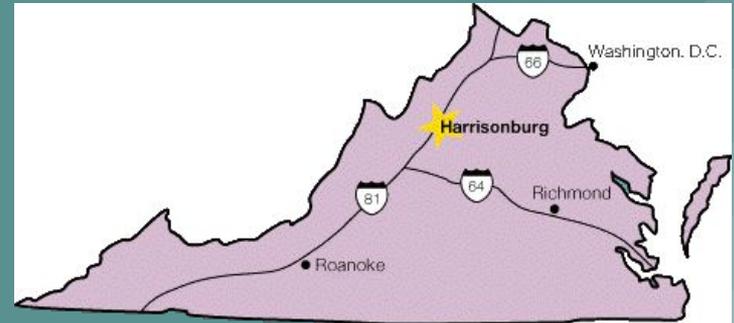


Adapting SMART SCALE Metrics for Project Prioritization in the HRMPO

Jonathan Howard, CSPDC
Brad Reed, AICP, VDOT Staunton District
James May, AICP, Rockingham County

May 10, 2018





HRMPO 2040 Long Range Transportation Plan

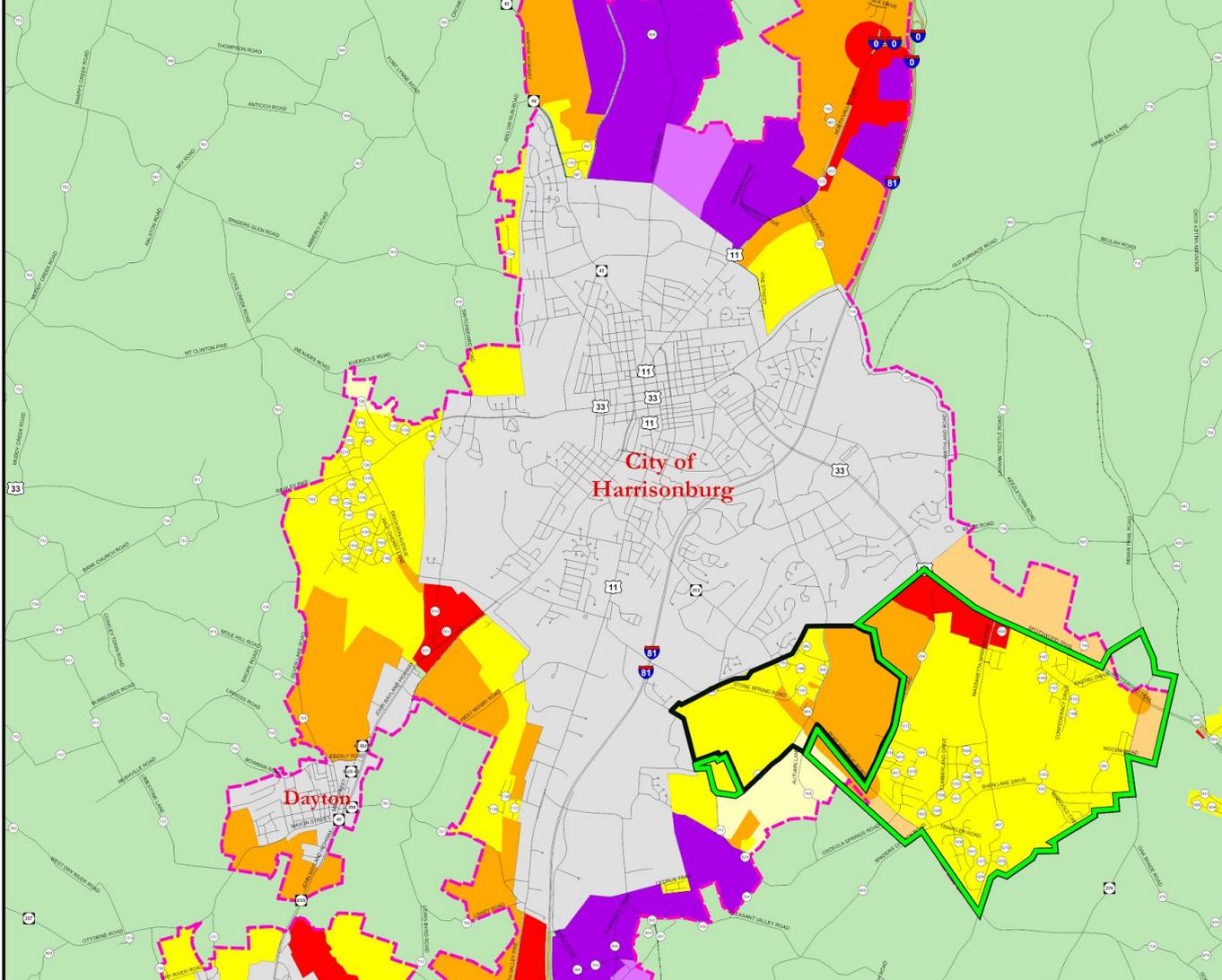
Adopted March 16, 2017



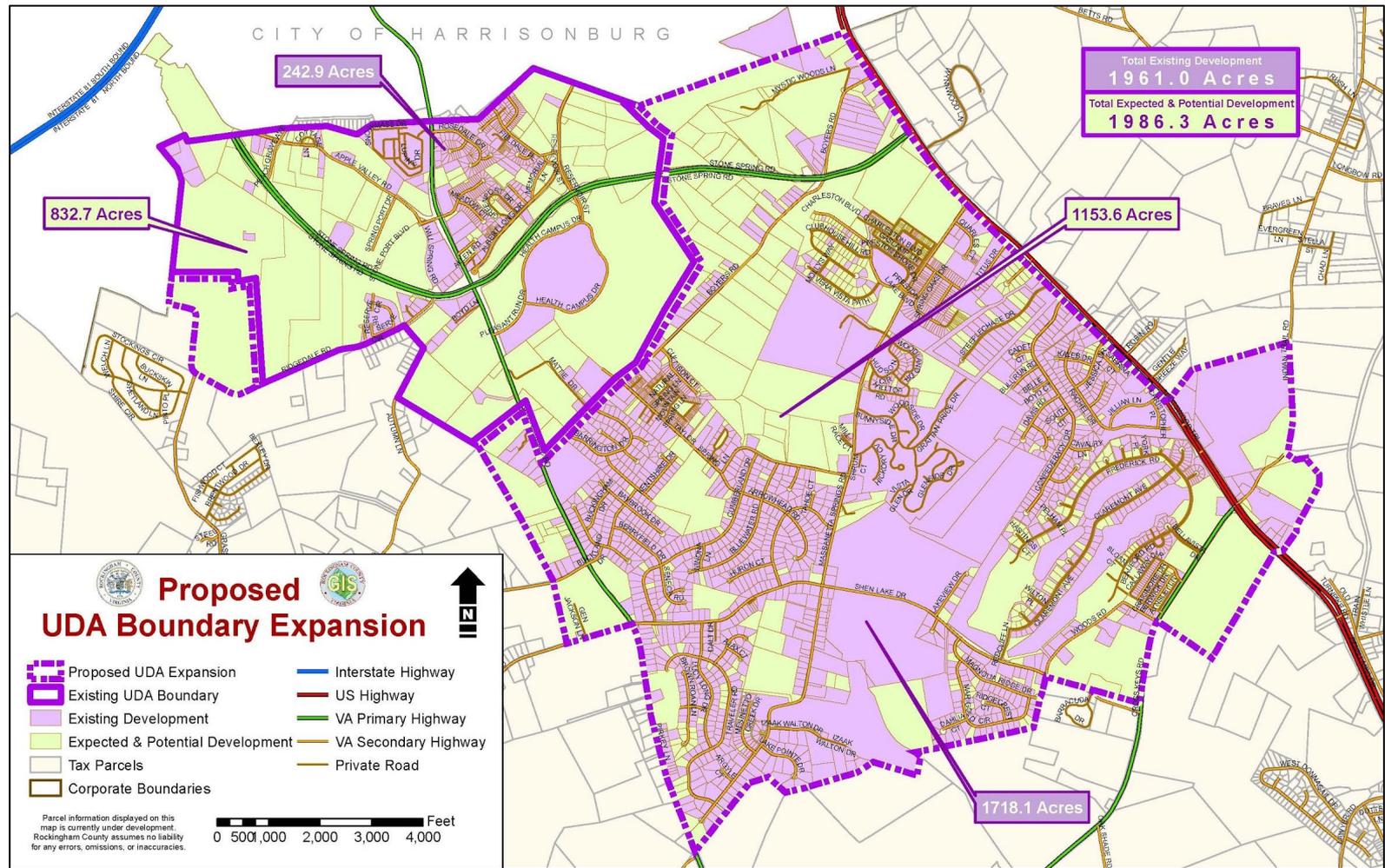
**Harrisonburg
Rockingham**
Metropolitan Planning
Organization

112 MacTanly Place
Staunton, VA 24401
Phone (540) 885-5174
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HRMPO.org





CITY OF HARRISONBURG



Proposed UDA Boundary Expansion

- Proposed UDA Expansion
- Existing UDA Boundary
- Existing Development
- Expected & Potential Development
- Tax Parcels
- Corporate Boundaries
- Interstate Highway
- US Highway
- VA Primary Highway
- VA Secondary Highway
- Private Road

Parcel information displayed on this map is currently under development. Rockingham County assumes no liability for any errors, omissions, or inaccuracies.

