

TIERING WORKSHOP



STAC
APRIL 13, 2012

OVERVIEW

➤ Background and Goals

Feb 2012

- What is tiering and why tier?
- What's happening in other states?
- What are goals for tiering?





OVERVIEW

➤ Background and Goals

Feb 2012

- Examined other states
- Examples of several different approaches:
 - Volume-based
 - Strategic Corridors
 - Program Tiering
- Utah tiers by volume
- Today look at a volume-based approach
 - Does not include bridge or safety

OVERVIEW

➤ Tiering at CDOT

- What has CDOT done in the past?
 - CDOT Statewide Strategic Corridors
- What is CDOT doing today?
 - Current Practices

Feb 2012



OVERVIEW OF WORKSHOPS

Tiering at CDOT	
Program	Factor
Practical Design	<ul style="list-style-type: none">• AADT• Truck AADT
Pavement Management System	<ul style="list-style-type: none">• AADT• Surface condition inputs
Bridge Program	<ul style="list-style-type: none">• AADT (for Scour Plans)• Cost Benefit (for Preventative Maintenance)• Sufficiency Rating including importance of route (for Replacement and Major Rehabilitation)
Maintenance and Operations	<ul style="list-style-type: none">• AADT (for snow removal)

OVERVIEW

➤ Today's Workshop

April 2012

- Analysis of Potential Factors for Tiering
- Potential Tiering Groups
- Findings
- Discussion and Next Steps





WHAT WE HEARD FROM THE TC

- Need policy framework for cost effective means to allocate resources.
- TC “affirmative policy” that clearly outlines state’s tiering direction.
- Set policy for CDOT Regions to follow.
- Consider volume, economic development, connectivity, and energy development.
- Maintain flexibility.
- Urban and rural differences and equity need to be considered.



POTENTIAL FACTORS FOR TIERING

- Designation
- Population
- Economic Activity
 - Employment
 - Retail Sales
 - High Priority Corridors
 - Energy Corridors
- Connectivity
 - Intermodal Facilities
 - Airports
- Traffic Volume
- Truck Volume

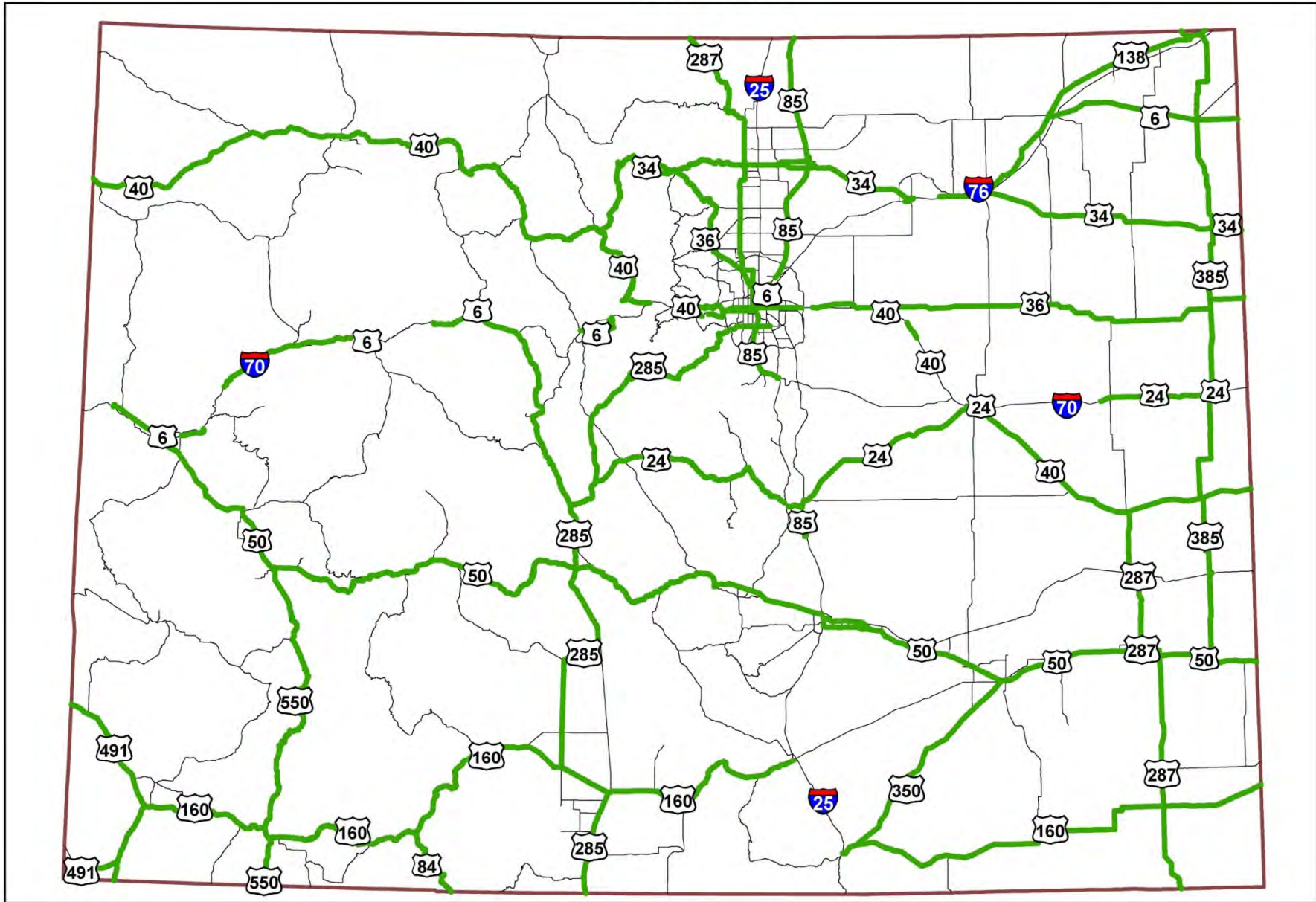
DESIGNATIONS

➤ US Routes

- U.S. road numbering and marking system to facilitate travel on the main interstate lines, over the shortest routes and the best roads.
 - Focused on connectivity
 - Initially designated in 1926

