I-55/75/26

Multimodal Corridor Study

▶Executive Summary

Prepared by:
AECOM
1000 Corporate Centre Drive, Suite 250
Franklin, TN 37067, USA
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TN TDOT Department of Transportation

I-55/75/26 Multimodal Corridor Study

Executive Summary

Introduction

Tennessee's interstates form the backbone of the state's transportation system, complemented by state highways, local roads, airports, railroads, transit systems, bicycle and pedestrian facilities, and waterborne navigation facilities. Tennessee's interstate highways carry about 30% of all vehicle miles traveled in the state, and 80% of all truck miles, making them the key component of the roadway system, facilitating the movement of people and goods across the state and across the country. Developing a multimodal transportation system that meets the changing needs of Tennessee's residents, businesses, and visitors will support the state's growth and provide a range of safe transportation options for everyone.

The I-55/75/26 Multimodal Corridor Study evaluated potential transportation improvements to address existing and emerging issues in the system. The analysis is centered on study areas surrounding four Interstate corridors: I-55 in southwestern Tennessee, I-155 in northwestern Tennessee, I-75 in the east-central part of the state, and I-26 in eastern Tennessee. Together, these corridors represent more than 200 miles of freeway traveling through urban and rural counties, supported by a robust network of non-freeway facilities.

The study considered innovative, long-range approaches to addressing multimodal issues and opportunities in these corridors. Solutions were developed to address traffic and congestion, operations and safety, expanded transportation choice, and the ways in which the transportation system supports economic growth, freight movement, and access to employment. The study included multiple opportunities for stakeholder involvement, including surveys, regional meetings, interactive online mapping and the guidance of a project advisory committee made up of representatives from each corridor's study area.

The I-55/75/26 Multimodal Corridor Study is documented in four technical memoranda and a final report. This Executive Summary presents an overview of the key transportation deficiencies identified in each corridor and the top ranked solutions for addressing those deficiencies. For technical details and full explanations of the planning process and its outcomes, please refer to the study documents. This Executive Summary outlines the general shape of the future of transportation in these interstate corridors, suggesting planning studies and projects that will enable them to function efficiently for Tennessee's residents, businesses, and visitors long into the future.

Study Corridors

Four interstate corridors - I-55, I-155, I-75 and I-26 - are included in the study.

I-26 Corridor

▶ Executive Summary

I-26 Corridor Deficiencies & Solutions Summary

Safe, efficient, and equitable multimodal transportation is critical to the well-being and economic vitality of Tennessee. The I-55/75/26 Multimodal Corridor Study identified and evaluated potential improvements to address issues on four interstate corridors, including I-26. Solutions address traffic and congestion, operations and safety, transportation mode, and support for economic growth and freight movement.

The study included four core activities:

1. Evaluating transportation, demographic, and economic data.
2. Assessing system deficiencies to develop goals and performance measures.
3. Developing and evaluating feasible solutions.
4. Prioritizing actions to implement those solutions.

The I-26 corridor is critical for economic development and growth in northeast Tennessee. As the region continues to increase in population and employment, pressure on the interstate and adjacent highways also continues to increase. A suite of solutions to address existing and emerging problems was developed, and potential solutions were prioritized for their ability to meet the region's vision in a cost-effective manner while minimizing adverse environmental impacts.

Performance Goals and Objectives — I-26

Goals	Objectives		
Provide efficient and reliable travel	Improve travel times and reduce delay	Provide transportation options for people and freight	Optimize freight movement
Improve safety conditions	Reduce crash rates along the corridor – especially at identified crash "hot spots"	Implement or upgrade technologies that promote safety and effective incident management	Improve bicycle and pedestrian accommodations
Coordinate transportation investments with economic development plans	Improve interchange on/off ramps	Coordinate with MPOs/RPOs to determine areas where new/improved Interstate access is needed	
Invest equitably throughout the corridor	Expand transportation options for traditionally underserved populations within the corridor	Consider regional transit options	Identify areas with the greatest data-driven needs
Protect the natural environment and sensitive resources within the corridor	Identify transportation improvements that are not likely to result in major impacts to environmental, social, and cultural resources		

I-26 Corridor Overview & Transportation Deficiencies

The I-26 corridor extends 54 miles in northeastern Tennessee from the North Carolina border to Kingsport, where the highway transitions to US 23. The interstate travels through rural and urban areas and carries between 8,000 (Unicoi County) and 64,000 (Johnson City) vehicles per day. Traffic is expected to increase as population and employment increase - especially around the urban interchanges. Through data analysis and extensive stakeholder involvement, existing and future deficiencies affecting operations, safety, economic development and transportation equity were identified.

