



Cabarrus Rowan Community College - Photo from Rowan Chamber of Commerce

Safety Measures

Safety has long been a primary concern of transportation system management, maintenance, and system expansion.

SAFETEA-LU placed a greater emphasis on safety at the planning systems (MTP) level with essentially three components:

1. Under 23 CFR 450.306(a)(3) that MPO's increase the security of the transportation system for motorized and non-motorized users;
2. Under 23 CFR 450.306(h) that the metropolitan transportation planning process should be consistent with the Strategic Highway Safety Plan, as specified in 23 USC 148, and other transit safety and security planning and review processes, plans, and programs as appropriate;
3. Under 23 CFR 450.322(h) that the metropolitan

transportation plan should include a safety element that incorporates or summarizes the priorities, goals, countermeasures, or projects for the MPO contained in the Strategic Highway Safety Plan required under 23 USC 148.

The goal of the Strategic Highway Safety Plan is to reduce the number of fatalities and to decrease the economic impact from highway-related crashes. As projects are planned and developed, elements from the SHSP should be incorporated and linked back to the planning systems level in the CR MPO.

Such improvements are reflected in the Transportation Improvement Program as well as in the day-to-day work of field operations. Within the 2018-2024 TIP, NCDOT has the following spot safety projects programmed for the CR MPO:

Table 6-1 Spot Safety Projects

Roadways	Proposed Safety Improvement
Gold Knob Road, Anthony Road, and Crescent Road	Realign intersection
NC 801 at Parks Road	Realign intersection and turn lanes
Old Beatty Ford Road	Widen lanes and install rumble strips
Old Beatty Ford Road	Relocation with new bridge of I-85
Stokes Ferry Road and Oddie Road	Intersection improvements
Poplar Tent Road and US 29	Intersection improvements
NC 3 and US 601	Intersection improvements
Roxie Street and NC 3	Improvements

The Cabarrus-Rowan 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. Safety is a consideration in the CMP, partly because roadway incidents are a significant source of traffic congestion. NCDOT implements a regional safety program through coordination between Division 9 and 10, the office of the Area Traffic Engineer, law enforcement, and the Cities of Salisbury, Kannapolis, and Concord.

The CMP and MTP recommend continued use of incident management patrols, coordination with law enforcement agencies, and implementation of safety and mobility projects by the MPO and the NCDOT to respond to safety trends and issues.

Additional MPO and NCDOT strategies aimed at increasing the efficiency of the transportation system without adding additional capacity to the roadways include:

- Expansion of transit operations
- Advance Traveler Information Systems and Variable Message Signs (VMS)
- Improvements to the Concord and Salisbury Signal Systems

Safety can be measured in a number of ways. Transportation Planners tend to think about safety in terms of specific roadways. It is also important

to understand the overall safety conditions of the system of roadways. The NC Department of Motor Vehicles (DMV) collects many types of safety and accident attributes at the county and municipal level.

The Cabarrus-Rowan MPO is fortunate that the planning boundary coincides with the county lines for Rowan and Cabarrus, and there are 3 municipalities with over 10,000 in population in the MPO. Moreover, NCDOT provides rankings to show relative progress of safety initiatives within counties and cities in comparison to their jurisdictional cohorts. For example, by combining a number of factors such as crash severity, crash rates based on population, registered vehicles, and estimated vehicle miles traveled, NCDOT projected that Rowan County went from a ranking of 42nd in 2007 to a ranking of 62nd in 2012 to 46th in 2016 among the 100 counties in NC. Cabarrus showed slight decline from 75th in '07 to 66th in '12 to 55th in 2016.

For those same factors, NCDOT ranked the City of Salisbury at 10th among municipalities greater than 10,000 in 2016, up from 22nd in 2012 and 17th in 2007. The City of Concord actually increased from 21st to 13th in 2012 and down to 26th in 2016 and the City of Kannapolis improved slightly from 36th to 40th in '12 to 45th in 2016. It should be noted that a lower rank is actually a positive indication that a city or county's safety trends are improving relative to the overall population.