0 500 1,000 2,000 3,000 4,000 Feet

Total Existing Development
1961.0 Acres
Total Expected & Potential Development
1986.3 Acres

832.7 Acres

242.9 Acres

1153.6 Acres

1718.1 Acres

I. WHERE SHOULD FUTURE GROWTH WITH A MIX OF USES BE LOCATED?





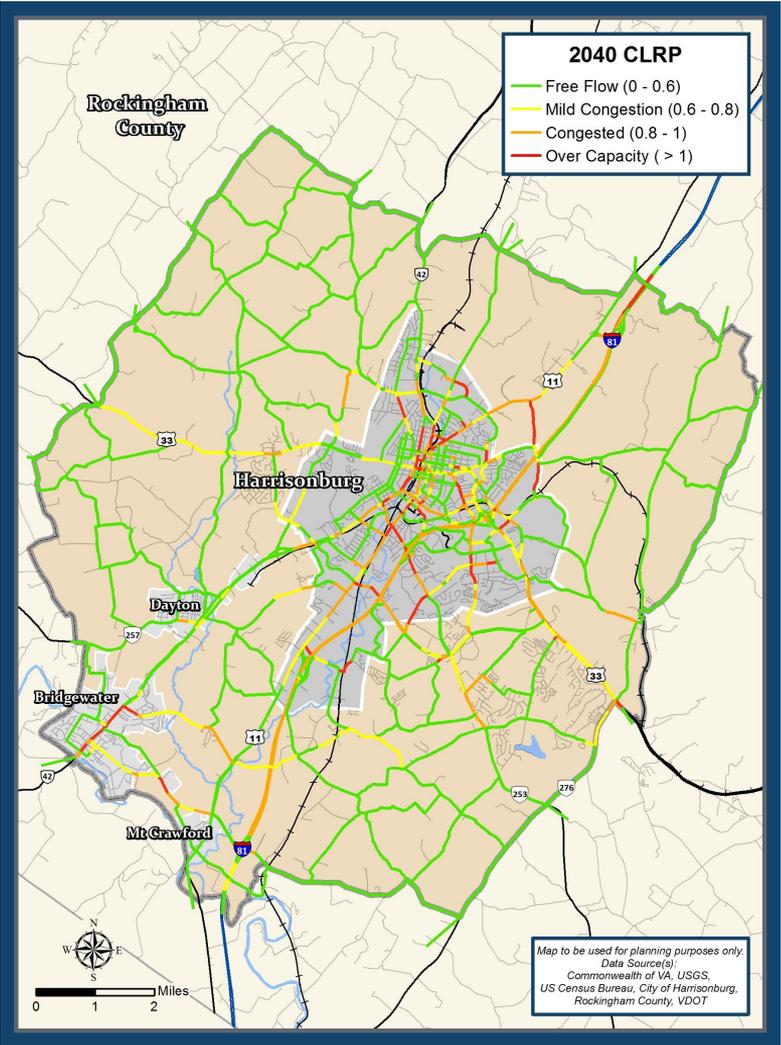
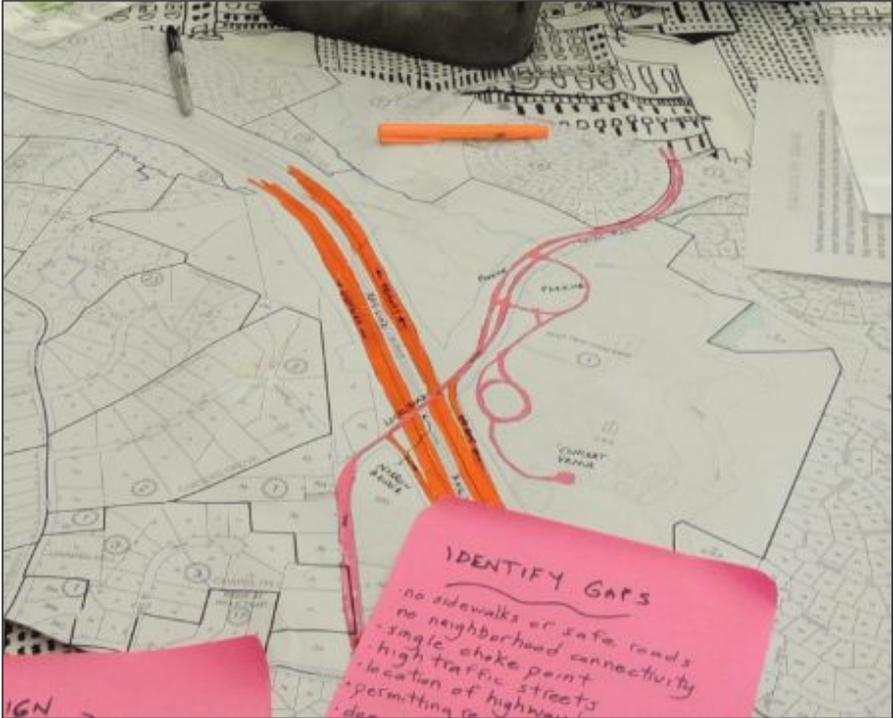
Stone Spring UDA Transect Map