I-26 Fast Facts

Length

54 Miles

Counties

4

Carter | Unicoi | Sullivan | Washington

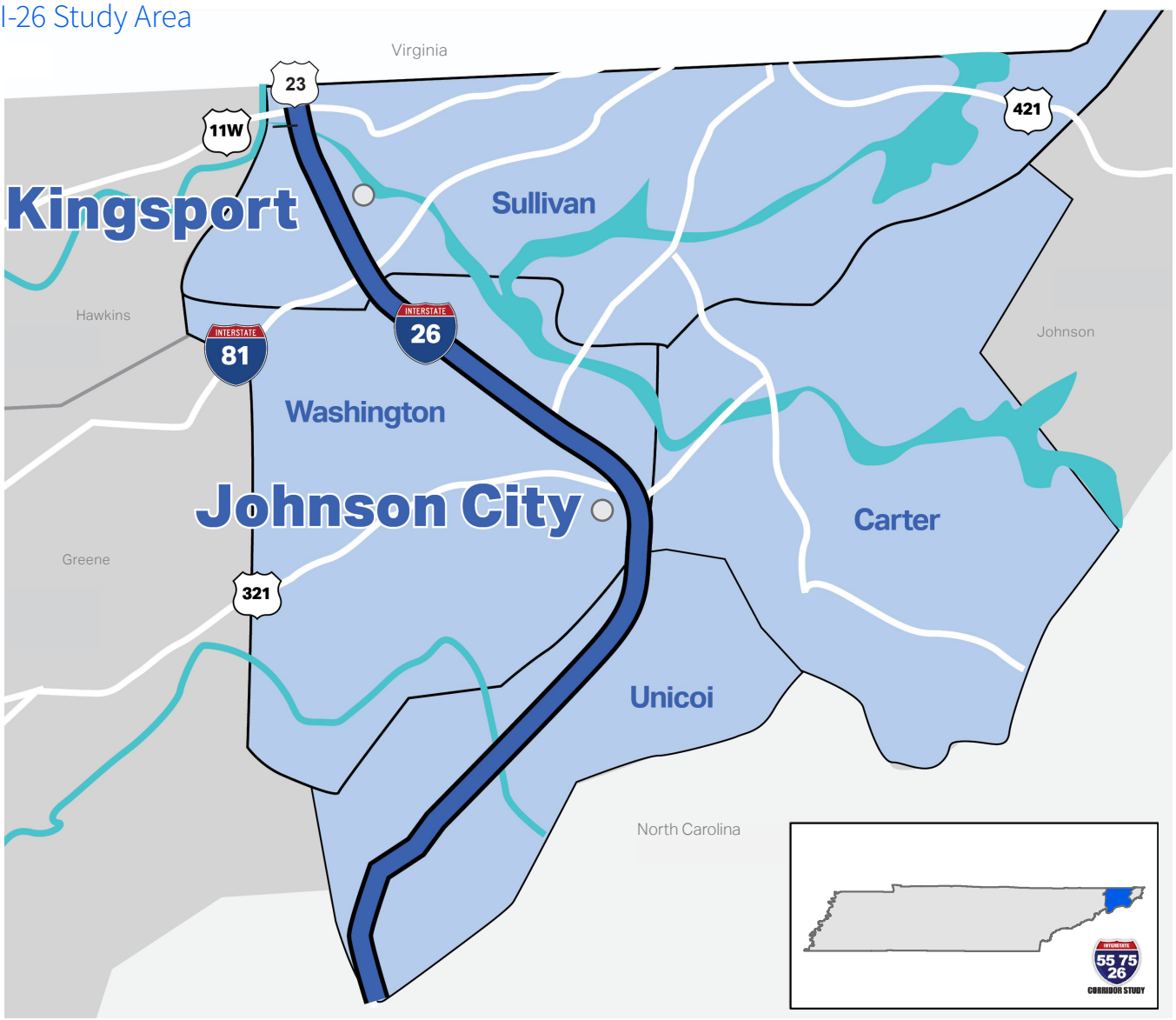
Traffic (Vehicles per Day)

