

Maintaining and Enhancing Statewide Levels of Service

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Overview

- State System
 - Levels of Service
 - Current Trends and Maintenance
 - Improvements & Upgrades
 - Costs
- County System
 - Levels of Service
 - Costs
 - Inflation Impacts
- Township System
 - Levels of Service
 - Costs
 - Inflation Impacts
- Cities

Levels of Service

- State System
 - Surface Condition
 - Lane Width
 - Shoulder Width

Surface Condition

- Given current funding, overall condition will deteriorate over the next 20 years

Surface Condition	Percentage of System (2010)	Percentage of System (2030)	Change
Very Good	38	32	-6
Good	26	30	+4
Fair	29	27	-2
Poor	6	11	+5

Surface Condition

- How much will it deteriorate?
- Define scale

Surface Condition	Range
Very Good	>4
Good	3.4-3.9
Fair	3.1-3.4
Mediocre	2.6-3.1
Poor	<2.5

- Source: Federal Highway Administration
C&P Report, Chapter 3 – System Conditions

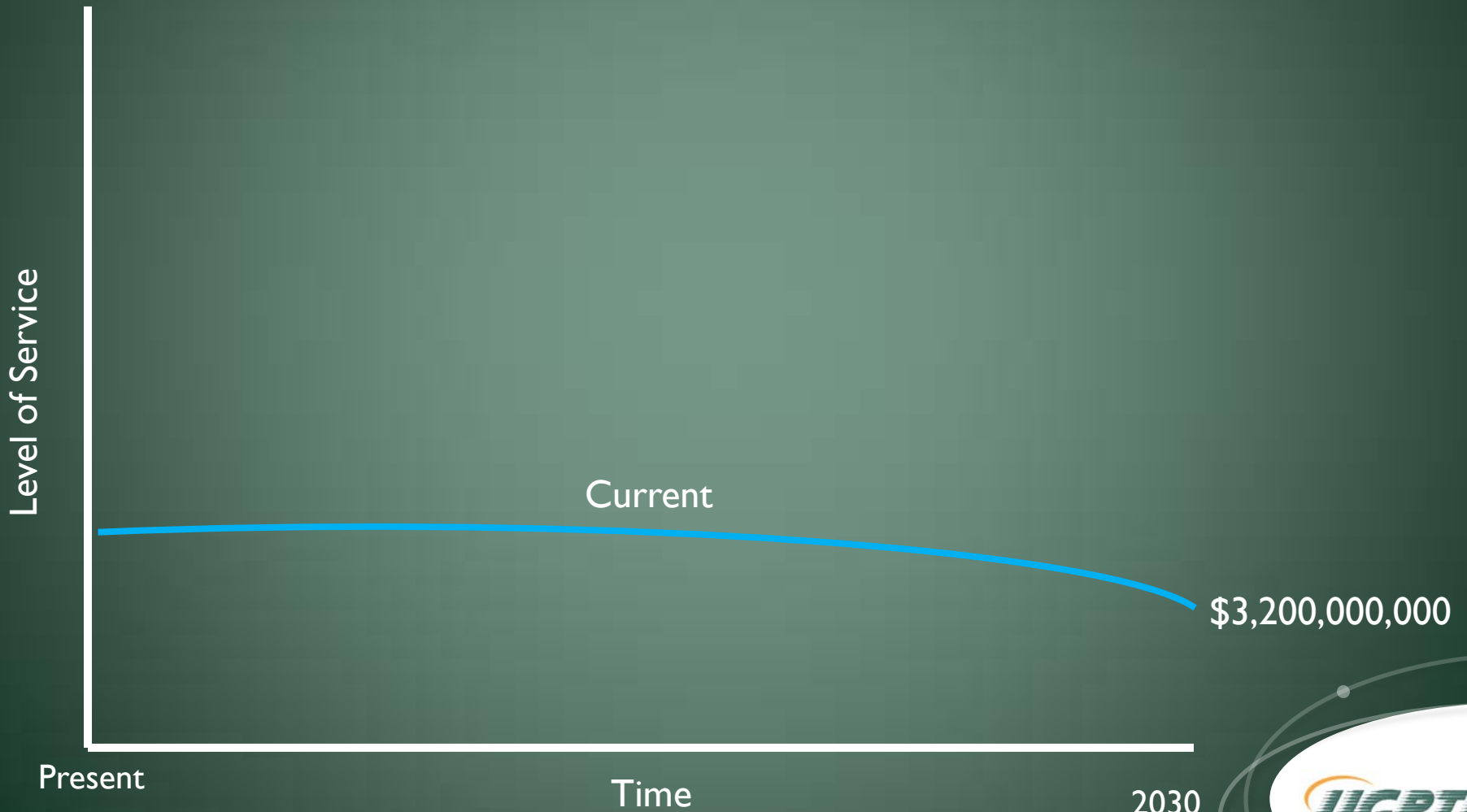
State System

- Average System Condition

HPCS	2010	2030	Rating 2010	Rating 2030
Statewide	3.40	3.24	Good	Fair
Interstate	3.69	3.57	Good	Good
Interregional	3.18	3.30	Fair	Fair
State Corridor	3.42	3.30	Good	Fair
District Corridor	3.41	3.16	Good	Fair
District Collector	3.24	2.97	Fair	Mediocre

