CHAPTER 7: HIGHWAY ELEMENT

7.1 Introduction

Of the several transportation modes represented in the Midlands Tomorrow multi-modal plan, the highway system is the most heavily utilized. The vast majority of trips in the COATS planning area are automobile trips It is also significant that the major roadway network provides the basis for other transportation modes, specifically fixed route bus, higher capacity commuter bus transit services, para-transit for special needs populations, and bicycle and pedestrian facilities, all of which travel in road rights of way. While improvements to the major road network benefit automobile travelers, these improvements can also result in better service for transit users, pedestrians, bicyclists and motor freight haulers.

This chapter explains improvements recommend for reducing congestion and expanding capacity of the highway network. The major topics of discussion are the project prioritization process, road widening, “new right of way” construction, intersection improvements and. interstate highway improvements. The chapter also explains the “financially constrained” planning requirements of SAFETEA-LU, and presents both financially constrained and “enhanced revenue” plans.

Chapter 4, earlier in this document, presents a series of transportation system design principles. The principles are intended to guide the development of an efficient, safe multi-modal network of roads, transit and bike and pedestrian ways. The improvements proposed in this chapter should be designed in accordance with the principles in Chapter 4. Another Chapter, Chapter 8, summarizes the Congestion Management Plan developed as part of the Midlands Tomorrow planning process. This process is designed to identify opportunities to make relatively quick, low cost improvements to the transportation system, as opposed to an over-reliance on expensive road widening projects which, due to financial limitations, proceed very slowly. The Congestion Management process should be applied to all congested transportation corridors to identify the most appropriate type of improvement and level of investment.

7.2 The Financially Constrained Planning Requirement

Under the requirements of SAFETEA-LU, the MPO must adopt a Financially Constrained Plan, showing prioritized projects that can be funded with revenues that are reasonably expected to be available

during the planning period. The Financial Element (Chapter 12) further explains this requirement and provides revenue forecasts that were used in preparing the financially constrained component of the Midlands Tomorrow plan.

SAFETEA-LU also provides inclusion of projects that would be included in the adopted, financially constrained plan if additional resources beyond the funds identified in the financial plan were to become available. Because the costs of the transportation improvements needed in the COATS area are far in excess of the funding forecast, this chapter also includes an Enhanced Revenues Plan. A third component---a Vision Plan— includes very long range-range projects with no currently identified funding source.

7.3 Highway Proposals

The Midlands Tomorrow Regional Transportation Plan proposes widenings of major thoroughfares and interstate highways, intersection improvements, interstate highway interchange improvements, and construction of a few new roads on new rights of way. COATS prioritized the major thoroughfare and intersections projects through the process described below. Interstate highway improvements were taken from the South Carolina Department of Transportation State-Wide Multi-Modal Transportation Plan.

7.3.1 The Project Prioritization Process

Both SAFETEA-LU and SC ACT 114 require an objective, data-driven process for selecting projects for inclusion in the financially constrained plan, and, ultimately, for funding and construction. One key component of the process included using the COATS Travel Demand Model to analyze current and anticipated travel patterns and traffic congestion rates. Documentation of the travel demand model appears in a separately bound appendix to this plan.

Following the requirements of SC ACT 114, COATS adopted a project ranking systems for road widening, intersection improvements, and construction. of new roads (“new right of way construction”.) These ranking criteria and their potential scoring ranges are shown in Table 7.1.

It should be noted that the project ranking requirements do not apply to projects that do not use SCDOT Guideshare funding. Projects funded entirely by state or federal earmarks, a local sales tax initiative, local

government general obligation bonds or other exempt sources could be built as funds became available at the discretion of SCDOT and the funding entity.

Table 7.1: Road Widening Ranking Criteria

Widening Projects	Weighting
Financial Viability and Maintenance Cost	20 Points
Public Safety	10 Points
Potential for Economic Development	8 Points
Traffic Volume and Congestion	33 Points
Truck Traffic	8 Points
Pavement Quality Index	5 Points
Environmental Impact	8 Points
Right of Way Preservation	8 Points
Alternative Transportation Solutions	For Consideration Only
Consistency with Local Land Use Plans	For Consideration Only

In addition to these criteria, two other criteria that do not lend themselves to quantitative scoring were considered. The first is financial feasibility. Based on guidance received from SCDOT, viability review was performed on the initial list of road segments needing improvements. To be considered feasible, the cost of a project must not be so high that it is impossible to fund and build it within the 6-year cycle of the Transportation Improvement Program (TIP). Projects which could not meet this test were reconfigured into smaller segments for ranking purposes.

The second un-quantified criterion is consistency with local land use plans. In the judgment of COATS, this assessment is best left to the local governments who are given, under the South Carolina Planning Enabling Act, the responsibility to prepare comprehensive development plans and the authority to develop land use regulations and capital improvements programs to implement those plans. Representatives of local government land use planning agencies participate in the COATS Technical Committee. During the final public comment period, local governments have further opportunities to suggest changes to the final draft based on any comprehensive land use planning concerns.

Prioritized lists of road widenings, intersections, and new construction projects are included in the following sections.

7.3.2 Road Widenings

Using the COATS travel demand model, the regional highway network was analyzed to identify road segments that would be at level of service "E" or "F" by 2035 if they were not improved. Levels of service "E" and "F" represent unacceptable levels of travel delay and traffic congestion. These roads are shown on Map 7.1. This needs analysis provided the basis for a shorter list of projects which was prioritized using the road widening project selection criteria.