8,000- 64,000

Typical Section

4 Lanes

I-26 Study Area



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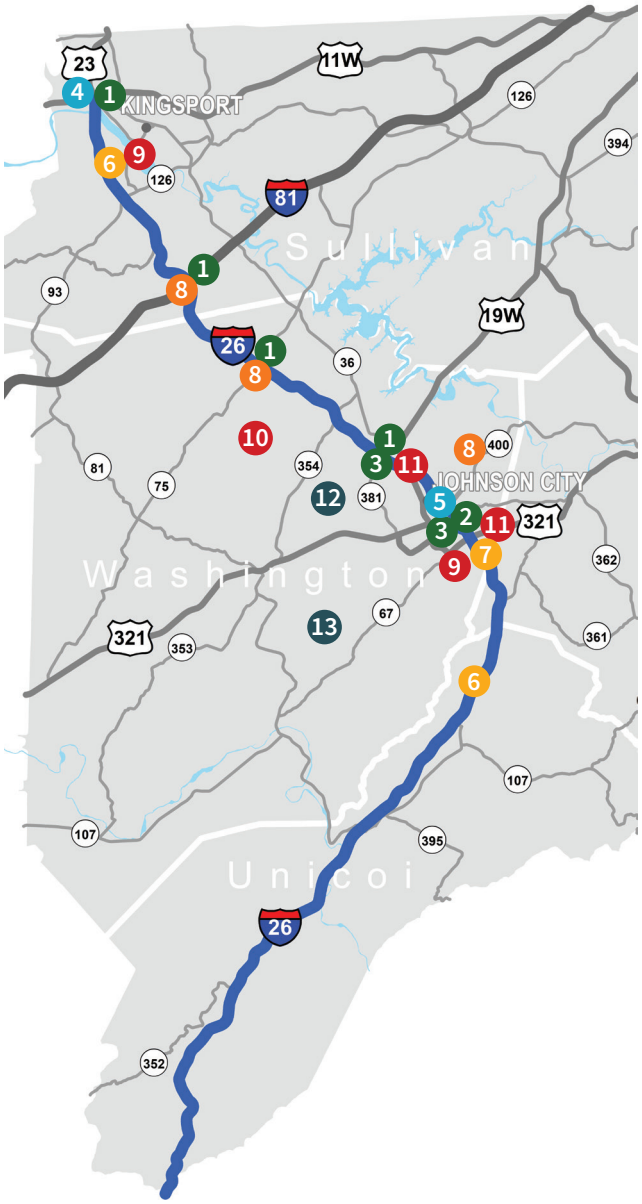
I-26 Key Existing Deficiencies and Future Needs



Highway Capacity

1. Interchange congestion
2. Traffic bottlenecks
3. Truck climbing lanes needed

Safety

4. Areas with safety concerns
5. Bike and pedestrian crashes at interchanges

Freight

6. Freight traffic bottleneck
7. Truck parking needed

Economic Development

8. Employment growth expected

Multimodal

9. Park-and-Ride lots needed
10. Regional transit needed
11. Bicycle and pedestrian facilities needed through interchange

Pavement & Structures

12. Road pavement aging in Washington County
13. Fifteen corridor bridges eligible for rehabilitation

I-26 Corridor Multimodal Transportation Solutions

Once the corridor deficiencies were identified and analyzed, a universe of alternatives – potential solutions addressing those deficiencies – was developed and evaluated against a set of goals and performance measures. The alternatives were analyzed for their impacts to safety, traffic congestion, freight movement, and other factors, as well as for how they might function individually and with other solutions over the long term. Twenty-nine alternatives were evaluated for locations throughout the corridor.

