Projects*

Projects funded before October 1, 2013 will receive the state and federal funding originally committed as long as construction is let by July 1, 2015. These projects are shown in Table 15-4 on the next page and Figure 15-3.
### Table 15-4: Funded Bicycle, Pedestrian, and Greenway Projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Jurisdiction</th>
<th>Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barton Creek Greenway</td>
<td>Charlotte</td>
<td>$1,064,000</td>
</tr>
<tr>
<td>Bearskin Creek Greenway</td>
<td>Monroe</td>
<td>$1,640,000</td>
</tr>
<tr>
<td>Cornelius Greenway Trail</td>
<td>Cornelius</td>
<td>$2,150,000</td>
</tr>
<tr>
<td>Irwin Creek Bikeway</td>
<td>Charlotte</td>
<td>$600,000</td>
</tr>
<tr>
<td>Kistler Farm-Briarcliff-Bellingham-White Oak Sidewalk</td>
<td>Mooresville</td>
<td>$429,000</td>
</tr>
<tr>
<td>Little Sugar Creek Greenway</td>
<td>Charlotte</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>Marshville Sidewalk</td>
<td>Marshville</td>
<td>$228,000</td>
</tr>
<tr>
<td>Nevin Road Sidewalk</td>
<td>Charlotte</td>
<td>$1,108,000</td>
</tr>
<tr>
<td>NC 115 Bike Lane</td>
<td>Mooresville</td>
<td>$2,250,000</td>
</tr>
<tr>
<td>Old Mountain Road Sidewalk to Iredell High School</td>
<td>Troutman</td>
<td>$480,000</td>
</tr>
<tr>
<td>Providence Road Sidewalk</td>
<td>Charlotte</td>
<td>$1,075,000</td>
</tr>
<tr>
<td>South Tryon Street Sidewalk</td>
<td>Charlotte</td>
<td>$1,743,000</td>
</tr>
<tr>
<td>Sunset Road Sidewalk on I-77 Overpass</td>
<td>Charlotte</td>
<td>$1,848,000</td>
</tr>
<tr>
<td>Toby Creek II Greenway</td>
<td>Charlotte</td>
<td>$2,293,000</td>
</tr>
<tr>
<td>Troutman Greenway Trail</td>
<td>Troutman</td>
<td>$430,000</td>
</tr>
<tr>
<td>University City Boulevard Multi-Use Path</td>
<td>Charlotte</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

**Unfunded Bicycle, Pedestrian, and Greenway Projects**

In 2013, NCDOT approved a revised data-driven approach to evaluate projects of all modes for potential funding, including bicycle and pedestrian projects. Bicycle and pedestrian projects that do not have committed funding as of October 1, 2013 will be subject to the new submittal and evaluation criteria outlined in NCDOT’s approved process. As outlined in the new process, MPOs will be eligible to submit projects to be evaluated to compete for funding. In response, CRTPO has submitted the unfunded bicycle and pedestrian projects shown in Table 15-5, and mapped in Figure 15-4, for consideration. These projects were selected using the CRTPO’s approved bicycle and pedestrian ranking methodology previously discussed in this chapter.
<table>
<thead>
<tr>
<th>Municipality/County</th>
<th>Route Name</th>
<th>From</th>
<th>To</th>
<th>Description</th>
<th>County</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charlotte</td>
<td>Matheson Av Conversion &amp; Bicycle Route 10 Extension</td>
<td>Statesville Av</td>
<td>Parkwood Av</td>
<td>Extension of signed Bicycle Route 10 from Statesville Avenue to Pinckney Street, with a street conversion to include bicycle lanes from Tryon Street to Parkwood Road</td>
<td>Mecklenburg</td>
<td>$400,000</td>
</tr>
<tr>
<td>Charlotte</td>
<td>Plott Rd / Highland Av</td>
<td>SR 2803 (Plaza Rd Extension)</td>
<td>Hickory Grove Rd</td>
<td>An on-street bicycle connection between existing bicycle lanes on Pence Road at the southern terminus of the project and existing bicycle lanes on The Plaza</td>
<td>Mecklenburg</td>
<td>$5,750,000</td>
</tr>
<tr>
<td>Cornelius</td>
<td>McDowell Creek Greenway</td>
<td>W Catawba Av</td>
<td>Westmoreland Rd</td>
<td>McDowell Creek Greenway from W. Catawba Avenue to the terminus of the Greenway at Westmoreland Road</td>
<td>Mecklenburg</td>
<td>$2,366,000</td>
</tr>
<tr>
<td>Cornelius</td>
<td>McDowell Creek Tributary Greenway</td>
<td>Catawba Dr</td>
<td>Washam Potts Rd</td>
<td>Construct a multi-purpose path from Smithville Park to JV Washam Elementary School</td>
<td>Mecklenburg</td>
<td>$1,950,000</td>
</tr>
<tr>
<td>Cornelius</td>
<td>NC 115</td>
<td>Potts St</td>
<td>Smith Rd</td>
<td>Construct Bicycle Lanes</td>
<td>Mecklenburg</td>
<td>$385,300</td>
</tr>
<tr>
<td>Cornelius</td>
<td>South Prong Rocky River Greenway</td>
<td>South St</td>
<td>Main St</td>
<td>Construct a multi-purpose path from South St to Cornelius Town Center</td>
<td>Mecklenburg</td>
<td>$1,680,000</td>
</tr>
<tr>
<td>Davidson</td>
<td>Exit 30 Bike/Ped Improvements</td>
<td>Exit 30</td>
<td>Griffith St Bridge</td>
<td>Bicycle and Pedestrian Improvements at Exit 30 (I-77) in Davidson to Griffith Street Bridge over I-77</td>
<td>Mecklenburg</td>
<td>$500,000</td>
</tr>
<tr>
<td>Municipality/County</td>
<td>Route Name</td>
<td>From</td>
<td>To</td>
<td>Description</td>
<td>County</td>
<td>Total Cost</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Davidson</td>
<td>Safe Routes to School Pedestrian Beacons</td>
<td>Various locations</td>
<td>Various locations</td>
<td>To install Rapid Flashing Beacons at intersections near local schools or on routes frequently taken by local students walking or biking to schools; to be placed at crossings of high-traffic thoroughfares</td>
<td>Mecklenburg</td>
<td>$90,000</td>
</tr>
<tr>
<td>Indian Trail</td>
<td>Highway 74 Multi-Use Path</td>
<td>West Town Limit</td>
<td>Wesley Chapel Stouts Rd</td>
<td>10' Multiuse path</td>
<td>Union</td>
<td>$1,210,000</td>
</tr>
<tr>
<td>Matthews</td>
<td>Pleasant Plains Rd Bike Lanes</td>
<td>Trade St/ Weddington Rd</td>
<td>McKee Rd</td>
<td>Pleasant Plains Road Bike Lanes from Trade Street/Weddington Road to McKee Road</td>
<td>Mecklenburg</td>
<td>$400,000</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>Irvins Creek Greenway</td>
<td>Idlewild Rd</td>
<td>Lakeview Cir</td>
<td>Two-mile greenway trail will provide a safer connection between Crown Point Elementary School and Idlewild Road Park</td>
<td>Mecklenburg</td>
<td>$1,194,900</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>Little Sugar Creek Greenway</td>
<td>Huntingtowne Farms Park</td>
<td>Cadillac St</td>
<td>This greenway will provide connectivity between many single family and multi-family projects and significant retail shopping, allowing access to diverse socio-economic areas</td>
<td>Mecklenburg</td>
<td>$1,730,400</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>McAlpine Creek Greenway</td>
<td>Rea Rd</td>
<td>Four Mile Creek Greenway</td>
<td>Expand the existing 6 mile McAlpine/McMullen/Four Mile system and end north of Pineville-Matthews Road at Green Rea Road and Country Day Middle School</td>
<td>Mecklenburg</td>
<td>$1,635,900</td>
</tr>
<tr>
<td>Municipality/County</td>
<td>Route Name</td>
<td>From</td>
<td>To</td>
<td>Description</td>
<td>County</td>
<td>Total Cost</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
<td>------</td>
<td>----</td>
<td>-------------</td>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>McDowell Creek Greenway</td>
<td>Sam Furr Rd</td>
<td>Torrence Creek Greenway</td>
<td>3.5 mile corridor is a combination of side trail, existing bicycle lanes with sidewalk, trailhead parking and greenway connecting existing greenway to extensive Birkdale development to Torrence Creek Greenway</td>
<td>Mecklenburg</td>
<td>$2,280,600</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>Stewart Creek Greenway</td>
<td>State St</td>
<td>Rozelles Ferry Rd</td>
<td>0.6 mile connection between two sections of existing Stewart Creek Greenway</td>
<td>Mecklenburg</td>
<td>$554,000</td>
</tr>
<tr>
<td>Mecklenburg County</td>
<td>Walker Branch Greenway</td>
<td>Sledge Rd</td>
<td>Smith Rd</td>
<td>1.8 mile greenway will extend an existing developer-built greenway from Sledge Road to the RiverGate Shopping Center then on to Smith Road</td>
<td>Mecklenburg</td>
<td>$1,152,720</td>
</tr>
<tr>
<td>Mooresville</td>
<td>CTT-Iredell-Route Y</td>
<td>Bellingham Park</td>
<td>Johnson Dairy Rd</td>
<td>Trail connecting Bellingham Park to residential neighborhoods</td>
<td>Iredell</td>
<td>$854,000</td>
</tr>
<tr>
<td>Stallings</td>
<td>Stallings Elementary School Sidewalk</td>
<td>NA</td>
<td>NA</td>
<td>Sidewalk and Crosswalk system around Stallings Elementary School</td>
<td>Union</td>
<td>$307,311</td>
</tr>
<tr>
<td>Statesville</td>
<td>CTT-Iredell-Route Q - Gardner Bagnal to Amity Hill</td>
<td>Gardner Bagnal Blvd</td>
<td>Amity Hill Rd</td>
<td>Will provide bicycle and pedestrian mobility to residents as automobile alternative</td>
<td>Iredell</td>
<td>$790,500</td>
</tr>
<tr>
<td>Troutman</td>
<td>CTT-Iredell-Route Q4</td>
<td>Rumble St</td>
<td>Julian Pl</td>
<td>2.25 mile off road multiuse path connecting an existing greenway in downtown Troutman to elementary and middle schools and commercial area</td>
<td>Iredell</td>
<td>$2,357,000</td>
</tr>
</tbody>
</table>
Sources:


http://www.catawbalands.org/trail.php)

http://www.co.iredell.nc.us/Departments/Planning/forms/LNRBP_1-13-10.pdf

http://www.catawbacountync.gov/Planning/Projects/LNBR/BikeRoute.asp

West Branch Greenway in the Town of Davidson.

Photo taken by Rodney Graham
List of Figures

15-1 .................. B-Cycle Stations
15-2 .................. Lake Norman Bike Route
15-3 .................. Funded Bicycle, Pedestrian, and Greenway Projects
15-4 .................. Unfunded Bicycle, Pedestrian, and Greenway Projects
**Fund ed Bicycle, Pedestrian, and Greenway Projects**

**Legend**

- **CRTPD Planning Area**
- **Funded Projects**
  1. Old Mtn Rd Sidewalk to Iredell High School
  2. Troutman Greenway Trail
  3. Kistler Farm-Briarcliff-Bellingham-White Oak Sidewalk
  4. Cornelius Greenway Trail
  5. NC 115 Bike Lane
  6. Sunset Rd Sidewalk on I-77 Overpass
  7. Nevin Rd Sidewalk
  8. Banton Creek Greenway
  9. Toby Creek II Greenway
  10. University City Blvd Multi-Use Path
  11. Irwin Creek Bikeway
  12. South Tryon St Sidewalk
  13. Little Sugar Creek Greenway
  14. Providence Rd Sidewalk
  15. Bearskin Creek Greenway
  16. Marshville Sidewalk

Source: NCDOT State Transportation Improvement Program

**Figure 15-3**

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
Unfunded Bicycle, Pedestrian, and Greenway Projects

Legend

- Unfunded Projects
- CRTPO Planning Area

1. Bicycle Rte 10
2. CTT-Iredell-Route Q
3. CTT-Iredell-Route Q4
4. CTT-Iredell-Route Y
5. Exit 30 Bike-Ped Improvements
6. Highway 74 Multi-Use Path
7. Irvins Creek Greenway
8. Little Sugar Creek Greenway
9. McAlpine Creek Greenway
10. McDowell Creek Greenway (Cornelius)
11. McDowell Creek Greenway (Meck County)
12. McDowell Creek Tributary Greenway
13. NC 115 Bike Lanes & Sidewalk
14. Pleasant Plains Road Bike Lanes
15. Plott Road / Highland Ave Bike Lanes
16. South Prong Rocky River Greenway
17. Stallings Elementary School Sidewalk
18. Stewart Creek Greenway
19. Walker Branch Greenway

Pedestrian Beacons - Safe Routes to School

Figure 15-4
Prepared by Charlotte-Mecklenburg Planning Department, April 2014
16. Other Transportation Modes

The transportation needs of the residents and workers within, and visitors to, the Charlotte Regional Transportation Planning Organization (CRTPO) region are sometimes met by transportation modes other than the highway, transit, and bicycle and pedestrian modes already highlighted in this Metropolitan Transportation Plan (MTP). Aviation, inter-city rail, inter-city bus, and taxi service each play a significant role in transportation in the area.

This chapter describes operations and plans for these modes within the CRTPO area. Also included at the end of this chapter are coordination activities associated with the development of CRTPO’s MTP.

Aviation

Mecklenburg County

The Charlotte-Douglas International Airport is the major hub of US Airways and provides direct flights to many domestic and international destinations. In 2012, the airport served almost 41 million passengers and handled over 127,000 tons of cargo. The airport averaged 690 daily departures, with nonstop service to 143
destinations. The Charlotte-Douglas International Airport is currently ranked 8th nationally in passengers and 33rd nationally in cargo.

In order for the Charlotte-Douglas International Airport to accommodate the anticipated growth in air travel and cargo shipments that will be vital to the regional economy, improvements and expansions need to be made to the facility's main components. These include the following:

- Runway and taxiway system;
- Road network;
- Passenger terminal area;
- Cargo and general aviation; and
- Parking.

In recent years, the runway and taxiway system experienced delays, indicating the airport was unable to adequately accommodate demand during peak periods. Because of the anticipated growth in operations, particularly during peak periods, the lack of runway capacity was the airport’s most significant constraint to growth. As a result, construction of Runway 36L was completed in 2010. The 36L runway is located 4,300 feet west of Runway 36C and measures 9,000 feet long. The addition of this parallel runway increased peak period capacity and reduced annual delay costs by $36 million.

Based on projected growth in air cargo, the existing length of Runway 18R (8,700 feet) will not be adequate. There are plans to extend Runway 18R to 12,000 feet, which will allow non-stop Pacific Rim service with aircraft such as the Boeing 747, 767, or MD-11.

Charlotte-Douglas International Airport is currently ranked sixth nationwide in total operations.
As a consequence of the airfield expansions, some roadways will be relocated and others will require upgrades, such as:

- A new Airport Entrance Road is currently under construction, extending Little Rock Road into the airport terminal area as a limited-access roadway;
- West Boulevard was relocated as part of both the new runway and runway extension projects. This road now connects to an interchange at I-485. West Boulevard provides primary access to the Air Cargo Center and the commercial developments that are attracted to the areas south of the airport; and
- A section of Wilkinson Boulevard will be upgraded to a limited access roadway from I-485 to the Airport Entrance Road. Wilkinson Boulevard will then provide seamless access from the interstate to the main terminal.

