Prioritization 3.0 Ferry Scoring Criteria
Summary Report
May 2014

In 2013, the North Carolina General Assembly created the Strategic Transportation Investments Act (STI) to strengthen the state's economy and provide a new formula to direct construction funds through strategic transportation investments. Governor Patrick McCrory signed the Act on June 26, 2013. Governor McCrory and the N.C. Department of Transportation (NCDOT) are committed to improving the quality of life for citizens in North Carolina. The desire is to find more efficient ways to better connect all North Carolinians - to jobs, health care, education and recreational experiences. The STI law will help make that possible by better leveraging existing funds to enhance the state's infrastructure, providing greater opportunity for economic growth.

The STI law outlines a new Strategic Mobility Formula (SMF) which is a new way to fund and prioritize transportation projects to ensure they provide the maximum benefit to our state. It allows NCDOT to use its existing revenues more efficiently to fund more investments that improve North Carolina's transportation infrastructure, create jobs and help boost the economy.

It was apparent even in the early stages of the STI draft bill that the identification of scoring criteria, methodologies, and transportation data to quantify the need of a future project would be critical to potential bill implementation. A Workgroup (established previously by NCDOT for its Prioritization 3.0 process) provided recommendations for both highway and non-highway scoring methodologies to support bill requirements. The Workgroup consisted of representatives from MPO's, RPO's, NCDOT planning staff, Division Engineers and other advocacy organizations. Division 1 and Ferry Division staff in particular attended meetings and brought forward criteria and data recommendations that would best represent and point to the needs of the state's ferry system.

The Ferry Division made extensive utilization of available data including but not limited to, traffic counts, asset conditions ratings, NBIS scores, historical repair and maintenance costs associated with the respective assets, route travel times, etc. As the work progressed it was evident that some data did not exist or was not readily available. Therefore Ferry personnel worked to gather data, measure asset conditions, measure exact route lengths, and coordinated with other State Agencies such as the Department of Commerce in order to include job data and produce maps used to develop a quantitative scoring system. The Ferry Division also coordinated with various NCDOT Units, such as the Division of Highway's Equipment Unit, and Industry partners to ensure that the methodology developed was consistent and incorporated the most up to date industry standards and associated guidelines. This was especially true for the development of the Asset Efficiency Criteria and its associated scoring methodology.

The NCDOT Board of Transportation on November 7, 2013, approved the criteria, weights and measures used in the SMF (see summary table on next page). The following pages provide a brief description of each Ferry project scoring criteria, how it will be measured, its data source and what percentage it is of a project's overall score. The hope is that this information provides a clear, concise and transparent view of the data used in the SMF. des   Please be aware all criteria are measured on a 0 to 100 point scale and Ferry projects are eligible for STI Regional Impact (excluding all vessels) and Division Need categories.

Ferry Scoring Criteria by STI Category

Criteria	Statewide Mobility	Regional Impacts (excluding vessels)	Division Needs
	% Wt	% Wt	% Wt
Safety	N/A	15	15
Benefit/Cost	N/A	15	15
Accessibility/Connectivity	N/A	10	10
Asset Efficiency	N/A	10	10
Capacity/Congestion	N/A	20	N/A
Total	N/A	70%	50%

Safety (Ferry)

Definition
The Safety criterion is a measure of the Asset Health Index (AHI) rating for each respective ferry route. The AHI formula produces an Asset Health score that is a cumulative number based on the condition ratings of the vessels and ramps & gantries that are present on each respective ferry route.

Formula
Asset Health Index = 100-[(Average Vessel Health Ratings for the specific route)*50%) + (Average Ramp & Gantry Ratings)*50%)]

Data Source
The Average Vessel Health Ratings are provided by the Ferry Division Shipyard based on annual reviews and full dry dock inspections that are performed every three years as per Coast Guard regulations.

The Ramp & Gantry Ratings are based on structural inspections as performed every two years by the NCDOT Structures Management Unit as required by FHWA's National Bridge Inspections Standards program.

Criteria Percent Weight by STI Category:
Statewide Mobility – N/A
Regional Impact – 15%
Division Needs – 15%

Note: That there are several vessel projects that are not route specific. These vessels are referred to as "Support Fleet Vessels" and include, but are not limited to, the tugs, a crane barge, fuel barges, dredge, etc. Please note that these vessels serve the entire Ferry Division and as such the scores of these projects were determined based on the average scores of the seven ferry routes in each respective criteria.