Project Ranking Across all Modes/Strategies — I-26

ID	Project Description	Termini	Source of Solution	Cost Efficiency			
				Total Benefit	Cost Estimate	Benefit Cost Index	Dollar per Benefit
C1	Widen Eastbound Off-Ramp to Provide Option Lane	SR-400 to SR-91	Data Analysis	12	$1,290,000	9.3	$107,500
F4	Install CCTV to Monitor Congestion & Accidents, Advise Trucks Via HAR	SR-381 to US-321	Data Analysis	11	$1,950,000	5.6	$177,300
S2	Widen Inside Shoulders	SR-93 to SR-347	Public/ Stakeholder	10	$3,180,000	3.1	$318,000
S5	Install Additional Lighting & Signage	Kingsport and Johnson City Urbanized Areas	Public/ Stakeholder	10	$6,490,000	1.5	$649,000
S7	Install Additional Guardrail & Median Cable Barrier	Throughout Corridor	Public/ Stakeholder	10	$14,400,000	0.7	$1,440,000
TS2	ITS Installation (CCTV & DMS)	Kingsport and Johnson City Urbanized Areas	Public/ Stakeholder	10	$3,270,000	3.1	$327,000
BP2	Add Bicycle Lane/Multi-Use Path on US-11W Through I-26 Interchange	I-26 / US-11W Interchange	Data Analysis	10	$2,050,000	4.9	$205,000
S8	Reconfigure Interchange to Address Ramp Geometry	I-26/I-81 Interchange	Public/ Stakeholder, TN Freight Plan	9	$18,000,000	0.5	$2,000,000
ED2	Improve Interchange Capacity & Geometry to Accommodate Expected Economic Growth	I-26/I-81 Interchange	Public/ Stakeholder	9	$18,000,000	0.5	$2,000,000
S4	Install Road Weather Information System	TN/NC State Line to Unicoi/Carter Co. Line	Public/ Stakeholder	8	$12,200,000	0.7	$1,525,000
S6	Install Additional Overhead Signage	State of Franklin Rd. Interchange (SR-381)	Public/ Stakeholder	8	$248,000	32.3	$31,000
F5	Add Overnight Parking Location (~50 spaces)	Along Corridor	Data Analysis	8	$1,270,000	6.3	$158,800
F2	Add Eastbound Truck Climbing Lane	SR-93 to SR-347	Kingsport MTPO 2040 LRTP	8	$6,720,000	1.2	$840,000
F7	Add Eastbound Truck Climbing Lane	Flag Pond Rd to NC State Line	TN Freight Plan	8	$40,800,000	0.2	$5,100,000

Note: See full report for project details.

Project Ranking Across all Modes/Strategies — I-26

ID	Project Description	Termini	Source of Solution	Cost Efficiency			
				Total Benefit	Cost Estimate	Benefit Cost Index	Dollar per Benefit
S1	Install Fencing by Bays Mountain Nature Preserve	US-11W to Meadowview Pkwy	Data Analysis	7	$441,000	15.9	$63,000
F6	Add Eastbound Truck Climbing Lane	Near Clear Branch Access	TN Freight Plan	7	$32,700,000	0.2	$4,671,400
TS5	Construct Median Breaks to allow for EMS Vehicle Turnaround	Erwin to NC State Line	Public/ Stakeholder	7	$77,000	90.9	$11,000
T10	Designate Park-and-Ride Lots Near SR-93, SR-347, SR-75	Various Locations	Public/ Stakeholder	7	$906,000	7.7	$129,400
TS1	HELP Truck Expansion to I-26	Throughout Corridor	Public/ Stakeholder	6	$675,000	8.9	$112,500

Note: See full report for project details.