Other airport improvements include:

- Expanding the passenger terminal on Concourse E, the airport’s regional aircraft facility. The existing concourse has 36 gates, which will be expanded to a total of 50 gates in multiple phases over the next several years;
- Expanding the terminal lobby to accommodate passenger growth, which will provide more space for security checkpoints, airline ticketing space and baggage claim areas; and
- Growth of the cargo building area from its current size of 570,000 square feet to 1.2 million square feet by 2015. Because of the needed space for cargo aircraft parking, the total property set aside for air cargo will more than triple from today’s 43 acres to 146 acres.

Finally, along with the growth already mentioned at the Charlotte-Douglas International Airport, the demand for parking has significantly increased over the past five years. In response, the airport continues to expand surface lots and a new parking structure has been constructed in the business valet parking lot. A larger parking deck in front of the terminal will also be constructed to accommodate both hourly parking and rental car ready return facilities.
Union County

The City of Monroe assumed direct management of aviation services at the Charlotte-Monroe Executive Airport on March 1, 2009. For many years prior, the Fixed Base Operation (FBO) was managed by private enterprise under contract to the City. The Charlotte-Monroe Executive Airport is a popular destination for business and pleasure aircraft due to the proximity of businesses and attractions in the areas of Monroe and southeastern Charlotte-Mecklenburg.

The airport operates a full-service FBO, providing services such as aviation fuels, hangars, parking, tie downs, catering, a pilot’s lounge, refreshment area, computer flight planning, satellite weather service, conference room, aircraft towing, ground power units, baggage handling, rental cars, and hotel reservations, among the other services normally provided at large metropolitan airports. All Aircraft Line Service Technicians, Customer Service Representatives, and the Airport Manager are experienced FBO personnel with many years of service in aviation.

The Charlotte-Monroe Executive Airport meets the service needs of corporate and private aircraft from small piston engine aircraft to larger turboprop and jet aircraft. This includes over eighty aircraft based at the airport, as well as the daily transient aircraft. The terminal building is also the home of the Monroe Economic Development Office.

Already equipped with a 5,500 foot runway with a full-length taxiway, an instrument landing system (ILS), remote radio clearance delivery for instrument flights, an automatic weather observation system, full runway and taxiway lighting systems, the airport recently added improved approach lights to aid in the landing of instrument flights. The runway was also recently lengthened to 7,000 feet to accommodate much larger aircraft. Future plans to improve and enhance the usefulness of the airport include the additions of new maintenance and storage hangars.
Iredell County

The Statesville Regional Airport has been owned by the City of Statesville since approximately 1942. Statesville Flying Service (SFS) has been in operation as the full service FBO at the airport since 1978 under a lease agreement with the City of Statesville. Although the operation of airport equipment and maintenance of the grounds is the responsibility of the City of Statesville, SFS provides airport services to transient traffic as well as based tenants. These services include aviation fueling, hangar rental, tie-downs, catering, computer flight planning, conference room, aircraft towing, ground power units, car rentals and other services normally provided.

The airport is home to 72 based aircraft, ranging in size from small aircraft to regional jets. The tax base of the airport has increased over the last decade from $41 million to just over $250 million. The City of Statesville has worked (and will continue to work) with the North Carolina Department of Transportation (NCDOT)-Division of Aviation to improve the airport. Iredell County has also been a willing partner in the development of the airport, providing 50 percent of the local match on grants that the City has been fortunate enough to obtain. In 2004, runway 10-28 was increased in length from 5000 feet to 7000 feet, and a full ILS was installed. In 2009, the runway, taxiways, and apron were strengthened to accommodate larger aircraft. The facility is now rated to withstand an aircraft weight of 95,000 pounds. Statesville has also acquired properties for future installation of a taxiway that will be parallel to the south side of the runway. Installation of this parallel taxiway will allow for safer operations of aircraft accessing the runway from the south side of the field. Several other improvement projects are currently planned for the airport, including the addition of an apron for helicopter parking and grooves to the runway to allow for safer operation during inclement weather.

While it is currently home to various corporate and NASCAR tenants, the proximity of the airport to two major interstates, and rail access, also makes it a popular consideration amongst industrial and corporate flight departments interested in relocation. Another feature of the airport that makes it a target for relocation of flight departments is the fact that Statesville Regional Airport is under the regulation of Atlanta airspace, which alleviates the potential for airport departure delays due to traffic associated with the Charlotte-Douglas Airport.
Inter-City Rail

The Charlotte region has a long history of railroad service, with the first railroads arriving prior to the Civil War. Currently freight service is active on both the Norfolk Southern and the CSX Transportation rail lines. Passenger service has seen a resurgence since the 1990s when the state of North Carolina revived daily daytime roundtrip service between Charlotte and Raleigh and onto Washington and New York, on the “Carolinian,” supplementing the overnight “Crescent” service. Since that time, the state has added two additional round trips between Raleigh and Charlotte each day.

Amtrak Service

Charlotte’s current passenger station is located on North Tryon Street approximately two miles north of the uptown business district. Constructed in the early 1960s, at a time of declining passenger services, the station does not meet current North Carolina or Americans with Disabilities Act (ADA) standards. ADA problems are acute for parking, station and platform access. Parking itself is available for only 60 cars, with overflow often parking in the grass area and on adjacent properties. The parking area is unfenced and in the past year has flooded, damaging passenger vehicles. As an interim measure the waiting room and ticket areas were expanded in 2002 with the removal of Norfolk Southern offices from the building. The station is adjacent to an active freight yard and occupies the mainline tracks, creating conflicts with freight operations.

Pedestrian access and connections to other transportation modes are inadequate at the current station. The region’s main business, government and cultural center is two miles away, and there are no connections to inter-city bus service or car rental agencies nearby. The Charlotte Area Transit System (CATS) provides transit service to the station, but passengers who wish to connect to the Route 11 service to downtown Charlotte (in order to connect with other services) have to cross 4 lanes of traffic, without a signal or crosswalk.

The current schedule consists of four trains – Piedmont Service (2), the Carolinian, and the Crescent. Current scheduled times are:

<table>
<thead>
<tr>
<th>Time</th>
<th>Train</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:46 AM</td>
<td>Crescent</td>
<td>Northbound departure for Washington and New York</td>
</tr>
<tr>
<td>2:45 AM</td>
<td>Crescent</td>
<td>Southbound departure for Atlanta and New Orleans</td>
</tr>
<tr>
<td>7:00 AM</td>
<td>Carolinian</td>
<td>Northbound departure for Raleigh, Washington and New York</td>
</tr>
<tr>
<td>9:55 AM</td>
<td>Piedmont</td>
<td>Southbound arrival from Raleigh and Greensboro</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Piedmont</td>
<td>Northbound departure for Greensboro and Raleigh</td>
</tr>
<tr>
<td>2:55 PM</td>
<td>Piedmont</td>
<td>Southbound arrival from Raleigh and Greensboro</td>
</tr>
<tr>
<td>5:15 PM</td>
<td>Piedmont</td>
<td>Northbound departure for Greensboro and Raleigh</td>
</tr>
<tr>
<td>8:12 PM</td>
<td>Carolinian</td>
<td>Southbound arrival from Raleigh, Washington and New York</td>
</tr>
</tbody>
</table>
All trains serve numerous intermediate points in addition to the destinations named.

**American Recovery and Reinvestment Act (ARRA)**

North Carolina was awarded funding under the ARRA for several projects, among them the restoration of the final three sections of double track, between Charlotte and Greensboro, passing sidings on the line from Greensboro to Raleigh and some funding for a new station in Raleigh. Since 2009 several of the passing sidings have been completed, and it is expected that the double track projects will be let for bid in 2013 and 2014, with completion by 2017. The completion of these projects will allow for the addition of a 4th, and ultimately a 5th, frequency of the Piedmont service between Charlotte and Raleigh.

In addition, ARRA funds have been designated for use, along with other state funds, for the purchase of land adjacent to the Charlotte Pipe and Foundry, just outside the I-277 loop for a train maintenance facility for both Piedmont services and future Southeast High Speed Rail (SEHSR) train sets. At this point, no funds have been identified for construction of the SEHSR Corridor.

