NDDOT
North Dakota
Department of Transportation

2018

Snow and Ice Control Route Optimization Study Results

2018 Snow & Ice Control Study Results

1.0 Executive Summary

Providing a safe and efficient transportation system for motorists is an important outcome of the snow and ice control operations process. North Dakota Department of Transportation (NDDOT) team members work on our mission to safely move people and goods daily and always pursue advancements and efficiencies with snow and ice control operations.

Through the years NDDOT has explored route and section optimization to meet the changing needs of state residents. Prior to the 1960s the department had approximately 135 section locations, excluding the District Headquarters for road maintenance. Over time and with the use of innovative equipment, material modifications and computer technology we have reduced our section locations throughout the state to 61.

Senate Bill 2012 contained a provision that required NDDOT to study the manner in which it provides snow and ice control services and potential savings available in providing these services. In late 2017, NDDOT hired a contractor, C2Logix, to conduct a technical analysis of current snow and ice control routes. The department created a team to work with the contractor and provide information about current services and pertinent parameters to analyze routes plus level of service.

Levels of service and cycle times were two important criteria used in analyzing the optimized routes. The contractor and NDDOT worked closely together and went through several iterations of optimizations before deciding on a final run showing the need for 327 routes to cover the highways that we are responsible for. The optimization model created uniform cycle times based on levels of service across the state. The model shows a 19% reduction in mileage and an 8% reduction in plowing time when comparing NDDOT's previous cycle times and routes. The optimization model accomplished this by configuring more uniform cycles for routes. For example, it changed the cycle time of one route from 5 hours to 3 hours and then changed the cycle time for another route from 1 hour to 3 hours. See Attachment J for table on plow cycles

NDDOT's experience with snow and ice control operations requires 351 operators to cover the 327 routes. The 351 operators account for plowing the designated routes, overnight crews in metro areas (Fargo, Bismarck, Minot and proposed Grand Forks), as well as planned and unplanned absences. The analysis included reviewing a variety of existing section locations for possible reductions or consolidations and the addition of a new section location.

In addition to this technical analysis, the NDDOT conducted a Public Survey on Snow and Ice Control to learn what level of snow and ice control services were acceptable to motorists on ND highways. The results from the first question indicated that the majority of drivers are satisfied with their current level of service. The survey also indicated that the majority of drivers expected the service provided should be the same for all 4-lane roads. For questions addressing roadways with snow covered and compacted snow, the survey results show drivers on 2-lane roads are less accepting of snow covered roads than 4-lane roads. See Attachment L for more information on the public survey.

In reviewing the public survey results and historical data, NDDOT collaborated with the contractor to have the North Dakota highway network optimized for plowing. Using the modeled 327 routes, the optimization study shows long term savings on capital, employees and equipment while maintaining statewide uniformity in snow and ice control.

The optimization study results are based on providing a uniform level of service identified by the subject matter experts and did not look at adding more services. The study shows the possibility of long term savings of $345,000/year through the reduction of operating costs and three employees. It also shows a

one-time cost saving of $634,000 through removal of three snowplows from the fleet. The study also looked at capital investments, reviewing long term options in which some section locations may be consolidated and an additional section location may need to be built, while many other existing section locations need to be improved to accommodate optimization needs. Consolidation may reduce capital assets by $5 million but approximately $4.6 million will be needed to invest in buildings for optimization improvements.

Our next steps are to:

- Evaluate and prove the technical study results by testing the optimized routes this winter season and verifying operational reliability.
- Obtain additional public feedback by conducting focus groups across the state.
- Review capital asset needs.

This study showed the department that NDDOT's current snow and ice control operations are efficient but there are also other techniques we can use to improve effectiveness. The technical data from the study and public input are tools that we will use to help make decisions for updating facilities, maximizing service levels and providing potential cost savings in the future.

2.0 Purpose

The purpose of this study is to meet the legislative requirement that NDDOT study the manner in which it provides snow and ice control services and potential savings available in providing these services. This requirement comes from the Senate Bill 2012 passed during the 65th Legislative Assembly. See Attachment K.

3.0 Current Department Innovations

In the past, studies were developed around staffing and the number of lane miles per operator. The rationale was to provide staffing and resources in order to provide an improved level of service. Now with the advancements being made in equipment and methods of operation, more efficiencies can be obtained and still provide an improved level of service. Some of those advancements are identified below:

- The towplow is one of the newest advancements in equipment to bring efficiencies to the snow and ice control operation. The towplow is beneficial wherever you have multi-lane facilities like the Interstate system or wide shoulders. The towplow can assist in removing snow that would otherwise be needed to make a second pass on the roadway. The towplow can also directly apply liquid salt brine to the surface of the roadway in an anti-icing or de-icing application. The towplow and truck can be used to apply straight salt or liquid salt brine in a slurry application. The department currently has 32 towplows in the fleet.
- The advancements made to the plow truck include an electronic spreader control that can meter straight salt at calibrated pounds of salt per lane mile, much like an agriculture crop spraying operation allowing for a more precise application rate. Tandem axle trucks spreading straight salt can cover more lane miles than the same truck with sand/salt mix. A tandem axle truck is capable of covering approximately 70 lane miles of roadway at a 300 pounds per lane mile application rate, which is a common application rate.
- Maintenance Decision Support System (MDSS) in conjunction with a value added meteorologist has also advanced the efficiencies of snow and ice control. The weather forecast is used to measure the magnitude of the storm event while MDSS can provide the timing of the storm, how much and what type of precipitation is to be expected, when the best time would be to apply liquid or granular material, and provide the most cost effective treatment recommendation that should be used.

4.0 Department Analysis History

Over time the department has reviewed the number of maintenance section locations statewide and consolidated service areas based on efficiencies. Prior to the 1960s the department had approximately 135 section locations which concentrated primarily on gravel road maintenance. Through the years as gravel roads transitioned to pavement and equipment evolved, the need for larger crew sizes grew and maintenance operations changed. This lead to the optimization and consolidation of maintenance section locations. Section optimization studies were completed in 1994, 2008, and 2017. The 2017 study focused on using the most efficient and cost effective methods of snow and ice control such as using straight salt, pre-wetting, anti-icing, and towplows. As a result of the 2017 study, NDDOT reduced the number of section locations by eight going from 69 to 61.

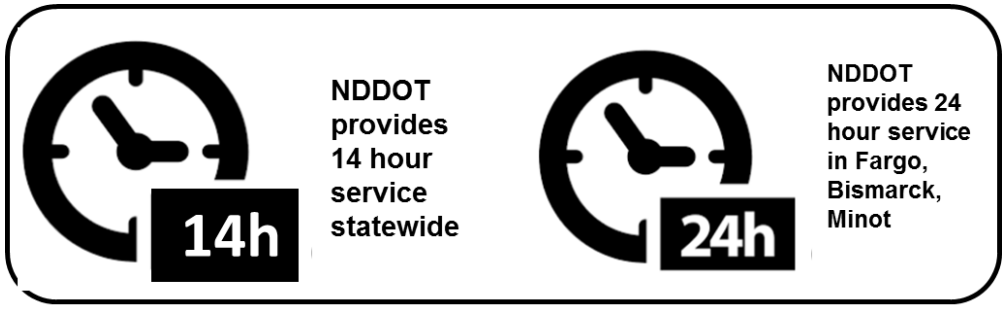
4.01 Methodology of C2Logix Route Optimization Analysis

The department was tasked with studying the manner in which it provides snow and ice control services. To meet the legislative requirements for 2018, NDDOT contracted with a route optimization consultant and conducted a public survey on snow and ice control. Using the information gained, the department analyzed current operations and will look at recommended efficiencies for the future. These recommendations can be found in Section 5.0 Conclusions and Discussion of this report.

Background

NDDOT is responsible for plowing approximately 17,250 lane miles of state highways. There is currently a total of 354 transportation technicians (trans techs) stationed in 61 section locations and eight NDDOT District Headquarters (see Attachment A). Out of these 354 trans techs, six are dedicated night-shift operators. This leaves a total of 348 trans techs who plow snow during the daytime hours. During planned and unplanned absences, other staff, such as sign shop personnel, engineering techs, or other employees with commercial driver's licenses, help operate the plows during significant events.

NDDOT is not a 24-hour snow plowing operation, generally providing service through a 14-hour day from 5 a.m. to 7 p.m., however there are three 24-hour snow plowing operations located in Fargo, Bismarck, and Minot metro areas. It is in these three locations where there are six dedicated winter night-shift operators.



Analysis team established

NDDOT acquired the services of a consultant to analyze current snow plow operations and determined the current cycle times being performed. Working with the consultant the department set up a team of Subject Matter Experts to establish the needed inputs for the program. The team consisted of

representatives from the eight districts, the central office maintenance division, and the NDDOT executive office.

Cycle times, plowing speeds and innovation analyzed

The team decided on parameters to be used in the optimization study such as level of service, cycle times, plowing speeds, deadhead speeds, down time, working hours, and current department innovations. The modeling process used a statewide snow event to calculate the total time to clear all driving lanes with optimized routing. Other information included items such as how wide a plow could clear, how far a plow could travel on a tank of fuel, and delays associated with intersections and interchanges, to name a few.

Level of Service Six Tier System utilized

NDDOT used a six tier system to identify the level of service (LOS) for the different classifications of highways from urban Interstates to rural District Collectors (see Attachment B). The LOS was based on the Highway Performance Classification System passed by Legislature in 2003 (see Attachment C).

The department grouped levels of service by plowing cycle times: urban Interstate goal was a two hour cycle time; rural Interstate, Interregional highways, and State Corridors goal was a three hour cycle time; and District Corridors and District Collectors goal was a four hour cycle time. A cycle consists of a plow starting at the section building, plowing its route, refueling and reloading as necessary, and getting back to the starting point ready to plow the route again, a full circle. A plow truck would be seen at any given point along the route approximately once every two, three, or four hours depending on the highway classification. Two cycles per day were required for all routes.

The contractor then designed balanced, optimized routes based on the remaining section locations utilizing a commercially available route optimization software system. The software was capable of automatically determining the most efficient snowplow routes using multiple levels of service and storm scenarios and was programmable to account for future changes to section locations, salt sheds, lane miles, and equipment capacity. Although the department's maintenance sections perform both summer and winter maintenance operations, the optimization study focuses on winter maintenance operations only. The department provided cost figures for labor and equipment to the consultant for use in the study summary.

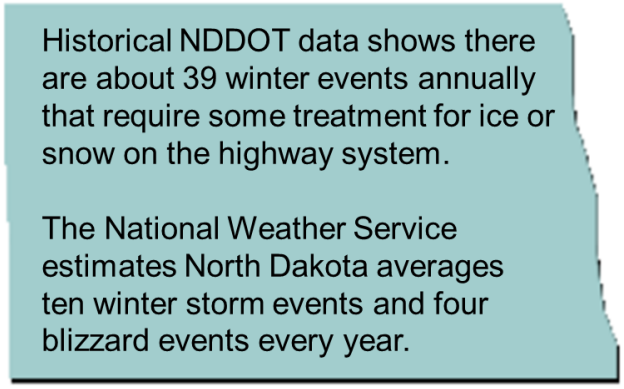
Population centers, public health facilities and school locations included

The company then modeled NDDOT's existing practices, coordinated with the department on adjustments to their work, and optimized the plow routes based on established criteria and NDDOT practices. This resulted in cycle times ranging from approximately a 1-hour cycle time to a 9-hour cycle time. In order to help determine where modifications could possibly be made to our existing operations the department looked at existing locations of population centers, public health facilities, schools (see Attachments E, F, G, and H), and applied a 25 mile radius around existing section locations (see Attachment I) to help identify redundancies. With this information the department identified potential areas of redundancy.

The contractor performed multiple iterations of route optimization. As different optimized runs were completed, the department analyzed the results and verified the runs would meet our service criteria. Working through this process the department and the contractor agreed on an accepted optimized run. This run was labeled Run 3 and the results as prepared by the contractor are attached to this report as Attachment D.

The results of the C2Logix route optimization model shows that daytime plow operations could cover the statewide highway network using 327 routes. All highways would be plowed with the parameters set by NDDOT and according to LOS. The model shows a 19% reduction in mileage and an 8% reduction in plowing time when comparing 354 routes to 327 routes. The optimization model accomplished this by

balancing cycle times and determining more uniform cycle times for routes. For example, it changed the cycle time of one route from 5 hours to 3 hours and then changed the cycle time for another route from 1 hour to 3 hours.



Historical NDDOT data shows there are about 39 winter events annually that require some treatment of the highway system. According to the National Weather Service, North Dakota averages ten winter storm events and four blizzard events every year. North Dakota is a large state with varying topography and weather. It is rare that the entire state experiences a winter event requiring all plows to work for the full 14-hour day. Where the optimization model does show consistent savings is with the reduced number of plow routes, therefore reducing equipment and staff costs over the entire year.

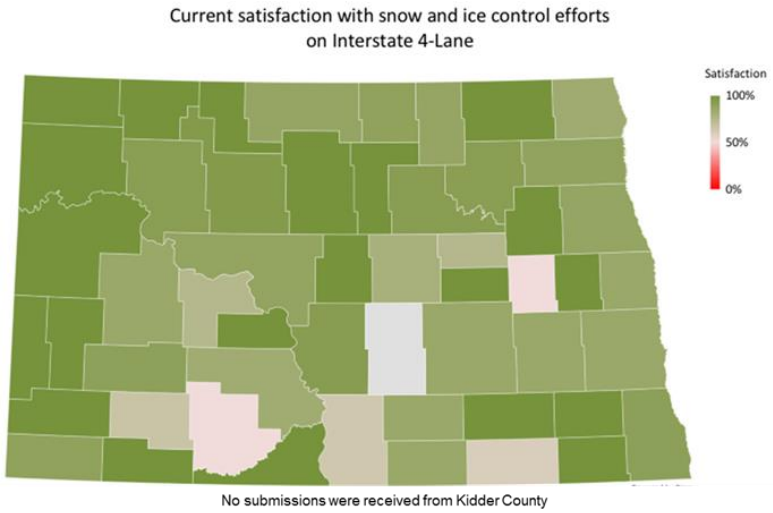
The plowing model created by the contractor improves plowing uniformity across the state. Uniformity would be based on the highway performance classification system. The optimization model applied consistent level of service, cycle times, and hours of operation to the highway network.

4.02 NDDOT Public Survey on Snow and Ice Control 2018

NDDOT conducted a Public Survey on Snow and Ice Control to learn what level of snow and ice control services were acceptable on ND highways. The survey comprised of 43 questions and was conducted online as well as distributed in paper format at a couple of local public events in May. There were a total of 1,189 responses.

The results from the first question indicated that the majority of drivers are satisfied with their current level of service. Questions 2 & 3 compared the service provided and service expected on Interstate four-lane versus Non-Interstate four-lane. The results indicated that the majority of drivers currently saw more service provided to the Interstate than Non-Interstate. The results also indicated that the majority of drivers expected that service provided should be the same for all four-lane roads, whether they are Interstate or Non-Interstate.

In regard to NDDOT's hours of operation the majority of survey respondents wanted no change to the plow start or stop times. The survey results support the idea that the traveling public has become accustom to NDDOT's hours of operations. This is shown in the results of questions 4-8 as well as the Acceptability of Road Conditions questions. In general, the traveling public is more accepting of poor road conditions at 6 a.m. and less accepting of poor road conditions by 10 a.m. The traveling public generally knows the NDDOT is not a 24/7 operation and understands it will take some time in the morning hours to catch up with what snow fell over the night hours. Expectations through the evening hours are generally consistent. With plow crews finishing their operations around 5-7 p.m. nightly, the general public seems to understand there will not be significant improvements in road conditions between 8-10 p.m., hence their expectations remaining the same for the 8-10 p.m. time period.



For questions addressing roadways with snow covered and compacted snow, the survey results show drivers on 2-lane roads are less accepting of snow covered roads than four-lane roads. In other words, survey respondents expect 2-lane roads to be plowed more often than four-lane roads. All of the survey results are attached to this report as Attachment L.

5.0 Conclusions and Discussion

In reviewing the public survey results and historical data, NDDOT collaborated with the contractor to have the North Dakota highway network optimized for plowing. The contractor modeled 327 routes to be the most optimized number of routes to accomplish plowing the state highway network given the parameters. The optimization reduced the necessary equipment and staff while still maintaining the highway network with similar plowing cycles per day as the current operation. A table showing the plow cycles per day for each district are shown in Attachment J.

According to the optimization study, the 327 optimized routes would reduce costs and provide statewide uniformity, but there are known shortcomings with the final optimized routes. The optimized routes do not account for overnight staffing in the metro areas. The optimized routes do not account for planned and unplanned absences.

NDDOT requires 24 more trans techs than the contractor accounted for to fill the overnight shifts in Fargo, Bismarck, and Minot, to create an overnight presence in Grand Forks, and to account for unavailable operators. These 24 operators would be added to the optimized 327, totaling 351 operators. This plan would allow 327 routes to be covered while accounting for unavailable staff, while also maintaining an overnight presence in the four metro areas. 351 operators is 0.8% less than the existing 354, but provides uniform service across the state based on highway classification.

In order to meet the proposed optimization recommended by C2Logix and the reallocation of staff needed by NDDOT, many existing section buildings would require improvement. While some section locations may be closed or consolidated, an additional section location may need to be built and many other existing section locations would need to be improved to accommodate the reallocation of employees and staff. It is estimated by NDDOT that approximately 32,000 square feet of improvements would be needed for the existing section buildings.

The department plans on testing the optimized routes this winter season to verify operational reliability. The department expects minor changes based on turn around points, staffing requirements, and existing section building sizes. It is anticipated that route optimization will be an ongoing process in the department and will be conducted by department staff.

6.0 Cost Summary

Using the modeled 327 routes, the optimization study shows long term savings on capital, employees and equipment while maintaining statewide uniformity in snow and ice control.

The optimization study results are based on providing a uniform level of service identified by the subject matter experts and did not look at adding more services. The study shows the possibility of long term savings of $345,000/year through the reduction of operating costs and three employees. It also shows a one-time cost saving of $634,000 through removal of three snowplows from the fleet. The study also looked at capital investments, reviewing long term options in which some section locations may be consolidated and an additional section location may need to be built, while many other existing section locations need to be improved to accommodate optimization needs. Consolidation may reduce capital assets by $5 million but approximately $4.6 million will be needed to invest in buildings for optimization improvements.

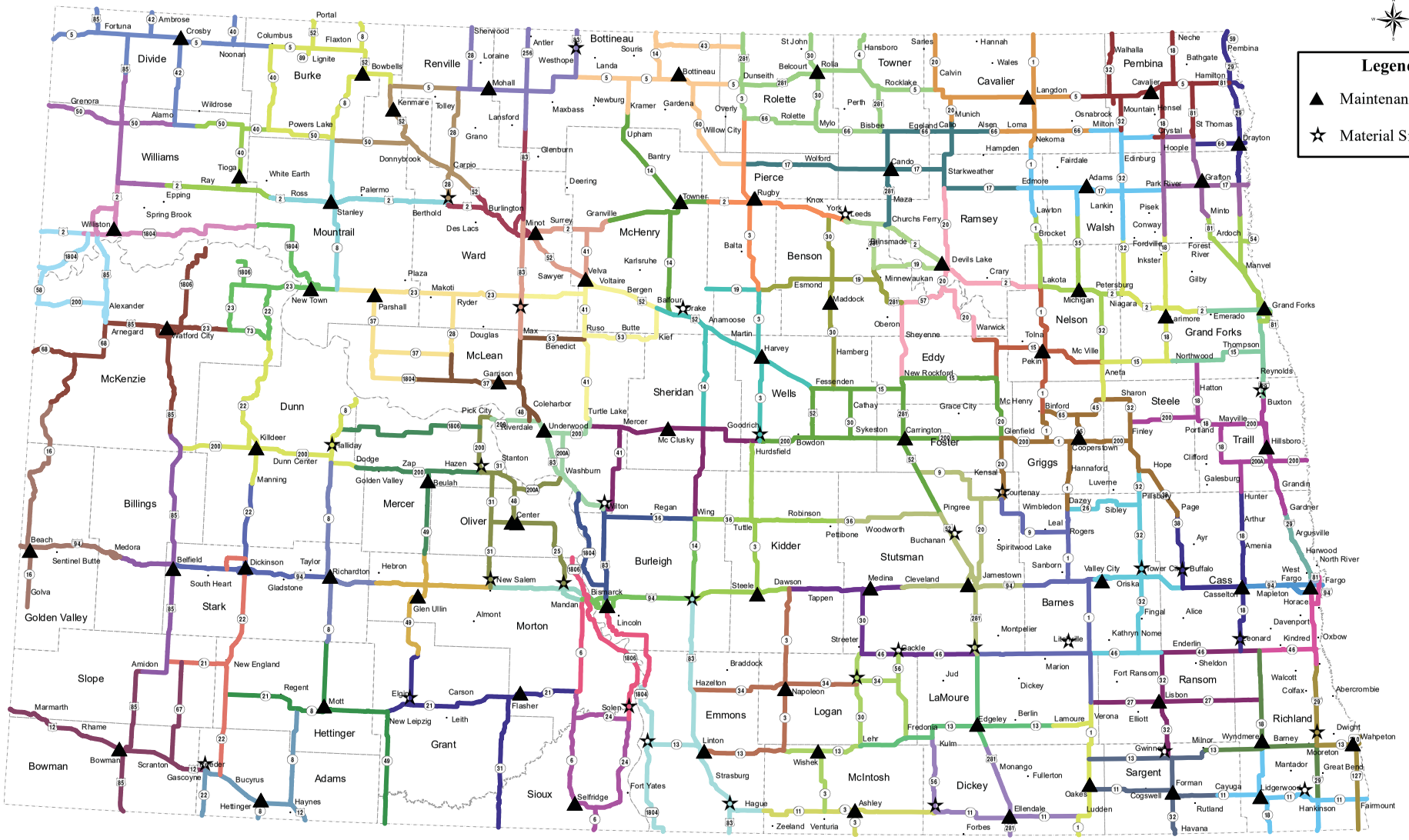
Our next steps are to:

- Evaluate and prove the technical study results by testing the optimized routes this winter season and verifying operational reliability.
- Obtain additional public feedback by conducting focus groups across the state.
- Review capital asset needs.

This study showed the department that NDDOT's current snow and ice control operations are efficient but there are also other techniques we can use to improve effectiveness. The technical data from the study and public input are tools that we will use to help make decisions for updating facilities, maximizing service levels and providing potential cost savings in the future.