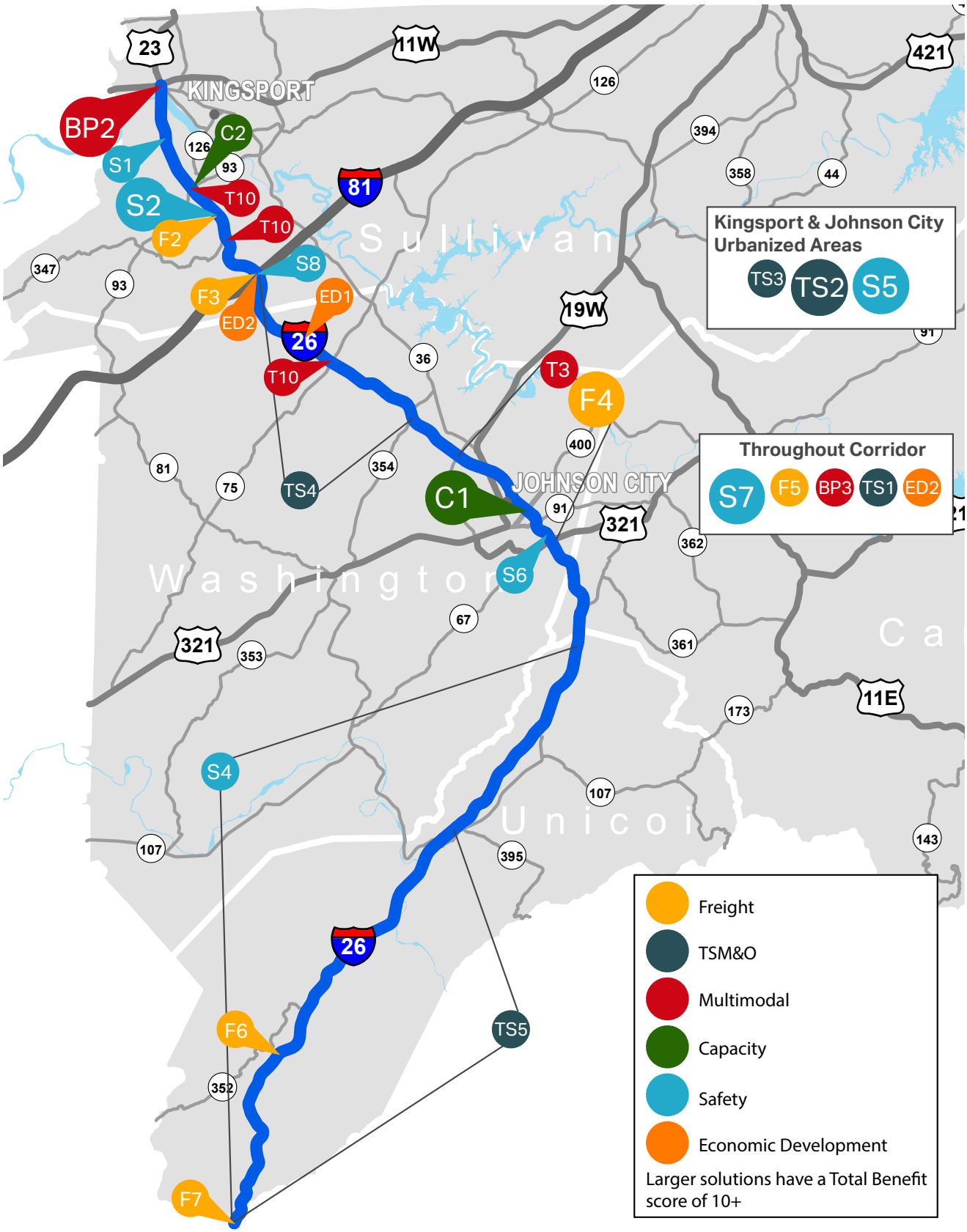
Project Ranking Across all Modes/Strategies (Studies) — I-26