	US Routes
Lane Miles	8,493
% of Lane Miles	37%
% of VMT	30%

U.S. Routes



— US Routes

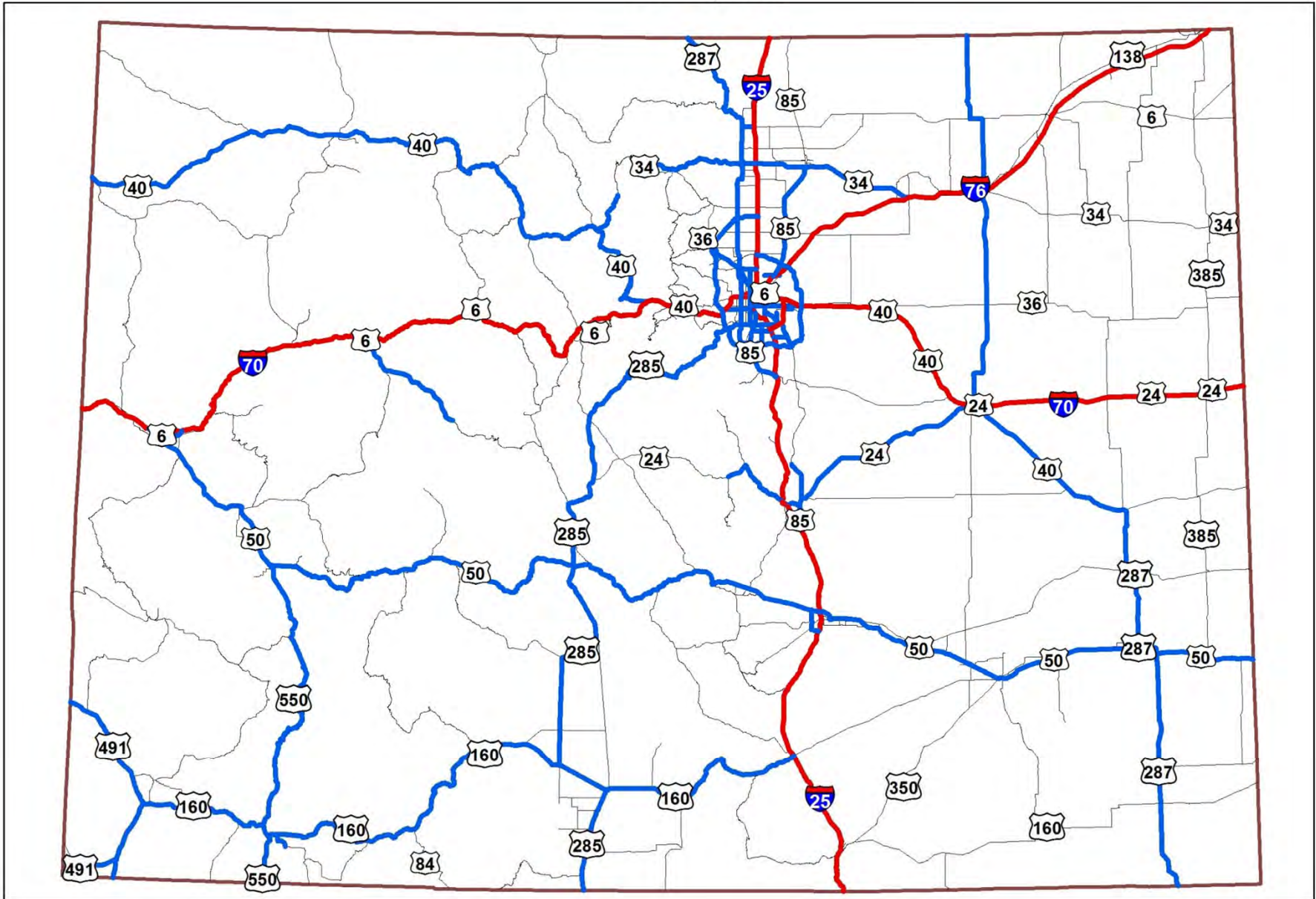


DESIGNATIONS

- National Highway System (NHS)
 - 160,000 miles of roadway nationwide.
 - Includes roads that are:
 - Interstate Highway System;
 - important to the nation's economy;
 - important to defense and mobility;
 - providing access between major intermodal facilities.
 - Approved by US Congress in 1995.

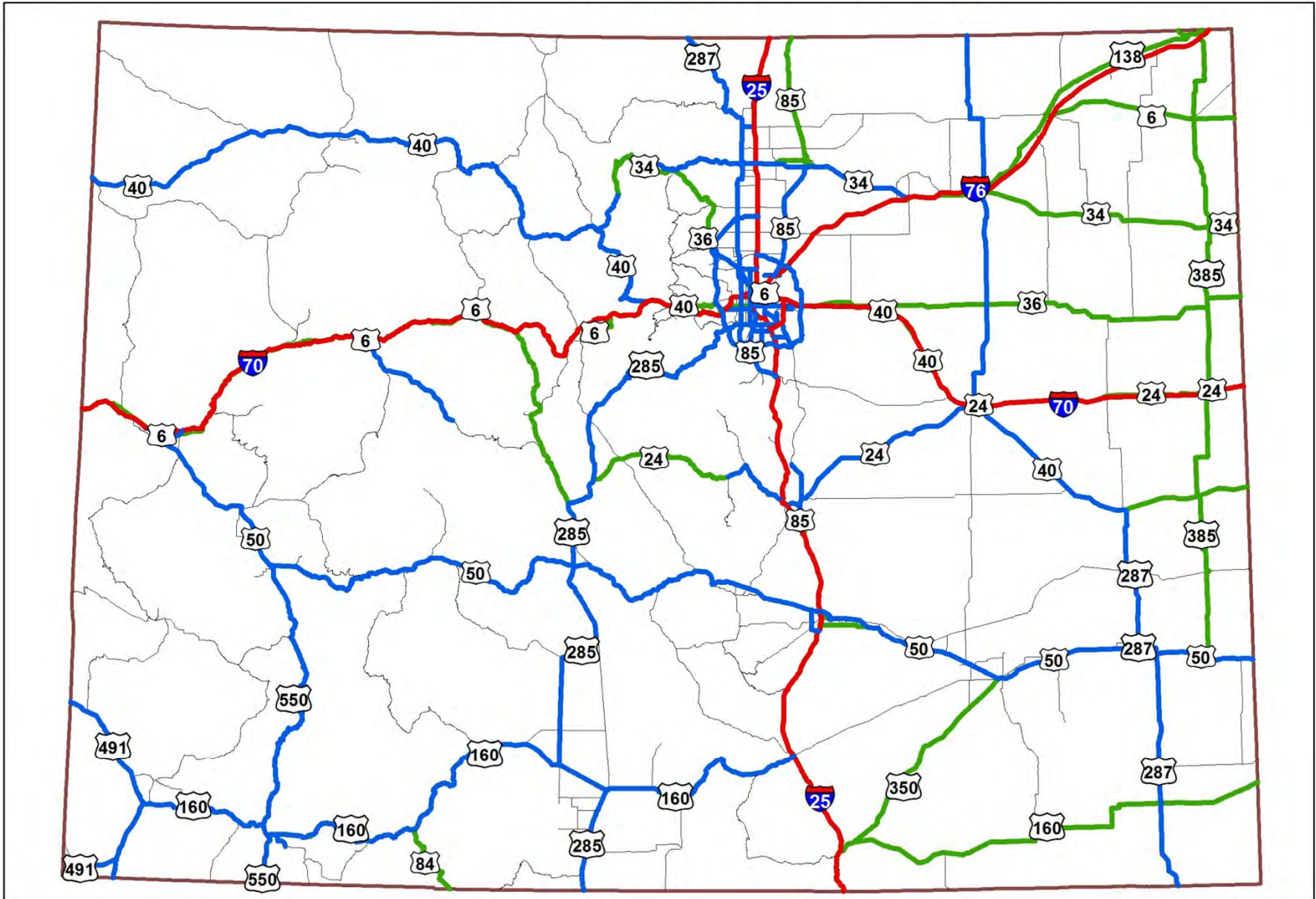
	NHS
Lane Miles	11,020
% of Lane Miles	48%
% of VMT	80%

NHS System



- Interstate
- Non-Interstate NHS

NHS and Non-NHS U.S. Routes Combined



- Interstate
- Non-Interstate NHS
- Non-NHS -US Routes



Data Source: CDOT 2010
Published: March 2012



DESIGNATIONS

➤ Summary

- 5,341 lane miles of US Routes are also on the NHS, representing slightly less than half of total NHS in Colorado.
- 3,152 lane miles of US Routes are not NHS.

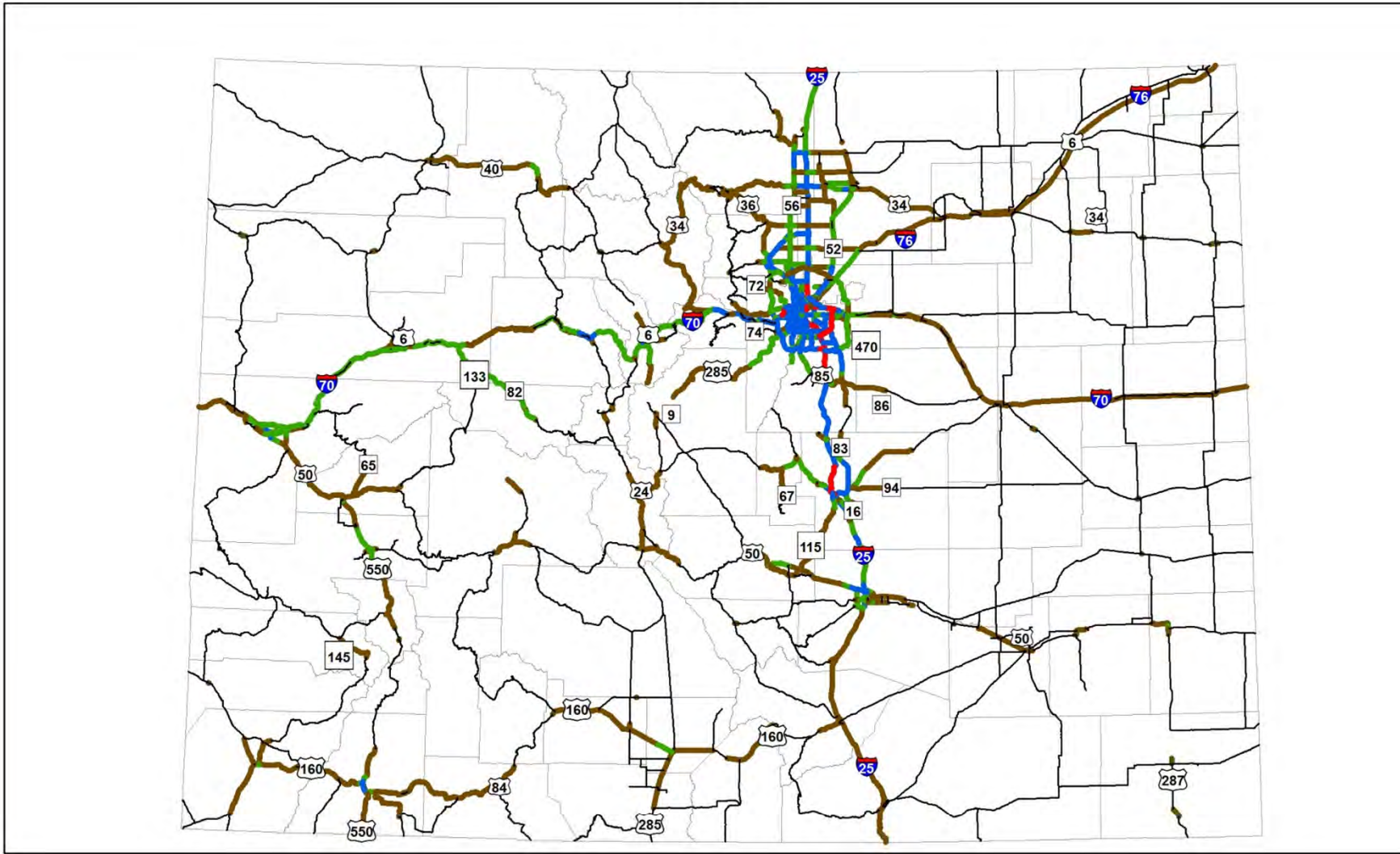
	US Routes	NHS
Lane Miles	8,493	11,020
% of Lane Miles	37%	48%
% of VMT	30%	80%