7.0 Attachments

- Attachment A: Current Section Locations
- Attachment B: Level of Service (LOS)
- Attachment C: Highway Performance Classification System (HPCS)
- Attachment D: C2Logix – Run 3
- Attachment E: Annual Average Daily Traffic (AADT)
- Attachment F: Population Density
- Attachment G: Public Health Care Facilities
- Attachment H: ND Schools and Higher Education
- Attachment I: NDDOT Sections – 25 mile radius circles
- Attachment J: Cycles Per Day
- Attachment K: Senate Bill 2012
- Attachment L: NDDOT Public Survey on Snow and Ice Control 2018



NDDOT
North Dakota Department of Transportation

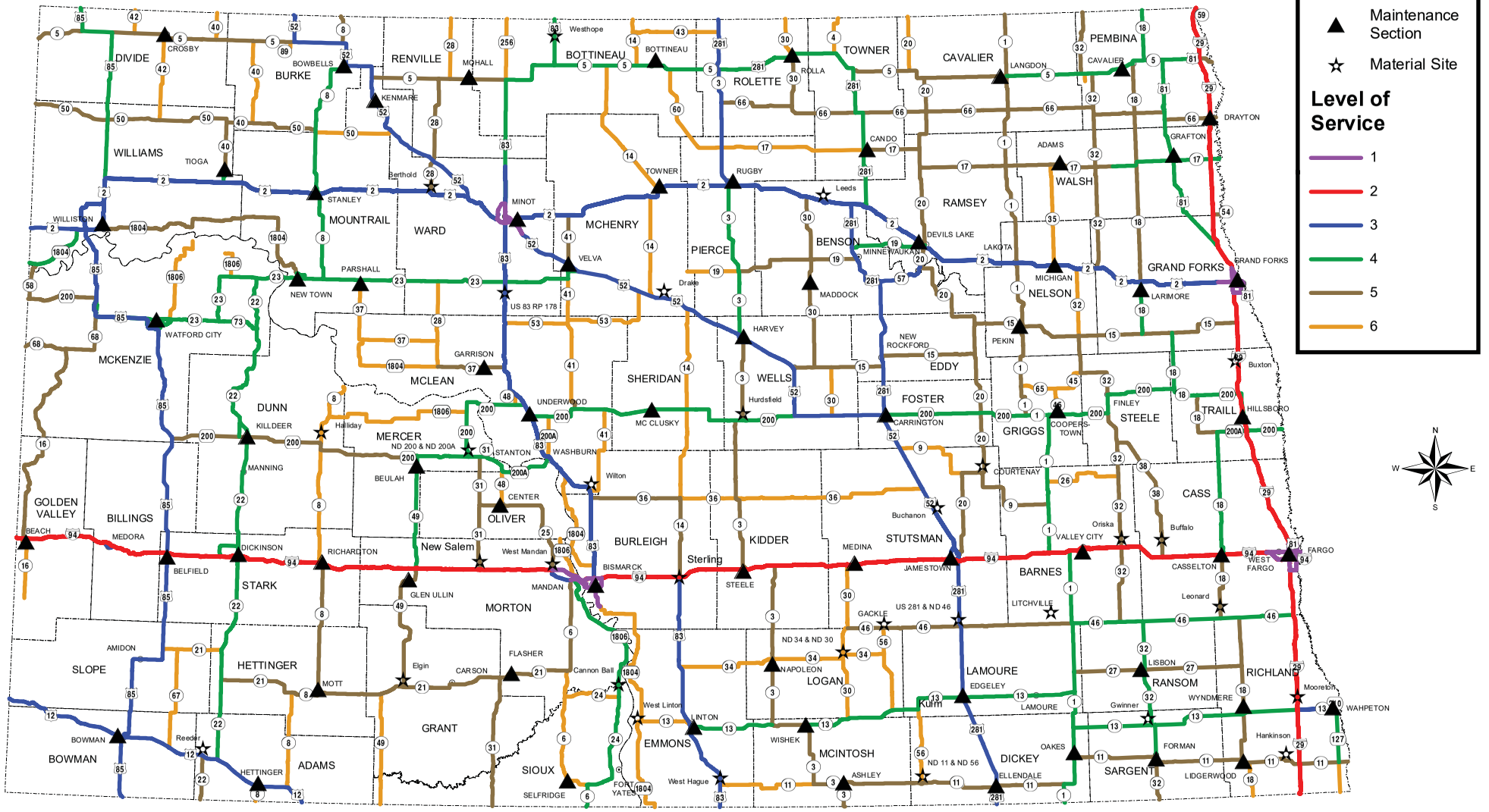
ATTACHMENT A

Current Section Locations

STATE OF
NORTH DAKOTA

PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION
Date Saved: 8/31/2018

F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\Current Section Locations.mxd



NDDOT
North Dakota Department of Transportation

ATTACHMENT B

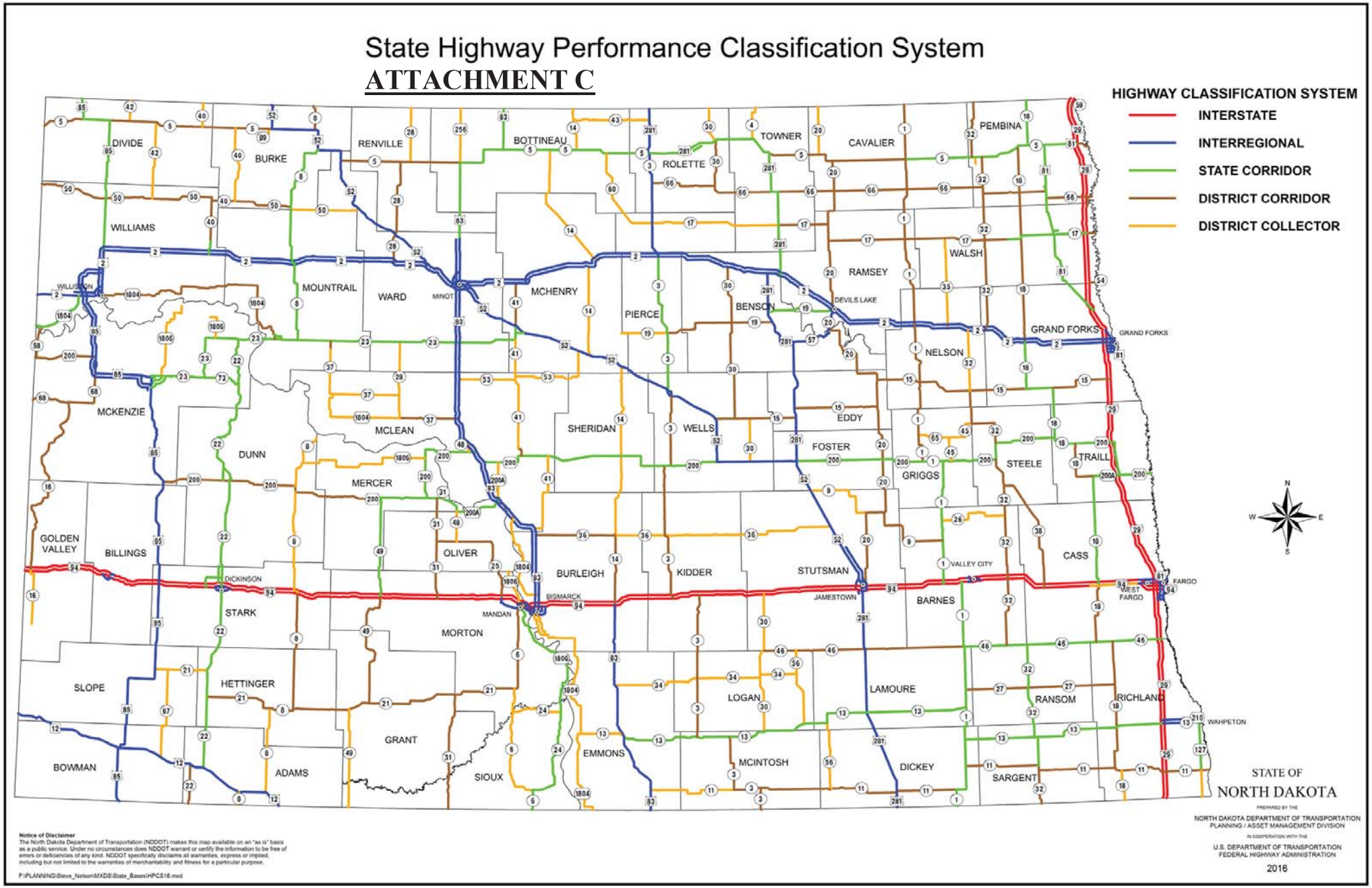
Level of Service (LOS)

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION
Date Saved: 8/31/2018

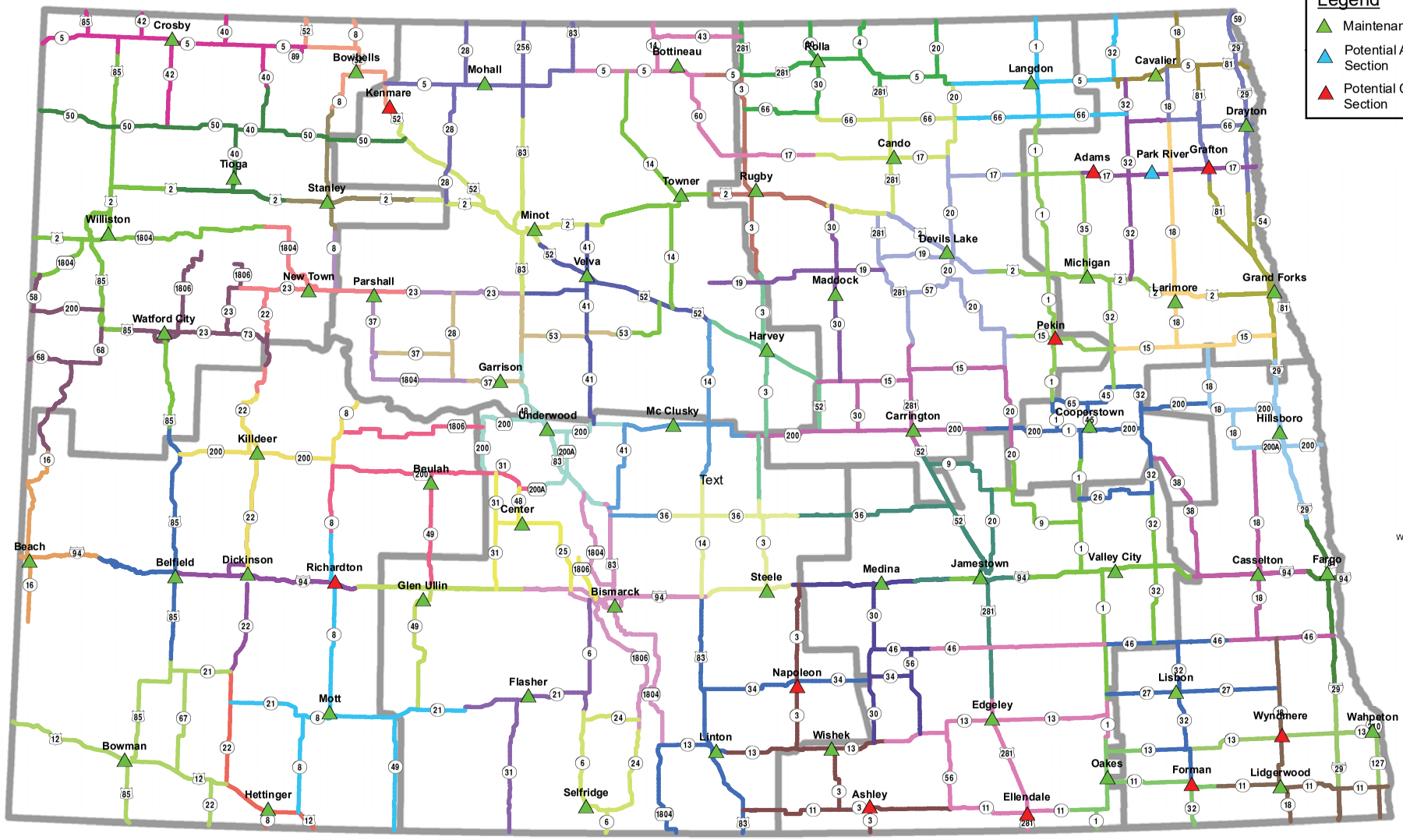
F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\Level of Service (LOS).mxd

State Highway Performance Classification System

ATTACHMENT C



ATTACHMENT C



NDDOT
North Dakota Department of Transportation

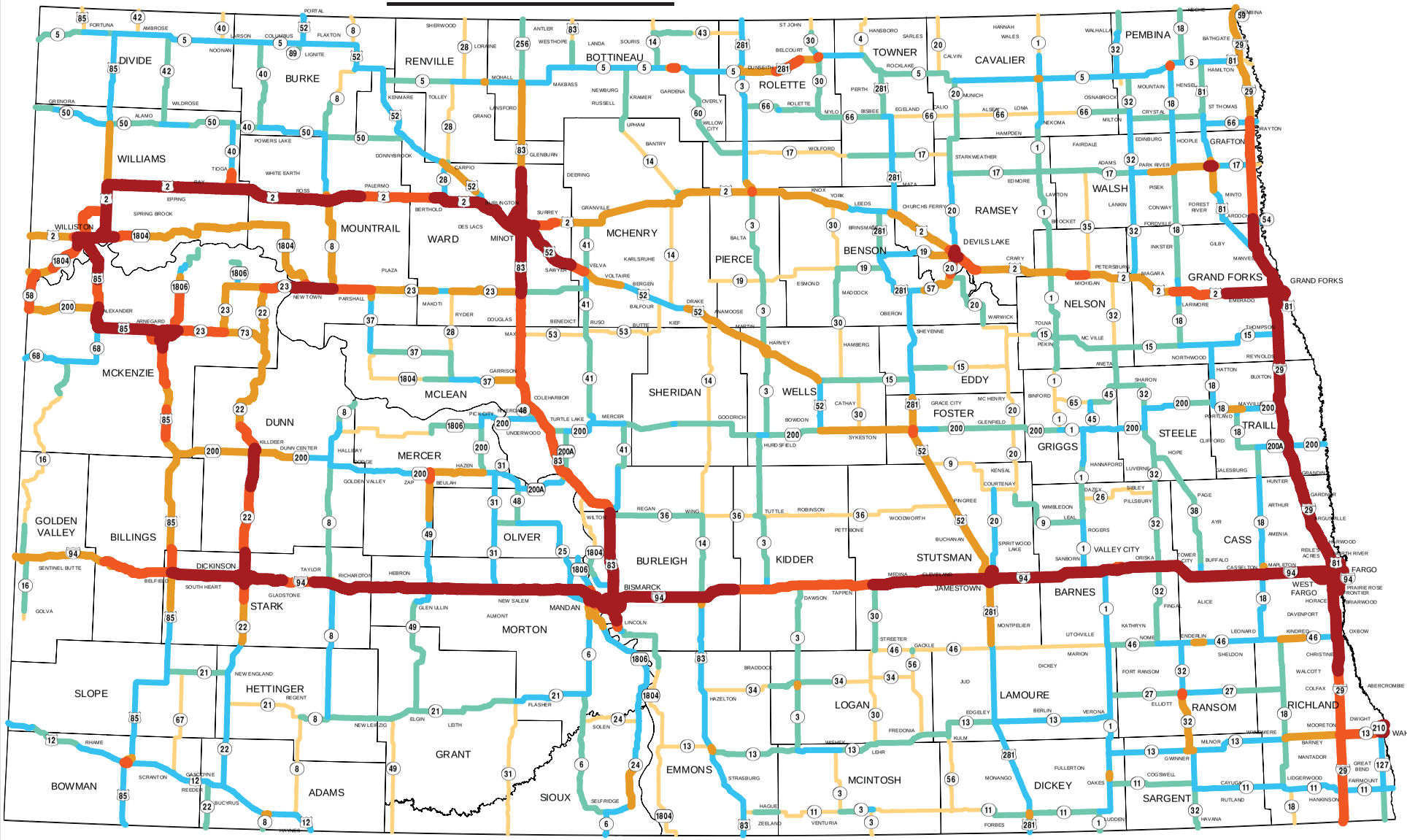
ATTACHMENT D

C2Logix - Run 3

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION
Date Saved: 8/31/2018
Path: F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\C2Logix - Run 3.mxd

Annual Average Daily Traffic (2015)

ATTACHMENT E



(14)

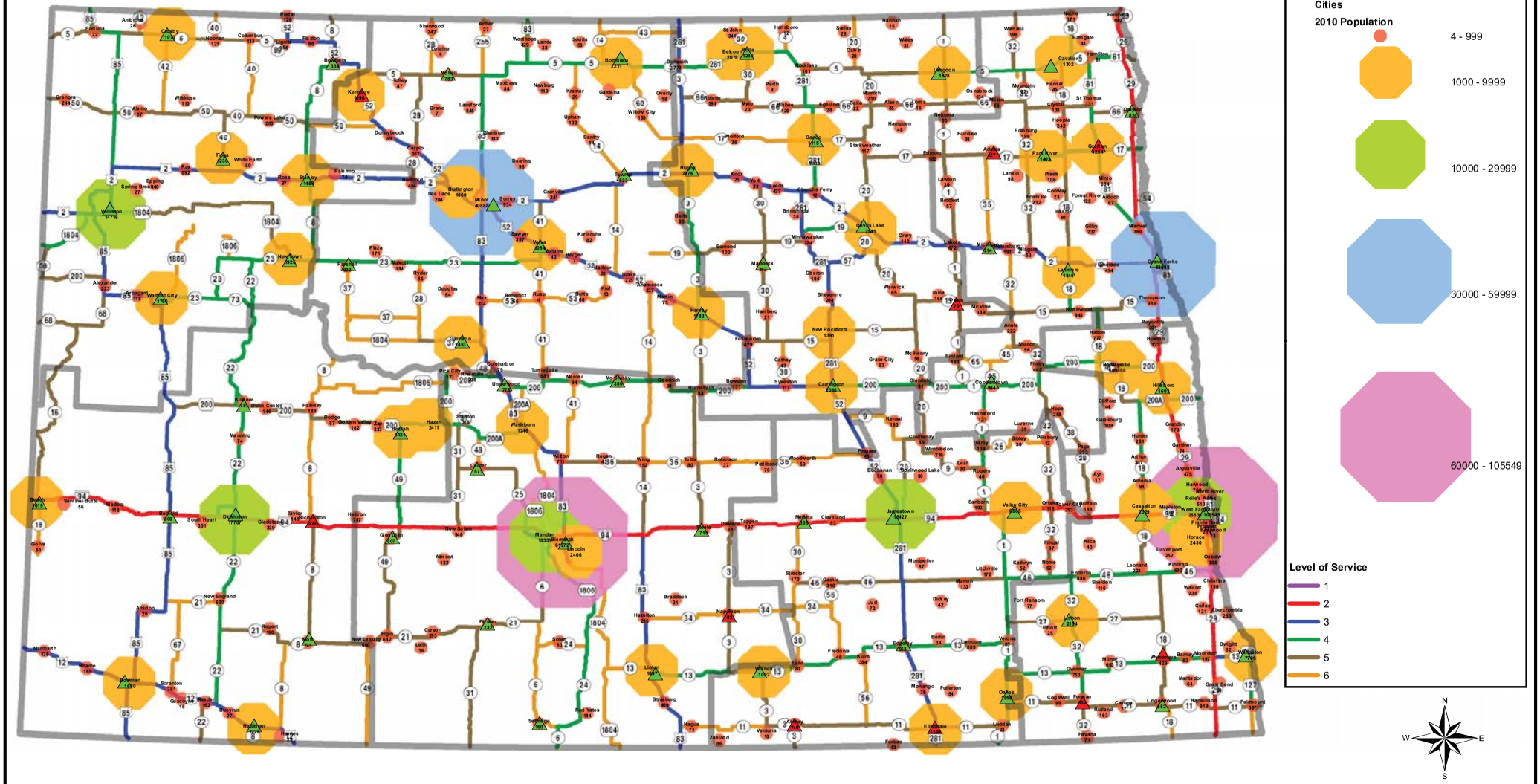
Notes: - Data from 2015 highway components segments.
- The AADT for longer sections are an average of the traffic segments.
- Data for the four lane roadways are AADT for both directions (either north and south or east and west).