ID	Project Description	Termini	Source of Solution	Cost Efficiency			
				Total Benefit	Cost Estimate	Benefit Cost Index	Dollar per Benefit
TS3	Evaluate Need for Ramp Metering	Kingsport and Johnson City Urbanized Areas	Public/ Stakeholder	10	$75,000	N/A	N/A
T3	Study Commuter Route Between JCT Transit Center & Citi Commerce Solutions/ Frontier Health (Gray)	Johnson City to Gray	JCT Comprehensive Operations Analysis	10	$50,000	N/A	N/A
F3	Study I-81/I-26 Interchange for Capacity, Truck Use	I-26/I-81 Interchange	Kingsport MTPO 2040 LRTP	9	$220,000	N/A	N/A
TS4	Conduct Speed Study	Eastern Star Rd to Boones Creek Rd (SR-354)	Public/ Stakeholder	9	$25,000	N/A	N/A
ED1	Evaluate Need for Additional Interstate Access Point	Eastern Star Rd to SR-75	Public/ Stakeholder	9	$100,000	N/A	N/A
T9	Study Commuter Route Between Johnson City & Kingsport	Johnson City to Kingsport	Data Analysis	9	$75,000	N/A	N/A
BP3	Study to propose Bike/ Ped Connectivity & Safety Improvements at U.S. & State Route Interchanges	Throughout Corridor	Data Analysis	9	$50,000	N/A	N/A
C2	Evaluate Need for C-D Lanes and/or Other Improvements Between Interchanges	Meadowview Pkwy to SR-93/SR-126	Public/ Stakeholder	8	$160,000	N/A	N/A

Note: See full report for project details.

The alternatives were screened for feasibility and effectiveness. The alternatives that advanced through the evaluation were finally ranked for their positive impact on transportation in the corridor and cost effectiveness. The ranked projects are shown below.

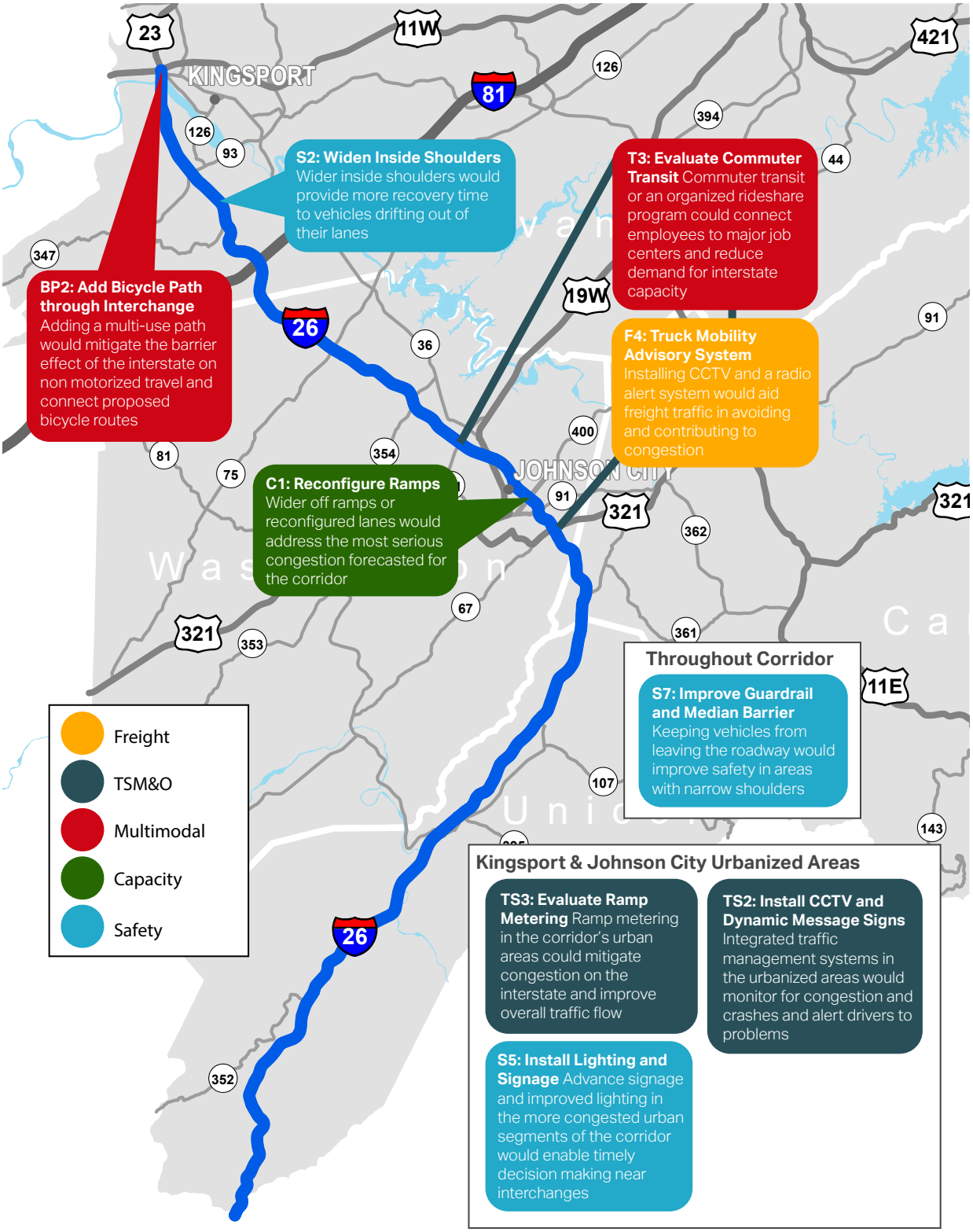
Feasible Multimodal Solutions - Full List — I-26



