Environmental Screening

Introduction

Transportation projects have the potential to create significant impacts to the natural and man-made environment and often disrupt communities as much as they improve mobility. Only through early awareness and responsible planning can these impacts be minimized or even avoided. For this reason, the CHATS long range transportation planning process includes an environmental screening systems level planning phase. The use of a screening process allows the project team to evaluate projects using available and collected data sets. In this manner, options can be evaluated quickly and recommendations can be formulated which best accomplish the transportation goals while minimizing impacts.

In some cases, this process has been proven to effectively eliminate those projects, which are determined to have unacceptable impacts or are likely to encounter permitting difficulties due to potential impacts. In these cases projects may actually be eliminated from consideration. Because individual projects can significantly affect other projects, these issues must be resolved as early as possible to avoid inefficient use of time and resources. The result is a transportation plan that is respectful of the environment and cost-effective in its implementation.

The vast majority of impacts associated with projects in this plan are associated with roadway projects. This is mainly due to the large amounts of land required to build roadway projects and the resulting traffic that can become not only a conduit for traffic but also a barrier to community. Sidewalks and bicycle facilities are much more limited in the magnitude of their impacts, due to smaller cross-sections and greater flexibility to avoid problem areas. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities and have only marginal impacts, if any, beyond those of the roadway itself.

> *"No one has the right to use America's rivers and America's waterways that belong to all the people, as a sewer. The banks of a river may belong to one man or one industry or one state, but the waters which flow between the banks should belong to all the people."*
>
> — ***President Lyndon B. Johnson***, *upon signing the Clean Water Act of 1965*

The vast majority of transit projects in the long-range transportation plan (LRTP) are associated with bus route service expansions on existing rights of way, which typically involve no new construction and have minimal impacts on either the natural or the manufactured environment. In general, transit impacts tend to be positive because increased service tends to reduce vehicle miles traveled (VMT), lower air emissions, and improve accessibility in disadvantaged neighborhoods.

The Ashley River is one of many sensitive waterways within the CHATS planning area.

The following discussion of the plan's environmental screening process is divided into two parts. The first focuses on overall screening of the natural and cultural environment. It also addresses specific issues related to environmental justice.

The second section attempts to identify potential environmental and social impacts associated with the proposed transportation improvements. To assist with this effort, the project team developed a series of maps that inventory known environmental features. These maps include wetlands, endangered species, protected land, archeological sites, and historic sites as well as many other features. When overlaid with the proposed transportation projects, these prove to be useful tools in assessing the relative impacts to the environment.

This information also has been translated into an environmental screening model, which provides an overview of potential project impacts when compared with quantitative performance measures. Both of these tools are discussed in later sections of this chapter. It is important to point out that this environmental screening is merely a cursory review of available data and is not intended as a replacement for a more thorough project by project evaluation. As project plans are further refined, more precise environmental assessments may be necessary. For some of the projects recommended in the LRTP, NEPA studies are underway or completed.

Environmental Features

The Charleston area continues to urbanize. As growth occurs, impacts to the environment are inevitable. With the development of new infrastructure it will be important to manage and minimize these impacts. Some natural amenities, however, such as clean water and open spaces must be maintained to satisfy not only residents' desires for a high quality of life, but also state and federal

environmental policies. Figure 10.1depicts important environmental features within the Charleston area. Figure 10.1 clearly shows the magnitude of wetlands throughout the planning area as well as state and federal protected lands. Two large areas of protected land are the Medway Plantation just north of Goose Creek and Francis Marion National Forest, northeast of Mount Pleasant.

In addition, most of the wetlands identified in Figure 10.1 are jurisdictional with 401 Certification, which represent sites where the state has authority to protect water quality under the Clean Water Act (CWA). Figure 10.2 identifies the location of cultural features, including historic sites and features registered on the National Registry of Historic Places. Figure 5.3 presents the community facilities that need to be served by transportation facilities, but also need to be protected from in the externalities of transportation facilities. Collectively, the maps represent wetlands, protected lands, bodies of water, historic sites, parks, schools, churches, hospitals, fish advisory streams, and other significant features.

As with most urban coastal communities, the CHATS area has a number of pristine environmental features that continue to attract newcomers and visitors alike. While these amenities make positive contributions to the area's identity, a careful review of these maps reveals how challenging it can be to construct new transportation facilities in areas where they are most needed. Responsible planning dictates that these features be considered during the planning process, as well as an integrated approach to coordinating land use-development and transportation planning.

Environmental Justice

Environmental justice is a law intended to prevent the use of federal funds for projects, programs, or other activities that generate disproportionate or discriminatory adverse impacts on minority or low-income populations. This effort is consistent with Title IV of the 1964 Civil Rights Act, and is promoted by the U.S. Department of Transportation (USDOT) as an integral part of the transportation planning process, from individual project planning and design to the long range visioning process. The environmental justice assessment incorporated in this update was based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should avoid, minimize, or mitigate environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity.
- Transportation benefits should not be delayed, reduced, or denied to minority and low-income populations.
- Any community potentially affected by outcomes of the transportation planning process should be provided with the opportunity for complete and equitable participation in decision-making.

As part of this transportation plan update, Census 2000 data was used to identify the geographic distribution of low-moderate-income (LMI), and minority populations, so that the positive and negative effects of various transportation investments in the transportation plan could be assessed. Minority populations include Blacks, Hispanics, Asian Americans, American Indian, and Alaskan Natives. LMI is defined as a household in which the total household income does not exceed fifty percent (low income) and eighty percent (moderate income) of the median for the area, as adjusted for household size by the US Department of Housing and Urban Development (HUD). This information is presented on Figures 10.4and 10.5. Figure 10.4 depicts the distribution of LMI populations. This map reveals a significant area along the east side of Charleston that has fifty percent or greater of the population designated as LMI. Figure 10.5 shows the distribution of the minority population and spatial distribution across the study area. CHATS endeavored to develop and carry out a public involvement process that not only reduced obstacles to participation by minority and low-income communities, but also actively sought out meaningful input. For additional information on minority and low income outreach efforts, please refer to *Chapter 2 — Introduction and Vision*.

While it is nearly impossible to construct infrastructure without impacts, it is through careful planning and early consideration that the Plan intends to manage impacts to communities effectively. Rather than an ad hoc approach to environmental justice planning, this transportation plan identified sensitive communities early in the process. Early identification allowed for an assessment of the existing transportation plan and influenced the selection and alignment of future transportation improvements.

It must be stressed that the environmental justice screening conducted for this study is not intended to quantify specific impacts. As described above, it is intended to guide the development of a plan that is equitable in terms of both costs and benefits. In addition, a critical purpose of this screening is the identification of projects in the transportation plans that, due to proximity, have the potential to affect communities of special interest. When individual studies are begun as part of project implementation, more detailed analyses, including field surveys, will be needed to identify and minimize specific community impacts on a project-by-project basis.

Planning Guidelines

During the development of the transportation plan, the project team used the available data to avoid and minimize impacts to known environmental features. The collection and consideration of these data early in the planning process is intended to lessen environmental impacts and reduce potential conflicts during permitting. In addition, when considering new roadway alignments and extensions, planners and engineers should use a guiding set of principles, including those listed below, to ensure that environmental considerations are followed:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from FEMA designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impact to historic features and districts
- Minimize the number and size of impact to threatened and endangered species

Candidate Project Assessment Process

A quantitative screening was performed to assess the potential environmental and social impacts of projects included in the CHATS study area. This analysis consisted of overlaying transportation project alignments/locations onto a series of spatial analyses that depict natural features, cultural sites, community facilities, and environmental justice data. The goal is to assess the impact of the transportation project and use this information to quantify the overall costs and benefits of the improvement. Projects will be prioritized based on this analysis to ensure the regional transportation system is providing the highest mobility benefit with at the lowest impact. Subsequent analyses can be performed to select the alignment alternatives with the methodology and tools developed herein. The results of this evaluation are summarized in matrix form and represent a quantitative assessment of potential project issues (see Table 10.1). The matrix evaluation criteria are grouped into four separates areas:

- Constructability & Implementation
- Travel Demand Benefits
- Financial Viability
- Livability Index

Potential project impacts (if any) were quantified for each of the above categories. This determination is based on the results of a spatial overlay analysis performed for each evaluation criteria. For example, impacts are generally considered major if the project affects a greater acreage of sensitive area. The following is a brief description for each of these headings.