Annual Average Daily Traffic

- 1 - 349
- 350 - 749
- 750 - 1999
- 2000 - 3999
- 4000 - 6999
- 7000 and greater

Planning & Asset Management Division
Traffic Data Section
December 2015

N
W
E
S

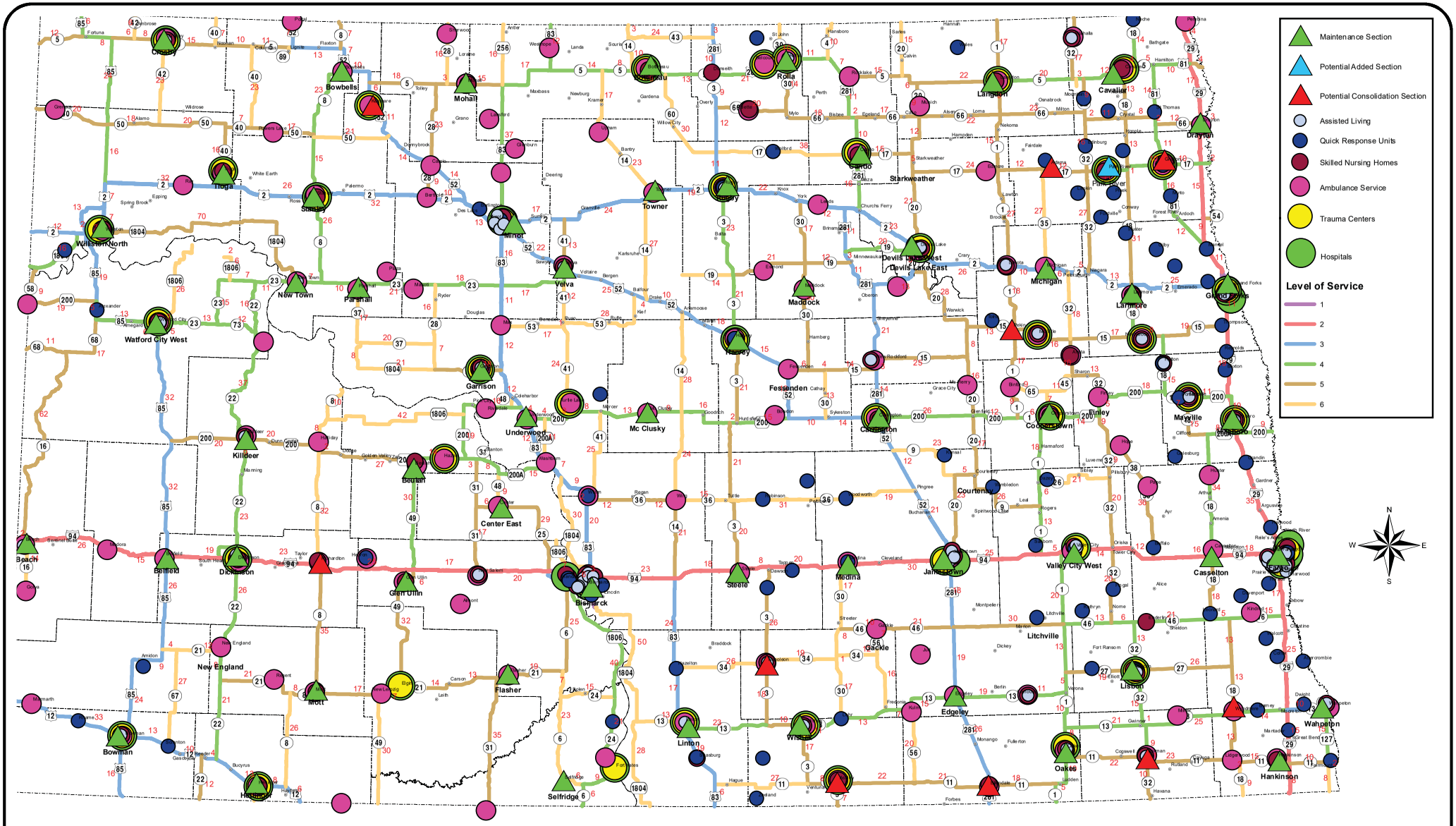


NDDOT
North Dakota
Department of Transportation

ATTACHMENT F

Population Density

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION
Date Saved: 8/27/2018
Path: F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\Population Density.mxd



ATTACHMENT G

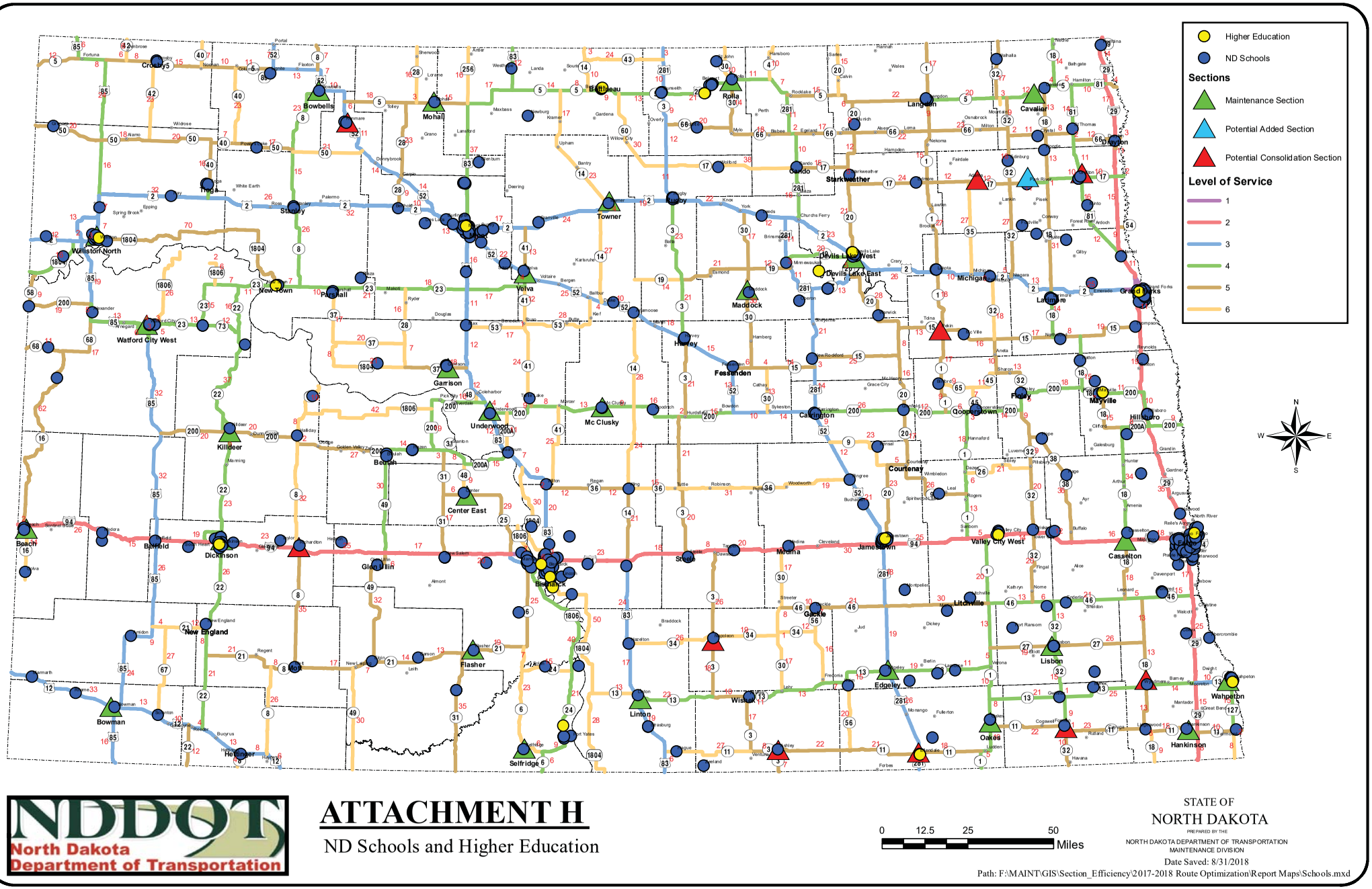
Public Health Care Facilities

0 12.5 25 50 Miles

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION

Date Saved: 8/31/2018

Path: F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\Public Health Care Facilities.mxd



NDDOT
North Dakota
Department of Transportation

ATTACHMENT H

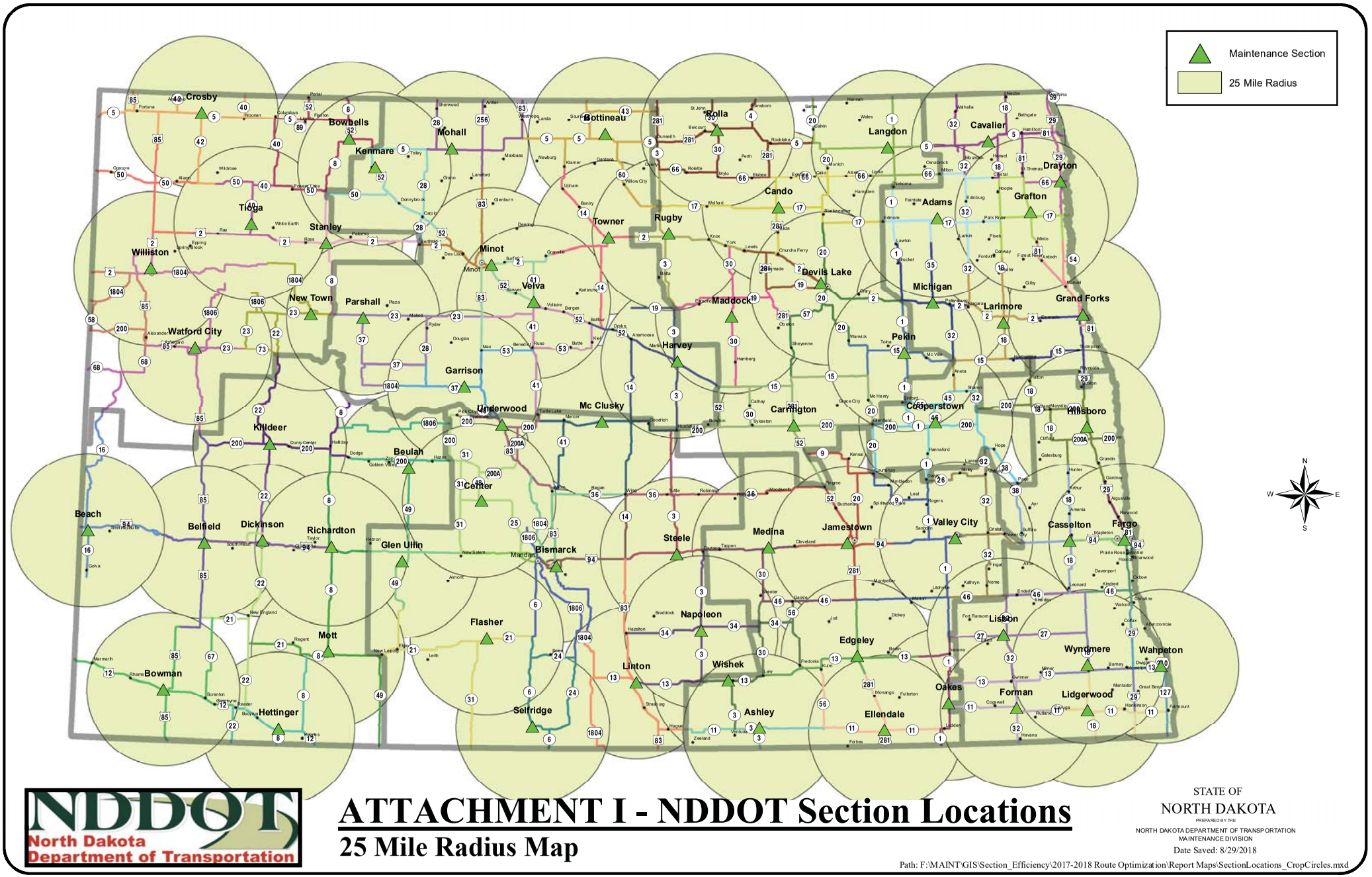
ND Schools and Higher Education

0 12.5 25 50 Miles

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION

Date Saved: 8/31/2018

Path: F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\Schools.mxd



NDDOT
North Dakota Department of Transportation

ATTACHMENT I - NDDOT Section Locations

25 Mile Radius Map

STATE OF
NORTH DAKOTA
PREPARED BY THE
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
MAINTENANCE DIVISION
Date Saved: 8/29/2018

Path: F:\MAINT\GIS\Section_Efficiency\2017-2018 Route Optimization\Report Maps\SectionLocations_CropCircles.mxd

ATTACHMENT I

ATTACHMENT J

The optimization study model created uniform plowing cycles based on levels of service across the state. The table below shows optimization cycles with existing similar plowing cycles per day.

Average Cycles/Day*			
NDDOT District: Levels of Service (LOS)	**Existing Cycles Average**	**Optimization Run 3 Cycles FINAL**	**Optimization Run 3 Average Cycles FINAL**
Bismarck: 1	3.2	5.9	3.6
Bismarck: 2, 3 & 4		3.4	
Bismarck: 5 & 6		2.9	
Valley City: 1	3.7	-	3.1
Valley City: 2, 3 & 4		3.4	
Valley City: 5 & 6		2.6	
Devils Lake: 1	4.1	-	3.2
Devils Lake: 2, 3 & 4		3.5	
Devils Lake: 5 & 6		2.7	
Minot: 1	3.5	6.1	3.5
Minot: 2, 3 & 4		3.6	
Minot: 5 & 6		2.9	
Dickinson: 1	3.7	-	3.3
Dickinson: 2, 3 & 4		3.5	
Dickinson: 5 & 6		2.7	
Grand Forks: 1	3.4	6.1	3.5
Grand Forks: 2, 3 & 4		3.6	
Grand Forks: 5 & 6		2.9	
Williston: 1	4.3	-	3.4
Williston: 2, 3 & 4		3.6	
Williston: 5 & 6		2.7	
Fargo: 1	3.4	5.0	3.7
Fargo: 2, 3 & 4		3.4	
Fargo: 5 & 6		2.9	

***Cycles per day are based on a 14 hour work day with 3.5 hours of daily "non-plowing" time.**

ATTACHMENT K

Sixty-fifth Legislative Assembly of North Dakota
In Regular Session Commencing Tuesday, January 3, 2017

SENATE BILL NO. 2012
(Appropriations Committee)

AN ACT to provide an appropriation for defraying the expenses of the department of transportation; to amend and reenact section 24-02-37 of the North Dakota Century Code, relating to state highway fund expenditures; to provide for a transfer; to provide for disposition of maintenance section sites; to provide exemptions; to provide for studies; and to provide for reports.

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:

SECTION 1. APPROPRIATION. The funds provided in this section, or so much of the funds as may be necessary, are appropriated from special funds derived from federal funds and other income, to the department of transportation for the purpose of defraying the expenses of the department of transportation, for the biennium beginning July 1, 2017, and ending June 30, 2019, as follows:

	Base Level	Adjustments or Enhancements	Appropriation
Salaries and wages	$207,778,278	($6,299,937)	$201,478,341
Operating expenses	295,762,751	(66,381,105)	229,381,646
Capital assets	700,081,402	71,020,449	771,101,851
Grants	62,918,030	4,610,000	67,528,030
Total special funds	$1,266,540,461	$2,949,407	$1,269,489,868
Full-time equivalent positions	1,080.50	(33.50)	1,047.00

SECTION 2. HEALTH INSURANCE INCREASE. The salaries and wages line item in section 1 of this Act includes the sum of $2,702,395 from other funds for increases in employee health insurance premiums from $1,130 to $1,241 per month.

SECTION 3. ONE-TIME FUNDING. The following amounts reflect the one-time funding items approved by the sixty-fourth legislative assembly for the 2015-17 biennium:

One-Time Funding Description	2015-17	2017-19
General fund transfers to highway fund	$486,982,489	$0
Transfer to public transportation fund	186,900	0
Short line railroad	7,000,000	0
Transportation distributions - non-oil-producing counties	104,664,000	0
Contingent transfer to highway fund	18,690,000	0
Truck harmonization study	56,070	0
Recreational road access	1,869,000	0
Vehicle registration and titling system replacement	2,500,000	0
Motor coach reimbursement	934,500	0
Total all funds	$622,882,959	$0
Total special funds	9,500,000	0
Total general fund	$613,382,959	$0

SECTION 4. LINE ITEM TRANSFERS. The director of the department of transportation may transfer between the salaries and wages, operating, capital assets, and grants line items in section 1 of this Act when it is cost-effective for construction and maintenance of highways. The department of transportation shall notify the office of management and budget of any transfers made pursuant to this section.

SECTION 5. ADDITIONAL FUNDING FOR FEDERAL HIGHWAY MATCHING FUNDS. The department of transportation may use up to $16,300,000 of the funding transferred, pursuant to

section 4 of chapter 12 of the 2015 Session Laws, from the general fund to the highway fund to provide state matching funds for federal highway construction funding provided by the federal highway administration during the biennium beginning July 1, 2017, and ending June 30, 2019.

SECTION 6. EXEMPTION - ENHANCED STATE HIGHWAY INVESTMENT FUNDING. Section 54-44.1-11 does not apply to funding of $503,115,558 in the capital assets line item relating to enhanced state highway investments in section 1 of chapter 12 of the 2015 Session Laws. Any funds continued into the 2017-19 biennium but not spent by June 30, 2019, must be continued into the biennium beginning July 1, 2019, and ending June 30, 2021, and may be expended only for enhanced state highway investments.

SECTION 7. EXEMPTION - SPECIAL ROADS FUND PROJECTS. Funding of $2,000,000 appropriated to the department of transportation for special road projects, as contained in section 1 of chapter 12 of the 2015 Session Laws, is not subject to the provisions of section 54-44.1-11. Any unexpended funds from this appropriation are available to the department of transportation for special road projects during the biennium beginning July 1, 2017, and ending June 30, 2019.

SECTION 8. DISPOSITION OF MAINTENANCE SECTION SITES. Notwithstanding any other provision of law, the department of transportation may discontinue operations of department maintenance section sites in New England, Starkweather, Fessenden, Courtenay, Gackle, Litchville, Finley, and Mayville as provided in this section.

1. During the biennium beginning July 1, 2017, and ending June 30, 2019, the department may not dispose of any real property assigned to a section site where operations are being discontinued.

2. The department shall consult with representatives of the political subdivisions in which the section site is located, in the following order: first with the county, second with the city, and third with the township. If requested by any of the political subdivisions, the department shall negotiate a lease agreement with that political subdivision regarding the use of the section site and facilities. The lease agreement must address, at a minimum, the following:

    a. The political subdivision may use the department's maintenance site and building, road oil tank, and shop equipment contained in the building. The political subdivision must be responsible for all routine maintenance and utility costs.

    b. If requested by the political subdivision, the department may transfer ownership of an equipped snow plow to the political subdivision. The snow plow must be one that the department intends to dispose of as part of its equipment replacement schedule.

    c. The department may charge a reasonable fee to the political subdivision under the lease.

    d. The department shall retain the use of salt buildings located on the property, the right to park one vehicle inside the maintenance building during a major winter storm, the use of an electrical outlet to plug in various vehicles for wintertime loading of deicing materials, and the right to use a portion of the site for a salt and sand pile for winter snow and ice control operations.

    e. If an emergency occurs in or around a section site, and the department is unable to respond, the political subdivision may agree to have an individual available to respond to the emergency. The political subdivision may establish a process that allows emergency response teams to contact the political subdivision to allow it to respond to an emergency occurring within the area currently served by the section site. The response may require the political subdivision to provide snow and ice control on the state highway system for an emergency situation.

3. If the department does not enter a lease agreement for a section site during the biennium beginning July 1, 2017, and ending June 30, 2019, the department may dispose of the section site property in accordance with state law after June 30, 2019.

4. If the department has an employee whose home residence is located within the vicinity of the maintenance section the department intends to discontinue, the department shall locate one of its snow plows at or near the maintenance section site during a major winter storm event from November 1 through March 31 of each fiscal year.

SECTION 9. AMENDMENT. Section 24-02-37 of the North Dakota Century Code is amended and reenacted as follows:

24-02-37. State highway fund - Priorities for expenditure - Use of investment income.

The state highway fund, created by law and not otherwise appropriated and allocated, must be applied and used for the purposes named in this section, as follows:

1. Except for investment income as provided in subsection 3, the fund must be applied in the following order of priority:

   a. The cost of maintaining the state highway system.

   b. The cost of construction and reconstruction of highways in the amount necessary to match, in whatever proportion may be required, federal aid granted to this state by the United States government for road purposes in North Dakota. Notwithstanding any other provision of law, the department of transportation may repay the United States department of transportation for previous related expenditures from current biennium appropriations to allow the department to reobligate the federal aid to other federal aid projects.

   c. Any portion of the highway fund not allocated as provided in subdivisions a and b may be expended for the construction of state highways without federal aid or may be expended in the construction, improvement, or maintenance of such state highways.

2. All funds heretofore appropriated or hereafter appropriated or transferred to the department, whether earmarked or designated for special projects or special purposes or not, must be placed or transferred into a single state highway fund in the office of the state treasurer and any claims for money expended by the department upon warrants prepared and issued by the office of management and budget and signed by the state auditor under this title must be paid out of the state highway fund by the state treasurer; provided, however, that the commissioner shall keep and maintain complete and accurate records showing that all expenditures have been made in accordance with legislative appropriations and authorizations.

3. The state treasurer shall deposit the moneys in the state highway fund in an interest-bearing account at the Bank of North Dakota. The state treasurer shall deposit eighty percent of the income derived from the interest-bearing account in a special interest-bearing account in the state treasury known as the special road fund. The special road fund may be used, within the limits of legislative appropriation, exclusively for the construction and maintenance of access roads to and roads within recreational, tourist, and historical areas as designated by the special road committee. A political subdivision or state agency may request funds from the special road fund by applying to the committee on forms designated by the committee. The committee may require the political subdivision or state agency to contribute to the cost of the project as a condition of any expenditure authorized from the special road fund. Any moneys in the fund not obligated by the special road committee by June thirtieth of each odd-numbered year must be held for an additional two years after which the funds revert to the state highway fund.

SECTION 10. DEPARTMENT OF TRANSPORTATION STUDY - SNOW AND ICE CONTROL SERVICES - REPORT TO LEGISLATIVE MANAGEMENT. During the 2017-18 interim, the department of transportation shall study the manner in which it provides snow and ice control services on the state highway system, including the existing costs for these services and any potential savings available in providing these services. Based on its findings, the department shall determine the most efficient and effective manner in which to provide snow and ice control services. The department shall provide a report to the legislative management before July 1, 2018, regarding the results of the study.

SECTION 11. DEPARTMENT OF TRANSPORTATION STUDY - CONSOLIDATION OF SERVICES - REPORT TO LEGISLATIVE MANAGEMENT - REPORT TO SIXTY-SIXTH LEGISLATIVE ASSEMBLY. During the 2017-18 interim, the department of transportation shall study options to consolidate transportation facilities within Williams County and the Williston district headquarters. The department shall provide the final report, including the results of the study, to the legislative management before July 1, 2018. If the results of the study determine that it is beneficial to consolidate facilities, the department may proceed with consolidation efforts. Before the completion of the study and the determination of whether the consolidation of facilities is beneficial, the department may not construct any new buildings at the Williston district headquarters. The department shall provide reports to the appropriations committees of the sixty-sixth legislative assembly regarding the study and the outcomes of the study.

SECTION 12. LEGISLATIVE MANAGEMENT STUDY - TRANSPORTATION FUNDING. During the 2017-18 interim, the legislative management shall consider studying the funding mechanisms and options available to the department of transportation, political subdivisions, and public transportation providers, for road construction, maintenance, other transportation infrastructure needs, and transit services. The legislative management shall report its findings and recommendations, together with any legislation necessary to implement the recommendations, to the sixty-sixth legislative assembly.

SECTION 13. DEPARTMENT OF TRANSPORTATION FEES - REPORT TO BUDGET SECTION. The department of transportation shall report to the legislative management's budget section by September 30, 2017, and by September 30, 2018, regarding all fees charged by the department in comparison to the actual cost of providing the services for which the fee is charged.

