

**Chittenden County I-89 2050 Study**  
**DRAFT Second Round Interchange Screening Matrix**

Metric	Metric Description	Units	2050 Base Scenario		Exit 12B	Exit 13		Exit 14		
					New Interchange	Hybrid + Bike Overpass	SPDI	Enhanced Cloverleaf	DDI	
<b>SAFETY: Enhance safety along the I-89 Study Corridor and Adjacent Interchanges for all users.</b>										
<b>Ramp Spacing</b>	Meets AASHTO Standard for Ramp Spacing to Next Closest Interchange	Yes / No	N/A		Yes	Yes*	Yes		Yes	Yes
<b>Safety Impact</b>	Interactive Highway Safety Design Model (IHSDM) Change in Total Crashes across the Network	% Change in Total Estimated Crashes Compared to 2050 Base Scenario	N/A		-3.2%	-1.3%	0.4%		-5.0%	-2.8%
	Interactive Highway Safety Design Model (IHSDM) Change in Fatal and Injury Crashes across the Network	% Change in Estimated Injury / Fatal Crashes Compared to 2050 Base Scenario	N/A		-1.1%	-1.9%	-3.1%		-4.5%	-2.3%
<b>Bike/Ped Safety</b>	Safety Improvements for Bicyclists and Pedestrians based on Proposed Accommodations, Number of Conflicts Points, and Type of Conflict Point	Relative Level of Safety Improvement for Bicyclists and Pedestrians	N/A		Improved	Significantly Improved	Significantly Improved		Improved	Significantly Improved
<b>Safety / Operational Commentary</b>						*Left Off-Ramp and Left On-Ramp Not Advised	Declassify I-189 from Interstate to Limited Access State Highway		C-D Road Advised at Current/Future Volumes for Loop Ramps	Removes Merge on Mainline
<b>LIVABLE, SUSTAINABLE, &amp; HEALTHY COMMUNITIES: Promote compact growth that supports livable, affordable, vibrant, and healthy communities.</b>										
<b>Consistent with Regional Plan</b>	Proportion of 2020 to 2050 Household Growth Located in Growth Zones Inclusive of Secondary Growth (includes Center, Enterprise, Metro, Village and Suburban Designations)	Total Secondary Growth Households	0		593	203	203		0	0
		Proportion of 2020 to 2050 Household Growth Located in Growth Zones Inclusive of Secondary Growth	90.24%		90.40%	90.33%	90.33%		90.24%	90.24%
<b>ROW Impacts</b>	Approximate area of ROW impacts based on limit of disturbance around the interchange	Acres of ROW Disturbance	N/A		4.0	0.2	0.0		0.4	0.1
<b>Environmental Justice / Underserved Populations</b>	Additional Travel Time for Traffic Analysis Zones Identified as EJ communities	Minutes of Additional Travel Time in 2050	N/A		0.019	0.022	0.011		0.018	0.023
	Average Trip Length in the Model	Average Trip Length in minutes	15.69		15.61	15.66	15.68		15.69	15.72
	Additional Travel Time for EJ TAZs as a Percent of Average Trip Length	% Additional Travel Time per Average Trip in 2050	N/A		0.12%	0.14%	0.07%		0.12%	0.15%
<b>MOBILITY &amp; EFFICIENCY: Improve the efficiency and reliability of the I-89 Corridor and Adjacent Interchanges for all users.</b>										
<b>Interchange Trips</b>	Daily trips using new interchange in 2050	Total Trips Using New Interchange in 2050	N/A		24,321	56,198	57,334		49,677	46,924
	Number of daily trips using the Exit 14 Interchange. (Note: For scoring purposes, larger reductions at Exit 12B and 13 were scored higher, while at Exit 14, lower reductions were scored higher)	# of Daily Trips Using Exit 14	51,929		47,226	46,654	45,319		49,677	46,924
		Percent Change in # of Daily Trips Using Exit 14	N/A		-9.1%	-10.2%	-12.7%		-4.3%	-9.6%
<b>VMT</b>	Networkwide change in Vehicle Miles of Travel (VMT) per vehicle trip with interchange improvement and projected growth compared to the Future Base Model	Total VMT	5,207,449		5,219,058	5,206,473	5,201,707		5,203,632	5,200,102
		Average Trip Length in miles	8.103		8.087	8.097	8.090		8.097	8.092
		% Change in average trip length in 2050	N/A		-0.20%	-0.07%	-0.17%		-0.07%	-0.14%
<b>VHT</b>	Networkwide change in Vehicle Hours of Travel (VHT) with interchange improvement and projected growth compared to the Future Base Model	Total VHT	147,758		147,394	147,452	147,636		147,737	147,906
		% Change in VHT in 2050	N/A		-0.25%	-0.21%	-0.08%		-0.01%	0.10%