- Minimize the number and size of impact to hazardous waste sites
- Minimize the number and size of impact to superfund sites
- Minimize or avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority and LMI communities
- Avoid impacts to parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns
- Capitalize on street connectivity opportunities such stub streets
- Encourage a multimodal system with the promotion of pedestrian, bicycle, and transit networks

Environment/Natural Features

This section is primarily focused on natural features related to water quality and endangered/threatened species as well as protected land. The characterization of impacts is primarily related to the amount of acres impacted by a project corridor. As the number of acres impacted increases the severity index increases from no impact to major impacts. Specific features in this category include:

- Hydrological
- Wetlands
- Floodplains/riparian buffers
- Endangered/Threatened species
- Federally, State and privately protected land
- Greenbelt projects

The following methodology was employed to rate project impacts in this category. Hydrologic features were buffered using a 100 ft radius distance. Radius distances were assigned based on South Carolina riparian forest buffer widths recommendations, along with other recommendations made by other states and local governments. All features were spatially overlaid in a GIS software package and compiled into one feature, which was later used in the analysis. All values were summed to obtain the final number of features that may be possibly impacted. The combined feature was later clipped to the road alignment to obtain the impacted area. The environmental, cultural, and constructability characteristics of road alignment, or other transportation improvement projects were evaluated based on acres directly impacted by the proposed project. The following equation was used to calculate impact:

$$I_{mpact} = \left(\frac{\sum_{impact} Acres}{\sum_{Project} Acres} \right) \times (Weight)$$

Cultural and Community Resources

This category indicates the presence of community services, cultural resources, and institutions including schools, hospitals, religious buildings, parks, and historic resources, and archeological sites. The impacts to these types of community resources are often that of proximity or when right-of-way is required from these sites. In the most extreme cases buildings may be directly impacted. These criteria were assessed with the same methodology described in the Environmental/Natural Features section immediately preceding this section.

Environmental Justice

Environmental justice reviews conducted at the systems planning level typically involve the analysis of available demographic data from the US Census Bureau. When reviewing the LRTP, it is important to consider not only specific project impacts but also the distribution of projects and transportation investments throughout the study area. The plan seeks to minimize disproportionate impacts to minority and Low-to-Moderate income (LMI) groups through proactive planning. As previously mentioned, the CHATS transportation planning process sought to minimize impacts to these groups by involving them in the planning process and avoiding or minimizing disproportionate impacts during the project selection.

The following guidelines were used to rate project impacts in this category. Spatial and demographic data from the 2000 Census were used to conduct the environmental justice analysis. Both minority and LMI variables were analyzed at the block group level. Minority populations were defined as the non-white population (i.e. Blacks, Hispanics, Asian Americans, American Indian, and Alaskan natives). LMI is defined as a household in which the total household income does not exceed fifty percent (low income) and eighty percent (moderate income) of the median income for the area, as adjusted for household size by the US Department of Housing and Urban Development (HUD). LMI data were used for the environmental justice analysis to be consistent with other federal agencies such as EPA, HUD, and USDOT.

Minority and LMI were evaluated based on the number of persons directly impacted verses the total number of people impacted by the transportation project using Census blockgroups as the spatial extent. These social features were evaluated in the same manner described in the Environmental/Natural Features section, except that number of acres impacted is replaced with number of persons impacted. It should be noted that impacts should not always be assumed to be a negative attribute. For example, neighborhood with a high percentage of LMI residents can realize mobility benefits from a proposed transportation project. In this manner, the total impact values necessary for the evaluation criteria were established. These values were used to determine the areas that are more or less suitable for transportation projects.

Mobility and Implementation

As projects are considered it is important to understand the relative benefits as well as the difficulties that may be encountered during implementation. For this reason, the relative mobility benefits and constructability difficulties have been included in this evaluation. This is one of the first steps in understanding the expected ratio between costs and benefits. This evaluation is a quantitative assessment of specific benefits and project costs, providing this information empowers planners to select projects for inclusion in the plan that have a realistic chance of being implemented. This information is also used to group projects into respective horizon years and to develop a financially-constrained project list.

CONSTRUCTABILITY

For the purposes of this evaluation project constructability was considered to ascertain the difficulties associated with project permitting, costs, and even traffic control. Projects with challenging constructability issues may be more costly due to impacts on design and delays associated with maintaining traffic flow during construction. Moreover, a project that is difficult to bring to construction may squander public resources not provide the congestion relief it was intended to offer. An example of a project with minor constructability issues would be a bus rapid transit (BRT) route on an existing roadway. Conversely, an example of a major constructability challenge could be a bridge replacement project where sensitive environmental features of the built and natural environment are present and where limited crossing alternatives exist. In this example, an atypical bridge design may be necessary and creative solutions to maintain traffic flow would likely extend the duration of construction having an impact on project cost. This criterion is quantified by scoring projects in an inverse relationship to the number of permits needed to implement the project (Army Corps, Coast Guard, Air Quality determination, permission from railroad operators, publicly owned facilities (publicly owned parks, recreational areas, wildlife and

waterfowl refuges), or SC DHEC), availability of ROW, and intensity of utilities present. The following guidelines were used to rate project impacts in this screening process:

FINANCIAL VIABILITY

This criterion measures the ability to fund the construction of project and maintain the facility for the functional life span of infrastructure. Included in this category is to include life cycle maintenance / operating cost and pavement quality. Cost will be generalized by facility type or vehicles in operation for the functional life span of infrastructure. Pavement quality will be considered in the assessment by the project's impact positive or negative impact on pavement management.

LIVABILITY INDEX

There are a number of elements that comprise this measure. Livability is being defined by these components and this Plan seeks to implement transportation projects that support these objectives. The index consists of public safety, economic development, consistency with land use plans, and consistency with livability principles. Public safety scoring was scored on the project's implementation of a strategy, a named project in SCDOT Highway Safety Plan, or appears on the SCDOT prioritized safety list. Economic development is comprised of a locally provided ranking and a score calculated South Carolina Department of Commerce. Projects that advance the six principles of livability as promulgated by the Federal government and are consistent with an adopted comprehensive land use plan will be assigned a full score for these criteria.

TRAVEL DEMAND BENEFITS

The assessment of mobility benefits is the primary objective in evaluating candidate projects throughout this process. While all of the previous evaluation criteria relate to a project's potential impacts and compatibility with land use plans and livability principals, this category seeks to quantify the relative travel benefits associated with implementing the project. This measure seeks to enumerate the relative travel benefits associated with implementing the project. Travel demand benefit is quantified by the level of daily congestion relief obtained in the current and the horizon year, each comprising 10% of the ranking. The remaining 10% of the travel demand benefit score is comprised of a measure of travel time improvement (system delay). The Candidate Project Evaluation Matrix presents the results of this ranking process. The following table summarizes the CHATS LRTP ranking criteria.

CHATS LRTP Project Ranking Criteria	Rank
Travel Demand Benefits	**40%**
Current Year V/C	15%
Future Year V/C	15%
Freight Mobility	10%
Constructability	**15%**
Environmental Justice	5
Cultural/Facilities Features	5
Environmental Features	5
Financial Viability	**15%**
Ability to Fund Capital Cost in 6-Year TIP	10
Pavement Quality Index	5
Livability Index	**30%**
Public Safety	10
Evacuation Routes	5
Economic Development	10
Consistency with Land Use Plans	Yes/No
Consistency with Livability Principles	5
Consideration of Modal Options	High/Med/Low
Total	**100%**

Environmental Screening as a Planning Tool

The collection and consideration of environmental data during the development of the LRTP serves as a tool to ensure that the plan respects the natural and man-made environment. When considered with best practices, these data resulted in selecting transportation projects and alignments that minimized impacts. Therefore, this analysis was used not only to eliminate any candidate projects with "fatal" flaws, but also to improve those projects that provide true benefits to the transportation network. The information obtained from this planning process identifies projects with the greatest return on public investment and those project that match the vision and goals of the community. Finally, this screening process allows early identification of likely impacts and areas of uncertainty that will need to be investigated more fully as a particular project moves forward through more

detailed planning and design. The remainder of the chapter is devoted to the communication of known environmental features considered during the LRTP planning process (Figures 10.1-10.5 and the Candidate Project Evaluation Matrix (Table 10.1).

Candidate Transportation Project Total Benefit and Impact Rankings

A ranking process was conducted for the purpose of identifying those projects to be considered in the financially constrained plan. Using the environmental, cultural, environmental justice, project constructability impacts, and the travel demand benefits information, a ranking process was developed based on weighted values identified by the CHATS Study Team members. The transportation project ranking process was based on the following steps.

Step 1: Community Vision and Goals were collected and summarized in to priorities. The CHATS Study Team identified weighted values for the evaluation criteria.

Step 2: Collaborated with partner agencies to assign scores to for each criteria - Constructability, Financial Viability, and the Livability Index. (Total potential points 70).