Pedestrian and Bicycle Connectivity Map

Plan and Elevation View

The Land Use-Transportation Connection



Connecting Goals to Project Performance

Scoring Category	HRMPO LRTP Goal
Congestion Mitigation	Make strategic investments to provide connectivity and accessibility (Goal 1)
Safety	Improve safety and security (Goal 2)
Accessibility	Increase mobility options, expansion of transit service and bike/ped (Goal 4)
Economic Development	Optimize existing infrastructure for the safe and efficient movement of people and goods (Goal 3)
Environment	Enhance the quality of life of all residents (Goal 6)
Land Use	Connect the land use and transportation decision-making processes. (Goal 5)

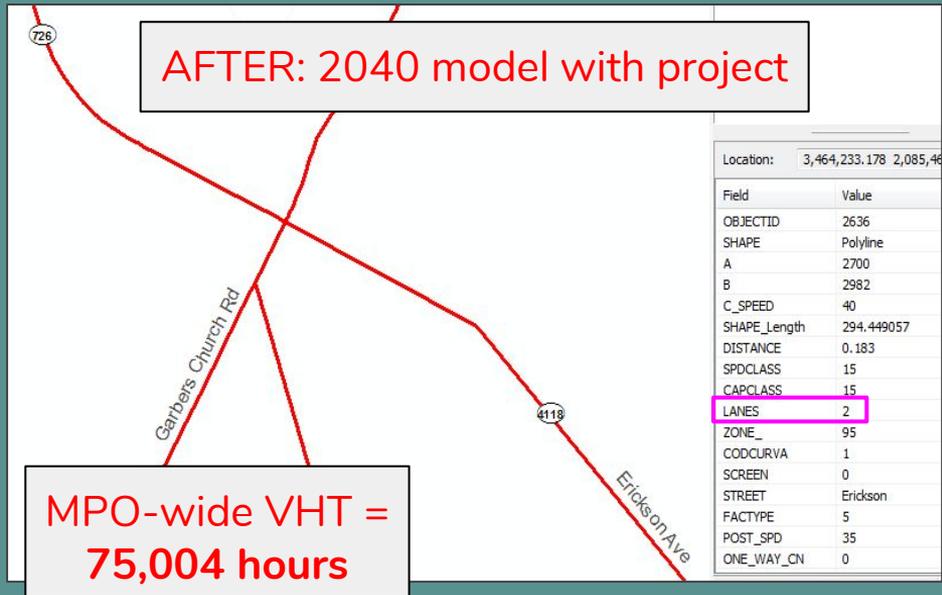
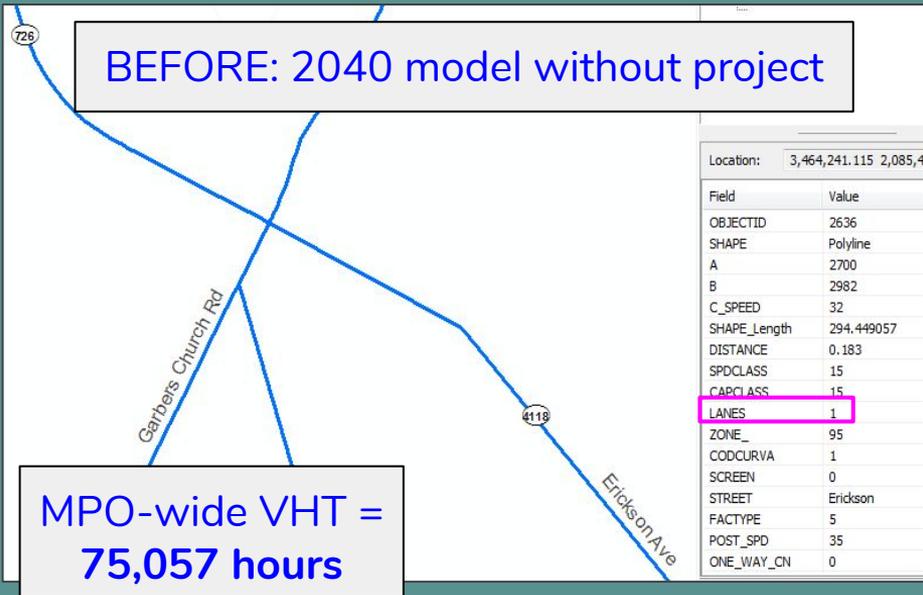
Scoring Category (Relative Weighting)	HRMPO Project Performance Metric
Congestion Mitigation (7.5%)	Reduction in vehicle hours traveled (VHT) per capita (100%)
Safety (25%)	Equivalent property damage only (EPDO) of fatal and injury crashes expected to reduced (50%)
	Equivalent property damage only (EPDO) of fatal and injury crash rate expected to reduced (50%)
Accessibility (25%)	Change in average job accessibility per person (60%)
	Change in average job accessibility per person for disadvantaged populations (20%)
	Project includes transit, bicycle and/or pedestrian improvements (20%)
Economic Development (25%)	Decay weighted job growth adjacent to project (70%)
	Intermodal access and efficiency/tons of goods impacted (30%)
Environment (10%)	Air quality and environmental effect (50%)
	Amount of potentially impacted natural and cultural resource acres within 1/4 mile buffer (50%)
Land Use (7.5%)	Reduction in vehicle miles traveled (VMT) per capita (100%)