- Current Funding: \$160 million/year (\$2010)

Projected Levels of Service Given Current Funding Level (\$2010)*



Present

Time

2030

* Not Inflation Adjusted

Maintain Current Levels of Service (2010-2030)

- Analysis to estimate the cost of maintaining current system condition

HPCS	2010	2030	Rating 2010	Rating 2030
Statewide	3.40	3.37	Good	Good
Interstate	3.69	3.79	Good	Good
Interregional	3.18	3.38	Fair	Fair
State Corridor	3.42	3.41	Good	Good
District Corridor	3.41	3.28	Good	Fair
District Collector	3.24	3.13	Fair	Fair

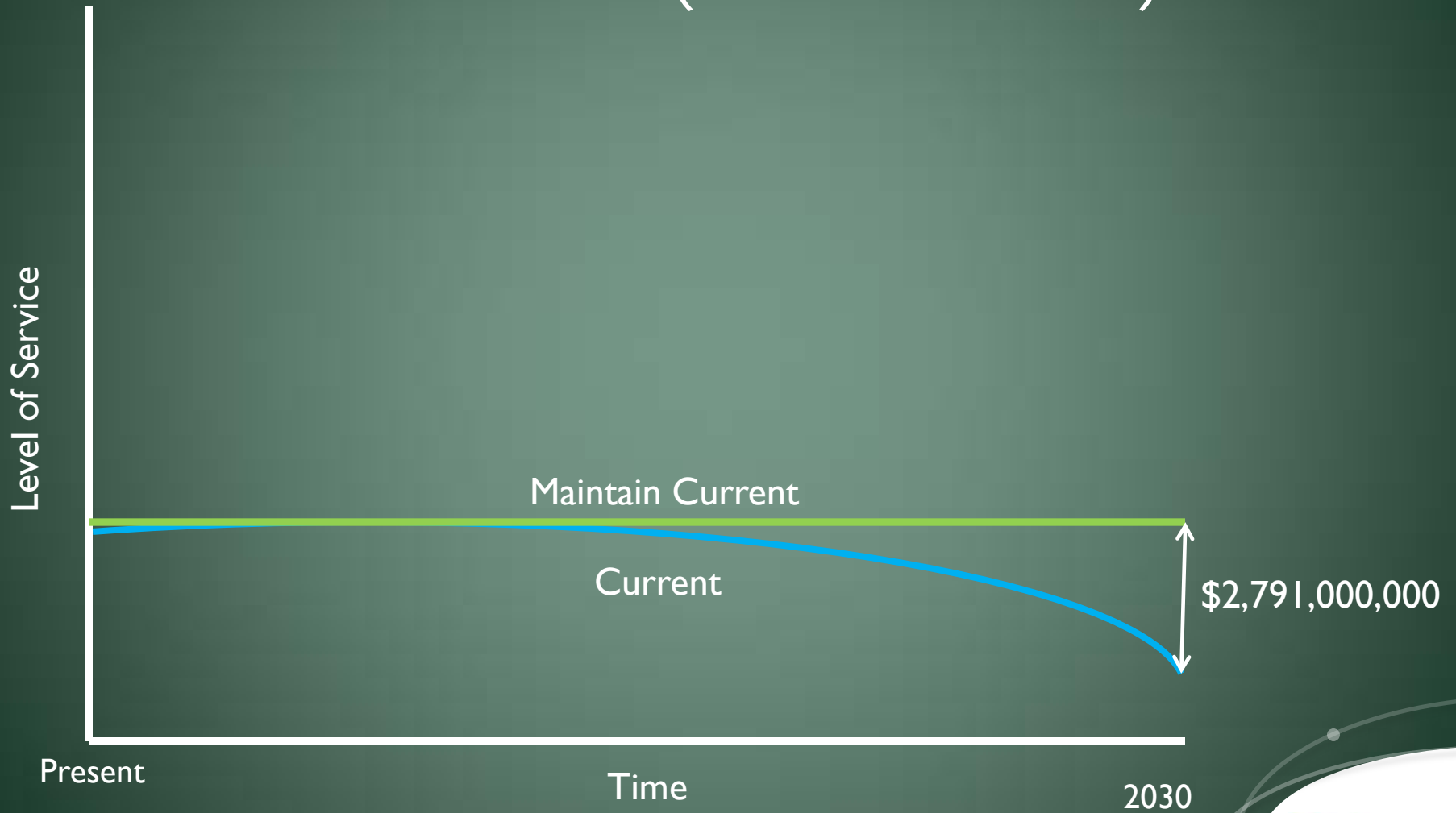
- Estimate to maintain: \$289 million/year (\$2010)