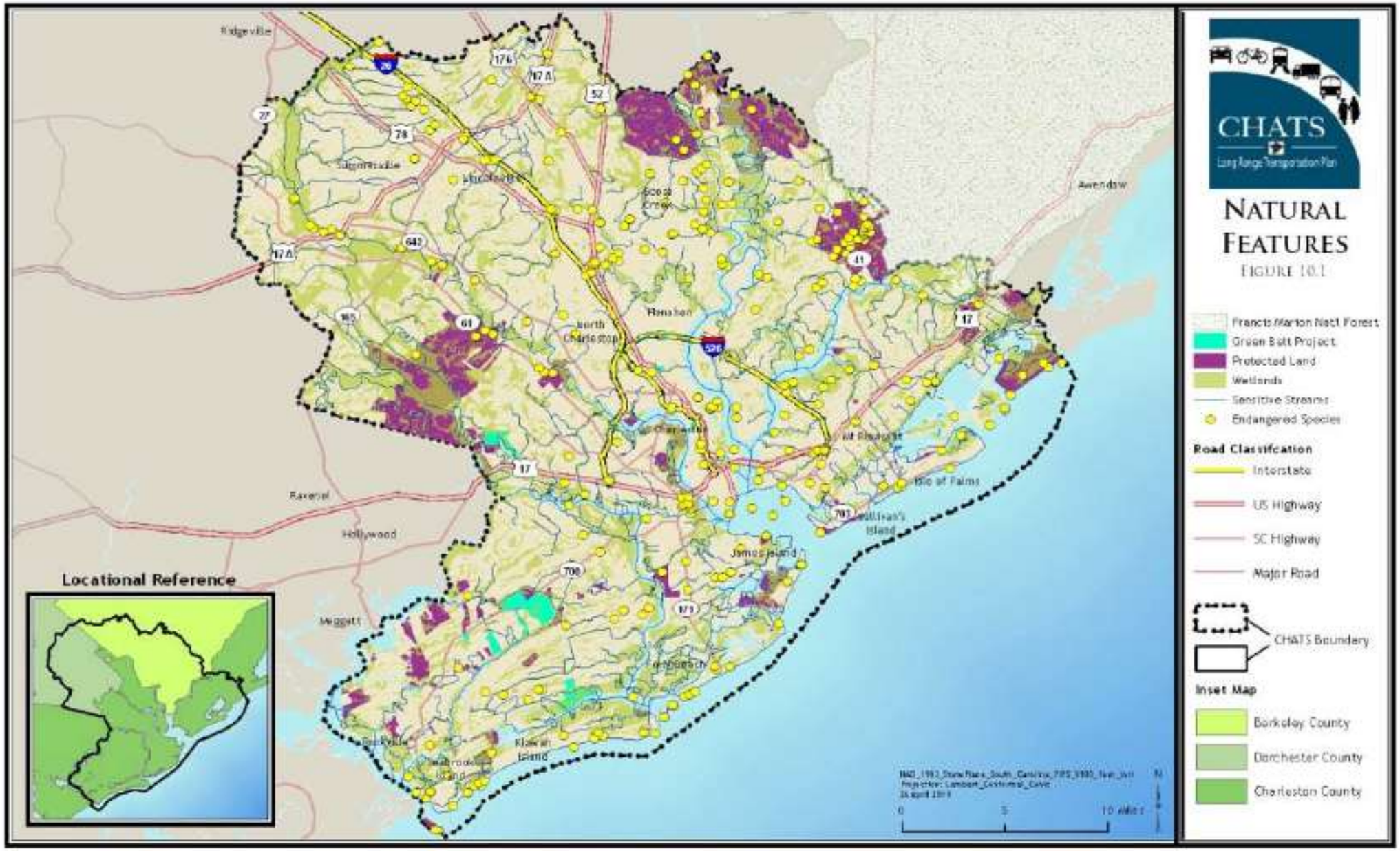
Step 3: Tested each candidate project in the Travel Demand Forecasting Model benefits based on the following criteria:

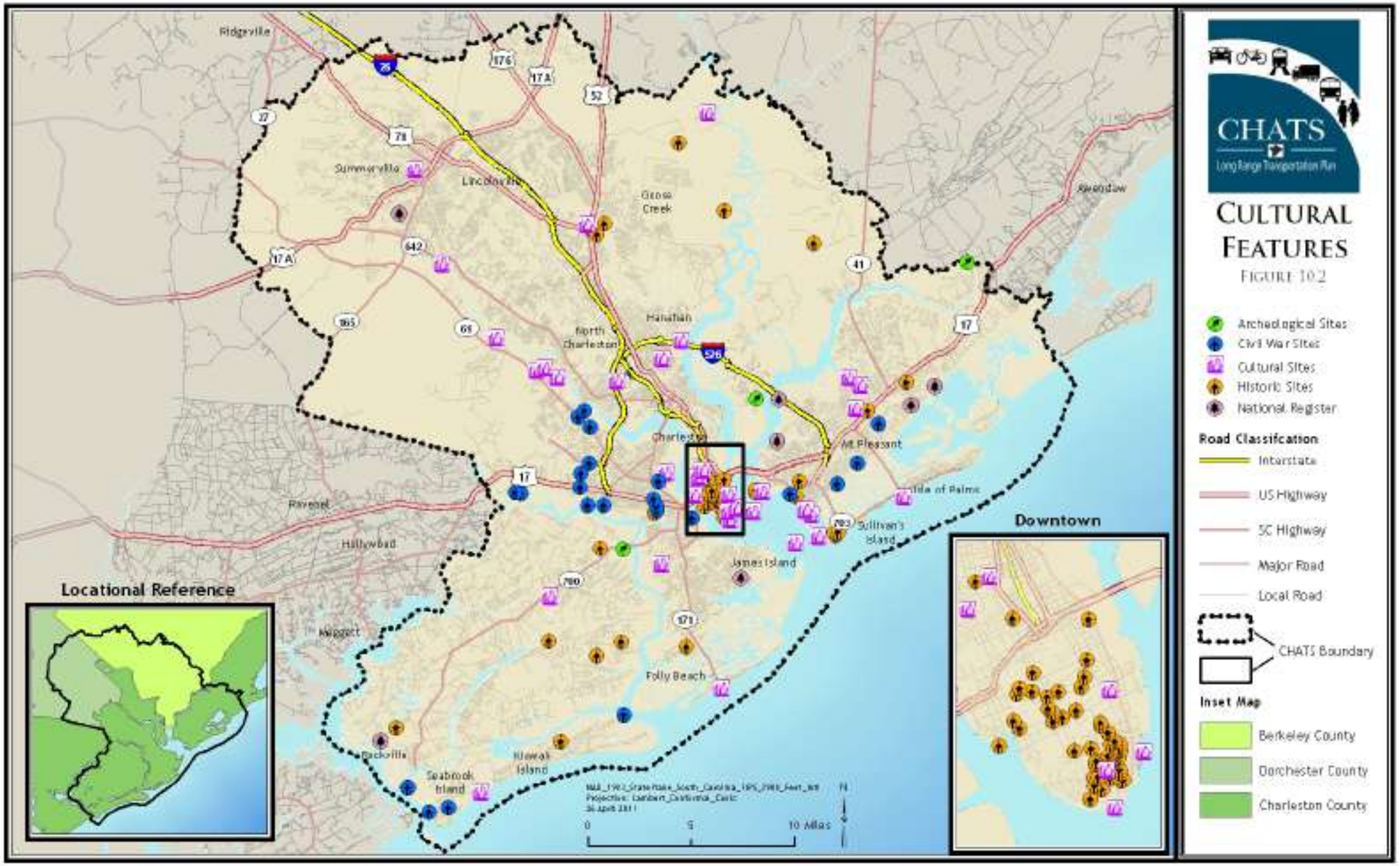
Relief of Existing Congestion (based on 2008 volume-to-capacity ratio (V/C)
Relief of Future Congestion (based on 2035 V/C)
Total 2035 Travel Delay (Vehicle Travel Speed)