In 1992, the US Department of Transportation designated five national High Speed rail corridors. The original SEHSR Corridor, extending from Washington DC to Charlotte NC was identified as the most economically viable.

The SEHSR program is designed to provide an alternative to the overburdened highway and airport networks. Because of its slower speed, the existing conventional passenger service is not time competitive with the highway and airport modes, but the proposed SEHSR service could reduce travel times between Charlotte and Washington from its current 10 hours to an estimated six to seven hours.

In 2004, the Rail Division of the NCDOT along with the Virginia Division of Rail and Public Transportation completed the National Environmental Policy Act (NEPA) Tier 2 Environmental Impact Study. Since that time both departments have been
refining alternative alignments and holding public meetings along the route seeking public comment. The most recent meetings were held in the spring of 2013. Information is available at www.sehsr.org.

**Western North Carolina Service**

In March 2001, NCDOT adopted a phased plan to extend passenger rail service to Asheville and Western North Carolina. This service would include a station stop in Statesville, within the CRTPA area. The plan includes renovating or building train stations that incorporate other community uses. NCDOT continues to work with communities on station and rail safety improvements, and is also working to identify funding to restore passenger rail service to Western NC. Information is available at www.ncbytrain.org.

**Proposed Multimodal Station**

A new multimodal station, to include a rail passenger facility, is being planned in Charlotte to better serve the increasing number of rail passengers, and to provide better connections to local transit options including intercity bus services. It will also accommodate the Norfolk Southern Railroad’s desire to separate passenger and freight operations at the existing North Tryon Street station.

The NCDOT has completed an engineering feasibility study for a multimodal facility on West Trade Street (the location of the original Charlotte passenger station) and has purchased 27 acres of land, bounded by West Trade Street, Graham Street, Fourth Street and the Norfolk Southern Railroad.

In 2012, the NCDOT and the City of Charlotte announced a partnership with the Hines Group out of Atlanta, GA as the Master Developer for the Charlotte Gateway Station. The City, Charlotte City Partners, the NCDOT and the Hines Group continue to meet to refine the station area plan. It is expected that the project will be a public-private partnership (P3) as it proceeds.

**Inter-City Bus**

**Mecklenburg County**

Greyhound Lines, Inc. serves the Charlotte region from its terminal located on West Trade Street. There are approximately 86 daily arrivals and departures serving the entire continental United States. Four local and ten express CATS routes, as well as the Gold Rush Red Line uptown circulator, serve the Greyhound terminal. This permits Greyhound’s passengers convenient access to the Charlotte Transportation Center and other transportation terminals in the region. As noted in the previous section, the NCDOT is currently acquiring land on West Trade Street for construction of a new multimodal station that could include a new inter-city bus terminal.

In addition, Megabus provides service to and from the Charlotte Transportation Center several times per day between Charlotte and the cities of Atlanta, Durham, New York, Richmond, and Washington D.C. Arrivals and departures to the cities listed range from one to three daily, seven days a week.
Union County
Greyhound Lines, Inc. serves Union County from its terminal located in the City of Monroe. There is one daily arrival and one daily departure serving the entire continental United States.

Iredell County
Greyhound Lines, Inc. serves Iredell County from its terminal located in the City of Statesville. There are two daily arrivals and three daily departures serving the entire continental United States.

Taxi Services
Passenger vehicle-for-hire services are an integral mode of transportation in the Charlotte region. Under City Code, the City of Charlotte regulates the industry within the corporate limits for safety, fares, and number of approved companies and vehicles. Effective July 2011, the City ordinance was revised to include regulation of not only metered vehicles (taxicabs) but also non-metered vehicles (limousines, shuttle vans, special needs vehicles, and executive cars).

Mecklenburg County
There are presently 11 approved taxicab companies located in Charlotte. These companies provide on-demand services to destinations throughout the Charlotte region. The distribution of vehicles is spread fairly evenly across service providers, with all companies having at least 30 vehicles in their fleet.

Aside from on-call services typically provided by taxi companies, Mecklenburg County’s Social Services has contracted with cab companies to offer reduced fare service to the elderly and disabled within the community. Additionally, CATS contracts with taxi operators to provide free rides home (up to twice a month) to vanpool and express bus riders who have emergencies, medical appointments, or unplanned work schedule changes.

Union County
There are currently seven taxicab companies providing service within Union County, operating 46 vehicles. These companies provide on-demand services in a similar manner to those companies in Mecklenburg County, although due to the more residential and low-density nature of Union County, they almost exclusively provide services on an on-call basis.

Iredell County
There are currently five taxicab companies providing service within Iredell County, operating 43 vehicles. These companies provide on-demand services in a similar manner to those companies in Mecklenburg County, although due to the more residential and low-density nature of Iredell County, they almost exclusively provide services on an on-call basis.
Coordination with MTP Development

The CRTP does not currently consider the modes described in this chapter — aviation, inter-city rail, inter-city bus and taxi services — in the development of its MTP project list and rankings.

The airport and rail projects currently in the NCDOT Transportation Improvement Program (TIP) are developed by the NCDOT Rail and Aviation divisions, as well as CATS, Charlotte-Douglas International Airport, the Charlotte-Monroe Executive Airport, and the Statesville Regional Airport. The CRTP approves amendments to the TIP to include such projects, but typically has very little to do with the actual development of the projects or coordination with the proposing agency.

For CATS’ transit projects in Mecklenburg County, the Metropolitan Transit Commission (MTC) governs all decisions. Union County Transportation, governed by the Union County Board of Commissioners, makes all public transportation decisions in Union County. Similarly, the Iredell County Board of Commissioners makes all public transportation decisions in Iredell County.

The 2040 Metropolitan Transportation Plan includes the following goals related to “Other Transportation Modes”:

**Goal 1**
Provide, manage, and maintain a safe, efficient, and sustainable transportation system for all modes, intended to serve all segments of the population.

**Objectives**
- Develop an efficient street and highway network capable of providing an appropriate level of service for a variety of transportation modes; and
- Enable all users to choose a convenient, comfortable way to reach their destination, regardless of location, personal mobility level, age or economic status.

**Goal 2**
Encourage Walking, bicycling and transit options, integrated with motor vehicle transportation, by providing a transportation system that serves the public with mobility choices.

**Objective**
- Include sidewalks and bicycle facilities in the design of roadways to accommodate and encourage pedestrian and bicycle travel, and maximize linkages to off-road facilities and transit services.
Sources:
http://charlottechamber.com/eco-dev/airport-fast-facts/
us.megabus.com
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List of Figures

16-1................. Other Transportation Modes
17. Freight

Through Moving Ahead for Progress in the 21st Century (MAP-21), the Federal Government has dramatically increased the visibility of freight movement in metropolitan areas throughout the United States. The guidelines, recommendations, and requirements set forth under MAP-21 are to be used by State Departments of Transportation and Metropolitan Planning Organizations (MPOs) to guide the development of an overall baseline assessment and a set of recommendations for improving the transportation network and its performance for freight movement. In addition, MAP-21 established a national freight policy with the following objectives:

1. Strengthen the contribution of the national freight network to the economic competitiveness of the US;
2. Reduce congestion;
3. Increase productivity, particularly for domestic industries and businesses that create high-value jobs;
4. Improve safety, security, and resilience of freight transportation;
5. Improve the state of good repair of the national freight network;

6. To use advanced technology to improve the safety and efficiency of the national freight network;

7. To incorporate concepts of performance, innovation, competition, and accountability into the operation and maintenance of the national freight network; and

8. To improve the economic efficiency of the national freight network.

The Charlotte Regional Transportation Planning Organization (CRTPO) must continue to monitor the regions' freight initiatives and recommendations and ensure the region is following the MAP-21 guidelines and policies. In addition, the region's perspective must be continually communicated with the North Carolina Department of Transportation (NCDOT) and Federal Highway Administration (FHWA) representatives.

