

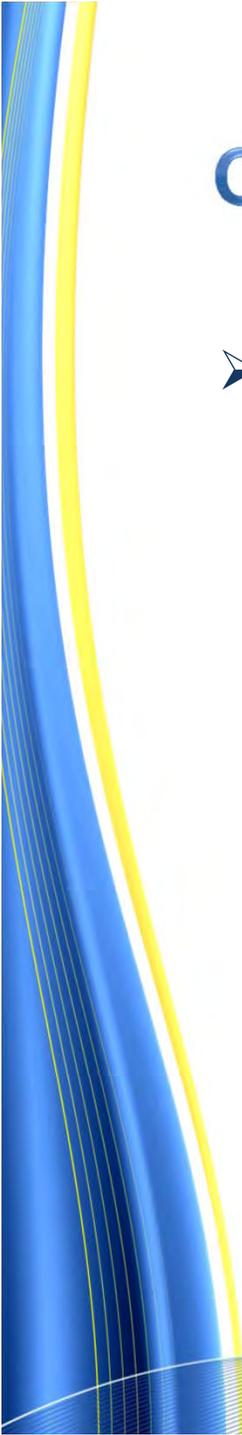
# TIERING WORKSHOP



**COLORADO  
TRANSPORTATION COMMISSION**

**JUNE 20, 2012**

PRESENTED AT STAC ON JUNE 15, 2012



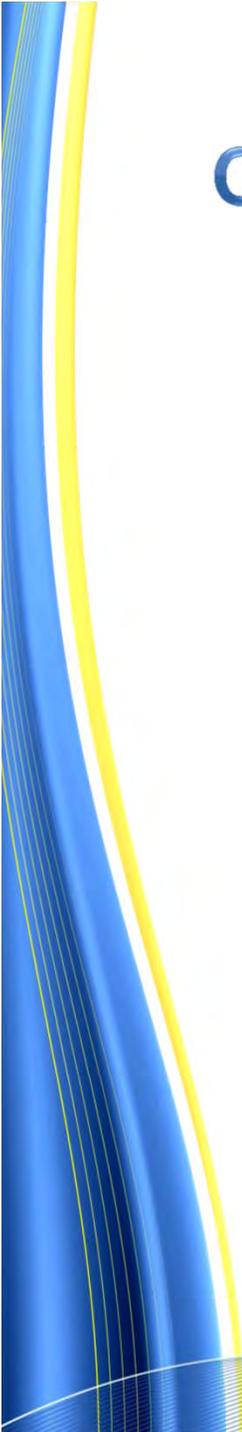
# OVERVIEW OF WORKSHOPS

- Today's Workshop
  - Summarize findings
  - Wrap up tiering discussion
  - Decisions on applicability of tiering will be made in the future within the context of 2040 Statewide Long-Range Transportation Plan



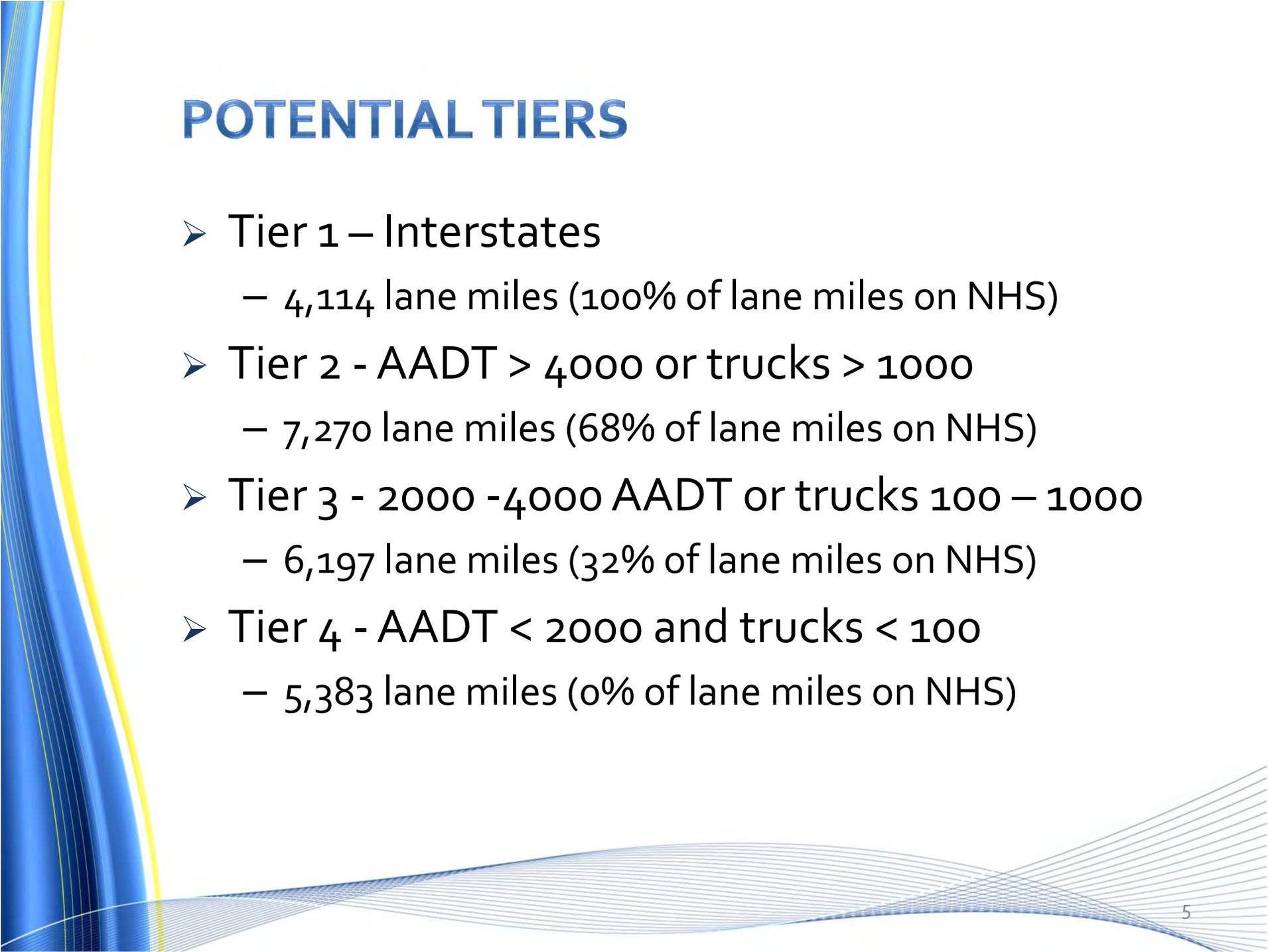
# OVERVIEW OF WORKSHOPS

- Topics addressed in the previous tiering workshops included:
  - General background information & examples of tiering in other states
  - History & current practices of tiering at CDOT
  - Potential tiering groups