Benefit Cost (Ferry)

Definition
Benefit Cost is a measure of the total cumulative travel time saved by ferry users by taking the ferry (on each respective route) as opposed to driving the nearest alternative route that would be taken if not utilizing the ferry. This travel time savings is then divided by 10,000 hours to produce a comparative score used for ranking.

Formula
Benefit Cost = [(Highway hours on alternate route - hours on ferry crossing) / 10,000 hours)

Note: Score cannot exceed 100 points

Data Source
Travel time savings are generated using national mapping software to determine highway travel times. Ferry passage times are known times based on crossing times at each respective route.

Criteria Percent Weight by STI Category:
Statewide Mobility – N/A
Regional Impact – 15%
Division Needs – 15%

Note: That there are several vessel projects that are not route specific. These vessels are referred to as "Support Fleet Vessels" and include, but are not limited to, the tugs, a crane barge, fuel barges, dredge, etc. Please note that these vessels serve the entire Ferry Division and as such the scores of these projects were determined based on the average scores of the seven ferry routes in each respective criteria.

Connectivity / Accessibility (Ferry)

Definition
Connectivity / Accessibility is a measure of the number of Points Of Interest (POI) within three (3) concentric radii (10, 20, & 30 miles). For the sound routes the POI are calculated based on the average of the POI within each concentric circle as centered at the termini of the respective route. For all other (short) routes the circles are centered on the centroids of the respective routes.

The number of POI in each concentric circle are then multiplied by respective factors as follows:

Number of POI in Ring 1 * 75%
Number of POI in Ring 2 * 50%
Number of POI in Ring 3 * 25%

The scores of each respective ring are then added to produce a cumulative score for each respective route.

The Points of Interest that are used to determine this score are:

Hospitals	Airports
Division of Coastal Management Beach Accesses	Military Installations
State Parks	High Schools
Colleges & Universities	County Seats
Business Locations (Employing 100 or more)	Municipalities w/ population > 2500
National Register Historic Places	National Register Historic Districts

Formula
Connectivity / Accessibility = [(Number of POI in Ring #1) * 75% + (Number of POI in Ring #2) * 50% + (Number of POI in Ring #3) * 25%]

Data Source
The number of POIs in the respective concentric rings was determined based on GIS maps that were composed based on a joint effort between NCDOT Division 1 GIS Personnel and GIS personnel within the NC Department of Commerce. Example maps and chart are shown in Appendix A.

Criteria Percent Weight by STI Category:
Statewide Mobility – N/A
Regional Impact – 10%
Division Needs – 10%

Note: That there are several vessel projects that are not route specific. These vessels are referred to as "Support Fleet Vessels" and include, but are not limited to, the tugs, a crane barge, fuel barges, dredge, etc. Please note that these vessels serve the entire Ferry Division and as such the scores of these projects were determined based on the average scores of the seven ferry routes in each respective criteria.

Asset Efficiency (Ferry)

Definition

A measure in percent of the three year maintenance costs associated with an asset versus the pro-rated three year replacement costs that would be associated with the respective asset.

The theory behind this scoring system is based on Nationwide Asset Management Guidelines where this maintenance vs replacement ratio is a decision making tool on when to replace a particular asset. The industry standards associated with this ratio are as follows:

- If the ratio is less than 40% - then the asset is considered for replacement
- If the ratio is greater than or equal to 40%, but less than 50% - then replacement can be considered
- If the ratio is greater than or equal to 50%, but less than 60% - then replacement is needed
- If the ratio is greater than or equal to 60% - then replacement is critical in order to ensure operations can be sustained at the current level of service

Formula

Asset Efficiency Score = [(3 year total maintenance costs) / (3 year pro-rated replacement cost)] * 100

Data Source

The Ferry Division will produce expenditure reports related to each respective asset to determine the mainteanance costs associated with each respective asset.

The replacement costs will be based on project estimates for each replacement project.

Percent Weight by STI Criteria

Statewide Mobility – N/A
Regional Impact - 10%
Division Needs – 10%

Note: That there are several vessel projects that are not route specific. These vessels are referred to as "Support Fleet Vessels" and include, but are not limited to, the tugs, a crane barge, fuel barges, dredge, etc. Please note that these vessels serve the entire Ferry Division and as such the scores of these projects were determined based on the average scores of the seven ferry routes in each respective criteria.

Capacity / Congestion (Ferry)

Definition

The Capacity / Congestion criteria is an evaluation of the traffic (number of vehicles) left behind in the queue (at the loading ramp) when each boat departs from shore versus the total numbers of vehicles loaded and carried across the route.