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Smart Scale Measure (LRTP Weight)	Metric
Congestion Mitigation (7.5%)	Reduction in Vehicle Hours Traveled (VHT) per capita

VHT = cumulative daily travel time for all vehicles on all roadways

Congestion Mitigation Score = MPO-wide total VHT in 2040 travel demand model **BEFORE** vs. **AFTER** project



- Simplified method from SMART SCALE, but...
more capable of capturing system-wide effects

Smart Scale Measure (LRTP Weight)	Metric
Safety (25%)	S1: EPDO* Reduction in fatal and injury crashes (50%)
	S2: EPDO* Reduction in fatal and injury crash rate (50%)

Table 6.2 EPDO Crash Value Conversion Table

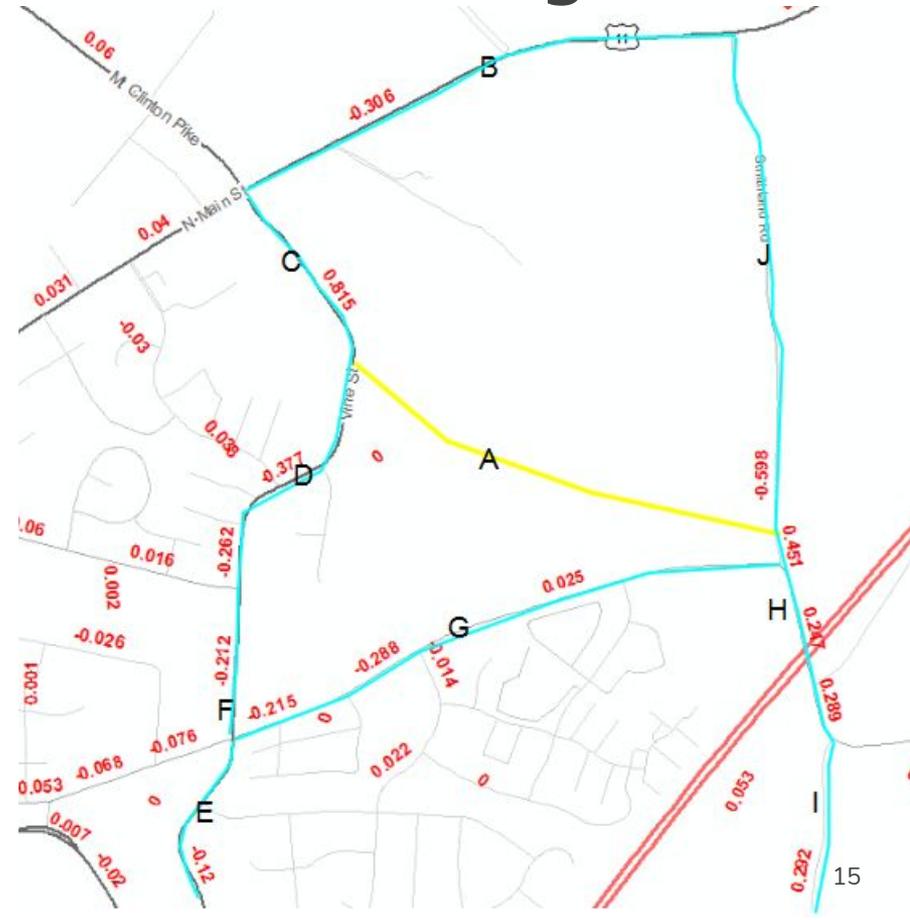
Accident Type	Rounded Value	Weight
Fatal + Injury	\$850,000	85
Moderate Injury	\$100,000	10
Minor Injury	\$50,000	5