## OVERVIEW OF WORKSHOPS

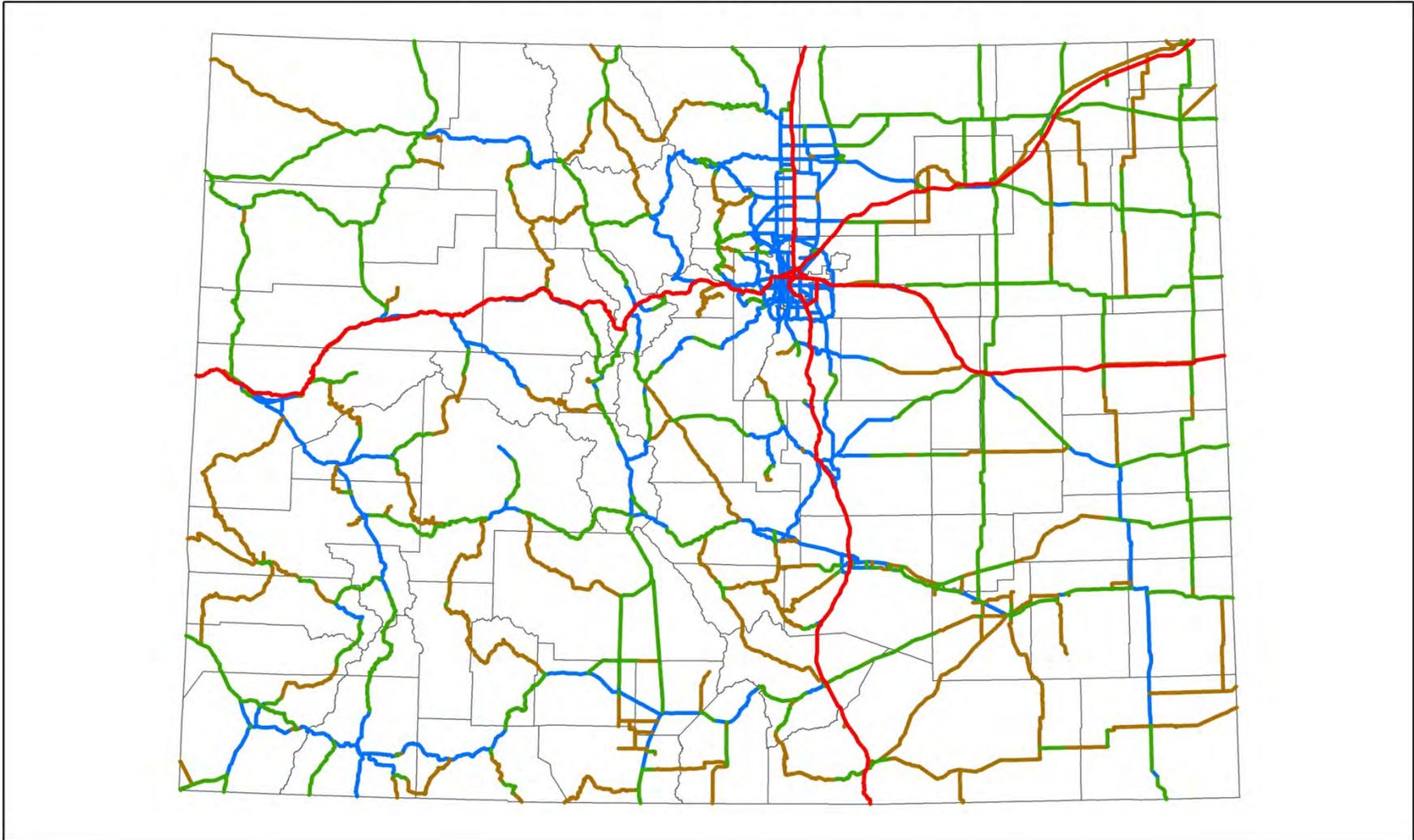
- This morning's workshop will respond to questions posed by Commissioners:
  - What have we been spending on roads by Tier?
  - What are the results of those expenditures?
  - What does staff recommend?
- A second workshop will follow with a focus on the current Pavement Management system and an alternative Pavement Management approach.



## POTENTIAL TIERS

- Tier 1 – Interstates
  - 4,114 lane miles (100% of lane miles on NHS)
- Tier 2 - AADT > 4000 or trucks > 1000
  - 7,270 lane miles (68% of lane miles on NHS)
- Tier 3 - 2000 -4000 AADT or trucks 100 – 1000
  - 6,197 lane miles (32% of lane miles on NHS)
- Tier 4 - AADT < 2000 and trucks < 100
  - 5,383 lane miles (0% of lane miles on NHS)

