Michigan's Roads Crisis: Study Findings and Conclusions

For Senate Transportation Funding Task Force

Rick Olson, State Representative, 55th District
November 7, 2012

Overview of Presentation

- Focus on:
  "How Much Additional Money Do We Need to Maintain our Roads and Bridges?"
- Not:
  - How do we raise the money?
  - How do we distribute the money?
  - How we can get the greatest value for our money in road and bridge maintenance?
  - Are there benefits which exceed the costs?
  - How does Michigan rank in terms of cost and road quality compared with other states?

Transportation Funding Task Force

- Transportation Funding Task Force (TF2) created in response to Public Act 221 in Dec. 2007
- Issued final report to Legislature, Governor and State Transportation Commission on Nov. 10, 2008
- TF2: Double Investment - $3 Billion/Year Needed
- Report available online: www.michigan.gov/tf2

Transportation Funding Work Group

Reason: Skepticism about the TF2 recommendations.

Task: Review previous studies, consult with various stakeholders, and make recommendation for the future funding needs of transportation.

Objective: Recommend funding level needed to minimize the long term cost of maintaining our roads and bridges

Technical Analysis Team

- Gil Chesbro, MDOT Transportation Planning Specialist
- Jim Ashman, MDOT Transportation Planner
- Craig Newell, MDOT Manager, Statewide Systems Management Section
- Denise Jackson, MDOT Administrator, Statewide Transportation Planning Division
- Bill Tansil, MDOT Administrator, Asset Management Division
- Kelly Bartlett, MDOT Legislative Liaison
- Carmine Palombo, MI Asset Management Council
- Bob Morris, SEMCOG
- Steve Warren, MI Asset Management Council
- Frank Raha, Michigan Transportation Commission

How Much Money Do We Need?

Using models from:

- MDOT RQFS (Road Quality Forecasting System)
- Asset Management Council (PASER data) (50,000' level, not project specific like RoadSoft)
- MDOT Bridge Forecasting model

Database of the condition ratings of MI roads

- Federal Aid roads – 100%
- Non-federal Aid roads – 40% (assume representative of remaining 60%)

Models contains

- Deterioration rates of PASER condition
- Improvement in PASER road condition with selected "fix" from X to Y additional road life for each "fix"

How Much Money Do We Need?

The model does not provide for additional money for:

- Strategies to relieve congestion
- Mega-type reconstructions, like the I-75 and I-94 reconstructions whose costs are in the $1.7 M range.
- Reactions to address safety needs based on accident analysis
- Additions to paved roads or increased attention to gravel roads
- Local & State road agency equipment needs
- Transit: light rail, bus systems

Assumed current stream of money for these needs continues

2012 – 2016 MDOT Five-Year Transportation Plan

Category	Five-Year Total (millions)
Routine Maintenance	1,343
Repair & Rebuild Roads	2,151
Repair & Rebuild Bridges	962
Capacity Improvement & New Roads	385
Safety & System Operations	638
Other	520
	5,999

How Much Money Do We Need?

Goals: % Good or Fair:

- Freeway: 95%
- Remainder State Trunkline, Non-Freeway: 85%
- Federal Aid, Non- State Trunkline : 85%
- Non-federal Aid roads: 85%

Goal: Select the combination and timing of fixes from the "mix of fixes" that costs the least long-term to maintain our asset value of our highway system –
a business approach.

How Much Money Do We Need?

Assume Costs Per Lane Freeway Mile Through 2015 of:

- **Reconstruction - $1,456,000**
- **Rehabilitation - $643,000**
- **Capital Preventive Maintenance - $66,600**

Similar assumptions for

- **Non-freeway state trunkline highway**
- **Remainder of federal aid highways, non-state trunkline**
- **Remainder of paved roads in state**

Assumes 5% inflation after 2015

Assumed Existing Revenue

Continued stream:

- **Gas tax**
- **Diesel fuel tax**
- **Vehicle registration fees**
- **Federal gas tax allocations - steady**

How Much Money Do We Need?

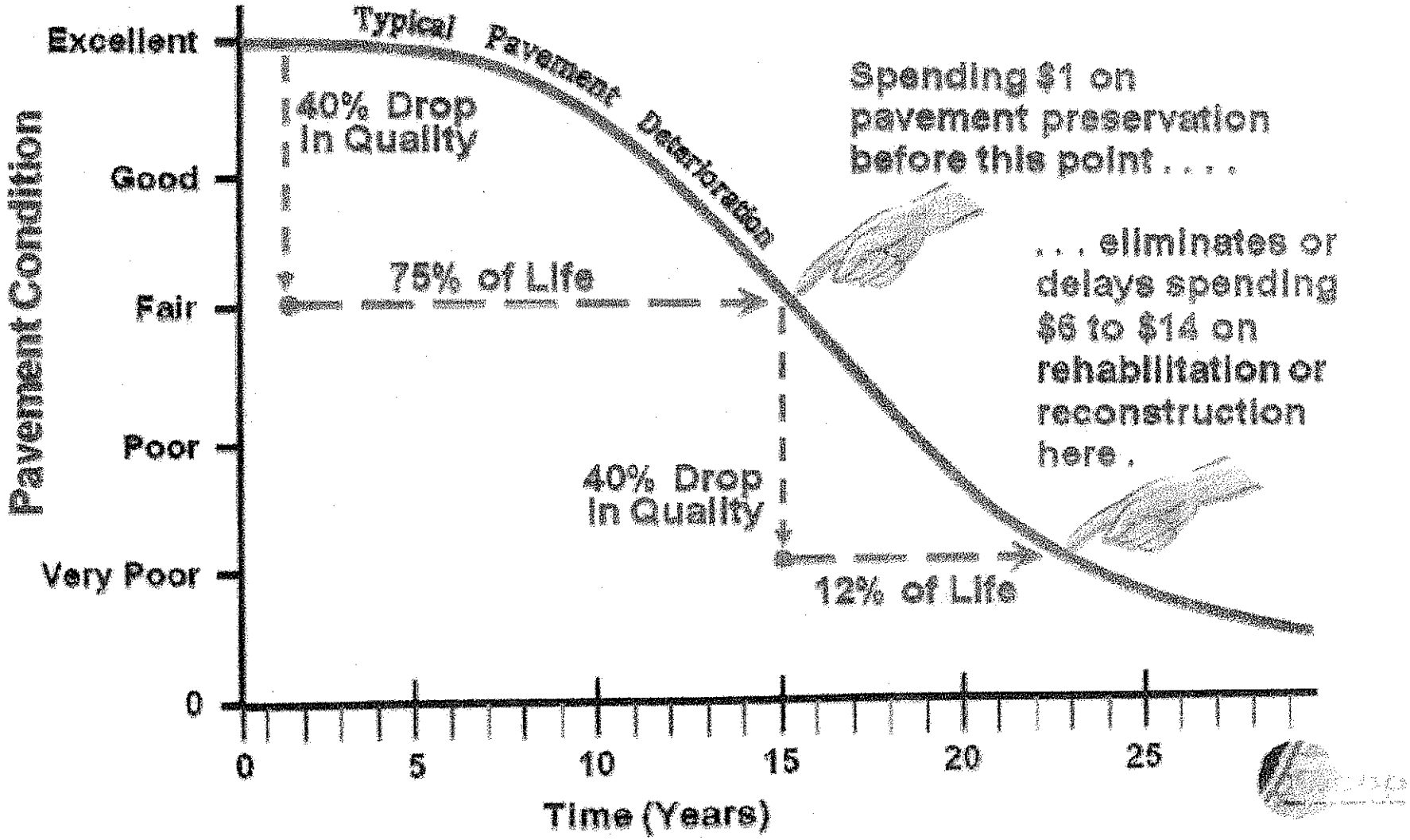
Assume <u>when</u> you use each "Fix", e.g., State Trunkline highways:

	Freeway		Non-Freeway
2012-2016			
Reconstruction	1.13%		0.98%
Rehabilitation	4.34%		3.09%
Preventive Maintenance	5.50%		7.89%
2017-2023			
Reconstruction	1.13%		0.96%
Rehabilitation	4.51%		3.09%
Preventive Maintenance	4.91%		7.03%
		2024	
Reconstruction			0.99%
Rehabilitation			3.10%
Preventive Maintenance			6.14%
2024-2028		**2025-2028**	
Reconstruction	1.51%		0.99%
Rehabilitation	4.06%		2.91%
Preventive Maintenance	5.27%		6.14%