Table 7.3 and Map 7.2 show a prioritized list of road widening projects. Unless otherwise noted, these projects involve widening 2 or 3 lane roads to 4 or 5 lanes. While a number of existing 4 and 5 lane roads will have future capacity problems according to the travel demand model, the plan proposes to limit use of Guideshare funds to upgrading the 2 and 3 lane facilities, rather than re-widening roads that have already been upgraded. This does not mean that issues with the existing 4 and 5 lane roads will not be addressed. The plan proposes to seek alternate funding sources beyond the projected Guideshare. allocation, and, also, to use the six-level screening process in the Congestion Management Program (Chapter 8) to provide additional travel improvements. Table 7.3a and Map 7.2a identifies the four and five lane roads that fall into this category. They are included in the Enhanced Revenues Plan.

Map 7.1: Highway Widening Needs Assessment

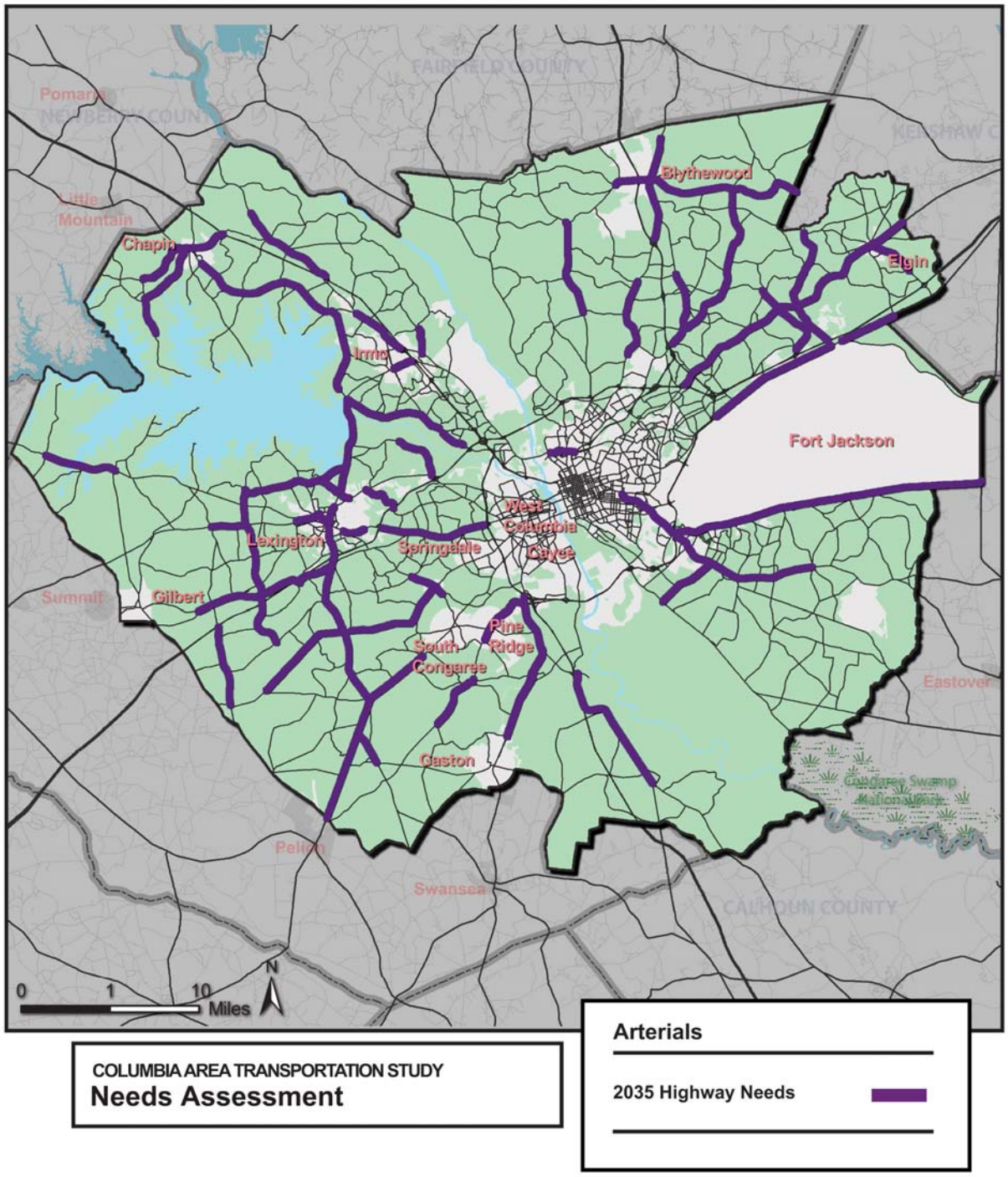


Table 7.2: Prioritized Road Widening Projects

(Blue Shading indicates fiscally constrained projects)