POPULATION AND ECONOMIC ACTIVITY

- Concentrations of population and economic activity correspond closely with higher AADT.
 - Population and AADT
 - Employment and AADT
 - Retail Sales and AADT

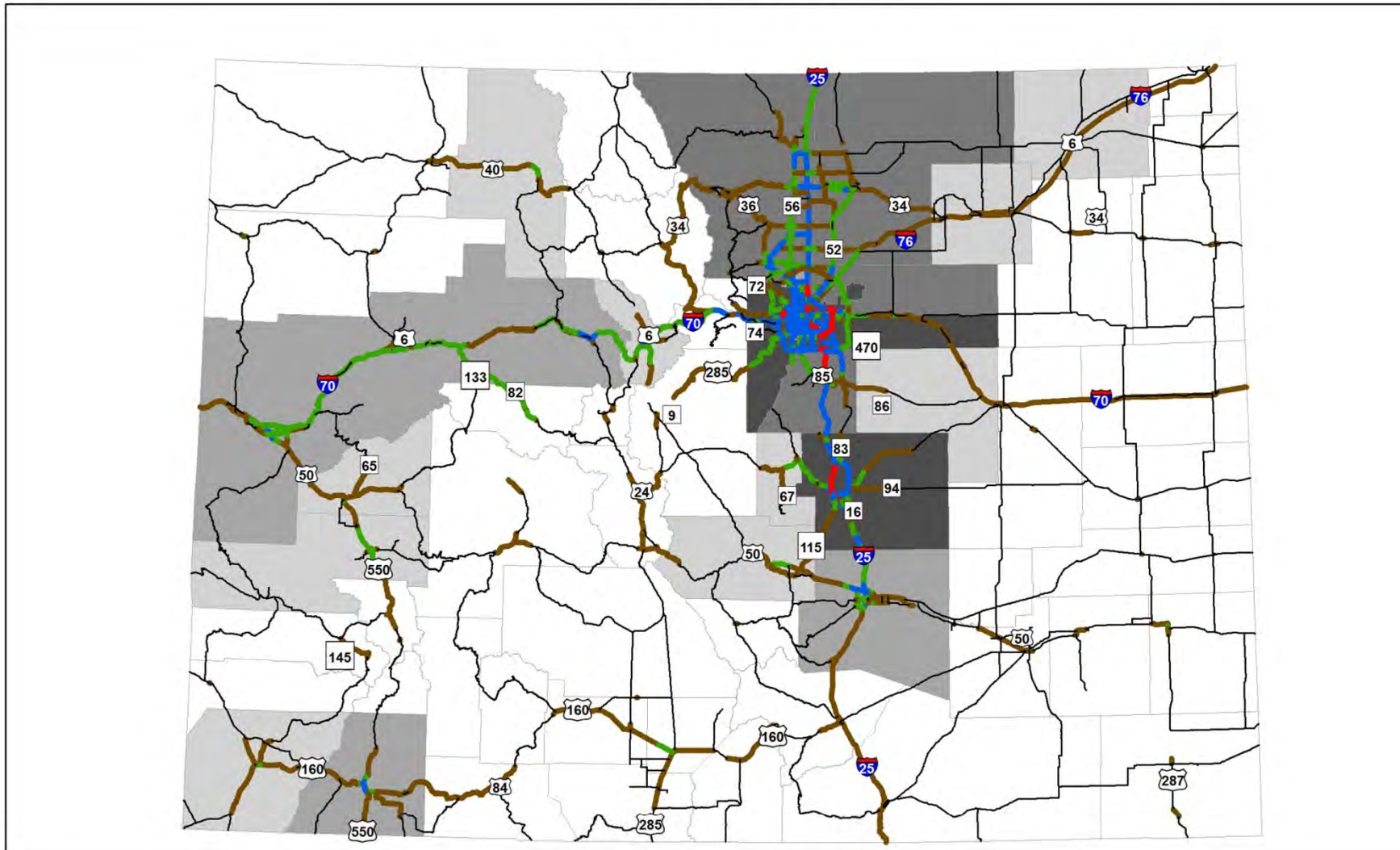
AADT



AADT

- 99,999 - 240,999
- 31,000 - 99,999
- 15,000 - 31,000
- 4,000 - 15,000
- < 4000 AADT

AADT and Population



2010 Population by County

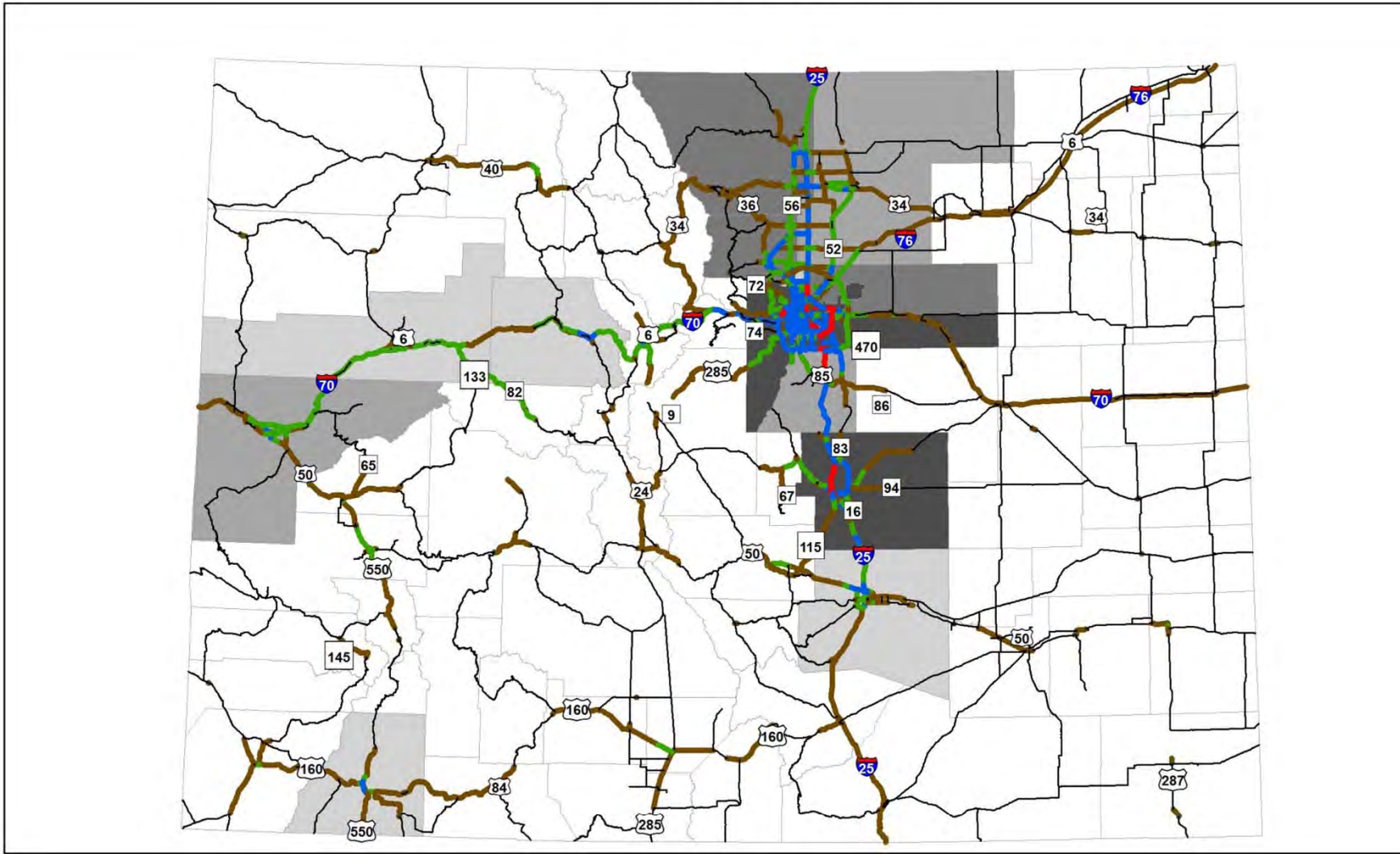
- 500,001 - 1,000,000
- 25,001 - 500,000
- 50,001 - 250,000
- 20,001 - 50,000
- 699 - 20,000