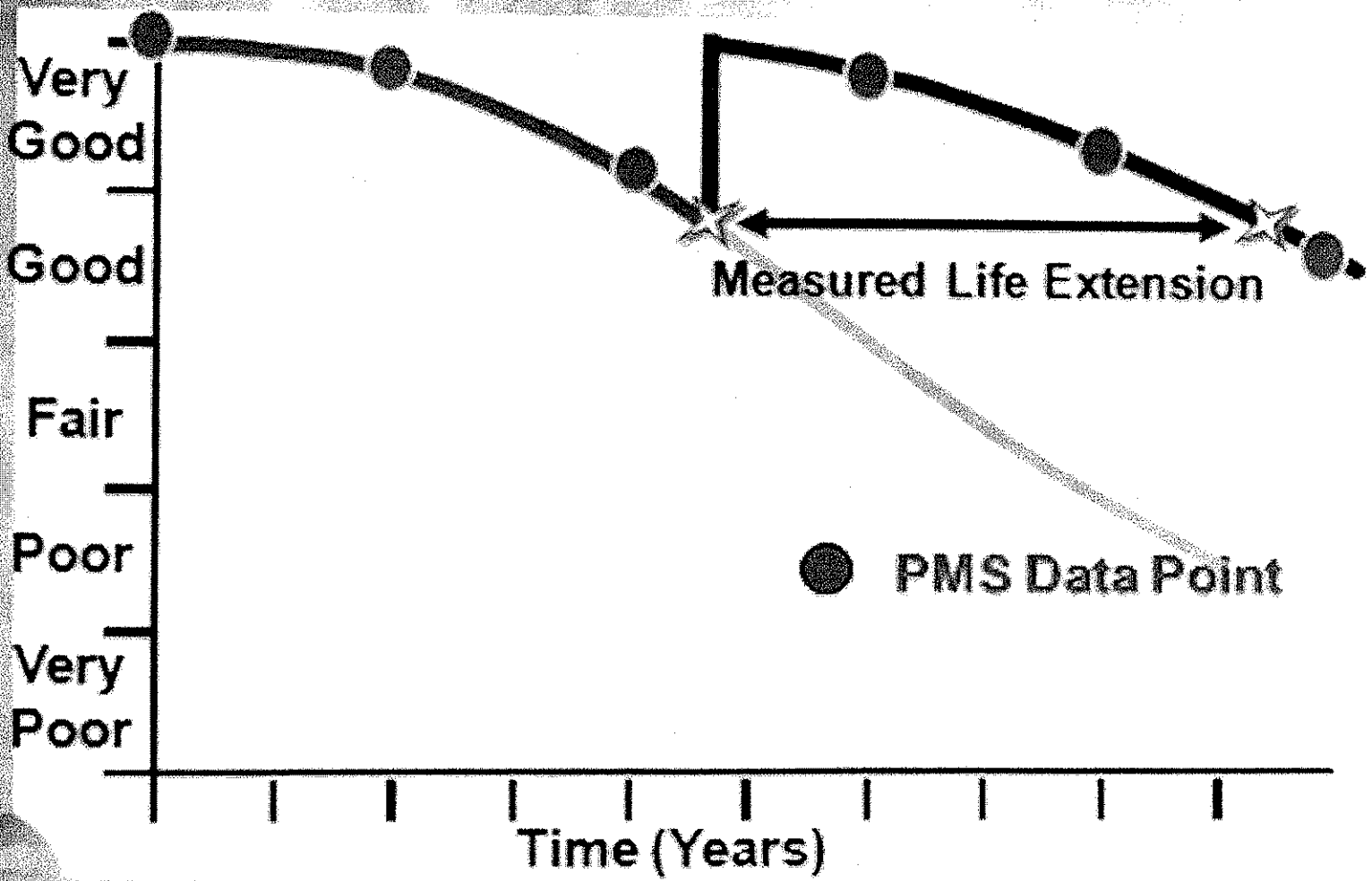
Strategy in Selecting Projects

- Not enough funds to do all that needs doing
- Seek to minimize long term cost of maintaining the roads via an "asset management" strategy
- Prevent roads in "fair" condition from falling into "poor" category

Pavement Preservation is Cost Effective



Life Extension



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Typical Life Extensions
(Years)

Treatment	Good Condition (PCI=80)	Fair Condition (PCI=60)	Poor Condition (PCI=40)
Crack Fill	1 - 3	0 - 2	0
Crack Seal	1 - 5	0 - 3	0
Fog Seal	1 - 3	0 - 1	0
Chip Seal	4 - 10	3 - 5	0 - 3
Micro-Surfacing	4 – 8	3 - 5	1 - 4
Thin HMA	4 - 10	3 - 7	2 - 4

National Center for Pavement Preservation

Strategy in Selecting Projects

- Result when there are insufficient funds: roads in "poor" condition get in even worse shape
- Reality: Pressures from people are responded to – "worst first" vs. "asset management"
- Therefore, this model is optimistic, with the conclusion that we will need <u>at least</u> the amount forecast

Funds Needed to Achieve Condition Goal for 2012-2023

	Paved Lane Miles	Goal (Percentage in Good/Fair Condition)	Funds Needed	Current Budget	Shortfall	Average Annual Lane Miles Improved
			. . . . Annual Average in Millions			
Freeway	10,024	95%	$614	$148	$466	10.7%
Federal Aid, Trunkline	19,432	85%	$696	$317	$379	11.4%
Federal Aid, Non-Trunkline	54,396	85%	$958	$378	$580	19.1%
Non-Federal Aid	79,482	85%	$561	$254	$307	16.9%
Road Subtotal	**163,334**	**86%**	**$2,829**	**$1,097**	**$1,732**	**16.6%**
	Bridges					
Freeway	3,260	95%	$208	$148	$60	
Non-Freeway Trunkline	1,209	85%	$43	$37	$6	
Non-Trunkline Bridges	6,446	84%	$75	$44	$31	
Bridge Subtotal	**10,915**	87%	**$326**	**$229**	**$97**	
		Grand Total	**$3,155**	**$1,326**	**$1,829**	

This shows the 12 year averages.

Percentages To Lane Miles

Example: 2012

Non-Trunkline Federal Aid Roads:	
Reconstruct	511
Rehabilitation	1,988
Capital Preventive Maintenance	7,885
Non-Federal-Aid Roads	
Reconstruct	276
Rehabilitation	1,371
Capital Preventive Maintenance	11,760

Insight: Although I say we need at least $X billion, we are constrained from spending more on roads and bridges due to congestion considerations.

Additional Investment Needed Year by Year (in millions)

Year	Total Funds Needed to meet Goals	Total Additional Funding Above Current Investment Needed to Meet and Sustain Goals
2012	$2,703.13	$1,377.13
2013	$2,687.68	$1,361.68
2014	$2,691.92	$1,365.92
2015	$2,688.46	$1,362.46
2016	$2,834.30	$1,508.25
2017	$3,059.50	$1,733.10
2018	$3,202.86	$1,876.84
2019	$3,344.49	$2,018.61
2020	$3,503.72	$2,177.80
2021	$3,558.88	$2,231.77
2022	$3,707.19	$2,381.76
2023	$3,896.18	$2,569.40
Total	$37,878.31	$21,964.72

Study Results Compared with TF2

Additional Funding Suggested by TF2 at the "Good" Level

(in millions of dollars per year)

	MDOT	Locals	Total
Capacity Improvements and Border Crossings	675	233	908
Safety and ITS	35	118	153
Other Highway Facilities	10	9	19
Highway Maintenance	54	474	528
	774	**834**	**1,608**
Road and Bridge Preservation - 2011 Study			**1,377**
Total			**2,985**

Conclusion: By the time you add all of the other "needs" considered in the TF2 report, the results are comparable.