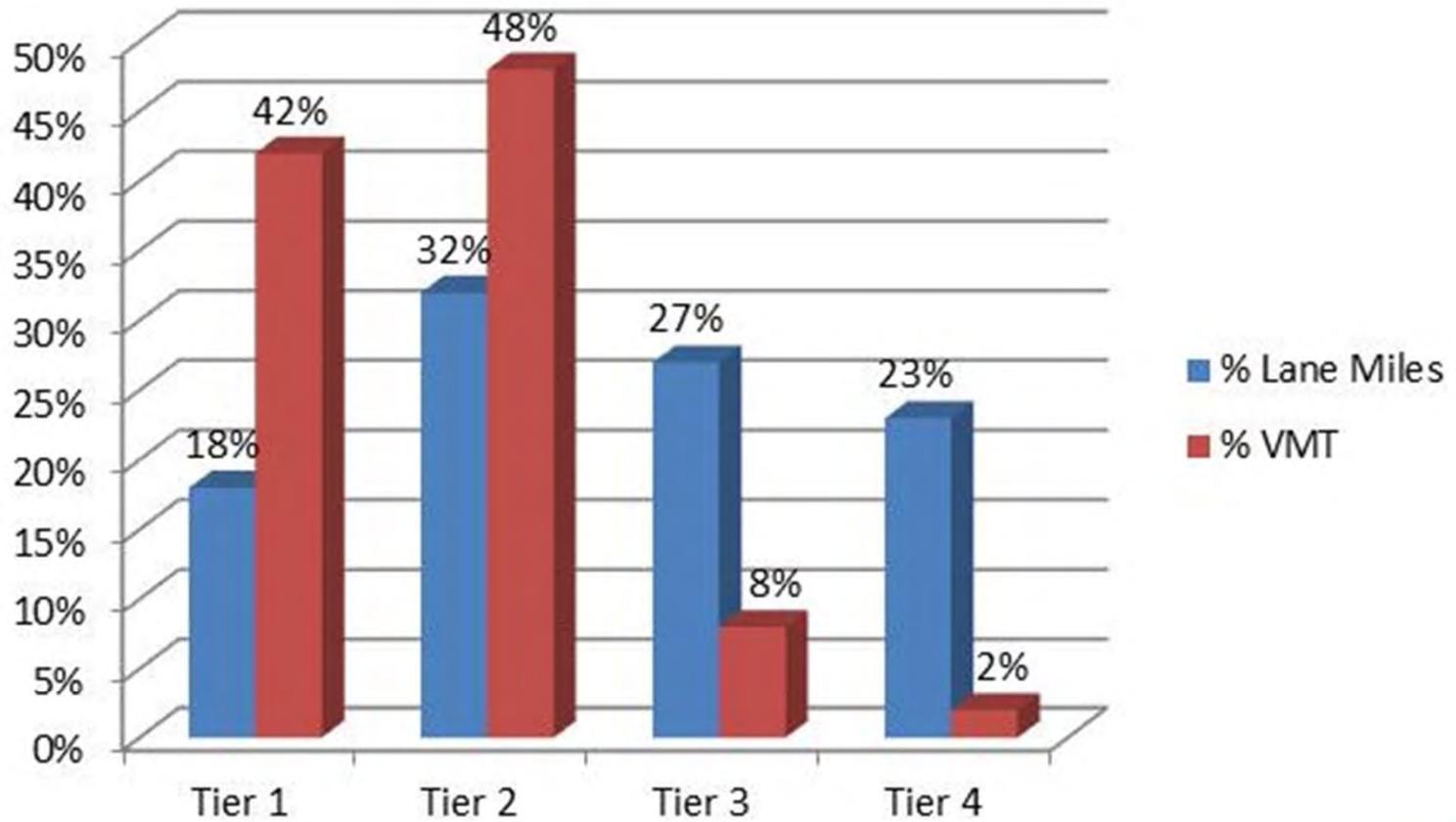
# Potential Tiers

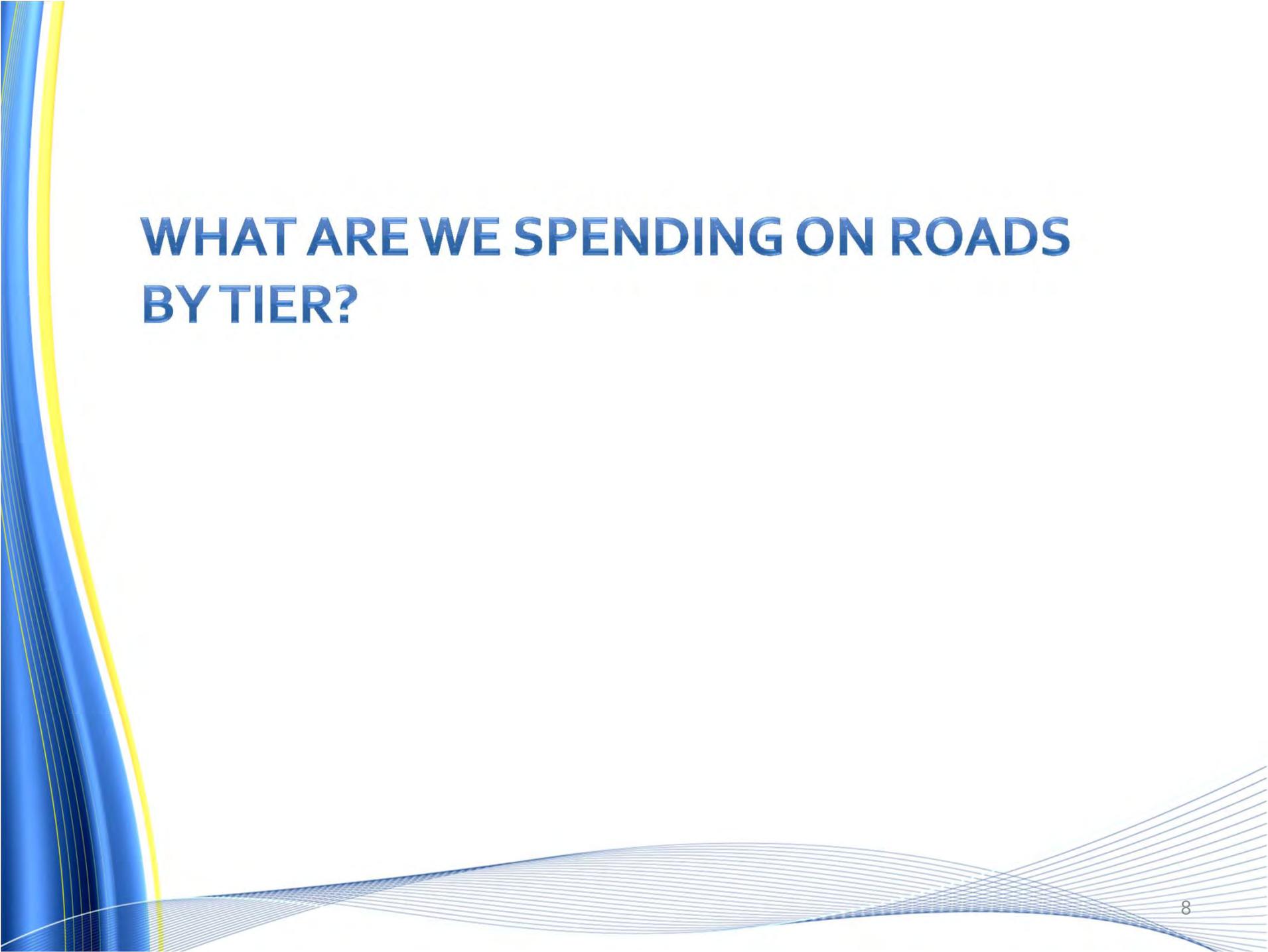


Tier	Linetype	Description	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	%VMT	VMT
1		Interstate	950	10.45%	4,115	17.92%	41.71%	31,883,175
2		AADT >4000 or Trucks >1000	2,449	26.94%	7,270	31.66%	48.21%	36,849,958
3		2000- 4000 AADT or Truck is 100-1000	3,002	33.02%	6,197	26.98%	7.66%	5,855,288
4		AADT less than 2000 and Truck less than 100	2,690	29.59%	5,383	23.44%	2.41%	1,843,678
		Total	9,091	100.00%	22,964	100.00%	100.00%	76,432,101