This chapter examines the existing conditions, trends, and policies for freight movement in North Carolina, the Charlotte Combined Statistical Area (CSA), and the CRTPO planning area. The CSA is also referred to as the Charlotte Region and is a 13 county area at which freight movements are typically analyzed and reported. In addition, this chapter discusses statewide and regional planning initiatives as well as freight recommendations for the CRTPO area.

The map included in Figure 17-1 shows the 13 county Charlotte CSA Region as well as the CRTPO planning area. Figure 17-2 shows freight, rail, and intermodal freight facilities in the CRTPO planning area.

**Existing Freight Conditions**

The facts shown below provide information that impact freight and freight movement in the larger Charlotte Region which includes the CRTPO area. According to the Charlotte Chamber of Commerce, the following statistics highlight the current freight conditions:

- The Charlotte Region is the largest industrial hub in the Southeast US and 6th largest wholesale center nationwide;
- There are two major rail systems linking to 27,000 miles of track;
- 311 trucking companies are located in Charlotte, making this area the 11th largest in the U.S.; and
- 57 percent of Fortune 500 companies have facilities in the area.

Due to the increasing globalization of the economy as well as the importance of the global supply chain, freight logistics and transportation capacity have become an important platform for regional economic growth. Continuing economic growth and prosperity in the CRTPO region will require increasing the capacity of
local infrastructure to efficiently and effectively handle the forecasted growth of freight both in tonnage and value. As shown in the maps on the following page, the general origins and destinations of freight for North Carolina are not expected to change between now and 2040, but the absolute amount of freight moving on those corridors will increase. In addition, trucks are expected to remain the overwhelmingly dominant mode for freight movement in the region.

Table 17-1 shows the tons, ton-miles, and monetary value for freight carried by trucks, rail, and air in the Charlotte CSA region in 2011 and 2040. The percentage increase is also presented.

As illustrated in Table 17-1, the amount of freight carried to and from the Charlotte Region is overwhelmingly carried on trucks. Of this amount, approximately three-quarters remain within North Carolina. Much of the remaining trade between the Charlotte Region and other states is with adjacent states in the southeastern United States. Little trade occurs outside of the southeast, although rail and air freight does reach many parts of the country.

As shown in Table 17-1, by 2040, the freight flows are projected to increase from 64.7 million tons to 81.2 million tons of freight, 10.2 billion to 16.2 billion ton-miles, and $94 billion to $131 billion in monetary value. This represents a 25 percent increase in the amount of freight carried for trucks, but a 72 percent and 75 percent increase in the amount of freight moved by rail and air, respectively. Despite this

<table>
<thead>
<tr>
<th>Charlotte Region Freight Flows (NC Only)</th>
<th>Truck Freight</th>
<th>Rail Freight</th>
<th>Air Freight</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2040</td>
<td>%</td>
<td>2011</td>
</tr>
<tr>
<td>Tons (in thousands)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>63,691</td>
<td>79,472</td>
<td>25%</td>
<td>1,026</td>
</tr>
<tr>
<td>Ton-Miles (in millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9,683</td>
<td>14,907</td>
<td>54%</td>
<td>527</td>
</tr>
<tr>
<td>Value (in millions of dollars)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$93,615</td>
<td>$130,114</td>
<td>39%</td>
<td>$463</td>
</tr>
</tbody>
</table>

Source: Freight Analysis Framework Data Tabulation Tool, Center for Transportation Analysis in the Oak Ridge National Laboratory

Due to the increasing globalization of the economy as well as the importance of the global supply chain, freight logistics and transportation capacity have become an important platform for regional economic growth.
Major Flows by Truck To, From, and Within North Carolina: 2007

Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty-five FAF trucks per day and between places typically more than fifty miles apart.


Major Flows by Truck To, From, and Within North Carolina: 2040

Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty-five FAF trucks per day and between places typically more than fifty miles apart.

increase, nearly 98 percent of all freight will still be moved by truck in 2040, and over 92 percent of ton-miles.

Transportation of commodities has evolved, becoming increasingly important to companies, and regional economies, as noted by the Bureau of Transportation Statistics. Trends that will likely have an impact on the region include:

- Increasing shift of tonnage away from West coast ports to the East coast;
- Opening of the new, larger Panama Canal that will allow for much larger freight vessels;
- Potential change to “feeder” system of ships and ports reflecting adaptation to larger vessels;
- Increasing use of warehouses closer to ports and less reliance on scattered warehouses;
- Unknown impact from the increases in fuel costs and efficiencies;
- Availability of reliable workers and a large logistics workforce; and
- Freight traffic at east coast ports is expected to grow by 100 percent by 2020.

The projected increases noted in Table 17-1 require careful consideration and a re-examination of how freight is handled in the region, from policies to challenges facing the industry. In April 2013, the NCDOT concluded the state has not been adequately investing in its statewide tier of highways, which is affecting freight movement, and as a result restructured the state’s funding formula to emphasize improvements on higher volume roads and freight corridors. These changes, incorporated in the Strategic Transportation Investments (STI) program, have already begun to change how the CRTPO and other organizations evaluate and prioritize projects. Additional information about the STI and project evaluation process is included in the Financial Plan and Streets and Highways chapters.

**Trends in Intermodal Freight**

According to the 2009 NC State Rail Plan, the prospects for future rail intermodal business are bright, with national tonnage volumes rising 213 percent by 2035 and Panama Canal expansion moving more imports to the east coast ports. Transportation experts expect the $5.25 billion expansion of the Panama Canal to fundamentally alter global shipping patterns, allowing larger ships to pass through its locks. With larger cargo shipments on the move, goods can reach the East Coast both easily and economically.

As a part of this Metropolitan Transportation Plan (MTP) process, the CRTPO solicited input from private sector freight industries on transportation needs in the Charlotte Region. The results of this input included a focus on increased system flexibility and reliability within and through the region, rather than a focus on serving a specific route or port, as the implications from the widened Panama Canal are not yet fully understood.
Trends in Rail Freight

The 2009 NC State Rail Plan reports that major factors affecting growth in rail freight volume and tonnage show that between 2000 and 2030, the state’s total income is expected to increase by about $190 billion. These increases will also result in additional congestion on the roadways. In addition, the demand for consumer goods is also expected to increase which will create an increased demand for freight rail services. Key facts and trends affecting rail demand in the state and region include:

- The manufacturing sector contributes nearly 20 percent of the state’s gross domestic product (GDP) and requires efficient and reliable rail transportation to ensure continued competitiveness;
- North Carolina is the ninth largest agricultural exporter in the United States. Rail services play a key role in transporting the state’s agricultural products, as well as supplying supporting agricultural resources;
- As of 2013, North Carolina ranks 12th in the nation for coal consumption and relies on shipments of coal transported by rail from nearby states. Although there may be a decline in the future as alternative sources gain prominence, the increased emissions control technologies will likely support the continued use of coal; and
- North Carolina’s construction industry is one of the largest in the country and is dependent on rail and truck for transporting needed materials.

Freight Movements and Modes
According to the Federal Highway Administration (FHWA), overall freight tonnage is expected to double nationwide by 2020 with an 80 percent increase in tonnage in the southeast. In addition, the growth in regional population and businesses will also impact freight movement. The existing and projected growth is shown in graphics presented on the following page.

**Truck Freight**

As with passenger related travel, network performance for freight-related traffic focuses on congestion, pavement condition, and reliability. The defining difference between passenger and freight related movement is in the value of time. The value of time for trucks has been identified as significantly higher than for passenger vehicles. With the value of time for trucks, addressing recurring and intermittent congestion is of particular concern to freight-related businesses.

The most important freight-related roads within the CRTPO region are found on the NCDOT’s Statewide Mobility category of roads, which include the routes with the highest truck volumes. Several sections of the US, NC, and Interstate routes in the CRTPO region score among the most congested in North Carolina, specifically I-485 in southern Mecklenburg County, I-77 through Mecklenburg County and southern Iredell County, and US 74 in Mecklenburg and Union Counties.