With respect to measuring safety on specific roadways and intersections, NCDOT provides a wealth of data on crashes and accidents. Some of the NCDOT safety measures include accident rates, the severity index, and exposure. The 1990 NCDOT “Traffic Accident Analysis Manual” defines a severity index with a formula that is used to measure the mix of accident severity in a group of accidents at a specific location. The severity index is unique to a particular intersection and can be used to calculate the EPDO Index (Equivalent Property-Damage-Only Index). This index is more relevant to comparing intersections or corridors because it includes the vehicle exposure measure or number of times vehicles are exposed to the paths of other vehicles’ paths. The severity index for NCDOT Division 10 is 4.64 and 5.43 for NCDOT Division 9. These numbers represent an average of accident severity for the larger regions that include the 2 counties of the Cabarrus-Rowan MPO. Surrounding Urban Areas in the Metrolina Region have used the EPDO Index to define and highlight high accident locations. An index score of 360 translates to an unusually high number of accidents that resulted in relatively large amounts of property damage. The MPO requested accident data on several key intersections within the Urban Area and has ranked them accordingly.

Table 6-1 lists the key intersections as recommended by MPO jurisdictions with several performance measures

Local Measures

In order to assist the state of North Carolina in meeting its goal of reducing the number of fatalities and decreasing the economic impact from crashes, jurisdictions within the CR MPO are pursuing a number of initiatives including additional street lighting, crosswalks and pedestrian signals, bicycle and pedestrian signage, sidewalk construction, access management, and median installation. A couple of towns are currently pursuing Safe Routes to Schools (SRTS) funding through the NCDOT Division offices to enhance pedestrian safety for elementary school children. In addition, several cities have agreed to close at-grade

railroad crossings, planning and construction for grade separated crossings, and improvements to existing at-grade railroad crossings as part of the North Carolina Sealed Corridor Program. All of these local measures are intended to reduce potential conflicts and avoid future crashes and fatalities, which is consistent with the State’s overall safety goal. The 2045 MTP will further support this goal by carrying many of these local measures into project development and implementation. Safety is often a hidden and immeasurable cost to the transportation system that can be borne by consumers of all modes of transportation. Conversely, investment in safety measures can result in hidden and immeasurable benefits to those same consumers. The CR MPO will continue to partner locally or with NCDOT in those efforts that will enhance safer roads, routes, crossings, etc. and ultimately reduce crashes system wide.

Security

Highway

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 Department of Defense, comprises about 45,400 miles of Interstate and defense highways and 15,600 miles of other highways.

STRAHNET 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 Cabarrus-Rowan Urban Area there are three STRAHNET routes: I-85 and NC 49. These routes are also listed in the MPO’s Priority List for improvement by NCDOT thru the TIP.

The MPO and City of Concord staff have participated in the Cabarrus County Highway Incident Team meetings where representatives from the local Emergency Management Systems, police and fire departments, and NCDOT Incident Management Assistance Program (IMAP) to discuss accidents, disasters, and major events at Lowe's Motor Speedway. During the major races (fall and spring) at the Speedway, special evacuation plans are devised and implemented to accommodate the huge flow of traffic accessing and departing the Speedway complex. In addition to these plans, intersection improvements, and TIP capacity projects, the MPO should consider the following recommendations for improving security on the MPO's streets and highways.

Highway Recommendations

1. Reduce the number of fatalities and decrease the economic impact from highway-related accidents
2. Continue use of incident management patrols, coordination with law enforcement agencies, and implementation of safety and mobility projects by the municipalities and the NCDOT to respond to safety trends and issues.

Transit

Authority for emergency response activities and the use of community resources and services to respond to large scale emergencies is granted by various legislation that includes the Robert T. Stafford Disaster and Emergency Assistance Act (Federal Level), North Carolina General Statute 166A Emergency Management Act (State Level), Cabarrus County Emergency Operations Plan (County Level) and Concord City Code.

The purpose of the CK Rider Emergency Action Plan is to identify how CK Rider will work with local government's emergency operations and procedures. The plan will detail CK Rider's framework for response to disasters based on the management concepts contained within the National Incident Management System.

The National Incident Command System (NIMS) is intended to standardize response to emergencies involving City Departments and other jurisdictions or multiple agencies. The system is intended to be flexible and adaptable to the needs of all emergency responders. Emergency response agencies use basic principles and components of emergency management, including the Incident Command System, multi-agency or inter-agency coordination and established mutual aid systems.

NIMS is a nationally used, standardized, on-scene emergency management concept which allows incidents of all sizes to be organized in a common structure regardless of jurisdictional boundaries. NIMS uses standard incident command structures (ICS, Multi-agency Coordination, and Public Information) to provide the national framework for incident response.