Summary of Findings of Studies

1. 2008 - TF2 Report - $3 billion

2. September, 2011 – House Transportation Committee Transportation Funding Work Group (Schmidt & Olson) - $1.4 billion

3. October, 2011 - Gov. Snyder's Work Group on Infrastructure - $1.4 billion

2012 Update

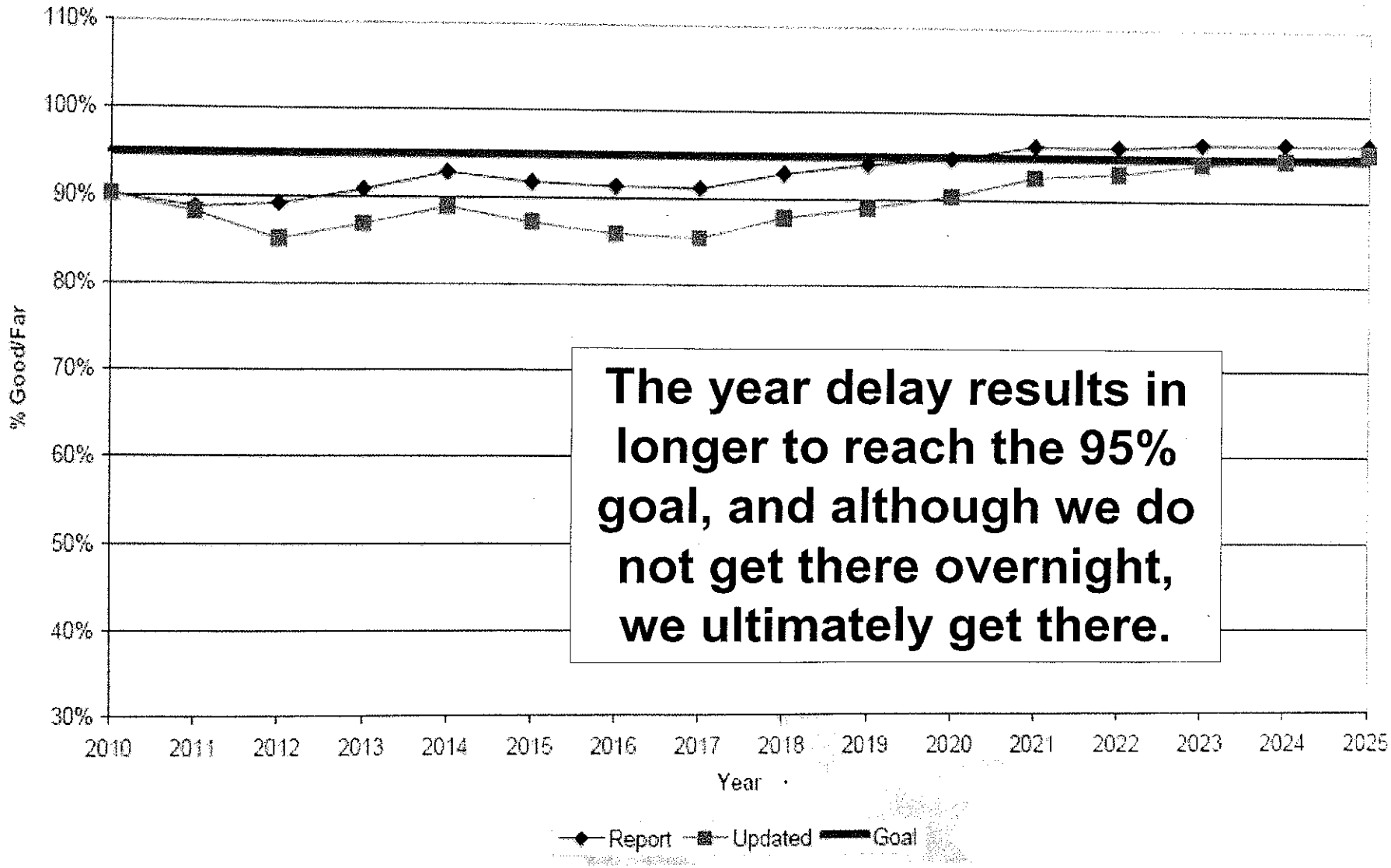
March, 2012– House Transportation Committee Transportation Funding Work Group (Schmidt & Olson) – 2012 Update

- **No legislative action in 2011**
- **Road rating data available on more roads**

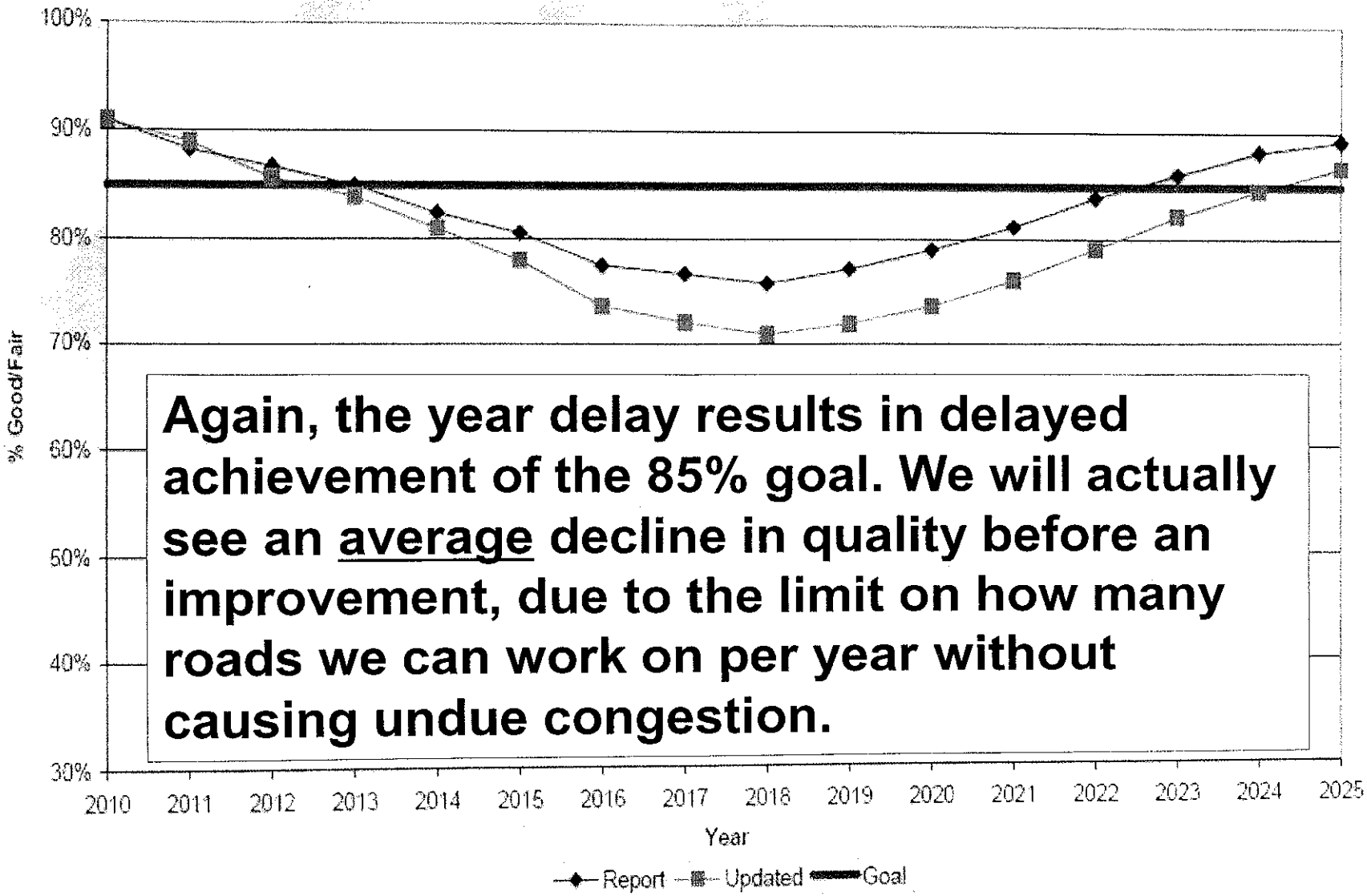
All Roads & Bridges ($ in millions)

Year	Year	Total Funds Needed to Meet Goals	Total Additional Funding Above Current Investment Needed to Meet and Sustain Goals	Year	Total Funds Needed to Meet Goals	Total Additional Funding Above Current Investment Needed to Meet and Sustain Goals	Increase in Shortfall
	2011 Study Results			2012 Study Results			
1	2012	$2,703.13	$1,377.13	2013	$2,868	**$1,542**	$164.87
2	2013	$2,687.68	$1,361.68	2014	$2,872	**$1,546**	$184.32
3	2014	$2,691.92	$1,365.92	2015	$2,868	**$1,542**	$176.08
4	2015	$2,688.46	$1,362.46	2016	$2,949	**$1,623**	$260.54
5	2016	$2,834.30	$1,508.25	2017	$3,180	**$1,854**	$345.75
6	2017	$3,059.50	$1,733.10	2018	$3,330	**$2,004**	$270.90
7	2018	$3,202.86	$1,876.84	2019	$3,478	**$2,152**	$275.16
8	2019	$3,344.49	$2,018.61	2020	$3,643	**$2,318**	$299.39
9	2020	$3,503.72	$2,177.80	2021	$3,706	**$2,379**	$201.20
10	2021	$3,558.88	$2,231.77	2022	$3,861	**$2,536**	$304.23
11	2022	$3,707.19	$2,381.76	2023	$4,058	**$2,731**	$349.24
12	2023	$3,896.18	$2,569.40	2024	$4,250	**$2,924**	$354.60
				2025	$4,460	$3,134	
12 Year Total		**$37,878.31**	**$21,964.72**	**Total**	**$41,063**	**$25,151**	$3,186.28
				Less 2012 Increased Construction Spending Avoided by Delay			$1,377.13
				12 Year Increase in Cost Due to Delay in Legislative Action			**$1,809.15**

Freeway Pavement Condition Forecast
Original Report vs Updated Cost and Pavement Condition Data



Non-Freeway Trunkline Pavement Condition Forecast
Original Report vs Updated Cost and Pavement Condition Data

