



# FINAL

## Operational Report

### Wisconsin State Highway 2006 Maintenance, Traffic, and Operations Conditions

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## ***Introduction and Overview***

### **About this report**

The *Compass Operational Report* is issued annually to identify the condition of Wisconsin's state highway network. The primary audience for this report includes Operations Supervisors and Operations Managers at the Wisconsin Department of Transportation (WisDOT) and partner organizations including the 72 counties. Compass reports are used to understand trends and conditions, prioritize resources, and set future target condition levels for the state highway system. As more information is gathered, data will also be used to illustrate and understand the consequences of funding and policy shifts, and to demonstrate accountability to decision-makers at WisDOT and in the State Legislature.

This report *includes* data on bridges, traveled ways, shoulders, drainage, roadsides, selected traffic devices, and specific aspects of winter operations. It is important to note information *not* contained in this report when using it to make decisions. It *does not include* measures of preventive maintenance, operational services (like traveler information and incident management), or electrified traffic assets (like signals and lighting). The first section of this report is an executive overview, a condensed version of the full report for executive managers in WisDOT. Both documents are available on the Compass website ([http://dotnet/dtid\\_bho/extranet/compass/reports/index.shtm](http://dotnet/dtid_bho/extranet/compass/reports/index.shtm) from within WisDOT or [https://trust.dot.state.wi.us/extntgtwy/dtid\\_bho/extranet/compass/reports/index.shtm](https://trust.dot.state.wi.us/extntgtwy/dtid_bho/extranet/compass/reports/index.shtm) from outside WisDOT).

Feedback on format, content, and other aspects of the report is welcome and should be sent to Scott Bush, Compass Program Manager, at [scott.bush@dot.state.wi.us](mailto:scott.bush@dot.state.wi.us) or (608) 266-8666.

### **Background**

Compass was implemented statewide in 2002 as WisDOT's quality assurance and asset management program for highway operations. The Compass report is intended to provide a comprehensive overview of highway operations by integrating information from field reviews with inventory data and other data sources.

### **Process**

The Compass report is issued annually in cooperation with the research team from the Midwest Regional University Transportation Center (MRUTC) at University of Wisconsin – Madison. Started in September of each year, the team collects data from WisDOT and works on the analysis of each chapter. The team presents the draft report at the Compass Advisory Team Meeting and the Highway Operations Managers Meeting in April and May. Feedback was taken at these meetings, and after subsequent revisions, the report is finalized and officially published.

This report uses inventory data for bridges, pavement, routine maintenance of signs, and winter storms. It uses sample data for highway maintenance features. The research team collected data from the related areas within WisDOT between October 2006 and March 2007.

The highway maintenance data includes data sampled from the field. Two hundred and forty 1/10-mile segments are randomly selected in each of the five WisDOT regions. A WisDOT

Area Maintenance Coordinator and a County Patrol Superintendent collect the field data between August 15 and October 15 each year. The field survey includes a condition analysis of shoulders, drainage features, roadside attributes, and traffic control and safety equipment.

Winter data is gathered from the winter season 2005-06 and includes Time to Bare Wet, Winter Severity Index, Winter VMT, and crash data. Also included are figures and tables directly taken from the 2005-06 WisDOT *Annual Winter Maintenance Report* prepared by WisDOT's Winter Operations unit, including the "Winter by the Numbers" table and the statewide snowfalls and Winter Severity Index figures.

Pavement data was obtained from the Pavement Information File (PIF) and contains the complete highway pavement inventory data in Wisconsin. Inspections of state-maintained highway pavements in Wisconsin are done regularly in two-year cycles, with half of the state's pavements inspected in one year, and the other half in the next year. In previous Compass reports, a two-year rolling average of all pavement segments condition was used to calculate statewide conditions. It was determined last year that the rolling average method doesn't accurately represent the actual condition at any one year and can dilute the condition of one or both halves of the state. Therefore, starting this year the pavement condition is calculated for the current year of the report, which means that at any one year, statewide numbers of pavement condition will represent half of the state. This also means that a trend of pavement condition can only be shown as two separate trends, which shows the condition of pavements evaluated in years 2001, 2003, 2005 and those pavements reviewed in years 2002, 2004, and 2006.

The sign data comes from the Sign Inventory Management System (SIMS), and the bridge data comes from the Highway Structure Information System (HSIS).

After the field data was collected, backlog percentages for each feature were calculated at the county, region, and statewide level. Backlog percentages identify what percent of that feature is in a condition where maintenance work is required, if adequate budget was available. Therefore, an increasing backlog percentage reflects fiscal constraints rather than inadequate work.

See Appendix B for information on when an asset is considered backlogged for highway maintenance features. For pavement features, the backlog was determined based on the Pavement Maintenance Management System (PMMS) ratings. In the PMMS, each segment of road receives a rating for each distress type. The ratings include "excellent", "fair", "moderate", or "bad", depending on the extent and severity of distress. For the Compass report, a pavement segment that receives a rating other than "excellent" needs routine maintenance and is considered backlogged. Signs are considered backlogged if it is still in use past its recommended service life.

Additionally, a feature grade (from "A" through "F") is assigned to each feature based on the backlog percentage. The feature grade declines as more of a feature is backlogged. These grades are weighted for importance. So something that contributes to safety, for example, would decline more rapidly than something that was primarily aesthetic in nature. A feature grade of "A" means that all basic routine maintenance needs have been met within the maintenance season and there is not a significant backlog. See Appendix B for the grading scale used to grade Compass features.

Operations Supervisors and Operations Managers annually set targets of backlog percentage levels for each feature. These targets are intended to reflect priorities and goals for the year, in light of fiscal constraints. See Appendix D for details on the 2006 targets.

## Results

Overall, the maintenance condition of most features in 2006 is better than targeted. There is also a significant increase in the number of features exceeding the target condition. Hazardous debris and drop-off/build-up of unpaved shoulders are the only two features with conditions below their targets.

Each Compass feature is assigned to a category based on the primary type of contribution to the roadway system. The categories include Critical Safety, Safety, Ride/Comfort, Stewardship, and Aesthetics. The following tables show the trend of Compass feature grades for the past three years in each of the contribution categories, followed by some key observations for the features in each category.

### Critical Safety

Critical Safety features are roadway features that necessitate immediate action – with overtime pay if necessary - to remedy if not properly functioning.

Feature	2006	2005	2004	Element
Hazardous debris	D	D	D	Shoulders
Rutting	C	--	B	Traveled way, asphalt
Centerline markings	B	B	B	Traffic and safety devices
Regulatory/warning signs (emergency)	A	A	A	Traffic and safety devices

- Removal of hazardous debris on the shoulders received a feature grade of D, which is notably worse than targeted.
- Rutting received a feature grade of C, a decline from a B received in 2004.
- Centerline markings and the emergency repair of regulatory/warning signs consistently received grades of B and A, respectively

### Safety

Safety features are highway attributes and characteristics that protect users against – and provide them with a clear sense of freedom from – danger, injury or damage.

Feature	2006	2005	2004	Element
Drop-off/build-up (unpaved)	F	F	F	Shoulders
Delineators	C	D	C	Traffic and safety devices
Regulatory/warning signs (routine)	D	F	D	Traffic and safety devices
Raised pavement markers	C	C	C	Traffic and safety devices
Mowing	C	C	C	Roadsides
Edgeline	B	B	B	Traffic and safety devices
Special pavement markings	A	A	C	Traffic and safety devices
Other signs (emergency repair)	A	A	A	Traffic and safety devices
Protective barriers	A	A	A	Traffic and safety devices

Feature	2006	2005	2004	Element
Fences	A	A	A	Roadsides
Mowing for vision	A	--	D	Roadsides
Woody vegetation control	A	A	A	Roadsides
Woody vegetation control for vision	A	A	A	Roadsides

- Repair of drop-off/build-up of unpaved shoulders contributes to Safety by keeping cars from dropping down dramatically on one side and possibly over-correcting if one or two wheels leave the pavement. This feature has received a grade of F consistently for the past three years.
- Delineators improved to C from the D it received last year.
- Routine replacement of regulatory/warning signs and the emergency repair of other signs are both backlogged for maintenance, or beyond their recommended service life. A higher rate of backlog for other signs (55%, compared to 59% in 2005) than for regulatory/warning signs (31%, compared to 41% in 2005) is a result of limited funding and WisDOT priorities that allocate all routine sign maintenance resources to regulatory/warning signs.
- WisDOT places a higher priority on routine replacement of regulatory/warning signs than other signs. As a result, 30% of other signs are being used more than five years beyond their recommended service life compared to 14% of regulatory/warning signs. The replacement backlog for both types of signs has improved from last year (33% and 23%, respectively).

### **Ride/Comfort**

Ride/Comfort features provide a state of ease and quiet enjoyment for highway users and include roadway characteristics such as ride quality, proper signing, or lack of obstructions.

Feature	2006	2005	2004	Element
Transverse faulting	F	--	F	Traveled way, concrete
Other signs (routine)	D	D	D	Traffic and safety devices
Distressed joints/cracks	C	--	C	Traveled way, concrete
Patch deterioration	C	--	C	Traveled way, concrete
Slab breakup	C	--	C	Traveled way, concrete
Cross-slope (unpaved)	C	B	B	Shoulders
Patch deterioration	B	--	A	Traveled way, asphalt
Longitudinal distortion	A	--	A	Traveled way, asphalt
Longitudinal joint distress	A	--	A	Traveled way, concrete
Surface raveling	A	--	A	Traveled way, asphalt
Transverse distortion	A	--	A	Traveled way, asphalt
Potholes/raveling (paved)	A	B	A	Shoulders

- Cross-slope of unpaved shoulders received a feature grade of C, down from a B in 2005.

### **Stewardship**

Stewardship features help a highway attribute obtain its full potential service life.

Feature	2006	2005	2004	Element
Cracking (paved)	D	D	D	Shoulders
Culverts	B	B	B	Drainage

Feature	2006	2005	2004	Element
Flumes	C	C	C	Drainage
Noxious weeds	C	C	C	Roadsides
Edge raveling	B	--	B	Traveled way, asphalt
Longitudinal cracking	F	--	D	Traveled way, asphalt
Surface distress	B	--	B	Traveled way, concrete
Transverse cracking	F	--	D	Traveled way, asphalt
Storm sewer system	B	B	B	Drainage
Under-drains/edge-drains	B	B	B	Drainage
Alligator cracking	A	--	A	Traveled way, asphalt
Block cracking	A	--	A	Traveled way, asphalt
Flushing	A	--	A	Traveled way, asphalt
Erosion (unpaved)	A	A	A	Shoulders
Curb & gutter	A	A	A	Drainage
Ditches	A	A	A	Drainage
Walls & barriers	--	--	--	Roadsides

- Cracking on paved shoulders received a feature grade of D. However, this score is better than targeted.
- Flumes received a feature grade of C; all other drainage features received grades of A or B.
- Noxious weeds received a feature grade of C with a maintenance backlog much lower than targeted.

### **Aesthetics**

Aesthetics ensure a display of natural or fabricated beauty items located along a highway corridor and include aspects such as landscaping and decorative structures. Aesthetic features also include the absence of litter, which detracts from roadway sightlines.

Feature	2006	2005	2004	Element
Litter	D	D	D	Roadsides

In addition to the above information, the Compass report also includes data on winter operations and bridges conditions. Currently targets are not set for winter operations and bridges and grades are not established for them. Some key observations on winter operations and bridges include:

### **Winter operations:**

- In keeping with WisDOT guidelines, during similar storm events, drivers on major urban freeways and highways have less time to wait until they see bare/wet pavement than do drivers on secondary roads. From storm to storm, however, variability in this time is due to specific local weather effects (type, duration and severity of storms throughout the winter season).
- The average time to bare/wet pavement during winter 2005-06 was 1 hour and 55 minutes, which is nine minutes less than in winter 2004-05. The average Winter Severity Index (WSI) in 2005-06 was 31.8, equal to the average for the previous five-year (winter 2000-2001 to winter 2004-2005).

**Bridges:**

- Thirty three percent of bridge decks are in “Fair” condition and in need of reactive maintenance, based on their NBI ratings of 5 or 6. These include 29% of concrete bridges and 42% of steel bridges.

**Notes**

Several changes were made to improve the report this year. Some of the changes are related to how information is displayed, as a way to better show cause and effect relationships with trends on expenditures and conditions. To illustrate the effect of inflation, maintenance costs are now provided as nominal dollars at the time the money was spent and also in real dollar values, expressed in 2006 constant dollars. The report also provides the maintenance costs divided by the statewide lane miles being maintained to illustrate how maintenance budgets are stretched as the highway system grows. The other changes are specifically related to each chapter and how the analysis was done. WisDOT recently increased the expected useful life standard for high intensity grade signs from 10 to 12 years. The pavement report has also been updated to provide results from the annual pavement inspection instead of a two-year rolling average numbers in previous Compass reports. Because of the change in presenting pavement data, all statewide annual numbers were recalculated and the statewide pavement backlog trend is now shown as two separate trends.



## ***Executive Overview Reports***

## Wisconsin 2006 Targets: Targets for Paved Traveled Way Maintenance Conditions

Targets are set annually, and are intended to reflect priorities for that year, given fiscal constraints. They are a measure of effective management, not system condition.

Contribution Category	Feature	Element	Actual % backlog 2006	Target % backlog 2006	On target <sup>2</sup>	Statewide												Regions <sup>1</sup>		
						Gap if target missed												Worse condition	On Target	Better condition
						Worse condition						Better condition								
						30	20	10	0	0	10	20	30	0	10	20	30			
Critical Safety	Rutting	Traveled way, asphalt	7%	13%															NC	NE, SE
Ride/Comfort	Longitudinal distortion	Traveled way, asphalt	0%	1%	◎														NC, NE, SE	
	Patch deterioration	Traveled way, asphalt	7%	10%	◎														NC, NE, SE	
	Surface raveling	Traveled way, asphalt	0%	2%	◎														NC, NE, SE	
	Transverse distortion	Traveled way, asphalt	0%	5%	◎														NC, NE, SE	
	Distressed joints/cracks	Traveled way, concrete	18%	43%																NC, NE, SE
	Longitudinal joint distress	Traveled way, concrete	0%	27%																NC, NE, SE
	Patch deterioration	Traveled way, concrete	18%	30%																NC, NE, SE
	Slab breakup	Traveled way, concrete	29%	45%																NC, NE, SE
	Transverse faulting	Traveled way, concrete	61%	75%														SE	NC	NE
Stewardship	Alligator cracking	Traveled way, asphalt	2%	5%	◎													NC, NE, SE		
	Block cracking	Traveled way, asphalt	2%	5%	◎													NC, NE, SE		
	Edge raveling	Traveled way, asphalt	17%	18%	◎												SE	NC, NE		
	Flushing	Traveled way, asphalt	0%	1%	◎													NC, NE, SE		
	Longitudinal cracking	Traveled way, asphalt	62%	28%														NC, NE, SE		
	Transverse cracking	Traveled way, asphalt	62%	28%														NC, NE, SE		
	Surface distress	Traveled way, concrete	8%	25%															NC, NE, SE	

<sup>1</sup> Because of the biennial testing schedule for traveled way, only a very small amount of pavement segments were tested in the Northwest and Southwest Regions in 2006 and they are not enough to represent the whole region.

<sup>2</sup> ◎ This symbol indicates that the percent backlogged for that feature is the same as the target, or within 5 percentage points.

## Wisconsin 2006: Targets for Highway Maintenance Conditions

Targets are set annually, and are intended to reflect priorities for that year, given fiscal constraints. They are a measure of effective management, not system condition.

Contribution Category	Feature	Element	Actual % backlog 2006	Target % backlog 2006	On target <sup>3</sup>	Statewide						Regions		
						Gap if target missed						Worse condition	On Target	Better condition
						Worse condition			Better condition					
						20	10	0	0	10	20			
Critical Safety	Centerline markings	Traffic and safety devices	4%	5%	⊙								All	
	Regulatory/warning signs (emergency)	Traffic and safety devices	1%	0%	⊙								All	
	Hazardous debris	Shoulders	13%	6%				7				NE, SW	NC, NW, SE	
Safety	Delineators	Traffic and safety devices	21%	25%	⊙								NW, SE, SW	NC, NE
	Edgeline	Traffic and safety devices	6%	6%	⊙								NC, NE, NW, SW	SE
	Other signs (emergency repair)	Traffic and safety devices	1%	1%	⊙								All	
	Protective barriers	Traffic and safety devices	4%	3%	⊙							NE, SE	NC, NW, SW	
	Raised pavement markers	Traffic and safety devices	18%	25%					7			SE	SW	NC, NE, NW
	Regulatory/warning signs (routine)	Traffic and safety devices	31%	35%	⊙								NC, NE, SE, SW	NW
	Special pavement markings	Traffic and safety devices	3%	25%						17				All
	Drop-off/build-up (unpaved)	Shoulders	40%	30%				10				NW, SE, SW	NC, NE	
	Fences	Roadsides	3%	14%							11			All
	Mowing	Roadsides	39%	40%	⊙							NE	SE, SW	NC, NW
Mowing for vision	Roadsides	2%	5%	⊙								All		

<sup>3</sup> ⊙ This symbol indicates that the percent backlogged for that feature is the same as the target, or within 5 percentage points.

Contribution Category	Feature	Element	Statewide						Regions						
			Actual % backlog 2006	Target % backlog 2006	On target <sup>3</sup>	Gap if target missed						Worse condition	On Target	Better condition	
						Worse condition			Better condition						
						20	10	0	0	10	20				
	Woody vegetation control	Roadsides	3%	5%	⊙								All		
	Woody vegetation control for vision	Roadsides	1%	3%	⊙								All		
Ride/Comfort	Other signs (routine)	Traffic and safety devices	55%	65%					10				NC, NE	NW, SE, SW	
	Potholes/raveling (paved)	Shoulders	5%	10%	⊙								NW, SE, SW	NC, NE	
	Cross-slope (unpaved)	Shoulders	25%	20%	⊙							NW, SE	NE, SW	NC	
Stewardship	Cracking (paved)	Shoulders	50%	60%					10			SE		NC, NE, NW, SW	
	Erosion (unpaved)	Shoulders	3%	5%	⊙								All		
	Culverts	Drainage	15%	15%	⊙							NE, NW	NC, SW	SE	
	Curb & gutter	Drainage	8%	10%	⊙							NW	NC	NE, SE, SW	
	Ditches	Drainage	3%	2%	⊙							SE	NC, NE, NW, SW		
	Flumes	Drainage	27%	30%	⊙				8			NC, NW	SE	NE, SW	
	Storm sewer system	Drainage	9%	10%	⊙							SE	NE, NW, SW	NC	
	Under-drains/edge-drains	Drainage	13%	25%					12			SW	SE	NC, NE, NW	
	Barriers	Roadsides	--	5%											
	Noxious weeds	Roadsides	34%	50%					16				NE, SE	NC, NW, SW	
Aesthetics	Litter	Roadsides	64%	75%					11					All	

## Wisconsin 2006: Compass Report on Paved Traveled Way Conditions

Element	What are we spending?			Feature	How much of the system still needs work at the end of the maintenance season?			How well maintained is the system?						
	Dollars spent <sup>4</sup> (in millions)				Condition change: 2004 to 2006	% of system backlogged			2006 Feature grades					
	FY 02	FY 04	FY 06			2002	2004	2006	A	B	C	D	F	
Traveled way, asphalt	--	21.1 22.5 0.67 0.72	18.0 18.0 0.57 0.57	Alligator cracking	↓	1	1	2	×					
				Block cracking	↑	2	4	2	×					
				Edge raveling	↓	15	15	17		×				
				Flushing	--	0	0	0	×					
				Longitudinal cracking	↓↓	17	49	62						×
				Longitudinal distortion	--	0	0	0	×					
				Patch deterioration	↓	10	6	7		×				
				Rutting	↓	6	3	7		×				
				Surface raveling	--	0	0	0	×					
				Transverse cracking	↓↓	18	49	62						×
				Transverse distortion	--	0	0	0	×					
Traveled way, concrete	--	3.1 3.3 0.10 0.11	4.0 4.0 0.13 0.13	Distressed joints/cracks	↓	16	16	18			×			
				Longitudinal joint distress	↑	2	1	0	×					
				Patch deterioration	--	19	18	18			×			
				Slab breakup	↓	33	28	29			×			
				Surface distress	↑	16	9	8		×				
				Transverse faulting	↑↑	77	69	61						×

<sup>4</sup> The dollar values listed in each column show the nominal dollars, real dollars (in 2006 constant dollars), nominal dollars per one thousand lane miles, and real dollars (in 2006 constant dollars) per one thousand lane miles, respectively.

Arrows indicate a condition change from 2004 to 2006 (↑ = improved condition/lower backlog percentage, ↓ = worse condition/higher backlog percentage).

## Wisconsin 2006: Compass Report on Highway Maintenance Conditions

Element	What are we spending?				Feature	How much of the system still needs work at the end of the maintenance season?				How well maintained is the system?						
	Dollars spent (in millions) <sup>5</sup>					Condition change: 2005 to 2006 <sup>6</sup>	% of system backlogged				2006 Feature grades					
	FY 03	FY 04	FY 05	FY 06			2003	2004	2005	2006	A	B	C	D	F	
Traffic & safety (selected)	17.8 19.5 0.57 0.62	16.9 18.0 0.54 0.57	15.8 16.3 0.50 0.52	16.4 16.4 0.52 0.52	Centerline markings	↑	6	5	5	4		×				
					Delineators	↑	19	21	24	21			×			
					Edgeline markings	↓	11	7	5	6		×				
					Other signs (emergency repair)	--	2	0	1	1	×					
					Other signs (routine)	↑	n/a	46	59	55					×	
					Protective barriers	--	18	3	4	4	×					
					Raised pavement markers	↓	11	15	15	18			×			
					Reg./warning signs (emergency)	--	6	1	1	1	×					
					Reg./warning signs (routine)	↑↑	n/a	36	41	31					×	
Special pavement markings	↑	15	13	5	3	×										
Shoulders	9.3 10.2 0.30 0.33	8.2 8.8 0.26 0.28	7.5 7.7 0.24 0.24	8.2 8.2 0.26 0.26	Hazardous debris	↓	9	13	12	13				×		
					Cracking (paved)	↑	46	51	52	50				×		
					Potholes/raveling (paved)	↑	7	5	7	5	×					
					Cross-slope (unpaved)	↓↓	14	15	14	25			×			
					Drop-off/build-up (unpaved)	↓	45	37	36	40					×	

<sup>5</sup> The dollar values listed in each column show the nominal dollars, real dollars (in 2006 constant dollars), nominal dollars per one thousand lane miles, and real dollars (in 2006 constant dollars) per one thousand lane miles, respectively.