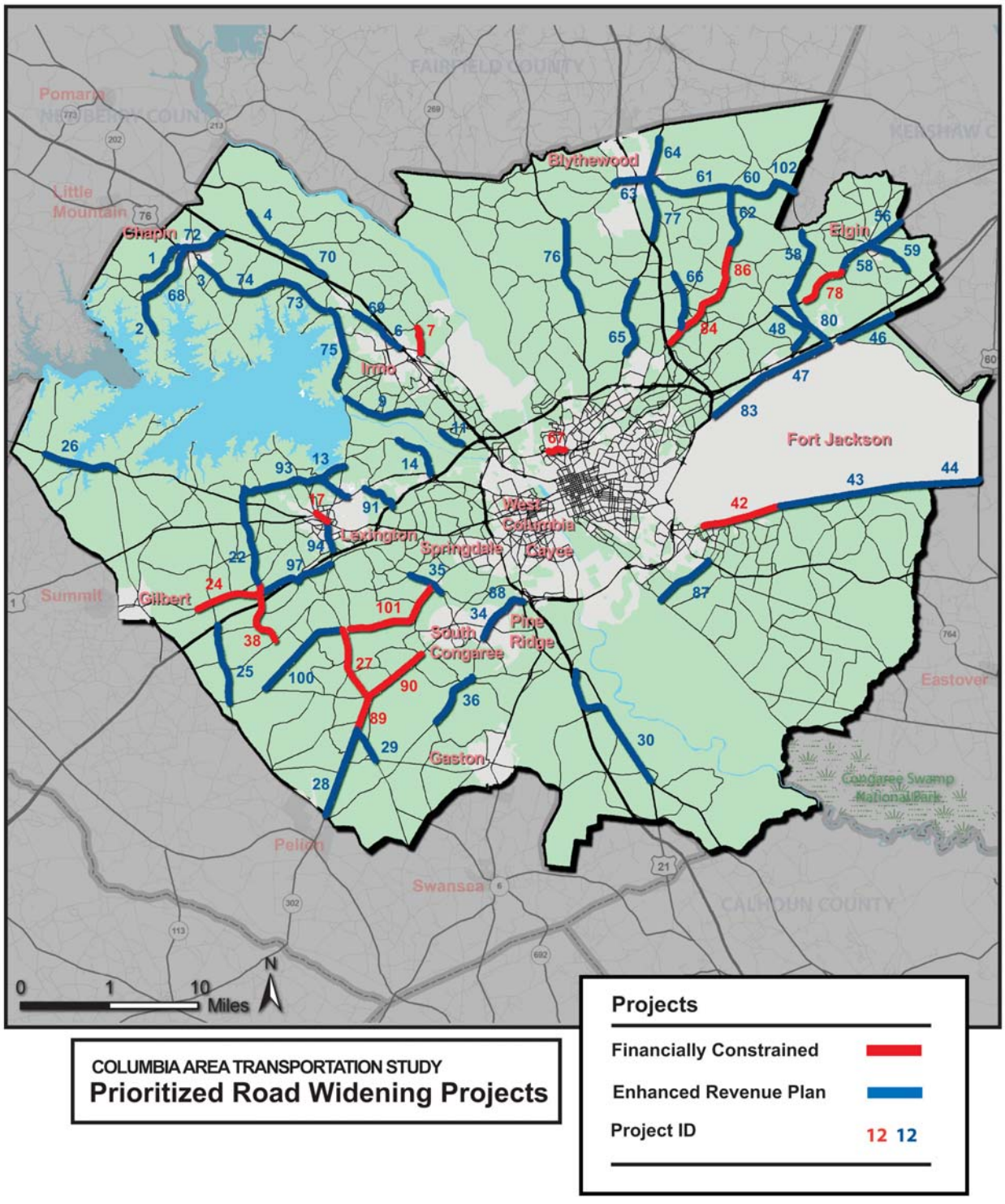
Rank	Project	Est. Cost
1	**Two Notch Road (US 1) Pontiac** *(Spears Creek Ch Rd S-52 to Steve Campbell Rd S-407)*	**$17,208,719.00**
2	**Longs Pond Road (S-204)** *(Barr Rd S-77 to Nazareth Rd S-243)*	**$24,268,706.00**
3	**W. Main St Lexington (US 1)** *(Columbia Ave US 378 to N Lake Dr SC 6)*	**$4,853,741.00**
4	**Edmund Highway (SC 302)** *(Segment of US 302 combined with SC 6)*	**$11,840,187.00**
5	**Hard Scrabble Road (S-83)** *(Farrow Rd SC 555 @ I-77 to Clemson Rd S-52)*	**$27,210,368.00**
6	**Leesburg Road (SC 262)** *(Fairmont Dr S-404 to Lower Richland Blvd S-37)*	**$27,357,451.00**
7	**Sunset Drive (SC 16)** *(River Dr US 176 to N Main St US 21/321)*	**$5,883,323.00**
8	**S Lake Drive (SC 6)** *(Platt Springs Rd SC 602 to Boiling Springs Rd S-279/SC 302)*	**$25,886,620.00**
9	**Kennerly Road (S-129)** *(Broad River Rd US 176 to Hollingshed Rd S-635)*	**$9,045,609.00**
10	**Hard Scrabble Road (S-83)** *(Clemson Rd S-52 to Lake Carolina)*	**$20,959,337.00**
11	**Two Notch Road (S-70/77)** *(Long Ponds Rd S-204 to Wire Rd S-60)*	**$22,871,417.00**
12	**Edmund Highway (SC 302)** *(S Lake Dr SC 6 to Gator Road (S-647)*	**$21,106,420.00**
13	**Platt Springs Road (SC 602)** *(Emmanuel Church Rd S-168 to Old Orangeburg Rd S-244)*	**$34,932,229.00**
14	**Old State Road (US 21)** *(I-26 Exit 119 to Columbia Rd US 176)*	**$49,934,701.00**
15	**N. Lake Drive (SC 6)** *(Dutch Fork Rd US 176 to Lake Murray Blvd SC 60)*	**$29,416,614.00**
16	**Fish Hatchery Road (S-73)** *(Pineridge Dr S-103 to Old Charleston Hwy US 321)*	**$15,884,971.00**
17	**Jefferson Davis Hwy (US 1)** *(Steve Campbell Rd S-407 to Sessions Rd S-47)*	**$16,225,072.00**
18	**Broad River Road (US 76/176)** *(Woodrow St S-27 to Dutch Fork Rd US 76)*	**$14,477,756.00**
19	**Percival Road (SC 12)**	**$23,963,183.00**