<b>I-89 Corridor V/C</b>	Mainline corridor congestion as indicated by the number of miles with v/c of greater than or equal to 0.9	Miles of Mainline with v/c > 0.9	1.34		2.18	1.34	1.34		1.34	1.34
<b>Average Delay</b>	Change in 2050 PM Peak Hour Delay at Exit 14	Change in Average Delay per Trip (seconds)	N/A		-40	-34	-37		-47	-41
<b>Bike/Ped Connectivity</b>	Bicyclist and Pedestrian Connectivity Improvements Across I-89 Based on Existing and Proposed Accommodations	Level of Bike/Ped Connectivity Improvements	N/A		Improved	Significantly Improved	Significantly Improved		Improved	Improved
<b>ENVIRONMENTAL STEWARDSHIP: Establish a resilient I-89 Corridor that minimizes environmental impacts associated with the transportation system.</b>										
<b>Wetland Impacts</b>	Approximate area of wetland/wetland buffer impacts based on the estimated limits of disturbance for the interchange improvements	Acres of Impact to VSWI Wetlands	N/A		0	0.4	0.1		0.1	0
		Acres of Impact to 50 ft Wetland Buffers	N/A		0.1	1.0	0.5		0.3	0
<b>River Corridors</b>	Approximate area of river corridor, floodway, and 100-year flood zone impacts based on the estimated limits of disturbance for the interchange improvements	Acres of Impact to River Corridors	N/A		0	1.1	1.8		0	0
		Acres of Impact to 100-year Flood Zone	N/A		0	1.1	0.5		0	0
<b>Natural Habitats</b>	Approximate area of rare, threatened, and endangered (RTE) species impacts based on the estimated limits of disturbance for the interchange improvements	Acres of RTE Impacts	N/A		7	0	0		0	0
<b>Resilience</b>	Percent Change Network Trip Robustness (NTR)	Percent change in robustness	N/A		-0.38%	0.81%	0.93%		-0.08%	-0.14%
<b>Fuel Consumption</b>	Total Fuel Consumption Across Model Network (based on 2050 projection assuming MTP Investments and 90% electric vehicle fleet)	Total Gallons of Fuel Consumed per Day in 2050	40,744		40,835	40,736	40,699		40,714	40,686
		% Change in Gallons of Fuel Consumed per Day in 2050	N/A		0.22%	-0.02%	-0.11%		-0.07%	-0.14%
<b>ECONOMIC ACCESS: Improve economic access and vitality in Chittenden County.</b>										
<b>Connectivity to Areas Planned for Growth</b>	Percentage of land area within 1 mile of interchange that is classified as an ECOS Growth Zone (includes Center, Enterprise, Metro, Village and Suburban Designations)	Percentage of area within 1 mile of interchange in ECOS Growth Zone	N/A		87%	90%	90%		100%	100%
<b>Job Access</b>	Total number of projected new jobs in 2050 compared to 2020 within 1 radial mile of the interchange including adopted job projections and secondary growth	Total number of New Jobs within 1 Radial Mile of the Interchange	N/A		3,054	2,461	2,461		4,133	4,133
	Total number of projected 2050 jobs within 1 radial mile of the new interchange infrastructure including adopted job projections and secondary growth	Total Number of Jobs Within 1 Radial Mile of Interchange	N/A		11,416	9,592	9,592		27,220	27,220
<b>SYSTEM PRESERVATION: Preserve and improve the condition and performance of the I-89 corridor.</b>										
<b>Asset Maintenance Cost</b>	Estimated 30-year asset maintenance costs at Exits 12B, 13 & 14 combined	Asset Maintenance Cost (Bridges & Culverts) for Exits 12B, 13, & 14 combined (not including assets replaced with construction)	\$94,151,074		\$88,516,699	\$90,832,324	\$48,464,064		\$74,859,153	\$84,840,338
<b>Construction Cost</b>	Estimated cost for the interchange improvements	Planning-Level Cost Estimate (millions of 2020 dollars) (includes PE, CON, and contingency)	\$0		\$29,000,000	\$15,000,000	\$61,000,000		\$44,000,000	\$37,000,000
<b>Maintenance &amp; Construction Cost</b>	Estimated cost for the interchange improvements plus 30-year asset maintenance costs at Exits 12B, 13 & 14 combined	Total 2050 Cost (inclusive of asset maintenance and new construction costs)	\$94,151,074		\$117,516,699	\$105,832,324	\$109,464,064		\$118,859,153	\$121,840,338
		Incremental Additional Cost	\$0		\$23,365,625	\$11,681,250	\$15,312,990		\$24,708,079	\$27,689,264