Maintain Current Levels of Service 2010-2030 (\$2010)

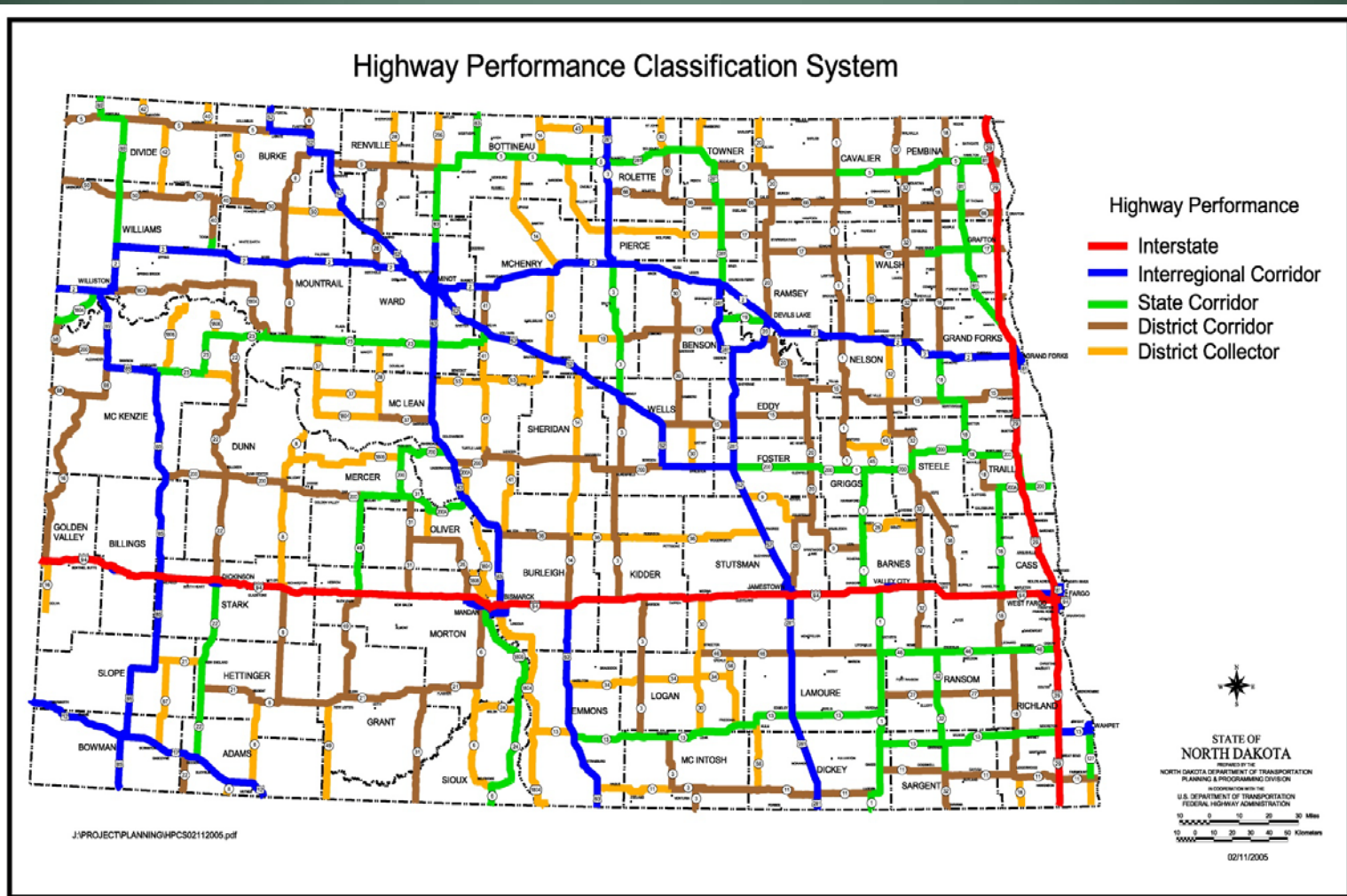


* Not Inflation Adjusted

Maintain Current Levels of Service 2010-2030 (4 % Inflation)