<sup>6</sup> Arrows indicate a condition change from 2005 to 2006 (↑= improved condition/lower backlog percentage, ↓= worse condition/higher backlog percentage). Double arrows indicate a change of 8 or more percentage points.

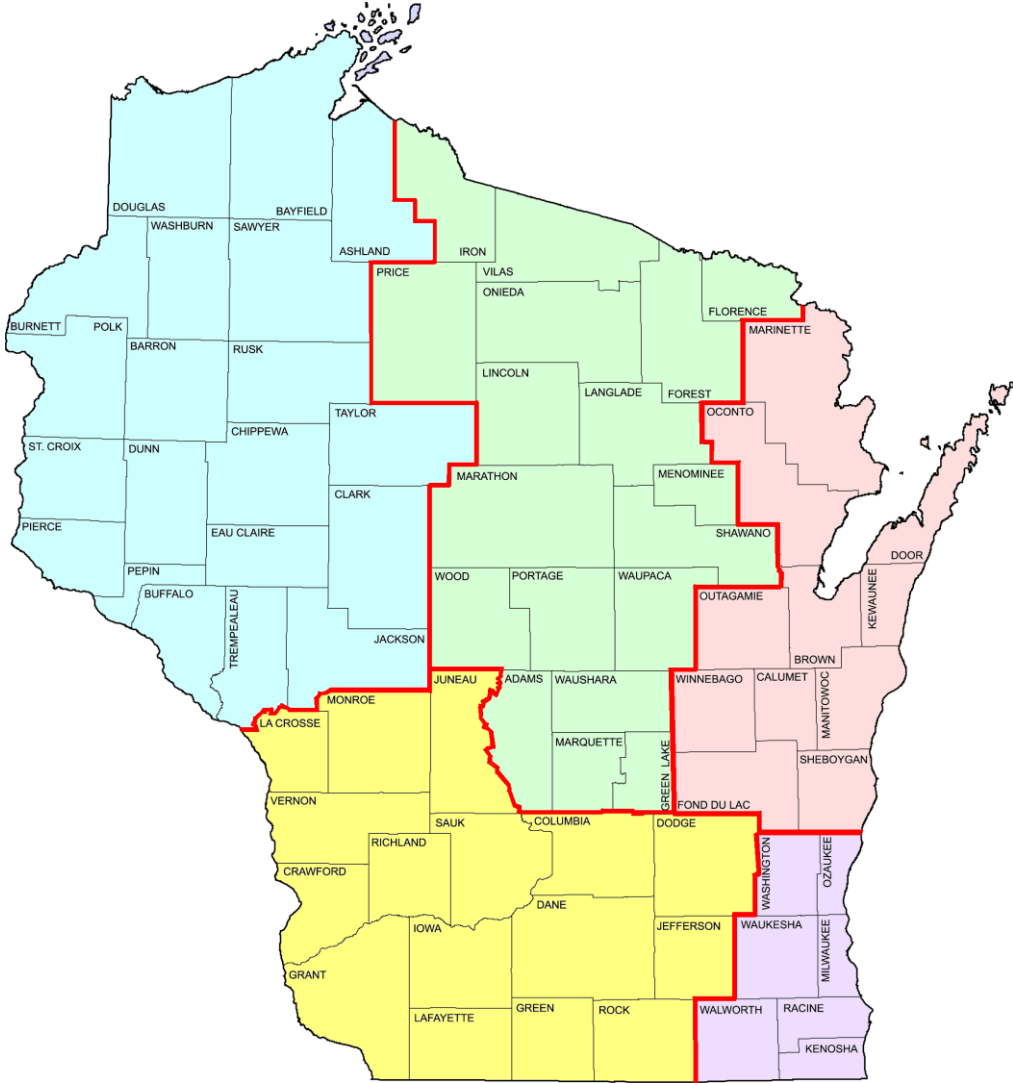
Element	What are we spending?				Feature	How much of the system still needs work at the end of the maintenance season?				How well maintained is the system?						
	Dollars spent (in millions) <sup>5</sup>					Condition change: 2005 to 2006 <sup>6</sup>	% of system backlogged				2006 Feature grades					
	FY 03	FY 04	FY 05	FY 06			2003	2004	2005	2006	A	B	C	D	F	
					Erosion (unpaved)	--	3	3	3	<b>3</b>	×					
Drainage					Culverts	↑	14	17	18	<b>15</b>		×				
	6.5	6.5	5.7	5.1	Curb & gutter	↓	8	6	7	<b>8</b>	×					
	7.1	6.9	5.9	5.1	Ditches	↓	2	2	2	<b>3</b>	×					
	0.21	0.21	0.18	0.16	Flumes	↓	20	32	19	<b>27</b>			×			
	0.23	0.22	0.19	0.16	Storm sewer system	--	8	9	9	<b>9</b>		×				
					Under-drains/edge-drains	↑	15	14	20	<b>13</b>		×				
Roadsides					Barriers	n/a	2	n/a <sup>7</sup>	n/a	n/a						
					Fences	↓	14	4	2	<b>3</b>	×					
	23.4	19.4	20.2	21.9	Litter	↓	67	70	62	<b>64</b>				×		
	25.6	20.7	20.9	21.9	Mowing	↓	n/a <sup>8</sup>	40	35	<b>39</b>			×			
	0.75	0.62	0.64	0.69	Mowing for vision	n/a	n/a <sup>9</sup>	26	n/a	<b>2</b>	×					
	0.82	0.66	0.66	0.69	Noxious weeds	↓	19	30	29	<b>34</b>			×			
					Woody vegetation	--	4	4	3	<b>3</b>	×					
					Woody veg. control for vision	--	0	1	1	<b>1</b>	×					

<sup>7</sup> There were not enough field observations of noise barriers and retaining walls to draw a valid conclusion about their condition in years 2004, 2005 and 2006.

<sup>8</sup> There were not enough field observations of mowing to draw a valid conclusion about condition in the year 2003.

<sup>9</sup> There were not enough field observations of mowing for vision to draw a valid conclusion about condition in the years 2003 and 2005.

# Wisconsin Regional Map





## Regions 2006: Compass Report on Highway Maintenance Conditions

Element	Feature	How much of the system needs work at the end of the season? <i>What did it cost to achieve this condition?</i>					
		Region <sup>10</sup> Percent of System Backlogged					
		NC	NE	NW	SE	SW	Statewide
Traveled way, asphalt	Alligator cracking	1	2	-	3	-	2
	Block cracking	2	2	-	2	-	2
	Edge raveling	14	15	-	26	-	17
	Flushing	0	0	-	0	-	0
	Longitudinal cracking	58	74	-	64	-	62
	Longitudinal distortion	0	0	-	0	-	0
	Patch deterioration	5	6	-	14	-	7
	Rutting	12	5	-	4	-	7
	Surface raveling	0	0	-	0	-	0
	Transverse cracking	62	62	-	72	-	62
	Transverse distortion	0	0	-	0	-	0
	Dollars spent on traveled way, asphalt (in millions)	\$3.5	\$2.0	\$4.0	\$4.4	\$4.1	\$18.0
Traveled way, concrete	Distressed joints/cracks	19	21	-	21	-	18
	Longitudinal joint distress	0	0	-	0	-	0
	Patch deterioration	16	22	-	22	-	18
	Slab breakup	28	29	-	38	-	29
	Surface distress	2	4	-	4	-	8
	Transverse faulting	76	40	-	91	-	61
	Dollars spent on traveled way, concrete (in millions)	\$0.3	\$0.6	\$0.7	\$1.0	\$1.4	\$4.0
Traffic and safety (selected devices)	Centerline markings	2	5	5	1	3	4
	Delineators	12	18	29	26	20	21
	Edgeline	6	5	8	0	6	6
	Other signs (emergency repair)	1	0	3	1	2	1
	Other signs (routine)	61	60	52	48	56	55
	Protective barriers	0	13	1	10	0	4
	Raised pavement markers	14	16	15	31	20	18
	Regulatory/warning signs (emergency)	0	1	3	1	3	1
	Regulatory/warning signs (routine)	35	39	26	30	31	31
	Special pavement markings	4	5	3	2	2	3
	Dollars spent on traffic and safety (selected) (in millions)	\$2.9	\$2.4	\$2.7	\$5.0	\$3.4	\$16.4
Shoulders	Hazardous debris	9	15	8	8	19	13
	Cracking (paved)	42	54	48	69	46	50
	Potholes/raveling (paved)	4	2	6	6	5	5
	Cross-slope (unpaved)	13	21	31	41	25	25
	Drop-off/build-up (unpaved)	35	34	43	52	42	40
	Erosion (unpaved)	0	1	3	5	6	3

<sup>10</sup> Because of the biennial testing schedule for traveled way, very few pavement segments are tested in regions NW and SW in 2006 and they are not enough to represent the whole region.

		<b>How much of the system needs work at the end of the season?</b> <i>What did it cost to achieve this condition?</i>					
Element	Feature	Region <sup>10</sup> Percent of System Backlogged					
		NC	NE	NW	SE	SW	Statewide
	Dollars spent on shoulders (in millions)	\$2.0	\$0.8	\$1.8	\$1.1	\$2.5	\$8.2
Drainage	Culverts	10	23	21	5	17	15
	Curb & gutter	6	3	23	3	2	8
	Ditches	1	2	1	8	2	3
	Flumes	36	11	45	26	17	27
	Storm sewer system	0	13	8	16	10	9
	Under-drains/edge-drains	1	12	6	21	32	13
	Dollars spent on drainage (in millions)	\$0.4	\$0.6	\$1.1	\$1.6	\$1.4	\$5.1
Roadsides	Barriers	--	--	--	--	--	--
	Fences	0	0	7	0	5	3
	Litter	68	65	58	60	68	64
	Mowing	29	61	32	42	42	39
	Mowing for vision	0	0	5	3	3	2
	Noxious weeds	29	47	15	52	43	34
	Woody vegetation control	2	2	1	1	6	3
	Woody vegetation control for vision	3	0	2	2	1	1
	Dollars spent on roadsides (in millions)	\$2.9	\$2.4	\$4.2	\$6.3	\$6.2	\$21.9

## 2006 Winter: Compass Report on Winter Operations

The Bureau of Highway Operations (BHO) reports winter performance measures in the Annual Winter Maintenance Report and is now in the process of developing standards for those performance measures. As standards get developed, this Compass Report on Winter Operations will begin measuring how we are meeting expectations.

The BHO 2005-2006 Annual Winter Maintenance Report – with more operational detail – can be found on the winter reports home page ([http://dotnet/dtid\\_bho/extranet/winter/reports/index.htm](http://dotnet/dtid_bho/extranet/winter/reports/index.htm) from inside WisDOT or [https://trust.dot.state.wi.us/extntgtwy/dtid\\_bho/extranet/winter/reports/index.htm](https://trust.dot.state.wi.us/extntgtwy/dtid_bho/extranet/winter/reports/index.htm) from outside WisDOT).

### Statewide measures for winter

		2005-06	2004-05	2003-04
Winter severity index		<b>31.8</b>	<b>31.9</b>	<b>31.2</b>
Time to bare/wet pavement		<b>1 hour 55 minutes</b> after the storm ended	<b>2 hours 4 minutes</b> after the storm ended	<b>2 hours 38 minutes</b> after the storm ended
Cost per Lane Mile	(in nominal dollars)	<b>\$1,400</b>	<b>\$1,374</b>	<b>\$1,279</b>
	(in 2006 dollars)	<b>\$1,400</b>	<b>\$1,418</b>	<b>\$1,365</b>
Winter Related Crash		<b>24 per 100 million</b> vehicle miles traveled	<b>25 per 100 million</b> vehicle miles traveled	<b>26 per 100 million</b> vehicle miles traveled

### Key findings

- In keeping with WisDOT's guidelines, during similar storm events, drivers on major urban freeways and highways have less time to wait until they see bare/wet pavement than do drivers on secondary roads. From storm to storm, however, most of the variability in this time is due to weather effects (type, duration and severity of storms throughout the winter season).
- The average time to bare/wet pavement during winter 2005-06 was 1 hour and 55 minutes, which is nine minutes less than the previous winter. The average Winter Severity Index (WSI) in 2005-06 was 31.8 versus 31.9 in the previous year.

The detailed Compass Report on Winter Operations begins on page 52 of this document.

## Wisconsin and Regions 2006: Compass Report on Bridges

### Bridge Condition

Feature	Region Percent of Bridges											
	NC		NE		NW		SE		SW		statewide	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Decks in Fair <sup>11</sup> condition	18%	19%	25%	23%	40%	44%	56%	51%	24%	24%	34%	33%
Superstructures in Fair condition	13%	14%	16%	15%	34%	35%	52%	52%	20%	20%	29%	29%
Substructures in Fair condition	18%	17%	30%	27%	32%	34%	53%	51%	17%	16%	31%	29%
<b>Number of state-maintained bridges</b>	<b>600</b>	<b>604</b>	<b>759</b>	<b>771</b>	<b>1023</b>	<b>1040</b>	<b>1073</b>	<b>1034</b>	<b>1423</b>	<b>1451</b>	<b>4878</b>	<b>4900</b>
<b>Dollar spent on bridges (in millions)</b>											<b>\$10.6</b>	<b>\$10.5</b>

### Bridge Maintenance Needs

Maintenance Action	Region Percent of Bridges needing maintenance # of Bridges needing maintenance											
	NC		NE		NW		SE		SW		statewide	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Deck – Seal Surface Cracks	9%	24%	5%	13%	8%	8%	8%	12%	4%	8%	7%	11%
	53	144	40	102	86	78	88	122	52	114	319	560
Expansion Joints – Seal	4%	8%	14%	22%	2%	1%	11%	15%	2%	3%	6%	8%
	23	48	105	167	20	11	114	150	31	39	293	415
Misc. – Cut Brush	1%	2%	1%	2%	9%	8%	8%	13%	3%	5%	5%	7%
	6	12	4	18	91	85	84	138	38	68	223	321
Approach – Seal Approach to Paving Block	1%	1%	1%	2%	15%	17%	2%	6%	2%	5%	4%	7%
	4	4	7	15	151	175	25	63	24	74	211	331
Approach - Wedge Approach	2%	2%	0%	1%	3%	3%	7%	11%	3%	4%	3%	5%
	9	14	1	5	30	31	71	109	38	65	149	224
Drainage – Repair	1%	1%	2%	7%	4%	5%	6%	11%	1%	3%	3%	6%

<sup>11</sup> Bridge decks, superstructures, and substructures that receive NBI ratings of 5 or 6 are regarded to be in fair condition and warrant reactive maintenance treatments

<b>Maintenance Action</b>	<b>Region</b>												
	Percent of Bridges needing maintenance												
	# of Bridges needing maintenance												
	<b>NC</b>		<b>NE</b>		<b>NW</b>		<b>SE</b>		<b>SW</b>		<b>statewide</b>		
<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>	<b>2006</b>
Washouts / Erosion	6	8	15	56	40	50	65	112	21	46	147	272	
Deck – Patching	1%	10%	4%	6%	1%	4%	5%	8%	1%	2%	3%	5%	
	7	61	29	48	15	37	55	87	16	33	122	266	

## Wisconsin and Regions 2006: Compass Report on Signs

### Wisconsin 2006: Sign Condition

	Regulatory/Warning/School Signs				Other Signs			
	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>12</sup>	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>12</sup>
2005	160185	41%	65092	5.7	113693	59%	67449	6.0
2006	157742	31%	49457	5.0	126362	55%	69051	5.9

<sup>12</sup> When comparing the 'Average years beyond service life column', please note that starting with the 2006 data the useful life standard for signs with high intensity face material changes from 10 years to 12 years. The useful life standard for engineer-grade signs remained at 7 years.

**Regions 2006: Sign Condition**

Region	Regulatory/Warning/School Signs				Other Signs				
	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>12</sup>	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>12</sup>	
NC	2005	26164	45%	11746	6.1	18480	66%	12177	6.6
	2006	26117	35%	9097	5.4	20152	61%	12342	6.5
NE	2005	22246	47%	10346	5.4	20367	62%	12647	5.5
	2006	21520	39%	8463	5.0	21517	60%	12953	5.5
NW	2005	36737	37%	13606	5.4	29848	59%	17541	5.2
	2006	34087	26%	8883	4.7	31874	52%	16544	5.1
SE	2005	32872	32%	10533	4.9	21077	50%	10439	5.7
	2006	35226	30%	10426	4.7	26987	48%	12835	5.7
SW	2005	42166	45%	18861	6.3	23921	61%	14645	7.0
	2006	40792	31%	12588	5.1	25832	56%	14377	6.9

## ***Operational Reports***



## ***2006 Signs: Compass Report on Condition and Age Distribution***

Data in this section comes from the Sign Inventory Management System (SIMS). Reporting and analysis were done by Professor Teresa Adams of the University of Wisconsin, with Project Assistants Emil Juni and David Sokolowski, under the direction of WisDOT staff. This section covers only routine maintenance, not emergency replacement of knocked-down signs and related work.

### **Key Observations:**

- Note that the recommended service life is calculated based on the manufactured date of the signs instead of the installation date. It is possible that a sign is installed one year or more after it is manufactured.
- Routine maintenance of both regulatory/warning signs and other signs have high numbers of signs backlogged, or beyond their recommended service life. A higher rate of backlog for other signs (55%, a decline from last year's 59%) than for regulatory/warning signs (31%, an improvement from last year's 41%) is a result of WisDOT priorities that allocate all routine sign maintenance resources to regulatory/warning signs.
- Since WisDOT places a higher priority on routine maintenance of regulatory and warning signs than of other signs, 30% of other signs are being used more than five years beyond their recommended service life while 14% of regulatory and warning signs are being used more than five years beyond their recommended service life.
- The NW region has the lowest percentages of signs backlogged for routine maintenance at 26% for regulatory/warning signs, while the SE region has the lowest backlog percentage for other signs at 48%.
- The backlog for routine maintenance in the counties ranges from 13% to 77% for regulatory/warning signs and from 33% to 82% for other signs. Taylor County has the lowest percentages of backlog for regulatory/warning signs and Rusk County has the lowest percentages of backlog for other signs.

### Wisconsin 2006: Sign Condition

	Regulatory/Warning/School Signs				Other Signs			
	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>13</sup>	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>13</sup>
2005	160185	41%	65092	5.7	113693	59%	67449	6.0
2006	157742	31%	49457	5.0	126362	55%	69051	5.9

### Regions 2006: Sign Condition

Region	Regulatory/Warning/School Signs				Other Signs			
	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>13</sup>	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life <sup>13</sup>
NC	26117	35%	9097	5.4	20152	61%	12342	6.5
NE	21520	39%	8463	5.0	21517	60%	12953	5.5
NW	34087	26%	8883	4.7	31874	52%	16544	5.1
SE	35226	30%	10426	4.7	26987	48%	12835	5.7
SW	40792	31%	12588	5.1	25832	56%	14377	6.9

<sup>13</sup> When comparing the 'Average years beyond service life column', please note that starting with the 2006 data the useful life standard for signs with high intensity face material changes from 10 years to 12 years. Useful life standard for engineer-grade signs remained at 7 years.