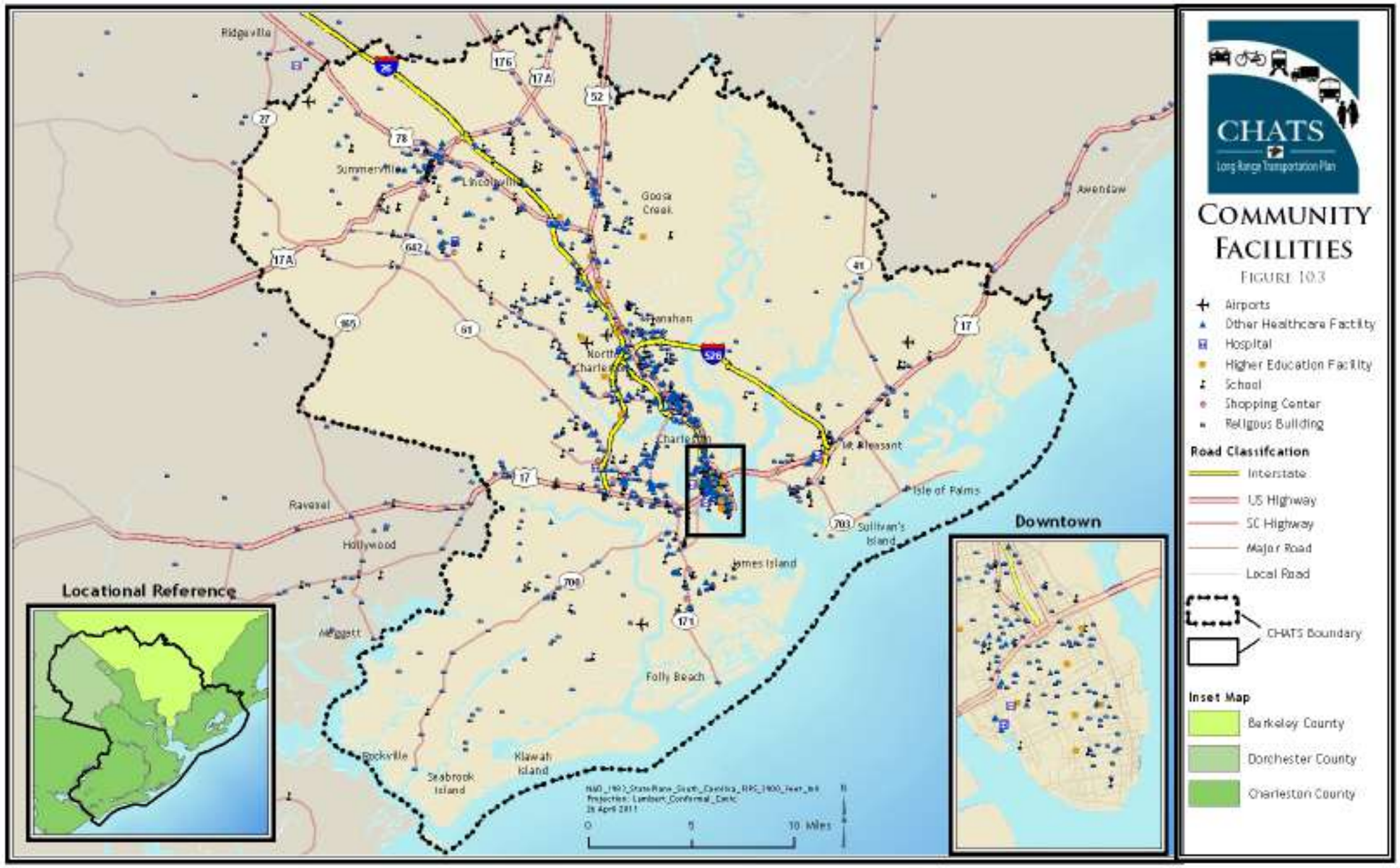
The results of this analysis are shown in Table 10.1 – Candidate Project Total Benefit and Impact Matrix. As presented in the table, a mix of small and large scale projects rose to the top of the rankings. In fact, the top ten ranked projects include:

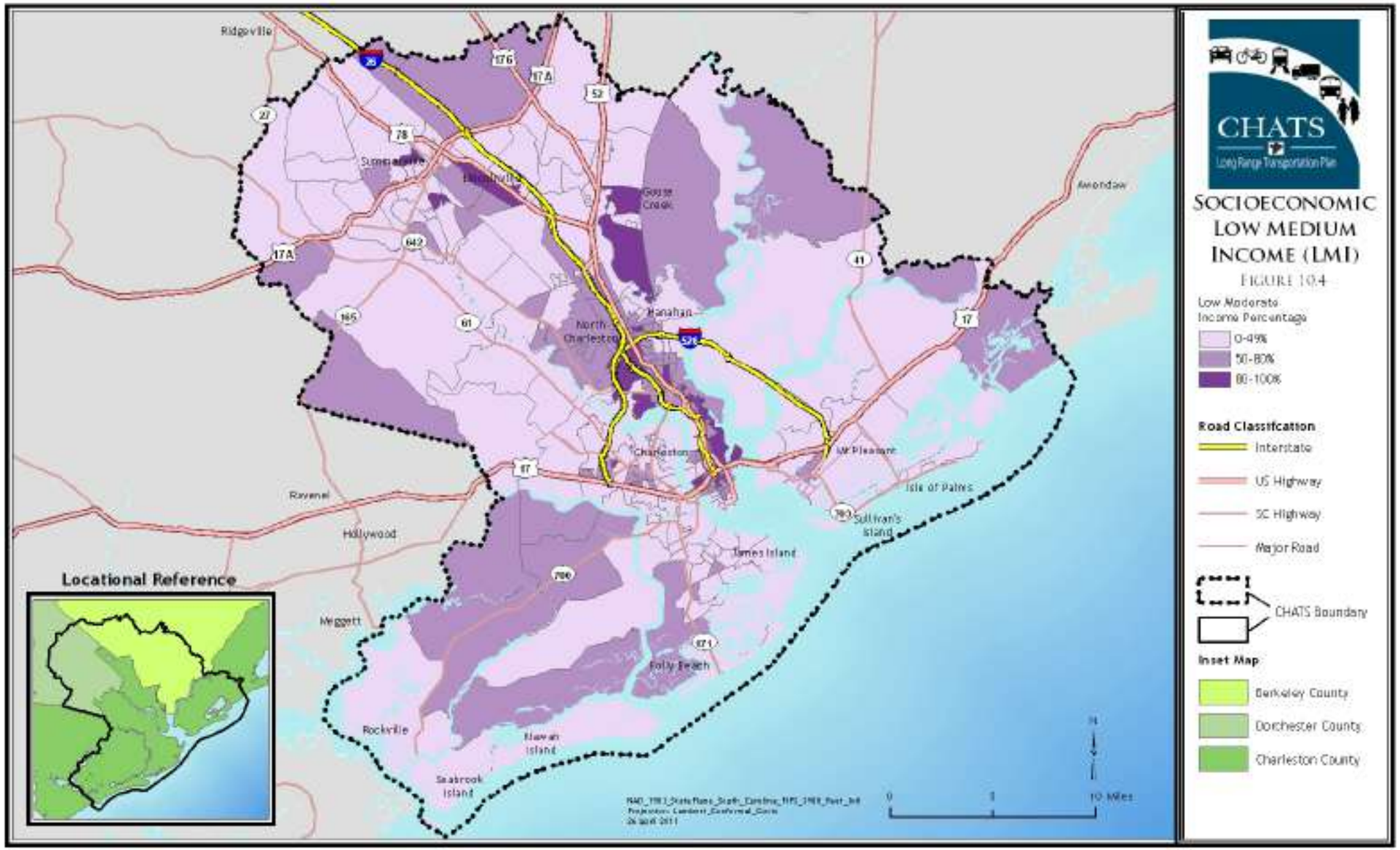
1. US 17 Alternative (North Main Street) (ID # 66)
2. I-526 & I-26 Interchange (ID #21)
3. ITS- Region-wide Signal Systems (ID # 23)
4. US Hwy 52 / US Hwy 176 Intersection Improvements (ID # 44)
5. SC Hwy 41 (ID # 39)
6. Ashley Phosphate Road (ID # 49)
7. Jedburg Road (ID # 24)
8. Savannah Highway (ID # 64)
9. Aviation Connector to Ashley Phosphate (ID # 1)
10. Sheep Island Parkway, Sheep Island Interchange at I-26, I-26 widening, and I-26 Frontage Roads (ID # 42)