Highway Performance Classification System



HPCS Guidelines

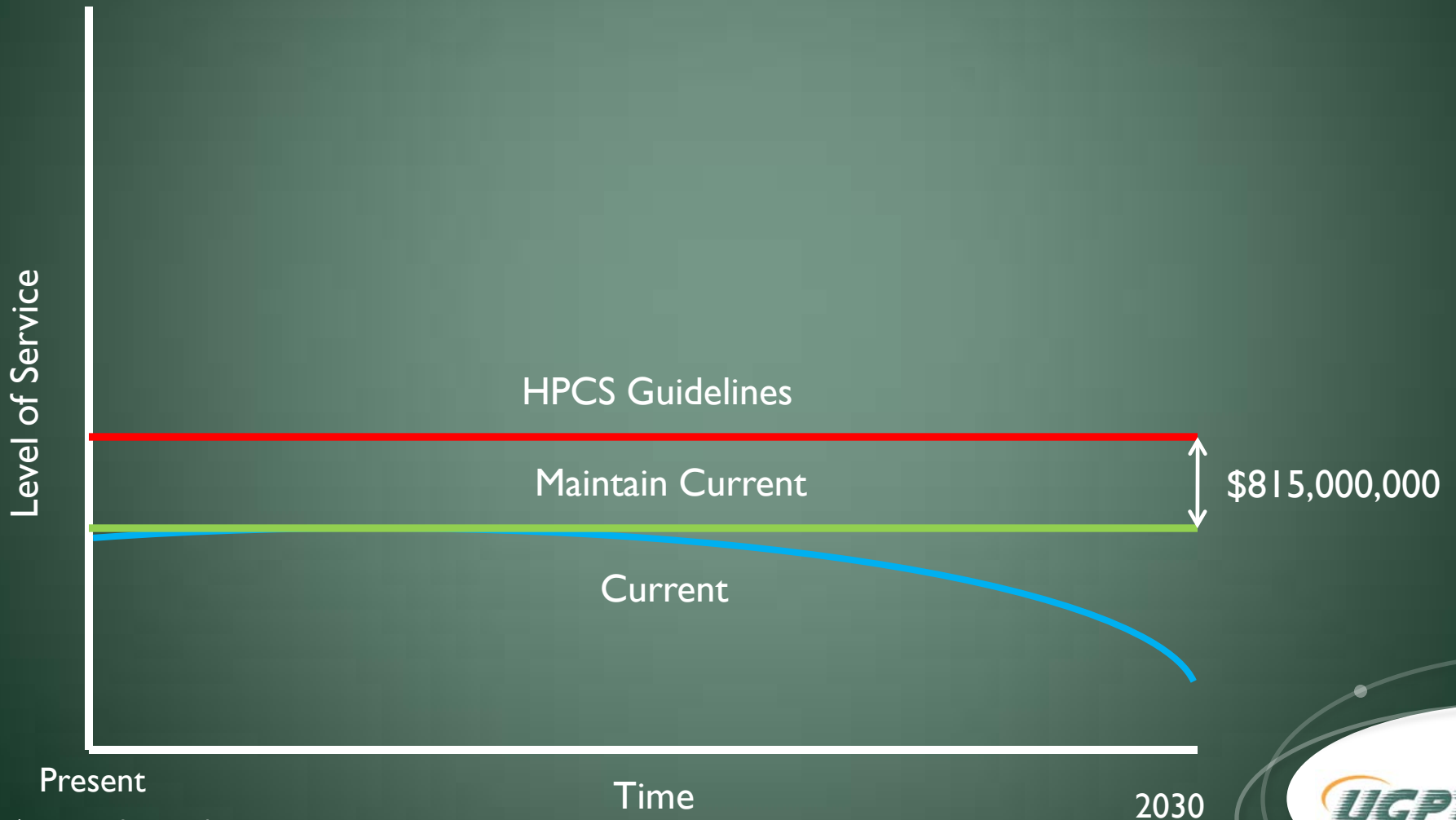
HPCS	Load Restrictions	Distress Condition	Ride Condition
Interstate	Legal Weights	Good to Excellent	Good to Excellent
Interregional Corridor	Legal Weights	Good to Excellent	Good to Excellent
State Corridor	Legal Weights	Good	Good
District Corridor	May be restricted to 7 or 8 ton seasonal limits	Fair to Good	Fair to Good
District Collector	May be restricted to 6 or 7 ton seasonal limits	Fair	Fair

Maintain and Eliminate HPCS Deficiencies 2010-2030 (\$2010)*

- Deficiency Types
 - Load (Structural Overlay)
 - 560.6 miles
 - Cost: \$266,285,000
 - Distress (Minor Rehabilitation)
 - 1088.7 miles
 - Cost: \$310,279,500 (Distress Alone)
 - Ride (Thin Lift Overlay)
 - 1289.0 miles
 - Cost: \$238,465,000 (Ride Alone)

* Not Inflation Adjusted

Maintain and Eliminate HPCS Deficiencies 2010-2030 (\$2010)*



* Not Inflation Adjusted



Enhanced Levels of Service

- Responses
 - Roadway Width (Primary Level of Service)
 - Upgrade Highway Performance Classification
 - Add Roadway Lanes
 - Add Turn/Acceleration Lanes

Roadway Widening

- Cost Estimate to Widen Existing Highways
 - Major Rehab Width - Widening Only

HPCS	# of Miles	Cost
Interstate	0	\$0
Interregional 4-Lane	182	\$59,605,000
Interregional 2-Lane	175	\$63,175,000
State Corridors	918	\$326,808,000
District Corridors	1,685	\$588,905,000
District Collectors	719	\$226,844,000
Total	3,679	\$1,265,340,000