## Counties 2006: Sign Condition

Region	County	Regulatory/Warning/School Signs				Other Signs			
		Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life
NC	ADAMS	919	16%	147	4.5	705	55%	387	5.0
	FLORENCE	492	53%	262	6.7	442	71%	312	9.7
	FOREST	1269	35%	442	6.4	1008	50%	500	8.7
	GREEN LAKE	826	21%	172	4.2	710	73%	518	6.7
	IRON	1044	56%	588	6.0	846	60%	506	8.4
	LANGLADE	1202	56%	670	6.8	1206	82%	986	9.8
	LINCOLN	1425	34%	489	6.9	1358	62%	842	9.2
	MARATHON	3925	22%	870	4.5	2564	47%	1210	5.5
	MARQUETTE	959	30%	287	4.7	970	82%	792	4.6
	MENOMINEE	421	32%	133	4.5	168	52%	87	5.2
	ONEIDA	1888	67%	1272	6.2	1325	75%	994	7.3
	PORTAGE	2158	33%	710	4.1	2095	56%	1177	4.1
	PRICE	1025	77%	785	5.6	1078	65%	697	6.5
	SHAWANO	295	38%	112	4.3	366	57%	207	3.6
VILAS	1547	59%	915	5.9	947	75%	711	7.6	

Region	County	Regulatory/Warning/School Signs				Other Signs			
		Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life
	WAUPACA	2638	21%	546	3.7	1809	53%	966	4.4
	WAUSHARA	1812	19%	353	2.5	1290	71%	919	5.4
	WOOD	2272	15%	344	4.5	1265	42%	531	5.5
NE	BROWN	3021	35%	1058	4.6	3902	66%	2568	5.7
	CALUMET	927	35%	323	0.0	1072	60%	638	5.1
	DOOR	1653	42%	700	4.4	994	70%	697	4.5
	FOND DU LAC	2471	41%	1009	0.0	2361	50%	1169	NA
	KEWAUNEE	569	37%	210	5.0	522	69%	362	5.0
	MANITOWOC	1727	52%	894	5.0	1973	74%	1466	5.6
	MARINETTE	1397	38%	532	5.1	1292	52%	674	5.3
	OCONTO	1658	17%	280	4.6	1216	39%	472	4.6
	OUTAGAMIE	3093	46%	1415	5.5	2659	64%	1695	5.5
	SHEBOYGAN	2592	41%	1069	4.8	3035	68%	2049	5.1
WINNEBAGO	2412	40%	973	4.9	2491	47%	1163	5.7	
NW	ASHLAND	1219	22%	271	3.4	905	51%	462	4.5
	BARRON	1802	29%	518	4.6	1701	53%	909	6.3
	BAYFIELD	1477	18%	273	2.7	1172	42%	488	4.4

Region	County	Regulatory/Warning/School Signs				Other Signs			
		Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life
	BUFFALO	1580	31%	495	7.8	1324	56%	739	7.8
	BURNETT	1214	22%	265	4.2	868	50%	432	5.2
	CHIPPEWA	2318	26%	606	4.7	2385	52%	1245	4.6
	CLARK	1796	16%	289	4.0	1435	50%	716	3.7
	DOUGLAS	1944	32%	616	3.7	1595	56%	898	4.6
	DUNN	2052	22%	456	4.4	2431	44%	1060	4.1
	EAU CLAIRE	2571	43%	1107	5.1	2537	57%	1440	4.6
	JACKSON	1662	36%	594	7.0	1695	60%	1010	7.8
	PEPIN	575	24%	137	4.8	635	52%	333	4.8
	PIERCE	1674	23%	387	3.7	2215	67%	1493	4.1
	POLK	2210	17%	372	4.0	1582	50%	785	5.1
	RUSK	1217	24%	293	4.0	908	33%	304	4.8
	SAWYER	1403	14%	199	3.8	1192	43%	514	4.6
	ST. CROIX	2552	23%	581	4.6	3014	50%	1496	4.3
	TAYLOR	978	13%	126	3.8	1013	42%	428	4.2
	TREMPEALEAU	1882	44%	819	6.2	1833	58%	1063	6.7
	WASHBURN	1961	24%	479	3.0	1434	51%	729	4.5

Region	County	Regulatory/Warning/School Signs				Other Signs			
		Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life
SE	KENOSHA	3809	33%	1261	4.4	3268	43%	1401	5.7
	MILWAUKEE	10191	32%	3263	5.0	8613	51%	4373	6.8
	OZAUKEE	1759	23%	398	4.0	1344	57%	763	5.9
	RACINE	4299	35%	1484	3.8	3388	50%	1696	5.0
	WALWORTH	3560	21%	745	5.2	2638	46%	1224	5.0
	WASHINGTON	3621	29%	1053	4.2	2916	44%	1279	4.7
	WAUKESHA	7987	28%	2222	5.1	4820	44%	2099	5.0
SW	COLUMBIA	3060	23%	695	5.6	1508	52%	790	6.5
	CRAWFORD	2152	24%	524	3.9	1531	56%	851	6.7
	DANE	6049	35%	2128	5.3	2766	58%	1615	6.4
	DODGE	2717	38%	1033	5.0	1555	57%	889	6.2
	GRANT	2899	40%	1162	5.4	1705	60%	1025	7.2
	GREEN	1488	22%	324	5.0	693	46%	318	7.0
	IOWA	1821	28%	508	5.9	1072	52%	553	7.3
	JEFFERSON	2108	28%	589	4.4	1108	55%	610	7.0
	JUNEAU	1870	25%	461	3.9	1750	60%	1054	6.3
	LA CROSSE	2750	28%	770	4.2	2482	61%	1502	7.2

Region	County	Regulatory/Warning/School Signs				Other Signs			
		Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life	Total Signs	%Backlog	Deficient Signs	Average Years Beyond Service Life
	LAFAYETTE	1193	51%	609	6.6	822	72%	591	8.5
	MONROE	2533	21%	537	4.5	2355	53%	1258	7.7
	RICHLAND	1896	34%	652	5.4	1529	46%	696	7.1
	ROCK	2254	41%	918	5.0	1505	53%	796	7.1
	SAUK	3264	25%	813	6.2	1265	53%	676	6.7
	VERNON	2738	32%	865	3.5	2186	53%	1153	6.6

## Wisconsin and Regions 2006: Sign Age Distribution

### Regulatory/warning/school signs

	Years prior to the end of service life							Years beyond service life						Total
	6-10	5	4	3	2	1	0	1	2	3	4	5-10	>10	
<b>State</b>	68663	6139	4247	6239	7269	8503	7225	7694	7934	6130	5455	17397	4847	157742
	44%	4%	3%	4%	5%	5%	5%	5%	5%	4%	3%	11%	3%	100%
<b>NC</b>	11170	1064	675	1047	1045	947	1072	1353	1187	1043	984	3372	1158	26117
	43%	4%	3%	4%	4%	4%	4%	5%	5%	4%	4%	13%	4%	100%
<b>NE</b>	7179	658	518	1054	1038	1347	1263	937	1297	1102	817	3708	602	21520
	33%	3%	2%	5%	5%	6%	6%	4%	6%	5%	4%	17%	3%	100%
<b>NW</b>	15598	1691	1176	1692	1321	1966	1760	1492	1824	1110	1044	2425	988	34087
	46%	5%	3%	5%	4%	6%	5%	4%	5%	3%	3%	7%	3%	100%
<b>SE</b>	15507	943	705	1126	2220	2605	1694	1877	1681	1379	1017	3646	826	35226
	44%	3%	2%	3%	6%	7%	5%	5%	5%	4%	3%	10%	2%	100%
<b>SW</b>	19209	1783	1173	1320	1645	1638	1436	2035	1945	1496	1593	4246	1273	40792
	47%	4%	3%	3%	4%	4%	4%	5%	5%	4%	4%	10%	3%	100%



## Guide and other signs

	Years prior to the end of service life							Years beyond service life						Total
	6-10	5	4	3	2	1	0	1	2	3	4	5-10	>10	
<b>State</b>	25292	1950	2518	4530	7753	8575	6693	8317	9043	6542	7986	26416	10747	126362
	20%	2%	2%	4%	6%	7%	5%	7%	7%	5%	6%	21%	9%	100%
<b>NC</b>	3730	288	195	595	975	967	1060	1732	1161	1410	999	4214	2826	20152
	19%	1%	1%	3%	5%	5%	5%	9%	6%	7%	5%	21%	14%	100%
<b>NE</b>	3746	181	475	766	1348	1132	916	1013	1693	1310	1729	6016	1192	21517
	17%	1%	2%	4%	6%	5%	4%	5%	8%	6%	8%	28%	6%	100%
<b>NW</b>	6104	575	645	1103	1735	2951	2217	1967	3252	1657	2897	4936	1835	31874
	19%	2%	2%	3%	5%	9%	7%	6%	10%	5%	9%	15%	6%	100%
<b>SE</b>	6609	352	616	1023	2307	1868	1377	2032	1498	1103	978	5346	1878	26987
	24%	1%	2%	4%	9%	7%	5%	8%	6%	4%	4%	20%	7%	100%
<b>SW</b>	5103	554	587	1043	1388	1657	1123	1573	1439	1062	1383	5904	3016	25832
	20%	2%	2%	4%	5%	6%	4%	6%	6%	4%	5%	23%	12%	100%

### Wisconsin and Regions 2006: Sign Inventory Management System Field Review Progress

Region	All signs		Not Field Reviewed <sup>14</sup>	Field Reviewed	
	Total Signs <sup>15</sup>	% Total		Field Reviewed	% Field Reviewed
NC	46275	16%	6	46269	99.99%
NE	43048	15%	11	43037	99.97%
NW	65988	23%	27	65961	99.96%
SE	62251	22%	38	62213	99.94%
SW	66662	23%	38	66624	99.94%
State	284224	100%	120	284104	99.96%

<sup>14</sup> Not Field Reviewed includes signs with no face data

<sup>15</sup> Erroneous records were not included in this report

### Wisconsin and Regions 2006: Sign Face Material Distribution

Face		Region					Statewide	
Grade	Type	NC	NE	NW	SE	SW	Total	Percentage
1	Non-Reflective	6	101	473	146	130	856	0.3%
	Other or Varies	19	7	750	21	1297	2094	0.7%
	Reflective - Engineering Grade	24852	25834	37017	34263	33101	155067	54.6%
2	Type D - Diamond Grade	34	12	5	12	204	267	0.1%
	Type F - Fluorescent	451	172	322	723	716	2384	0.8%
	Type H - High Intensity	19492	16357	25386	23597	28598	113430	39.9%
	Type HP - Prismatic High Intensity	1415	554	2008	3451	2578	10006	3.5%
Total		46269	43037	65961	62213	66624	284104	100.0%

## ***2006 Traveled Way: Compass Report on Maintenance Condition***

Data in this section comes from the Pavement Inventory File (PIF) dated March 2007 received from Mike Malaney. Reporting and analysis were done by Professor Teresa Adams of the University of Wisconsin, with Project Assistant Emil Juni and David Sokolowski, under the direction of WisDOT staff. Pavement condition reflects primarily dollars spent through WisDOT's improvement program.

### ***Key Observations:***

#### **Traveled way:**

- The procedure for calculating traveled way asphalt and concrete feature backlogs differed this year from previous years. Inspections of state-maintained highway pavements in Wisconsin are done regularly in two-year cycles, with half of the state's pavements inspected in one year, and the other half in the next year. In the past, for the annual backlog calculations, the most recently recorded inspection data was used to determine backlogs. For this report, 2006 pavement backlog numbers are calculated using only observations taken from each year's inspection. Backlog values from 2001 to 2005 were also recalculated using this new method to show trends.

## Pavement Testing Schedule Map

*Note: The below map is in color. If you are not viewing a color copy, please contact the Compass Program Manager at the Bureau of Highway Operations for a color version to be mailed or emailed to you*

The map below shows the pavement evaluation schedule in Wisconsin. Pavement inventory data is collected every two years with the data from half the state collected in one year and the other half of the state in the other year. The yellow shaded counties show the NW and SW regions with segments evaluated in 2001, 2003, and 2005 (odd years), while the green shaded counties show the NC, NE, and SE regions with segments evaluated in 2002, 2004, and 2006 (even years). There are a few exceptions to this rule with records of several segments that appear to have been tested in the different year as scheduled, but there are very few records of these segments available to validly represent the county or region where they are located.



## Wisconsin 2006: Traveled Way Maintenance Condition

### Asphalt Traveled Way

Distress	% of miles backlogged for year					
	Odd years			Even years		
	2001	2003	2005	2002	2004	2006
Alligator Cracking	2%	1%	3%	1%	1%	2%
Block Cracking	1%	2%	3%	2%	4%	2%
Edge Raveling	11%	11%	10%	15%	15%	17%
Flushing	1%	0%	0%	0%	0%	0%
Longitudinal Cracking	18%	26%	61%	17%	49%	62%
Longitudinal Distortion	0%	0%	0%	0%	0%	0%
Patch Deterioration	9%	7%	9%	10%	6%	7%
Rutting	9%	12%	6%	6%	3%	7%
Surface Raveling	1%	1%	0%	0%	0%	0%
Transverse Cracking	20%	23%	54%	18%	49%	62%
Transverse Distortion	0%	0%	0%	0%	0%	0%

### Concrete Traveled Way

Distress	% of miles backlogged for year					
	Odd years			Even years		
	2001	2003	2005	2002	2004	2006
Distressed Joint/Cracks	16%	20%	24%	16%	16%	18%
Longitudinal Joint Distress	10%	1%	0%	2%	1%	0%
Patch Deterioration	22%	18%	20%	19%	18%	18%
Slab Breakup	41%	35%	35%	33%	28%	29%
Surface Distress	3%	9%	2%	16%	9%	8%
Transverse Faulting	86%	73%	79%	77%	69%	61%

## Regional Trends: Traveled Way

### Asphalt traveled way

Distress	% of Miles Backlogged in Region <sup>16</sup>					
	Year	NC	NE	NW	SE	SW
Alligator Cracking	2001	--	--	1%	--	2%
	2003	--	--	0%	--	1%
	2005	--	--	3%	--	3%
	2002	1%	2%	--	2%	--
	2004	0%	1%	--	2%	--
	2006	1%	2%	--	3%	--
Block Cracking	2001	--	--	1%	--	3%
	2003	--	--	2%	--	2%
	2005	--	--	2%	--	4%
	2002	2%	2%	--	3%	--
	2004	4%	3%	--	4%	--
	2006	2%	2%	--	2%	--
Edge Raveling	2001	--	--	8%	--	17%
	2003	--	--	8%	--	15%
	2005	--	--	7%	--	14%
	2002	12%	15%	--	20%	--
	2004	11%	17%	--	23%	--
	2006	14%	15%	--	26%	--
Flushing	2001	--	--	1%	--	1%
	2003	--	--	1%	--	0%
	2005	--	--	0%	--	0%
	2002	0%	0%	--	0%	--
	2004	0%	0%	--	0%	--
	2006	0%	0%	--	0%	--
Longitudinal Cracking	2001	--	--	19%	--	20%
	2003	--	--	28%	--	26%
	2005	--	--	63%	--	62%
	2002	18%	16%	--	20%	--
	2004	50%	47%	--	66%	--
	2006	58%	64%	--	74%	--
Longitudinal Distortion	2001	--	--	0%	--	0%
	2003	--	--	0%	--	0%
	2005	--	--	0%	--	0%
	2002	0%	0%	--	0%	--
	2004	0%	0%	--	0%	--
	2006	0%	0%	--	0%	--
Patch Deterioration	2001	--	--	9%	--	10%

<sup>16</sup> Due to the biennial testing schedule for traveled way, there are not enough data taken to represent regions NW and SW in 2002, 2004 and 2006 and NC, NE, and SE in 2001, 2003, and 2005.

Distress	% of Miles Backlogged in Region <sup>16</sup>					
	Year	NC	NE	NW	SE	SW
	2003	--	--	6%	--	10%
	2005	--	--	7%	--	13%
	2002	8%	6%	--	14%	--
	2004	5%	4%	--	13%	--
	2006	5%	6%	--	14%	--
	2001	--	--	11%	--	10%
Rutting	2003	--	--	14%	--	11%
	2005	--	--	0%	--	13%
	2002	8%	5%	--	5%	--
	2004	6%	0%	--	0%	--
	2006	12%	5%	--	4%	--
	2001	--	--	1%	--	2%
Surface Raveling	2003	--	--	0%	--	1%
	2005	--	--	0%	--	0%
	2002	0%	0%	--	0%	--
	2004	0%	0%	--	0%	--
	2006	0%	0%	--	0%	--
	2001	--	--	25%	--	19%
Transverse Cracking	2003	--	--	30%	--	17%
	2005	--	--	63%	--	48%
	2002	20%	18%	--	19%	--
	2004	52%	46%	--	64%	--
	2006	62%	62%	--	72%	--
	2001	--	--	0%	--	0%
Transverse Distortion	2003	--	--	0%	--	0%
	2005	--	--	0%	--	0%
	2002	0%	0%	--	0%	--
	2004	0%	0%	--	0%	--
	2006	0%	0%	--	0%	--

### Concrete traveled way

Distress	% Miles Backlogged in Region					
	Year	NC	NE	NW	SE	SW
Distressed Joint/Cracks	2001	--	--	16%	--	17%
	2003	--	--	22%	--	20%
	2005	--	--	25%	--	24%
	2002	15%	16%	--	22%	--
	2004	16%	13%	--	25%	--
	2006	19%	21%	--	21%	--
Longitudinal Joint Distress	2001	--	--	10%	--	11%
	2003	--	--	0%	--	0%
	2005	--	--	0%	--	0%
	2002	1%	4%	--	0%	--
	2004	0%	0%	--	0%	--



Distress	% Miles Backlogged in Region					
	Year	NC	NE	NW	SE	SW
	2006	0%	0%	--	0%	--
Patch Deterioration	2001	--	--	17%	--	27%
	2003	--	--	17%	--	20%
	2005	--	--	20%	--	21%
	2002	17%	25%	--	23%	--
	2004	17%	20%	--	22%	--
	2006	16%	22%	--	22%	--
Slab Breakup	2001	--	--	35%	--	48%
	2003	--	--	35%	--	38%
	2005	--	--	35%	--	38%
	2002	31%	40%	--	45%	--
	2004	28%	28%	--	37%	--
	2006	28%	29%	--	38%	--
Surface Distress	2001	--	--	2%	--	4%
	2003	--	--	5%	--	10%
	2005	--	--	1%	--	3%
	2002	7%	14%	--	7%	--
	2004	4%	5%	--	4%	--
	2006	2%	4%	--	4%	--
Transverse Faulting	2001	--	--	90%	--	92%
	2003	--	--	81%	--	75%
	2005	--	--	78%	--	82%
	2002	80%	88%	--	91%	--
	2004	80%	62%	--	91%	--
	2006	76%	40%	--	91%	--

## Wisconsin 2006: Traveled Way Condition Distribution

### Asphalt traveled way

Distress	Condition <sup>17</sup> % of miles <sup>18</sup>			
	Excellent	Fair	Moderate	Poor
Alligator Cracking <sup>19</sup>	98%	1%	0%	0%
Block Cracking <sup>19</sup>	98%	1%	1%	0%
Edge Raveling	83%	16%	0%	1%
Flushing	100%	0%	0	0
Longitudinal Cracking <sup>19</sup>	38%	41%	17%	4%
Longitudinal Distortion	100%	0	0	0
Patch Deterioration	93%	3%	2%	2%
Rutting	93%	7%	0%	0%
Surface Raveling	100%	0%	0%	0%
Transverse Cracking <sup>19</sup>	38%	44%	15%	2%
Transverse Distortion	100%	0	0	0

### Concrete traveled way

Distress	Condition % of miles			
	Excellent	Fair	Moderate	Poor
Distressed Joint/Cracks	82%	10%	8%	0%
Longitudinal Joint Distress	100%	0%	0%	0%
Patch Deterioration	82%	13%	4%	1%
Slab Breakup	71%	22%	7%	0%
Surface Distress	92%	5%	3%	0%
Transverse Faulting	39%	61%	0%	0%

<sup>17</sup> Condition comes from WisDOT's Pavement Maintenance Management System and reflects extent and severity of distress.

<sup>18</sup> Rows may not sum to 100% due to rounding.

<sup>19</sup> Only miles with unsealed cracks are included in the % backlogged. Cracks in asphalt pavement may be sealed or unsealed.

## Regions 2006: Traveled Way Condition Distribution

### Asphalt traveled way

Distress	Condition	% of miles				
		Region <sup>20</sup>				
		NC	NE	NW	SE	SW
Alligator Cracking	Excellent	99%	98%		97%	
	Fair	1%	1%		2%	
	Moderate	0%	0%		1%	
	Poor	0%	0%		0%	
Block Cracking	Excellent	98%	98%		98%	
	Fair	1%	1%		1%	
	Moderate	1%	1%		0%	
	Poor	0%	0%		0%	
Edge Raveling	Excellent	86%	85%		74%	
	Fair	13%	14%		24%	
	Moderate	0%	0%		1%	
	Poor	0%	1%		1%	
Flushing	Excellent	100%	100%		100%	
	Fair	0%	0%		0%	
	Poor	0%	0%		0%	
Longitudinal Cracking	Excellent	42%	36%		26%	
	Fair	45%	43%		39%	
	Moderate	11%	16%		29%	
	Poor	3%	6%		6%	
Longitudinal Distortion	Excellent	100%	100%		100%	
	Fair	0%	0%		0%	
	Moderate	0%	0%		0%	
	Poor	0%	0%		0%	
Patch Deterioration	Excellent	95%	94%		86%	
	Fair	2%	2%		5%	
	Moderate	1%	2%		5%	
	Poor	1%	2%		5%	
Rutting	Excellent	88%	95%		96%	
	Fair	12%	4%		4%	
	Poor	0%	0%		0%	
Surface Raveling	Excellent	100%	100%		100%	
	Fair	0%	0%		0%	
	Moderate	0%	0%		0%	
	Poor	0%	0%		0%	
Transverse Cracking	Excellent	38%	38%		28%	
	Fair	47%	48%		44%	
	Moderate	14%	12%		24%	
	Poor	2%	3%		4%	

<sup>20</sup> Due to the biennial testing schedule for traveled way, there are not enough data taken to represent regions NW and SW in 2006.