SECTION 14. TELECOMMUNICATIONS INFRASTRUCTURE ON HIGHWAY RIGHTS OF WAY - LIMITATION - DEPARTMENT OF TRANSPORTATION AND INFORMATION TECHNOLOGY DEPARTMENT STUDY - REPORT. Prior to the department of transportation permitting any nonstate owned, controlled, or leased wireless telecommunication infrastructure used for wireless transmission of voice, data, images, or other signals or information within state highway rights of way, the department of transportation and the information technology department shall study, during the 2017-18 interim, the benefits of allowing wireless telecommunication infrastructure within state highway rights of way and what, if any, requirements of allowing the installation may be in the public interest. The department of transportation and the information technology department shall report the results of the study to the legislative management by June 30, 2018.

President of the Senate

Speaker of the House

Secretary of the Senate

Chief Clerk of the House

This certifies that the within bill originated in the Senate of the Sixty-fifth Legislative Assembly of North Dakota and is known on the records of that body as Senate Bill No. 2012.

Senate Vote:	Yeas 44	Nays 1	Absent 2
House Vote:	Yeas 53	Nays 40	Absent 1

Secretary of the Senate

Received by the Governor at _____M. on _____, 2017.

Approved at _____M. on _____, 2017.

Governor

Filed in this office this _____day of _____, 2017,

at _____ o'clock _____M.

Secretary of State

ATTACHMENT L

2018

NDDOT Public Survey on Snow and Ice Control

Overview

The North Dakota Department of Transportation (NDDOT) conducted a Public Survey on Snow and Ice Control to learn what level of snow and ice control services were acceptable on ND highways. The survey comprised of 43 questions and was conducted online as well as distributed in paper format at a couple of local public events in May. There were a total of 1,189 responses.

The results from the first question indicated that the majority of drivers are satisfied with their current level of service. Questions 2 & 3 compared the service provided and service expected on Interstate four-lane versus Non-Interstate four-lane. The results indicated that the majority of drivers currently saw more service provided to the Interstate than Non-Interstate. The results also indicated that the majority of drivers expected that service provided should be the same for all four-lane roads, whether they are Interstate or Non-Interstate.

In regard to NDDOT's hours of operations the majority of survey respondents wanted no change to the plow start or stop times. The survey results support the idea that the traveling public has become accustom to NDDOT's hours of operations. This is shown in the results of questions 4-8 as well as the Acceptability of Road Conditions questions. In general, the traveling public is more accepting of poor road conditions at 6 a.m. and less accepting of poor road conditions by 10 a.m.

The traveling public generally knows the NDDOT is not a 24/7 operation and understand it will take some time in the morning hours to catch up with what snow fell over the night hours. Expectations through the evening hours are generally consistent. With plow crews finishing their operations around 5-7 p.m. nightly, the general public seems to understand there will not be significant improvements in road conditions between 8-10 p.m., hence their expectations remaining the same for the 8-10 p.m. time period.

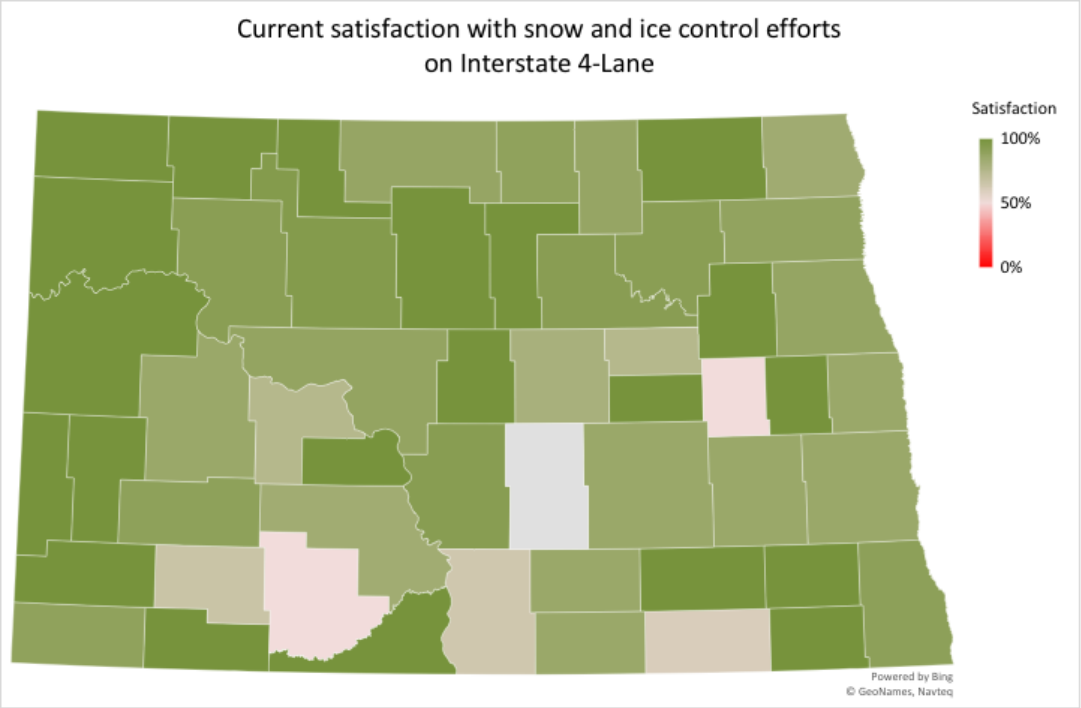
For questions addressing roadways with snow covered and compacted snow, the survey results show drivers on 2-lane roads are less accepting of snow covered roads than four-lane roads. In other words, survey respondents expect 2-lane roads to be plowed more often than four-lane roads.

The NDDOT plans to obtain additional public feedback on snow and ice control by conducting focus groups across the state next year.

1. How satisfied are you with the service currently provided by NDDOT snow and ice control efforts for each type of state maintained rural highway listed below, not including local, city, or county road?

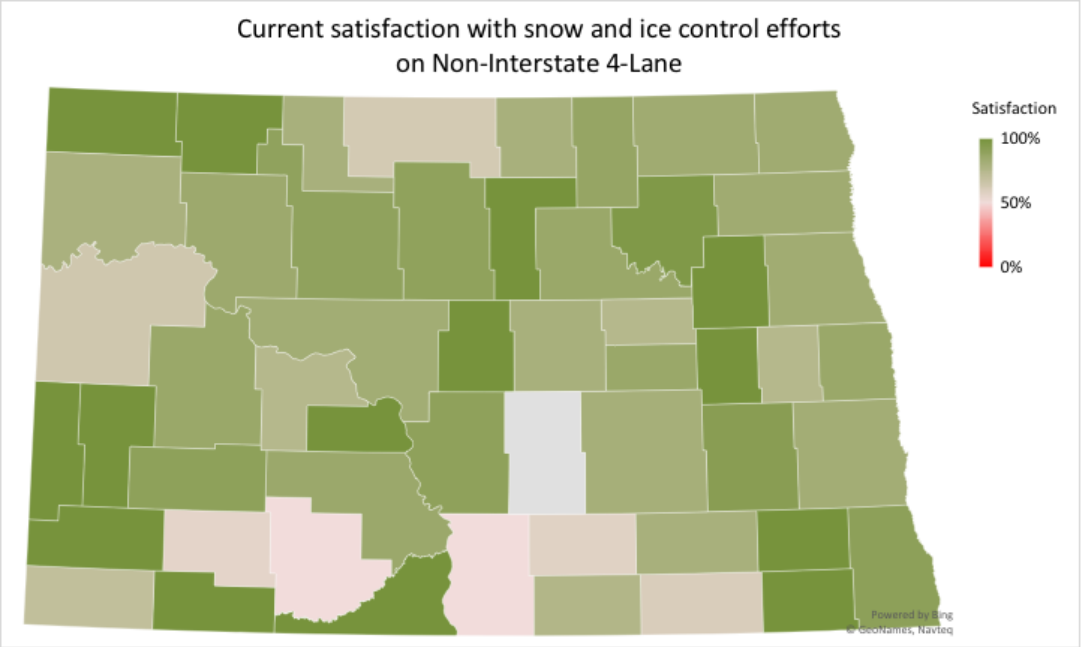
Overall, relatively high satisfaction with 4-lane efforts (both interstate and non-interstate). Satisfaction drops with rural 2-lane but remains higher in more "urban" counties like Cass and Burleigh.

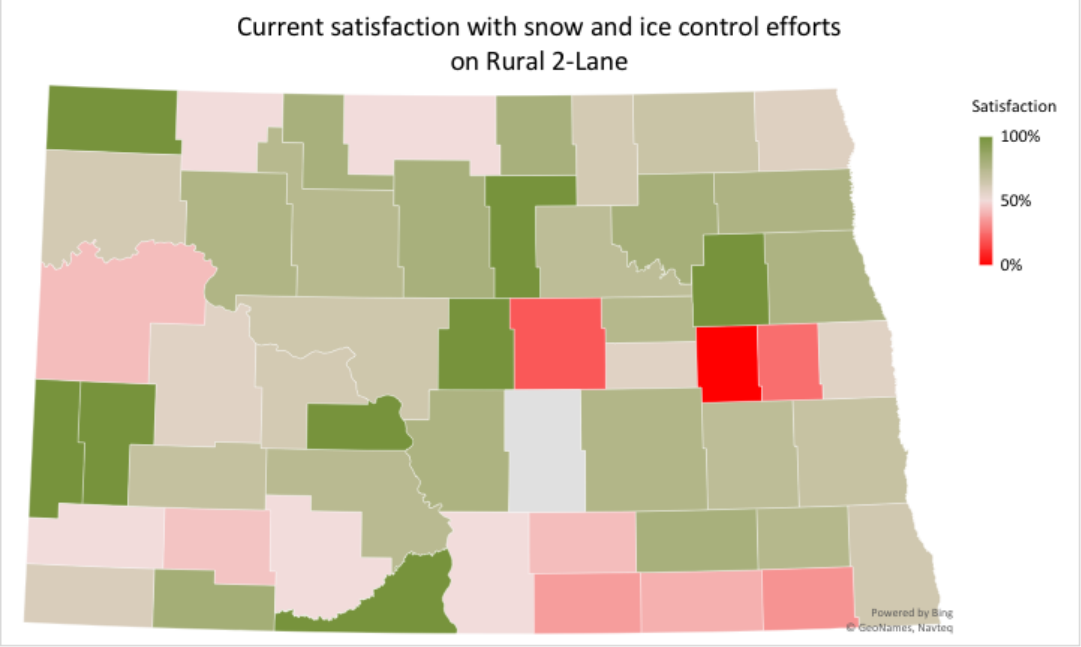
Note: There were no submissions from Kidder County



[1]

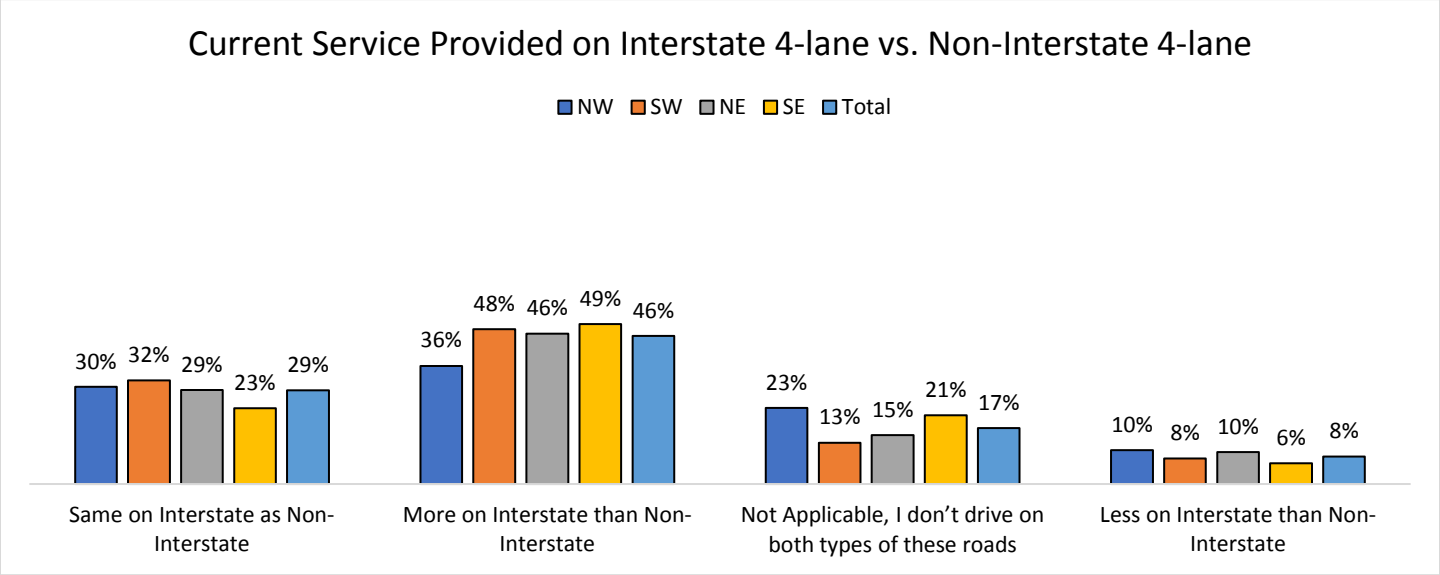
[1] NOTE: There were no submissions from Kidder County


Current satisfaction with snow and ice control efforts
on Non-Interstate 4-Lane
Satisfaction
100%
50%
0%
Powered by Bing
© GeoNames, Navteq

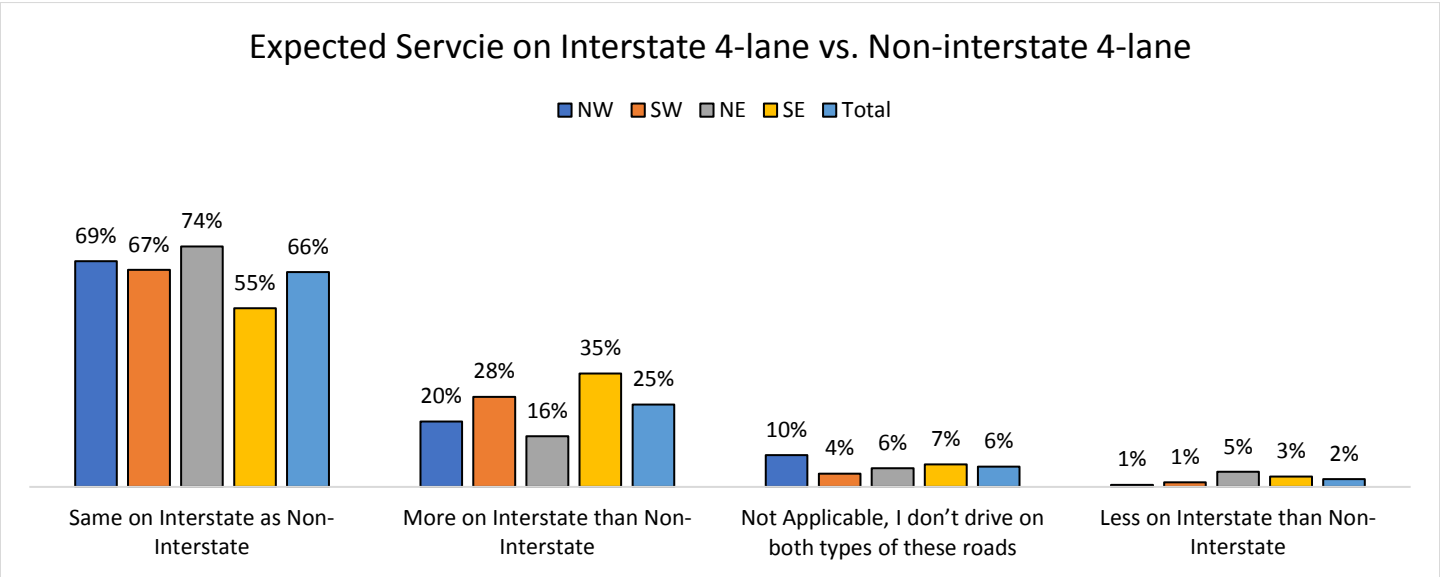

Current satisfaction with snow and ice control efforts
on Rural 2-Lane
Satisfaction
100%
50%
0%
Powered by Bing
© GeoNames, Navteq

2. Do you currently see the same service provided on Interstate 4-lane (I-29, I-94) as on Non-Interstate 4-lane (US-2, US-83)?

Respondents currently feel that more service is provided to interstate than non-interstate but think it should be equal.



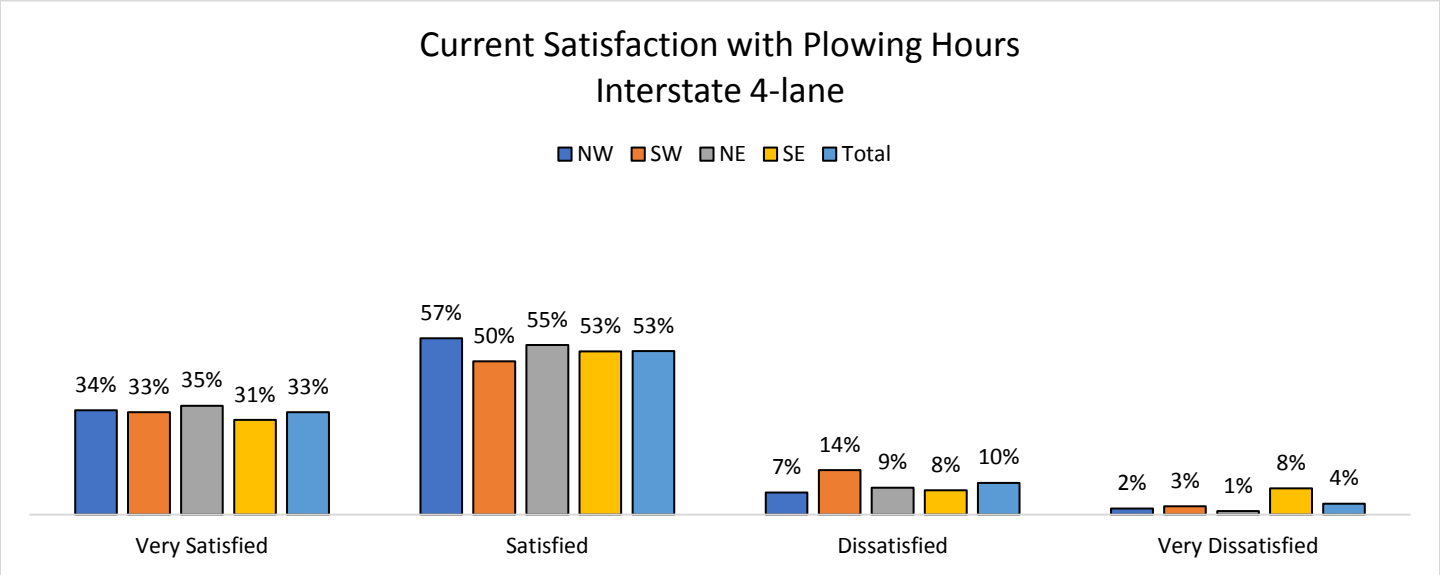
3. Would you expect to see the same service provided on Interstate 4-lane (I-29, I-94) as on Non-Interstate 4-lane (US-2, US-83)?

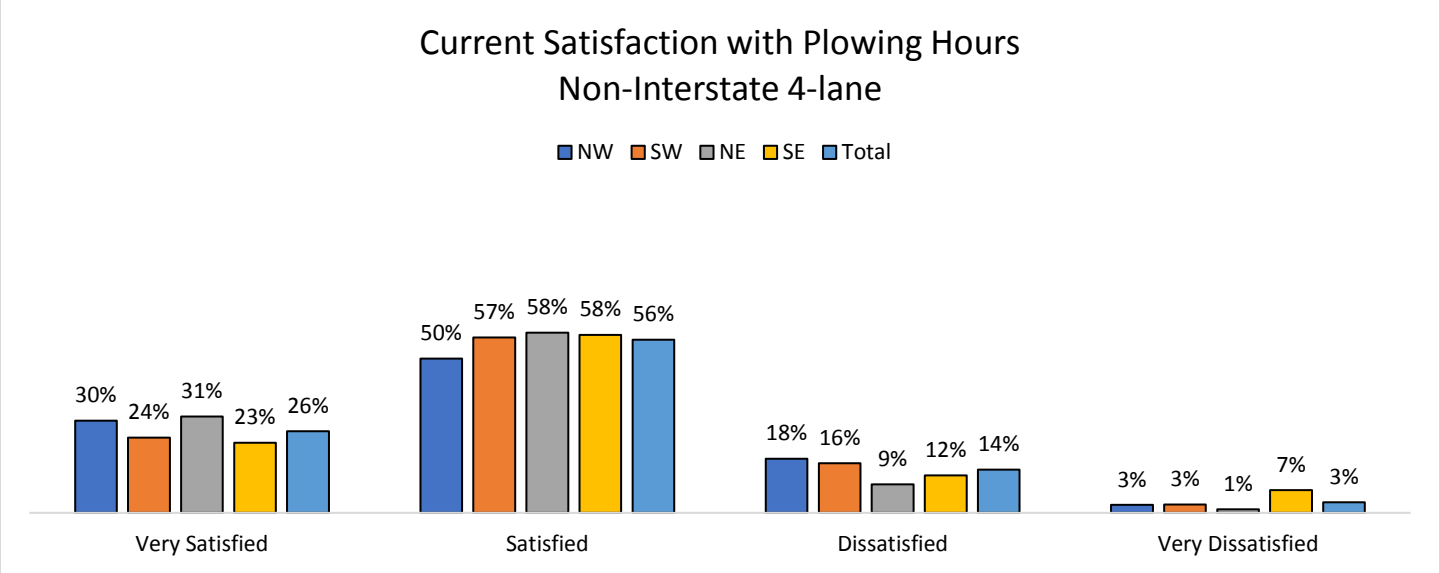


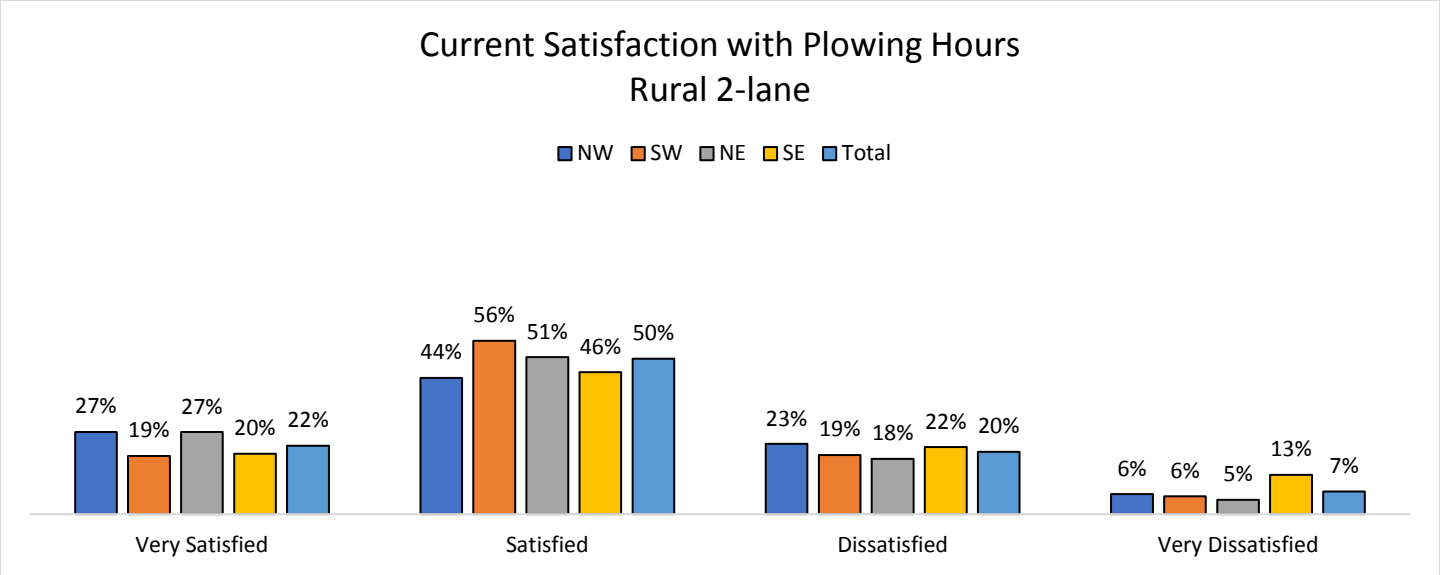
4. Snow plow drivers are typically out plowing roads from 5am – 7pm during winter storm events. Choose your level of satisfaction with the current hours of plowing for each type of state maintained rural highway listed below, not including local, city, or county roads.