# POTENTIAL TIERS





# WHAT ARE WE SPENDING ON ROADS BY TIER?

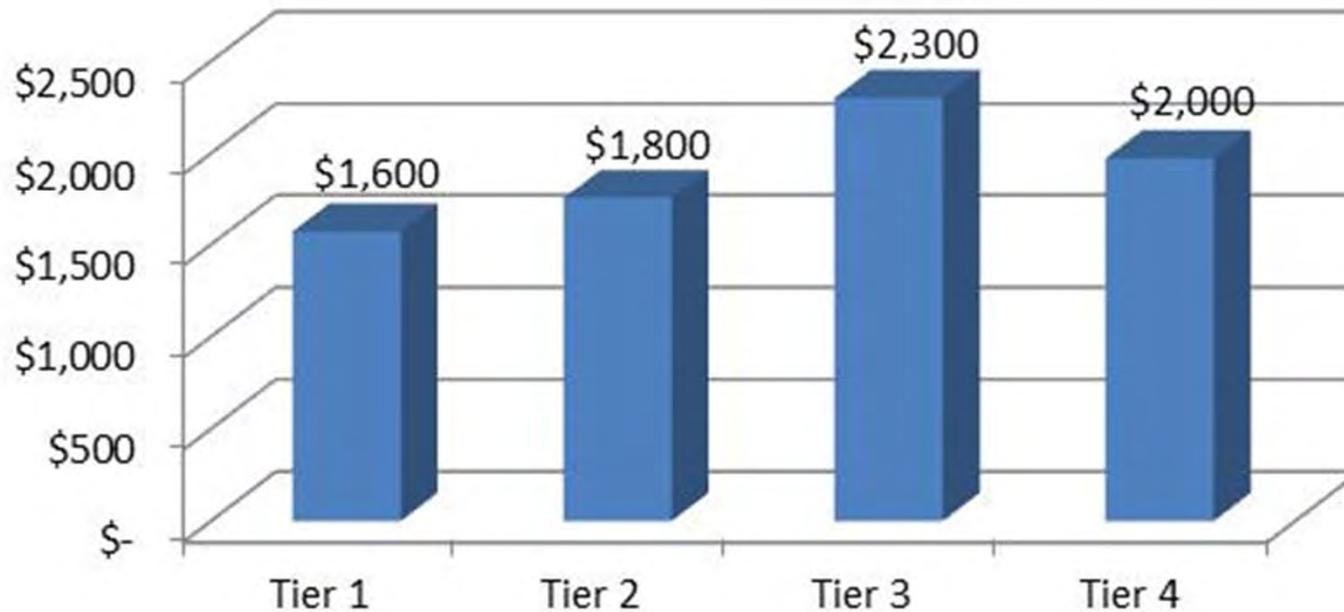
# CONSTRUCTION DOLLARS

## Average Annual Per Lane Mile Construction Awards 2007-2011



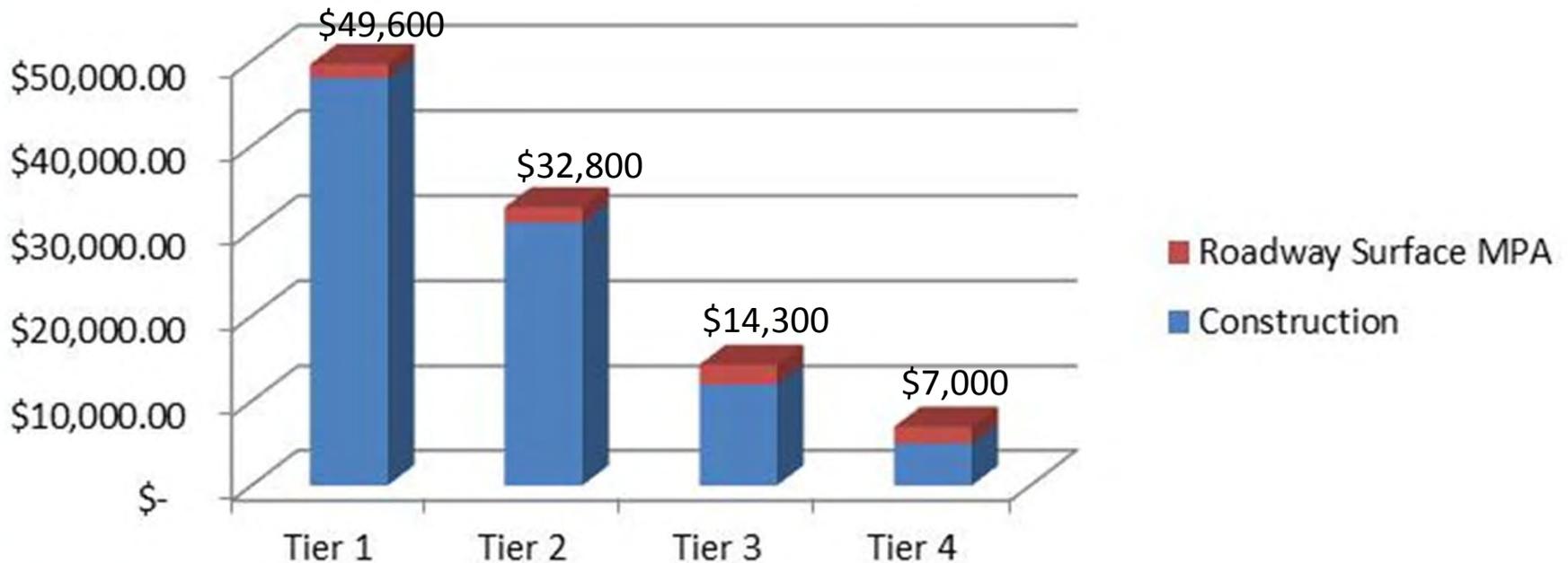
# MAINTENANCE DOLLARS

## Roadway Surface MPA Per Lane Mile Expenditures 2011



# CONSTRUCTION & MAINTENANCE DOLLARS

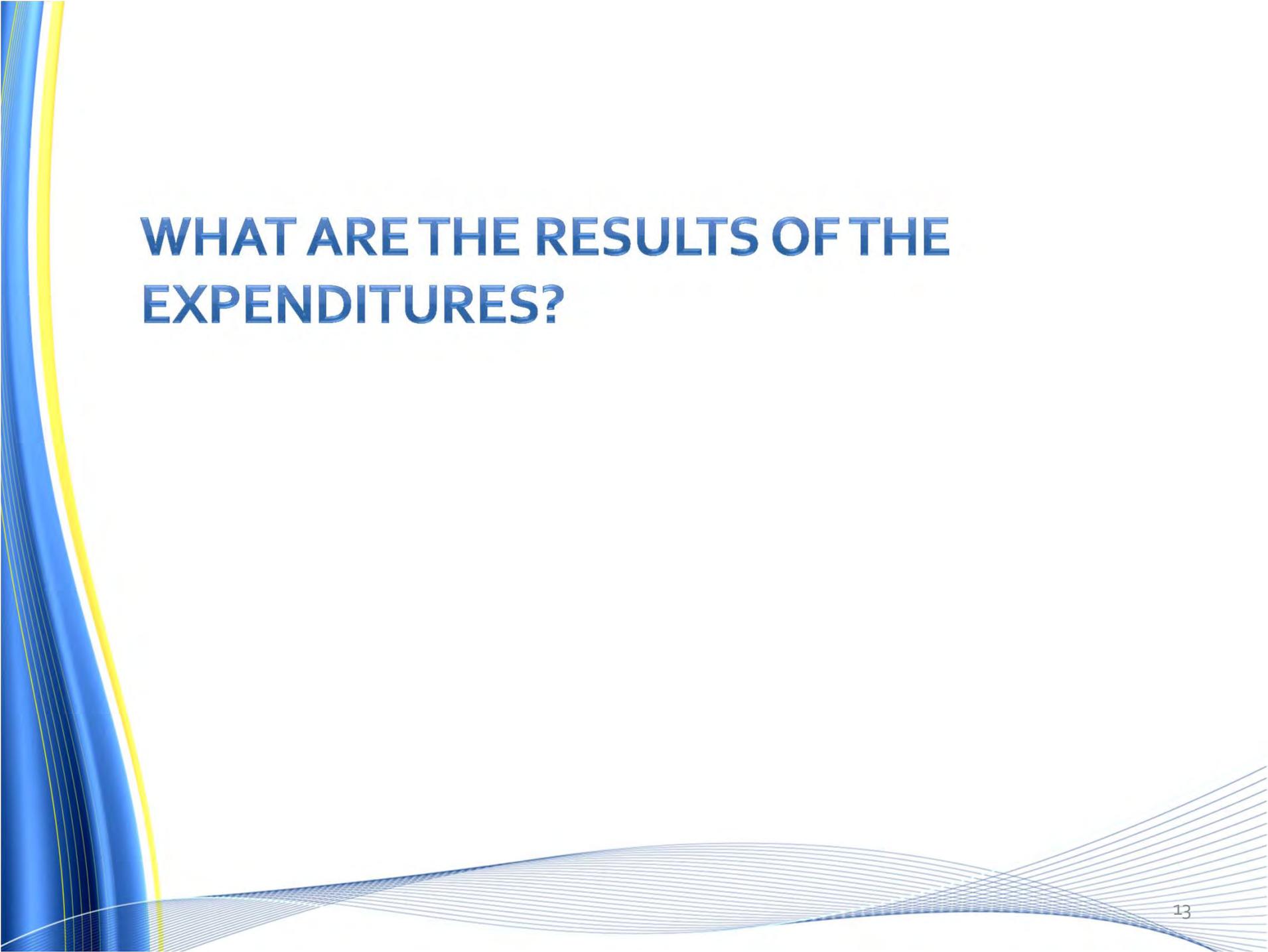