Transverse Distortion	Excellent	100%	100%	100%
	Fair	0%	0%	0%
	Moderate	0%	0%	0%
	Poor	0%	0%	0%

### Concrete traveled way

Distress	Condition	% of miles				
		Region <sup>20</sup>				
		NC	NE	NW	SE	SW
Distressed Joint/Cracks	Excellent	81%	79%		79%	
	Fair	15%	10%		6%	
	Moderate	4%	10%		14%	
	Poor	0%	0%		1%	
Longitudinal Joint Distress	Excellent	100%	100%		100%	
	Fair	0%	0%		0%	
	Moderate	0%	0%		0%	
	Poor	0%	0%		0%	
Patch Deterioration	Excellent	84%	78%		78%	
	Fair	10%	17%		16%	
	Moderate	6%	4%		5%	
	Poor	0%	2%		1%	
Slab Breakup	Excellent	72%	71%		62%	
	Fair	22%	22%		28%	
	Moderate	6%	8%		10%	
	Poor	0%	0%		0%	
Surface Distress	Excellent	98%	96%		96%	
	Fair	0%	0%		0%	
	Moderate	2%	4%		4%	
Transverse Faulting	Excellent	24%	60%		9%	
	Fair	76%	40%		91%	
	Moderate	0%	0%		0%	
	Poor	0%	0%		0%	

## Counties 2006: Traveled Way

### Asphalt traveled way

Region	County	% of miles backlogged										
		Alligator Cracking	Block Cracking	Edge Raveling	Flushing	Longitudinal Cracking	Longitudinal Distortion	Patch Deterioration	Rutting	Surface Raveling	Transverse Cracking	Transverse Distortion
NC	ADAMS	0%	9%	22%	0%	82%	0%	0%	16%	0%	82%	0%
	FLORENCE	0%	0%	16%	0%	43%	0%	5%	9%	0%	47%	0%
	FOREST	1%	0%	4%	0%	31%	0%	2%	2%	0%	61%	0%
	GREEN LAKE	0%	2%	14%	0%	57%	0%	7%	0%	0%	71%	0%
	IRON	0%	0%	14%	0%	61%	0%	2%	7%	0%	63%	0%
	LANGLADE	0%	0%	17%	0%	74%	0%	4%	15%	1%	74%	0%
	LINCOLN	2%	1%	2%	0%	39%	0%	3%	6%	0%	47%	0%
	MARATHON	4%	1%	21%	0%	64%	0%	12%	26%	0%	74%	0%
	MARQUETTE	1%	0%	6%	0%	62%	0%	3%	18%	0%	72%	0%
	MENOMINEE	0%	0%	63%	0%	56%	0%	3%	0%	0%	56%	0%
	ONEIDA	0%	1%	5%	0%	54%	0%	3%	15%	0%	56%	0%
	PORTAGE	2%	7%	13%	0%	67%	0%	4%	7%	1%	64%	0%
	PRICE	2%	0%	12%	0%	68%	0%	2%	13%	1%	69%	0%
	SHAWANO	1%	2%	17%	0%	65%	0%	2%	12%	0%	65%	0%
	VILAS	1%	0%	17%	0%	54%	0%	6%	6%	0%	55%	0%
	WAUPACA	0%	6%	22%	0%	69%	0%	7%	17%	0%	65%	0%
WAUSHARA	0%	3%	18%	0%	34%	0%	9%	4%	0%	35%	0%	
WOOD	3%	0%	8%	0%	62%	0%	7%	19%	0%	61%	0%	
NE	BROWN	0%	4%	9%	0%	72%	0%	4%	2%	0%	61%	0%
	CALUMET	0%	0%	7%	0%	51%	0%	3%	0%	0%	66%	0%

Region	County	% of miles backlogged										
		Alligator Cracking	Block Cracking	Edge Raveling	Flushing	Longitudinal Cracking	Longitudinal Distortion	Patch Deterioration	Rutting	Surface Raveling	Transverse Cracking	Transverse Distortion
	DOOR	0%	1%	7%	0%	75%	0%	5%	9%	0%	69%	0%
	FOND DU LAC	4%	1%	38%	0%	79%	0%	8%	2%	0%	79%	0%
	KEWAUNEE	0%	2%	7%	0%	38%	0%	0%	0%	0%	30%	0%
	MANITOWOC	0%	5%	13%	0%	62%	0%	6%	1%	0%	55%	0%
	MARINETTE	3%	0%	14%	0%	70%	0%	5%	2%	0%	70%	0%
	OCONTO	3%	4%	16%	0%	65%	0%	5%	6%	0%	70%	0%
	OUTAGAMIE	4%	1%	18%	0%	69%	0%	10%	14%	0%	64%	0%
	SHEBOYGAN	0%	1%	7%	0%	49%	0%	1%	12%	0%	48%	0%
	WINNEBAGO	1%	0%	18%	0%	58%	0%	10%	1%	0%	58%	0%
NW	ASHLAND	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	BARRON	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	BAYFIELD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	BUFFALO	--	--	--	--	--	--	--	--	--	--	--
	BURNETT	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	CHIPPEWA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	CLARK	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	DOUGLAS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	DUNN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	EAU CLAIRE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	JACKSON	--	--	--	--	--	--	--	--	--	--	--
	PEPIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	PIERCE	--	--	--	--	--	--	--	--	--	--	--
	POLK	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
RUSK	--	--	--	--	--	--	--	--	--	--	--	

Region	County	% of miles backlogged										
		Alligator Cracking	Block Cracking	Edge Raveling	Flushing	Longitudinal Cracking	Longitudinal Distortion	Patch Deterioration	Rutting	Surface Raveling	Transverse Cracking	Transverse Distortion
	SAWYER	--	--	--	--	--	--	--	--	--	--	--
	ST. CROIX	--	--	--	--	--	--	--	--	--	--	--
	TAYLOR	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	TREMPEALEAU	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	WASHBURN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SE	KENOSHA	2%	3%	22%	0%	66%	0%	7%	2%	0%	64%	0%
	MILWAUKEE	1%	1%	35%	0%	80%	0%	27%	2%	0%	80%	0%
	OZAUKEE	9%	0%	34%	0%	91%	0%	15%	6%	0%	89%	0%
	RACINE	3%	2%	22%	0%	64%	0%	10%	4%	0%	65%	0%
	WALWORTH	4%	4%	23%	0%	69%	0%	10%	7%	0%	60%	0%
	WASHINGTON	2%	2%	23%	0%	76%	0%	8%	3%	0%	73%	0%
	WAUKESHA	4%	0%	20%	1%	77%	0%	12%	4%	0%	74%	0%
SW	COLUMBIA	--	--	--	--	--	--	--	--	--	--	--
	CRAWFORD	--	--	--	--	--	--	--	--	--	--	--
	DANE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	DODGE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	GRANT	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	GREEN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	IOWA	--	--	--	--	--	--	--	--	--	--	--
	JEFFERSON	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	JUNEAU	--	--	--	--	--	--	--	--	--	--	--
	LA CROSSE	--	--	--	--	--	--	--	--	--	--	--
	LAFAYETTE	--	--	--	--	--	--	--	--	--	--	--
MONROE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Region	County	% of miles backlogged										
		Alligator Cracking	Block Cracking	Edge Raveling	Flushing	Longitudinal Cracking	Longitudinal Distortion	Patch Deterioration	Rutting	Surface Raveling	Transverse Cracking	Transverse Distortion
	RICHLAND	--	--	--	--	--	--	--	--	--	--	--
	ROCK	--	--	--	--	--	--	--	--	--	--	--
	SAUK	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	VERNON	--	--	--	--	--	--	--	--	--	--	--



## Concrete traveled way

Region	County	% of miles backlogged					
		Distressed Joint/Cracks	Longitudinal/ Joint Distress	Patch Deterioration	Slab Breakup	Surface Distress	Transverse Faulting
NC	ADAMS	0%	0%	14%	0%	0%	93%
	FLORENCE	0%	0%	0%	0%	0%	0%
	FOREST	0%	0%	0%	0%	0%	0%
	GREEN LAKE	100%	0%	0%	0%	0%	100%
	IRON	--	--	--	--	--	--
	LANGLADE	--	--	--	--	--	--
	LINCOLN	17%	0%	28%	46%	0%	80%
	MARATHON	39%	0%	25%	46%	3%	88%
	MARQUETTE	12%	0%	0%	24%	0%	53%
	MENOMINEE	--	--	--	--	--	--
	ONEIDA	33%	0%	0%	33%	0%	33%
	PORTAGE	8%	0%	23%	20%	5%	70%
	PRICE	--	--	--	--	--	--
	SHAWANO	11%	0%	7%	19%	0%	64%
	VILAS	--	--	--	--	--	--
	WAUPACA	10%	0%	0%	12%	0%	83%
	WAUSHARA	5%	0%	16%	18%	8%	61%
WOOD	20%	0%	13%	20%	7%	80%	
NE	BROWN	26%	0%	35%	48%	12%	23%
	CALUMET	25%	0%	0%	25%	0%	50%
	DOOR	36%	0%	36%	73%	0%	45%
	FOND DU LAC	12%	0%	16%	20%	3%	23%
	KEWAUNEE	--	--	--	--	--	--
	MANITOWOC	44%	0%	22%	50%	6%	75%
	MARINETTE	40%	0%	53%	60%	0%	100%
	OCONTO	4%	0%	0%	4%	0%	68%
	OUTAGAMIE	32%	0%	20%	19%	7%	35%
	SHEBOYGAN	13%	0%	35%	39%	1%	91%
	WINNEBAGO	12%	1%	9%	11%	1%	11%
NW	ASHLAND	--	--	--	--	--	--
	BARRON	--	--	--	--	--	--
	BAYFIELD	--	--	--	--	--	--

Region	County	% of miles backlogged					
		Distressed Joint/Cracks	Longitudinal/Joint Distress	Patch Deterioration	Slab Breakup	Surface Distress	Transverse Faulting
	BUFFALO	--	--	--	--	--	--
	BURNETT	--	--	--	--	--	--
	CHIPPEWA	--	--	--	--	--	--
	CLARK	--	--	--	--	--	--
	DOUGLAS	--	--	--	--	--	--
	DUNN	0%	0%	0%	0%	0%	0%
	EAU CLAIRE	0%	0%	0%	0%	0%	0%
	JACKSON	0%	0%	0%	0%	100%	0%
	PEPIN	--	--	--	--	--	--
	PIERCE	--	--	--	--	--	--
	POLK	--	--	--	--	--	--
	RUSK	--	--	--	--	--	--
	SAWYER	--	--	--	--	--	--
	ST. CROIX	0%	0%	0%	0%	0%	0%
	TAYLOR	--	--	--	--	--	--
	TREMPEALEAU	--	--	--	--	--	--
WASHBURN	--	--	--	--	--	--	
SE	KENOSHA	13%	0%	25%	56%	4%	94%
	MILWAUKEE	39%	0%	36%	65%	4%	97%
	OZAUKEE	8%	0%	6%	11%	0%	86%
	RACINE	36%	0%	36%	39%	6%	81%
	WALWORTH	15%	0%	22%	17%	5%	93%
	WASHINGTON	6%	0%	10%	22%	4%	96%
	WAUKESHA	28%	0%	24%	43%	4%	88%
SW	COLUMBIA	0%	0%	0%	0%	91%	0%
	CRAWFORD	--	--	--	--	--	--
	DANE	0%	0%	0%	0%	52%	0%
	DODGE	0%	0%	0%	0%	0%	0%
	GRANT	--	--	--	--	--	--
	GREEN	--	--	--	--	--	--
	IOWA	--	--	--	--	--	--
	JEFFERSON	0%	0%	0%	0%	0%	0%
	JUNEAU	0%	0%	0%	0%	100%	0%
	LA CROSSE	0%	0%	0%	0%	0%	0%

Region	County	% of miles backlogged					
		Distressed Joint/Cracks	Longitudinal/ Joint Distress	Patch Deterioration	Slab Breakup	Surface Distress	Transverse Faulting
	LAFAYETTE	--	--	--	--	--	--
	MONROE	0%	0%	0%	0%	100%	0%
	RICHLAND	--	--	--	--	--	--
	ROCK	0%	0%	0%	0%	0%	0%
	SAUK	0%	0%	0%	0%	0%	0%
	VERNON	--	--	--	--	--	--

## 2006 Winter: Compass Report on Winter Operations

### Executive summary

#### Statewide measures for winter

		2003-04	2004-05	2005-06
Winter severity index		31.2	31.9	31.8
Time to bare/wet pavement		2 hours 38 minutes after the storm ended	2 hours 4 minutes after the storm ended	1 hour 55 minutes after the storm ended
Cost per Lane Mile	(in nominal dollars)	\$1,279	\$1,374	\$1,400
	(in 2006 dollars)	\$1,365	\$1,418	\$1,400
Winter Related Crash		26 per 100 million vehicle miles traveled	25 per 100 million vehicle miles traveled	24 per 100 million vehicle miles traveled

### Key findings

- In keeping with WisDOT guidelines, during similar storm events, drivers on major urban freeways and highways have less time to wait until they see bare/wet pavement than do drivers on secondary roads. From storm to storm, however, most of the variability in this time is due to weather effects (type, duration and severity of storms throughout the winter season).
- The average time to bare/wet pavement during winter 2005-06 was 1 hour and 55 minutes, which is nine minutes less than the previous winter. The average Winter Severity Index (WSI) in 2005-06 was 31.8 and the previous five-year (winter 2000-2001 to winter 2004-2005) average was also 31.8.

### About this report

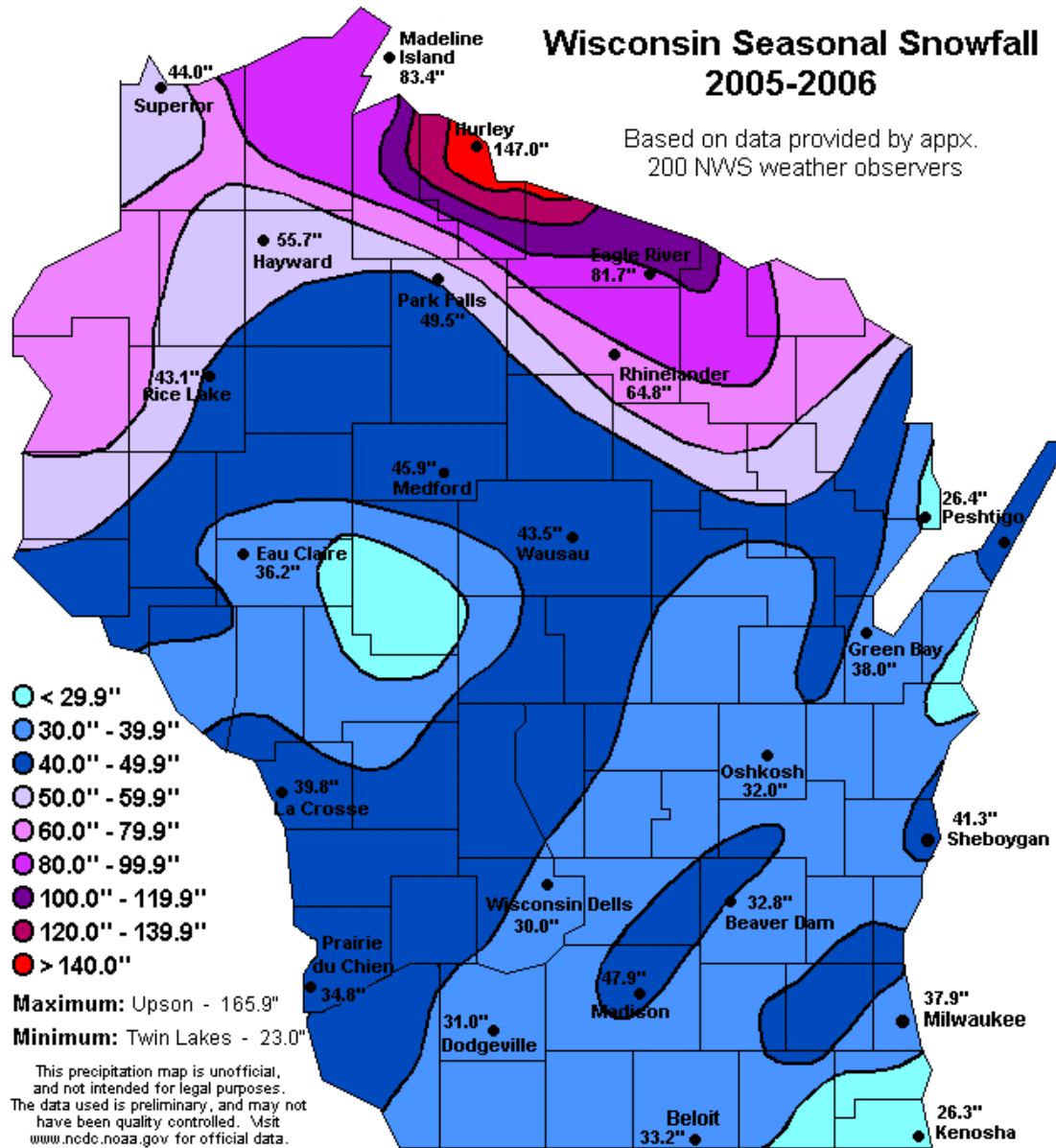
The measures in this section of the report focus on a few key winter operational outcomes critical to drivers and taxpayers. Reporting and analysis were done by Professor Teresa Adams of the University of Wisconsin-Madison with Project Assistants Emil Juni and David Sokolowski, under the direction of WisDOT staff. The primary audience for these measures is expected to be WisDOT and county highway managers with a general interest in winter operations, e.g., Region Directors and County Highway Commissioners. This section of the report looks at winter operations on state highways from November 1, 2005 to April 30, 2006.

The WisDOT Bureau of Highway Operations issues two reports on winter. This Compass report on winter focuses on measures critical to drivers and citizens, and is directed toward a general audience. The *Annual Winter Maintenance Report* focuses on operational measures and analysis, and is directed toward front-line operations managers. The full report can be viewed on the WisDOT Extranet site at: [http://dotnet/dtid\\_bho/extranet/winter/reports/pdf/2005-2006annualreport.pdf](http://dotnet/dtid_bho/extranet/winter/reports/pdf/2005-2006annualreport.pdf)

## 2005-2006 Winter Season Snowfall for Wisconsin

Note: The below map is in color. If you are not viewing a color copy, please contact the Compass Program Manager at the Bureau of Highway Operations for a color version to be mailed or emailed to you.

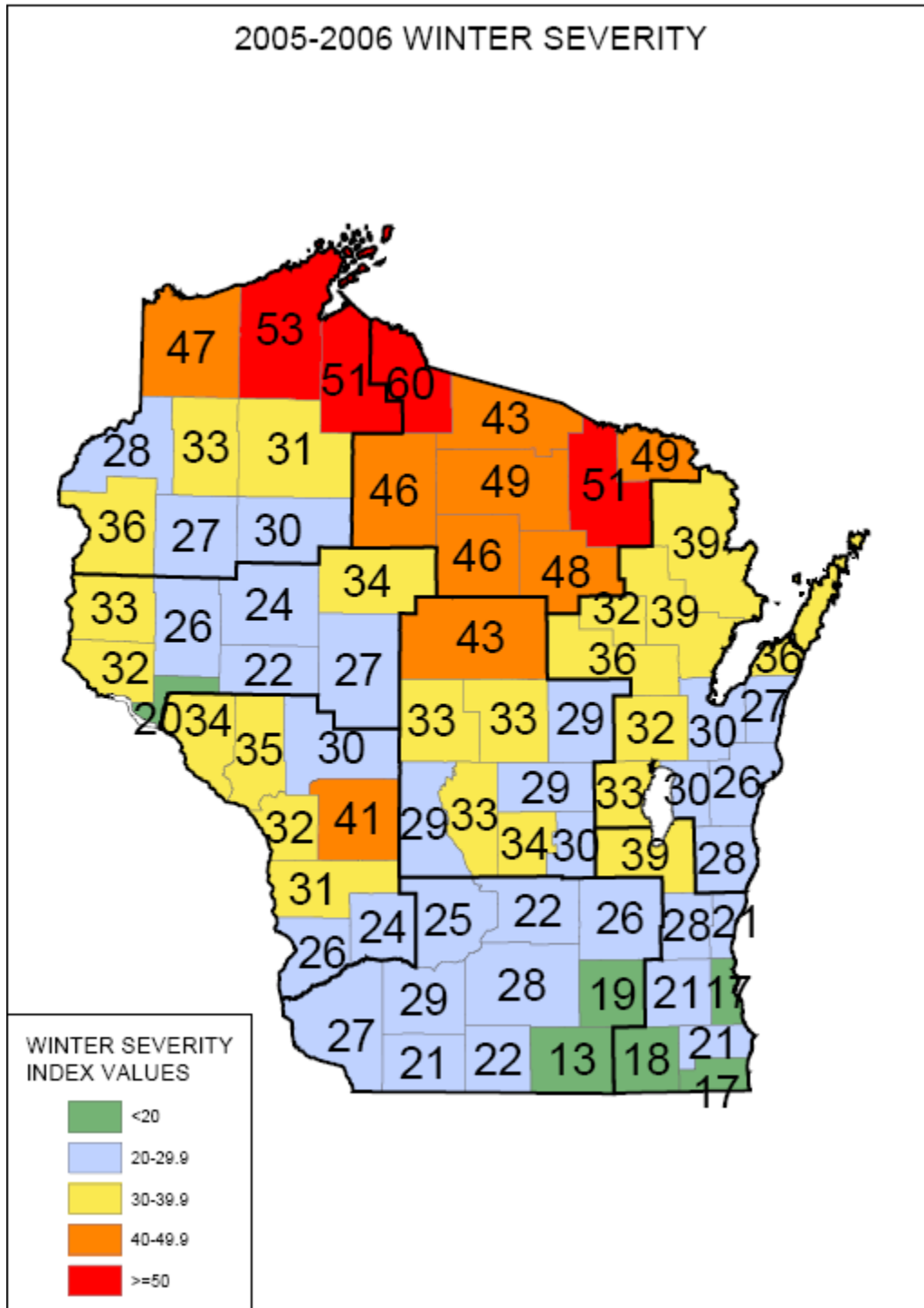
The National Weather Service (NWS) map below shows the snowfall for Wisconsin during the period July 1, 2005 to June 30, 2006. Comparison of the 2005-2006 snowfall map to the average snowfall map (also from NWS) indicates that the northern regions had more snowfall than average and the southern regions had less.