* Not Inflation Adjusted

Segment HPCS Upgrades

- Participants in regional public input meetings identified 27 segments that they would like to see upgraded to at least the next HPCS level.
 - Total mileage of the 27 segments: 1,244 miles
 - Estimated cost per mile to upgrade a District Corridor to a State Corridor: \$620,000/mile
 - Total cost: \$771,280,000

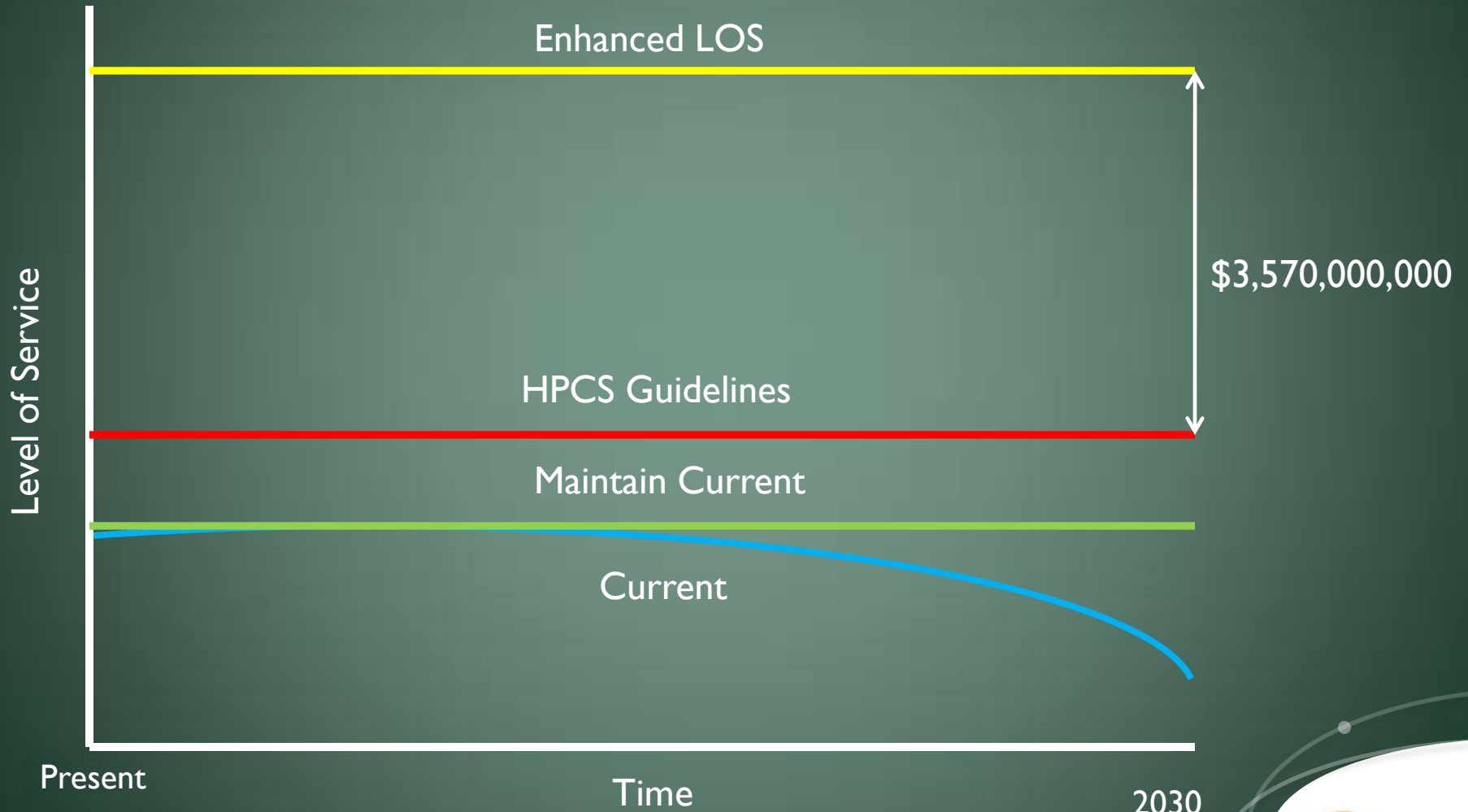
Upgrade from Two to Four Lanes

- Participants in regional public input meetings identified 6 highways that they would like to see upgraded to four-lane facilities
 - Total mileage of the 6 highways: 614 miles
 - Estimated cost per mile to upgrade a two-lane facility to a four-lane facility: \$2,500,000/mile
 - Total cost: \$1,535,000,000