	(I-77 Exit 15 to Smallwood Rd S-1026)	
20	**Columbia Avenue (S-48)** *(I-26 Exit 91 to Chapin Rd US 76)*	**$17,306,743.00**
21	**Clemson Road (S-52)** *(Two Notch Rd US 1 to Sparkleberry Ln S-2033)*	**$23,214,333.00**
22	**Broad River Road (US 76)** *(Woodrow St S-27 to I-26 Exit 101)*	**$7,738,111.00**
23	**Edmund Hwy (SC 302)** *(S Lake Dr SC 6 to Old Charleston Rd S-625)*	**$35,611,952.00**
24	**Blythewood Road (S-59)** *(Muller Rd S-59 to Wilson Blvd/Main St US 21)*	**$14,228,140.00**
25	**Bush River Road (S-273)** *(Seawright Rd S-1002 to Woodlands Dr)*	**$9,485,426.00**
26	**Chapin Rd/Dutch Fork Road (US 76)** *(Sid Bickley Rd S-715 to Three Dog Rd S-1403)*	**$17,722,771.00**
27	**Pilgrim Church Road (S-408)** *(N Lake Dr SC 6 to Old Cherokee Rd S-485)*	**$12,231,208.00**
28	**Dutch Fork Road (US 76)** *(Twin Gates Rd S-1151 to Three Dog Rd S-1403)*	**$25,960,115.00**
29	**Farrow Road (SC 555)** *(N Pines Rd S-1437 to Hard Scrabble Rd S-83)*	**$22,299,073.00**
30	**S Lake Drive (SC 6)** *(Industrial Dr S-626 near I-20 to Main St US 1)*	**$11,565,564.00**
31	**Emmanuel Church Road (S-168)** *(Old Barnwell Rd S-104 to W Dunbar Rd S-72)*	**$14,144,934.00**
32	**Jefferson Davis Hwy (US 1)** *(Sessions Rd S-47 to Watts Hill Rd S-757)*	**$14,644,167.00**
33	**Fish Hatchery Road (S-73)** *(Pineridge Dr S-103 to Bachman Rd S-1257)*	**$4,909,124.00**
34	**Amicks Ferry Road (S-51)** *(Paul Fulmer Rd to Shady Acres Dr)*	**$16,191,974.00**
35	**Percival Road (SC 12)** *(Spears Creek Ch Rd S-53 to Highway Ch Rd S-102)*	**$25,700,051.00**
36	**Langford Road (S-54)** *(Wilson Rd US 21 to Grover Wilson Rd S-60)*	**$37,467,474.00**
37	**Wilson Boulevard (US 21)** *(I-77 Exit 24 to Blythewood Rd S-59)*	**$26,923,863.00**
38	**Spears Creek Ch Road (S-53)** *(I-20 Exit 82 to Two Notch Rd US 1)*	**$21,181,361.00**
39	**Percival Road (SC 12)** *(Smallwood Rd S-1026 to Spears Creek Ch Rd S-53)*	**$32,666,365.00**
40	**Pineview Road (SC 769)** *(Garners Ferry Rd US76/378 to Bluff Rd SC 48)*	**$27,582,839.00**