## 2005-2006 Severity Index, Salt/Lane-mile, and Dollars/Lane-mile by County

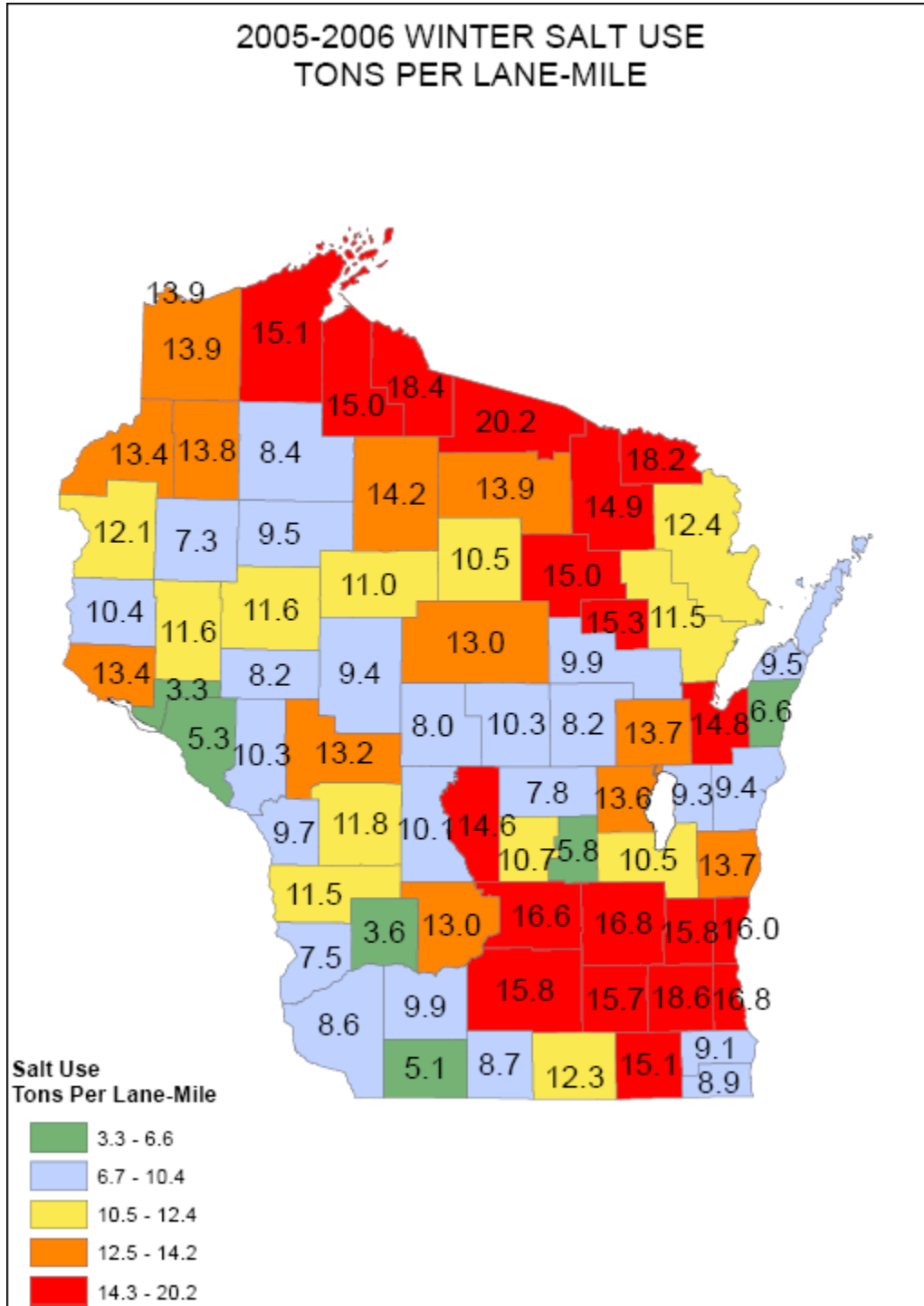
Note: The below map is in color. If you are not viewing a color copy, please contact the Compass Program Manager at the Bureau of Highway Operations for a color version to be mailed or emailed to you.

Wisconsin's Winter Severity Index (WSI) is highly correlated with snowfall. Looking at the statewide winter severity numbers, the statewide average for winter 2005-2006 was 31.8 and the previous five-year (winter 2000-2001 to winter 2004-2005) average was also 31.8.



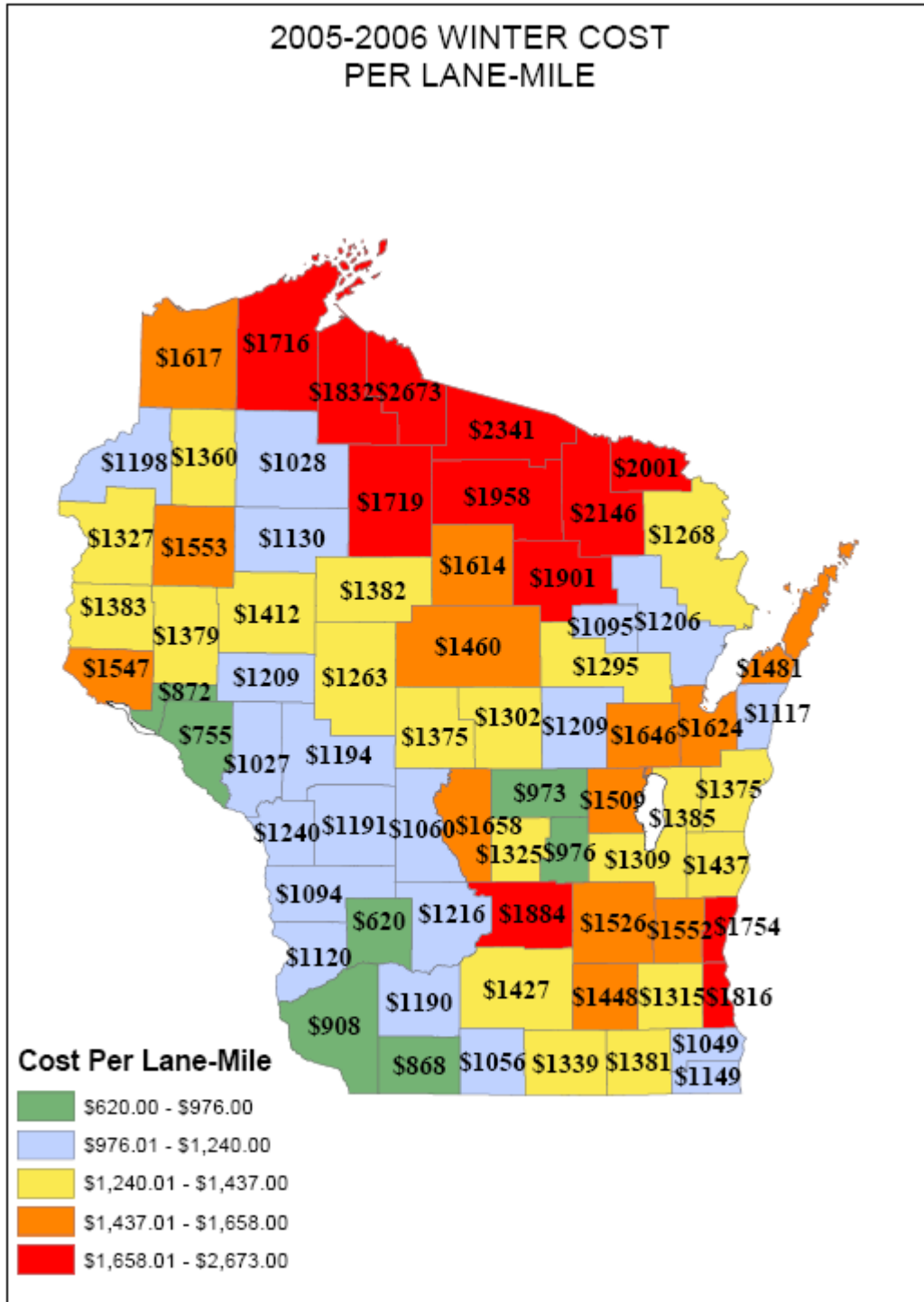
## 2005-2006 Winter Salt Use – Tons/Lane-Mile

Note: The below map is in color. If you are not viewing a color copy, please contact the Compass Program Manager at the Bureau of Highway Operations for a color version to be mailed or emailed to you.



## 2005-2006 Winter Cost per Lane-Mile

Note: The below map is in color. If you are not viewing a color copy, please contact the Compass Program Manager at the Bureau of Highway Operations for a color version to be mailed or emailed to you.





## Winter by the numbers

		<b>2004-05</b>	<b>2005-06</b>
<b>Infrastructure</b>	Lane miles	31,810 miles	33,022 miles
	Road Weather Information System (RWIS) stations	58	58
<b>Material usage<sup>4</sup></b>	Salt	407,924 tons 12.8 tons per lane mile	426,723 tons 12.9 tons per lane mile
	Average cost of salt	\$31.42 per ton	\$35.22 per ton
	Pre-wetting liquid used	638,685 gal.	803,131 gal.
	Anti-icing agent	272,856 gal.	435,277 gal.
	Sand	15,843 cubic yd.	15,997 cubic yd.
<b>Services</b>	Regular county hours on winter <sup>21</sup>	110,390 hrs.	110,354 hrs.
	Overtime county hours on winter	123,300 hrs.	112,522 hrs.
	Public service announcements aired	6,382 total 5,735 radio; 647 TV	6,989 total 6,353 radio; 636 TV
	Cost of public service announcements	\$31,500	\$31,500
	Patrol sections	719	733
<b>Management and Technology</b>	Average patrol section length	44.24 miles	45.05 miles
	Salt spreaders equipped with on-board pre-wetting unit <sup>22</sup>	639 of 2647 (24%)	639 of 2647 (24%)
	Counties with salt spreaders equipped with on-board pre-wetting unit	59 of 72 (82%)	59 of 72 (82%)
	Salt spreaders equipped with ground-speed controller unit	1316 of 2647 (50%)	1316 of 2647 (50%)
	Counties with salt spreaders equipped with ground-speed controller unit	69 of 72 (96%)	69 of 72 (96%)
	Underbody plows	508	508
	Counties with underbody plows	51 of 72 (71%)	51 of 72 (71%)
	Counties equipped to use anti-icing agents	65 of 72 (90%)	65 of 72 (90%)
	Counties that used anti-icing agents	56 of 72 (78%)	49 of 72 (68%)

<sup>21</sup> Costs and hours come from county Storm Reports, and reflect sanding, salting, plowing and anti-icing efforts.

<sup>22</sup> County equipment may be used on either state or county roads.

<sup>4</sup> All material usage quantities, except salt, are from the county Storm Reports. The salt quantities are from the Salt Inventory Reporting System.

## Compass winter operations measures

### Time to bare/wet pavement

The counties, under contract to WisDOT, provide different levels of effort during and after a storm depending on how busy and how critical a given category of highway is. State highways fall into five such categories, with category 1 being the highest priority. It is expected that an urban freeway (category 1) would receive more materials, labor and equipment – and would show a quicker time to bare/wet pavement – than would a rural two-lane highway (category 5). For more information on these categories, see page 62.

The table below shows that the trend for average time to bare/wet pavement is as expected: The more critical the highway, the shorter the average time to bare/wet pavement. Time to bare/wet pavement is measured from the reported end time of a storm. ‘Bare/wet never achieved’ means that it took more than 24 hours to achieve bare/wet condition, or the next storm began before bare/wet condition was achieved. Less critical highways are more likely to have snow on them 24 hours after a storm has ended than are more critical highways. This suggests that major urban freeways and highways are receiving a higher level of effort for winter operations than secondary roads.

Further analysis suggests that variability, within a category, is due more to weather effects (type, duration and severity of storms throughout the winter season) than to differences in the level of effort or relative resources.

Highway category		Average time to bare/wet pavement (hours after end of storm)*			2005 - 06 Storms		
		2003 - 04 Average	2004 - 05 Average	2005 - 06 Average	Total	Bare/wet never achieved	% Bare/wet never achieved
More critical highways	1	1.07	0.45	-1.21	175	9	5%
	2	1.31	0.64	0.2	387	30	8%
↓	3	1.52	1.82	1.32	528	39	7%
Less critical highways	4	2.45	3.06	2.47	557	43	8%
	5	3.63	2.89	3.4	712	91	13%

\* Only includes storms where bare/wet pavement was achieved

### Costs per lane mile versus winter severity index

The following table lists the total actual cost per lane mile for winter operations in each region, along with region winter severity index. The costs were obtained from the WisDOT’s Financial Operating System. As severity of the winter increases, so does the cost per lane mile. Regions that incurred higher cost per lane mile had more severe weather than the statewide average, with

the exception of SE region. The statewide average cost per lane mile was \$1,386 with average severity index of 31.80. Total costs include material, labor, equipment, and administrative costs.

Region	Average WSI			Actual cost/LM			Relative cost per WSI point		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
NC	38.21	36.04	40.16	\$1,500	\$1,481	\$1,573	\$39	\$41	\$39
NE	30.26	31.04	32.48	\$1,394	\$1,389	\$1,424	\$46	\$45	\$44
NW	36.69	34.43	32.61	\$1,264	\$1,244	\$1,327	\$34	\$36	\$41
SE	20.45	25.29	20.32	\$1,734	\$1,733	\$1,488	\$85	\$69	\$73
SW	21.78	27.89	25.93	\$1,224	\$1,201	\$1,272	\$56	\$43	\$49
Statewide	31.20	31.91	31.80	\$1,391	\$1,374	\$1,400	\$45	\$43	\$44

### Winter weather crashes per vehicle miles traveled (VMT)

The following table shows that counties with higher winter coverage tend to have fewer crashes per 100 million VMT. (Group A has higher coverage than Group B, etc.). For more information on county groupings A-D, see page 49 at the end of this section. Winter weather crashes are those crashes that occurred on snow-, slush-, or ice-covered pavements.

	Winter Service Group	VMT* (100 million)	Crashes	Crashes per 100 million VMT			Average Winter Severity Index		
				2003 - 04	2004 - 05	2005 - 06	2003 - 04	2004 - 05	2005 - 06
Counties with more coverage	A	136.00	2728	21	21	20	26.02	28.95	26.43
↓	B	73.80	1846	29	26	25	25.32	27.16	27.39
Counties with less coverage	C	47.23	1530	35	32	32	31.2	32.21	33.23
	D	22.99	620	34	28	27	37.98	36.71	36.77

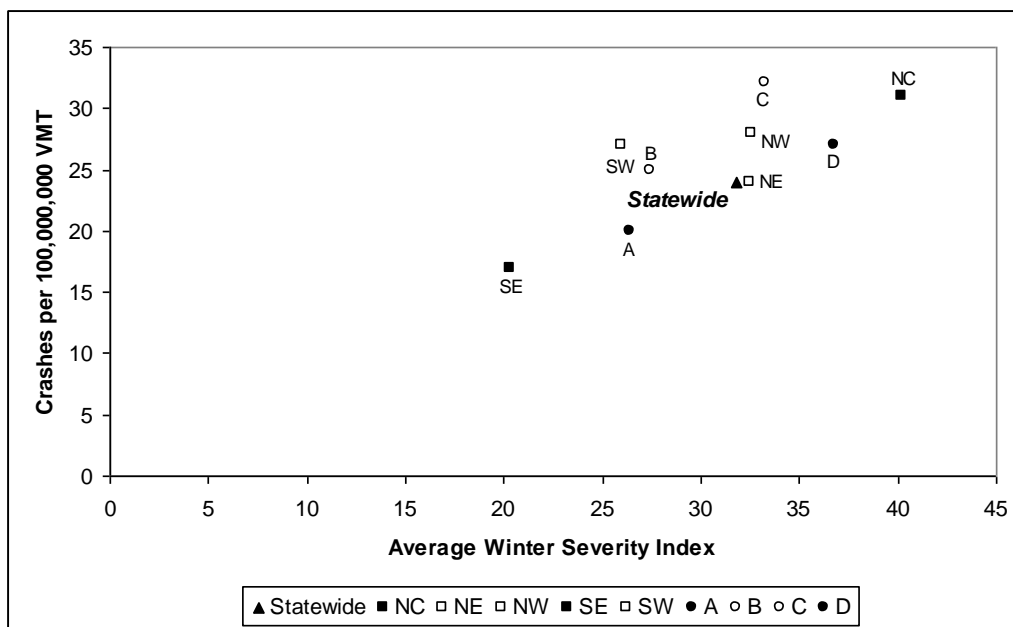
\*100 million vehicle miles traveled (VMT) for November 1, 2005 through April 30, 2006 determined from annual average daily traffic (AADT) counts, gallons of gas sold, fuel tax collected, and average vehicle miles per gallon.

The following table shows the crashes per 100 million VMT statewide and in each Region. The state average is 24 winter crashes per 100 million VMT.

Scope	VMT (100 million)	Crashes	Crashes per 100 million VMT			Average Winter Severity Index		
			2003 - 04	2004 - 05	2005 - 06	2003 - 04	2004 - 05	2005 - 06
Statewide	280.02	6724	26	25	24	31.20	31.91	31.80
NC	34.40	1072	34	31	31	38.21	36.04	40.16
NE	50.45	1226	26	25	24	30.26	31.04	32.48
NW	39.18	1102	37	31	28	36.69	34.43	32.61

Scope	VMT	Crashes	Crashes per 100 million VMT			Average Winter Severity Index		
	(100 million)		2003 - 04	2004 - 05	2005 - 06	2003 - 04	2004 - 05	2005 - 06
SE	84.61	1408	21	17	17	20.45	25.29	20.32
SW	71.39	1916	29	26	27	21.78	27.89	25.93

The following figure shows us that, as severity of the winter increases, so does the winter crash rate. As expected, the number of winter crashes increases as VMT increases. Regions with more rural roads tend to have higher winter crash rates (crashes per VMT), which is consistent with trends for non-winter crash rates.



## Winter Data, Definitions, and Categories

### Data

Unless otherwise noted, all material and labor figures come from the winter storm reports that are submitted by each county for every event or anti-icing procedure throughout the winter season. The data quality is unknown. Weather, road conditions, and materials usages are based upon the observations of county patrol superintendents and sometimes on their expert judgment and, as such, contain more variability than direct measurements.

### Definitions

Dollars: Cost data are from the fiscal year, July 1, 2005 to June 30, 2006.

Winter: November 1 through April 30, unless otherwise noted.

Winter Activities: Actual cost data incorporates all winter activities, including putting up snow fence, transporting salt, filling salt sheds, thawing out frozen culverts, calibrating salt spreaders,

producing and storing salt brine, and anti-icing applications, as well as plowing and salting. Costs from storm reports, however, cover only plowing, sanding, salting, and anti-icing.

Roads: The roads referred to in this report are state maintained highways, including Interstate and US highways. See the following tables for groupings.

### Categories & groupings

#### Winter service group assignments

Winter Service Group	County Name
A	Brown, Dane, Eau Claire, Kenosha, La Crosse, Marathon, Milwaukee, Ozaukee, Portage, Racine, Waukesha, Winnebago
B	Chippewa, Columbia, Dodge, Dunn, Jefferson, Manitowoc, Marquette, Oneida, Outagamie, Rock, Sauk, Shawano, Sheboygan, St. Croix, Walworth, Washington, Waushara
C	Calumet, Clark, Crawford, Door, Douglas, Fond du Lac, Grant, Iowa, Jackson, Juneau, Kewaunee, Lafayette, Lincoln, Monroe, Oconto, Trempealeau, Vernon, Vilas, Washburn, Waupaca, Wood
D	Adams, Ashland, Barron, Bayfield, Buffalo, Burnett, Florence, Forest, Green, Green Lake, Iron, Langlade, Marinette, Menominee, Pepin, Pierce, Polk, Price, Richland, Rusk, Sawyer, Taylor

#### Passable roadway expectation categories

Category	Definition	Lane miles	% of total
1	Major urban freeways and most highways with six lanes and greater	2,806	8%
2	High volume four-lane highways (ADT $\geq$ 25,000) and some four-lane highways (ADT < 25,000), and some 6-lane highways.	2,978	9%
3	All other four-lane highways (ADT < 25,000)	8,210	25%
4	Most high volume two-lane highways (ADT $\geq$ 5,000) and some 2-lanes (ADT < 5000)	4,905	15%
5	All other two-lane highways	14,123	43%

#### Winter service availability and coverage groups

Group	Definition	Number of Counties	% of Counties
A	Counties where all or most of the highways receive 24-hour coverage	12	17%
B	Counties with 18-hour and 24-hour coverage. More than 50% of highways receive 24-hour coverage.	17	24%
C	Counties with 18-hour and 24-hour coverage. Less than 50% of highways receive 24-hour coverage.	21	29%
D	Counties where no highways receive 24-hour coverage.	22	31%

## **2006 Highway Maintenance Conditions: Compass Report on Traffic, Shoulders, Drainage, Roadsides**

Data in this section comes from the field review performed by WisDOT region Area Maintenance Coordinators and county Patrol Superintendents. Reporting was done by WisDOT staff. No statistical analysis has been done on this data at the county level. Readers should take the number of observations into account when reviewing the information. Extreme caution should be exercised when analyzing data that has less than 30 observations.

### **Traffic:**

- Delineators received a feature grade of D for the second straight year.

### **Shoulders:**

- Unpaved shoulders drop-off /buildup received a feature grade of F. The statewide backlog increased between 2005 and 2006. Unpaved drop-off is significantly worse in the SE region than in other regions. Repair of shoulder drop-off contributes to safety by keeping cars from dropping down dramatically on one side and possibly over-correcting if one or two wheels leave the pavement.
- Hazardous debris received a feature grade of D. Hazardous debris is notably worse than targeted. Hazardous debris is significantly worse in the NE and SW regions than in other regions. Keeping hazardous debris off the shoulders prevents it from being somehow moved back into live traffic, and protects drivers of cars that may swerve or pull over onto the shoulder.
- Cracking on paved shoulders received a feature grade of D. However, this score is better than targeted. Cracking on paved shoulders is significantly worse in the SE region than in other regions.
- Unpaved cross-slope dropped to a feature grade of C from a feature grade of B in 2005.

### **Roadsides and drainage:**

- Flumes and culverts received a feature grade of C; all other drainage features received grades of A or B.
- Noxious weeds received a feature grade of C with a maintenance backlog much lower than targeted. Noxious weeds appear widespread in the NE, SE, and SW regions. There is a current policy to not spray Noxious Weeds due to budget limitations.