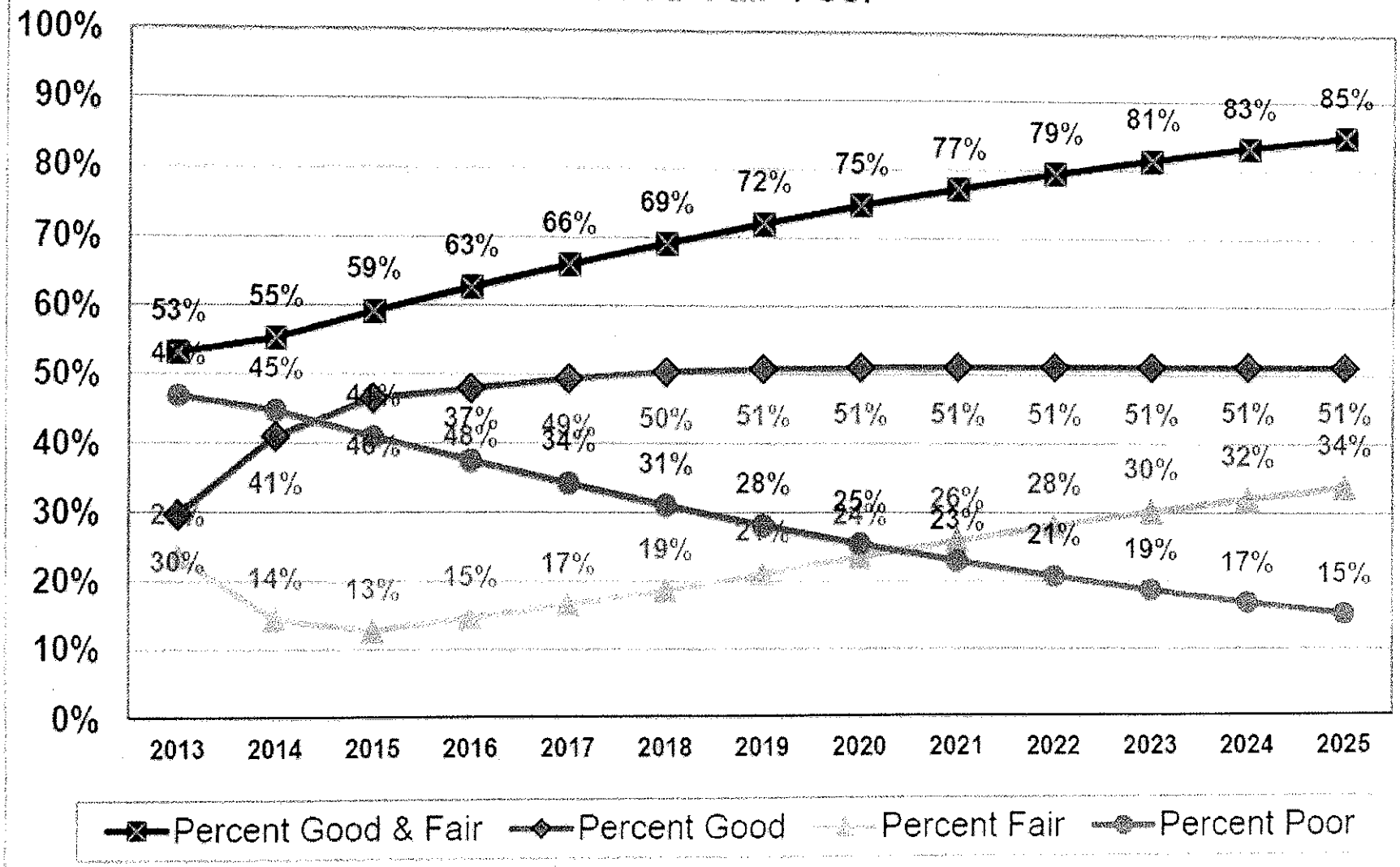


Again, the year delay results in delayed achievement of the 85% goal. We will actually see an <u>average</u> decline in quality before an improvement, due to the limit on how many roads we can work on per year without causing undue congestion.

Forecast of Pavement Condition

Non-Trunkline Paved Federal Aid

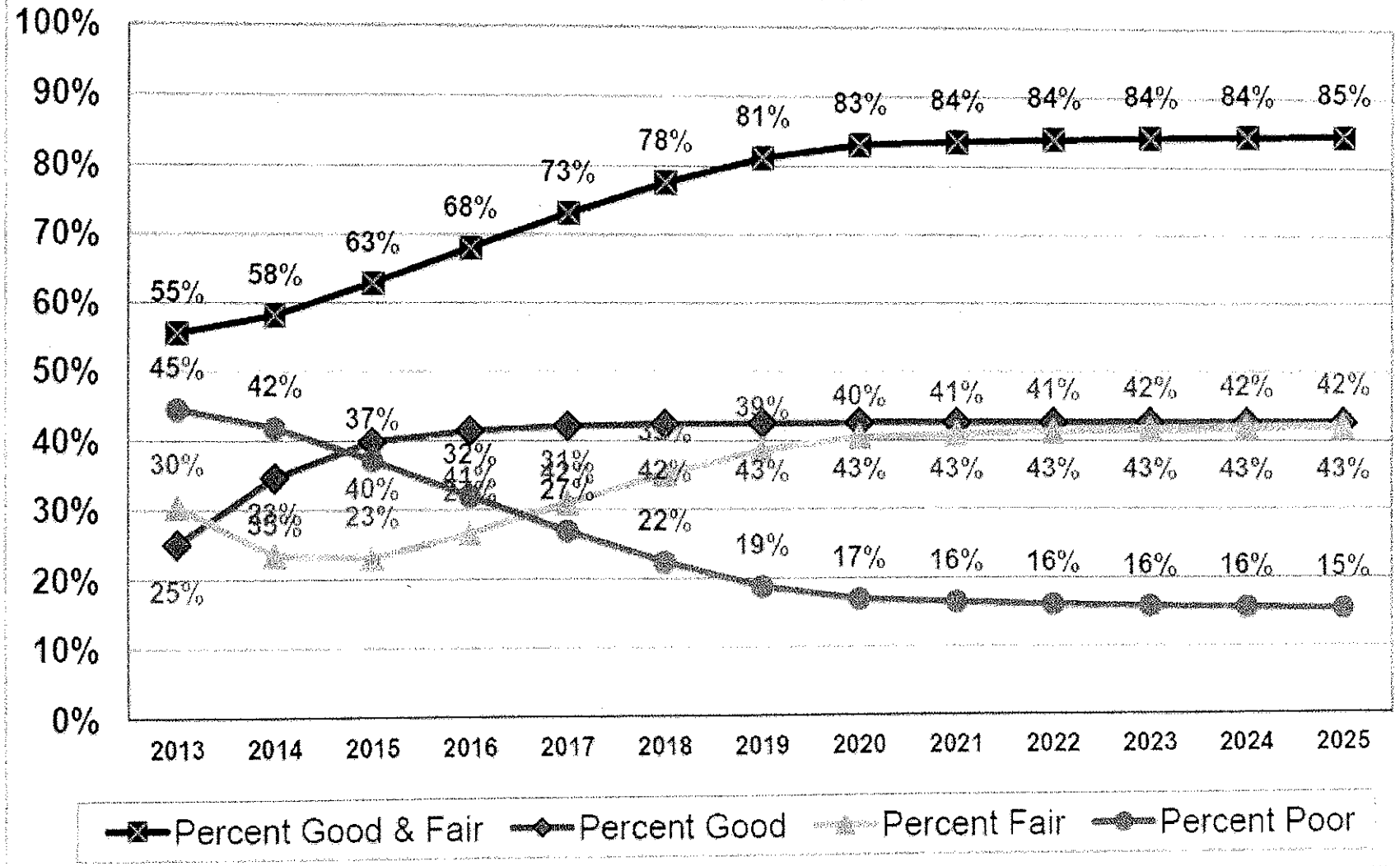
Good Fair Poor



Forecast of Pavement Condition

Paved NonFederal Aid

Good Fair Poor



Conclusion Reached

1. **We need at least $1.542 additional funding or savings to maintain our roads and bridges and achieve the 95%/85% "good or fair condition" in the next 12 years.**

Conclusion Reached

2. **To avoid another $1.8 billion cost to the taxpayers caused by delay, action needs to be taken timely in 2012 to avoid missing the 2013 construction year as well.**

   Time is not on our side.

All Roads & Bridges ($ in millions)

Note: A stream of additional revenue needed

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						Less 2012 Increased Construction Spending Avoided by Delay	**$1,377.13**
						12 Year Increase in Cost Due to Delay in Legislative Action	**$1,809.15**

How Much Less Additional Revenue Needed if Lower Goals Set?