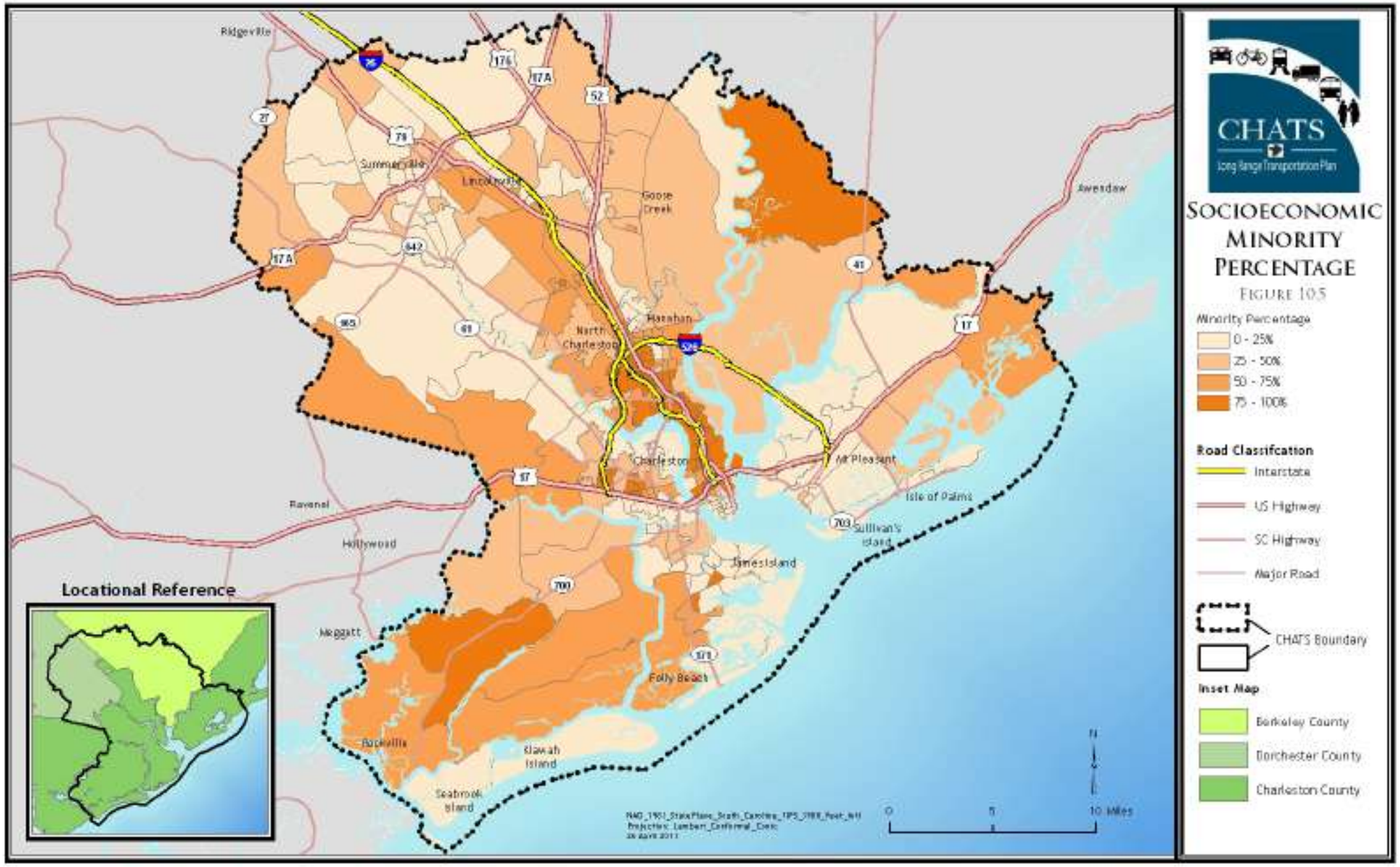
Some large-scale projects like the Mark Clark Expressway and interchange improvements at I-26 and I-526, and I-26 capacity improvements provided significant benefits in traffic demand and congestion relief fell short in the overall project rankings due to their significant environmental and constructability impacts. Others, like ITS Signal Systems, Clements Ferry Road, and Micheaux Parkway improvements provided immediate benefits to relieving existing congestion while having a moderate impact on the environment and cultural issues.


CHATS
Long Range Transportation Plan
NATURAL FEATURES
FIGURE 10.1
Francis Marion Nat'l Forest
Green Belt Project
Protected Land
Wetlands
Sensitive Streams
Endangered Species
Road Classification
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ravenel
Hollywood
Meggett
Awendaw
Isle of Palms
James Island
Kiawah Island


CHATS
Long Range Transportation Plan
CULTURAL FEATURES
FIGURE 10.2
Archeological Sites
Civil War Sites
Cultural Sites
Historic Sites
National Register
Road Classification
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Downtown
Ridgeville
Summerville
Lincolnville
Goose Creek
Awendaw
Hanahan
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Seabrook Island
Kiawah Island
0
5
10 Miles


CHATS
Long Range Transportation Plan
COMMUNITY FACILITIES
FIGURE 10.3
Airports
Other Healthcare Facility
Hospital
Higher Education Facility
School
Shopping Center
Religious Building
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Downtown
Locational Reference
Ridgeville
Summerville
Lincolnville
Goose Creek
Awendaw
Mt. Pleasant
Isle of Palms
Sullivan's Island
James Island
Folly Beach
Ravenel
Hollywood
Meggett
Rockville
Seabrook Island
Kiawah Island
0
5
10 Miles


CHATS
Long Range Transportation Plan
SOCIOECONOMIC
LOW MEDIUM
INCOME (LMI)
FIGURE 10.4
Low Moderate
Income Percentage
0-49%
50-80%
80-100%
Road Classification
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Goose Creek
North Charleston
Hanahan
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Folly Beach
Kiawah Island
Seabrook Island
Rockville
Meggett
Hollywood
Ravenel
Awendaw
0
5
10 Miles


Ridgeville
Summerville
Lincolnville
Goose Creek
Awendaw
Hanahan
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Locational Reference
SOCIOECONOMIC MINORITY PERCENTAGE
FIGURE 10.5
Minority Percentage
0 - 25%
25 - 50%
50 - 75%
75 - 100%
Road Classification
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
0
5
10 Miles

CHATS LRTP Candidate Project Cost-Benefit Matrix

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
			Constructability	Environmental / Natural Features	Environmental Justice	Cultural Facilities	Relief of Existing Congestion	Relief of Future Congestion	Freight Mobility	Life Cycle Maintenance / Operating Cost	Pavement Quality Index	Public Safety	Evacuation Route	Economic Development	Consistency w/ Land Use Plan	Consistency w/ Livability Principals	Consideration of Modal Options			
1	Aviation Connector to Ashley Phosphate	S. Aviation Ave. to Ashley Phosphate Rd (S-10-75)	2.83	1.6	2.5	4.7	12.0	9	4.0	10	4	4	3	5.00	Yes	0.83	Low	25.0	37.63	62.63
2	Bacon's Bridge Extension/Delmar Highway (SC 165)	SC 61 to Ashley Ridge High School (Approximately 2.3 Miles)	4.02	2.23	5	4.67	0.0	1	1.0	10	3.28	2	3	0.50	Yes	0.83	Low	2.0	35.17	37.17
3	Berlin Myers - North Extension (SC 165)	Maple St. (S 18-131) to Berlin Myers Pkwy (SC 165)	3.45	2.8	3.32	4.33	5.0	2	3.0	10	4	3	0	0.50	Yes	0.83	Low	10.0	32.12	42.12
4	Bus Rapid Transit	Extend BRT to New Wal-Mart Center past SC 41 to MUSC	5.00	5	5	5	5.0	1	1.0	10	2.5	6	5	1.75	Yes	5.00	High	7.0	50.25	57.25
5	Bus Rapid Transit	Folly Rd. (SC 171) to Downtown Charleston	4.79	5	5	5	5.0	1	1.0	10	2.5	4	5	1.00	Yes	5.00	High	7.0	46.67	53.67
6	Bus Rapid Transit	Goose Creek area to Downtown Charleston	4.79	5	5	5	6.0	1	1.0	10	2.5	5	5	1.50	Yes	5.00	High	8.0	48.17	56.17
7	Bus Rapid Transit	Powerline Easement to planned Intermodal Center	3.44	2.28	3.16	5	8.0	1	1.0	4	4	5	3	4.00	Yes	4.17	High	10.0	37.44	47.44