## Average Annual Per Lane Mile Construction & Roadway Surface MPA Dollars



# CONSTRUCTION & MAINTENANCE DOLLARS: CONCLUSIONS

- Current practices result in a level of tiering
  - Tiers 1 and 2 account for half the lane miles, 90% of the VMT and 80% of construction dollars.
  - Tiers 3 and 4 account for half the lane miles, 10% of the VMT and 20% of construction dollars.

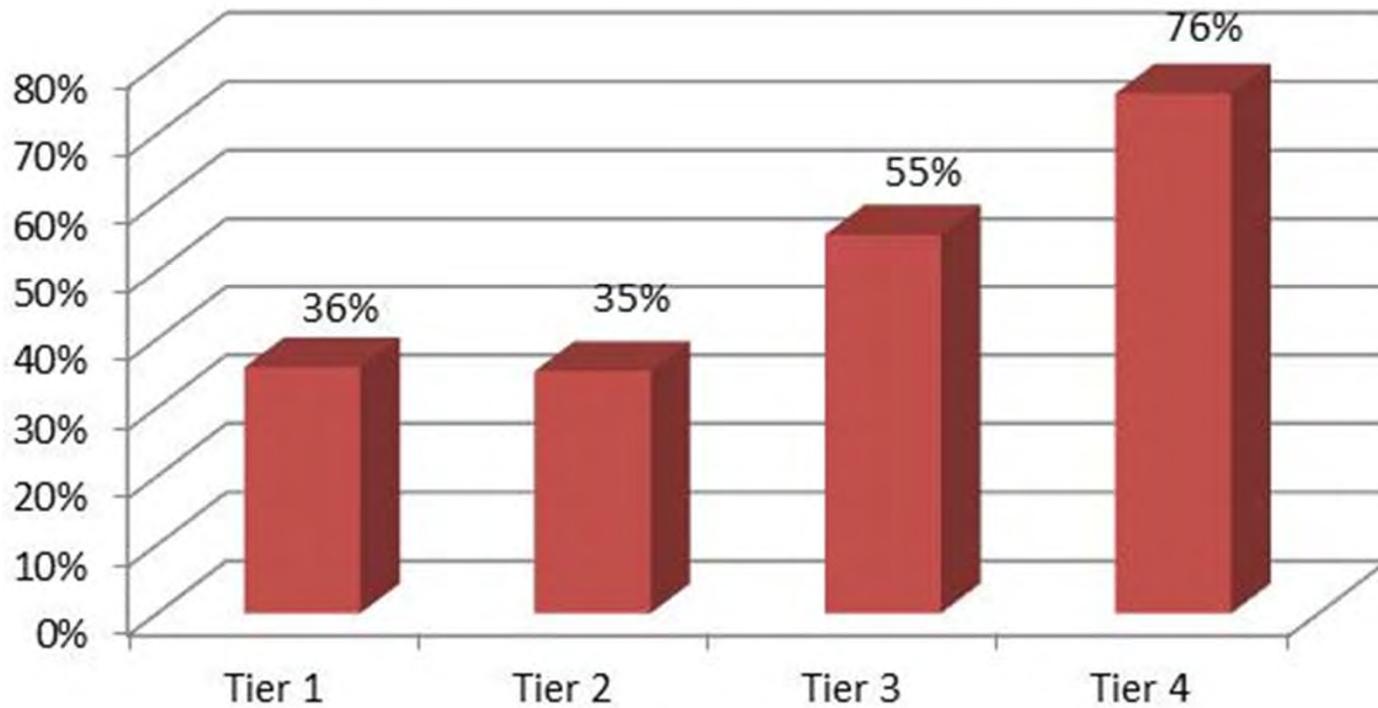
Tier	% Lane Miles	% VMT	% Construction Dollars
1	18%	42%	37%
2	32%	48%	43%
3	27%	8%	15%
4	23%	2%	5%