Safety Analysis

Existing

vs.

New Alignment





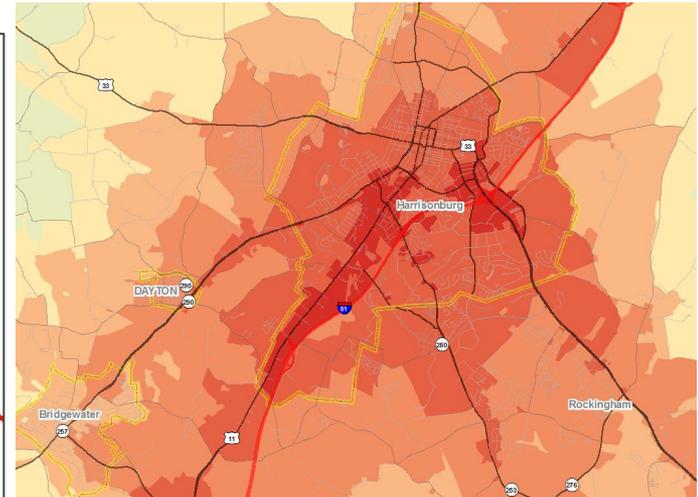
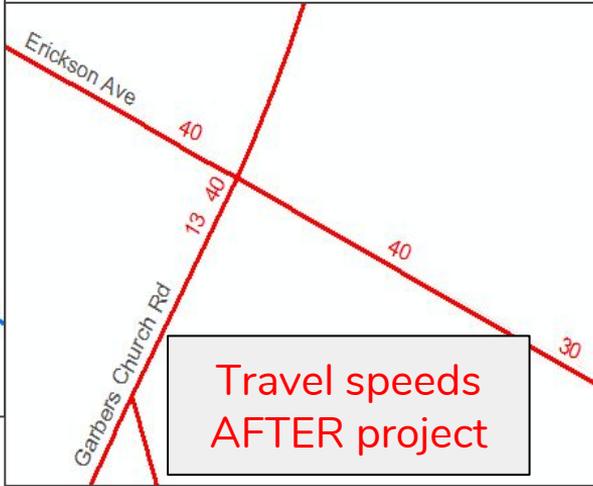
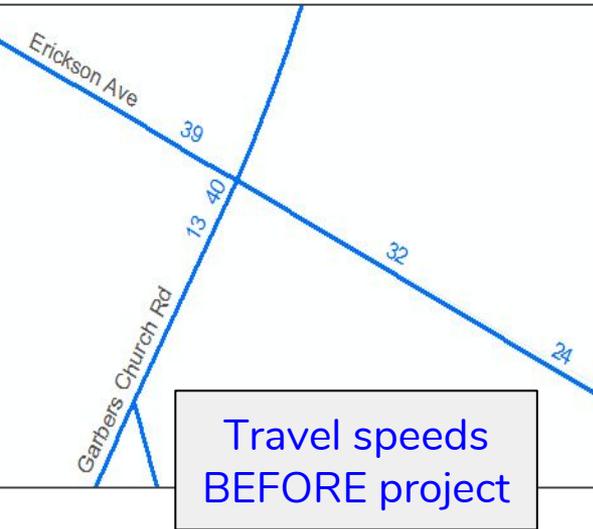
Safety Scoring Lessons Learned

- There is not a CMF for everything
- Influence Areas
- New location roadways - travel demand model outputs
- Thanks to Stephen Read, Brooke Jackson, Jared Buchanan, and Mark Herman for their assistance!