Addition of Turn Lanes

- Example Program
 - \$12,000,000/year
 - 107 miles on US 85 and ND 23

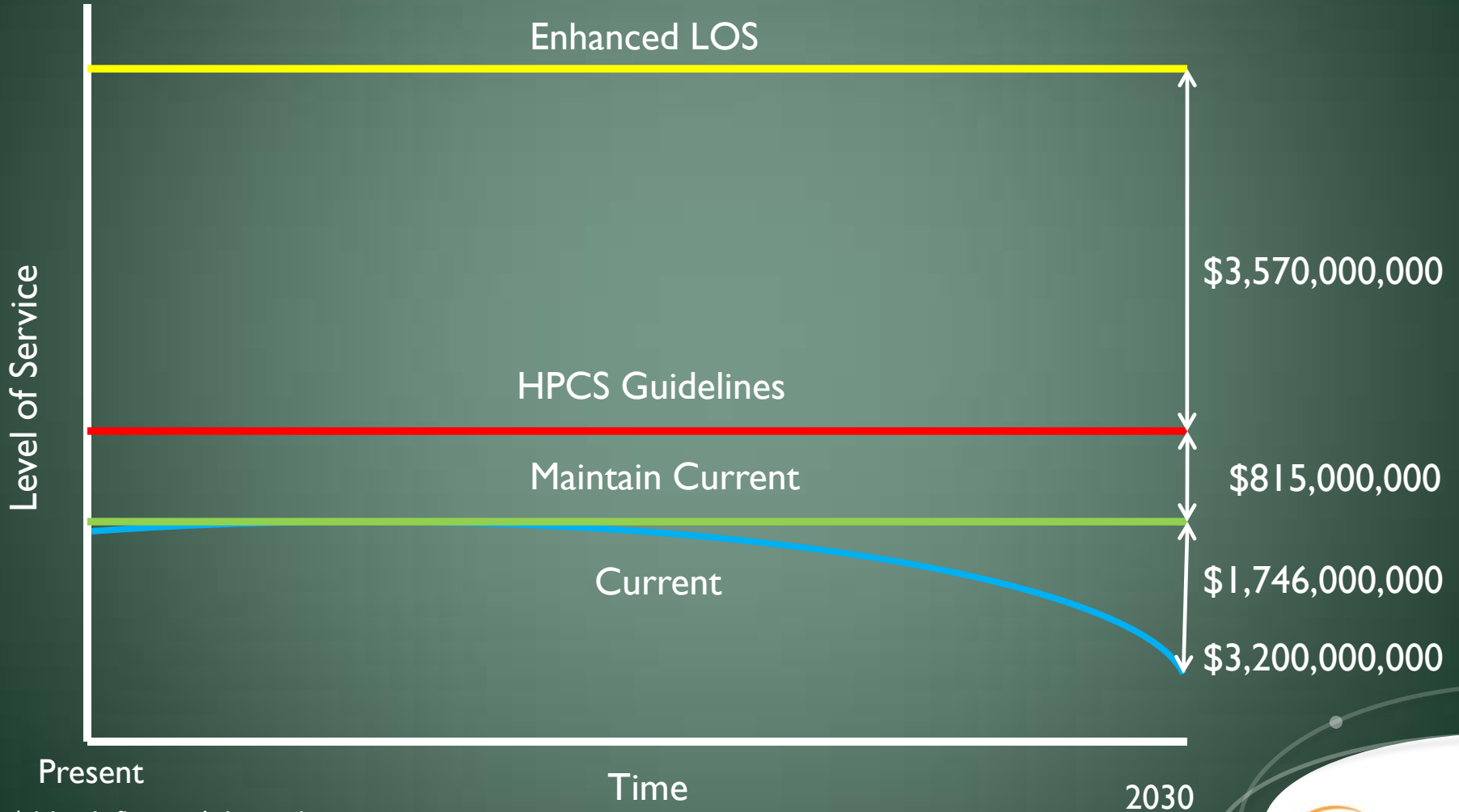
Enhanced Levels of Service*



* Not Inflation Adjusted



Summary Table*



* Not Inflation Adjusted



County Levels of Service

- Survey
 - Overlay Interval
 - Overlay Thickness
 - Gravel Interval
 - Gravel Thickness
 - Blading Interval

County Levels of Service

- County Responses
 - Overlay Interval
 - Average - 18.5 years
 - Range - 15-25 years
 - Most Frequent - 20 years
 - Overlay Thickness
 - Average - 2.33
 - Range - 1.5-3.5 inches
 - Most Frequent - 2 inches

County Levels of Service

- County Responses
 - Gravel interval
 - Average – 6 years
 - Range – 3-15 years
 - Most Frequent – 5 years
 - Regional Variations

County System

- FY 2009 funding was \$70,000,000 statewide (Federal, State and Mill Levies) excluding unorganized road mill levies
- 18,969 miles
- Example County Scenario