I-26 Corridor Top Ranked Transportation Solutions

The rankings indicate projects with the highest benefits to the corridor's multimodal transportation system and also shows projects that can be implemented with a smaller financial investment. The highest total benefit score a solution could receive is 15. In all, seven projects and two studies were scored at 10 or higher, indicating their potential to effectively and efficiently address corridor transportation deficiencies.

Top Ranked Transportation Solutions — I-26



I-26 Corridor Long Term Vision

The I-26 corridor is experiencing traffic growth, but appears to have enough capacity to accommodate this growth and congestion for the next two decades.

The transportation solutions recommended in this study would directly address the deficiencies identified through data analysis and by stakeholders. Implemented together, they would improve multimodal transportation in the corridor in measurable ways, mitigating the adverse conditions that currently exist and those that are forecast to emerge as corridor population, economic activity, and travel grow.

Performance Measure Summary — I-26

Goal	Performance Measure		Unit	Base (2010)	Trend (2040)	Build 2040	% Change (Base vs Trend)	% Change (Trend vs Build)
Traffic Operations	Traffic on interstate operates at LOS D or better		% of interstate operating at LOS D or better	100	99.6	99.6	<1	0
	Total Daily Vehicle Miles Traveled (VMT)		Miles (1,000s)	7,815	9,784	9,688	25	-1
	Total Daily Vehicle Hours of Travel (VHT)		Hours (1,000s)	211	259	258	23	-1
	Total Peak Hour Vehicle Hours of Delay (VHD)		Hours	7.3	9.4	9.35	28	-1
	Total VMT / Trip		Miles	4.26	4.32	4.28	1	-1
	Total Vehicle Minutes Traveled / Trip		Minutes	6.89	6.87	6.83	0	-1
	Average Peak Hour Travel Speed	Urban Interstate	MPH	68	63	66	-7	4
		Rural Interstate	MPH	72	70	70	-3	0
	Congested Travel Time Between Key O&D Pairs along Corridor (Total)		Minutes	172	185	185	8	0
	Peak Hour Density at Improved Interchanges		Vehicles/Mile/Lane	See “Traffic Operations Memo”				
	Average and Max Queues at Improved Interchanges		Feet	See “Traffic Operations Memo”				
Safety	Crash Reduction in Safety “hot spots”		Above or Below Average Crash Reduction Potential	See “Safety Recommendations”				
Operations & Maintenance	Bridge Condition (Sufficiency Rating)		% of bridges < 50	0	0	0	N/A	N/A
			50 < % of bridges < 80	11	9	8	N/A	N/A
	Pavement Condition (Resurfacing)		% of corridor resurfaced within the last 10 years	71	87	87	N/A	N/A
Multimodal	Pedestrian and Bicycle Accommodations at U.S. and State Route Interchanges		% interchanges with bike facilities	33	33	40	N/A	N/A
			% interchanges with ped. facilities	27	27	27	N/A	N/A
	Freight (Truck Parking)		# of rest area spots	53	53	53	0	0
			# of truck stop spots	0	0	50	0	100

Note: See full report for performance measure details.

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