All jurisdictions served by CK Rider, use the incident command system. In order for ICS to be used at all incidents, the first emergency responder on scene will always take the following basic actions:

- establish Incident Command Post, (ICP);
- size up the incident;
- determine the ICS organization elements required;
- request additional resources necessary to mitigate the incident;
- delegate authority within the ICS organizational structure; and
- develop Incident Action Plan, incorporating the incident objectives and strategies.

Incident Command System Functions

The five functions of the ICS organization are command, operations, planning, logistics, and administration.

Command is responsible for directing, ordering, and/or controlling resources by virtue of explicit legal, agency or delegated authority.

Operations is responsible for the coordinated tactical response of all field operations through an Incident Action Plan.

Planning is responsible for the collection, evaluation, documentation, and use of information about the development of the incident.

Logistics is responsible for resources and materials in support of the incident.

Finance/Administration is responsible for all financial and cost analysis aspects of the incident, and/or administrative functions.

Principles

NIMS can be used to manage incidents of all sizes. The organizational structure adapts to any emergency or incident to which emergency response agencies would expect to respond. The system can grow as an incident grows or contract as the incident needs decrease. The system has basic components in organization, terminology and procedures.

Unified Command

This form of ICS allows all agencies with responsibility for the incident to manage an incident by establishing a common set of incident objectives and strategies.

Span-of-Control

Manageable span-of-control within ICS is a limitation on the number of personnel who can effectively be supervised or directed by an individual supervisor. The ordinary span-of-control range is between three and seven personnel.

Pre-designated Incident Facilities

These are a common set of titles given to different facilities used in managing an incident such as command post, staging or heli-spot. The determination of the types and locations of facilities to be used will be based upon the requirements of the incident.

Transit-Related Roles in Local Emergency Management

During a local disaster or emergency, CK Rider Transport may be called upon to fulfill various functions. The majority of these will be coordinated through the Transportation Emergency Support Function section of the EOC.

These functions can include:

- Evacuation of local residents during flooding, fires, hazardous material spills, bomb threats, or other emergency conditions.
- Transportation of citizens during mass inoculations;
- Transport of emergency workers and volunteers to and from an emergency staging site;
- Use of air conditioned/heated buses as temporary shelters/respice facilities for emergency workers and victims, especially valuable during a fire or hazardous-material response effort;
- Monitoring of road conditions; determine safe travel routes,
- Windshield damage surveys
- Providing supplemental vehicles for police or other local agency.

The individual nature of a disaster prevents this list from being all-inclusive, nor does it indicate that CK Rider will be able to perform these missions during all emergencies. CK Rider will need to assess its resources, capabilities, and the potential needs and hazards that are likely to be faced within the cities it serves. Working with local governments and emergency response personnel, CK Rider can determine the function that they are best able to fulfill.

Basically, CK Rider will be asked to provide assistance in minor emergencies or those which have little or no effect on the normal level of service and those situations of a greater magnitude which result in service disruptions. Each situation will have different implications on CK Rider's internal priorities. In most situations, the continued safety and operation of the system will take precedence, though if CK Rider is not operating more resources will be available

Transit Recommendations

The City of Concord and CK Rider Transportation partner in the Transit Watch Program, a new public awareness and education campaign patterned after the successful "Neighborhood

Watch” program initiated in our community. Promoting transit as a community partner and safe haven, Transit Watch targets transit employees, passengers and neighborhood residents with a call for active involvement in staying alert and working together to maintain a safe transit environment.

The Transit Watch program is part of a nationwide initiative developed by the U.S. Department of Transportation’s Federal Transit Administration (FTA). In structuring the program, the FTA worked with industry partners, including the American Public Transportation Association (APTA), the Community Transportation Association of America (CTAA), the Amalgamated Transit Union (ATU), and the Transportation Security Administration (TSA).

The program will consist of signs in strategic locations throughout the public transit system, such as businesses served, city web page, and at selected bus stops. Brochures will also be available system wide for free distribution to riders as well as the general public.