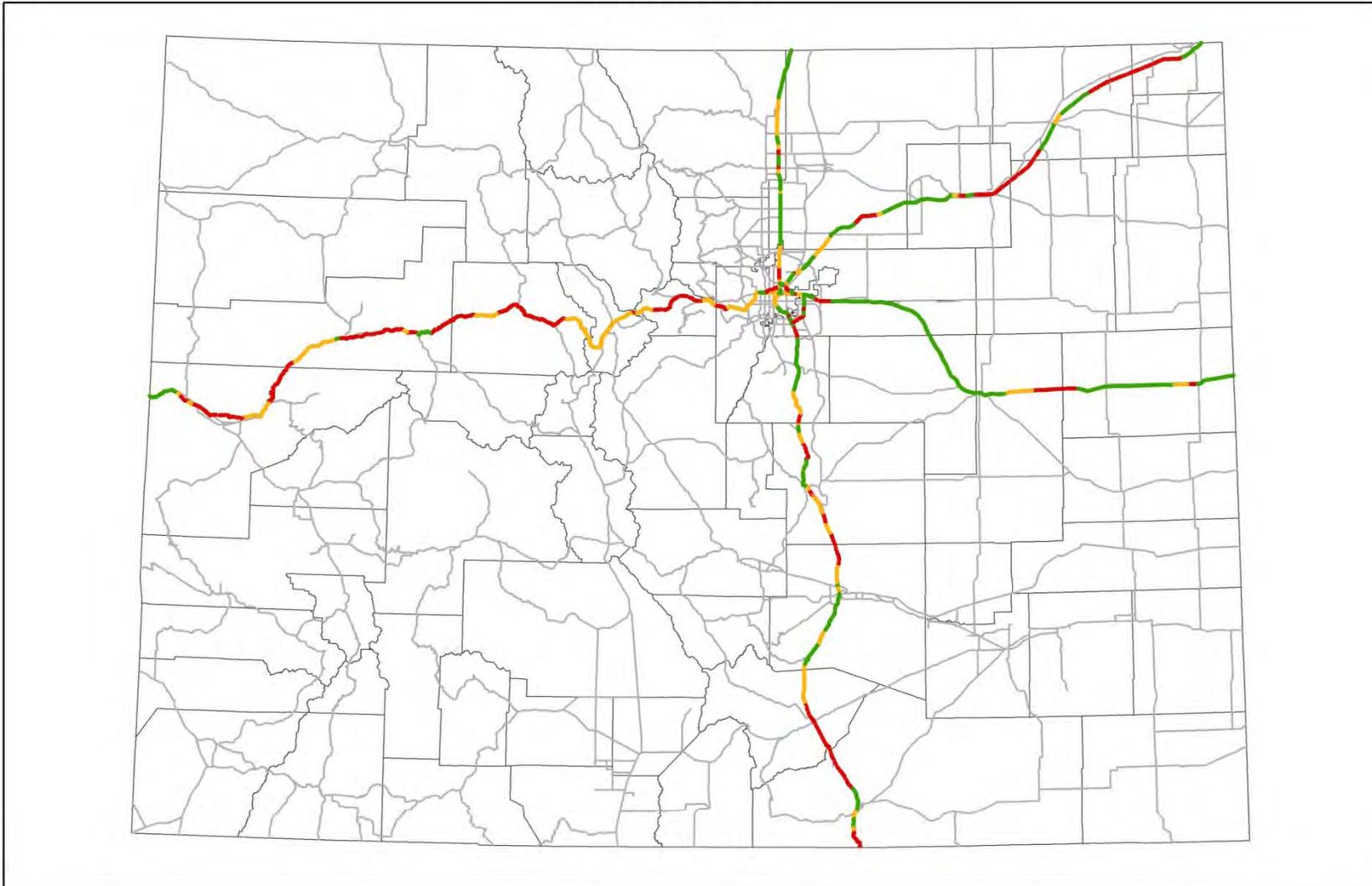
# WHAT ARE THE RESULTS OF THE EXPENDITURES?