Satisfied with current plowing hours:

- *86% Interstate 4-lane*
- *82% Non-interstate 4-lane*
- *72% Rural 2-lane*

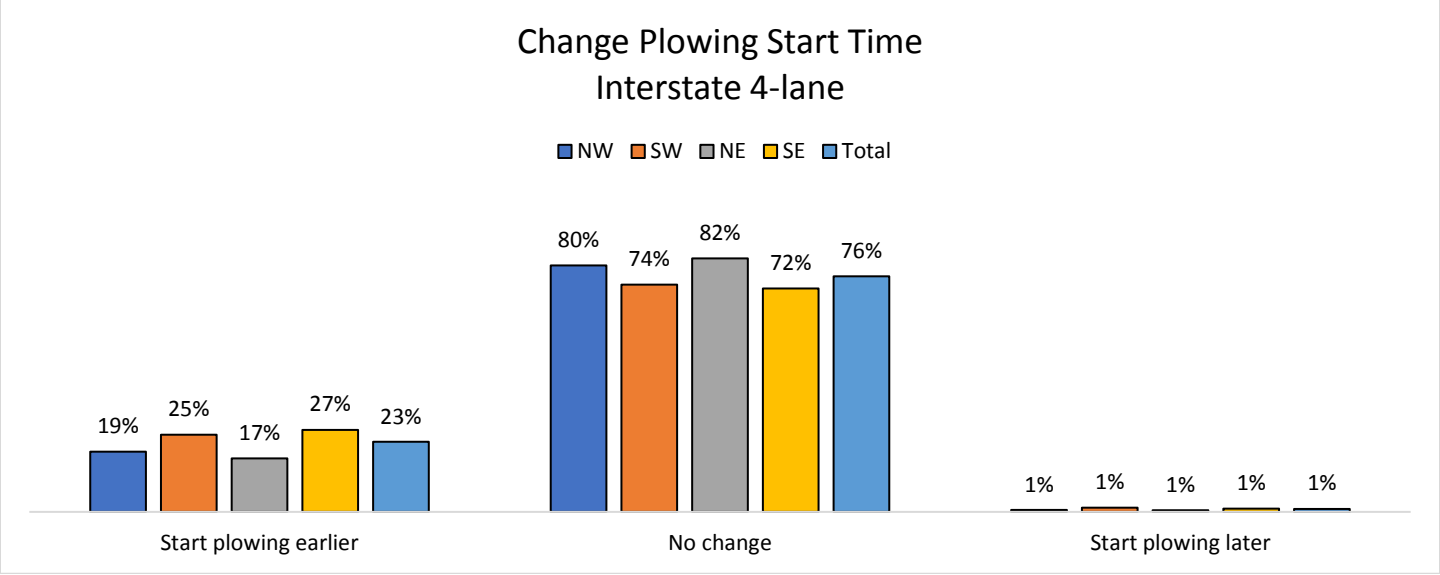


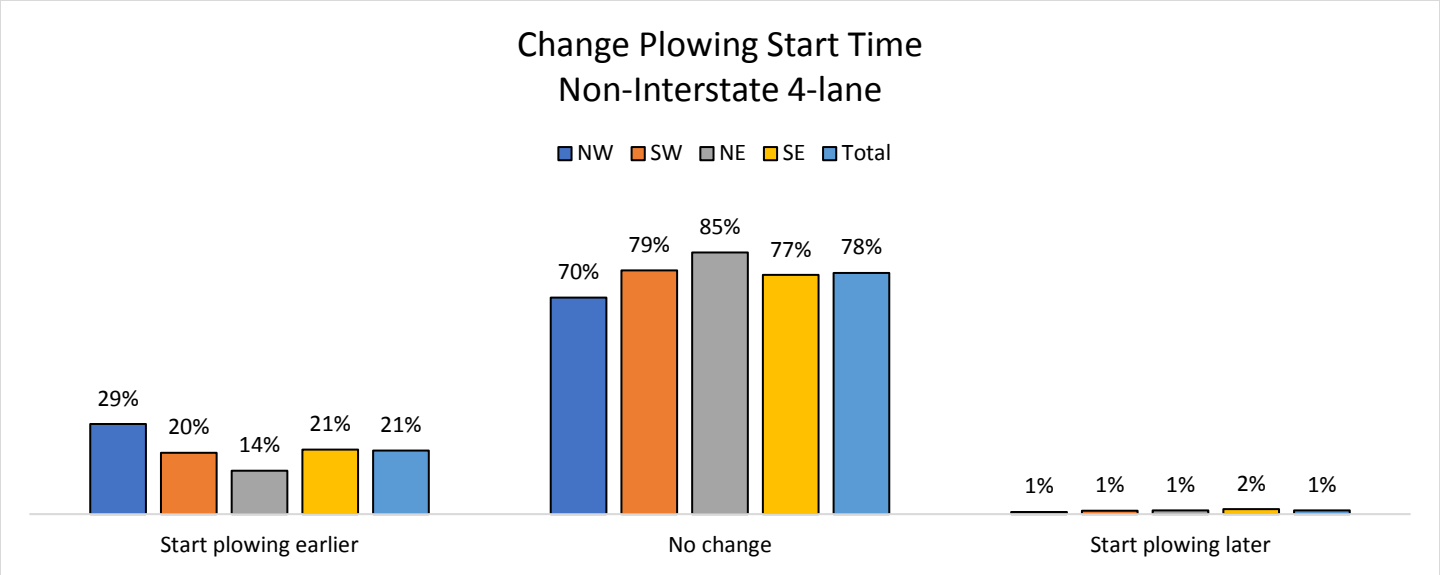


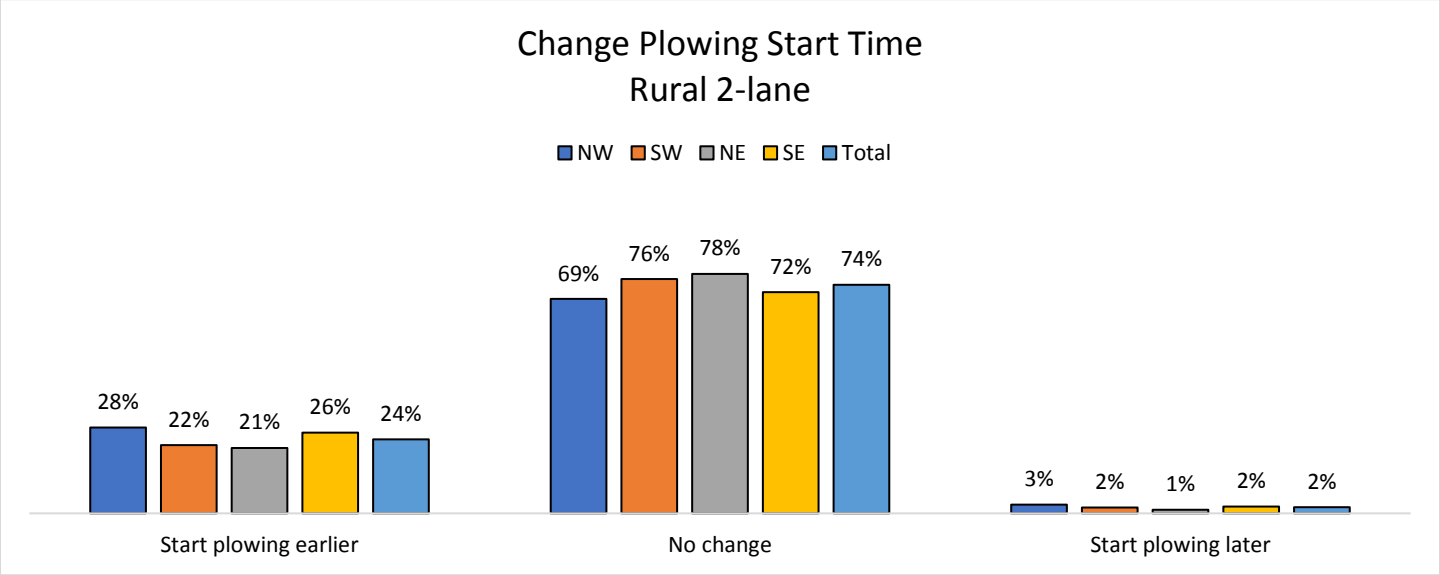


5. Should snow plow drivers change when they start plowing in the morning? Currently the plowing starts at 5am.

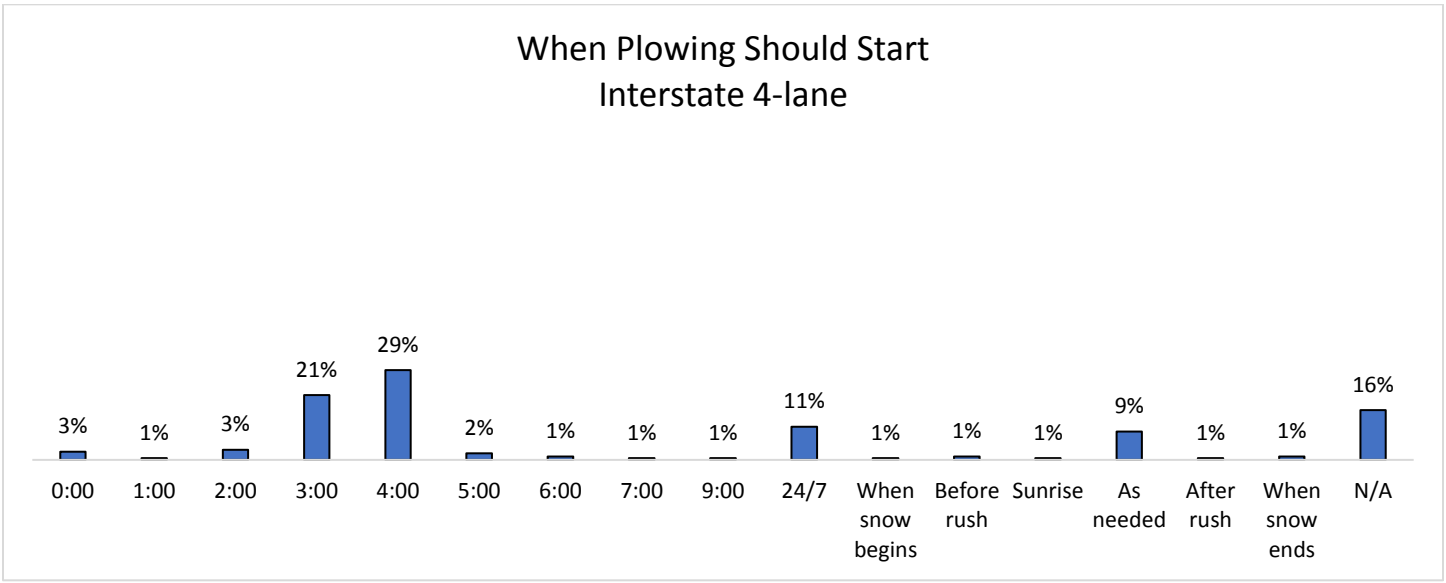
Three in four respondents say no change.

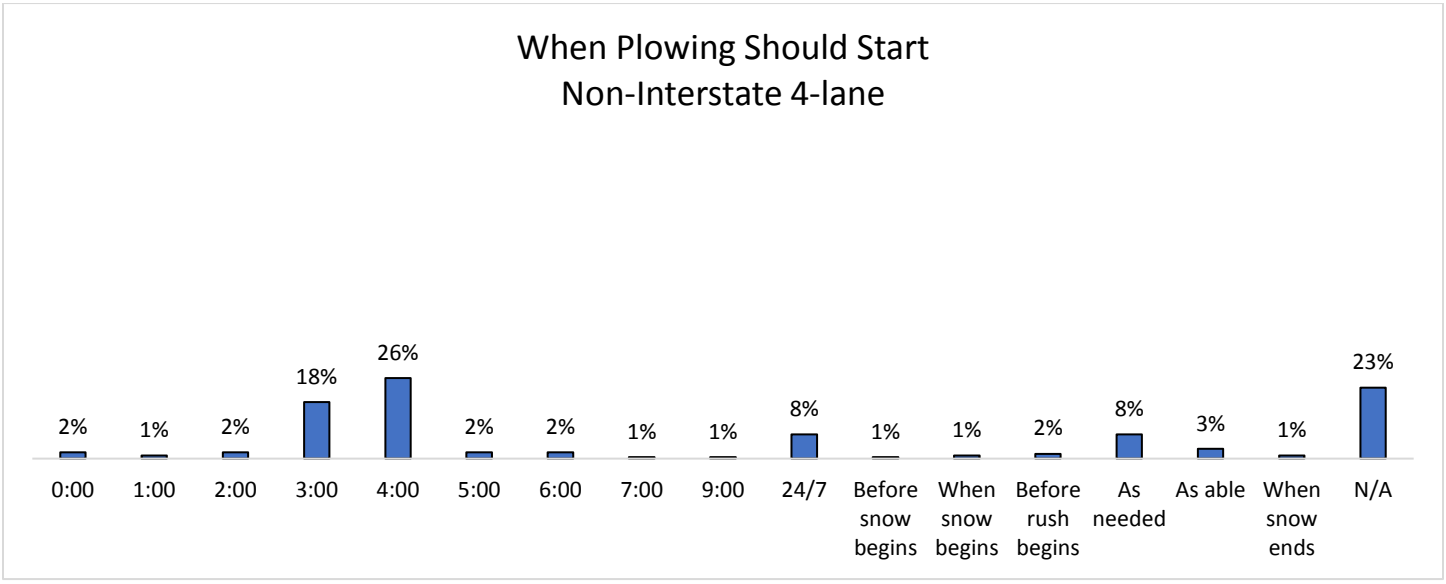


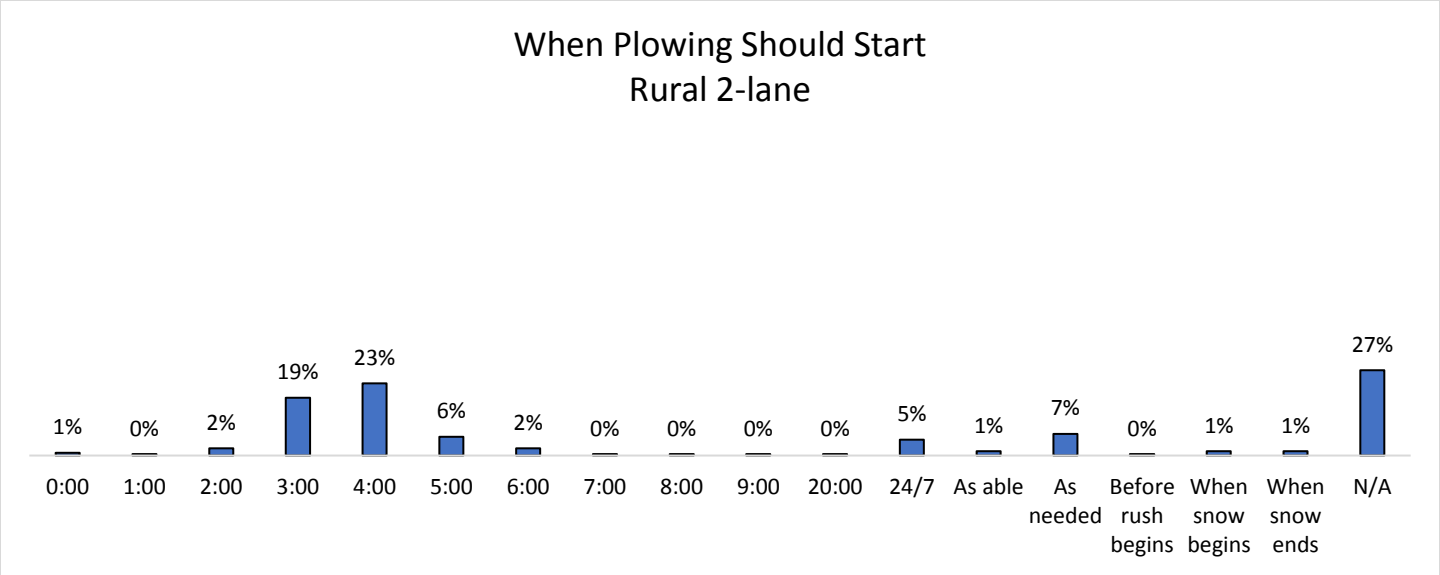

Change Plowing Start Time
Non-Interstate 4-lane
NW
SW
NE
SE
Total
29%
20%
14%
21%
21%
70%
79%
85%
77%
78%
1%
1%
1%
2%
1%
Start plowing earlier
No change
Start plowing later


Change Plowing Start Time
Rural 2-lane
NW
SW
NE
SE
Total
28%
22%
21%
26%
24%
69%
76%
78%
72%
74%
3%
2%
1%
2%
2%
Start plowing earlier
No change
Start plowing later

If you answered to change the time earlier or later, then please specify what time should plowing start.