## **Counties 2006: Compass Report on Traffic, Shoulders, Drainage, Roadside**

**Data in this section comes from the field review performed by WisDOT regional Area Maintenance Coordinators and county Patrol Superintendents. Reporting was done by WisDOT staff. No statistical analysis has been done on this data at the county level. Readers should take the number of observations into account when reviewing the information. Extreme caution should be exercised when analyzing data that has less than 30 observations.**

### Counties 2006: Traffic and Shoulders

Region	County	Condition % backlogged # of observations												
		Traffic							Shoulders					
		Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)
NC	ADAMS	0%	--	0%	--	--	0%	--	11%	25%	13%	0%	0%	0%
		9	--	11	--	--	16	--	9	8	8	7	7	7
	FLORENCE	0%	--	0%	--	--	0%	0%	25%	50%	0%	13%	63%	0%
		8	--	12	--	--	27	21	8	6	6	8	8	8
	FOREST	0%	--	0%	--	--	0%	0%	17%	22%	0%	0%	11%	6%
		18	--	23	--	--	41	16	18	18	18	18	18	18
	GREEN LAKE	0%	--	0%	--	--	0%	0%	17%	67%	0%	0%	0%	0%
		6	--	9	--	--	7	4	6	6	6	6	6	6
	IRON	0%	--	0%	--	--	0%	--	0%	0%	0%	10%	40%	0%
		10	--	25	--	--	39	--	10	5	5	10	10	10
	LANGLADE	0%	0%	0%	0%	--	0%	--	0%	64%	7%	39%	11%	0%
		18	11	36	11	--	76	--	18	14	14	18	18	18
	LINCOLN	0%	22%	0%	--	61%	0%	0%	21%	32%	11%	32%	47%	0%
		19	12	38	--	12	102	8	19	19	19	19	19	19
	MARATHON	0%	13%	0%	--	2%	0%	0%	7%	65%	10%	4%	62%	0%
		27	167	132	--	146	74	11	27	20	20	26	26	26
MARQUETTE	0%	25%	0%	--	40%	0%	0%	14%	50%	17%	0%	17%	0%	



Region	County	Condition												
		% backlogged # of observations												
		Traffic							Shoulders					
		Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)
		7	5	1	--	5	6	1	7	6	6	6	6	6
	MENOMINEE	50%	57%	0%	--	--	0%	--	0%	--	--	25%	100%	0%
		4	2	1	--	--	6	--	4	--	--	4	4	4
	ONEIDA	7%	--	6%	--	--	0%	0%	20%	57%	0%	8%	23%	0%
		15	--	31	--	--	11	11	15	14	14	13	13	13
	PORTAGE	0%	0%	0%	--	5%	0%	0%	0%	50%	0%	0%	43%	0%
		12	31	46	--	31	72	15	12	10	10	7	7	7
	PRICE	0%	--	0%	--	--	0%	--	0%	50%	0%	45%	18%	0%
		12	--	25	--	--	25	--	12	10	10	11	11	11
	SHAWANO	0%	15%	0%	0%	3%	0%	40%	0%	78%	0%	9%	73%	0%
		11	29	22	15	14	13	18	11	9	9	11	11	11
	VILAS	6%	0%	0%	0%	--	0%	--	6%	47%	0%	17%	33%	0%
		18	10	47	10	--	52	--	18	15	15	18	18	18
	WAUPACA	0%	0%	0%	0%	--	0%	0%	6%	29%	0%	6%	44%	0%
		16	23	28	5	--	58	8	16	14	14	16	16	16
	WAUSHARA	0%	0%	0%	--	0%	0%	--	7%	8%	0%	0%	7%	0%
		14	19	13	--	19	49	--	15	12	12	14	14	14
	WOOD	0%	0%	0%	0%	--	0%	0%	15%	10%	0%	--	36%	0%
		13	11	27	11	--	27	9	13	10	10	--	11	11
	BROWN	6%	14%	0%	0%	2%	0%	0%	22%	78%	0%	19%	69%	0%

Region	County	Condition												
		% backlogged # of observations												
		Traffic							Shoulders					
		Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)
NE		18	55	62	22	36	110	26	18	18	18	16	16	16
	CALUMET	0%	0%	0%	0%	--	0%	--	22%	33%	0%	0%	11%	0%
		18	19	69	12	--	76	--	18	18	18	18	18	18
	DOOR	0%	10%	0%	4%	--	0%	0%	0%	71%	0%	21%	86%	0%
		14	18	69	18	--	46	17	14	14	14	14	14	14
	FOND DU LAC	0%	27%	0%	46%	0%	4%	15%	11%	74%	0%	11%	37%	0%
		27	166	124	75	47	228	100	27	27	27	27	27	27
	KEWAUNEE	0%	--	0%	--	--	0%	0%	0%	11%	0%	89%	11%	0%
		9	--	25	--	--	15	1	9	9	9	9	9	9
	MANITOWOC	0%	7%	0%	0%	24%	6%	--	3%	54%	0%	9%	0%	9%
		29	93	118	8	85	153	--	29	28	28	22	22	22
	MARINETTE	16%	55%	0%	0%	--	0%	--	20%	76%	10%	36%	36%	0%
		25	21	49	21	--	145	--	25	21	21	25	25	25
	OCONTO	11%	15%	0%	0%	13%	0%	0%	15%	54%	0%	15%	30%	0%
		27	186	135	31	100	217	113	27	26	26	27	27	27
	OUTAGAMIE	10%	38%	0%	0%	39%	4%	23%	30%	71%	18%	35%	55%	0%
		20	19	91	33	7	132	35	20	17	17	20	20	20
	SHEBOYGAN	3%	8%	0%	0%	10%	0%	0%	20%	37%	0%	15%	32%	0%
		35	139	290	9	101	323	135	35	35	35	34	34	34
WINNEBAGO	5%	0%	0%	--	17%	0%	0%	5%	17%	0%	--	24%	0%	

Region	County	Condition												
		% backlogged												
		# of observations												
Traffic								Shoulders						
Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)		
		19	25	114	--	25	64	33	19	18	18	--	17	17
NW	ASHLAND	11%	--	0%	--	--	0%	--	11%	100%	0%	22%	100%	0%
		9	--	6	--	--	17	--	9	6	6	9	9	9
	BARRON	29%	--	31%	--	--	30%	0%	0%	60%	0%	0%	83%	0%
		7	--	18	--	--	17	15	7	5	5	6	6	6
	BAYFIELD	0%	0%	0%	0%	--	0%	--	25%	100%	0%	25%	63%	0%
		8	3	2	3	--	14	--	8	6	6	8	8	8
	BUFFALO	12%	20%	0%	0%	--	0%	--	0%	38%	0%	88%	71%	6%
		17	29	46	29	--	40	--	17	8	8	17	17	17
	BURNETT	0%	64%	0%	5%	--	0%	--	13%	50%	0%	13%	38%	0%
		8	15	10	7	--	35	--	8	6	6	8	8	8
	CHIPPEWA	0%	0%	0%	0%	14%	0%	0%	6%	13%	0%	0%	6%	6%
		17	52	72	8	30	47	1	17	15	15	17	17	17
	CLARK	0%	0%	0%	1%	0%	0%	--	10%	20%	0%	0%	10%	0%
		10	17	10	12	5	10	--	10	10	9	10	10	10
DOUGLAS	8%	0%	0%	--	28%	0%	0%	23%	85%	8%	8%	23%	0%	
	13	59	53	--	59	37	29	13	13	13	13	13	13	
DUNN	15%	33%	0%	0%	3%	0%	--	31%	64%	18%	8%	31%	0%	
	13	30	23	12	33	31	--	13	11	11	13	13	13	
EAU CLAIRE	0%	74%	0%	0%	0%	0%	0%	25%	13%	0%	14%	14%	0%	

Region	County	Condition												
		% backlogged # of observations												
		Traffic							Shoulders					
Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)		
		8	19	20	14	8	4	10	8	8	8	7	7	7
	JACKSON	0%	9%	0%	0%	23%	0%	0%	5%	37%	0%	29%	5%	5%
	PEPIN	20	60	60	15	60	90	16	21	19	19	21	21	21
		0%	100%	0%	0%	--	0%	0%	0%	50%	0%	100%	0%	50%
		2	3	1	3	--	1	1	2	2	2	2	2	2
	PIERCE	0%	51%	0%	0%	--	0%	--	0%	88%	38%	20%	30%	0%
		10	37	17	37	--	23	--	10	8	8	10	10	10
	POLK	27%	--	0%	--	--	7%	33%	0%	46%	8%	50%	71%	7%
		15	--	44	--	--	60	26	15	13	13	14	14	14
	RUSK	0%	--	--	--	--	0%	--	0%	20%	0%	29%	86%	0%
		7	--	--	--	--	18	--	7	5	5	7	7	7
	SAWYER	5%	--	0%	--	--	0%	--	0%	13%	7%	33%	67%	0%
		22	--	87	--	--	131	--	22	15	15	21	21	21
	ST. CROIX	0%	10%	0%	1%	5%	0%	0%	10%	60%	5%	48%	48%	0%
		21	57	122	50	36	97	25	21	20	20	21	21	21
	TAYLOR	0%	--	0%	--	--	0%	0%	0%	100%	100%	0%	17%	0%
		7	--	1	--	--	8	1	7	2	2	6	6	6
	TREMPEALEAU	0%	69%	13%	2%	--	20%	--	14%	54%	8%	92%	46%	15%
		14	25	26	32	--	17	--	14	13	13	13	13	13
	WASHBURN	0%	10%	0%	0%	10%	0%	0%	0%	55%	0%	9%	55%	0%

		Condition % backlogged # of observations												
		Traffic							Shoulders					
Region	County	Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)
		11	32	27	5	32	34	12	11	11	11	11	11	11
SE	KENOSHA	0%	31%	0%	0%	89%	0%	0%	10%	26%	0%	59%	56%	11%
		30	66	160	102	66	359	75	30	27	27	27	27	27
	MILWAUKEE	5%	25%	1%	13%	47%	5%	0%	11%	72%	10%	30%	70%	10%
		37	44	772	387	274	608	761	37	29	29	10	10	10
	OZAUKEE	0%	3%	0%	11%	67%	0%	0%	14%	86%	14%	86%	71%	0%
		7	14	17	10	12	29	26	7	7	7	7	7	7
	RACINE	0%	0%	0%	0%	--	0%	0%	4%	67%	8%	23%	36%	0%
		25	21	156	50	--	266	74	25	24	24	22	22	22
	WALWORTH	0%	25%	0%	0%	9%	0%	33%	4%	83%	9%	47%	53%	11%
48		532	773	83	554	330	131	48	47	47	47	47	47	
WASHINGTON	0%	38%	0%	22%	29%	0%	12%	5%	84%	0%	58%	58%	0%	
	44	279	429	226	190	722	82	44	43	43	43	43	43	
WAUKESHA	2%	22%	2%	0%	10%	2%	0%	16%	62%	7%	10%	40%	0%	
	45	305	743	384	416	604	379	45	42	42	40	40	40	
SW	COLUMBIA	0%	24%	0%	0%	10%	0%	0%	35%	82%	0%	88%	82%	18%
		17	35	57	19	16	67	18	17	11	11	17	17	17
	CRAWFORD	7%	10%	--	0%	--	0%	--	0%	33%	0%	14%	14%	0%
		14	68	--	68	--	79	--	14	12	12	14	14	14
DANE	6%	14%	3%	0%	17%	4%	0%	12%	65%	13%	0%	67%	0%	

		Condition % backlogged # of observations												
		Traffic							Shoulders					
Region	County	Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)
		33	131	357	89	54	226	79	33	23	23	9	9	9
	DODGE	0%	38%	0%	0%	18%	0%	0%	41%	53%	0%	24%	65%	0%
		17	39	48	8	39	89	42	17	17	17	17	17	17
	GRANT	5%	0%	0%	0%	25%	8%	0%	10%	29%	6%	30%	30%	15%
		20	33	82	24	9	82	27	20	17	17	20	20	20
	GREEN	0%	0%	7%	--	--	0%	0%	9%	56%	11%	18%	36%	9%
		11	10	42	--	--	17	2	11	9	9	11	11	11
	IOWA	0%	14%	10%	0%	7%	0%	0%	0%	33%	0%	17%	33%	8%
		12	41	54	12	36	22	22	12	9	9	12	12	12
	JEFFERSON	12%	25%	0%	0%	97%	14%	50%	6%	82%	6%	8%	23%	15%
		17	67	53	25	37	102	5	17	17	17	13	13	13
	JUNEAU	0%	0%	0%	--	0%	0%	--	33%	40%	0%	0%	17%	0%
		11	23	13	--	23	4	--	12	10	10	12	12	12
	LA CROSSE	0%	50%	0%	0%	--	0%	--	13%	25%	25%	14%	71%	0%
		8	11	12	11	--	5	--	8	4	4	7	7	7
	LAFAYETTE	0%	0%	0%	--	--	0%	--	40%	0%	0%	50%	50%	25%
		5	1	8	--	--	8	--	5	5	5	4	4	4
	MONROE	7%	7%	0%	0%	9%	0%	--	60%	23%	8%	0%	7%	0%
		15	40	36	4	40	11	--	15	13	13	15	15	15
	RICHLAND	9%	0%	0%	--	--	0%	--	0%	20%	0%	9%	9%	0%

Region	County	Condition												
		% backlogged # of observations												
		Traffic							Shoulders					
Centerline	Delineators	Other Signs (emergency)	Protective Barriers	Raised Pavement Markers	Reg./Warn. Signs (emergency)	Special Pavement Markings	Hazardous Debris	Cracking (paved)	Potholes (paved)	Cross Slope (unpaved)	Drop-off (unpaved)	Erosion (unpaved)		
		11	6	4	--	--	60	--	11	5	5	11	11	11
	ROCK	0%	0%	0%	0%	0%	0%	0%	0%	67%	11%	0%	9%	9%
		12	8	14	9	3	22	5	12	9	9	11	11	11
	SAUK	0%	29%	0%	0%	8%	0%	--	32%	36%	0%	68%	79%	0%
		19	48	45	31	53	53	--	19	14	14	19	19	19
	VERNON	0%	75%	0%	2%	--	0%	--	19%	15%	8%	14%	71%	0%
		16	22	30	28	--	31	--	16	13	13	14	14	14

## Counties 2006: Drainage and Roadsides

Region	County	Condition % backlogged # of observations														
		Drainage						Roadsides								
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision	
NC	ADAMS	--	1%	2%	--	--	0%	--	--	33%	63%	0%	0%	0%	0%	
		--	4	34	--	--	4	--	--	9	8	2	9	9	9	
	FLORENCE	--	--	0%	--	--	--	--	--	88%	0%	0%	38%	0%	0%	
		--	--	41	--	--	--	--	--	8	8	2	8	8	8	
	FOREST	0%	29%	5%	--	--	--	--	--	67%	6%	0%	6%	0%	0%	
		18	18	164	--	--	--	--	--	18	18	2	18	18	18	
	GREEN LAKE	0%	49%	0%	--	--	--	--	--	100%	50%	0%	33%	0%	0%	
		1	5	21	--	--	--	--	--	6	6	2	6	6	6	
	IRON	20%	--	2%	--	--	--	--	--	40%	40%	0%	20%	0%	0%	
		41	--	69	--	--	--	--	--	10	10	5	10	10	10	
	LANGLADE	50%	9%	0%	--	--	--	--	--	67%	33%	0%	50%	0%	0%	
		10	17	171	--	--	--	--	--	18	18	8	18	18	18	
	LINCOLN	17%	--	1%	0%	--	--	--	--	0%	95%	42%	0%	47%	0%	5%
		58	--	210	12	--	--	--	--	12	19	19	4	19	19	19
MARATHON	0%	9%	0%	5%	50%	0%	--	0%	67%	26%	0%	48%	0%	4%		
	69	12	458	134	8	70	--	113	27	27	4	27	27	27		
MARQUETTE	0%	0%	0%	--	--	0%	--	0%	43%	29%	0%	0%	0%	0%		



Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		5	1	27	--	--	1	--	5	7	7	1	7	7	7
	MENOMINEE	0%	--	1%	--	--	--	--	--	0%	0%	--	0%	100%	100%
		6	--	10	--	--	--	--	--	4	4	0	4	4	4
	ONEIDA	33%	1%	0%	--	100%	0%	--	0%	53%	27%	0%	13%	0%	0%
		34	15	111	--	11	15	--	14	15	15	1	15	15	15
	PORTAGE	0%	0%	0%	--	--	0%	--	0%	67%	25%	0%	25%	0%	0%
		18	27	87	--	--	14	--	16	12	12	1	12	12	12
	PRICE	20%	--	0%	--	--	--	--	--	67%	17%	0%	8%	0%	0%
		39	--	97	--	--	--	--	--	12	12	1	12	12	12
	SHAWANO	0%	26%	0%	0%	0%	--	--	--	91%	18%	0%	55%	0%	0%
		36	10	66	14	10	--	--	--	11	11	3	11	11	11
	VILAS	0%	4%	3%	--	--	--	--	--	78%	39%	0%	0%	6%	0%
		1	43	184	--	--	--	--	--	18	18	4	18	18	18
	WAUPACA	0%	0%	0%	--	--	--	--	--	69%	38%	0%	63%	0%	0%
		74	20	125	--	--	--	--	--	16	16	4	16	16	16
	WAUSHARA	0%	9%	0%	--	--	0%	--	0%	53%	33%	0%	0%	0%	0%
		15	10	114	--	--	6	--	19	15	15	5	15	15	15
	WOOD	33%	0%	0%	--	--	0%	--	--	100%	31%	0%	62%	0%	0%
		18	9	82	--	--	9	--	--	10	13	2	13	13	13
	BROWN	0%	4%	1%	14%	40%	9%	0%	0%	89%	83%	0%	78%	6%	0%

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
NE		50	71	157	12	27	41	12	53	18	18	8	18	18	18
	CALUMET	50%	0%	0%	0%	0%	0%	--	--	94%	75%	0%	39%	11%	0%
		36	30	177	19	19	11	--	--	17	16	9	18	18	18
	DOOR	0%	2%	2%	--	0%	0%	--	--	100%	57%	0%	50%	0%	0%
		31	4	105	--	4	4	--	--	14	14	3	14	14	14
	FOND DU LAC	25%	17%	3%	19%	14%	0%	--	0%	85%	68%	0%	81%	4%	0%
		181	74	400	110	74	87	--	62	27	25	5	27	27	27
	KEWAUNEE	100%	7%	1%	--	0%	--	--	--	89%	56%	0%	67%	0%	0%
		6	14	56	--	1	--	--	--	9	9	2	9	9	9
	MANITOWOC	22%	0%	0%	0%	100%	0%	--	0%	10%	48%	0%	7%	0%	0%
		126	65	465	34	23	38	--	85	29	29	15	29	29	29
	MARINETTE	9%	2%	2%	--	--	--	--	--	56%	56%	0%	28%	0%	0%
		125	54	350	--	--	--	--	--	25	25	8	25	25	25
	OCONTO	0%	26%	3%	0%	0%	0%	--	0%	44%	48%	0%	44%	0%	0%
		8	62	400	125	18	75	--	155	27	27	13	27	27	27
	OUTAGAMIE	40%	1%	7%	40%	0%	25%	--	--	80%	85%	0%	55%	0%	0%
60		20	217	9	19	15	--	--	20	20	9	20	20	20	
SHEBOYGAN	25%	1%	1%	0%	0%	30%	0%	0%	60%	66%	0%	71%	0%	0%	
	117	191	679	23	112	182	7	100	35	35	10	35	35	35	
WINNEBAGO	0%	1%	0%	0%	--	0%	--	--	63%	32%	0%	0%	5%	0%	

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		20	48	209	25	--	29	--	--	19	19	19	19	19	19
NW	ASHLAND	100%	27%	3%	--	--	--	--	--	22%	33%	50%	33%	0%	0%
		7	7	32	--	--	--	--	--	9	9	2	9	9	9
	BARRON	0%	51%	0%	--	--	0%	--	--	14%	29%	0%	0%	0%	0%
		9	8	34	--	--	8	--	--	7	7	3	7	7	7
	BAYFIELD	0%	--	0%	--	--	--	--	--	38%	0%	0%	75%	0%	0%
		12	--	33	--	--	--	--	--	8	8	1	8	8	8
	BUFFALO	31%	39%	7%	--	--	0%	--	--	76%	59%	0%	24%	0%	0%
		121	33	151	--	--	14	--	--	17	17	1	17	17	17
	BURNETT	0%	--	2%	--	--	0%	--	--	100%	25%	0%	50%	0%	0%
		7	--	43	--	--	9	--	--	8	8	2	8	8	8
	CHIPPEWA	0%	0%	0%	0%	0%	0%	--	0%	35%	35%	--	0%	0%	0%
		18	17	152	15	1	7	--	39	17	17	0	17	17	17
	CLARK	0%	17%	1%	0%	0%	0%	--	--	30%	90%	--	0%	0%	0%
		26	12	66	5	12	12	--	--	10	10	0	10	10	10
DOUGLAS	0%	--	0%	11%	--	--	--	43%	62%	23%	0%	0%	0%	0%	
	9	--	117	9	--	--	--	16	13	13	2	13	13	13	
DUNN	0%	0%	0%	--	0%	0%	--	0%	77%	0%	25%	0%	0%	0%	
	22	7	87	--	7	11	--	33	13	13	8	13	13	13	
EAU CLAIRE	0%	23%	1%	--	--	0%	0%	0%	63%	50%	0%	0%	0%	13%	

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		1	13	30	--	--	18	8	8	8	8	1	8	8	8
	JACKSON	63%	4%	0%	--	100%	50%	--	21%	86%	24%	0%	24%	0%	0%
		92	16	235	--	10	16	--	60	21	21	3	21	21	21
	PEPIN	0%	81%	0%	--	100%	--	--	--	50%	0%	--	100%	0%	0%
		3	3	4	--	3	--	--	--	2	2	0	2	2	2
	PIERCE	0%	14%	0%	--	0%	0%	--	--	80%	40%	0%	0%	0%	0%
		16	8	55	--	8	8	--	--	10	10	10	10	10	10
	POLK	0%	1%	7%	--	0%	0%	--	--	60%	53%	0%	0%	13%	13%
		1	19	123	--	11	14	--	--	15	15	9	15	15	15
	RUSK	33%	--	0%	--	--	--	--	--	43%	0%	0%	29%	0%	0%
		5	--	23	--	--	--	--	--	7	7	2	7	7	7
	SAWYER	0%	5%	0%	--	100%	0%	--	--	36%	27%	0%	0%	0%	0%
		42	28	156	--	13	15	--	--	22	22	7	22	22	22
	ST. CROIX	17%	12%	0%	--	0%	0%	0%	0%	86%	33%	6%	19%	0%	0%
		52	44	280	--	5	38	32	57	21	21	17	21	21	21
	TAYLOR	50%	100%	0%	--	--	67%	--	--	14%	14%	--	0%	0%	0%
		11	1	17	--	--	1	--	--	7	7	0	7	7	7
	TREMPEALEAU	0%	6%	3%	--	--	25%	--	--	57%	36%	0%	43%	7%	7%
		65	6	105	--	--	1	--	--	14	14	4	14	14	14
	WASHBURN	0%	--	3%	0%	--	--	--	1%	64%	9%	0%	0%	0%	0%