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
8	Bus Rapid Transit	Rivers Ave (US 52) from Otranto (S 10-542) to Downtown	4.21	5	1.83	5	6.0	2	2.0	10	2.5	5	5	3.00	Yes	5.00	High	10.0	47.33	57.33
9	Clements Ferry Road - Phase II (S-8-33)	Jack Primus Rd. (S-8-119) to SC 41	3.85	1.64	5	5	2.0	3	3.0	10	3.39	2	3	3.00	Yes	1.67	Low	8.0	37.95	45.95
10	Coleman Boulevard/Ben Sawyer Boulevard (SC 703)	Main Street Streetscaping from Magrath Darby Rd (S 10-703)/Patriots Point Road to Ben Sawyer Bridge	5.00	5	5	5	1.0	1	0.0	10	3	4	0	0.00	Yes	3.33	High	2.0	40.33	42.33
11	Commuter Rail	Goose Creek area to Downtown Charleston	4.79	5	5	5	5.0	2	2.0	0	5	6	5	2.50	Yes	5.00	High	9.0	42.67	51.67
12	Commuter Rail	Summerville to Downtown Charleston	4.79	5	5	5	5.0	3	3.0	2	5	8	5	2.50	Yes	5.00	High	11.0	46.67	57.67
13	Dorchester Road (SC 642)	Trolley Rd (S-18-199) to Ashley Phosphate (S-10-75)	2.84	3.01	0.03	5	3.0	7	4.0	8	3.61	3	3	3.50	Yes	1.67	High	14.0	33.65	47.65
14	Dorchester Rd. Connector (Local Road)	Micheaux Pkwy (Local Road) to W. Montague Ave. (S 10-162)	2.71	2.5	2.5	5	3.0	6	5.0	8	4	4	3	3.50	No	0.83	Med	14.0	33.67	47.67
15	Expand SHEP service area	I-26 to Exit 199 (US 17 A)	5.00	5	5	5	1.0	1	0.5	10	2.5	8	3	1.00	Yes	0.00	Low	2.5	44.00	46.50
16	Future Dr. Interchange (Local Road)	Future Dr. (Local Road) & I-26	3.23	2.5	2.5	5	4.0	4	4.0	8	4	4	0	3.75	Partial	0.00	Low	12.0	32.67	44.67
17	Glenn McConnell Extension Phase II (SC 61)	US 17A to Old Beech Hill Rd. (S-18-162) at Wright Road	4.26	2.89	4.97	5	1.0	0	0.0	10	4	2	5	1.00	No	0.00	Med	1.0	39.03	40.03
18	Glenn McConnell Extension-Phase I (SC 61)	Bees Ferry Rd. (S-10-57) to US 17A	2.84	0	3.02	5	5.0	5	5.0	10	4	2	5	1.00	Yes	0.00	Med	15.0	33.35	48.35
19	Hungry Neck Blvd (Phase IV) (Local Road)	Six Mile Rd. (S 10-921)to Porchers Bluff Rd.(S 10-51)	3.96	2.51	5	5	4.0	1	1.0	10	4	2	3	0.50	Yes	2.50	Med	6.0	37.34	43.34

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
20	I-26 Widening	Port Access Rd to I-526	2.96	3.15	0.34	5	6.0	4	3.0	6	1.7	8	5	5.00	No	1.67	High	13.0	39.19	52.19
21	I-526 & I-26 Interchange	Interchange Improvement	5.00	5	5	5	15.0	2	1.0	10	2.97	6	5	5.00	Yes	0.83	Med	18.0	49.80	67.80
22	I-526 Interchange Improvements (Exit 16)	International Blvd at I-526	3.07	3.11	0	5	3.0	5	4.0	6	3.74	3	3	5.00	Partial	0.83	Med	12.0	33.35	45.35
23	ITS-Signal Systems	Region wide	5.00	5	5	5	5.0	1	6.0	10	2.5	6	5	4.00	Yes	5.00	Low	12.0	52.50	64.50
24	Jedburg Rd. (S 18-58 and Local Road)	US 78 to Wildgame Rd. (S 8-203)	3.75	2.92	2.92	5	8.0	9	9.0	10	2.71	2	3	4.25	Yes	0.83	Med	26.0	37.30	63.30
25	Light Rail Transit Service	Rivers Ave. (US 52) in Neck Area	3.13	5	2	3	5.0	3	3.0	0	5	5	5	1.00	Partial	4.17	High	11.0	32.67	43.67
26	Light Rail Transit Service	US 17 from Mt. Pleasant to West Ashley	2.75	5	3	3	5.0	2	2.0	0	5	6	4	1.00	Partial	4.17	High	9.0	31.17	40.17
27	Light Rail Transit Service	City of Charleston to Town of Summerville	2.82	2.85	1.78	5	5.0	5	5.0	0	5	6	4	1.25	Partial	4.17	High	15.0	31.71	46.71
28	Light Rail Transit Service	CCAA Airport to Downtown Charleston	3.12	2.9	1.23	5	5.0	2	2.0	0	5	5	4	1.50	Partial	4.17	High	9.0	32.13	41.13

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
29	Lincolnville Rd. /Lincoln Ave. (S-8-881 N)	Streetscaping from Berlin Myers Pkwy (SC 165) to Ladson Rd.(S-10-76)	5.00	5	5	5	0.0	1	0.0	10	4	1	3	0.00	Yes	3.33	Med	1.0	40.83	41.83
30	Roadway System Long Point Rd. (S 10-197) Ext. Primus Dr. (Local Road) Extension Gregorie Ferry Connector Basketmakers Blvd. Jennie Moore School Rd. Charleston Co. School Rd. Johnie E. Brown Rd. *This system of projects has the potential to be implemented through multiple individual improvements	Long Point Rd. (S-10-197) to Lexington Dr. (Local Road) Six Mile Rd. (S-10-921) to Hamlin Rd.(S -10-504) US 17 to SC 41 Long Point Rd. Ext. (S-10-197) to Rifle Range Rd.(S-10-51) Hamlin Rd.(S-10-504) to Porchers Bluff Rd(S -10-51) Jennie Moore School Rd. to Rifle Range Rd. (S-10-51) US 17 to Primus Dr. Extension	3.84	2.04	5	5	4.0	2	1.0	10	4	3	1	0.50	Yes	3.33	Med	7.0	37.21	44.21
31	Long Point Re-Alignment (S-10-97)	Intersection of Long Point Rd.(S-10-97) & US Hwy. 17	3.95	1.65	5	5	4.0	4	3.0	10	3.87	10	0	0.50	Yes	0.83	Low	11.0	41.02	52.02
32	Mark Clark Expressway Extension (I-526)	US 17 to SC 30 Island Connector	2.61	1.65	2.95	5	8.0	15	8.0	4	4	2	5	1.00	Yes	1.67	Low	31.0	28.10	59.10
33	Miles Jamison (S-18-377)	Trolley Rd (S-18-199) to Ladson Rd (S-10-76)	3.95	3.16	3.49	5	2.5	3	3.0	10	3.17	6	0	2.50	Yes	0.83	Low	8.5	38.32	46.82

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
34	Mt. Pleasant Bypass	US 17 North to Clements Ferry Rd.(S-8-33) on new alignment	2.27	0.87	1.53	5	2.0	1	0.0	6	4	2	3	1.25	No	0.00	Med	3.0	24.82	27.82
35	Old Mount Holly (S-8-45)	St. James Ave (US 176) to US 52	3.85	1.24	5	5	2.5	1	1.0	10	3	4	3	0.50	Yes	1.67	Med	4.5	37.07	41.57
36	Old Orangeburg Road (S-18-22)	Dorchester Rd (SC 642) to Mallard Rd (S-18-58)	3.95	3	4.88	5	2.0	3	3.0	8	2.12	5	3	1.00	Yes	0.83	Low	8.0	35.25	43.25
37	Red Bank Road (S-8-29)	N. Rhett Ave. (S-8-136) to Bushy Park Rd.(S-*-503)	3.49	3.09	2.54	5	1.0	4	5.0	10	3.69	6	4	3.00	Yes	2.50	Med	10.0	43.15	53.15
38	S. Aviation Ave. (Local Road)	E. Spartan Blvd. (Local Road) to International Blvd. (Local Road)	1.90	0.37	1.38	5	6.0	12	8.0	10	2.5	2	3	5.00	Yes	1.67	Med	26.0	31.25	57.25
39	SC 41	US 17 to Joe Rouse (S-10-2057)	4.10	2.65	5	5	13.0	5	6.0	10	3.53	4	5	0.50	Yes	0.83	Med	24.0	40.26	64.26
40	SC 41	Dunes West Pkwy to Wando River /County Line	4.06	2.89	5	5	0.0	4	5.0	10	3.41	4	5	0.50	Yes	0.83	Low	9.0	39.97	48.97
41	Sea Island Parkway	Maybank Rd (SC 700) to Betsy Kerrison Blvd.(S-10-20)	2.99	1.94	2.5	5	1.0	9	4.0	2	4	6	5	0.50	Yes	0.00	Med	14.0	29.44	43.44
42	Sheep Island Parkway, I-26 Widening, I-26 Frontage Rds., & Sheep Island Rd. (S-8-275) Interchange @ I-26	N. Maple St. (S-8-131)to US 176, Sheep Island Rd.(S-8-275) to Jedburg Rd.(S-8-58 and Local Road)	3.43	2.28	2.7	5	1.5	15	10.0	4	4	5	3	5.00	Yes	1.67	Low	26.5	35.90	62.40
43	Transit Service	Local Service in CHATS Area, Bus Service from Daniel Island to to Bowman Rd. K-mart Transfer Point	5.00	5	5	5	0.0	1	0.0	10	2.5	6	0	1.00	Yes	5.00	High	1.0	44.50	45.50