**Note:** The grey cells include data for information purposes only.

# Chittenden County I-89 2050 Study

## DRAFT Second Round Interchange Screening Matrix

Metric	Metric Description	Units	Exit 12B	Exit 13		Exit 14	
			New Interchange	Hybrid + Bike Overpass	SPDI	Enhanced Cloverleaf	DDI
SAFETY: Enhance safety along the I-89 Study Corridor and Adjacent Interchanges for all users							
Ramp Spacing	Meets AASHTO Standard for Ramp Spacing to Next Closest Interchange	Yes / No	4	3	4		4   4
Safety Impact	Interactive Highway Safety Design Model (IHSDM) Change in Total Crashes across the Network	% Change in Total Estimated Crashes Compared to 2050 Base Scenario	3	1	0		4   2
	Interactive Highway Safety Design Model (IHSDM) Change in Fatal and Injury Crashes across the Network	% Change in Estimated Injury / Fatal Crashes Compared to 2050 Base Scenario	0	1	2		4   1
Bike/Ped Safety	Safety Improvements for Bicyclists and Pedestrians based on Proposed Accommodations, Number of Conflicts Points, and Type of Conflict Point	Relative Level of Safety Improvement for Bicyclists and Pedestrians	2	4	4		2   4
Safety / Operational Commentary				*Left Off-Ramp and Left On-Ramp Not Advised	Declassify I-189 from Interstate to Limited Access State Highway		C-D Road Advised at Current/Future Volumes for Loop Ramps   Removes Merge on Mainline
LIVABLE, SUSTAINABLE, & HEALTHY COMMUNITIES: Promote compact growth that supports livable, affordable, vibrant, and healthy communities.							
Consistent with Regional Plan	Proportion of 2050 Households Located in ECOS Growth Zones Inclusive of Secondary Growth (includes Center, Enterprise, Metro, Village and Suburban Designations)	Total Secondary Growth Households					
		Proportion of 2050 Households Located in Growth Zones Inclusive of Secondary Growth	4	4	4		4   4
ROW Impacts	Approximate area of ROW impacts based on limit of disturbance around the interchange	Acres of ROW Disturbance	0	3	4		3   4
Environmental Justice / Underserved Populations	Additional Travel Time for Traffic Analysis Zones Identified as EJ communities	Minutes of Additional Travel Time in 2050					
	Average Trip Length in the Model	Average Trip Length in minutes					
	Additional Travel Time as a Percent of Average Trip Length	% Additional Travel Time per Average Trip in 2050	2	2	2		2   2
MOBILITY & EFFICIENCY: Improve the efficiency and reliability of the I-89 Corridor and Adjacent Interchanges for all users.							
Interchange Trips	Daily trips using new interchange in 2050	Total Trips Using New Interchange in 2050					
	Number of daily trips using the Exit 14 Interchange	# of Daily Trips Using Exit 14					
		Percent Change in # of Daily Trips Using Exit 14		2	3	4	
VMT	Networkwide change in Vehicle Miles of Travel (VMT) per vehicle trip with interchange improvement and projected growth compared to the Future Base Model	Total VMT					
		Average Trip Length in miles					
		% Change in average trip length in 2050	4	0	3		0   2
VHT	Networkwide change in Vehicle Hours of Travel (VHT) with interchange improvement and projected growth compared to the Future Base Model	Total VHT					
		% Change in VHT in 2050	4	4	2		1   0