Three of the locations, I-77 and I-485 near Pineville, I-77 near Lake Norman, and I-85 at I-485 near the Charlotte-Douglas Airport have been identified as three of the nation’s top 200 most congested locations. Each carry significant truck volumes and have high congestion scores from the NCDOT’s project evaluation process. In the CRTPO’s 2040 fiscally constrained project list, each of these facilities is targeted for upcoming capital improvements in the form of added lanes, managed lanes, upgrade to expressway standards, and constructing bypasses. The major truck routes and their levels of truck traffic are shown in Figure 17-3.
Air Cargo

Although air freight makes up a small fraction of the weight of cargo shipments in the State, the 2008 Statewide Logistics Plan notes that air cargo makes up a much higher percent of the monetary value of North Carolina cargo shipments. According to the plan, as of 2006, the Charlotte-Douglas International Airport carried approximately 42 percent of North Carolina’s 336 million pounds of air cargo carried each year. No other airport in the CRTPPO region provides air cargo services.

The Charlotte-Douglas International Airport is located seven miles from Uptown Charlotte, adjacent to a Foreign Trade Zone, and immediately accessible to major interstates. The Charlotte Air Cargo Center consists of approximately 500,000 square feet of facilities and over 50 acres of aircraft ramp space. The airport’s three runways, which can accommodate all types of aircraft, measure 10,000 feet, 8,845 feet, and 7,500 feet, respectively. To support air cargo operations, this airport also has a full complement of international service support organizations, including the U.S. Customs, the U.S. Department of Immigration and Naturalization, and the U.S. Department of Agriculture. The Charlotte Air Cargo Center has more than 70 freight forwarders, custom house brokers, and professional international service providers.

As will be discussed in more detail in the next section, Norfolk-Southern (NS) is currently relocating their intermodal facility from uptown Charlotte to the airport. This new intermodal facility, located between the second and third runways, is expected to be completed in 2014.

Railroads

The NS Railroad and CSX Transportation (CSXT) are the two major rail lines serving the Charlotte region and linking the region to the rest of the nation. These railroads bring more than 500 trains through the Charlotte CSA region per week. As mentioned above, NS is constructing a new intermodal facility at the Charlotte-Douglas International Airport to both significantly expand its intermodal capacity in the region and more easily access interstates.

The NS and CSXT freight railroad companies operate over 70 percent of the state system via major/mainline routes and service the Charlotte Region. NS operates 43 percent of North Carolina’s rail system. The NS north-south route connects the Northeast and Midwest to Atlanta via Danville, Virginia, Greensboro, and Charlotte. CSXT operates 34 percent of the system. CSXT’s east-west route connects Wilmington and Charlotte to Atlanta and New Orleans. There are three minor rail facilities connecting the CRTPPO region to the State:

- The state-owned North Carolina Railroad (NCRR) which extends from Charlotte to Morehead City, with portions leased by NS;
- The rail line leased by Aberdeen, Carolina, and Western Railroad from Raleigh to Charlotte via Sanford;
The rail line connecting Charlotte to Greensboro; and

- In addition, the Alexander Railroad provides regional service between Iredell and Catawba Counties. The Lancaster and Chester (L&C) railroad is located at the southern end of the Charlotte Region and connects to the NS and CSXT lines. The rail lines in the Charlotte Region are shown in Figure 17-4.

According to the NCDOT Rail Division, as of 2013 NS and CSXT together provide 128 train trips per day to the 13 county Charlotte Region. NS runs 78 trains a day on the line roughly paralleling I-85 from both the east and west. CSXT provides 39 train trips per day along the US 74 corridor. North-South trips roughly paralleling I-77 and east-west along NC 24-27 include 13 trips per day.

**Intermodal Facilities**

Intermodal facilities allow for the easy transfer of freight between railroads, planes, ships, and trucks. With five freight terminals, the CRTPO area contains 28 percent of all freight intermodal terminals in North Carolina. These terminals include:

- The Charlotte-Douglas International Airport;
- The Norfolk Southern Intermodal Freight Terminal;
- The CSX Intermodal Freight Terminal;
- The North Carolina State Ports Authority; and
- The Pipeline Tank Farms (Paw Creek, Mecklenburg County).

The two major NS and CSX intermodal facilities at the airport and on Rozzerses Ferry Road are the primary intermodal yards in the region and are key to the two Class I railroads’ goal of providing speed and reliability which is comparable to trucks. The railroads are focusing improvements to these facilities and the lines leading to them to ensure quality service.

![Intermodal Facility Image](image-url)
Planning Initiatives

Statewide Planning Initiatives

As noted earlier, the change in the statewide prioritization process is focused on the major arterials, which include the major freight corridors. In addition to this change in the prioritization process, the following highlights several other state initiatives relevant to freight movement.

Logistics Task Force

In response to House Bill 1005, Session Law 2007-551, the North Carolina Office of State Budget and Management coordinated the development of a statewide logistics plan that addresses the state’s long-term economic, mobility, and infrastructure needs. The plan evaluates the following components:

- Identification of priority commerce needs;
- Enumeration of transportation infrastructure actions, including multimodal solutions that will support key industries vital to the State’s long term economic growth;
- Endorsement of the plan based on input from State agencies and the private sector regarding these needs and actions; and
- A timetable to meet any identified needs.

The Logistics Task Force reviewed transportation systems in North Carolina including roads and highways, railroads, airports, ports, and the multimodal interaction of transportation modes. This task force developed two statewide reports, the Statewide Logistics Plan and the Seven Portals Study.

Statewide Logistics Plan

The 2008 Statewide Logistics Plan notes that the Department of Commerce identifies agriculture (related to biotechnology and winemaking), textiles (as an emerging high-tech sector), and defense-related industries as key features of the future North Carolina economy. Other key sectors include information and communications technology, motor vehicles and heavy equipment, business and financial services, and chemicals, plastics, and rubber. Adding to this mix is growth in sports development, basic science and technology research, the film industry, and North Carolina’s traditionally strong and growing tourism, marine and seafood industries.
The Statewide Logistics Plan made two important recommendations that affect the NCDOT, the CRTPO, and its members through emphasizing system reliability and alternative road finance mechanisms such as tolling or vehicle-miles traveled (VMT) fees. These recommendations are the following:

- Transform NCDOT into an operations-based agency; and
- Facilitate pass-through traffic – especially traffic traveling on I-95, I-85, and I-77 in a north-south direction.

These recommendations highlight the role of transportation in the economy and the need to consider non-traditional funding strategies and specific performance metrics to meet the needs of private industry and the freight movements that significantly impact the transportation system.

**Seven Portals Study**
The goal of this 2011 study was to investigate potential “logistics villages” within each of the seven economic development regions across the state. The term “logistics villages” refers to freight-oriented business parks and intermodal centers. The initial focus for identifying such sites was proximity for air, rail, and highway connectivity, but the study discovered other possibilities for successful villages.

The Study provided recommendations for infrastructure and policy improvements to help increase economic activity and transportation efficiency at these sites, such as access between intermodal and private distribution centers, rest and parking areas for drivers, and fixing choke points and bottlenecks. The sites identified in the CRTPO region include:

1. **Mecklenburg County**
   - Charlotte-Douglas International Airport
   - Steele Creek-Arrowood-Westinghouse Industrial Center
   - Dixie-Berryhill Area

2. **Union County**
   - Charlotte-Monroe Executive Airport
   - Legacy Village

3. **Iredell County**
   - Statesville Regional Airport
Piedmont Improvement Program

Since the 1990s, the NCDOT Rail Division has actively worked to close at-grade rail crossings and make other incremental improvements to improve safety and reliability for rail transportation in North Carolina. In January 2010, North Carolina received $545 million through the American Recovery and Reinvestment Act (ARRA) stimulus program to improve the NCRR corridor between Charlotte and the Raleigh area, to be completed by September 2017. This project includes 12 miles of new track, 15 new grade separations, and the replacement of 51 public and private crossings. Due in part to the ARRA funding, the NCRR will ultimately have double tracks between Charlotte and Greensboro. A major component of this project is a grade separation of the NS and CSXT mainlines near Uptown Charlotte. This $110 million project will significantly increase capacity and reliability through the area.