41	**Amicks Ferry Road (S-51)** *(Chapin Rd US 76 to Paul Fulmer Rd)*	**$29,842,184.00**
42	**SC 6** *(Edmund Hwy SC 302 to Meadowfield Rd S-65)*	**$15,721,277.00**
43	**White Pond Road (S-47)** *(Main St US 1 to Heath Pond Rd S-336)*	**$19,769,270.00**
44	**Langford Road (S-54)** *(Hard Scrabble Rd S-83 to Heins Rd S-81)*	**$23,723,124.00**
45	**Old Cherokee Road (S-408/485/486)** *(N Lake Dr SC 6 to US 378)*	**$57,519,162.00**
46	**Heins Road (S-54)** *(Langford Rd S-54 to Cherokee Blvd S-53)*	**$9,508,077.00**
47	**US 378** *(Old Lexington Rd S-157 to Beulah Ch Rd S-24)*	**$31,913,250.00**
48	**Bush River Road (S-107)** *(N Lake Dr SC 6 to St Andrews Rd S-36)*	**$35,302,268.00**
49	**St Peters Church Road (S-29)** *(Chapin Rd US 76 to Paul Fulmer Rd)*	**$23,252,427.00**
50	**Hard Scrabble Road (S-83)** *(Langford Rd S-54 to Lake Carolina)*	**$23,432,215.00**
51	**Pisgah Ch Road (S-204)** *(Hermitage Rd S-172 to Barr Rd S-77)*	**$19,917,384.00**
52	**Fish Hatchery Road (S-73)** *(Casa Dell Rd S-868 to Glenn Rd S-875)*	**$30,568,390.00**
53	**Leesburg Road (SC 262)** *(Lower Richland Blvd S-37 to Harmon Rd S-86)*	**$46,331,880.00**
54	**Wilson Boulevard (US 21)** *(Langford Rd S-54 to Raines Rd S-2126)*	**$20,769,463.00**
55	**Broad River Road (US 176)** *(I-26 Exit 97 to Chapin Rd S-39)*	**$34,509,262.00**
56	**Winnsboro Road (US 321)** *(Koon Store Rd S-61 to Blythewood Rd S-2200)*	**$47,610,001.00**
57	**Platt Springs Road (S-34/63)** *(White Knoll HS to Boiling Springs Rd S-279)*	**$50,805,303.00**
58	**Calks Ferry Road (S-278)** *(I-20 to Pond Branch Rd S-34)*	**$39,834,766.00**
59	**Wilson Boulevard (US 21)** *(Fulmer Rd S-1352 to Pisgah Ch Rd S-34)*	**$40,686,846.00**
60	**Bookman Road (S-53)** *(Robin Hood Rd S-1051 to Two Notch Rd US 1)*	**$41,325,907.00**
61	**Chapin Road (US 76)** *(Murray Lindler Rd S-940 to Sid Bickley Rd S-715)*	**$18,958,792.00**
62	**Corley Mill Road (S-68)**	**$26,414,497.00**

	(Lee Kleckley Rd to Sunset Blvd US 378)	
63	**Broad River Road (US 176)** *(Chapin Rd S-39 to Jake Eargle Rd S-592)*	**$15,656,980.00**
64	**Leesburg Road (SC 262)** *(Harmon Rd S-86 to McCords Ferry Rd US 601)*	**$54,213,625.00**
65	**Two Notch Road (S-70)** *(S Lake Dr SC 6 to Longs Pond Rd S-204)*	**$40,154,296.00**
66	**Mineral Springs Road (S-106)** *(Sunset Blvd US 378 to Cedar Rd S-387/Cromer Rd)*	**$19,171,812.00**

Map 7.2: Prioritized Road Widening Projects



7.3.3 New Right of Way Projects

New right of way projects ---construction of new roads on new routes, as opposed to mere widening of existing roads ---- are needed in a number of circumstances:

- To improve continuity of the regional road system and to make connections between existing major roads that will make travel more efficient by creating more direct routes and shortening trip lengths;
- To create a more desirable spacing of major thoroughfares
- To take pressure off of parallel routes that are overburdened with traffic due to poor spacing of roadways
- To provide an alternative to widening a parallel route that is already improved to the extent permitted by available rights of way.

In the circumstances described, above, new construction may be the best alternative. There are, however, some problems associated with new construction projects. Acquisition costs for right of way are likely to be high because of the amount of land that must be purchased. Environmental impacts may be greater than those of road widening, since construction of a new road may have a greater impact than an incremental addition to an existing roadway.

New construction projects have one unique advantage: since they start with “a clean piece of paper”, they offer an opportunity to use state of the art design standards and construction practices. When new construction projects are being planned, it is a good time to be considering improved land use regulation to provide for good access management to avoid conflicts from excessive curb cuts and minor street intersections. Corridor overlays---special urban design and land use regulations added to underlying zoning---are one way to accomplish this. It is also important to develop a right of way preservation and acquisition for the corridor, well in advance of construction.