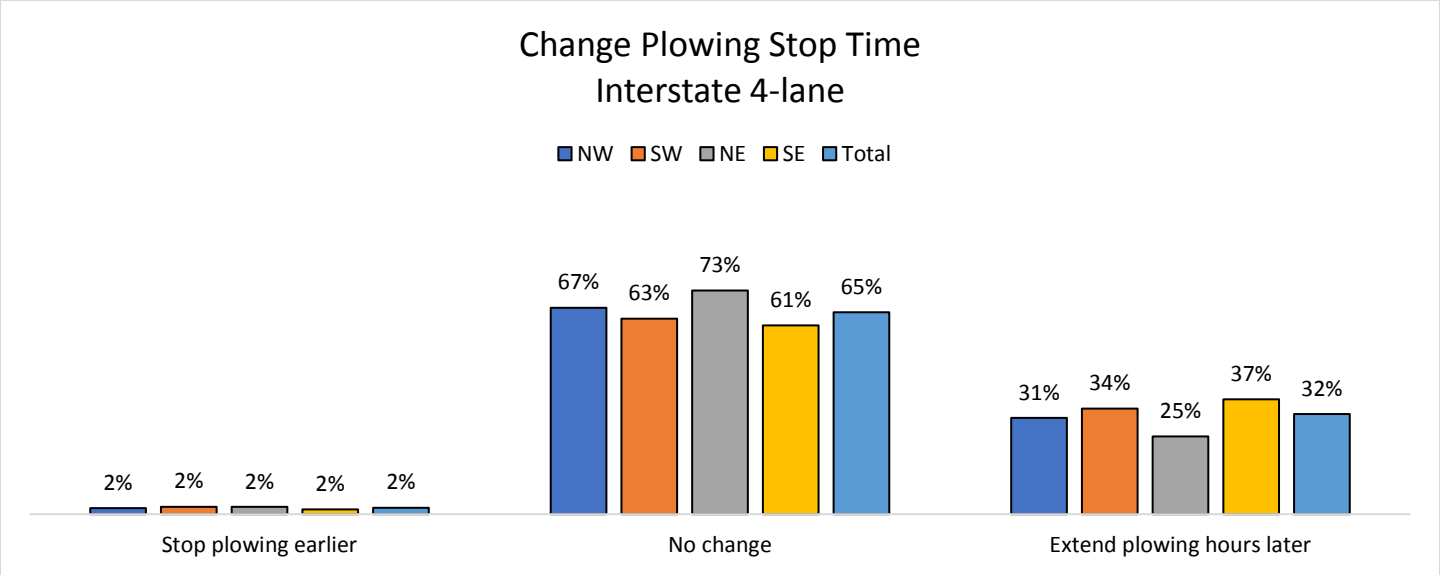


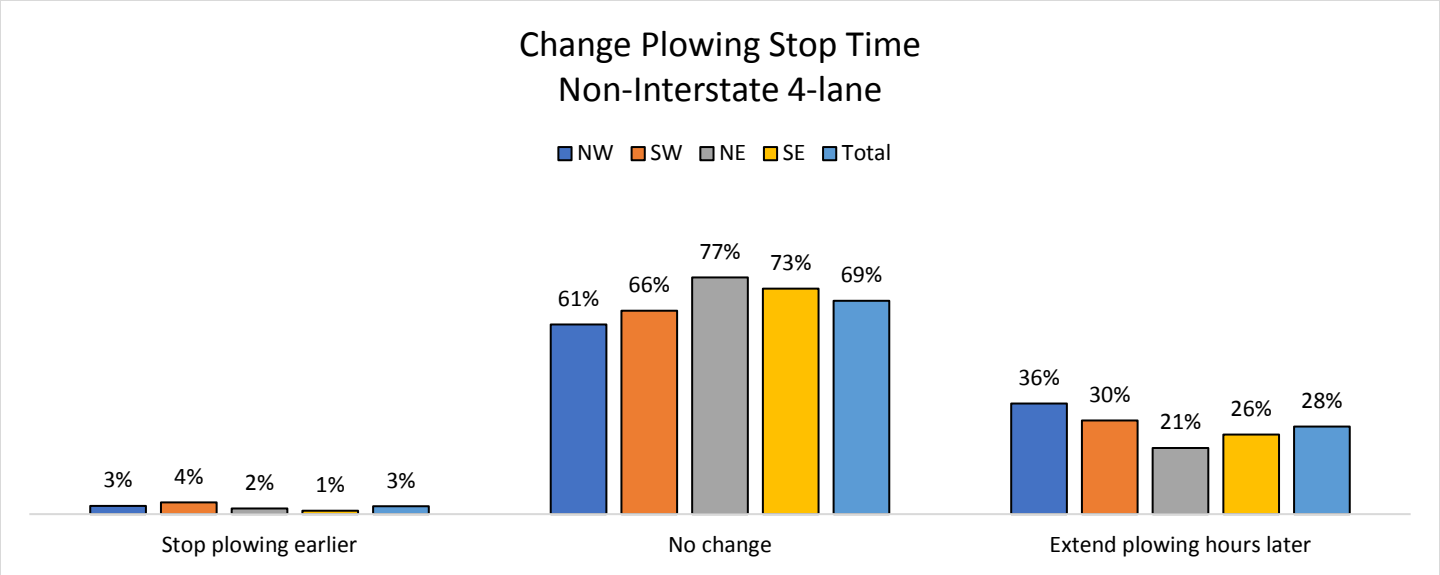


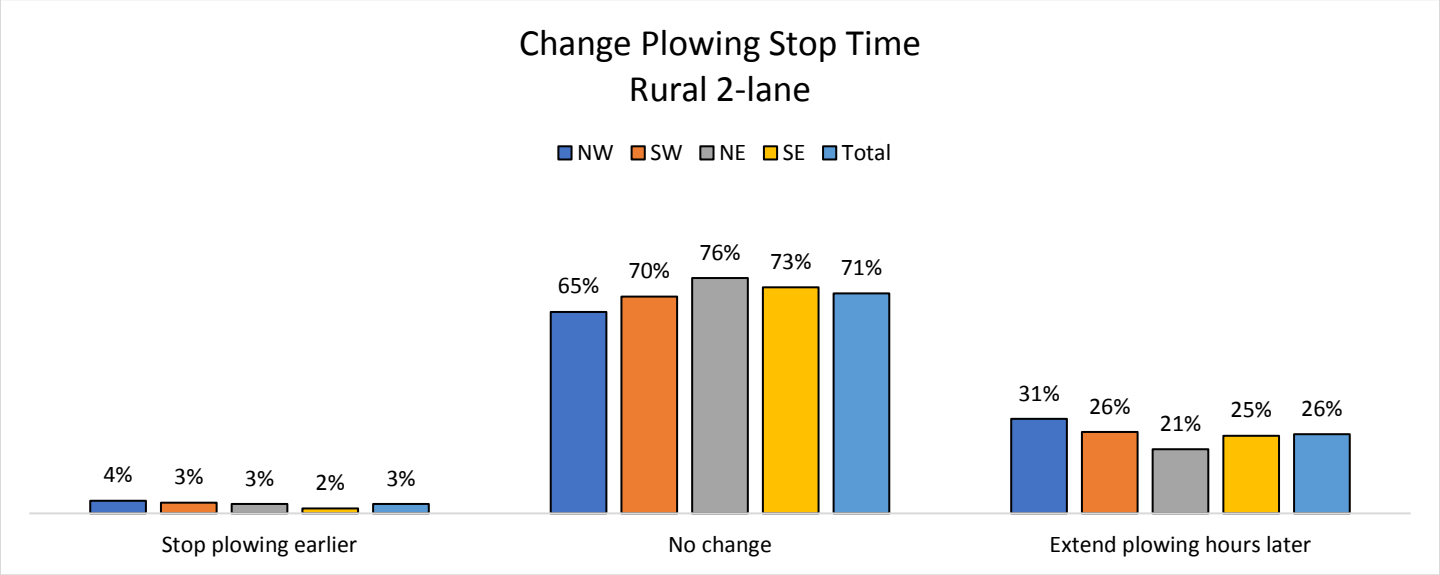


6. Should snow plow drivers change when they stop plowing at night? Currently the plowing stops at 7pm.

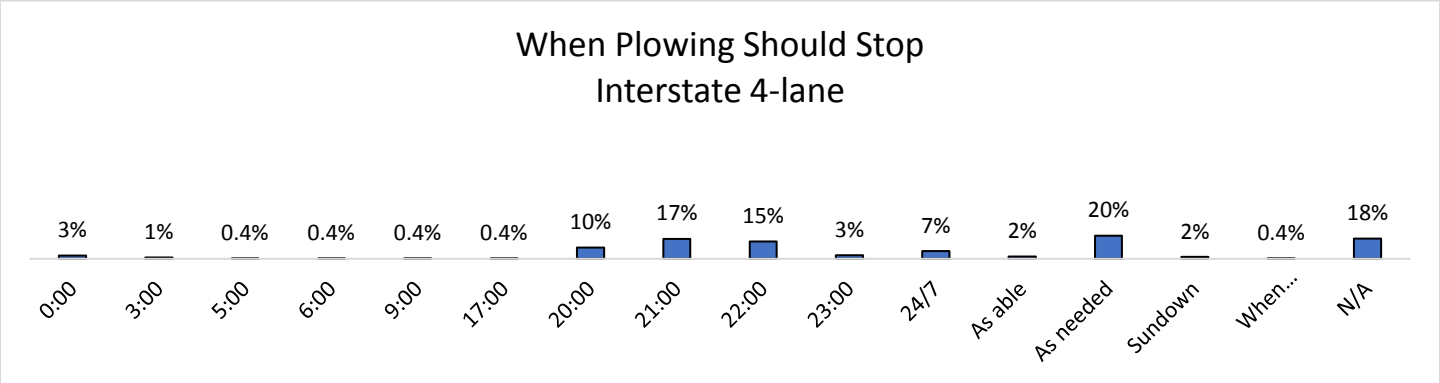
More than one in four respondents say to extend plowing hours.

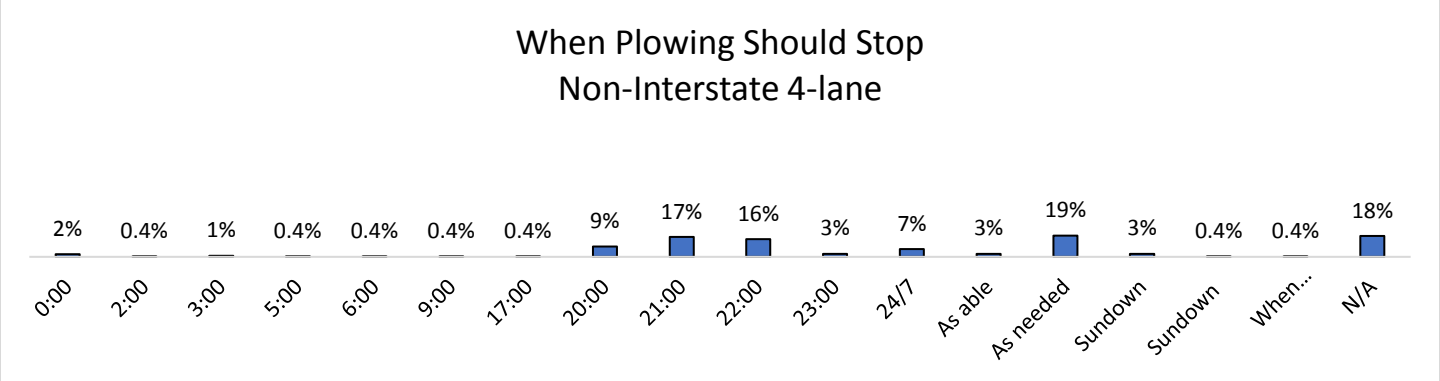


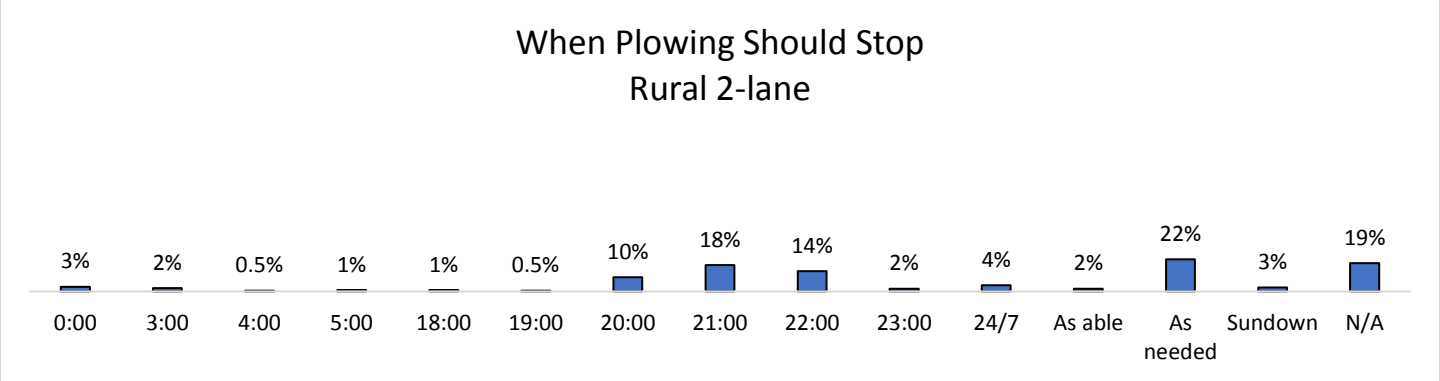

Change Plowing Stop Time
Non-Interstate 4-lane
NW
SW
NE
SE
Total
3%
4%
2%
1%
3%
61%
66%
77%
73%
69%
36%
30%
21%
26%
28%
Stop plowing earlier
No change
Extend plowing hours later


Change Plowing Stop Time
Rural 2-lane
NW
SW
NE
SE
Total
4%
3%
3%
2%
3%
65%
70%
76%
73%
71%
31%
26%
21%
25%
26%
Stop plowing earlier
No change
Extend plowing hours later

If you answered to change the time earlier or later, please specify what time should plowing stop:

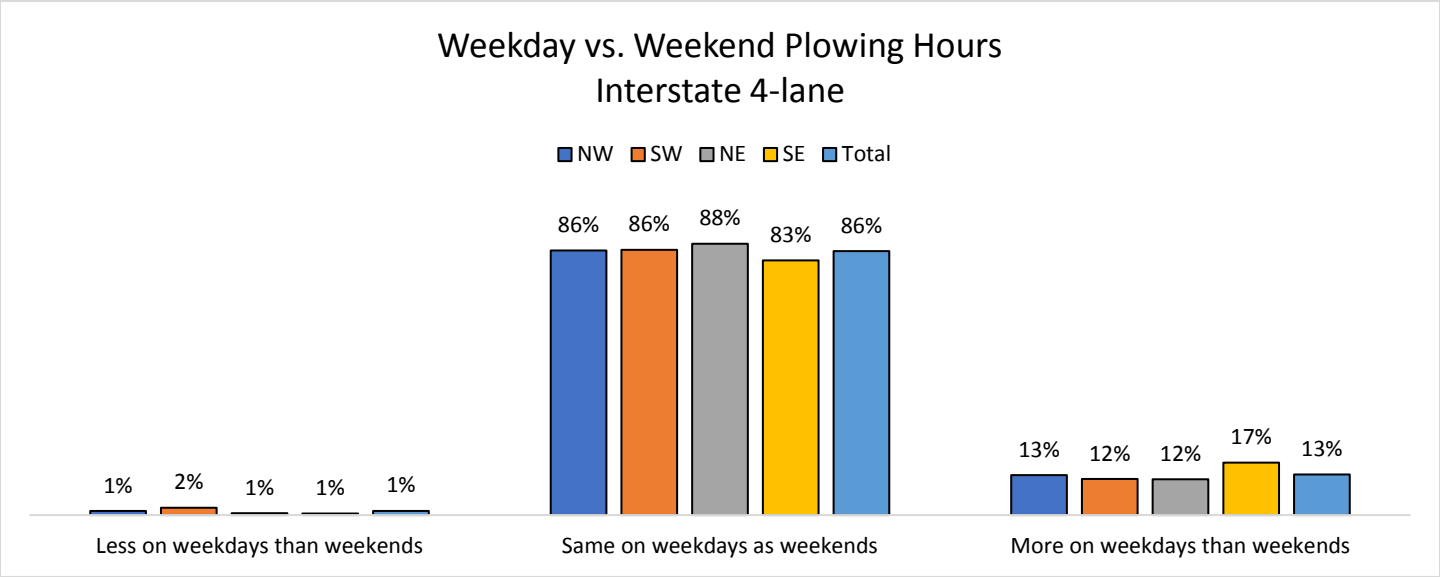


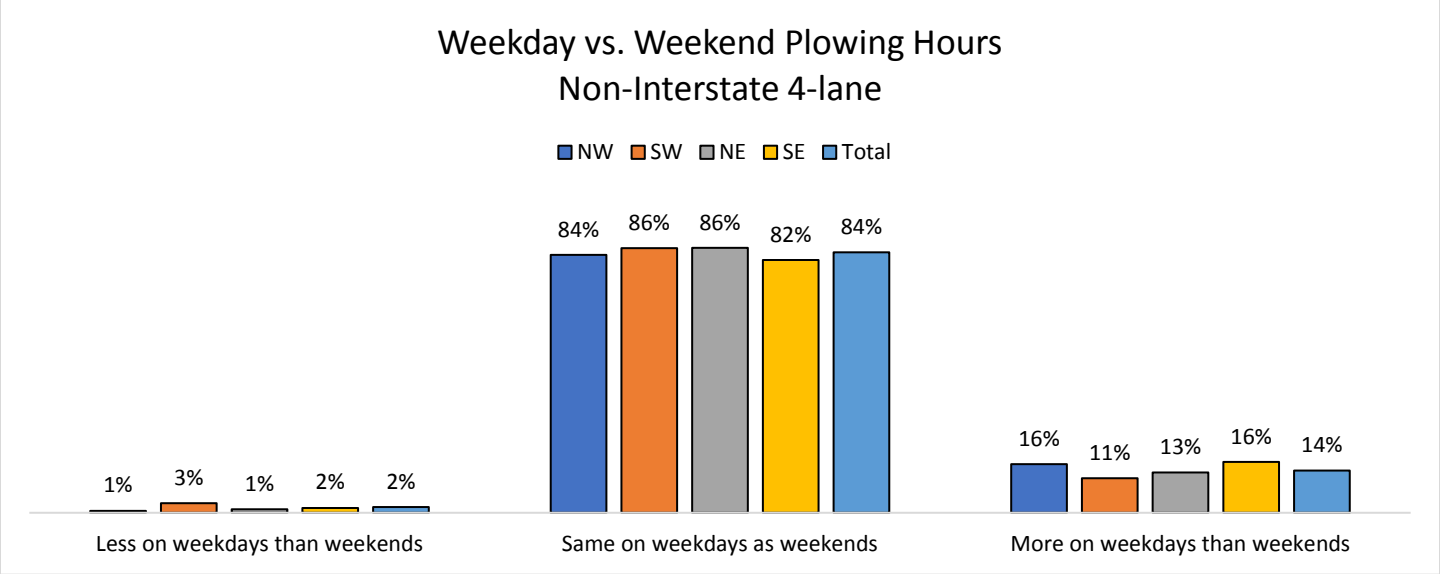


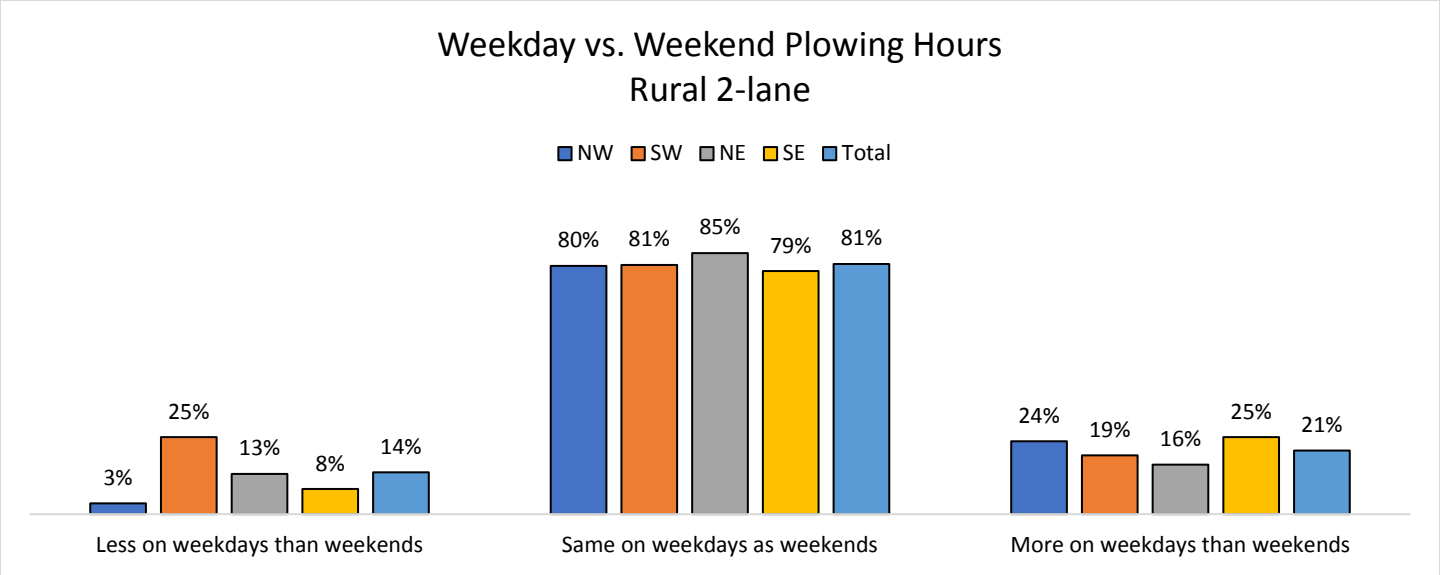


7. Should the same hours of plowing be provided on weekdays and weekends?

Over 80% say same to use the same hours on weekdays as weekends.





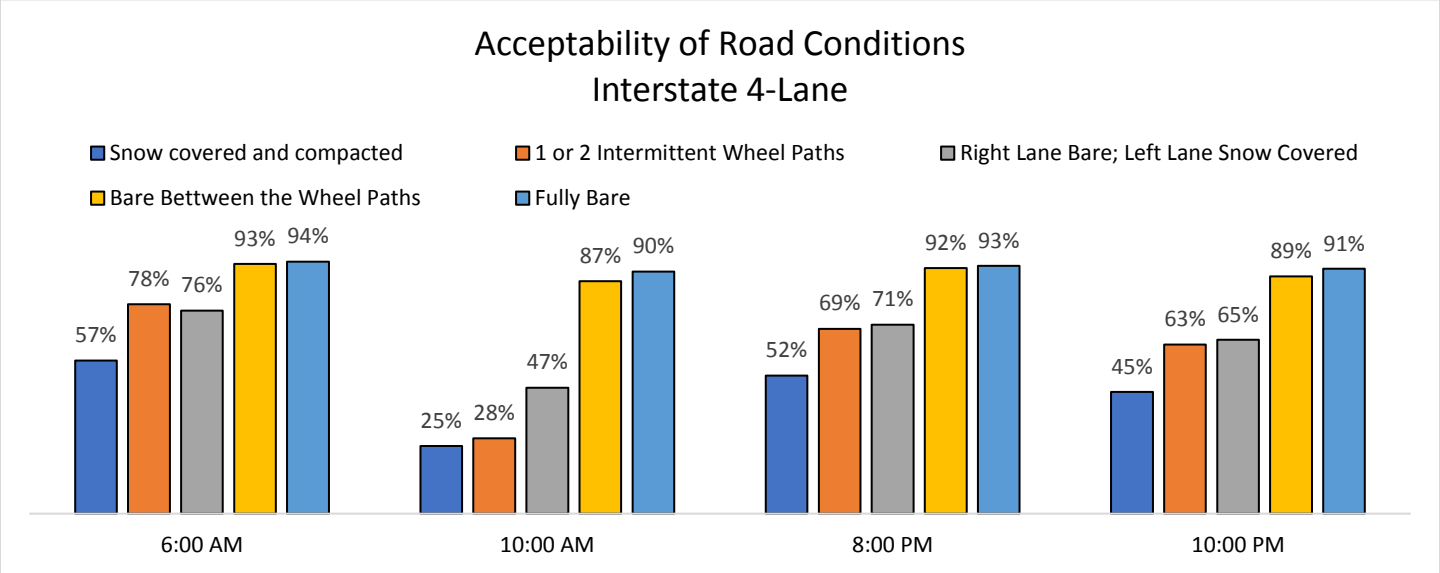


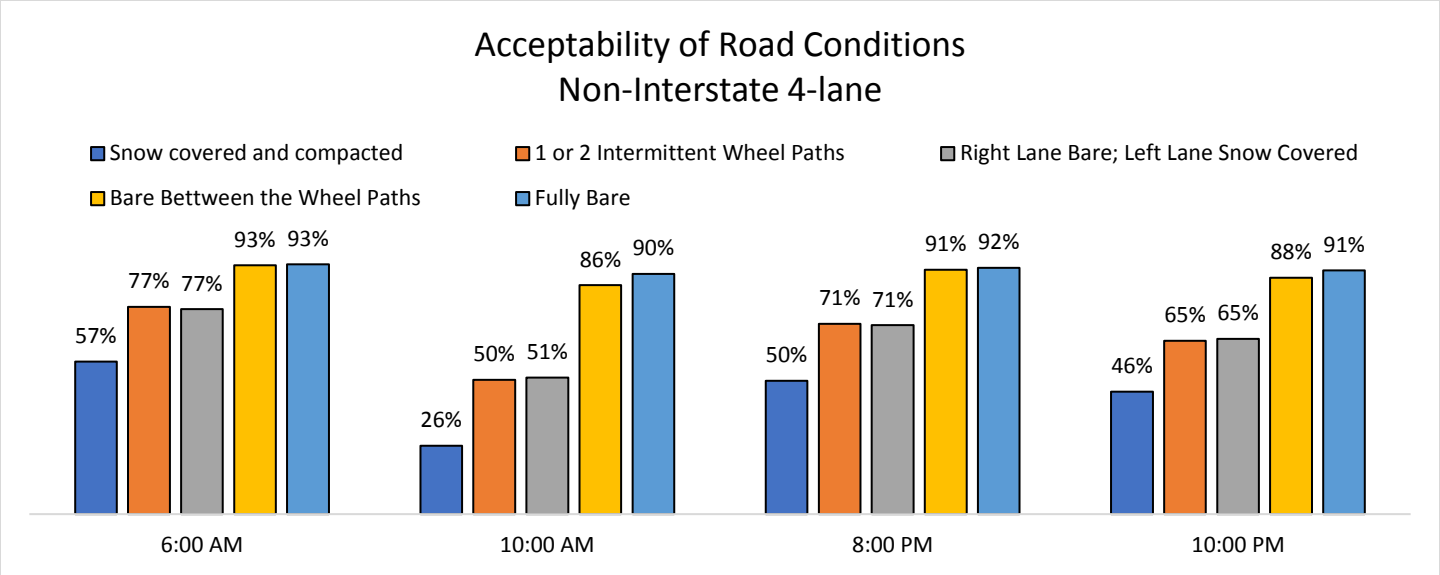
The next set of questions pertain to an Interstate 4-Lane Highway, not including local, city, or county roads (example: I-29, I-94). If you do not drive on the Interstate you can skip this section. Interstate 4-Lane (example: I-29, I-94) - Snow Covered and Compacted