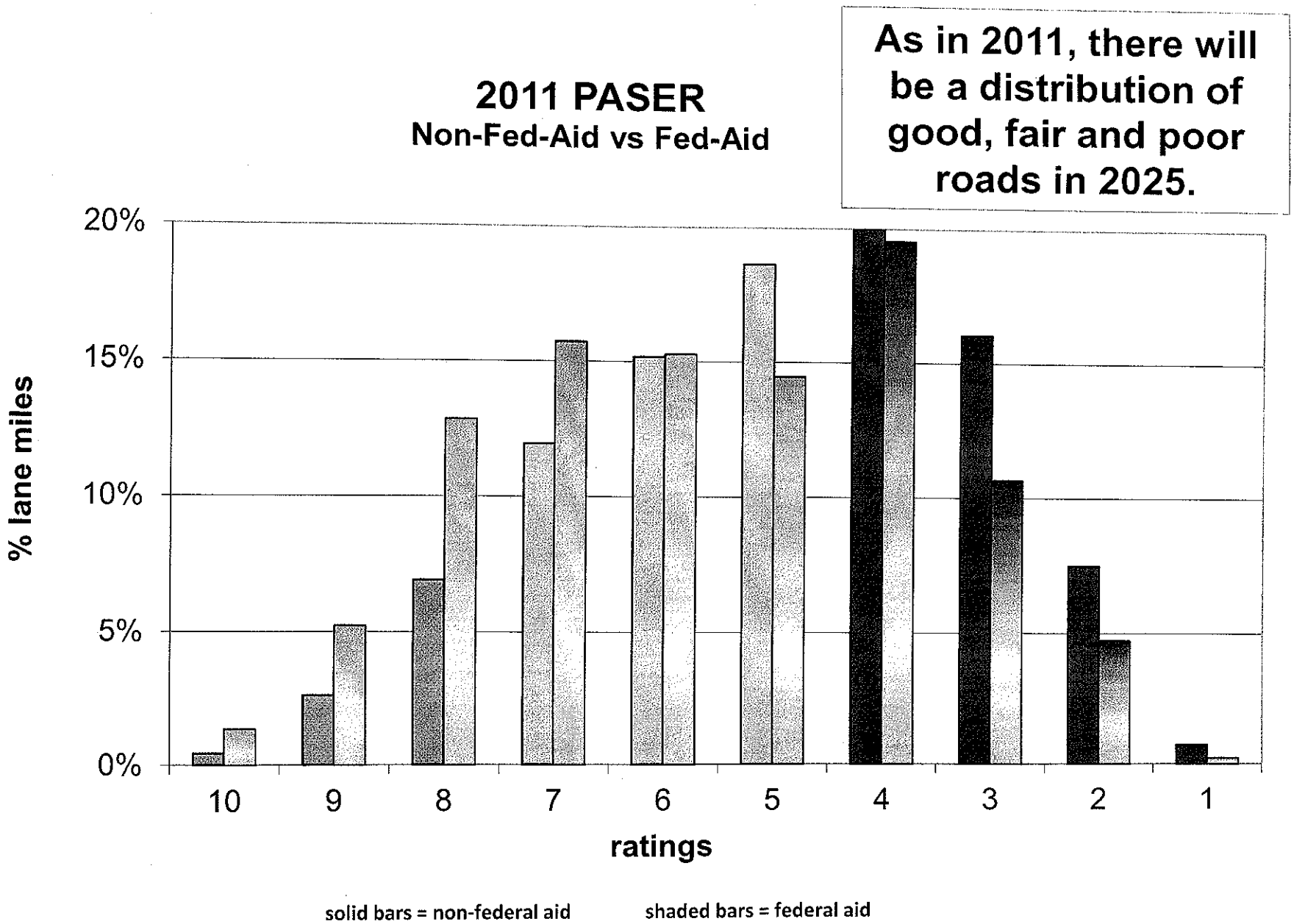
- $105 million if set target percentage of freeways that are rated "good" or "fair at 90%, instead of 95%.

- $146 million if set target percentage of non-freeways state trunkline highways that are rated "good" or "fair at 80%, instead of 85%.

- $70 million if set target percentage of federal aid, non-trunkline highways that are rated "good" or "fair at 80%, instead of 85%.

- $58 million if set target percentage of non-federal aid roads that are rated "good" or "fair at 80%, instead of 85%.

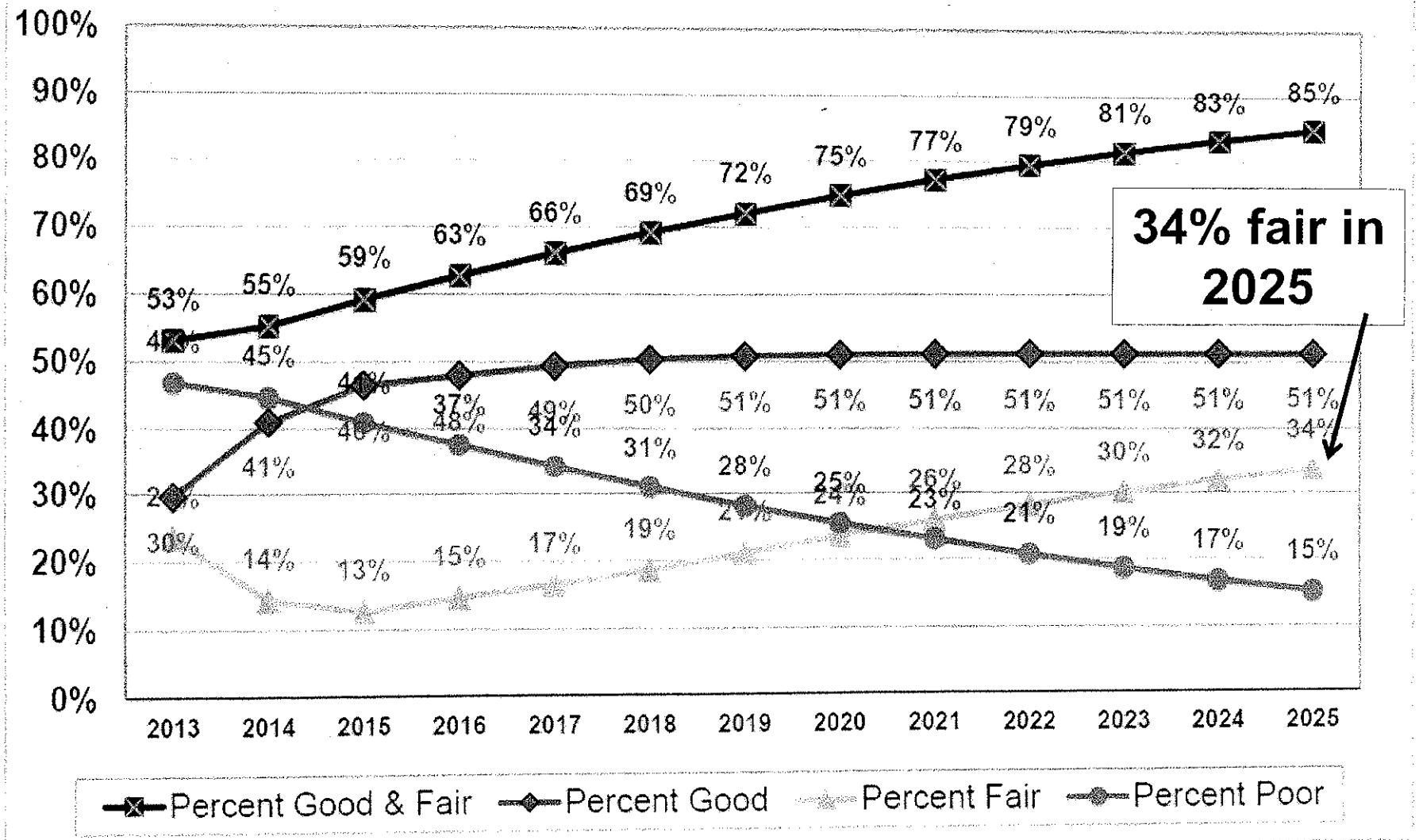
As in 2011, there will be a distribution of good, fair and poor roads in 2025.