Accessibility

Change in Job Access

- Average # jobs accessible per person **BEFORE** vs. **AFTER** project
- Sugar Access tool available to VDOT and MPOs/PDCs



Smart Scale Measure (LRTP Weight)	Metric
Economic Development (25%)	ED1: Decay weighted job growth adjacent to project (70%)
	ED2: Intermodal access and efficiency/tons of goods impacted (30%)



Economic Development

Decay Weighted Job Growth

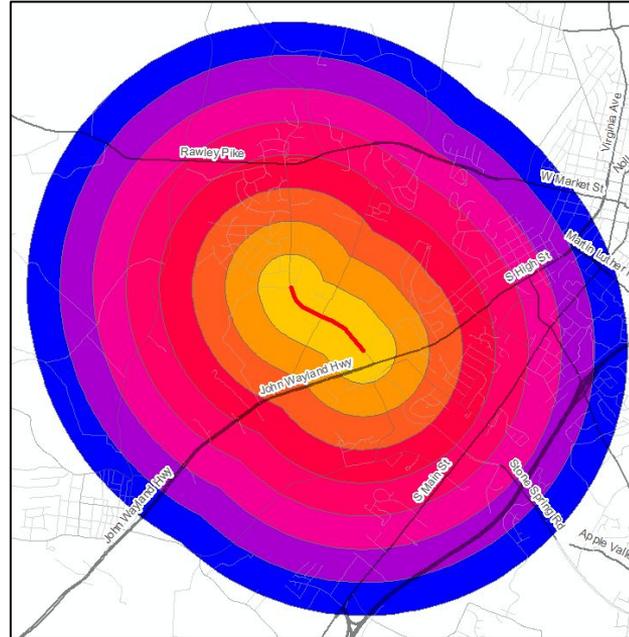
- Decay weighted quantity of 2015-2040 job growth adjacent to project
- Growth areas predicted by localities in travel demand model

	Buffer Distance to Determine Total Square Footage	Applicable Project Types
1 mile buffer	Tier 1 Project Type – 0.5 mile buffer	Turn Lane, Intelligent Transportation Systems, Bike Lane or Path, Sidewalk, Bus Stop, Park & Ride Lot
	Tier 2 Project Type – 1 mile buffer	Access Management, Signal optimization, Increase Bus service, Improvement to Rail Transit Station
2 mile buffer	Tier 3 Project Type – 3 mile buffer	New through lane, new/improved interchange, new bridge, new Rail Transit Station, additional Rail Track

Economic Development

Decay Weighted Job Growth

- Example widening project
 - 2 mile buffer
- % TAZ coverage by buffer
=
% TAZ job growth counted



Distance (miles)	Weight (% jobs)
0.25	100
0.5	75
0.75	60
1	50
1.25	44
1.5	38
1.75	32
2	25

Smart Scale Measure (LRTP Weight)	Metric
Land Use (7.5%)	Reduction in Vehicle Miles Traveled (VMT) per capita

VMT = cumulative daily vehicles miles traveled
for all vehicles on all roadways

Land Use Score = MPO-wide total VMT in 2040 travel demand model
BEFORE vs. AFTER project

Port Republic Rd TWLTL

Existing:

4-lanes undivided, sidewalk, bike lanes

Proposed:

5-lanes undivided, sidewalk, bike lanes

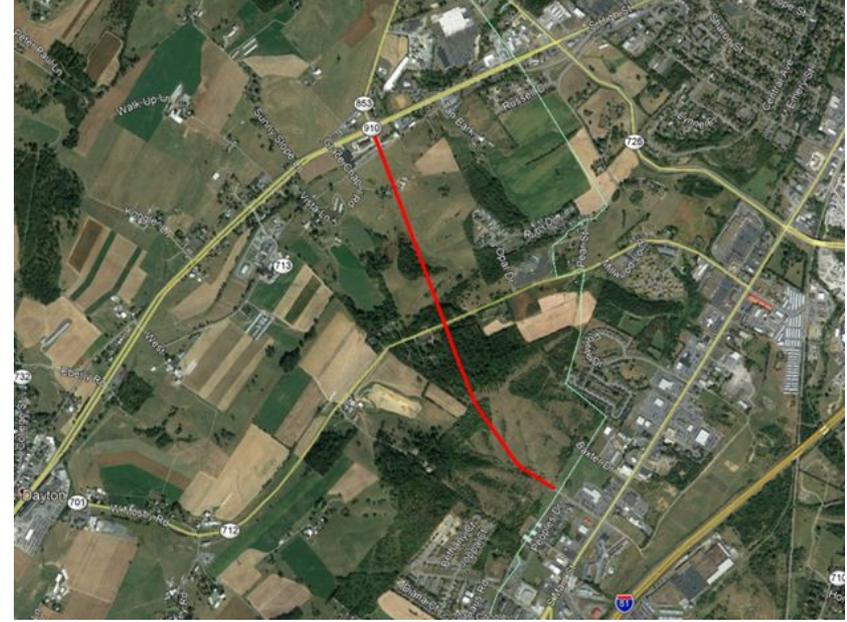


Project		Weighted Factor Values						Overall Scoring			
Jurisdiction	Name	Congestion Mitigation	Safety	Accessibility	Economic Development	Environment	Land Use	Project Benefit	Project Cost	Project Score	Rank
		7.5%	25%	25%	25%	10%	7.5%				
Harrisonburg	Port Republic Rd TWLTL	0.0	15.8	4.5	0.7	9.4	0.0	30.4	\$3.7 M	82.1	3

US-11 to Rte 42 Connector

Proposed:

- New 2-lane limited access roadway
- Wide shoulders
- 1.3 miles



Project		Weighted Factor Values						Overall Scoring			
Jurisdiction	Name	Congestion Mitigation	Safety	Accessibility	Economic Development	Environment	Land Use	Project Benefit	Project Cost	Project Score	Rank
		7.5%	25%	25%	25%	10%	7.5%				
Harrisonburg & Rockingham	Garbers Church - Kaylor Park Connector	0.0	0.6	0.4	3.5	4.7	7.5	16.7	\$13.1 M	12.7	22

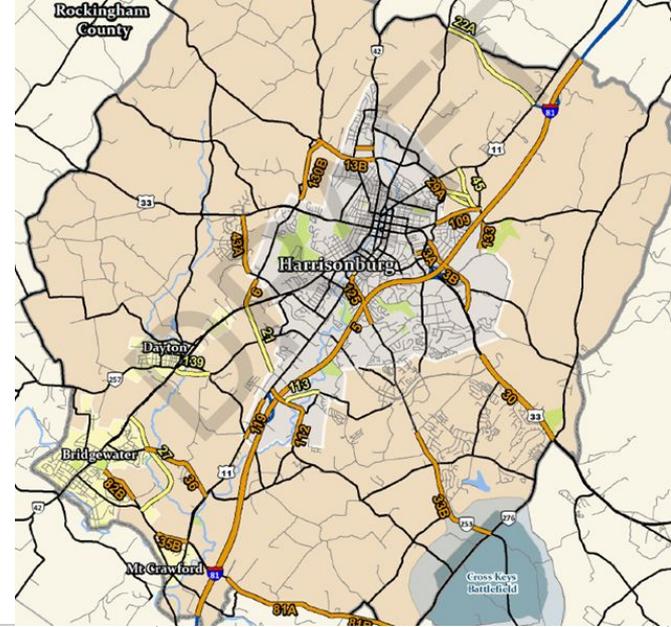
I-81 Widening Through MPO

Existing:

4-lanes (2 per direction)

Proposed:

6-lanes (3 per direction)



Project		Weighted Factor Values						Overall Scoring			
Jurisdiction	Name	Congestion Mitigation	Safety	Accessibility	Economic Development	Environment	Land Use	Project Benefit	Project Cost	Project Score	Rank
Harrisonburg & Rockingham	I-81 Widening to 6-lanes	7.5	10.6	25.0	25.0	4.6	0.0	72.7	\$607 M	1.2	36 (last)



Outcomes

- To degree possible, linked land use-transportation plans
- Added value to the regional planning process
- Provided project data to inform local planning efforts
- Prioritized projects for potential Smart Scale applications

Questions?

Jonathan Howard - *Central Shenandoah PDC / HRMPO*

Brad Reed, AICP - *VDOT Staunton District Planning*

James May, AICP - *Rockingham County Community Development*