County Scenario

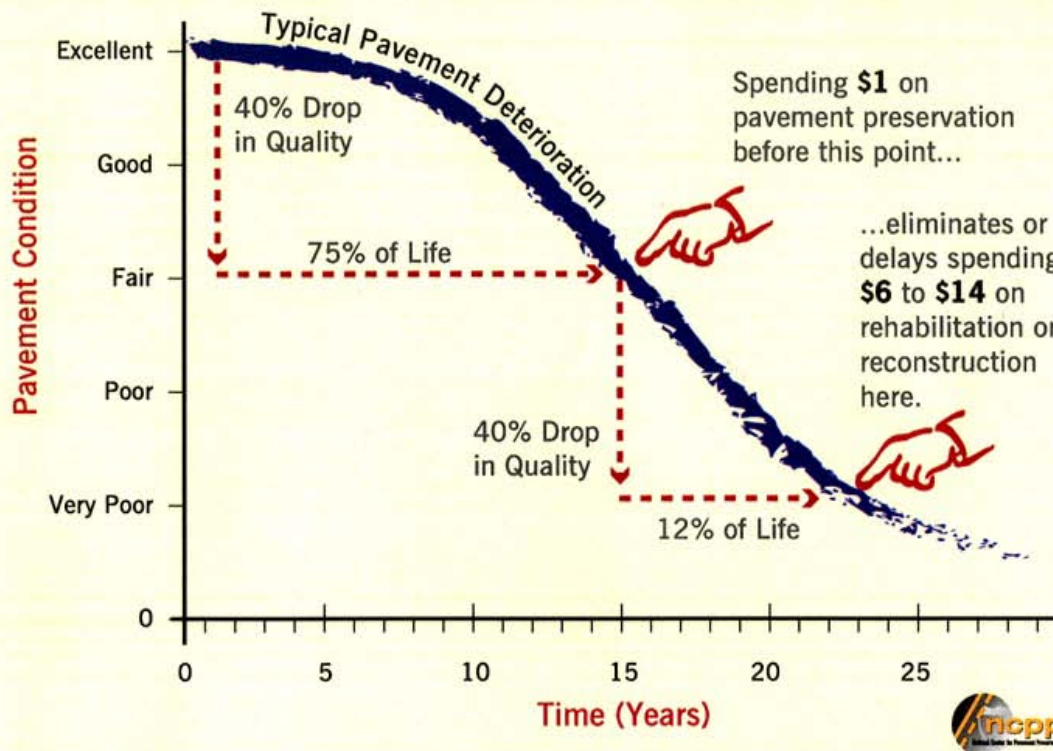
- Example County:
 - 300 total miles: 150 paved, 150 gravel
 - Average overlay thickness: 2"
 - Average overlay interval: 20 years
 - Average gravel thickness: 1,500 cubic yards/mile
 - Average gravel interval: 5 years

County Scenario

Category	Current Annual	2015 with 4% Inflation	2019 with 4% Inflation
Overlays	\$1,125,000	\$1,316,090	\$1,601,225
Graveling	\$180,000	\$210,574	\$256,196
Snow Removal	\$36,000	\$42,114	\$51,239
Blading	\$63,750	\$74,578	\$90,736
Total	\$1,404,750	\$1,643,358	\$1,999,397
Number of Miles Graveled Per Year	30	26	21
Ave. Graveling Interval	5 Years	6 Years	7 Years
Number of Miles of Overlay Per Year	7.5	6.5	5
Average Overlay Interval	20 Years	23 Years	28 Years

Timeliness of Improvements

PAVEMENT PRESERVATION IS COST EFFECTIVE



Source: National Center for Pavement Preservation.

Township System

- Levels of Service
 - Gravel Interval
 - Gravel Thickness
 - Blading Interval

Township System

- FY 2009 funding was \$23,200,000 statewide (state and mill levies)
- 56,621 miles
- Translates to roughly \$400 per township road mile
- What does \$400 per mile buy?

Township System

- Example:
 - Township with 50 road miles
 - 50% maintained & kept open during the winter months (25 miles)
 - Total annual present funding = \$20,000
 - Costs:
 - Snow Removal: 25 miles
 - Blading: Once every 2 months
 - Gravel: Applied at 500 cu.yd./mile

Township Scenario

	Current	2014 with 4% Inflation	2019 with 4% Inflation
Graveling	\$13,185	\$15,422	\$18,763
Snow Removal	\$3,275	\$3,831	\$4,661
Blading	\$3,541	\$4,143	\$5,040
Total	\$20,000	\$23,397	\$28,466
Number of Miles Graveled Per Year	4.4	3.4	2.9
Ave. Graveling Interval	6 Years	7 Years	9 years

Does not include flood/weather damages

Urban Systems

- 2009 Federal and State Funding for Cities: \$62,181,000 (not including local funding)
- Estimated from long range plans and past survey responses from Urban Street and County Road Assessment Study
- Amount of detail varies from city to city
- Each plan includes lists of expected improvements for next 15 to 20 years

Urban Systems

- Assumed that long range plans would maintain the level of service
- Some plans include expected maintenance costs
- When maintenance costs could not be determined, the survey results from the previous study were used and indexed
- Estimated funding to implement long range plans in 2010 dollars for all 13 cities is \$77 million annually