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		8	--	62	14	--	--	--	20	11	11	3	11	11	11
SE	KENOSHA	0%	1%	21%	18%	50%	17%	0%	0%	88%	42%	20%	19%	0%	4%
		38	108	493	228	124	205	45	44	26	26	5	26	26	26
	MILWAUKEE	7%	6%	50%	40%	0%	24%	0%	0%	70%	32%	0%	46%	3%	5%
		182	647	518	144	111	731	68	375	37	37	17	37	37	37
	OZAUKEE	0%	3%	1%	50%	75%	19%	0%	0%	43%	29%	0%	100%	0%	0%
		6	10	35	7	10	23	2	12	7	7	1	7	7	7
	RACINE	25%	0%	1%	11%	0%	0%	--	--	56%	80%	8%	8%	0%	4%
		112	121	395	43	42	68	--	--	25	25	12	25	25	24
	WALWORTH	0%	13%	0%	21%	0%	25%	--	0%	79%	38%	0%	81%	0%	0%
		507	148	1192	396	180	60	--	554	48	48	4	47	48	48
WASHINGTON	0%	5%	1%	38%	67%	17%	0%	0%	14%	43%	0%	93%	2%	0%	
	212	238	1089	120	79	162	52	174	44	44	4	44	44	44	
WAUKESHA	0%	0%	1%	14%	40%	4%	0%	0%	64%	33%	2%	24%	0%	0%	
	229	571	912	309	150	544	20	337	45	45	44	45	45	45	
SW	COLUMBIA	0%	0%	16%	--	--	50%	--	41%	94%	47%	0%	35%	29%	6%
		48	17	150	--	--	17	--	16	17	17	3	17	17	17
	CRAWFORD	0%	1%	0%	--	0%	0%	--	--	14%	46%	--	0%	0%	0%
		59	21	83	--	6	15	--	--	14	13	0	14	14	14
DANE	13%	1%	0%	0%	0%	0%	0%	0%	88%	21%	0%	45%	3%	0%	

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		231	36	561	20	3	24	46	201	33	33	15	33	33	33
		71%	19%	11%	46%	43%	33%	--	13%	94%	53%	0%	65%	12%	6%
	DODGE	64	23	158	39	12	15	--	39	17	17	5	17	17	17
		0%	3%	0%	--	0%	--	--	0%	20%	85%	0%	40%	0%	0%
	GRANT	42	57	210	--	27	--	--	9	20	20	6	20	20	20
		0%	0%	0%	--	0%	--	--	0%	27%	55%	0%	55%	18%	0%
	GREEN	11	13	66	--	6	--	--	11	11	11	2	11	11	11
		20%	4%	0%	--	--	--	--	0%	54%	31%	0%	31%	8%	0%
	IOWA	43	17	91	--	--	--	--	36	13	13	2	13	13	13
		0%	2%	0%	--	--	0%	--	0%	82%	24%	0%	82%	0%	0%
	JEFFERSON	46	19	162	--	--	21	--	37	17	17	3	17	17	17
		--	0%	0%	--	--	--	--	0%	75%	42%	0%	8%	0%	0%
	JUNEAU	--	4	84	--	--	--	--	23	12	12	12	12	12	12
		60%	0%	1%	--	0%	--	--	--	63%	88%	0%	63%	0%	0%
	LA CROSSE	26	9	37	--	9	--	--	--	8	8	3	8	8	8
		0%	1%	0%	0%	--	0%	--	--	80%	100%	0%	20%	0%	0%
	LAFAYETTE	4	4	11	1	--	4	--	--	5	5	2	5	5	5
		--	0%	0%	0%	--	--	--	1%	67%	27%	0%	0%	0%	0%
	MONROE	--	4	122	15	--	--	--	40	15	15	15	15	15	15
	RICHLAND	13%	--	0%	--	--	--	--	--	55%	0%	--	9%	0%	0%

Region	County	Condition % backlogged # of observations													
		Drainage						Roadsides							
		Culverts	Curb & Gutter	Ditches	Drains	Flumes	Storm Sewer	Barriers	Fences	Litter	Mowing	Mowing for Vision	Noxious Weeds	Woody Vegetation Control	Woody Vegetation Control for Vision
		43	--	79	--	--	--	--	--	11	11	0	11	11	11
	ROCK	0%	0%	0%	0%	0%	0%	--	0%	75%	33%	0%	92%	0%	0%
		14	4	78	5	4	3	--	3	12	12	1	12	12	12
	SAUK	20%	45%	5%	--	--	0%	--	17%	95%	42%	50%	68%	5%	0%
		47	1	192	--	--	17	--	33	19	19	2	19	19	19
	VERNON	14%	0%	0%	--	--	0%	--	--	75%	38%	13%	38%	13%	0%
		54	7	136	--	--	7	--	--	16	16	8	16	16	16

## **2006 Bridges: Compass Report on Condition and Maintenance**

Data in this section comes from the Highway Structures Information System (HSI) online report. Data from HSI was taken during the period of three weeks from February 15<sup>th</sup> to March 8<sup>th</sup>, 2007. Reporting and analysis were done by Professor Teresa Adams of the University of Wisconsin, with Project Assistants Emil Juni and David Sokolowski, under the direction of WisDOT staff.

### **Key observations**

#### **Bridge Deck Condition Distribution**

- 33% of decks statewide are in Fair condition and need reactive maintenance, based on their NBI ratings of 5 or 6. These include 29% of concrete bridges and 42% of steel bridges.
- The SE region has the lowest percent of decks in good condition, only 43% of decks in good condition and 6% of decks in poor condition. However, this is a 6% improvement from last year, and SE region does have the largest deck area to maintain (13,679,880 ft<sup>2</sup>).
- The SW region has the most bridges in the state (1,451) and performs excellently with 74% of decks in Good condition (2% improvement from last year) and only 2% in Poor condition.

#### **Bridge Maintenance Needs**

- Maintenance actions are those recommended by bridge inspectors for each bridge at the time of inspection.
- The following maintenance actions are recommended as needed. As approaches settle, brush continually grows, decks eventually crack and drainage issues arise at wings, these actions become necessary:
  1. Deck - Seal Surface Cracks
  2. Expansion Joints - Seal
  3. Approach - Seal Approach to Paving Block
  4. Misc. - Cut Brush
  5. Drainage - Repair Washouts / Erosion
  6. Deck – Patching
  7. Approach - Wedge Approach



## 2006 Bridges: Compass Report on Condition

### Wisconsin 2006: Bridge Condition Distribution

	Bridges	Deck Area (ft <sup>2</sup> )	Component	% of bridges in condition			
				Good <sup>1</sup>	Fair <sup>2</sup>	Poor <sup>3</sup>	Critical <sup>3</sup>
All	4,900	45,361,714	Decks	63%	33%	3%	0%
			Superstructures	70%	29%	2%	0%
			Substructures	70%	29%	1%	0%
Concrete	3,355	24,267,361	Decks	69%	29%	2%	0%
			Superstructures	76%	22%	2%	0%
			Substructures	78%	22%	0%	0%
Steel	1,545	21,094,353	Decks	53%	42%	5%	0%
			Superstructures	57%	42%	1%	0%
			Substructures	54%	44%	2%	0%

### Region 2006: Bridge Condition Distribution

Region	Bridges	Deck Area (ft <sup>2</sup> )	Component	% of bridges in condition			
				Good <sup>1</sup>	Fair <sup>2</sup>	Poor <sup>3</sup>	Critical <sup>3</sup>
NC	604	4,063,028	Decks	79%	19%	2%	0%
			Superstructures	85%	14%	1%	0%
			Substructures	82%	17%	1%	0%
NE	771	7,399,670	Decks	77%	23%	0%	0%
			Superstructures	84%	15%	1%	0%
			Substructures	73%	27%	0%	0%
NW	1,040	8,704,733	Decks	51%	44%	4%	0%
			Superstructures	63%	35%	2%	0%
			Substructures	63%	34%	3%	0%
SE	1,034	13,679,880	Decks	43%	51%	6%	0%
			Superstructures	45%	52%	3%	0%
			Substructures	48%	51%	1%	0%
SW	1,451	11,514,403	Decks	74%	24%	2%	0%
			Superstructures	78%	20%	2%	0%
			Substructures	83%	16%	1%	0%

<sup>1</sup>Good: Bridges with NBI rating 7-9 should receive Preventive Maintenance

<sup>2</sup>Fair: Bridges with NBI 5-6 should receive Reactive Maintenance. These bridges are considered backlogged for maintenance

<sup>3</sup>Poor and Critical: Bridges with NBI 0-4 should receive Rehabilitation or Replacement.

## Bridge Maintenance Needs

Bridges recommended for maintenance are shown as percentages of 'number of bridges recommended for this particular maintenance in this county/region/state' divided by 'total number of bridges in this county/region/state'.

### Wisconsin 2006: Bridge Maintenance Needs

Maintenance	% of bridges recommended for maintenance <sup>23</sup>					
	Statewide	Region				
		NC	NE	NW	SE	SW
Deck - Seal Surface Cracks	11%	24%	13%	8%	12%	8%
Expansion Joints - Seal	8%	8%	22%	1%	15%	3%
Approach - Seal Approach to Paving Block	7%	1%	2%	17%	6%	5%
Misc. - Cut Brush	7%	2%	2%	8%	13%	5%
Drainage - Repair Washouts / Erosion	6%	1%	7%	5%	11%	3%
Deck - Patching	5%	10%	6%	4%	8%	2%
Approach - Wedge Approach	5%	2%	1%	3%	11%	4%
Misc. - Remove/Monitor Loose Concrete	4%	0%	0%	0%	16%	1%
Approach - Other Work	2%	1%	1%	1%	7%	2%
Deck - Other Work	2%	1%	1%	1%	6%	1%
Deck - Surface Repair Spalls	2%	1%	2%	4%	2%	1%
Approach - Seal Cracks	2%	0%	0%	1%	6%	1%
Channel - Remove Debris	2%	1%	1%	1%	2%	3%
Substructure - Repair Abutment / Wings	2%	2%	2%	1%	3%	1%
Misc. - Paint Spot / Complete	2%	1%	1%	1%	5%	0%
Superstructure - Other Work	2%	1%	0%	2%	3%	2%
Slope Protection - Reseal Slope Paving	2%	1%	0%	2%	4%	0%
Approach - Repair Approaches	1%	1%	1%	1%	3%	1%
Substructure - Other Work	1%	1%	1%	2%	1%	1%
Channel - Clean Box Culvert	1%	1%	1%	3%	2%	1%
Misc. - Other Work*	9%	5%	4%	2%	29%	4%

\* Misc. - Other Work\* are all maintenance works other than what are listed. The nature of a particular work is shown at the associated comment field in the HSI online report.

<sup>23</sup> The recommended maintenance listed on this table are the 20 most recommended maintenance statewide

## Counties 2006: Bridge Maintenance Needs

Region	County	Number of state bridges	% of bridges recommended for maintenance <sup>24</sup>							
			Deck - Seal Surface Cracks	Expansion Joints - Seal	Approach - Seal Approach to Paving Block	Misc. - Cut Brush	Drainage - Repair Washouts / Erosion	Deck - Patching	Approach - Wedge Approach	Misc. - Other Work*
NC	ADAMS	7	43%	29%	0%	0%	0%	0%	14%	0%
	FLORENCE	8	0%	0%	0%	0%	0%	0%	0%	0%
	FOREST	11	0%	0%	0%	0%	0%	0%	0%	0%
	GREEN LAKE	10	30%	10%	0%	10%	0%	0%	10%	10%
	IRON	18	6%	0%	0%	17%	0%	0%	0%	0%
	LANGLADE	10	0%	0%	10%	0%	0%	0%	0%	0%
	LINCOLN	49	4%	0%	0%	2%	0%	0%	2%	4%
	MARATHON	145	37%	14%	0%	4%	3%	0%	3%	10%
	MARQUETTE	36	22%	19%	0%	0%	0%	0%	3%	3%
	MENOMINEE	3	33%	0%	33%	0%	0%	0%	0%	0%
	ONEIDA	14	7%	0%	0%	0%	0%	0%	0%	0%
	PORTAGE	77	55%	8%	1%	0%	1%	0%	0%	6%
	PRICE	20	5%	0%	0%	0%	0%	0%	0%	0%
	SHAWANO	50	8%	2%	0%	2%	0%	6%	4%	0%
	VILAS	11	55%	0%	0%	0%	0%	0%	0%	0%
	WAUPACA	66	8%	5%	0%	0%	2%	0%	2%	3%
	WAUSHARA	21	33%	19%	0%	0%	0%	0%	0%	10%
WOOD	48	15%	6%	2%	0%	4%	6%	6%	4%	
NE	BROWN	217	15%	17%	0%	3%	8%	3%	0%	4%
	CALUMET	13	8%	23%	0%	0%	31%	0%	0%	0%
	DOOR	9	22%	22%	0%	0%	0%	0%	0%	0%
	FOND DU LAC	70	1%	7%	3%	0%	0%	13%	3%	6%
	KEWAUNEE	18	0%	11%	0%	0%	0%	0%	0%	0%
	MANITOWOC	89	3%	19%	0%	1%	4%	0%	0%	1%
	MARINETTE	26	12%	27%	23%	15%	0%	0%	0%	4%
	OCONTO	37	35%	16%	0%	0%	11%	0%	0%	0%
	OUTAGAMIE	77	10%	40%	5%	1%	6%	3%	3%	9%
SHEBOYGAN	85	19%	16%	4%	5%	9%	0%	0%	0%	

<sup>24</sup> The recommended maintenance listed on this table are the twelve most recommended maintenance statewide

			% of bridges recommended for maintenance <sup>24</sup>							
Region	County	Number of state bridges	Deck - Seal Surface Cracks	Expansion Joints - Seal	Approach - Seal Approach to Paving Block	Misc. - Cut Brush	Drainage - Repair Washouts / Erosion	Deck - Patching	Approach - Wedge Approach	Misc. - Other Work*
	WINNEBAGO	130	17%	33%	0%	1%	10%	1%	0%	6%
NW	ASHLAND	19	21%	0%	21%	42%	5%	0%	32%	0%
	BARRON	64	0%	0%	2%	0%	0%	0%	0%	0%
	BAYFIELD	34	6%	3%	9%	41%	9%	0%	0%	12%
	BUFFALO	70	1%	0%	3%	0%	0%	1%	1%	0%
	BURNETT	14	0%	0%	7%	21%	21%	0%	0%	0%
	CHIPPEWA	130	12%	0%	22%	2%	2%	0%	2%	5%
	CLARK	43	9%	0%	23%	19%	0%	0%	0%	5%
	DOUGLAS	61	7%	5%	10%	13%	8%	0%	2%	2%
	DUNN	88	9%	1%	24%	10%	6%	0%	5%	5%
	EAU CLAIRE	102	15%	0%	38%	5%	0%	0%	0%	1%
	JACKSON	73	4%	1%	11%	4%	4%	0%	1%	3%
	PEPIN	15	0%	7%	0%	13%	0%	0%	0%	7%
	PIERCE	57	5%	2%	7%	9%	11%	0%	5%	2%
	POLK	12	0%	8%	8%	8%	17%	0%	0%	0%
	RUSK	28	0%	0%	0%	0%	14%	0%	4%	0%
	SAWYER	19	0%	0%	0%	0%	0%	0%	0%	0%
	ST. CROIX	98	15%	1%	31%	12%	10%	2%	9%	2%
	TAYLOR	20	0%	0%	0%	0%	0%	0%	0%	0%
TREMPEALEAU	73	1%	0%	11%	5%	4%	3%	3%	0%	
WASHBURN	20	15%	5%	40%	0%	15%	5%	5%	0%	
SE	KENOSHA	58	24%	31%	3%	3%	7%	40%	2%	26%
	MILWAUKEE	520	9%	18%	5%	18%	4%	18%	4%	27%
	OZAUKEE	50	14%	4%	4%	8%	12%	4%	14%	24%
	RACINE	45	7%	16%	13%	7%	0%	22%	9%	27%
	WALWORTH	115	13%	10%	7%	10%	14%	4%	13%	34%
	WASHINGTON	75	0%	5%	12%	4%	4%	88%	3%	24%
	WAUKESHA	171	22%	9%	6%	11%	35%	4%	36%	33%
SW	COLUMBIA	97	0%	0%	0%	2%	2%	0%	0%	1%
	CRAWFORD	66	21%	0%	12%	9%	0%	5%	18%	9%
	DANE	283	0%	5%	3%	2%	3%	4%	1%	2%

Region	County	Number of state bridges	% of bridges recommended for maintenance <sup>24</sup>							
			Deck - Seal Surface Cracks	Expansion Joints - Seal	Approach - Seal Approach to Paving Block	Misc. - Cut Brush	Drainage - Repair Washouts / Erosion	Deck - Patching	Approach - Wedge Approach	Misc. - Other Work*
	DODGE	64	0%	0%	2%	5%	2%	2%	5%	5%
	GRANT	66	23%	0%	12%	8%	8%	2%	9%	8%
	GREEN	28	0%	0%	0%	0%	0%	0%	0%	0%
	IOWA	56	0%	0%	0%	2%	4%	0%	0%	0%
	JEFFERSON	70	0%	3%	0%	1%	0%	0%	0%	0%
	JUNEAU	80	24%	14%	0%	0%	1%	0%	0%	0%
	LA CROSSE	105	12%	1%	23%	10%	8%	9%	7%	10%
	LAFAYETTE	40	0%	0%	0%	5%	5%	3%	3%	0%
	MONROE	154	25%	3%	9%	7%	3%	1%	10%	10%
	RICHLAND	76	12%	3%	8%	17%	3%	1%	8%	7%
	ROCK	115	1%	0%	0%	0%	0%	0%	0%	1%
	SAUK	78	0%	1%	1%	1%	1%	4%	0%	0%
	VERNON	73	7%	4%	4%	8%	11%	0%	15%	0%

\* Misc - Other Work' are all maintenance works other than what are listed. The nature of a particular work is shown at the associated comment field in the HSI online report.

## ***Appendix***

- A. Program Contributors**
- B. Feature Thresholds and Grade Ranges**
- C. Feature Contribution Categories**
- D. 2006 Maintenance Targets**

## A. Program Contributors

The Wisconsin Department of Transportation appreciates the significant contributions to the Compass program that were made by the following people:

### 2006 Compass Advisory Team

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Todd Hogan, WisDOT SW Region Engineering Technician  
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Pete Strachan, WisDOT SW Region  
William Tackes, Ozaukee County  
Raymond Thomas, Florence County  
Michael Thompson, Buffalo County

John Thompson, Kewaunee County  
Alan Thoner, Pierce County  
Paul Van Beek, Marinette County  
Roger Venden, Iowa County  
Don Walker, Clark County  
Allen Washinawatok, Menominee County  
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John Ziech, Sauk County

### **Additional Compass Resources**

Mike Adams, WisDOT Central Office (winter)  
Dr. Teresa Adams, University of Wisconsin - Madison  
(data analysis, report)  
Dave Babler, WisDOT Central Office (bridge)  
JJ DuChateau, WisDOT Central Office (mapping)  
Scott Erdman, WisDOT Central Office (segment data)  
Emil Juni, University of Wisconsin - Madison (data  
analysis, report)  
Mary Kirkpatrick, WisDOT Central Office (desktop  
publishing)  
Mike Malaney, WisDOT Central Office (pavement)  
Tom Martinelli, WisDOT Central Office (winter)  
Tim Nachreiner, WisDOT Central Office (database,  
Rating Sheets)  
Curt Pulford, WisDOT Central Office (mapping)  
Matt Rauch, WisDOT Central Office (signs)  
Dave Sokolowski, University of Wisconsin - Madison  
(data analysis, report)  
Mike Sproul, WisDOT Central Office (winter)



## B. Compass Feature Thresholds and Grade Ranges

Element	Feature	Threshold	Ranges for System Grades <i>Grade determined by percent backlogged shown: top of range</i>				
			A	B	C	D	F
Traveled way, asphalt	Alligator cracking	10% or more of the surface has unsealed alligator cracking (by mile)	0-7%	8-18%	19-35%	36-60%	>60%
	Block cracking	10% or more of the surface has unsealed block cracking (by mile)	7%	18%	35%	60%	>60%
	Edge raveling	Visible cracking is present for 10% or more of the mile	7%	18%	35%	60%	>60%
	Flushing	Flushing is present in more than small, isolated areas (by mile)	7%	18%	35%	60%	>60%
	Longitudinal cracking	Any unsealed longitudinal cracking (by mile)	7%	18%	35%	60%	>60%
	Longitudinal distortion	Significant distortion affects 1% or more of roadway (by mile)	6%	15%	29%	50%	>50%
	Patch deterioration	Any patch is deteriorated enough to affect ride quality (by mile)	6%	15%	29%	50%	>50%
	Rutting	Ruts are ¼ inch or deeper (by mile)	2%	5%	9%	15%	>15%
	Surface raveling	The aggregate and/or asphalt binder has worn away and the surface texture is rough or pitted (by mile)	6%	15%	29%	50%	>50%
	Transverse cracking	Any unsealed transverse cracks at least 6' in length (by mile)	7%	18%	35%	60%	>60%
	Transverse distortion	Significant distortion affects 1% or more of roadway (by mile)	6%	15%	29%	50%	>50%
Traveled way, concrete	Distressed joints/cracks	Distress in wheel path greater than 2 inches wide (by mile)	6%	15%	29%	50%	>50%
	Longitudinal joint distress	Faulting or signs of distress are present (by mile)	6%	15%	29%	50%	>50%
	Patch deterioration	Any patch is deteriorated enough to affect ride quality (by mile)	6%	15%	29%	50%	>50%
	Slab breakup	Slab is divided into at least 2-3 large blocks, affecting 10% or more of the slab (by mile)	6%	15%	29%	50%	>50%
	Surface distress	Any measurable surface distress is present (by mile)	7%	18%	35%	60%	>60%
	Transverse faulting	Any measurable faulting (by mile)	6%	15%	29%	50%	>50%
Traffic control & safety	Centerline markings	Line with > 20% paint missing (by mile)	2%	5%	9%	15%	>15%
	Edgeline markings	Line with > 20% paint missing (by mile)	4%	9%	18%	30%	>30%