Charlotte Railroad Improvement and Safety Program

The Charlotte Railroad Improvement and Safety Program (CRISP) is a partnership among freight and transit providers and state and local agencies that are involved with freight and passenger rail transportation planning and implementation. Some of the objectives of CRISP include modernizing existing track infrastructure, improving safety and efficiency, and improving the environment and local quality of life. The grade separation of the NC and CSXT mainlines near Uptown Charlotte represent a component of CRISP. The graphic below contains a complete listing of CRISP projects.
Regional Planning Initiatives

CONNECT
“CONNECT Our Future” is a process in which communities, counties, businesses, educators, non-profits, and other organizations work together to grow jobs and the economy, improve quality of life and control the cost of government. This project, administered by the Centralina Council of Governments (CCOG), will create a regional growth framework developed through extensive community engagement and build on what communities identify as existing conditions, future plans and needs, and potential strategies. The CONNECT Our Future three-year process, from 2012 through 2014, is engaging public, private and non-profit organizations across a multi-county region, which includes the CRTPO planning area.

The information developed by CONNECT Our Future will inform economic development and land planning initiatives throughout the area, particularly on supporting current and future employment centers, establishing transportation priorities, and minimizing the negative effects of such activities. Siting and supporting manufacturing and associated land uses is an output of this process, which will affect the transportation demands and projections used in generating candidate projects and priorities for CRTPO into the future.

Regional Freight Mobility Plan Scoping Process
In 2009 and 2010, the CCOG led a regional governance study to evaluate the region’s current arrangement for conducting transportation planning, and compare it to several comparably-sized regions throughout the country. One of the issues identified through this process was the need for continued study and planning for freight movement at the regional level. It is anticipated that a regional Freight Mobility Plan will be developed, building on the framework provided by the CONNECT Our Future effort.
Freight Rail Recommendations

The 2008 Statewide Logistics Plan identified rail issues within the state and developed recommendations. While these issues and recommendations were developed on a statewide basis, they are directly applicable to the CRTPO planning area. Historically, private investment has funded rail infrastructure enhancements; however over the last decades, railroads have struggled to earn sufficient profits to afford such investments. Although somewhat improved for Class I railroads, it is highly unlikely that the NC short-line railroads will earn sufficient profits to self-fund needed infrastructure investments anytime in the foreseeable future. In addition, Class I railroads will likely only be motivated to invest in those areas where volume is sufficient to make such investment financial viable. Within this scenario, it is likely that any significant expansion of rail facilities or service will include some form of public participation.

Accordingly, the Logistics Plan identified the following that must be considered to enhance the rail infrastructure within the state:

- Retain existing rail corridors and halt track removal;
- Continue direct support for short-line railroad infrastructure improvements;
- Expand capacity in high-use rail corridors, including the expansion into double/triple track configurations;
- Enhance/improve scheduling and coordination with passenger rail service;
- Explore routing options for hazardous materials shipments to avoid highly populated areas;
- Reduce at-grade rail/highway crossings; and
- Provide rail access to North Carolina Port Authority inland terminals (currently located in Greensboro and Charlotte).

CRTPO Specific Recommendations

The following recommendations have been developed for the MTP. These recommendations were developed within the statewide and regional framework provided by the existing and ongoing initiatives.

1. Actively participate in future discussions with the NCDOT to develop MAP-21 compliant performance metrics for freight movement in North Carolina that:
   - Provides incentives to projects improving travel time reliability;
   - Decreases on-road emissions from freight movement;
   - Develops a reliable network with flexible routing options; and
   - Improves access to freight-intensive land uses.
2. Initiate data collection and analysis programs to assess the effectiveness of completed projects, consistent with MAP-21 regulations and metrics as approved by the USDOT, the NCDOT, and the CRTPO.

3. Participate in CONNECT and other regional and statewide initiatives to determine support and direction for a freight mobility plan for the region. If recommended through these initiatives, the plan should take a broad approach to addressing issues identified through the 2012 freight mobility plan scoping process. The issues included the following:
   - Inter-agency coordination;
   - Transportation;
   - Land use;
   - Economic development; and
   - Environment and energy.

4. Retain freight-oriented variables in the CRTPO MTP and Transportation Improvement Program (TIP) project ranking processes and Congestion Management Process (CMP) to adequately consider important freight-related variables, such as:
   - Land access;
   - Travel time reliability;
   - Congestion;
   - Inter-model connections; and
   - Safety.

5. Implement Seven Portals Study recommendations for “logistics villages” and general freight-oriented development, including:
   - Improved access roads to freight facilities, i.e. “the last mile”;
   - Increased rest and parking areas for trucks and their drivers; and
   - Addressing choke points and bottlenecks in the transportation system.
Sources:

Charlotte Chamber of Commerce

FHWA Freight Analysis Framework
List of Figures

17-1 .................. Charlotte CSA Region
17-2 .................. Freight, Rail, and Intermodal Freight Facilities
17-3 .................. Truck Traffic Volume
17-4 .................. Charlotte CSA Region Rail Lines
Figure 17-3

Legend

- CRTPO Planning Area
- 2010 Daily Truck Volume
  - 250 - 1000
  - 1001 - 4000
  - 4001 - 12500
  - 12501 - 18500

Source: North Carolina Department of Transportation

Prepared by Charlotte-Mecklenburg Planning Department, April 2014

Truck Traffic Volume

[Map of the region with detailed locations and traffic volume categories]
Figure 17-4

Legend

- CRTPD Planning Area
- Charlotte Combined Statistical Area (CSA) Region
- Operator
  - Aberdeen Carolina & Western Railway
  - Alexander Railroad
  - CSX Railroad
  - Norfolk Southern Railroad
  - Lancaster And Chester Railroad

Prepared by Charlotte-Mecklenburg Planning Department, April 2014
18. Conclusion

The Charlotte Regional Transportation Planning Organization’s (CRTPO’s) Metropolitan Transportation Plan (MTP) is updated every four years. Updating the MTP allows CRTPO, as it does any Metropolitan Planning Organization (MPO), the opportunity to incorporate the most recent data, identify any changes in factors affecting travel demand, and modify policies, programs or projects based on the most recent information and conditions. In essence, these activities are an ongoing process for the MPO, but the MTP update provides a platform for sharing this updated information, as well as ensuring that the MPO is complying with federal regulations in order to continue receiving federal funds to address the many needs of the region.

This 2040 MTP is especially different from previous long-range plans because of the many changes that have occurred in the region since the last plan update in May 2010. Those changes have been highlighted and explained throughout the 2040 MTP, and are represented most significantly by the following:

- An increase in population, membership and area of the MPO due to the expansion of the Charlotte Urbanized Area, as a result of the 2010 Census;
- A new name for the MPO, the Charlotte Regional Transportation Planning Organization, triggered by the expansion of the MPO’s planning area boundary;
- New Federal transportation legislation enacted in 2012, Moving Ahead for Progress in the 21st Century (MAP-21); and
- New State transportation legislation enacted in 2013, Strategic Transportation Investments (STI).
Urbanized Area (UZA) Expansion

As discussed in the Population and Land Use chapter, following the 2010 Census, the Charlotte UZA grew substantially between the 2000 Census and 2010 Census in population (increased by 65 percent) and area (increased by 70 percent). As a result, the MPO planning area boundary was extended to take in additional area to the south and west in Union County – notably the Town of Marshall – and a portion of Iredell County to the north – including the jurisdictions of Mooresville, Troutman and Statesville.

Due to its expansion, the MPO is now responsible for long range transportation planning in two North Carolina Department of Transportation (NCDOT) funding regions (Regions E and F), as well as two NCDOT Divisions (Divisions 10 and 12). While this is positive in that it means potentially more funding for the CRTP, it also brings the challenges of coordination with additional jurisdictions, implementation of plans and programs for a larger geography, and prioritizing and programming a greater number of projects. All of these activities must be accomplished while determining how to most efficiently and effectively utilize limited staff resources, and integrate and educate new MPO members.