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
44	US 52 & US 176 Intersection	Intersection Improvement	4.48	5	5	5	7.5	4	3.0	8	3.048	10	5	3.50	No	2.50	Med	14.5	49.96	64.46
45	Waterborne Transit Service	Daniel Island to Downtown Charleston	4.69	5	5	5	1.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	1.0	43.25	44.25
46	Waterborne Transit Service	Fort Johnson to Downtown Charleston	4.48	5	5	5	0.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	0.0	42.42	42.42
47	Waterborne Transit Service	North Charleston to Downtown Charleston	4.69	5	5	5	2.0	0	0.0	10	5	4	0	0.75	Yes	5.00	High	2.0	43.50	45.50
48	Waterborne Transit Service	Patriots Point to Downtown Charleston	4.69	5	5	5	1.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	1.0	43.25	44.25
49	Ashley Phosphate Road (S-10-75)	Cross County Road (S-10-2028) to Northwoods Blvd. (Local Rd) - capacity improvement	2.72	3.16	1.36	4.7	15.0	12	3.0	10	3.76	3	2	3.75	Yes	0.83	High	30.0	34.23	64.23
50	Ashley River Road (SC 61)	Old Parsonage (S-10-729) to Raoul Wallenberg (S-10-1372) - capacity improvement	3.54	2.79	5	4.7	9.0	2	2.0	10	3.22	2	5	0.00	No	0.83	High	13.0	35.21	48.21
51	College Park Road (S-8-62)	I-26 to Crowfield Blvd (S-8-1093) - capacity improvement	3.89	2.54	5	4.7	2.5	3	3.0	10	3.74	8	1	0.50	No	0.83	Med	8.5	39.65	48.15
52	Cross County Road (S-10-2028)	Ashley Phosphate Rd. (S-10-75)to Hill Park Rd. (Local Rd) - capacity improvement	3.44	3.24	2.5	4.7	10.0	4	4.0	10	3.1	0	2	4.00	No	0.83	Med	18.0	33.71	51.71
53	Deerwood Road (S-10-544 and S-10-1226)	Otranto Rd. (S-10-542) to US 78 (University Ave) - capacity improvement	3.85	3.18	5	4.7	7.0	9	8.0	10	2.72	0	1	0.00	No	0.83	Med	24.0	29.93	53.93
54	Folly Rd. (SC 171)	Sol Legare Rd (S-10-632) to Little Oak - capacity	3.27	2.33	3.53	4.7	2.5	5	5.0	10	2.614	1	5	0.25	No	0.83	Med	12.5	32.76	45.26

		improvement																		
ID	**FACILITY**	**DESCRIPTION**	**CONSTRUCTABILITY & IMPLEMENTATION**				**TRAVEL DEMAND BENEFITS**			**FINANCIAL VIABILITY**		**LIVABILITY INDEX**						**Travel Demand Benefit Rankings (0-30)**	**Project Impact Rankings (0-70)**	**Total Rankings (0-100)**
55	Folly Road (SC 171)	Windemere Rd (S-10-399) to Maybank Hwy (SC 700) - capacity improvement	3.64	3.1	5	3.96	7.5	5	5.0	10	3.039	1	5	0.25	No	0.83	Med	17.5	34.68	52.18
56	Folly Road (SC 171)	James Island Connector (SC 30) to Patterson Ave (S-10-752) - capacity improvement	3.93	2.69	5	4.7	12.0	5	5.0	10	2.568	3	5	0.25	Partial	0.83	Med	22.0	37.37	59.37
57	International Blvd (SC 10-1411)	Micheaux Pkwy (Local Road)to I-526 - capacity improvement	2.75	2.95	0	4.7	2.5	7	7.0	10	2.163	2	1	5.00	No	3.33	High	16.5	34.48	50.98
58	Long Point Road (S-10-197)	Whipple Rd (S-10-72)to Johnny Dodds Blvd(US 17) - capacity improvement	2.38	0.75	4	1.43	12.0	6	6.0	10	3.79	3	1	0.25	No	0.83	Low	24.0	28.39	52.39
59	Main Road (S -10-20)	Savannah Hwy (US 17) to River Road (S-10-54) - capacity improvement	3.19	2.67	2.5	4.66	12.0	7	6.0	10	2.88	3	5	0.25	Yes	0.83	Low	25.0	34.71	59.71
60	Micheaux Parkway (Local Road)	Dorchester Rd (SC 642) to International Blvd (Local Road)- capacity improvement	2.61	3.23	0	4.7	14.0	7	7.0	10	2.5	3	0	5.00	Yes	1.67	High	28.0	32.60	60.60
61	Montague Ave (S-10-62)	International Blvd (Local Road) to I-26 - capacity improvement	2.61	3.24	0	4.7	8.0	5	5.0	10	3.45	3	1	1.50	No	1.67	Med	18.0	31.06	49.06
62	Northside Dr. (S-10-2274)	Ingleside Plantation Rd. (Local Road) to Ashley Phosphate Rd. (S-10-75) - capacity improvement	2.78	3.09	0	4.7	1.0	6	6.0	10	3.45	1	1	2.75	Yes	0.83	Low	13.0	30.16	43.16
63	Otranto Road (S-10-542)	Deerwood Rd.(S-10-544) to Rivers Ave. (US 52)- capacity improvement	3.86	3.24	5	4.7	9.0	6	5.0	10	3.27	0	2	0.00	No	1.67	Med	20.0	32.38	52.38

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
64	Savannah Highway (US 17)	Orleans Rd. (S-10-1373) to Wesley Dr. (SC 171)- capacity improvement	3.52	3.16	3.71	4.7	8.0	12	6.0	10	2.291	3	5	1.25	No	1.67	Med	26.0	37.28	63.28
65	St. Andrews Blvd (SC 171 and SC 61)	Ashley River Road (SC 61) to Wesley Dr. (SC 171) - capacity improvement	3.60	3.24	3.94	4.7	15.0	7	5.0	10	1.57	1	5	0.50	No	1.67	Med	27.0	34.12	61.12
66	US 17 Alternate (North Main St)	Berlin Myers Parkway (SC 165) to Interstate 26 - capacity improvement	3.37	3.24	3.87	4.7	15.0	9	4.0	10	3.22	10	3	1.25	No	1.67	Med	28.0	42.11	70.11
67	US 17A	SR 61 to SR 642 - capacity improvement	3.55	2.9	4.22	4.58	1.0	6	5.0	10	2.17	4	5	0.75	No	0.83	Med	12.0	36.95	48.95
68	US 78	Deerwood Rd.(S-10-1226) to Ladson Rd. (S-10-76) - capacity improvement	3.42	2.95	3.54	4.7	2.0	7	6.0	10	3.31	5	5	4.00	Yes	0.83	Med	15.0	41.83	56.83
69	Wildgame Road (S-8-203)	Jedburg Rd (S-18-58 and Local Road) to Sheep Island Rd (S-8-275) - capacity improvement	3.83	3.11	3.76	4.7	0.0	12	9.0	10	2.84	2	0	1.25	No	0.83	Low	21.0	32.24	53.24
70*	Combined Project - Aviation Connector & S. Aviation Ave. (Local Road)	Ashley Phosphate Rd (S-10-75) to International Blvd. (Local Road)	2.02	0.53	1.53	4.96	6.3	11.6	7.8	8	2.70	2	2.5	5.0	Yes	1.6	Med	25.7	30.10	55.81
71	Gregorie Ferry Connector & Frontage Rd (Local Road)	SC Hwy 41 to US Hwy 17	3.63	2.28	4.22	4.70	10.0	4.00	4.00	10	2.53	3.0	3.0	0.50	Yes	0.83	Low	18.0	34.40	52.40

Environmental Mitigation

BACKGROUND

SAFETEA-LU requires that CHATS consult with Federal, State, and Tribal land management, wildlife, and regulatory agencies to develop a general discussion on possible environmental mitigation activities that should be incorporated into transportation projects identified in this plan. Since the transportation planning activities of CHATS are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Long Range Transportation Plan (LRTP) but rather offers a summary of environmentally sensitive areas to be aware of, the analyses conducted by the MPO to identify potential conflicts of planned projects, and mitigation strategies that could be considered in an effort to minimize any negative affect that a project may have on an environmentally sensitive area.

IDENTIFYING SENSITIVE AREAS

There are numerous environmentally sensitive areas found throughout the CHATS planning area. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as caves, sinkholes, and wetlands. When a project is ready to move from the LRTP into the design / engineering phases, the project sponsor should conduct any necessary analysis as required by state and federal regulations to determine the type and location of environmentally sensitive areas within the project study area.