Forecast of Pavement Condition

Non-Trunkline Paved Federal Aid

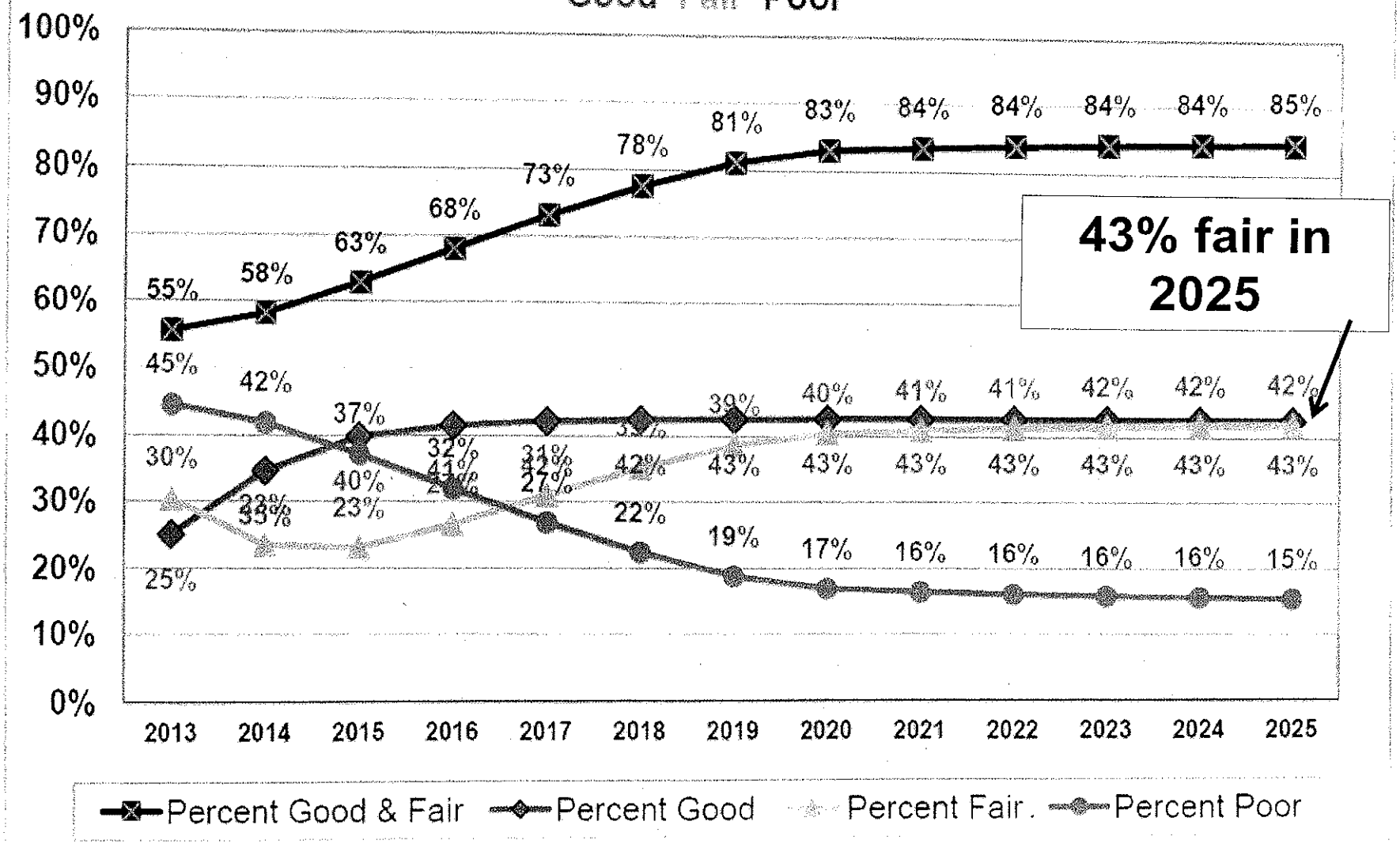
Good Fair Poor



Forecast of Pavement Condition

Paved NonFederal Aid

Good Fair Poor



"Fair" is not "good".

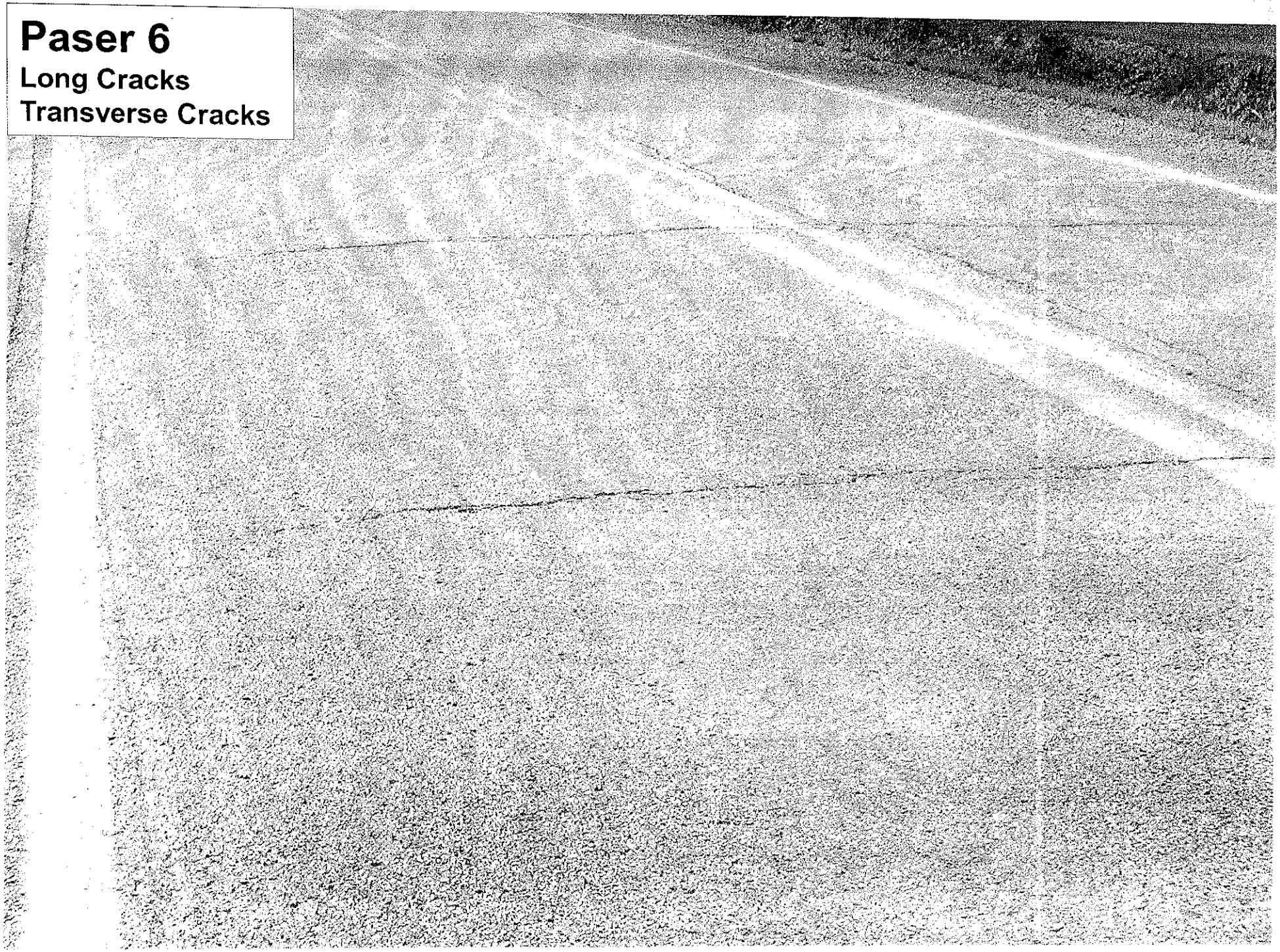
- We are not talking about having 95% or 85% pristine, perfectly good, "looking like new" roads.

- The following five slides are examples of "fair" roads.

- Conclusion: I don't recommend lowering the goals.