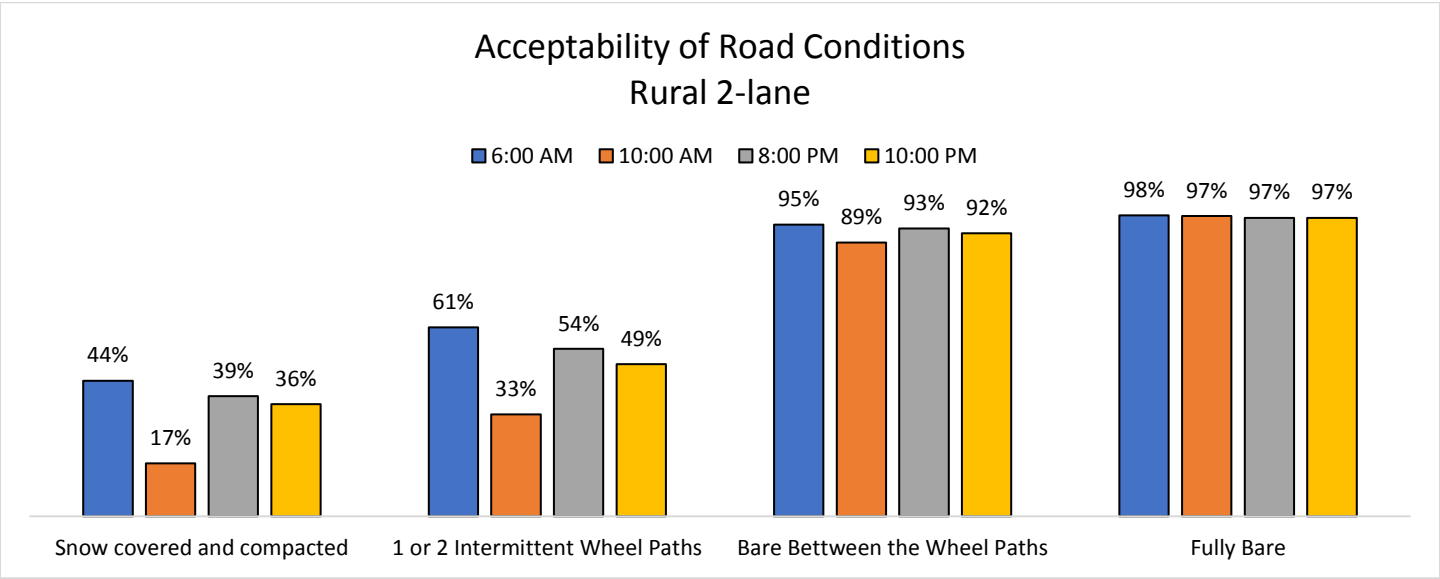
8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34. For the road condition shown above, if this 3 to 4-inch snowfall ended at 3am in the morning, and the wind had died down, how acceptable would this road condition be at:
9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35. For the road condition shown above, if this 3 to 4-inch snowfall ended at 6pm in the evening, and the wind had died down, how acceptable would this road condition be at:

Very little difference between 'bare between wheel paths' and 'fully bare.'

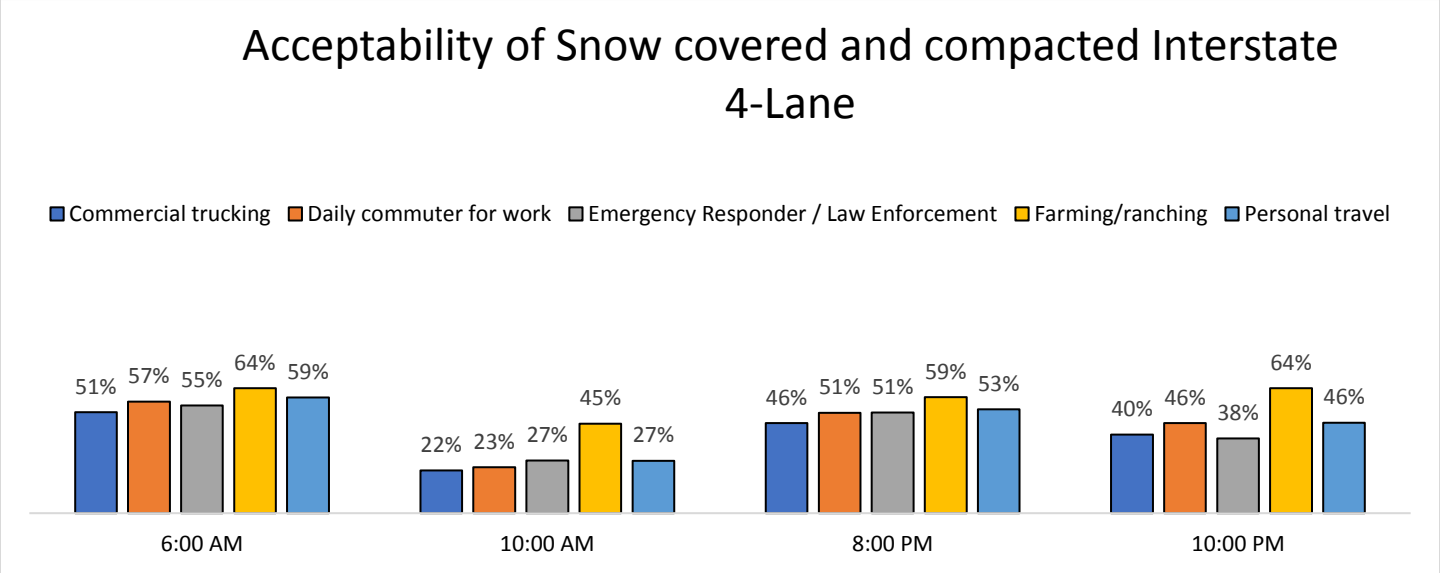
Acceptability of Road Conditions



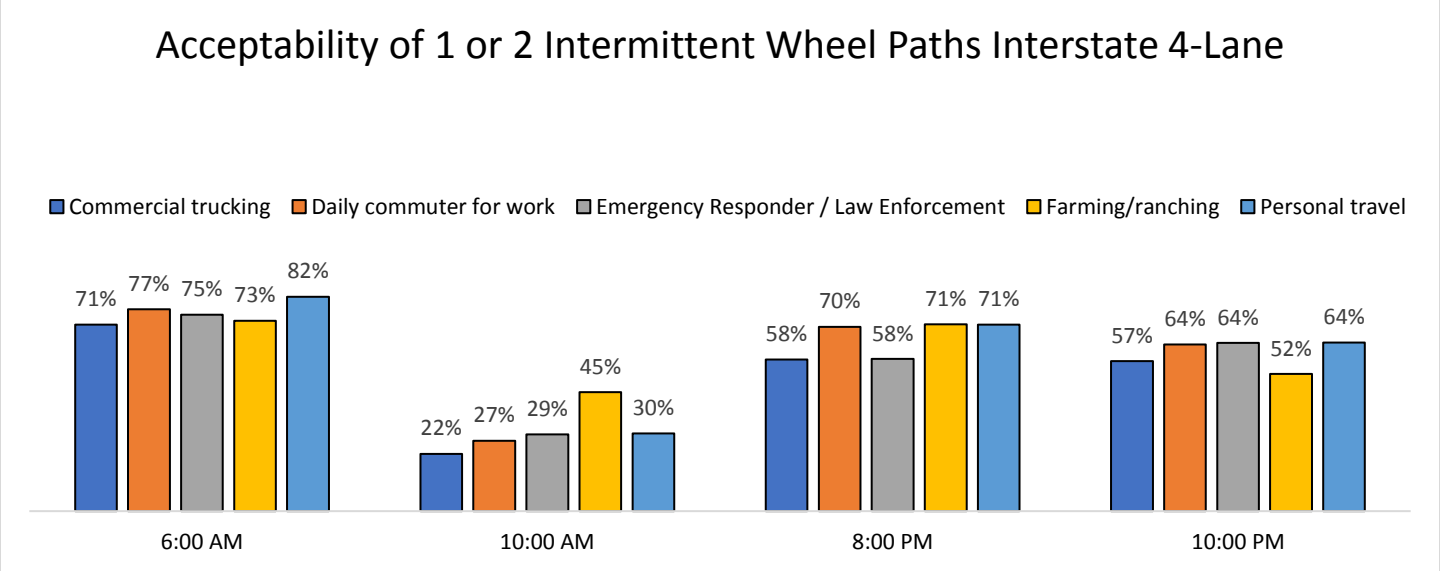

Acceptability of Road Conditions
Non-Interstate 4-lane
Snow covered and compacted
1 or 2 Intermittent Wheel Paths
Right Lane Bare; Left Lane Snow Covered
Bare Between the Wheel Paths
Fully Bare
57%
77%
77%
93%
93%
26%
50%
51%
86%
90%
50%
71%
71%
91%
92%
46%
65%
65%
88%
91%
6:00 AM
10:00 AM
8:00 PM
10:00 PM


Acceptability of Road Conditions
Rural 2-lane
6:00 AM
10:00 AM
8:00 PM
10:00 PM
44%
17%
39%
36%
61%
33%
54%
49%
95%
89%
93%
92%
98%
97%
97%
97%
Snow covered and compacted
1 or 2 Intermittent Wheel Paths
Bare Bettween the Wheel Paths
Fully Bare

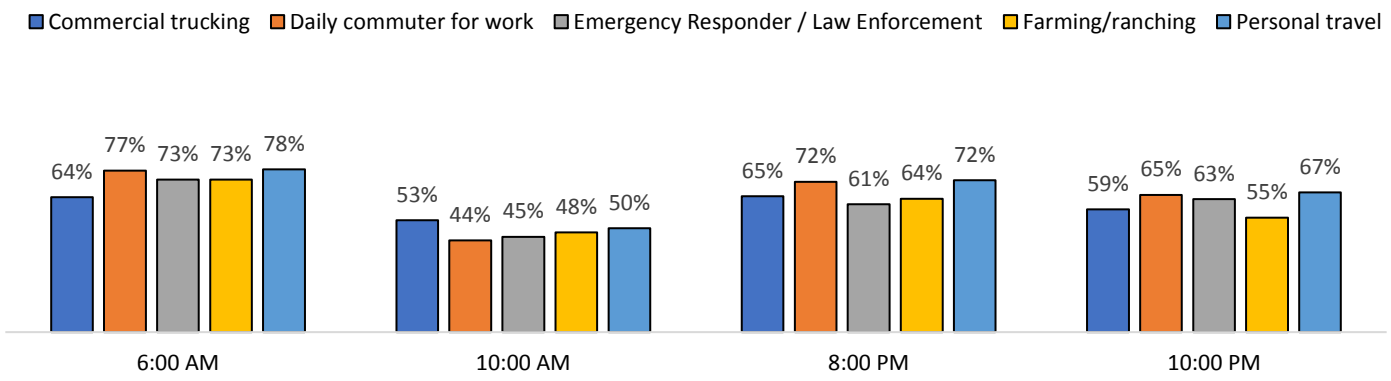
Interstate 4-lane by Driver Type



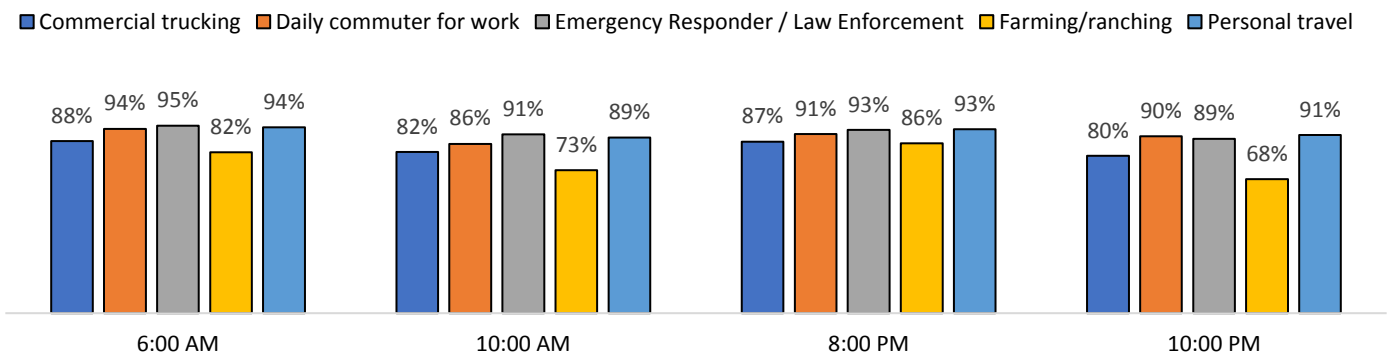
Farmers slightly more accepting of snow-covered roads on interstate

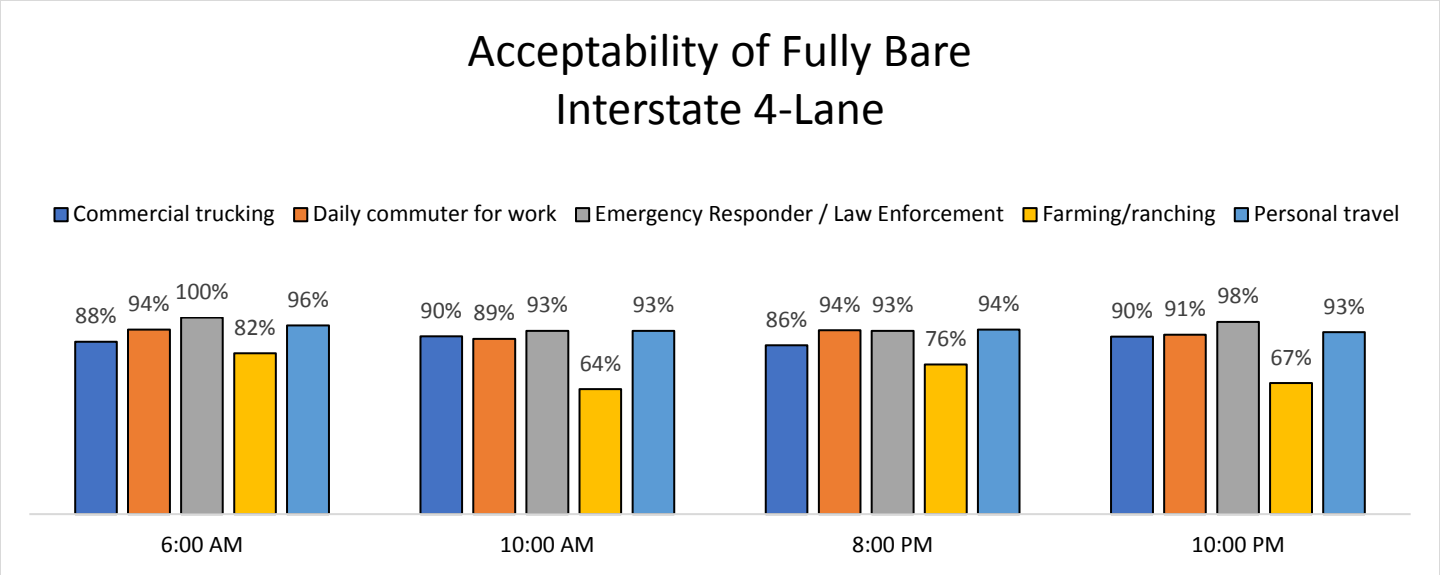


Acceptability of Right Lane Bare; Left Lane Snow Covered Interstate 4-Lane



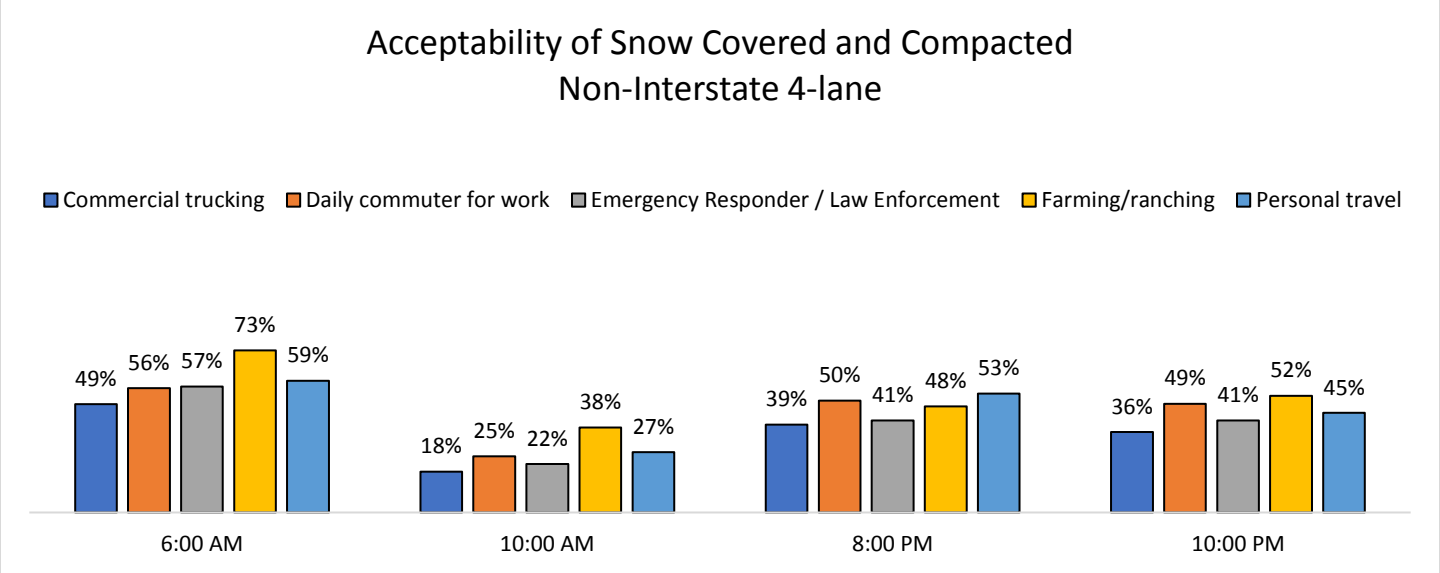
Acceptability of Bare Between the Wheel Paths Interstate 4-Lane



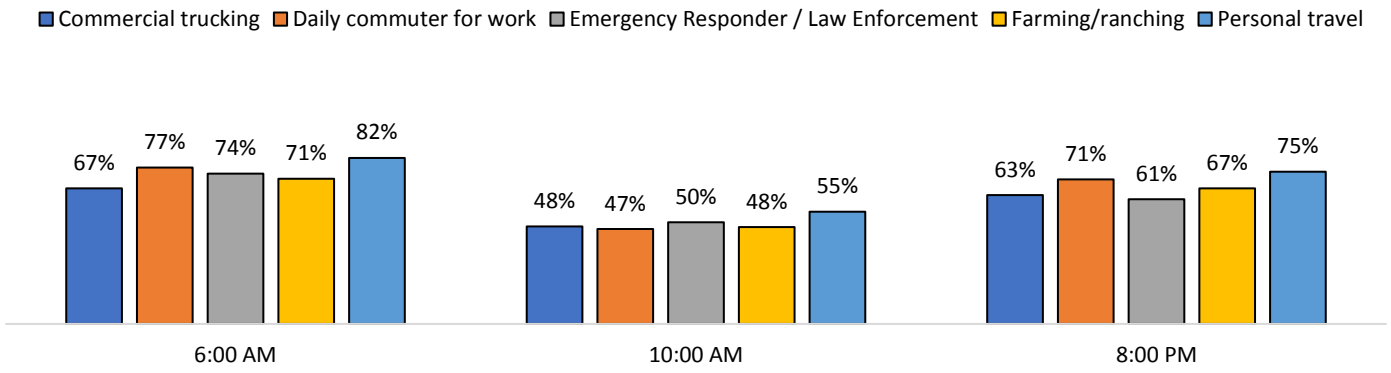


Farmers are slightly more accepting of snow covered roads on Interstate.