Additionally, the Transit Watch brochure includes the following detailed information:

- How to identify a suspicious package
- How to identify suspicious behavior or activities
- What to do in the event of a transit emergency or evacuation
- Personal emergency numbers and contacts for quick reference
- Overall emergency preparedness tips for individuals and families

All CK Rider transit revenue service vehicles are equipped with onboard digital audio and video surveillance systems, with 9-10 cameras providing full coverage both inside and outside each vehicle. This system can be access in real time, or stored video can be removed from each vehicle at a later time and downloaded for viewing and assessment. This system contributes significantly to the safety & security of the customers that use CK Rider.

Performance Based Planning Measures

Federal statutes 23 CFR 490 and 23 CFR 450 detail regulations that State DOT’s and MPO’s must follow regarding the inclusion of performance measures into the planning process, and implementation and details of the performance management process (targets, measures, etc.). Since the Federal regulations were issued in three separate rulemakings, the performance measures can broadly be grouped into 3 categories:

1. Safety
2. Pavement/Bridge, and
3. CMAQ, Reliability, and Freight.

There are 5 targets for safety-related performance measures that were recently submitted as part of NCDOT’s yearly Highway Safety Improvement Program (HSIP) annual report. This report was submitted to FHWA on August 31, 2017, and included the 5 safety-related measures:

1. Number of fatalities
2. Fatality Rate (per 100 million VMT)
3. Number of Serious Injuries
4. Serious Injury Rate (per 100 million VMT)
5. Number of Non-motorized (Pedestrians and Bicyclists) Fatalities and Serious Injuries.

MPO staff participated in the collaborative effort to establish NCDOT’s 2018 safety targets for these measures during the Safety Target Setting Coordination Training Workshop held in March, 2017. During this workshop the State discussed a coordination and collaboration process between NCDOT and the MPO’s.

Per section 490.209 (c), MPO’s will have 180 days from August 31, 2017 to establish a target by either:

- a) Agreeing to plan and program projects so that they contribute toward the accomplishment of NCDOT’s safety target for that performance measure; or
- b) Committing to a quantifiable target for that performance measure for your metropolitan planning area.

The NCDOT's 2018 Safety Targets to be achieved by December 31, 2018 are as follows:

Highway Safety Improvement Program (HSIP)

- 2018 HSIP goal is to reduce total fatalities by 5.10 percent each year from 1,340.6 (2012-2016 average) to 1,207.3 (2014-2018 average).
- 2018 HSIP goal is to reduce the fatality rate by 4.75 percent each year from 1.228 (2012-2016 average) to 1.114 (2014-2018 average).
- 2018 HSIP goal is to reduce total serious injuries by 5.10 percent each year from 2,399.8 (2012-2016 average) to 2,161.2 (2014-2018 average).
- 2018 HSIP goal is to reduce the serious injury rate by 4.75 percent each year from 2.191 (2012-2016 average) to 1.988 (2014-2018 average).

At the time this 2045 MTP was developed, safety was the only category for which performance targets were required to be established for State DOTs and MPOs. CR MPO coordinated with NCDOT and decided to establish the same safety performance targets as the state for its planning area.

Future Highway Performance Measures

The remaining categories of highway performance measures will also require the establishment of targets by both the NCDOT and CR MPO in the months that follow the adoption of the 2045 MTP.

Table 6-2 displays the timeline for when State DOTs and MPOs are required to establish targets for the remaining performance measure categories.

Table 6-2	Performance Measure	NCDOT Target Due Date	CR MPO Target Due Date
Infrastructure	Percentage of Pavements in Good Condition (Interstate)	May 20, 2018	November 20, 2018
	Percentage of Pavements in Poor Condition (Interstate)		
	Percentage of Pavements in Good Condition (Non-Interstate)		
	Percentage of Pavements in Poor Condition (Non-Interstate)		
	Percentage of NHS Bridges in Good Condition		
	Percentage of NHS Bridges in Poor Condition		
Congestion Mitigation	Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita on the National Highway System (NHS)	May 20, 2018	May 20, 2018
	Percent of Non- Single Occupancy Vehicle (SOV) Travel, Including Travel Avoided by Telecommuting		
System Performance	Level of Travel Time Reliability as the Ratio of Longer Travel Time (80th percentile) to a Normal Travel Time (50th percentile)	May 20, 2018	November 20, 2018
	Truck Travel Time Reliability for the Interstate System Over Five Travel Time Periods		
Mobile Source Emissions	Total Emissions Reduction For All CMAQ Funded Projects	May 20, 2018	November 20, 2018