AADT

- 99,999 - 240,999
- 31,000 - 99,999
- 15,000 - 31,000
- 4,000 - 15,000
- < 4000 AADT



AADT and Employment



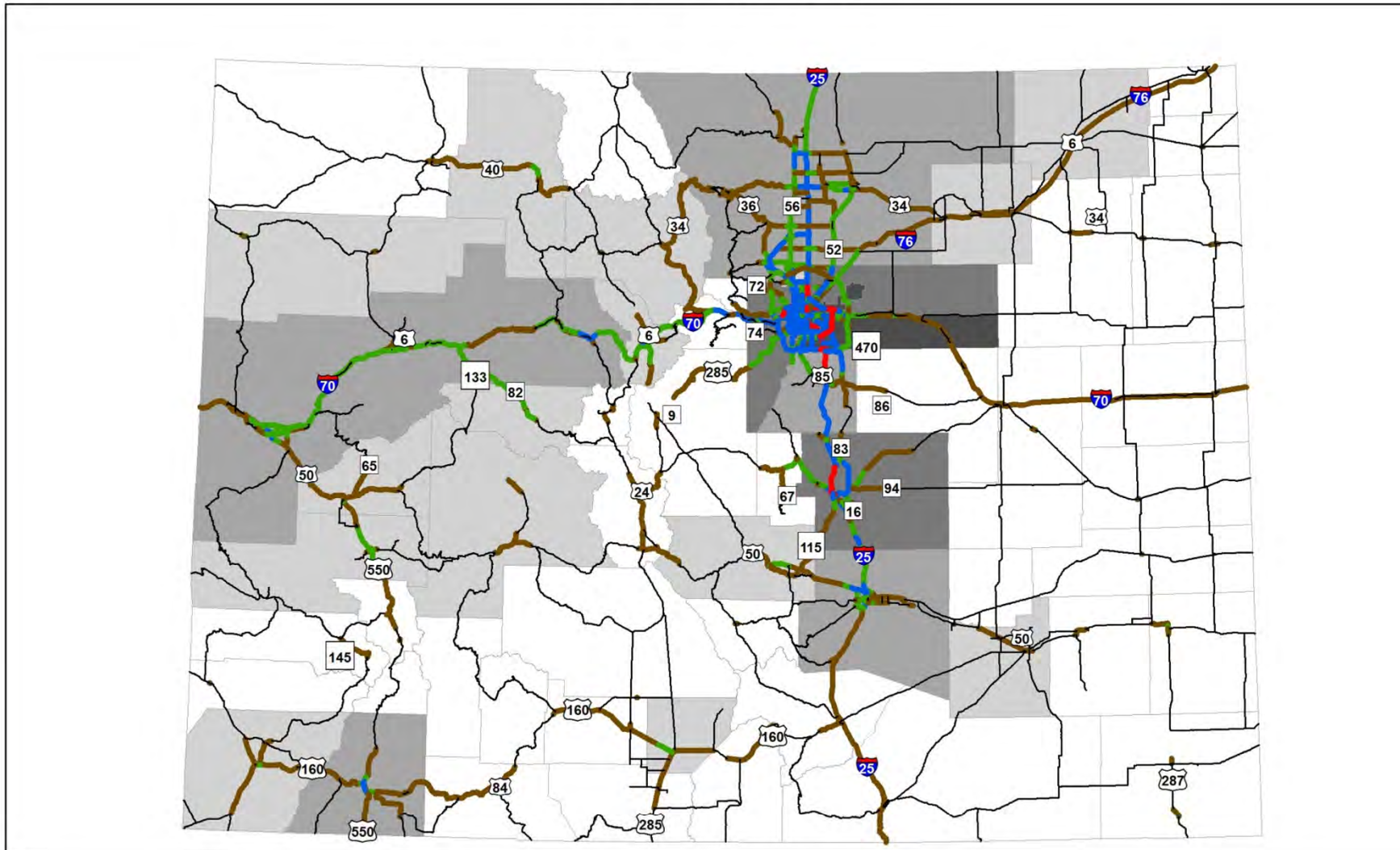
Employment By County

- 200,000.1 - 432,158
- 100,000.1 - 200,000
- 60,000.1 - 100,000
- 20,000.1 - 60,000
- 181 - 20,000

AADT

- 99,999 - 240,999
- 31,000 - 99,999
- 15,000 - 31,000
- 4,000 - 15,000
- < 4000 AADT

AADT and Retail Sales



Retail Sales in Dollars by County

■	\$15,000,000,000.1 - \$23,649,825,016
■	\$10,000,000,000.1 - \$15,000,000,000
■	\$1,600,000,000.1 - \$10,000,000,000
■	\$400,000,000.1 - 1,600,000,000
■	\$15,959,959 - \$400,000,000

AADT

—	99,999 - 240,999
—	31,000 - 99,999
—	15,000 - 31,000
—	4,000 - 15,000
—	< 4000 AADT





POPULATION AND ECONOMIC ACTIVITY

➤ Summary

- Highest volume roads generally correspond with concentrations of population, employment and economic activity.
- Low volume roads generally correspond with areas with less population, employment and economic activity.
- Volume can act as a surrogate for population, employment and economic activity.



POTENTIAL TIERING GROUPS

➤ Interstates

- Subject to distinct standards different from non-interstate highways.
- Greater FHWA involvement in project approvals.
- Serve interstate commerce and defense.
- Provide access to most major U.S. cities.

POTENTIAL TIERING GROUPS

➤ Interstates

- Interstates account for disproportionate amount of VMT and AADT

	Interstate
Lane Miles	4,114
% of Lane Miles	18%
% of VMT	42%
% of AADT	47%
% of Truck AADT	68%