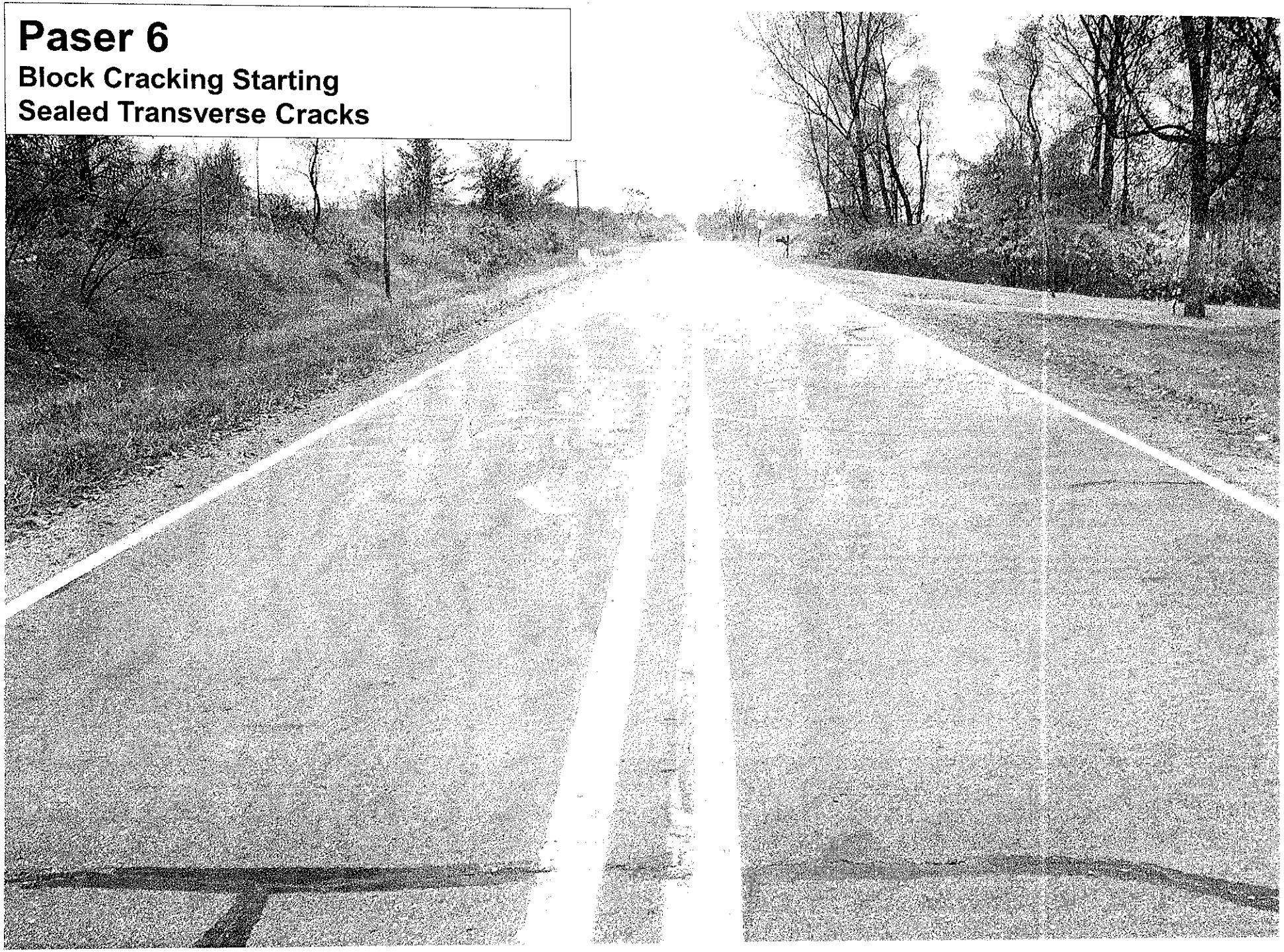
Paser 6

Long Cracks
Transverse Cracks



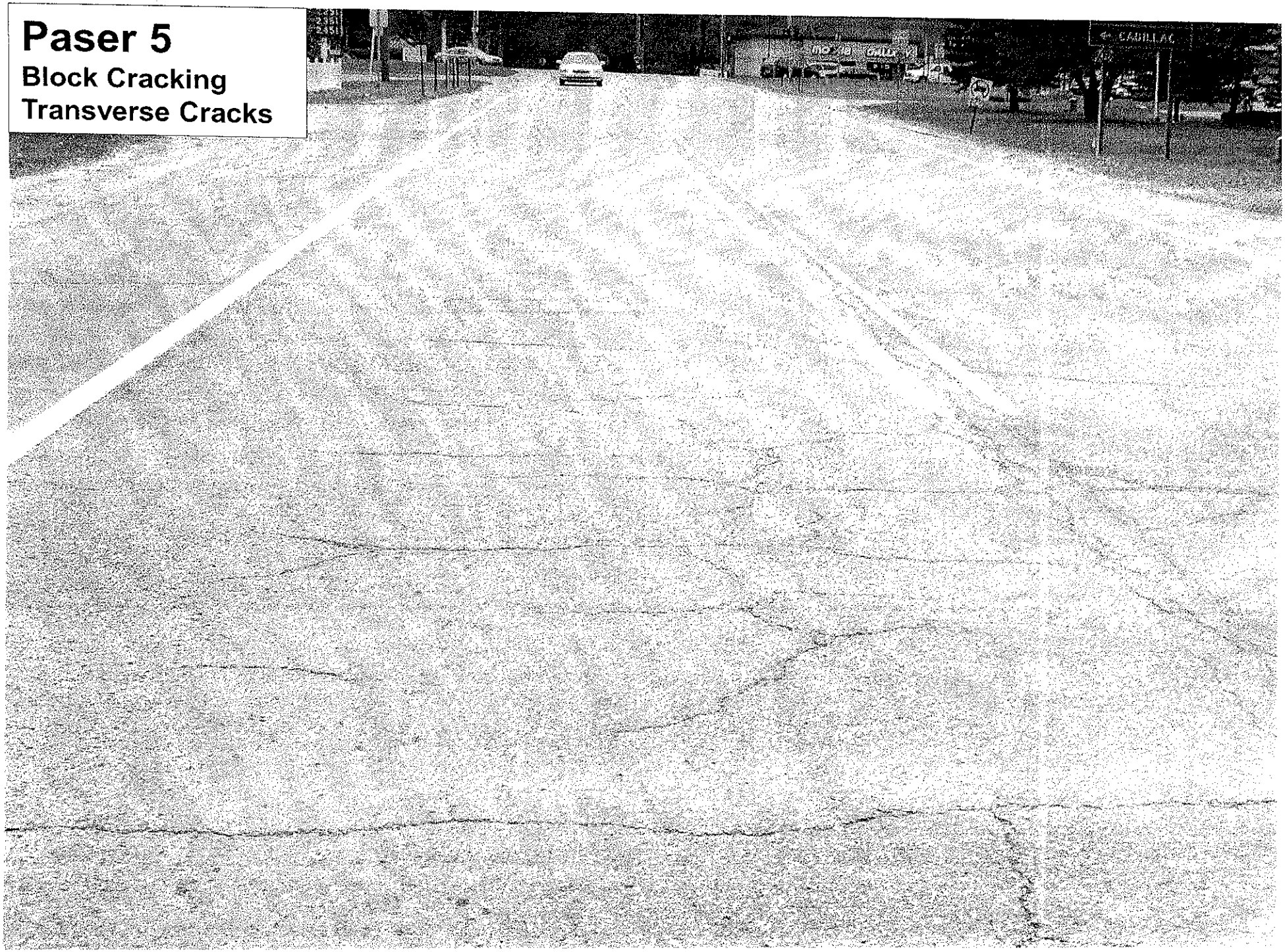
Paser 6

Block Cracking Starting
Sealed Transverse Cracks



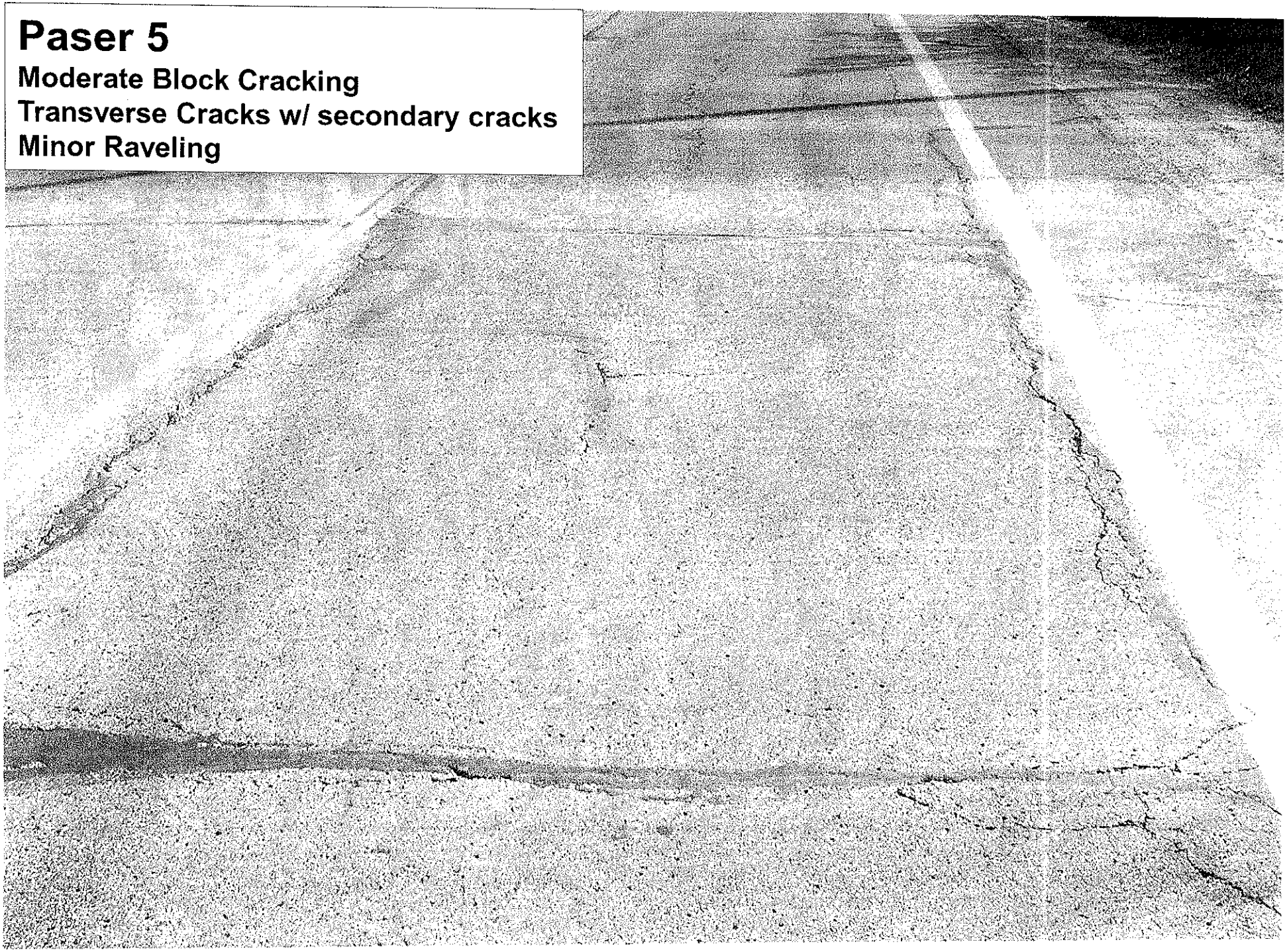
Paser 5

Block Cracking
Transverse Cracks



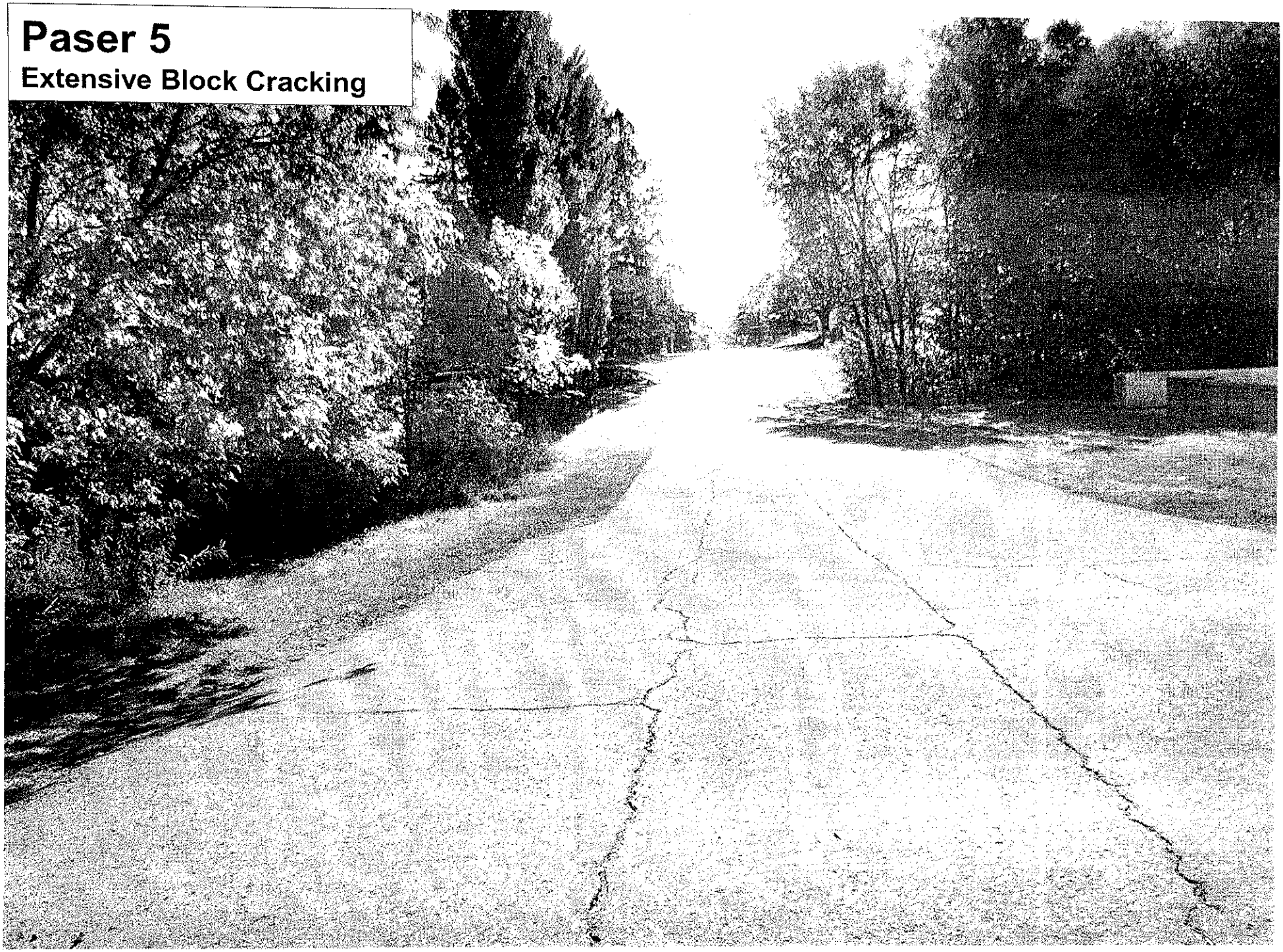
Paser 5

Moderate Block Cracking
Transverse Cracks w/ secondary cracks
Minor Raveling



Paser 5

Extensive Block Cracking

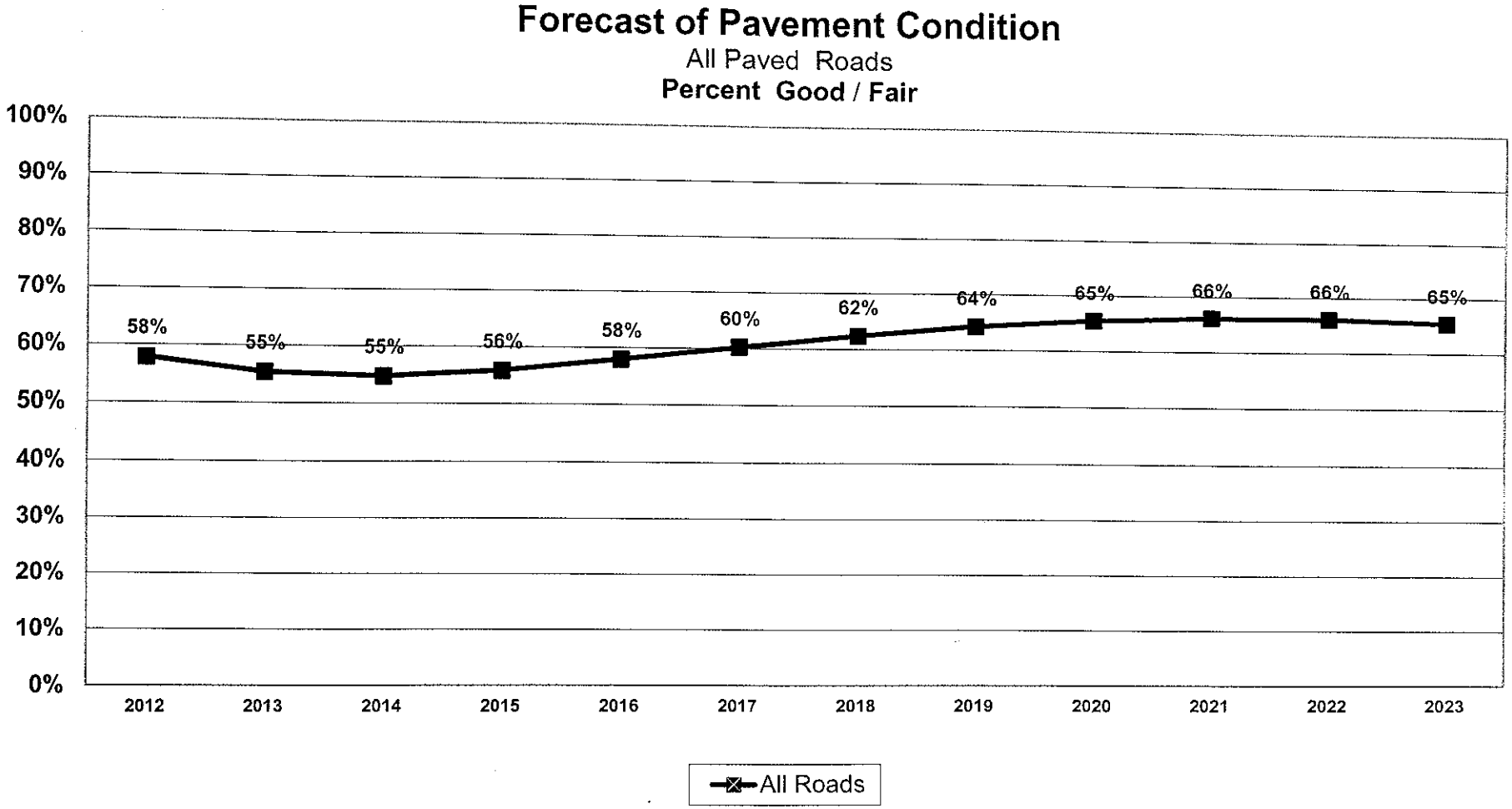


Funding Phase In??

$200 million, $400 million, etc. Phase In –

Better than NO additional dollars – But,

- **Our average road quality actually gets worse for a few years!**
- **We do not reach our 95%/85% "good or fair" goals**



Conclusion reached: We need to be bold in filling the funding gap in one fell swoop, as incrementalism does not achieve the goals.

Source: MDOT (Chesbro & Ashman)

Just Maintain Our Current Poor Quality?

Year	Total Funds Needed to Maintain Roads in 2011 Condition (millions)	Total Additional Funding Above Current Investment Needed to Maintain 2011 Condition (millions)
2013	$2,796.95	$1,104.53
2014	$2,796.42	$1,104.00
2015	$2,700.99	$1,008.57
2016	$2,276.56	$584.09
2017	$2,567.96	$875.14