I-89 Corridor V/C	Mainline corridor congestion as indicated by the number of miles with v/c of greater than or equal to 0.9	Miles of Mainline with v/c > 0.9	0	4	4		4   4
Average Delay	Change in 2050 PM Peak Hour Delay at Exit 14	Change in Average Delay per Trip (seconds)	2	0	1		4   2
Bike/Ped Connectivity	Bicyclist and Pedestrian Connectivity Improvements Across I-89 Based on Existing and Proposed Accommodations	Level of Bike/Ped Connectivity Improvements	2	4	4		2   2
ENVIRONMENTAL STEWARDSHIP: Establish a resilient I-89 Corridor that minimizes environmental impacts associated with the transportation system.							
Wetland Impacts	Approximate area of wetland/wetland buffer impacts based on the estimated limits of disturbance for the interchange improvements	Acres of Impact to VSWI Wetlands	4	0	4		4   4
		Acres of Impact to 50 ft Wetland Buffers	4	0	2		3   4
River Corridors	Approximate area of river corridor, floodway, and 100-year flood zone impacts based on the estimated limits of disturbance for the interchange improvements	Acres of Impact to River Corridors	4	1	0		4   4
		Acres of Impact to 100-year Flood Zone	4	0	2		4   4
Natural Habitats	Approximate area of rare, threatened, and endangered (RTE) species impacts based on the estimated limits of disturbance for the interchange improvements	Acres of RTE Impacts	0	4	4		4   4
Resilience	Percent Change Network Trip Robustness (NTR)	Percent change in robustness	0	4	4		1   0
Fuel Consumption	Total Fuel Consumption Across Model Network (based on 2050 projection assuming MTP Investments and 90% electric vehicle fleet)	Total Gallons of Fuel Consumed per Day in 2050					
		% Change in Gallons of Fuel Consumed per Day in 2050	0	3	4		4   4
ECONOMIC ACCESS: Improve economic access and vitality in Chittenden County.							
Connectivity to Areas Planned for Growth	Percentage of land area within 1 mile of interchange that is classified as an ECOS Growth Zone (includes Center, Enterprise, Metro, Village and Suburban Designations)	Percentage of area within 1 mile of interchange in ECOS Growth Zone	0	1	1		4   4
Job Access	Total number of projected new jobs in 2050 compared to 2020 within 1 radial mile of the interchange including adopted job projections and secondary growth	Total number of New Jobs within 1 Radial Mile of the Interchange	1	0	0		4   4
		Total Number of Jobs Within 1 Radial Mile of Interchange	0	0	0		4   4
SYSTEM PRESERVATION: Preserve and improve the condition and performance of the I-89 corridor.							
Asset Maintenance Cost	Estimated 30-year asset maintenance costs at Exits 12B, 13 & 14 combined	Asset Maintenance Cost (Bridges & Culverts) for Exits 12B, 13, & 14 combined (not including assets replaced with construction)	0	0	4		1   0
Construction Cost	Estimated cost for the interchange improvements	Planning-Level Cost Estimate (millions of 2020 dollars) (Includes PE, CON, and contingency)	3	4	0		1   2
Maintenance & Construction Cost	Estimated cost for the interchange improvements plus 30-year asset maintenance costs at Exits 12B, 13 & 14 combined	Total 2050 Cost (inclusive of asset maintenance and new construction costs)	1	4	3		0   0
		Incremental Additional Cost					