This score is a measure of the percentages of the vehicles left behind at each departure as compared to the total number of vehicles carried by the route in a year time frame. Please note that all of the vehicles make the transit via ferry, but we are trying to best quantify the wait at each location as average across the year.

Formula

Capacity / Congestion = [(Total Vehicles Left at departure) / (Total Vehicles carried)] * 100

Data Source

All the data used to determine this percentage will be provided by the Ferry Division based on their monthly traffic reports at each site.

Criteria Percent Weight by STI Category:

Statewide Mobility – N/A
Regional Impact – N/A
Division Needs – 20%

Note: That there are several vessel projects that are not route specific. These vessels are referred to as "Support Fleet Vessels" and include, but are not limited to, the tugs, a crane barge, fuel barges, dredge, etc. Please note that these vessels serve the entire Ferry Division and as such the scores of these projects were determined based on the average scores of the seven ferry routes in each respective criteria.
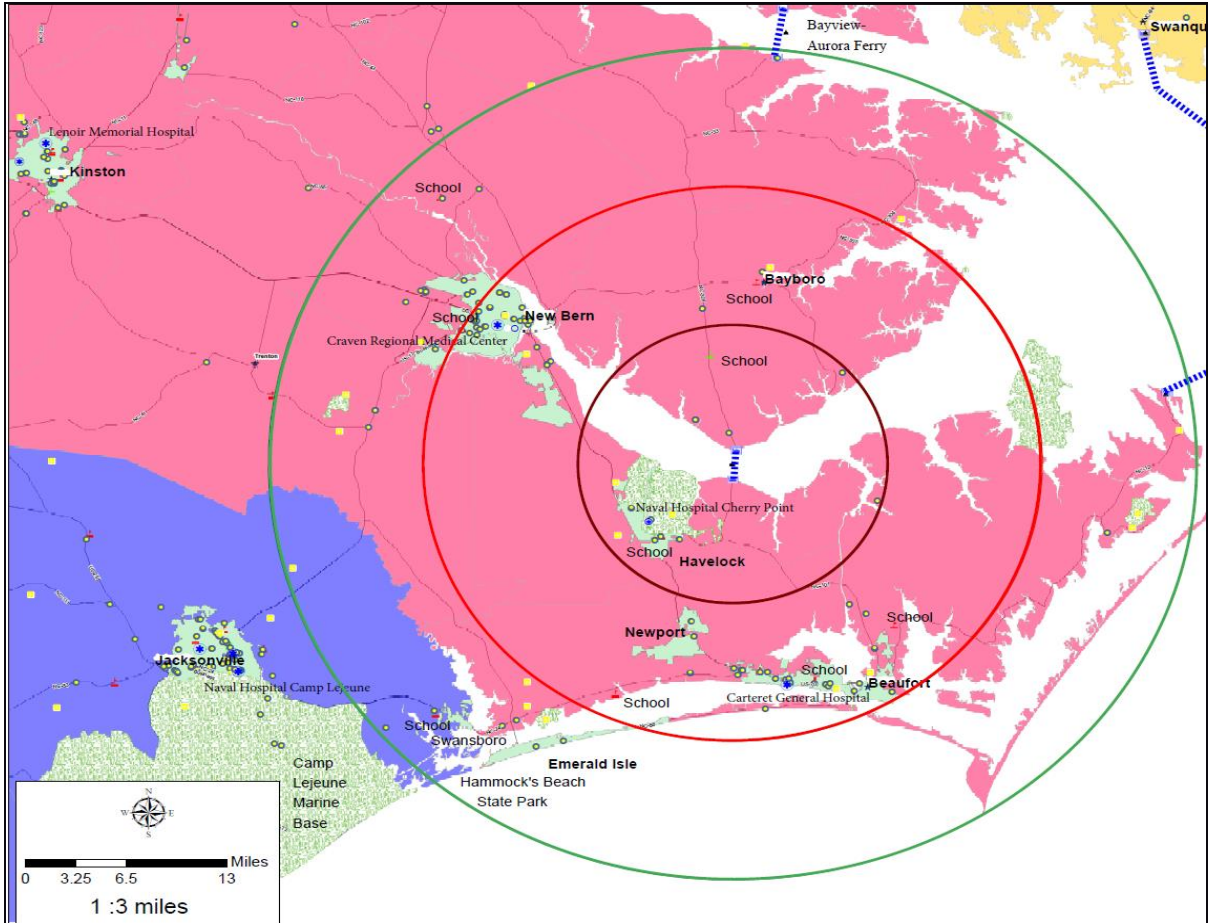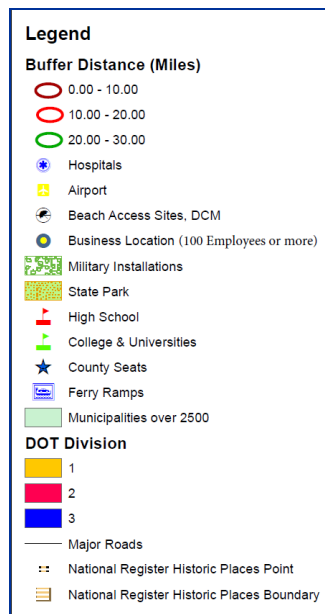
Appendix A