2018	$2,734.69	$1,042.25
2019	$2,916.46	$1,224.16
2020	$3,062.21	$1,369.87
2021	$3,035.90	$1,342.37
2022	$3,012.37	$1,320.52
2023	$3,122.45	$1,429.25
2024	$3,315.41	$1,623.00
2025	$3,485.79	$1,793.37
Total	**$37,824.16**	**$15,821.15**
Avg	***$2,909.55***	***$1,217.01***

Conclusions Reached

We would need to spend about a billion dollars more per year to just maintain our current road quality.

Doing less than the total need would expend considerable political capital and end up disappointing the taxpayers with higher costs - but no better roads.

If we are to take action, we might as well achieve the goals, rather than take the potential political heat for the higher costs AND still have poor roads

Net Additional Revenue Needed

Savings are as valuable as additional revenue

	Millions
March 2012 Study Revenue Needed	1,542
PA 225/SB 351 Shift of Sales Tax	-100
(Range of $101.5 - 136.6 estimated, but for the fiscal year ending September 30, 2013 only)	
Savings from SB 7/PA 152 - hard cap or 80/20	Some
MDOT efficiencies adopted in 2011 & 2012	-70
Other hoped for efficiencies	Some
Minimum net additional revenue needed	**1,300**

Questions?

"He who knows all the answers has not been asked all the questions."