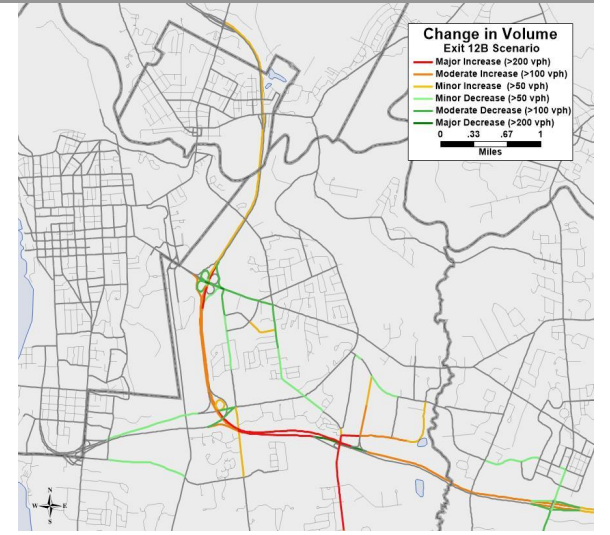
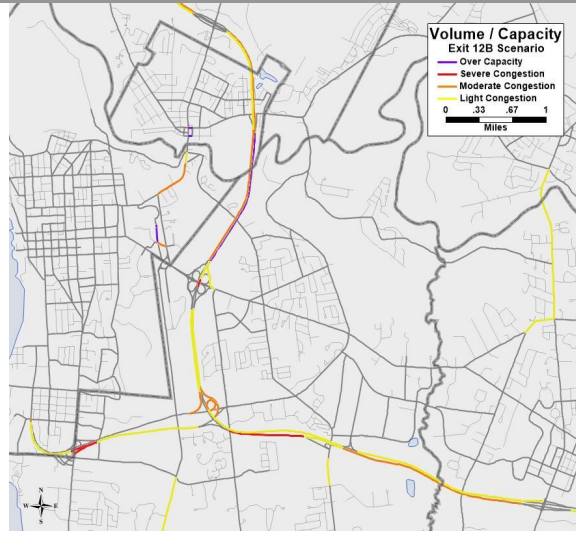
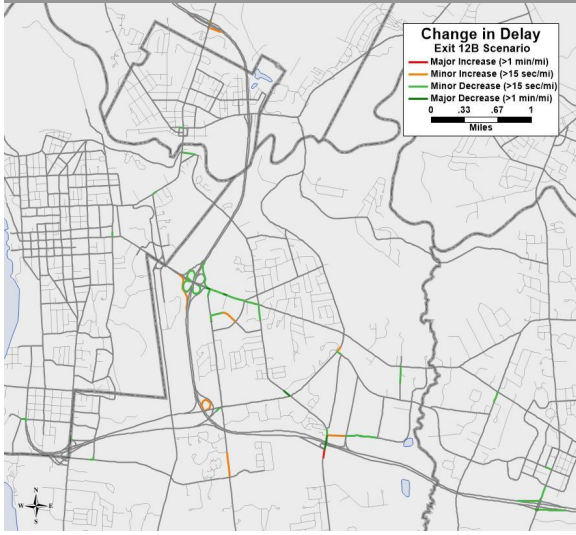