POTENTIAL TIERING GROUPS

➤ Interstates

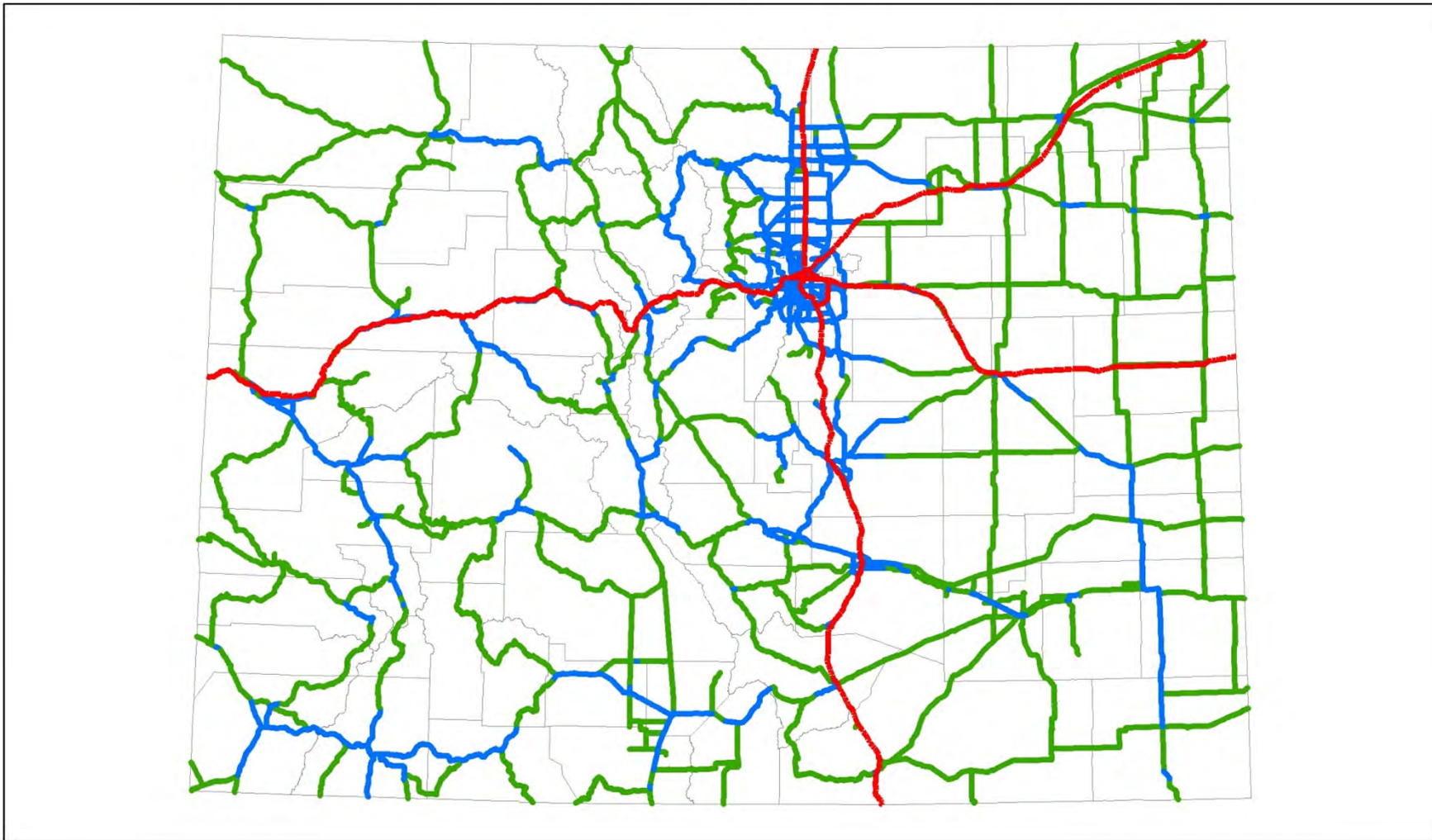
- Volumes vary but even the least traveled segments include substantial volumes of traffic.

	Min	Max
AADT	6,200	249,000
Truck AADT	1,200	12,200

POTENTIAL TIERING GROUPS

- High – Interstate
- Medium – Non-Interstate > 4,000 AADT or > 1,000 Truck AADT
- Low – Non-Interstate < 4,000 AADT and <1,000 Truck AADT
 - > 4,000 AADT and > 1,000 Truck AADT represent thresholds currently used by Pavement Management to differentiate approaches to surface treatment.

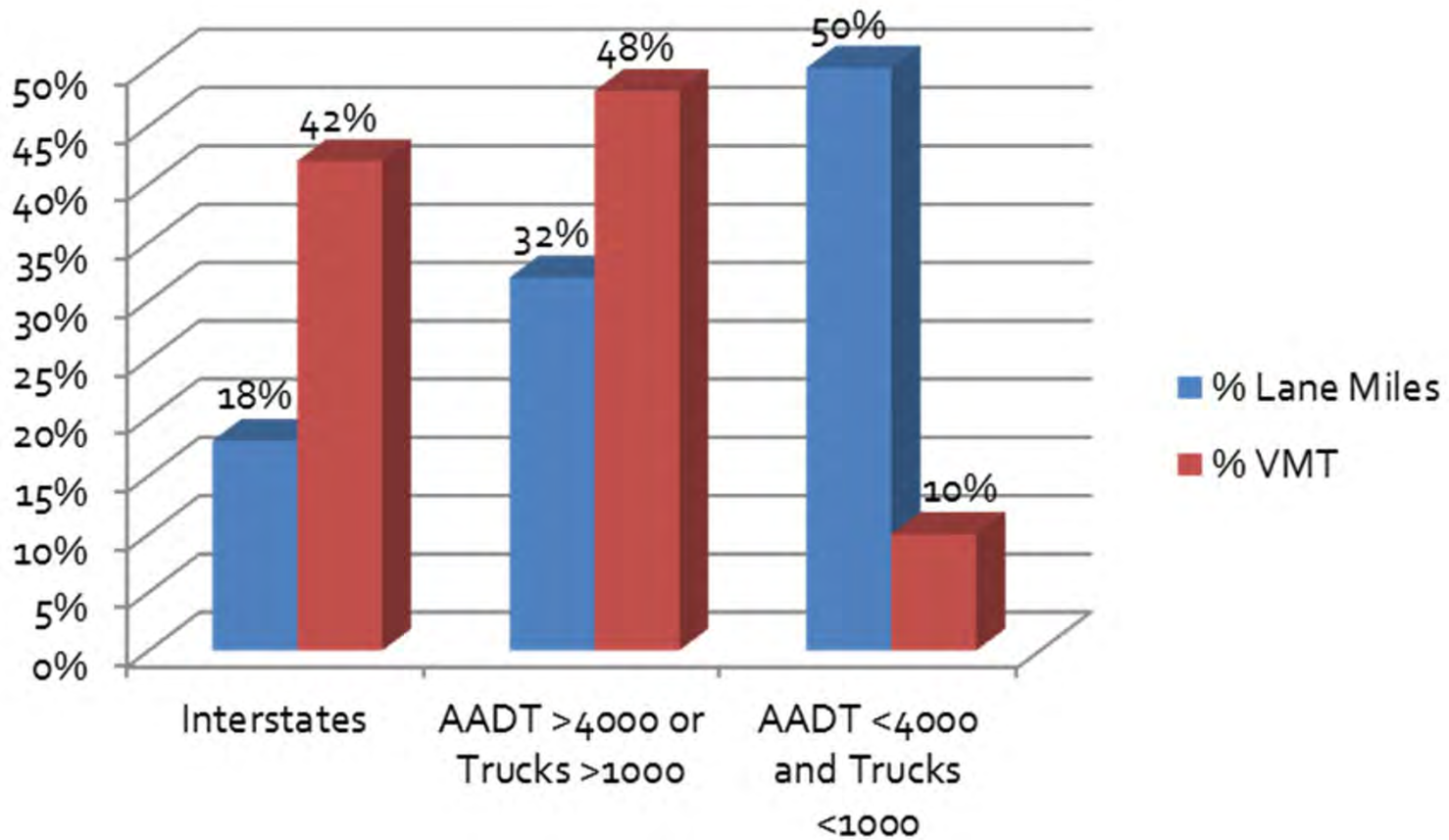
AADT and Truck AADT



Linetype	Description	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	%VMT
	Interstates	950	10.46%	4,114	17.92%	41.71%
	AADT >4000 or Trucks >1000	2,449	26.94%	7,270	31.66%	48.21%
	AADT less than 4000 and Truck less than 1000	5,691	62.61%	11,579	50.43%	10.07%
	Totals	9,091	100.00%	22,963	100.00%	100.00%