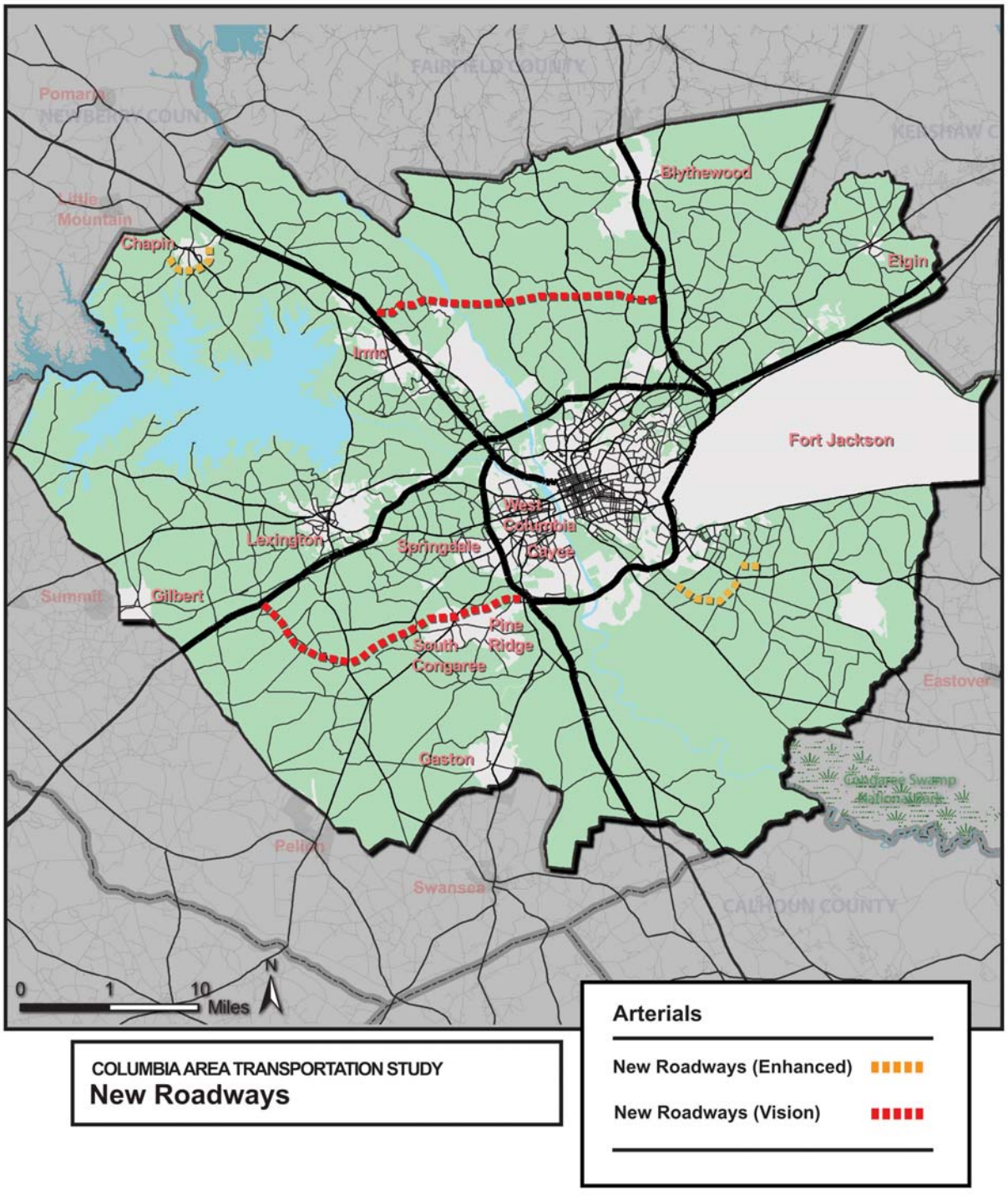
SCDOT is currently developing a policy on new construction road projects and how they fit into the ranking requirements of Act 114. Based on staff’s understanding of the policy being developed, the Midlands Tomorrow Plan provides a list of new construction projects and leaves the COATS/CMCOG Board of Directors the option of adding these projects to the Financially Constrained Plan, subject to demonstrating that the project is consistent with the goals, objectives

and polices of the plan. Projects of this type should be evaluated in a feasibility study, Advanced Project Planning Report, or Sub-Area Plan prior to being included in the Financially Constrained Plan.

This plan includes a very short list of new construction projects. The proposed projects include the Shop Road Extension and Rabbit Run Road in lower Richland and the proposed Southern Connector in Chapin. All three projects were recently studied in Sub-Area Plans for Lower Richland and Chapin, respectively. These roads are needed to provide more continuity and connectivity in the regional thoroughfare system and to relieve congestion on other routes.

There are also two major new construction projects shown in the Vision Plan: the Northwest and Southeast Connectors. These projects have long histories as proposals in earlier plans and would provide connections between suburban areas. They are well beyond the current or anticipated financial capabilities of the COATS program, would require environmental studies, and may be difficult to implement die to encroachments of new development on their potential routes. The routes shown are conceptual, and any actual route would require more study. Map 7.3 illustrates the locations of the new construction projects included in the enhanced revenue and vision plans.

Map 7.3: New Construction Projects



7.4 Intersection Improvements

Intersection improvements are generally quicker and less expensive to construct and design than road widenings. Some congested corridors respond well to intersection improvements which serve to relieve bottlenecks and create improved traffic patterns. Strategic improvements to a string of intersections along a congested corridor may provide relief from traffic congestion while funding is being obtained to widen the roadway. Correction of poorly designed intersections---those with more than four "legs", angles other than 90 degrees, or conflicts with other roadways located too close to the intersection--- can be justified in terms of safety improvements.

Intersections were prioritized based on the criteria shown in Table 7.3. Table 7.4 shows the intersections in order of priority.Map 7.4 shows the intersections identified for improvements.