Element	Feature	Threshold	Ranges for System Grades <i>Grade determined by percent backlogged shown: top of range</i>				
			A	B	C	D	F
devices (selected)	Delineators	Missing OR not visible at posted speed OR damaged (by delineator)	5%	12%	23%	40%	>40%
	Other signs (emergency repair)	Missing OR not visible at posted speed (by sign)	4%	9%	18%	30%	>30%
	Other signs (routine)		7%	18%	35%	60%	>60%
	Protective barriers	Not functioning as intended (linear feet of barrier)	4%	9%	18%	30%	>30%
	Raised pavement markers	Missing OR damaged (by RPM)	4%	9%	18%	30%	>30%
	Regulatory/warning signs (emergency repair)	Missing OR not visible at posted speed (by sign)	2%	5%	9%	15%	>15%
	Regulatory/warning signs (routine)	Beyond recommended service life (by sign)	5%	12%	23%	40%	>40%
	Special pavement markings	Missing OR not functioning as intended (by marking)	5%	12%	23%	40%	>40%
Shoulders	Hazardous debris	Any items large enough to cause a safety hazard (by mile)	2%	5%	9%	15%	>15%
	Cracking on paved shoulder	200 linear feet or more of unsealed cracks > ¼ inch (by mile)	7%	18%	35%	60%	>60%
	Potholes/raveling on paved shoulder	Any potholes OR raveling > 1 square foot by 1 inch deep (by mile)	6%	15%	29%	50%	>50%
	Cross-slope on unpaved shoulder	200 linear feet or more of cross-slope at least 2x planned slope with the maximum cross slope of 8% (by mile)	7%	18%	35%	60%	>60%
	Drop-off/build-up on unpaved shoulder	200 linear feet or more with drop-off or build-up > 1.5 inches (by mile)	4%	9%	18%	30%	>30%
	Erosion on unpaved shoulder	200 linear feet or more with erosion >2 inches deep (by mile)	7%	18%	35%	60%	>60%
Drainage	Culverts	Culverts that are >25% obstructed OR where a sharp object - e.g., a shovel-can be pushed through the bottom of the pipe OR pipe is collapsed or separated (by culvert)	7%	18%	35%	60%	>60%
	Curb & gutter	Curb & gutter with severe structural distress OR >1 inch structural misalignment OR >1 inch of debris build-up in the curb line (by linear feet of curb & gutter)	9%	22%	41%	70%	>70%
	Ditches	Ditch with greater than minimal erosion of ditch line OR obstructions to flow of water requiring action (by linear feet of ditch)	7%	18%	35%	60%	>60%

Element	Feature	Threshold	Ranges for System Grades <i>Grade determined by percent backlogged shown: top of range</i>				
			A	B	C	D	F
	Flumes	Not functioning as intended OR deteriorated to the point that they are causing erosion (by flume)	7%	18%	35%	60%	>60%
	Storm sewer system	Inlets, catch basins, and outlet pipes with >=50% capacity obstructed OR <80% structurally sound OR >1 inch vertical displacement or heaving OR not functioning as intended (by inlet, catch basin & outlet pipes)	7%	18%	35%	60%	>60%
	Under-drains/edge-drains	Under- and edge-drains with outlets, endwalls or end protection closed or crushed OR water flow or end protection is obstructed (by drain)	9%	22%	41%	70%	>70%
Roadsides	Barriers	Noise barrier or retaining wall not functioning as intended (by LF of barrier)	4%	9%	18%	30%	>30%
	Fences	Fence missing OR not functioning as intended (by LF of fence)	4%	9%	18%	30%	>30%
	Litter	Any pieces of litter on shoulders and roadside visible at posted speed, but not causing a safety threat. (by mile)	10%	25%	47%	80%	>80%
	Mowing	Any roadside has mowed grass that is too short, too wide or is mowed in a no-mow zone (by mile)	10%	25%	47%	80%	>80%
	Mowing for vision	Any instances in which grass is too high or blocks a vision triangle (by mile)	4%	9%	18%	30%	>30%
	Noxious weeds	Any visible clumps (by mile)	7%	18%	35%	60%	>60%
	Woody vegetation control	Any instances in which a tree is present in the clear zone OR trees and/or branches overhang the roadway or shoulder creating a clearance problem (by mile)	4%	9%	18%	30%	>30%
	Woody vegetation control for vision	Any instances in which woody vegetation blocks a vision triangle (by mile)	4%	9%	18%	30%	>30%

### C. Feature Contribution Categories

		<i>This Feature Contributes Primarily To:</i>				
<b>Element</b>	<b>Feature</b>	<b>Critical Safety</b>	<b>Safety/Mobility</b>	<b>Ride/Comfort</b>	<b>Stewardship</b>	<b>Aesthetics</b>
<b>Asphalt Traveled Way</b>	Alligator Cracking				✓	
	Block Cracking				✓	
	Edge Raveling				✓	
	Flushing				✓	
	Longitudinal Cracking				✓	
	Longitudinal Distortion			✓		
	Patch Deterioration			✓		
	Rutting	✓				
	Surface Raveling			✓		
	Transverse Cracking				✓	
	Transverse Distortion			✓		
	<b>Concrete Traveled Way</b>	Distressed Joints/Cracks			✓	
Longitudinal Joint Distress				✓		
Patch Deterioration				✓		
Slab Breakup				✓		
Surface Distress					✓	
Transverse Faulting				✓		

		<i>This Feature Contributes Primarily To:</i>				
<b>Element</b>	<b>Feature</b>	<b>Critical Safety</b>	<b>Safety/Mobility</b>	<b>Ride/Comfort</b>	<b>Stewardship</b>	<b>Aesthetics</b>
<b>Traffic and Safety</b>	Centerline Markings	✓				
	Delineators		✓			
	Edgeline Markings		✓			
	Other Signs (emerg. repair)		✓			
	Other Signs (routine repair)			✓		
	Protective Barriers		✓			
	Raised Pavement Markers		✓			
	Reg./Warning Signs (emerg.)	✓				
	Reg./Warning Signs (routine)		✓			
	Special Pavement Markings		✓			
	<b>Shoulders</b>	Hazardous Debris	✓			
Cracking (paved)					✓	
Potholes/Raveling (paved)				✓		
Cross-Slope (unpaved)				✓		
Drop-off/Build-up (unpaved)			✓			
Erosion (unpaved)					✓	

		<i>This Feature Contributes Primarily To:</i>				
Element	Feature	Critical Safety	Safety/Mobility	Ride/Comfort	Stewardship	Aesthetics
<b>Drainage</b>	Culverts				✓	
	Curb & Gutter				✓	
	Ditches				✓	
	Flumes				✓	
	Storm Sewer System				✓	
	Under-drains/Edge-drains				✓	
<b>Roadside</b>	Barriers				✓	
	Fences		✓			
	Litter					✓
	Mowing		✓			
	Mowing for Vision		✓			
	Noxious Weeds				✓	
	Woody Vegetation		✓			
	Woody Veg. Control for Vision		✓			

**Category Definitions:**

Critical safety: Critical safety features that would necessitate immediate action – with overtime pay if necessary - to remedy if not properly functioning.

Safety: Highway features and characteristics that protect users against – and provide them with a clear sense of freedom from – danger, injury or damage.

Ride/comfort: Highway features and characteristics, such as ride quality, proper signing, or lack of obstructions, that provide a state of ease and quiet enjoyment for highway users.

Stewardship: Actions taken to help a highway element obtain its full potential service life.

Aesthetics: The display of natural or fabricated beauty items, such as landscaping or decorative structures, located along a highway corridor. Also, the absence of things like litter and graffiti, that detract from the sightlines of the road.

## WisDOT Highway Operations 2006 and 2007 Target Service Levels

October 16, 2006

Issued by

*David Vieth, Director of the Bureau of Highway Operations*

Attached are the 2006 and 2007 target service levels for highway operations. Highway operations managers expect these targets to provide guidance to central and regional highway operations staff in selecting activities and expending resources. The 2007 targets will help structure the process for developing 2007 Routine Maintenance Agreements.

Targets are the conditions expected on state highways at the end of the summer maintenance season. They were selected by highway operations managers in the regions and BHO to set priorities within the budget, and to increase consistency across region and county lines.

The condition measure used is the percent of inventory with backlogged maintenance work. A measure greater than 0% backlogged reflects work left undone at the end of the summer season. Under full funding of operations needs, we would expect to see features at or close to 0%. The following chart provides historical service levels statewide and by region for 2005. Please remember that targets have not yet been set for a portion of highway operations expenditures including winter operations, certain traffic devices and electrical operations.

Targets do not necessarily reflect an optimal maintenance condition for the highways, but instead reflect organizational priorities, existing highway conditions, and dollars available. It is assumed that all highway operations staff is doing the best job possible, given constrained resources.

These organizational priorities include:

- Focusing our resources on keeping the system safe and operating from day to day.  
Highway operations will:
  - Decrease the amount of hazardous debris on shoulders.
  - Decrease drop-off on unpaved shoulders.
  - Increase the routine replacement of regulatory and warning signs.
- Expending far fewer resources based on limited funding.
  - Activities that address pavement cracking, noxious weeds and fence maintenance will be done infrequently, if at all. Litter removal and mowing will be reduced over time.
  - No maintenance of raised pavement markers and other wet reflective markings. Special pavement markings will only be addressed for the most critical safety needs. Some edgeline markings will be deferred due to reduced funding.
- Leveraging improvements that can decrease the maintenance workload.
  - Now and going forward, operations managers will step up their work with the improvement program to decrease pavement rutting and to improve culverts.

Thank you to Scott Bush and the Compass program for coordinating this effort and preparing this report.

### D. 2006 and 2007 Highway Operations Targets

Element	Feature	2003 Actual Percent Backlogged and Feature Grade - Statewide	2004 Actual Percent Backlogged and Feature Grade - Statewide	2005 Actual Percent Backlogged and Feature Grade - Statewide	2004 Target Percent Backlogged and Feature Grade - Statewide	2005 Target Percent Backlogged and Feature Grade - Statewide	2006 Target Percent Backlogged and Feature Grade - Statewide	2007 Target Percent Backlogged and Feature Grade - Statewide
Asphalt Traveled Way	Alligator Cracking	1=A	1=A	1=A	3=A	5=A	5=A	5=A
	Block Cracking	3=A	3=A	3=A	5=A	5=A	5=A	5=A
	Edge Raveling	14=B	15=B	15=B	15=B	15=B	18=B	20=C
	Flushing	1=A	0=A	0=A	1=A	1=A	1=A	1=A
	Longitudinal Cracking	24=C	26=C	26=C	21=C	25=C	28=C	30=C
	Longitudinal Distortion	0=A	0=A	0=A	0=A	1=A	1=A	1=A
	Patch Deterioration	10=B	9=B	9=B	10=B	10=B	10=B	10=B
	Rutting	11=D	9=C	9=C	17=F	15=D	13=D	10=D
	Surface Raveling	2=A	1=A	1=A	2=A	2=A	2=A	2=A
	Transverse Cracking	22=C	24=C	24=C	24=C	25=C	28=C	30=C
Transverse Distortion	1=A	1=A	1=A	5=A	5=A	5=A	5=A	
Concrete Traveled Way	Distressed Joints/Cracks	34=D	34=D	33=D	43=D	43=D	43=D	43=D



<b>Element</b>	<b>Feature</b>	<b>2003 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2006 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2007 Target Percent Backlogged and Feature Grade - Statewide</b>
	Longitudinal Joint Distress	22=C	21=C	21=C	27=C	27=C	27=C	27=C
	Patch Deterioration	28=C	28=C	28=C	30=D	30=D	30=D	30=D
	Slab Breakup	46=D	45=D	44=D	44=D	45=D	45=D	45=D
	Surface Distress	21=C	20=C	20=C	25=C	25=C	25=C	25=C
	Transverse Faulting	76=F	74=F	74=F	80=F	75=F	75=F	75=F
Traffic and Safety	Centerline Markings	6=C	5=B	5=B	6=C	5=B	5=B	6=C
	Delineators	19=C	21=C	24=D	15=C	15=C	25=D	25=D
	Edgeline Markings	11=C	7=B	5=B	6=B	6=B	6=B	7=B
	Other Signs (emerg. repair)	2=A	0=A	1=A	15=C	1=A	1=A	1=A
	Other Signs (routine repair)	--	46=D	59=D	--	50=D	65=F	70=F
	Protective Barriers	18=C	3=A	4=A	9=B	3=A	3=A	3=A
	Raised Pavement Markers	11=C	15=C	15=C	14=C	25=D	25=D	25=D

<b>Element</b>	<b>Feature</b>	<b>2003 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2006 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2007 Target Percent Backlogged and Feature Grade - Statewide</b>
	Reg./Warning Signs (emerg.)	6=C	1=A	1=A	6=C	0=A	0=A	0=A
	Reg./Warning Signs (routine)	--	36=D	41=F	--	40=D	35=D	30=D
	Special Pavement Markings	15=C	13=C	5=A	21=C	25=D	25=D	25=D
Shoulders	Hazardous Debris	9=C	13=D	12=D	6=C	6=C	6=C	6=C
	Cracking (paved)	46=D	51=D	52=D	50=D	60=D	60=D	60=D
	Potholes/Raveling (paved)	7=B	5=A	7=B	12=B	10=B	10=B	10=B
	Cross-Slope (unpaved)	14=B	15=B	14=B	9=B	20=C	20=C	20=C
	Drop-off/Build-up (unpaved)	45=F	37=F	36=F	34=F	35=F	30=D	25=D
	Erosion (unpaved)	3=A	3=A	3=A	8=B	5=A	5=A	5=A
Drainage	Culverts	14=B	17=B	18=B	13=B	15=B	15=B	15=B
	Curb & Gutter	8=A	6=A	7=A	8=A	8=A	10=B	10=B
	Ditches	2=A	2=A	2=A	2=A	2=A	2=A	2=A
	Flumes	20=C	32=C	19=C	14=B	30=C	30=C	30=C
	Storm Sewer System	8=B	9=B	9=B	8=B	10=B	10=B	10=B

<b>Element</b>	<b>Feature</b>	<b>2003 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Actual Percent Backlogged and Feature Grade - Statewide</b>	<b>2004 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2005 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2006 Target Percent Backlogged and Feature Grade - Statewide</b>	<b>2007 Target Percent Backlogged and Feature Grade - Statewide</b>
	Under-drains/Edge-drains	15=B	14=B	20=B	11=B	20=B	25=C	25=C
Roadside	Barriers	2=A	--	--	5=B	5=B	5=B	5=B
	Fences	14=C	4=A	2=A	16=C	14=C	14=C	14=C
	Litter	67=D	70=D	62=D	71=D	75=D	75=D	75=D
	Mowing	--	40=C	35=C	58=D	40=C	40=C	40=C
	Mowing for Vision	--	26=D	--	5=B	5=B	5=B	5=B
	Noxious Weeds	19=C	30=C	29=C	48=D	50=D	50=D	50=D
	Woody Vegetation	4=A	4=A	3=A	7=B	5=B	5=B	5=B
	Woody Veg. Control for Vision	0=A	1=A	1=A	5=B	5=B	3=A	3=A

## E. 2006 Compass Rating Sheet



2006 Compass Rating Sheet  
Wisconsin Department of Transportation

«MySegment», «MyRoute», «MyCounty», «MyDistrict»  
Directions: «PrimaryDir»  
Alternate Directions: «AltDir»

Date Survey Taken:
Start Time:
Stop Time:
Reviewed by:

Segments can only be discarded for the following reasons. If this segment meets one of these criteria, please check the appropriate box and add the next highest "spare" segment to your list of segments to be rated. Please enter the reject reason in the database.

- A piece or all of the segment falls on a bridge.                       A piece or all of the segment is currently under construction.  
 We believe it would be unsafe to rate this segment.                       We cannot locate this segment.  
 A piece or all of the segment is scheduled for improvement in the next year.  
 An organization other than WisDOT is responsible for the maintenance of ANY of the four elements within this section.

Shoulders	Standard	Value	Comments
<b>Hazardous Debris (S-1)</b>	Number of items large enough to cause a safety hazard.....		
<b>Paved Shoulder</b> <input type="checkbox"/> None (If none, skip to Unpaved Shoulder)			
<b>Cracking (S-2)</b>	Linear ft. of unsealed cracks greater than ¼" (up to 150' on undivided or 300' on divided hwy).....		
<b>Potholes/ Raveling (S-3)</b>	Total sq. ft. of BOTH potholes AND raveling greater than 1 ft² x 1" deep.....		
<b>Unpaved Shoulder</b> <input type="checkbox"/> None (If none, skip to Drainage)			
<b>Drop off/ build-up (S-4)</b>	Linear ft. of <u>paved-to-unpaved</u> drop-off/build-up greater than 1.5".....		
<b>Cross Slope (S-5)</b>	Linear ft. with unpaved cross slope greater than 2x planned angle.....		
<b>Erosion (S-6)</b>	Linear ft. with ruts deeper than 2 inches.....		

Drainage			Value	Comments
<b>Ditches (D-1)</b>	<input type="checkbox"/> None	Total linear ft. of ditch..... Linear ft. with more than minimal erosion of ditch line OR obstructions to the flow of water requiring action.....		
<b>Culverts (D-2)</b>	<input type="checkbox"/> None	Total number of culverts..... Number more than 25% obstructed OR where a sharp object (a shovel) can be pushed thru bottom of pipe OR pipe is collapsing.		
<b>Under/ Edge Drain (D-3)</b>	<input type="checkbox"/> None	Total number of drains..... Number with outlets, endwalls or end protection closed or crushed OR where water flow or end protection is obstructed.....		
<b>Flumes (D-4)</b>	<input type="checkbox"/> None	Total number of flumes..... Number not functioning as intended OR deteriorated to the point that they are causing erosion.....		
<b>Curb &amp; Gutter (D-5)</b>	<input type="checkbox"/> None	Total linear ft. of curb and gutter..... Linear ft. with severe structural distress OR more than 1" structural misalignment OR more than 1" of debris build up in the curb line ..		
<b>Storm Sewer (D-6)</b>	<input type="checkbox"/> None	Total number of inlets, catch basins and outlet pipes..... Number with more than 50% capacity obstructed OR less than 80% structurally sound OR more than 1" vertical displacement OR not functioning as intended.....		

Roadsides		Value	Comments
<input checked="" type="checkbox"/> Litter (R-1)	Number of pieces (up to 15) of litter & non-natural encroachments on shoulders & roadside visible at posted speed, but not causing a safety threat.....		
<input type="checkbox"/> Mowing (R-2)	Mowing meets standard..... if NO, grass is mowed: <input type="checkbox"/> too wide <input type="checkbox"/> too short <input type="checkbox"/> too high <input type="checkbox"/> in a no mow zone if NO, why: <input type="checkbox"/> safety/equipment <input type="checkbox"/> mowed by property owner <input type="checkbox"/> woody vegetation control <input type="checkbox"/> maintenance decision		<input type="checkbox"/> yes <input type="checkbox"/> no
<input checked="" type="checkbox"/> Mowing Vision (R-2)	<input type="checkbox"/> None	Grass blocks a vision triangle or sightlines.....	<input type="checkbox"/> yes <input type="checkbox"/> no
<input type="checkbox"/> Noxious Weeds (R-3)	Visible clumps of noxious weeds are present.....		<input type="checkbox"/> yes <input type="checkbox"/> no
<input type="checkbox"/> Woody Vegetation (R-4)	Number of instances in which a tree > 4" in diameter is present in the clear zone OR trees and/or branches overhang the roadway or shoulder creating a clearance problem.....		
<input checked="" type="checkbox"/> Woody Vegetation Vision (R-4)	Woody vegetation causes a vision problem.....		<input type="checkbox"/> yes <input type="checkbox"/> no
<input type="checkbox"/> Fences (R-5)	<input type="checkbox"/> None	Total linear ft. of right-of-way fence..... Linear ft. missing OR not functioning as intended.....	
<input type="checkbox"/> Walls & Barriers (R-6)	<input type="checkbox"/> None	Total linear ft. of retaining walls and noise barriers..... Linear ft. not functioning as intended.....	

Traffic Control and Safety		Value	Comments
<input type="checkbox"/> Centerline Markings (T-1)	<input type="checkbox"/> None	Over total segment, > 20% centerline paint missing.....	<input type="checkbox"/> yes <input type="checkbox"/> no
<input type="checkbox"/> Edgeline Markings (T-1)	<input type="checkbox"/> None	Over total segment, > 20% edgeline paint missing.....	<input type="checkbox"/> yes <input type="checkbox"/> no
<input type="checkbox"/> Special Pavement Markings (T-2)	<input type="checkbox"/> None	Total number..... Number missing OR not functioning as intended.....	
<input checked="" type="checkbox"/> Raised Pavement Markers (T-3)	<input type="checkbox"/> None	Total number..... Number missing OR not visible at posted speed OR damaged.....	
<input checked="" type="checkbox"/> Regulatory/ Warning Signs (T-4)	<input type="checkbox"/> None	Total number..... Number missing OR not visible at posted speed.....	
<input checked="" type="checkbox"/> Other Signs (T-5)	<input type="checkbox"/> None	Total number..... Number missing OR not visible at posted speed.....	
<input checked="" type="checkbox"/> Delineators (T-6)	<input type="checkbox"/> None	Total number..... Number missing OR not visible at posted speed OR damaged.....	
<input type="checkbox"/> Protective Barriers (T-7)	<input type="checkbox"/> None	Total linear ft. of beam guard, concrete barrier, & cable guard.... Linear ft. of protective barriers not functioning as intended.....	

Indicates some or all of feature rating must be completed while driving at posted speed OR rated through the eyes of a driver traveling at posted speed.

1/10-mile	528 ft
X2	1056 ft
X3	1584 ft
X4	2112 ft

Rating sheets should be entered into your laptop database and emailed or given to your LAN administrator by **October 16, 2006**

Questions? Please call Scott Bush, Compass Program Manager, at 608-266-8666