Charlotte Regional Transportation Planning Organization (CRTP)

As mentioned, the expansion of the planning area boundary of the MPO has led to many changes. One of the most significant, being the additional membership to the MPO, which triggered revisions to the MPO’s Memorandum of Understanding (MOU), and consequently, a new name for the MPO – the Charlotte Regional Transportation Planning Organization, which became effective in October 2013. The CRTP consists of 27 jurisdictions, 24 of which are dues-paying, voting members, along with Federal Highway Administration (FHWA), NCDOT, and Metropolitan Transit Commission (MTC) representation.

When work began to update the MTP, the final UZA boundaries were not yet known, but it was anticipated that the Charlotte UZA would grow, and consequently the MPO boundary would expand. With that in mind, it was determined that the 2040 MTP update should reflect these expected changes. Some of the significant changes to the MTP include:

- Substantial revisions to the goals and objectives such as the inclusion of a goal to emphasize linkages between transportation and land use planning (Goals and Objectives chapter);
- Development of a new roadway ranking methodology, designed to more efficiently prioritize the nearly 300 candidate projects submitted for inclusion in the MTP, and to be more consistent with the State’s project evaluation process (Streets and Highways chapter);
- Development of a new Congestion Management Process using a more performance-based approach, utilizing innovative travel time index (TTI) data (Congestion Management Process chapter); and
The inclusion of a Health Impacts chapter, which describes the connection between public health and transportation and land use planning (Health Impacts chapter).

Along with the above-referenced changes, the updated 2040 MTP has a new look, indicative of the vast changes that have taken place, as well as creating a template for future plan updates. By incorporating the changes outlined, the CRTPO is taking steps to continue to improve its planning efforts, and to remain consistent with federal and state legislation.

Moving Ahead for Progress in the 21st Century (MAP-21)
The federal legislation, MAP-21, is discussed in the introduction of this MTP, but is worth noting again, as there are significant changes from previous federal transportation legislation that bear repeating. These changes are important particularly with regard to establishing national goals, introducing performance measures that must be addressed by State departments of transportation and MPOs, and consolidating certain funding sources as described below:

National Goals
MAP-21 established seven national, performance-based goals which include Safety, Infrastructure Conditions, Congestion Reduction, System Reliability, Freight Movement and Economic Vitality, Environmental Sustainability, and Reduced Project Delivery Delays. It is intended that State resources will be invested in individual projects that will collectively help attain specified performance outcomes, in particular with regard to accelerating project delivery.

Performance Measures
Since the national goals introduced by MAP-21 are intended to be performance-based, performance measures will be established at a national level, followed by States and MPOs developing their own performance targets in support of those measures. It is also incumbent upon States and MPOs to report how project selection will help achieve the defined targets.

Funding Consolidation
A new program, known as Transportation Alternatives (TA), was created under MAP-21 to fund a variety of “alternative” transportation projects that were previously eligible under several different funding categories. Eligible funding activities under TA include transportation enhancements, recreational trails, and safe routes to schools, among others. MPOs with urbanized area populations over 200,000 people, such as CRTPO, will be able to establish and conduct a competitive process to determine how the funds should be allocated. CRTPO anticipates receiving approximately $1.6 million in TA funds.
Strategic Transportation Investments (STI)
Not only has new federal legislation been passed since the CRTPO’s last MTP update, but new State transportation legislation was enacted in June 2013. The new STI legislation replaces what was previously referred to in the State of North Carolina as the “equity formula,” which had been in place since 1989. The STI is highlighted by the fact that it consolidates what were several funding categories, into two broad categories – the Highway Trust Fund for capital projects of all modes, and the Highway Fund for maintenance and operations – with the intent of directing more dollars to high priority capital projects of statewide importance. One implication is that candidate projects proposed throughout the State will compete for funding based on a set of quantitative criteria developed by a work group of the NCDOT.

As a result, the CRTPO revised its MTP revenue assumptions to more closely align with the new legislation (described in detail in the Financial Plan chapter of the MTP), and amended its roadway ranking criteria in order to evaluate projects in a manner more consistent with what is being done at the statewide level.

MTP Amendment Process
All of these changes highlighted above, and throughout the 2040 MTP, imply that there is some uncertainty as the CRTPO moves ahead into unchartered territory, not only as it adjusts to the new composition of a larger membership, but also as guidelines and requirements of evolving federal and state legislation are carried out.

A new MTP update will not be required for four years from the approval date of the 2040 MTP; however, a lot could happen within that four year timeframe. Specifically, the State and the State’s MPOs will be developing a new Transportation Improvement Program (TIP) for the first time since the STI legislation was enacted. Any number of potential situations could trigger a MTP amendment, which is defined (per 23 CFR 450.104) as:

“…a revision that involves a major change to a project, the addition or deletion of a project or a major change in project cost, project/project phase initiation dates, or a major change in design concept or design scope (e.g. changing project termini or the number of through traffic lanes).”

These types of MTP amendments require public review and comment, the re-demonstration of fiscal constraint, and, for the CRTPO, a conformity determination for non-exempt projects due to the MPO’s status as a non-attainment area for air quality. An amendment to the MTP must be approved by the CRTPO Board, in consultation with the FHWA.
Looking Ahead

In concluding this 2040 MTP update, and looking at what lies ahead for the region, it cannot be overstated how much growth has occurred in the State of North Carolina, but particularly in the Charlotte UZA. Over the past decade, it was one of the fastest growing regions in the nation, with a 65 percent increase in total population from the 2000 Census to the 2010 Census. Demographic projections show growth is expected to continue at a rapid pace for the foreseeable future, including increases in employment as areas within the CRTPO planning area continue to steadily attract new jobs.

The region’s growth has increased the demand for transportation facilities and services, and the CRTPO’s commitment to investing in transportation infrastructure has helped the area attract and cope with the current population growth and travel patterns. In addition, the growth has spurred economic activity which has significantly increased the freight activity in the region. Completion of an intermodal freight facility at the Charlotte-Douglas International Airport in 2014 is a prime example of an important infrastructure investment in the region to continue to keep pace with the evolving economic conditions. It also complements the various other activities taking place at the Charlotte-Douglas International Airport, which is already one of the most active airports in the country, ranking sixth nationally in overall operations and eighth nationally in total passengers.

The CRTPO’s 2040 MTP describes investments in freeways, other roadways, transit, and alternative modes of transportation that will provide additional capacity to serve the anticipated increase in travel demands projected in the region through 2040. In its continued attempt to accomplish its goals, the CRTPO has proven that it is willing to explore innovative project design and funding options, such as the implementation of managed lanes through a public-private partnership and the expansion of the light rail infrastructure through the utilization of federally acquired grants. Additionally, the CRTPO continues to emphasize the importance of alternative modes of transportation, as evidenced by the investment in bicycle and pedestrian planning, the introduction of bike share in Uptown Charlotte and adjacent communities, and the Mooresville to Charlotte Trail linking Iredell and Mecklenburg counties.

Even with the amount of growth and change occurring in the region, it should be noted that air quality in the CRTPO region continues to steadily improve, due in part to better emissions controls, along with advanced technologies which contribute to a reduction in the amount of emissions produced by vehicles. The CRTPO also evaluates and ranks projects for the allocation of Congestion Mitigation and Air
Quality (CMAQ) funds, which are funds programmed for projects that demonstrate a reduction in harmful emissions (refer to the Environment chapter of the MTP for additional information).

Finally, the CRTPo recognizes the importance of remaining engaged with its regional partners and member jurisdictions, and actively participating in the continuing, cooperative and comprehensive (3-C) process upon which MPO activities were originally based. The CRTPo continues to plan for future transportation needs that are compatible with the diverse land use patterns within the region, invest in all modes of its transportation network, maintain its desirability as a place to live and work, and remain economically competitive while engaging in activities that are not detrimental to environmental resources. All of these factors point toward a promising future for this dynamic region.
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