In developing project lists for the LRTP, the MPO conducts top level analysis to determine the potential need for future environmental mitigation. Specifically, CHATS staff looks at proposed project locations throughout the region to determine their proximity to the following natural or socio-cultural resources datasets. That analysis provides early guidance to project sponsors to develop mitigation strategies. Specific features in this category include:

- Hydrological
- Bodies of water
- Floodplains/buffers
- Threatened species
- Parks/US Army Corps of Engineers properties
- Hazardous materials
- Hazardous waste
- Superfund sites

For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context sensitive solutions process should be considered in which considerable public participation and alternative design solutions are used to lessen the impact of the

- Schools
- Shopping centers
- Hospitals
- Churches/cemeteries
- Historic resources
- Reinvestment areas

ENVIRONMENTAL MITIGATION ACTIVITIES

The CHATS Policy Committee is committed to minimizing and mitigating the negative effects of transportation projects on the natural and built environments in order to preserve the quality of life for our constituents. In doing so, the MPO recognizes that not every project will require the same type and/or level of mitigation. Some projects such as new roadways and roadway widening involve major construction with considerable earth disturbance. Others like intersection improvements, street lighting, and resurfacing projects involve minor construction and minimal, if any earth disturbance. The mitigation efforts used for a project should be dependent upon how severe the impact will be on environmentally sensitive areas. The following three step process should be used to determine the type of mitigation strategy to apply for any given project:

- Identify environmentally sensitive areas throughout the project study area;
- Determine how and to what extent the project will impact these environmentally sensitive areas; and
- Develop appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

To the extent possible, transportation projects should minimize off-site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments should be developed that would lessen the project's impact on environmentally sensitive areas. The three step mitigation planning process should solicit public input and offer alternative designs or alignments and mitigation strategies for comment by CHATS and its local governments.

project. The table below details mitigation activities that could be considered to deal with the primary areas of concern.

The considerations and recommendations made during the planning process are preliminary in nature. Detailed environmental analysis conducted through the National Environmental Policy Act (NEPA) does not apply to long range transportation plans. With exceptions for regional ambient air quality, offsetting environmental impacts during the long-range planning process is not required. While detailed environmental analysis is not required, it is important to consult with environmental resource agencies during the development of a long-range transportation plan. This interagency consultation provides an opportunity to compare transportation plans with environmental resource plans, develop a discussion on potential environmental mitigation activities, areas to provide the mitigation, and activities that may have the greatest potential to restore and maintain the environment.

Detailed environmental analysis of individual transportation projects occurs later in the project development process as the improvement approaches the preliminary engineering stage. At this stage, project features may be narrowed and refined, and the environmental impacts and environmental mitigation strategies can be appropriately ascertained. An environmental review process directs the project-by-project interagency review, study, and identification of environmental concerns. Related requirements that typically apply at this stage involve public hearings, environmental permit-processing, and NEPA studies. Usually, a variety of environmental documentation, permit, and mitigation needs are identified and environmental findings are closely considered and evaluated. Common project environmental mitigation measures (required silt-fence barriers, precautions to control dust, etc.) are managed using Road and Bridge Standards that apply to all construction activities. Special environmental concerns may differ widely by project and location. As environmental studies are conducted and undergo public and interagency review, needed mitigation plans are specified and committed to within the environmental documents on the particular transportation project or activity. Environmental management systems then are used to monitor, and ensure compliance with, the environmental mitigation commitments.

Potential environmental mitigation activities may include: avoiding impacts altogether, minimizing a proposed activity/project size or its involvement, rectifying impacts (restoring temporary impacts), precautionary and/or abatement measures to reduce construction impacts, employing special features or operational management measures to reduce impacts, and/or compensating for environmental impacts by providing suitable, replacement or substitute environmental resources of equivalent or greater value, on or off-site. Where on-site mitigation areas are not reasonable or sufficient, relatively large off-site compensatory natural resource mitigation areas generally may be preferable, if available. These may offer greater mitigation potential with respect to planning, buffer protection, and providing multiple environmental habitat value (example: wetland, plant, and wildlife banks).

Mitigation activities and the mitigation areas will be consistent with legal and regulatory requirements relating to the human and natural environment. These may pertain to neighborhoods and communities, homes and businesses, cultural resources, parks and recreation areas, wetlands and other water sources, forested and other natural areas, agricultural areas, endangered and threatened species, and the ambient air. The following table illustrates some potential mitigation activities and potential mitigation areas for these resources:

Environmental Concern	Applicable Requirement	Potential Mitigation Activities
Wetlands or Water Resources	Clean Water Act at 33 USC 1251-1376; Rivers and Harbors Act at 33 USC 403	Mitigation sequencing requirements involving avoidance, minimization, compensation (could include preservation, creation, restoration, in lieu fees, riparian buffers); design exceptions and variances; environmental compliance monitoring
Forested and other Natural Areas	Agricultural and Forest District Act (Code of VA Sections 15.2-4305; 15.2-4307-4309; 15.2-4313); Open Space Land Act (Section 10.1-1700-1705, 1800-1804)	Avoidance, minimization; Replacement property for open space easements to be of equal fair market value and of equivalent usefulness; design exceptions and variances; environmental compliance monitoring.

Agricultural Areas	Farmland Protection Policy Act of 1981 at 7 USC 4201-4209, Agricultural and Forest District Act (Code of VA Sections 15.2-4305; 15.2-4307-4309; 15.2-4313)	Avoidance, minimization; design exceptions and variances; environmental compliance monitoring

Environmental Concern		Potential Mitigation Activities
Endangered and Threatened Species	Endangered Species Act at 16 USC 1531-1544	Avoidance, minimization; time of year restrictions; construction sequencing; design exceptions and variances; species research; species fact sheets; Memoranda of Agreements for species management; environmental compliance monitoring
Ambient Air Quality	Clean Air Act at 42 USC 7401-7671, and Conformity regulations at 40 CFR 93	Transportation control measures, transportation emission reduction measures; travel demand management; land use and growth management techniques
Neighborhoods, Communities, Homes and Businesses	Uniform Relocation Assistance and Real Property Acquisition Policy Act at 42 USC 4601 et seq.	(appropriate functional and/or aesthetic design features)
Cultural Resources	National Historic Preservation Act at 16 USC 470	Avoidance, minimization; landscaping for historic properties; preservation in place or excavation for archeological sites; Memoranda of Agreement with the SC State Historic Preservation Office (SC SHPO); design exceptions and variances; environmental compliance monitoring
Parks and Recreation Areas	Section 4(f) of the USDOT Act at 49 USC 303	Avoidance, minimization, mitigation; design exceptions and variances; environmental compliance monitoring

FURTHER STRATEGIES

The regional mobility strategies outlined in CMP also focus on reducing traffic congestion and enhancing transportation alternatives to the single occupant vehicle (transit, bicycling, and walking). Implementing these strategies will improve air quality by reducing vehicle use and vehicle congestion. The multimodal transportation strategies section identifies specific tools to improve roadways, transit, bicycle, and pedestrian facilities.

Roundabouts can be used to improve area roadways, providing improved traffic flow and safety with less paved area and less idling than conventional intersections. Properly engineered modern roundabouts can support high volumes of traffic moving through an intersection, provide improved pedestrian movements, and can reduce the number of vehicle and pedestrian accidents. Signalized intersections typically require wider roads than roundabouts, to allow for added lanes to stack

vehicles waiting to complete the turning movement. They can also have less capacity, safety, and more delay than roundabouts.

A better-connected network of neighborhood streets will help relieve traffic congestion in heavily used corridors, especially at major choke points and intersections. These streets will also improve safety in the transportation network, allowing people to access attractions on smaller-scaled, walkable, bikeable, and transit-friendly roadways. A well-designed transit system that is fully integrated with other modes such as bicycling, walking, and ridesharing can minimize the impacts of transportation on the environment by reducing roadway congestion and the need for excess parking. Parking lots cover areas that once absorbed and filtered rainwater. In addition, oil and other pollutants pool in parking lots and are later washed off, exacerbating an area's surface water pollution problems. Ridesharing and travel demand management strategies help reduce travel via single occupant vehicle, and as a result, reduce traffic and traffic congestion and the resulting negative effects on air quality.

Land use and transportation are inextricably linked. Transit Oriented Development (TOD) provides excellent examples of combines land use and transportation strategies to minimize negative environmental impacts. TOD is designed to maximize access by transit and non-motorized transportation, with other features, to encourage transit ridership. TOD does more than simply shift car trips to transit; it also increases accessibility and transportation options through land use clustering and the mix of residential and commercial facilities. It reduces the need for automobile use and parking. By reducing the distance required for car trips, it encourages walking and cycling, and allows some households to reduce their car ownership, which together can result in large reductions in vehicle travel. TOD strategies address how development on a "greenfield" site can be adjusted to incorporate transit strategies early on, and continue to be transit-accessible as the community grows."

Interagency Consultation

The MPO has sought input from coordinating agencies and their comments have been incorporated into this chapter. The most prevalent response from coordinating agencies was that environmental mitigation would be conducted in accordance with the National Environmental Policy Act (NEPA). The US Fish and Wildlife Service stated that this was not the appropriate venue or time to comment on environmental mitigation. That appropriate time would be during a project level analysis when specific impacts could be identified. CHATS will continue to engage the resource management agencies, Military Departments, and regulatory agencies in transportation planning activities.