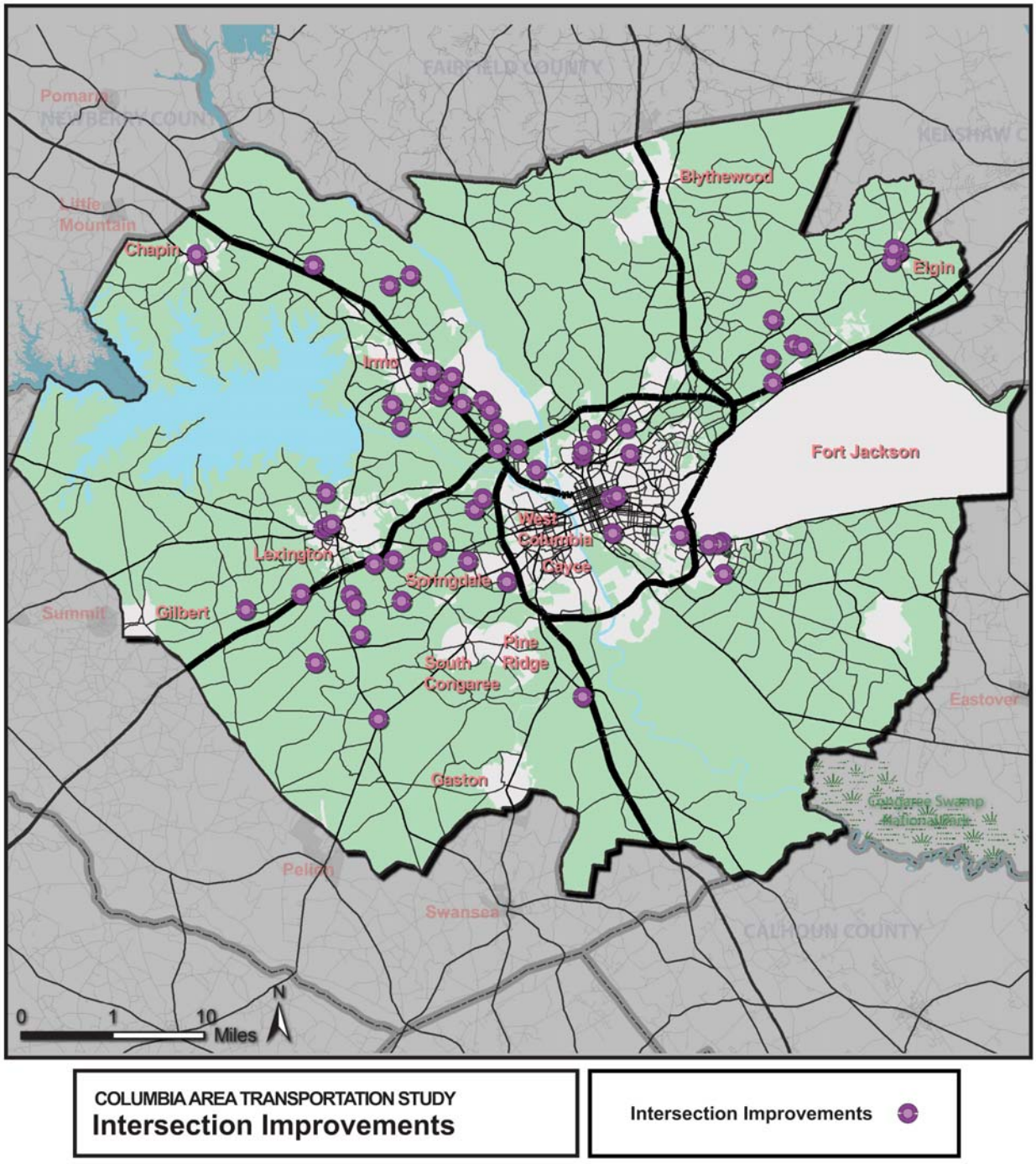
Table 7.3: Intersection Improvement Ranking Criteria

Intersection Improvement Projects	Weighting
Traffic Status (Site Specific Conditions)	20 Points
Average Daily Traffic (AADT)	25 Points
Average Daily Truck (% AADT)	15 Points
Economic Development	10 Points
Environmental Impact	10 Points
Public Safety	20 Points
Land Use Plans	For Consideration Only
District Review and Input	For Consideration Only
Compliance to National Rule and Guidelines	For Consideration Only

Table 7.4: Prioritized Intersection Improvements

(Table to be inserted)

Map 7.4: Intersection Improvements



7.5 The Interstate Highway System

The COATS/Central Midlands region is served by four Interstate Highways: IH 20, IH 26, I77 and I-126. Interstates 20, 26 and 77 link the Midlands to other states, while I -126 serves as a spur from I-26 into downtown Columbia.

An interstate "loop" surrounds the urban cores of Columbia, West Columbia, Cayce and Forest Acres. The loop is about 15 miles by 10.5 miles across. Over 175,000 people, more than 26% of the population of the Central Midlands region, live inside the loop. Downtown Columbia, the University of South Carolina, the principal commercial areas of Forest Acres, West Columbia and Cayce, and Richland Mall are all within the loop, and the Fort Jackson Army installation is immediately outside the loop on I-77. Two other roads, S-12 and S-277 have controlled access cross-sections and supplement the freeway system.

The COATS freeways are critical components in the South Carolina emergency evacuation plan. They are also heavily impacted by tourist traffic and by the increasing reliance on motor freight carriers, coupled with the growth in international freight movement through the Port of Charleston. The massive distribution center planned near the I-95/I-26 in Orangeburg County will impose further demands on the interstate system in the COATS region.

According to SCDOT's *Comprehensive Multi-Modal Plan*, "providing an additional lane in each direction on an interstate mainline is estimated to cost almost $20 million per mile for design, right of way acquisition, and construction. The cost to design, purchase right of way, and reconstruct an urban interchange averages over $40 million. A rural interstate interchange would cost slightly lower, averaging close to $35 million to construct."

Portions of I-20 and I-26 are among the most congested freeway segments in South Carolina. The interstate improvements needed in the COATS planning area by 2030 total over $1.13 billion. These interstate improvements are described in Table 7.5 and illustrated in Map 7.5.