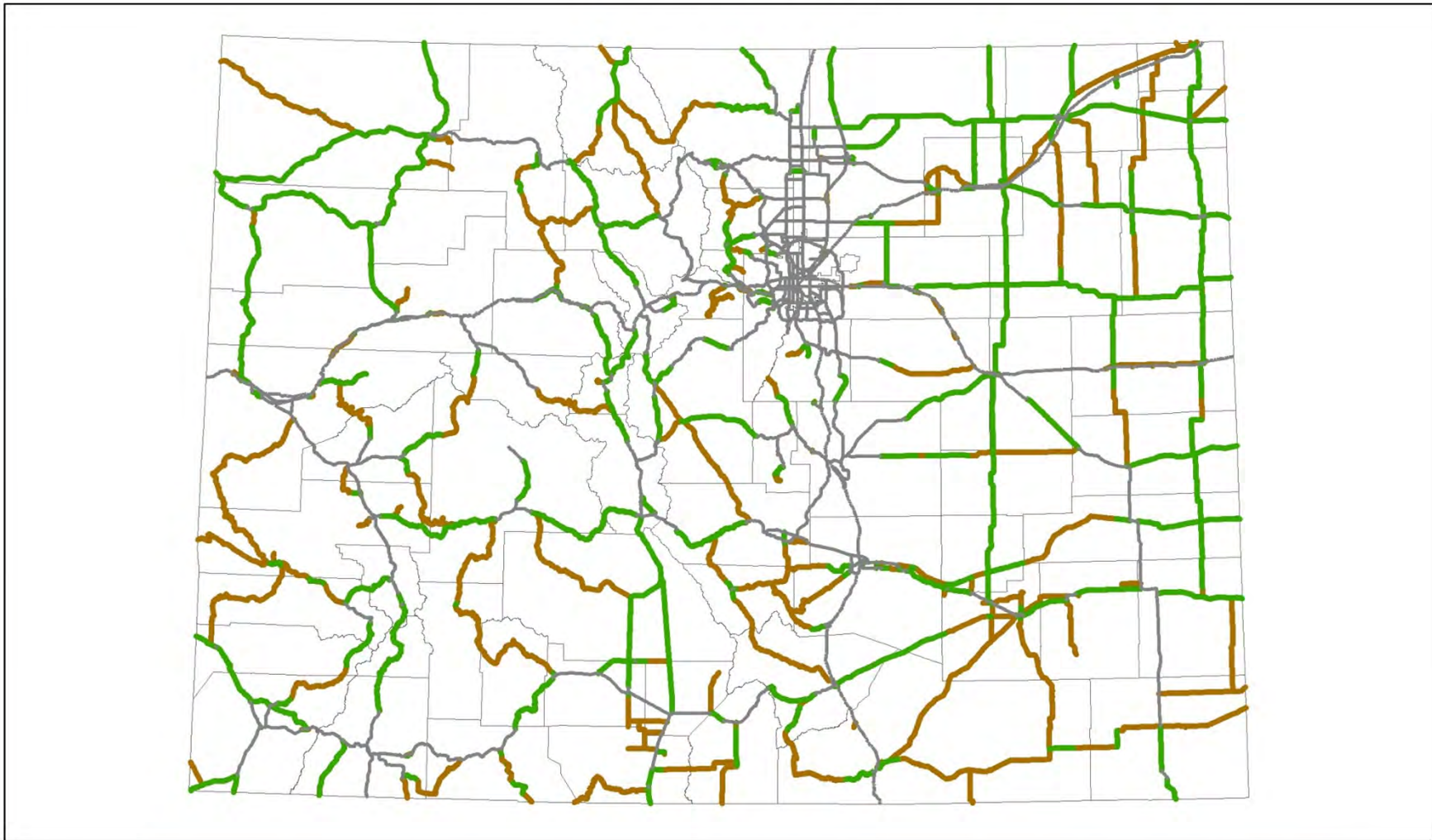
POTENTIAL TIERING GROUPS






POTENTIAL TIERING GROUPS

- Closer Look at Low Volume Roads
 - Further refinement focused on low volume roads.
 - Low tier split into two tiers based on Pavement Practical Design thresholds
 - Low – 2,000 – 4,000 AADT or 100 – 1,000 Truck AADT
 - “A combination of pavement preservation treatments or minor rehabilitation treatments will be the primary treatments considered for these pavements.”
 - Very Low – 0 – 2,000 AADT and < 100 Truck AADT
 - “Pavement preservation treatments will be the primary treatment considered for these pavements.”

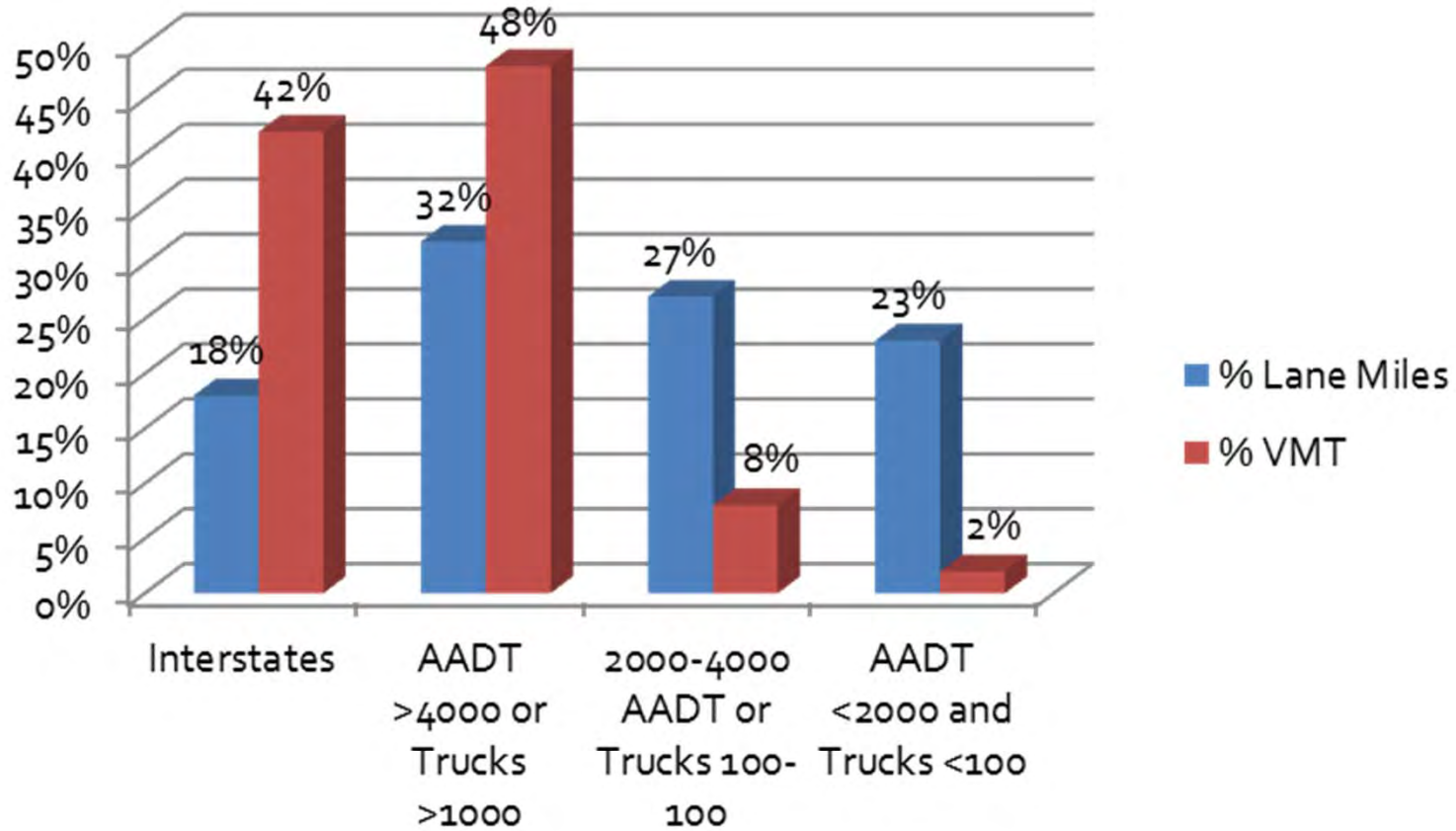
AADT and Truck AADT



Linetype	Description	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	%VMT
	AADT >4000 or Trucks >1000	3,399	37.40%	11,384	49.57%	89.93%
	2000- 4000 AADT or Truck is 100-1000	3,002	33.01%	6,197	26.99%	7.66%
	AADT less than 2000 and Truck less than 100	2,690	29.59%	5,383	23.44%	2.41%
	Total	9,091	100.00%	22,963	100.00%	100.00%