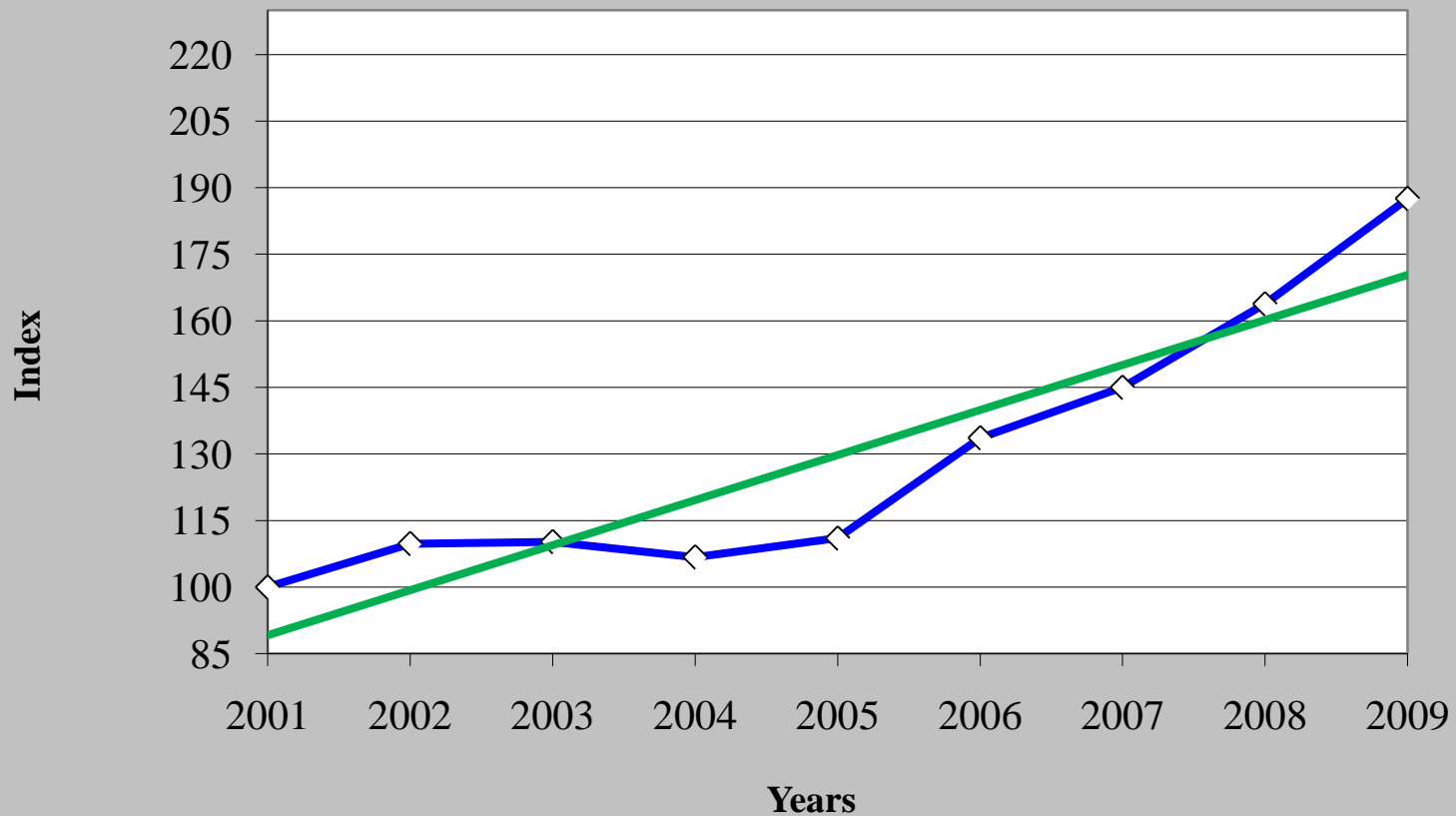
Small Cities

- Diverse needs within small cities
- Discussions with small city governments confirmed the findings of the 2002 Small City and Township Report
- Gap between current funding and cost to maintain current levels of service
- Focus is on maintenance and preservation

Cost Trends

Source: NDDOT

North Dakota's Overall Construction Cost Index



Improvement Costs

- Inflation Implications
 - The same funding “buys” fewer improvements than it did five years ago
 - Backlog of improvement projects
 - Timeliness of improvements can not be met in many cases
 - Repair vs. resurface vs. reconstruct vs. reduce level of service

Summary

- Levels of Service
 - Where are we now?
 - State – 64% Good or better
 - County – Average gravel every 6 years, average overlay every 18 years
 - Where will we be 20 years from now?
 - With existing revenue, overall system condition will decrease and inflation may continue to devalue the buying power of the revenue
 - Maintaining Levels of Service
 - Choices/Prioritization