# ROADWAY CONDITION

## % of Lane Miles in Poor Condition

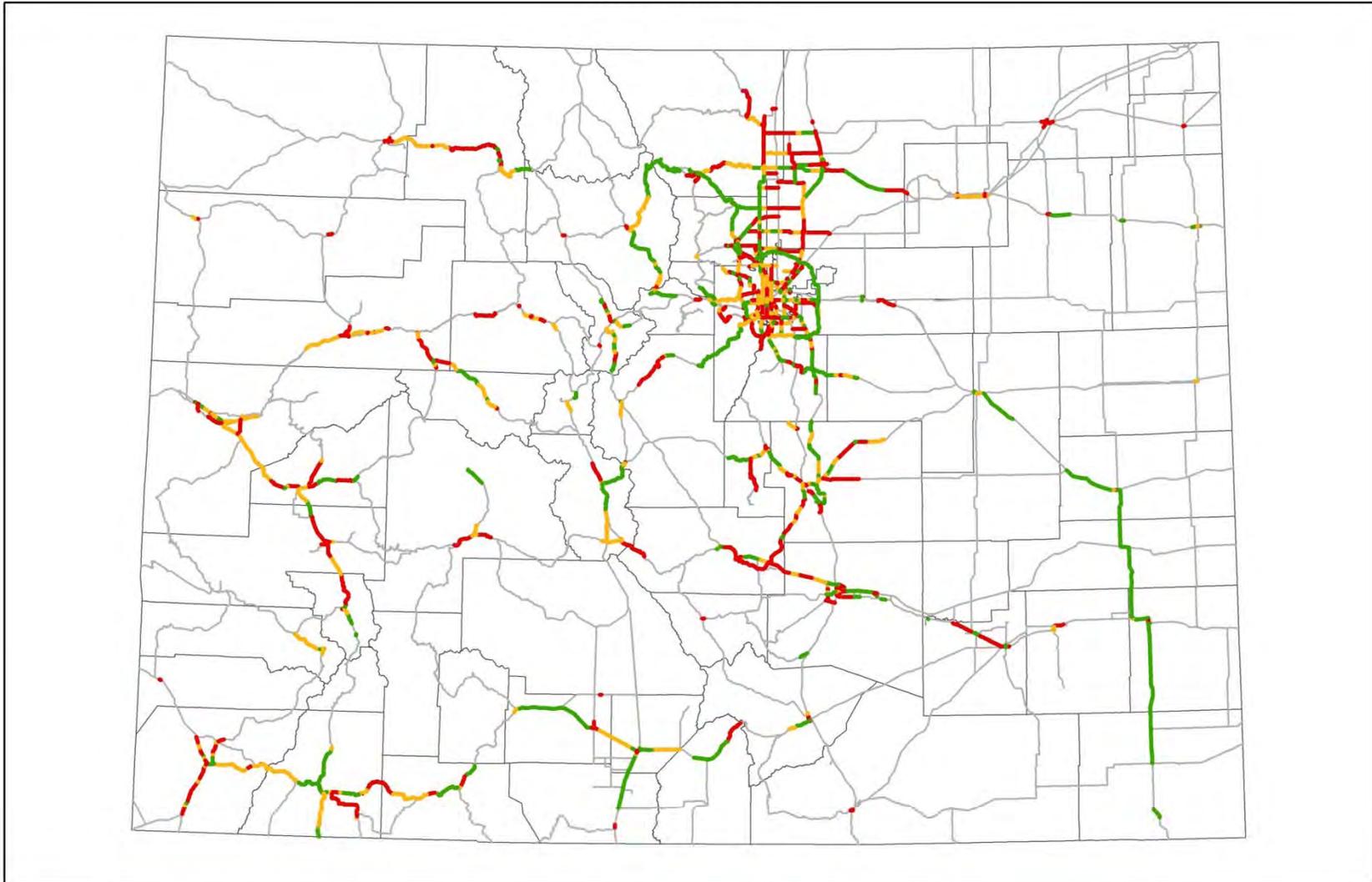


## Good/Fair/Poor – Interstate (Tier 1) Roads



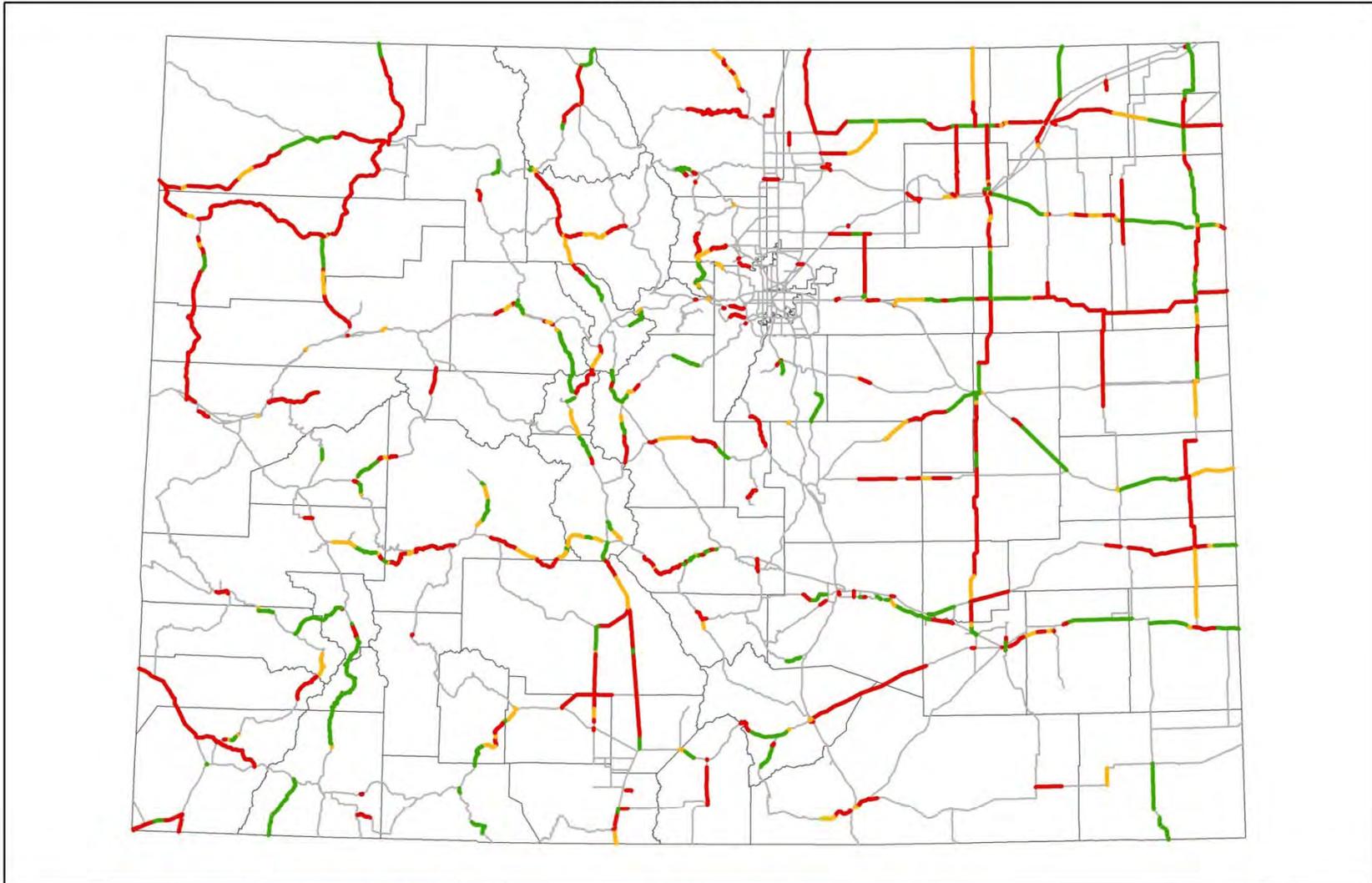
Linetype	Intestates (Tier 1)	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	AADT	% AADT	%VMT
<span style="color: green;">—</span>	Good	367	38.63%	1,597	38.82%	114,212,700	41.16%	39.49%
<span style="color: orange;">—</span>	Fair	233	24.47%	1,041	25.30%	88,881,100	32.03%	29.14%
<span style="color: red;">—</span>	Poor	351	36.91%	1,476	35.88%	74,364,200	26.80%	31.37%
	Total	950	100.00%	4,115	100.00%	277,458,000	100.00%	100.00%