POTENTIAL TIERING GROUPS

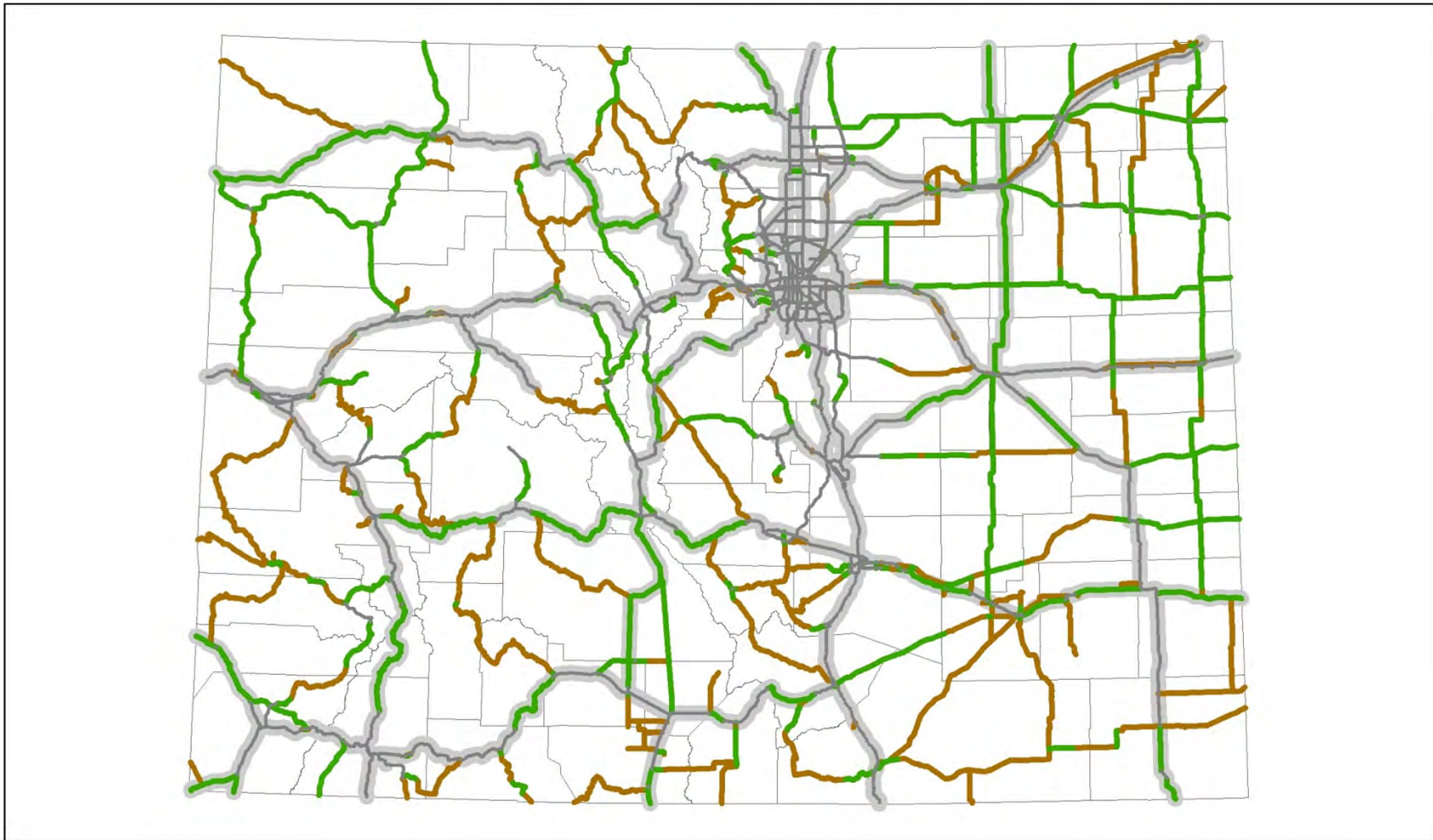




OTHER CONSIDERATIONS

- Other Considerations for Low Volume Roads
 - National Highway System (NHS)
 - Congressional High Priority Corridors
 - Energy Corridors

AADT and Truck AADT and NHS



Linetype	Description	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	%VMT
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NHS





OTHER CONSIDERATIONS

- Congressional High Priority Corridors
 - Beginning with ISTEA in 1991, corridors have been designated in Federal transportation legislation as high priority corridors on the NHS.
 - Heartland Expressway
 - Camino Real Corridor
 - Ports to Plains Corridor
 - Route 50 High Plains Corridor



Congressional High Priority Corridors on the National Highway System

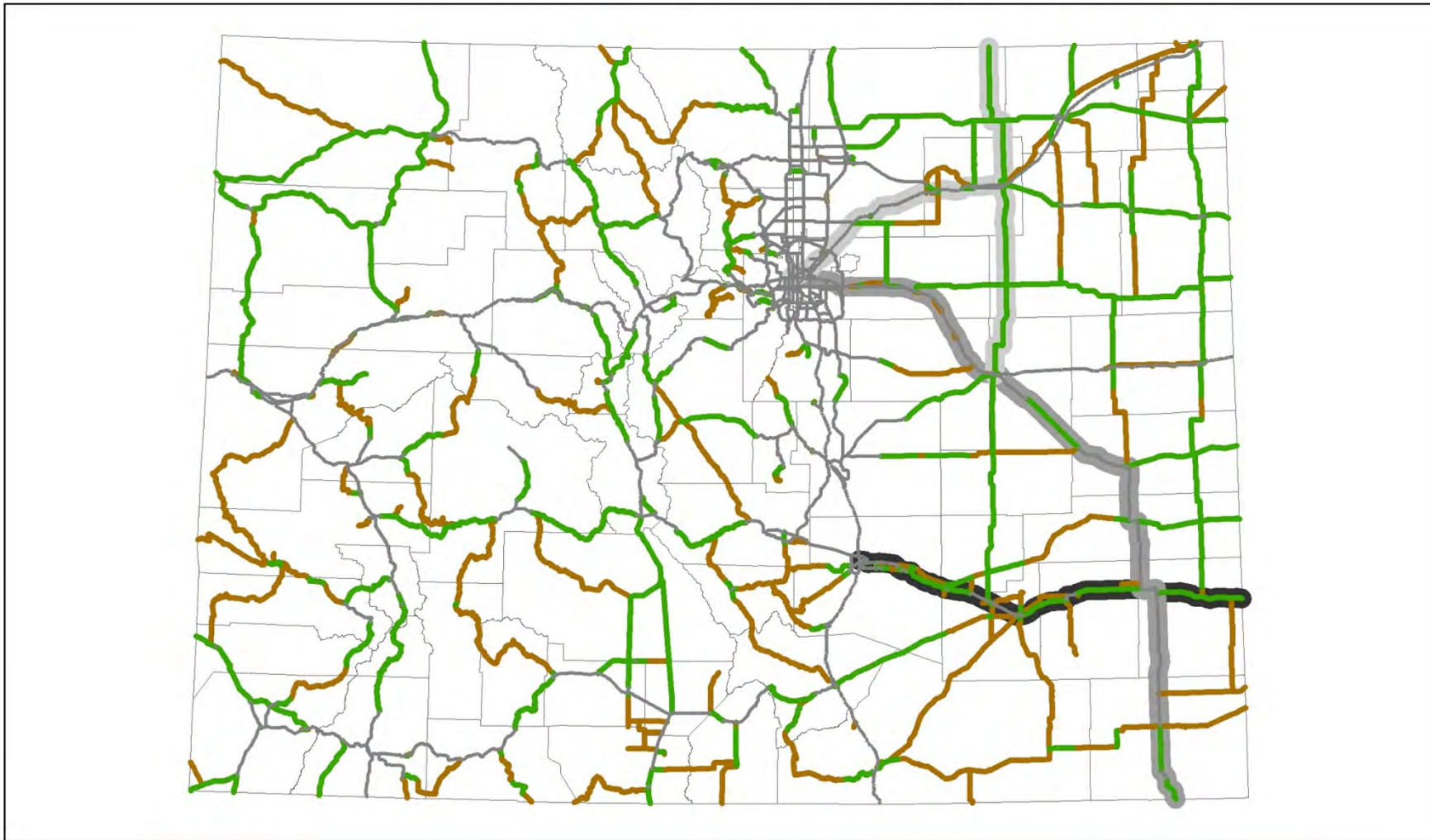


Note:

- ** Corridor numbers correspond to statutory listing in Section 1105(c) of ISTEA, as amended.
- ** Colors are added for clarity only.
- ** Dash black lines indicate relatively long sections of corridor overlap.
- ** Corridors based on information available as of September 7, 2006.
- ** In some corridors, alignments are in project development stage.