Points of Interest Example Maps
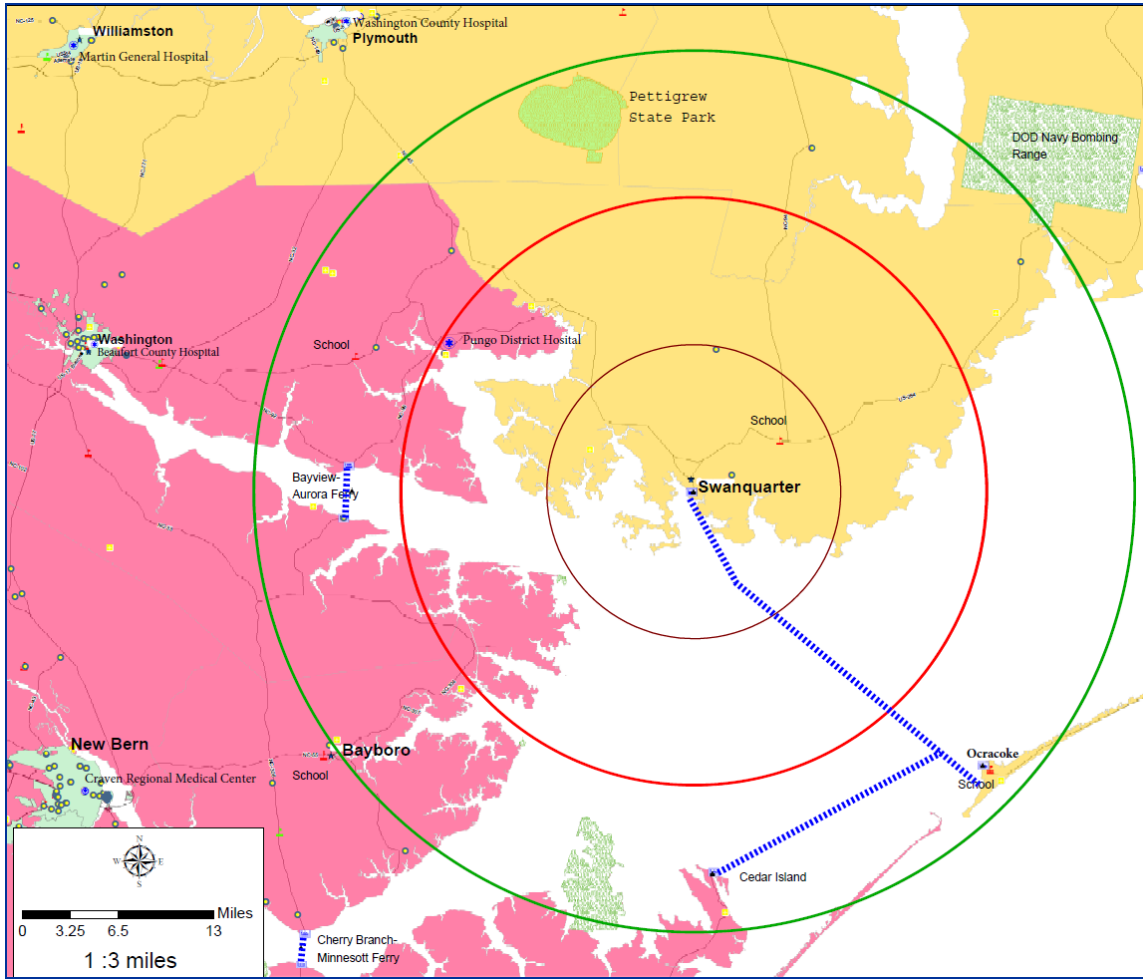
Swan Quarter POI Map

Cherry Branch _ minnesott Beach POI Map

Map Legend