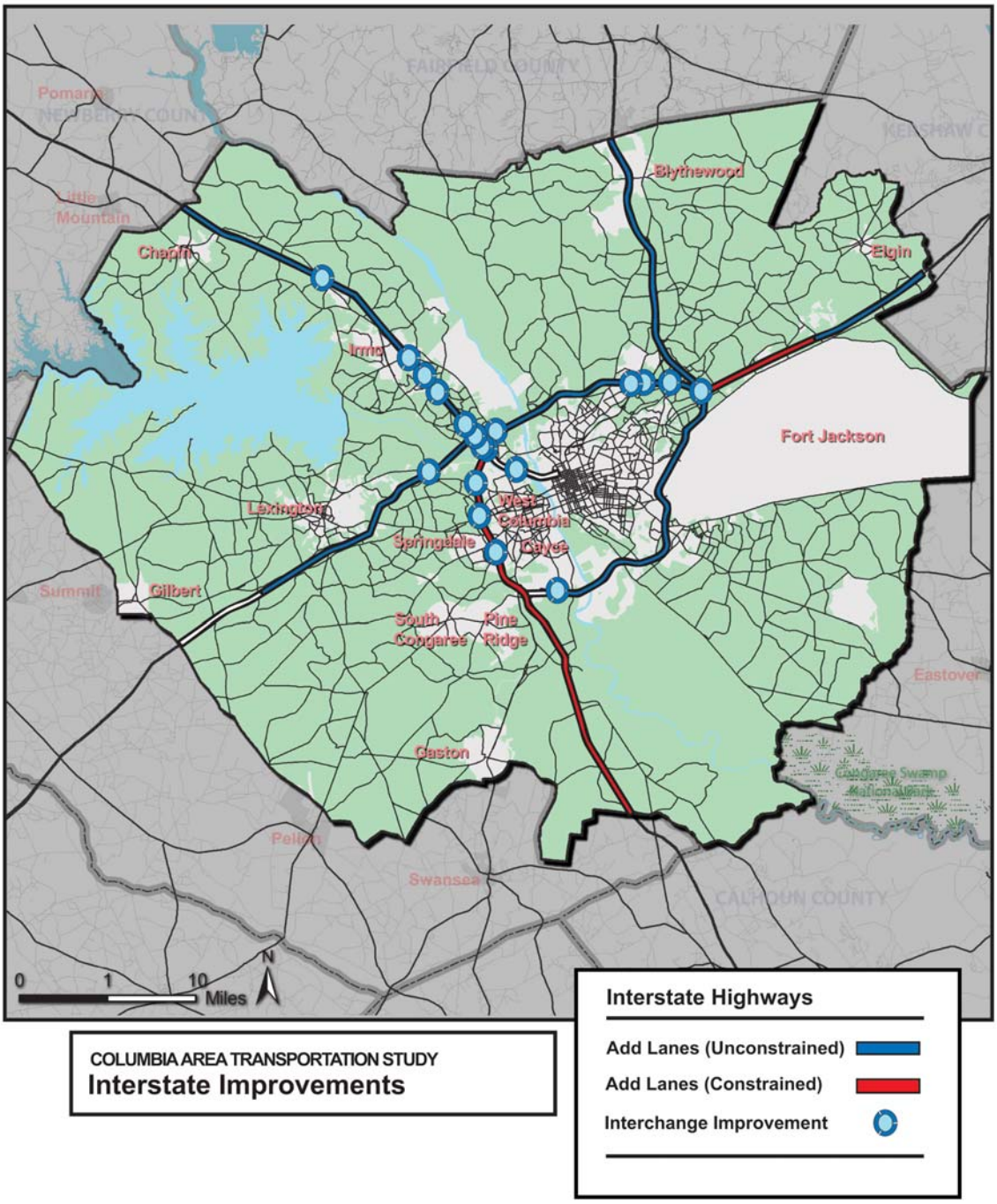
These improvements would be needed to maintain an acceptable level of service on the interstates. Because the COATS interstate system is moving from a primarily 4-lane system to a system with substantial mileage devoted to 6 to 8 lane freeways, COATS and SCDOT should begin investigating high occupancy vehicle (HOV),high occupancy toll

(HOT) , and contra-flow (reversible) lanes as relatively low cost techniques to add further capacity to the improved interstates.

Table 7.5: Interstate Improvements

	Total Cost $1,000s	Finish Preliminary Engineering	Finish Right of Way	Start Construction	Finish Construction
INTERCHANGES					
I-26@US 1 (Augusta Road)	80,500		2010	2019	2020
I-26 @ SC 302 (Airport Blvd.)	50,000			2017	2018
I-26@ I-20 and I126 (Exits 107 & 108)	10,500	2009	2010		
WIDENINGS					
I-20 from I-77 to SC- 53; Widen to 6 lanes	137,800	2010	2010	2011	2013
I-26 from I-126 to US 321; Widen to 8 lanes	337,000	2017	2019	2021	2024
I-26 from US 321 to S-31; Widen to 6 lanes	515,000	2023	2025	2028	2030

Map 7.5: Interstate Improvements



7.6 Objectives and Strategies

1. Improve the capacity and connectivity of the road network

- Increase highway capacity by widening roads that cannot maintain a level of service of "D" or above without widening.
- Improve Interstate Highway capacity by adding lanes where appropriate and upgrading interchanges.

2. Keep pace with new development

- Implement the transportation network design and land use principles in Chapter 4

3. Balance investments between major improvements (road widening) and projects that make the existing transportation system safer and more efficient.

- Provide incentives in the TIP process for right-of-way preservation, access management and land use/ transportation planning integration.
- Use intersection improvements, signalization, access management and other congestion management tools effectively to provide relatively quick, relatively low-cost mobility improvements.