Federal Highway Administration
Office of Interstate and Border Planning
May 8, 2008

AADT / Truck AADT and High Priority Corridors



Linetype	Description	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	%VMT
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- Heartland Express Highway
- Ports to Plains
- High Plains Corridor

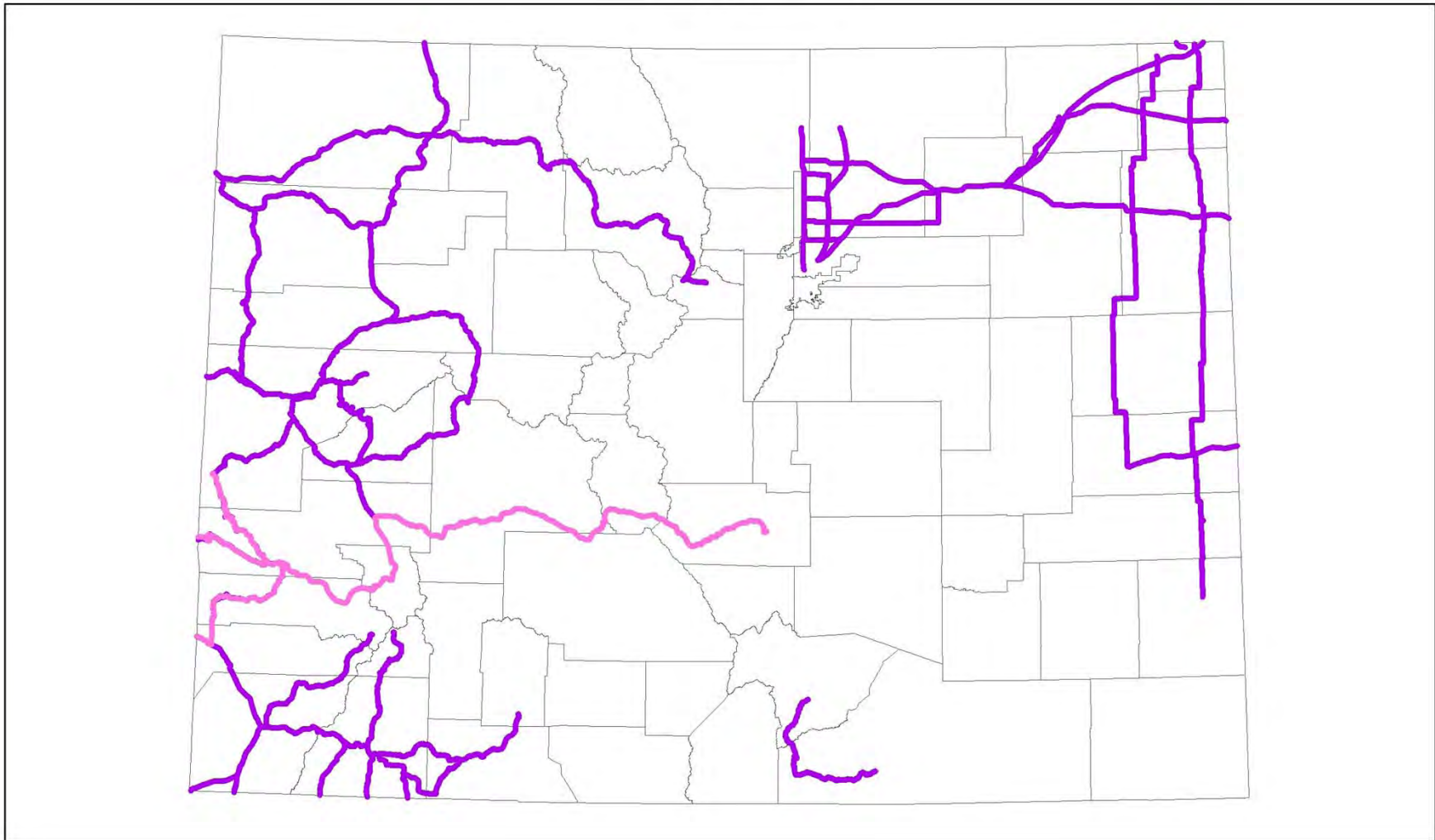


OTHER CONSIDERATIONS

➤ Energy Corridors

- CDOT Energy Corridor study looked at oil and gas, uranium, wind, solar, and biofuels.
- Oil and Gas
 - 98.7% of total energy related trips are for oil and gas development.
 - The highest level of activity is in the central Western Slope area and northern Eastern Plains area.
 - Transportation demands are primarily during construction (generally 30 to 60 days per location).
- Uranium mining results in 16 to 24 heavy trucks per day from the Uravan belt to processing facilities.
- Wind power development includes one-time transport of large structures.

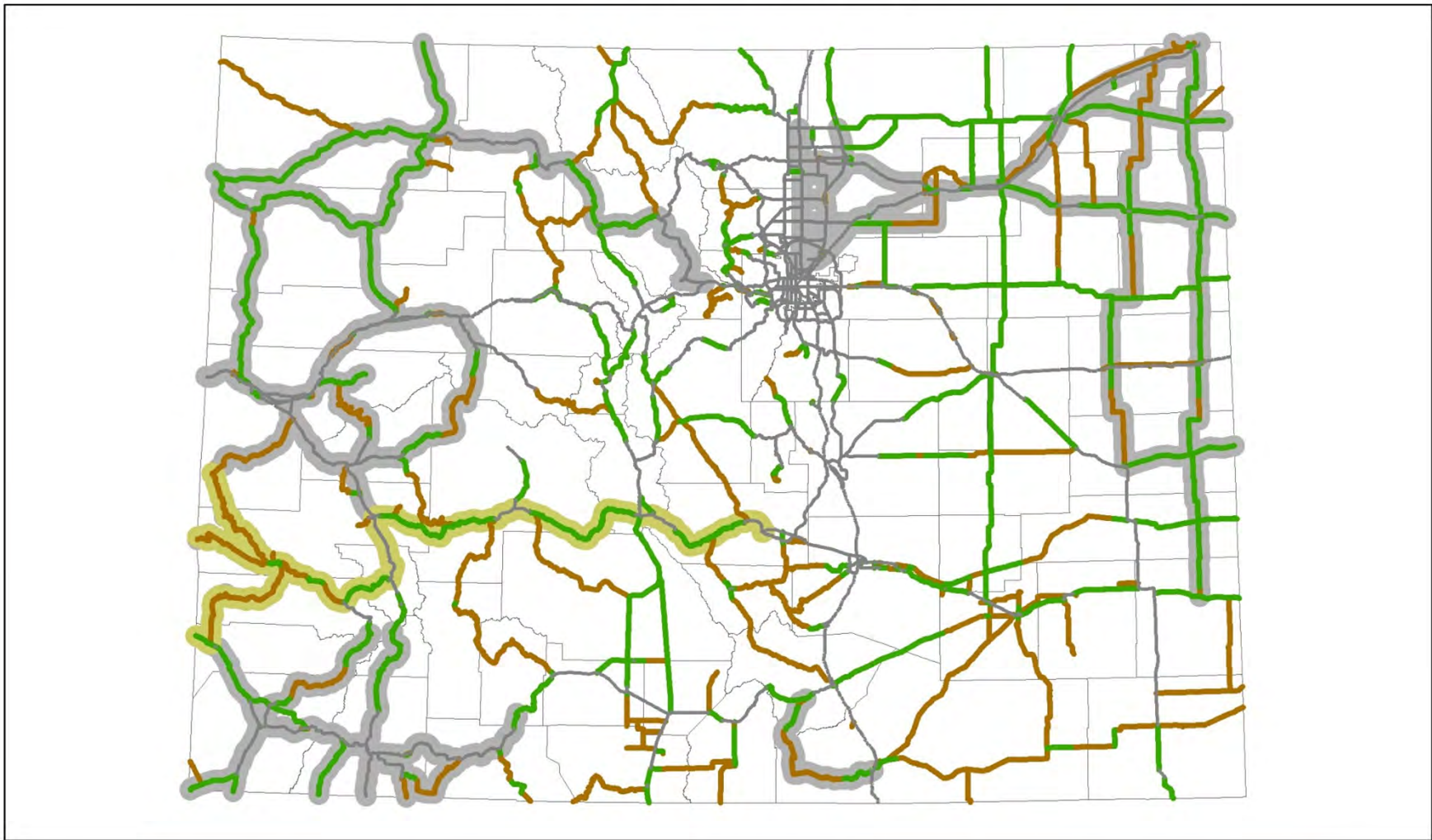
Energy Corridors



- Energy Corridors
- Uranium Impacted Corridors



AADT and Energy Corridors



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Uranium Impacted Corridors
 Energy Corridors



FINDINGS

- Some low volume roads are NHS, but no very low volume roads are NHS.
- Congressional High Priority Corridors include varying volumes.
- Energy Corridors include varying volumes and energy related activity is intermittent.
- Pavement Practical Design Guide suggests reduced treatment for low volume and very low volume roads.



FINDINGS

- Low Volume (2000-4000 AADT or Truck AADT 100-1000)
 - 27% of the lane miles but only 7.7% of the VMT.
 - Some are part of the NHS.
- Very Low Volume (<2000 AADT and <100 Truck AADT)
 - 23% of the lane miles but only 2.4% of the VMT.
 - None are on the NHS.



DISCUSSION

- Should interstates be considered a separate tier?
- Should low or very low volume roads be treated differently?
- Should non-interstate NHS be considered “medium” tier based on designation?
- Should Congressional High Priority Corridors be considered “medium” tier based on designation?
- How should Energy Corridors be treated?
- Are there other factors we should consider?