# Change in Delay

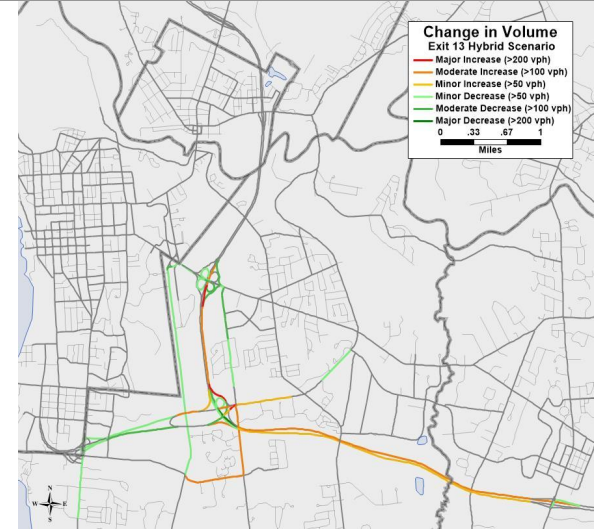
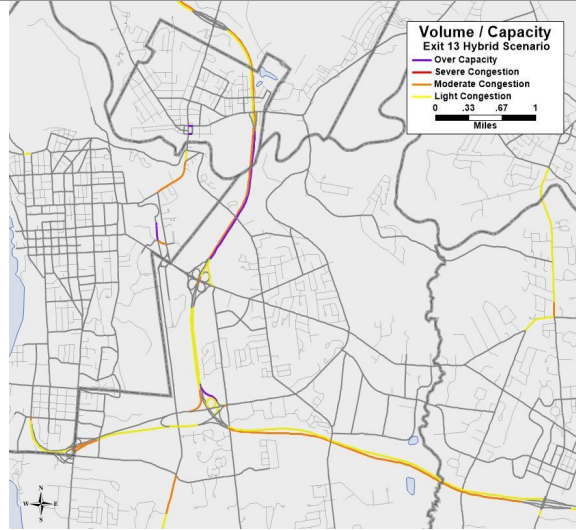
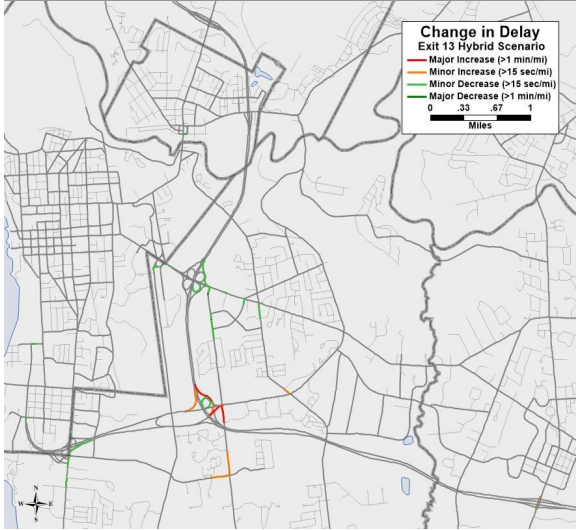
# Volume / Capacity

# Change in Volume

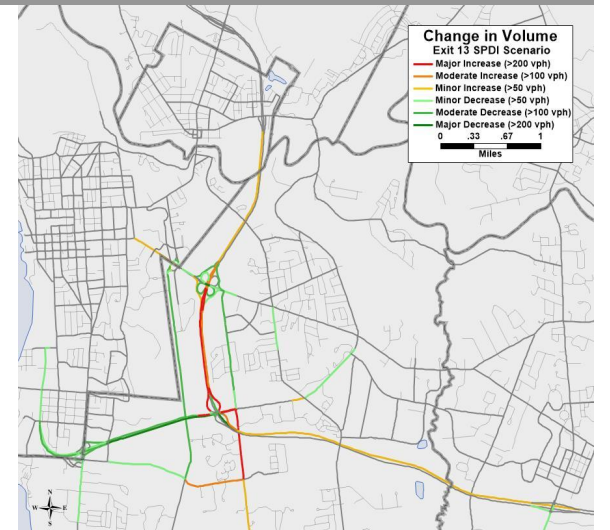
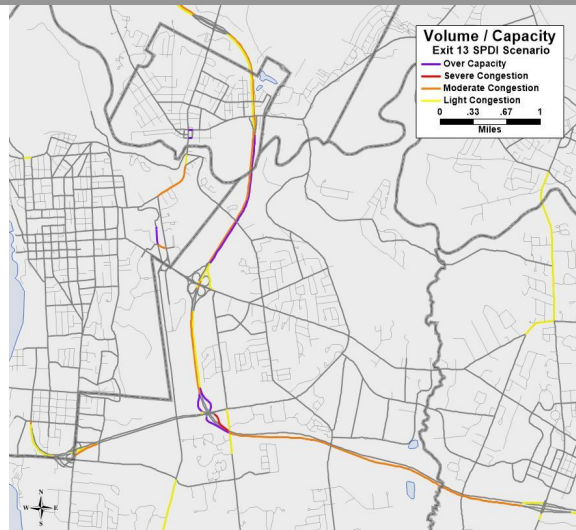
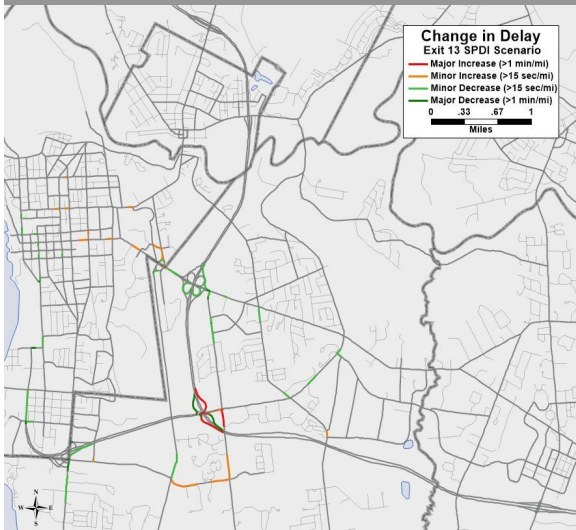
## Exit 12B