## Good/Fair/Poor – High Volume (Tier 2) Roads



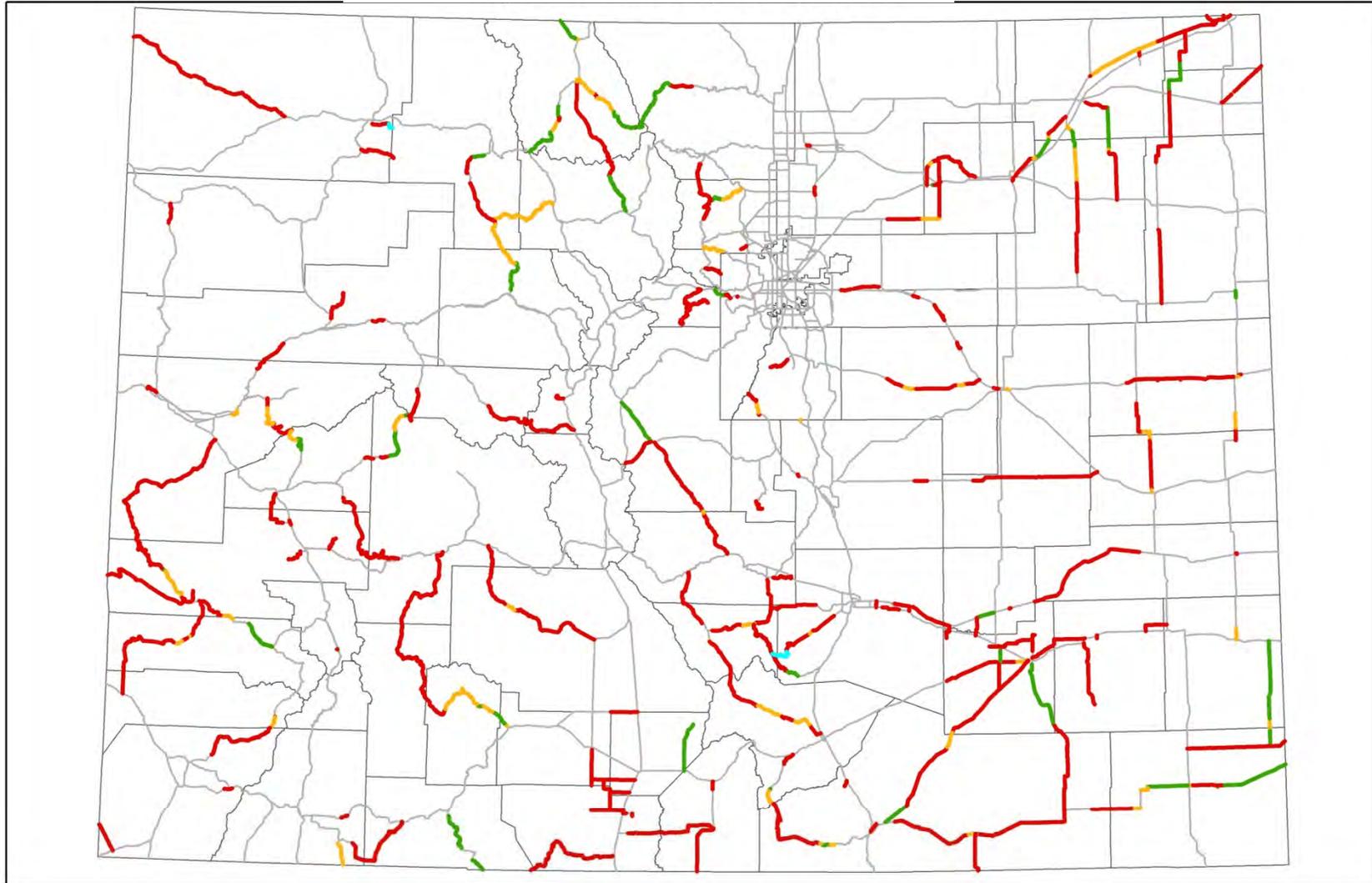
Linetype	Good, Fair and Poor for AADT >4000 or Trucks >1000 (Tier 2)	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	AADT	% AADT	%VMT
<span style="color: green;">—</span>	Good	885	36.12%	2,585	35.56%	82,114,700	28.58%	32.21%
<span style="color: yellow;">—</span>	Fair	693	28.30%	2,117	29.13%	93,686,100	32.60%	30.88%
<span style="color: red;">—</span>	Poor	871	35.58%	2,567	35.32%	111,540,300	38.82%	36.90%
	Total	2,449	100.00%	7,270	100.00%	287,341,100	100.00%	100.00%

## Good/Fair/Poor –Low Volume (Tier 3) Roads



Linetype	Good, Fair and Poor for 2000- 4000 AADT or Truck is 100-1000 (Tier 3)	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	AADT	% AADT	%VMT
—	Good	886	29.52%	1,838	29.67%	6,049,440	31.13%	33.16%
—	Fair	440	14.66%	928	14.98%	3,287,700	16.92%	15.83%
—	Poor	1,676	55.82%	3,430	55.36%	10,098,370	51.96%	51.01%
	Total	3,002	100.00%	6,197	100.00%	19,435,510	100.00%	100.00%

## Good/Fair/Poor – Very Low Volume (Tier 4) Roads



Linetype	Good, Fair and Poor for AADT less than 2000 and Truck less than 100	Centerline Miles	% Centerline miles	Lane Miles	% Lane Miles	AADT	% AADT	%VMT
<span style="color: green;">—</span>	Good	338	12.61%	676	12.61%	717,830	13.50%	14.74%
<span style="color: yellow;">—</span>	Fair	307	11.45%	615	11.47%	749,880	14.10%	13.33%
<span style="color: red;">—</span>	Poor	2,034	75.94%	4,069	75.93%	3,849,320	72.40%	71.93%
	Total *	2,678	100.00%	5,359	100.00%	5,317,030	100.00%	100.00%

\* 11 Center Line Miles & 23 Lane Miles with unknown condition

# ROADWAY CONDITION: CONCLUSIONS

- Higher tier roads are in better condition – Roughly 65% of lane miles are in good or fair condition on Tier 1 and 2 roads, compared to 45% on Tier 3 and 24% on Tier 4.
- System wide 48% of lane miles are in good or fair condition

Tier	% Good/Fair	% Poor
Tier 1	64%	36%
Tier 2	65%	35%
Tier 3	45%	55%
Tier 4	24%	76%
System	48%	52%

# ROADWAY CONDITION: CONCLUSIONS

## Policy Directive 14

- **Goal:** Achieve 60% good/fair pavement condition system wide.
- **Objective:** Maintain or improve the system-wide pavement condition forecast for 2016 of 40 percent good/fair condition

Tier	% Good/Fair	% Poor
Tier 1	64%	36%
Tier 2	65%	35%
Tier 3	45%	55%
Tier 4	24%	76%
System	48%	52%



## ROADWAY CONDITION: CONCLUSIONS

- Current allocation of construction and pavement management dollars has resulted in tiering the condition of the roadway system
  - Current condition of Tier 1 and 2 roads is 64% good/fair compared to 35% good/fair for Tiers 3 and 4, and 48% for the overall system.
  - PD 14 – System wide goal of 60% good/fair was not met, but objective of maintaining or improving forecast of 40% good/fair was met.



## OVERALL CONCLUSIONS

- Traffic volumes correspond closely with socio-economic factors and serve as a useful criteria in tiering.
- Current practices result in some level of tiering
  - Tiers 1 and 2 account for half the lane miles, 90% of the VMT, and 80% of construction and maintenance dollars.
  - Tiers 3 and 4 account for half the lane miles, 10% of the VMT, and 20% of construction and maintenance dollars.



## OVERALL CONCLUSIONS

- Models and decisions have resulted in allocation of resources to higher volume roads.
- By using AADT as a criteria the Pavement model has resulted in tiering that is reasonable.
- Tiering is not applicable for all programs.
- Tiering can be a useful concept in achieving desired outcomes or goals.
- The current pavement model criteria can be refined to reflect TC goals and performance measures.



## NEXT STEPS

- Develop framework principles for resource allocation (to be basis for Statewide Long-Range Plan).
- For each asset group develop performance goals to strengthen the relationship between performance and funding.
- Identify minimum thresholds for desired outcomes (to address the issue of limited resources)
- Refine criteria in models to reflect goals.