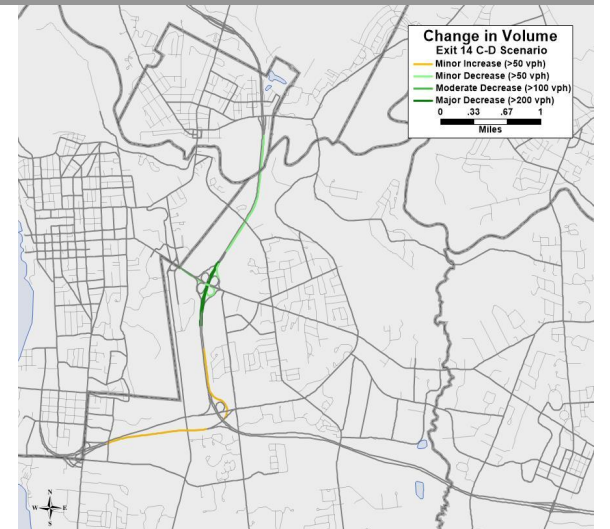
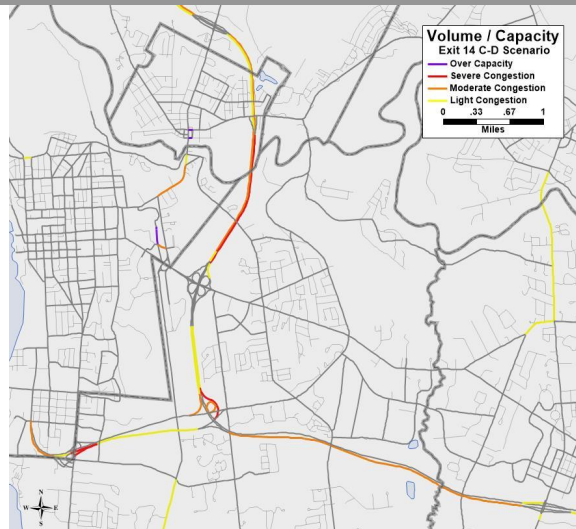
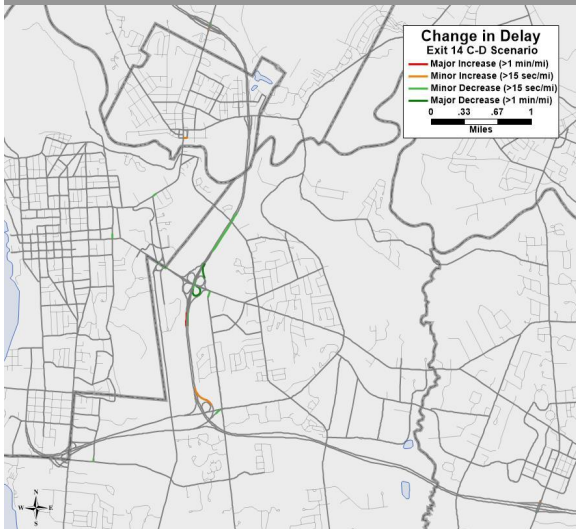
## Exit 13 Hybrid



## Exit 13 SPDI



## Exit 14 Enhanced Cloverleaf



## Exit 14 DDI