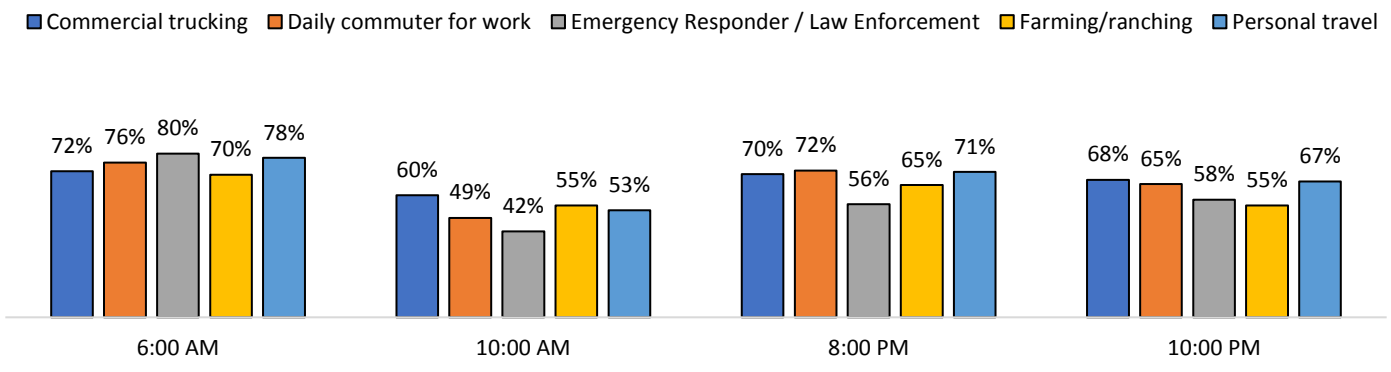
Non-Interstate 4-lane by Driver Type



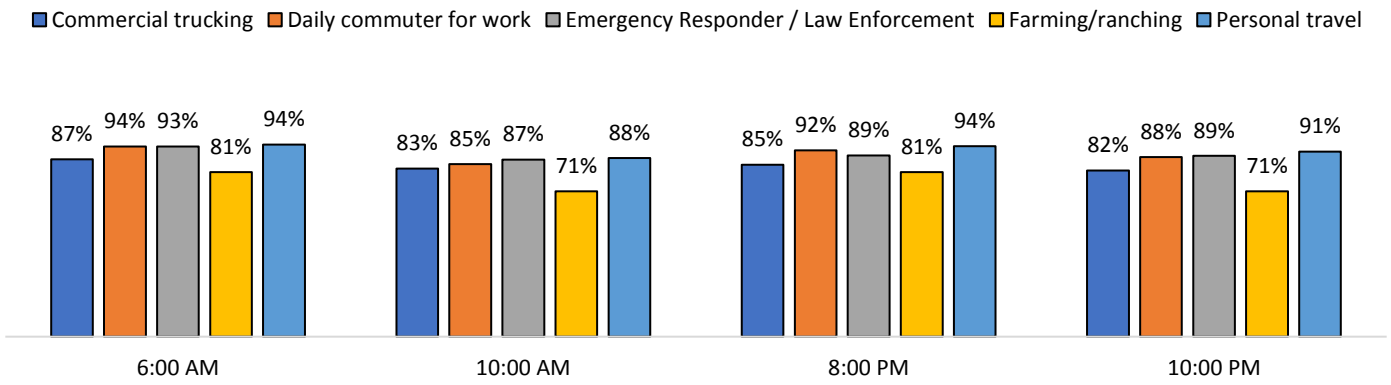
Acceptability of 1 or 2 Intermittent Wheel Paths Non-Interstate 4-lane

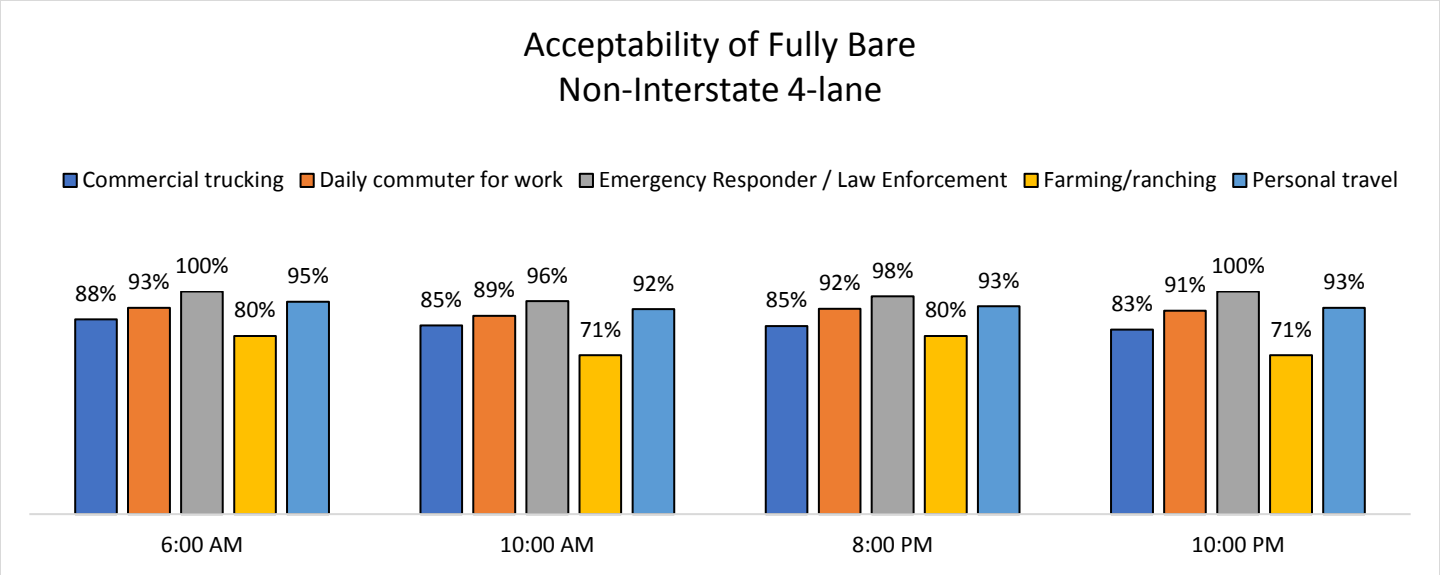


Acceptability of Right Lane Bare; Left Lane Snow Covered Non-Interstate 4-lane

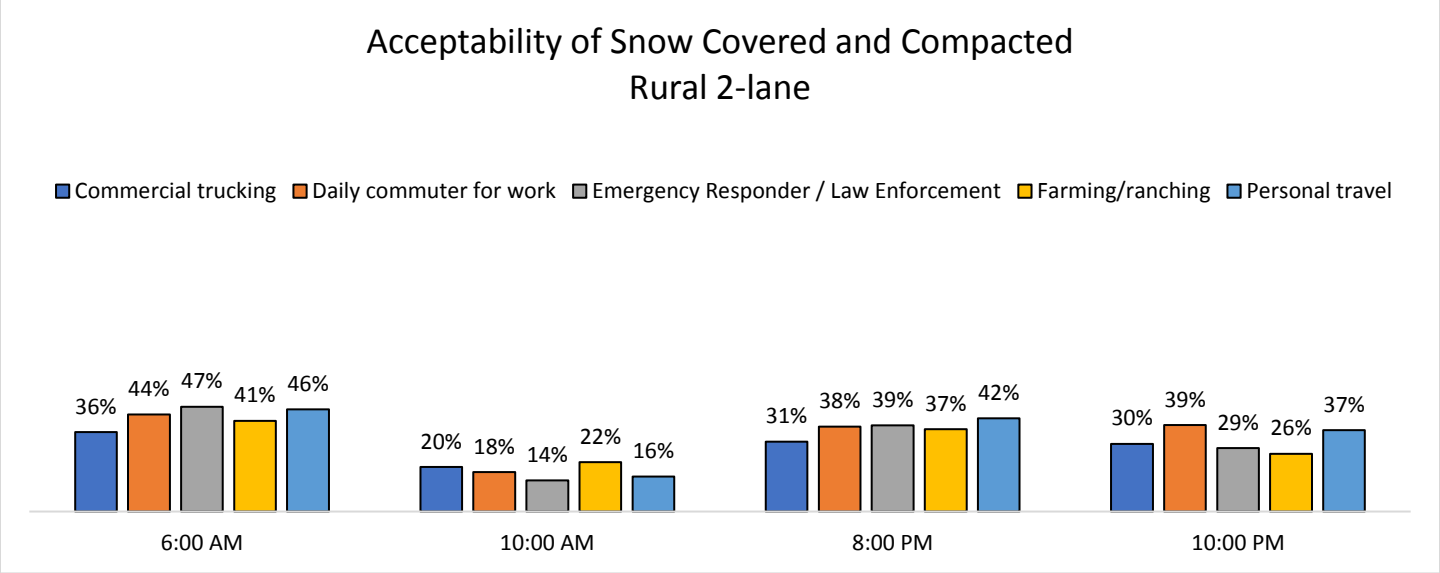


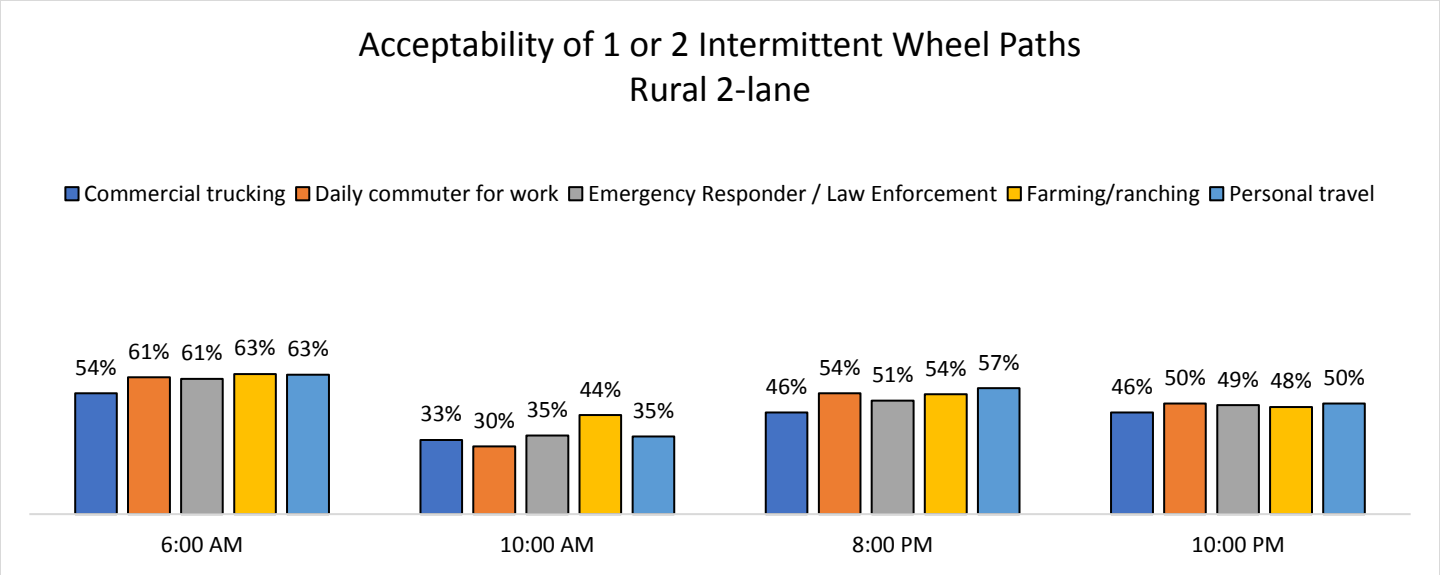
Acceptability of Bare Between the Wheel Paths Non-Interstate 4-lane

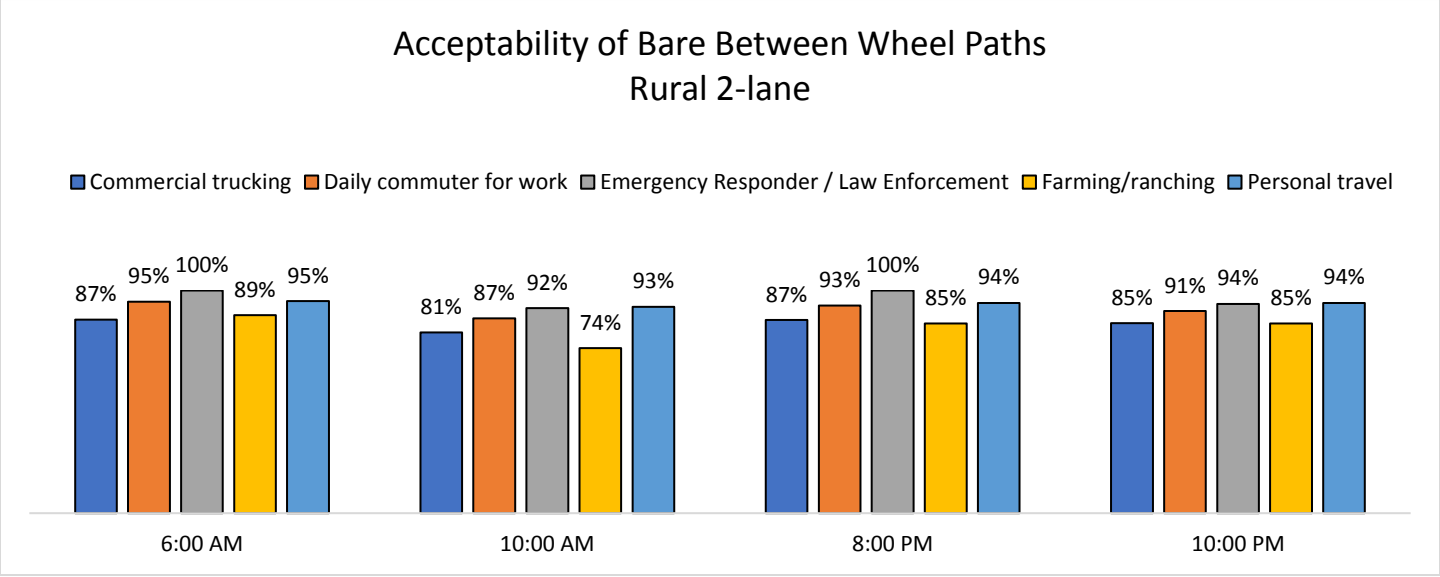


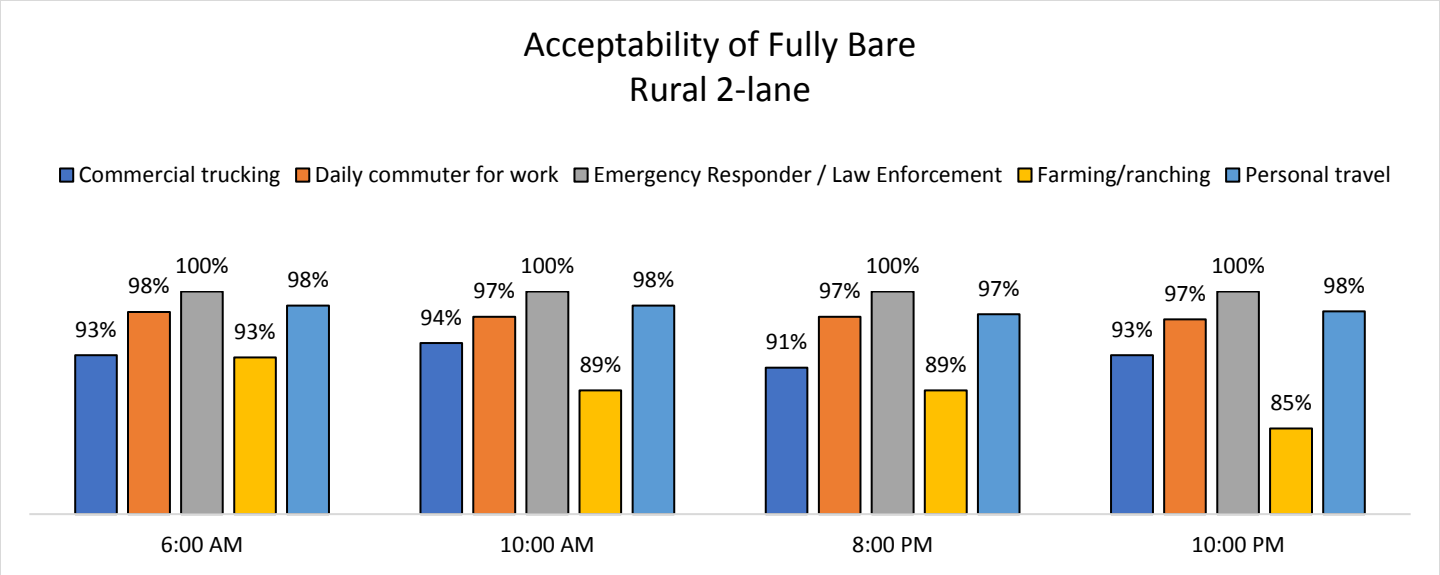


Rural 2-lane by Driver Type

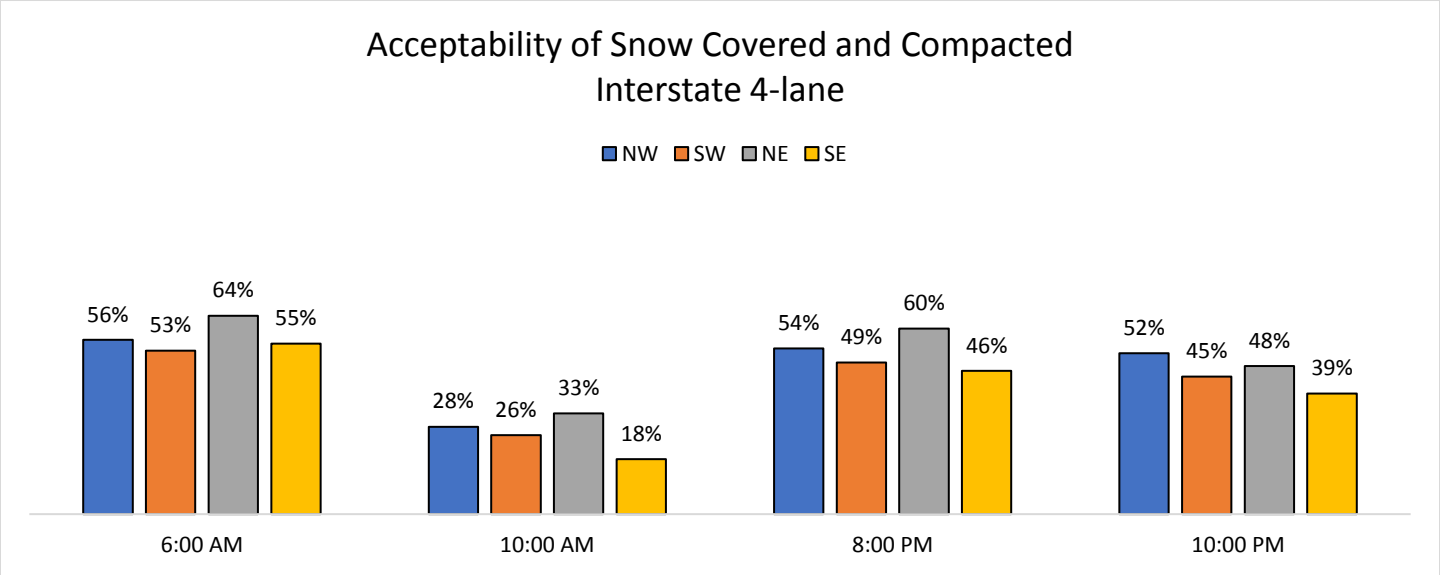



Acceptability of 1 or 2 Intermittent Wheel Paths
Rural 2-lane
Commercial trucking
Daily commuter for work
Emergency Responder / Law Enforcement
Farming/ranching
Personal travel
54%
61%
61%
63%
63%
33%
30%
35%
44%
35%
46%
54%
51%
54%
57%
46%
50%
49%
48%
50%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

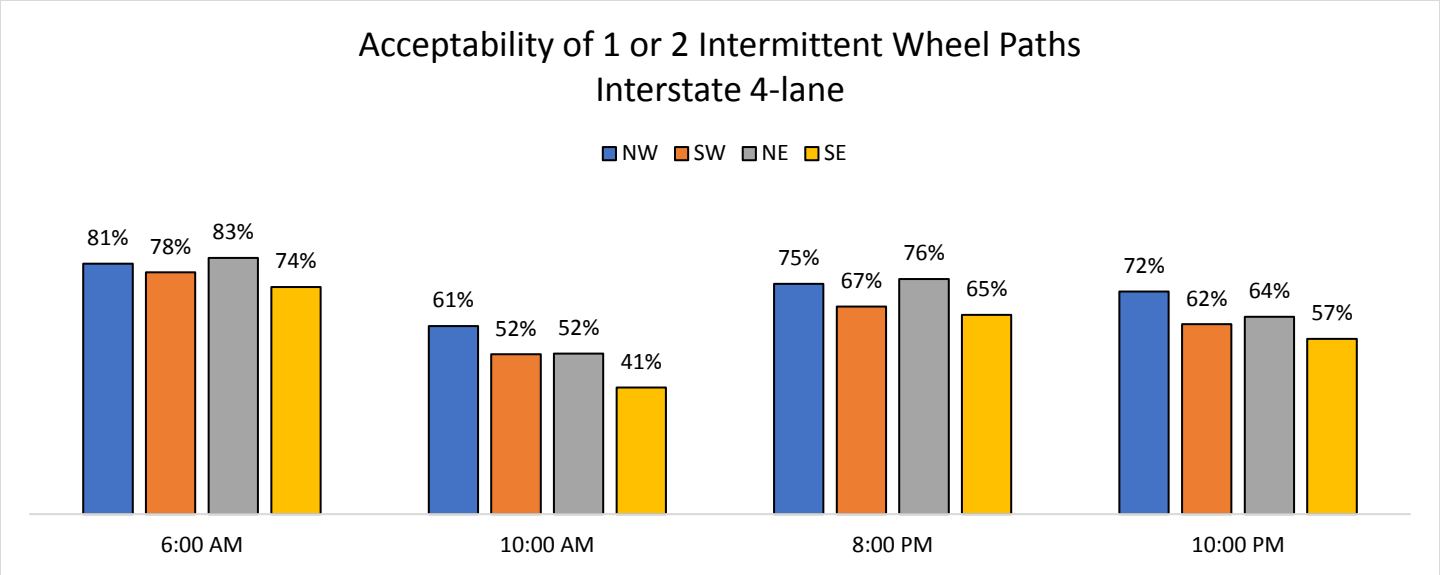

Acceptability of Bare Between Wheel Paths
Rural 2-lane
Commercial trucking
Daily commuter for work
Emergency Responder / Law Enforcement
Farming/ranching
Personal travel
87%
95%
100%
89%
95%
81%
87%
92%
74%
93%
87%
93%
100%
85%
94%
85%
91%
94%
85%
94%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

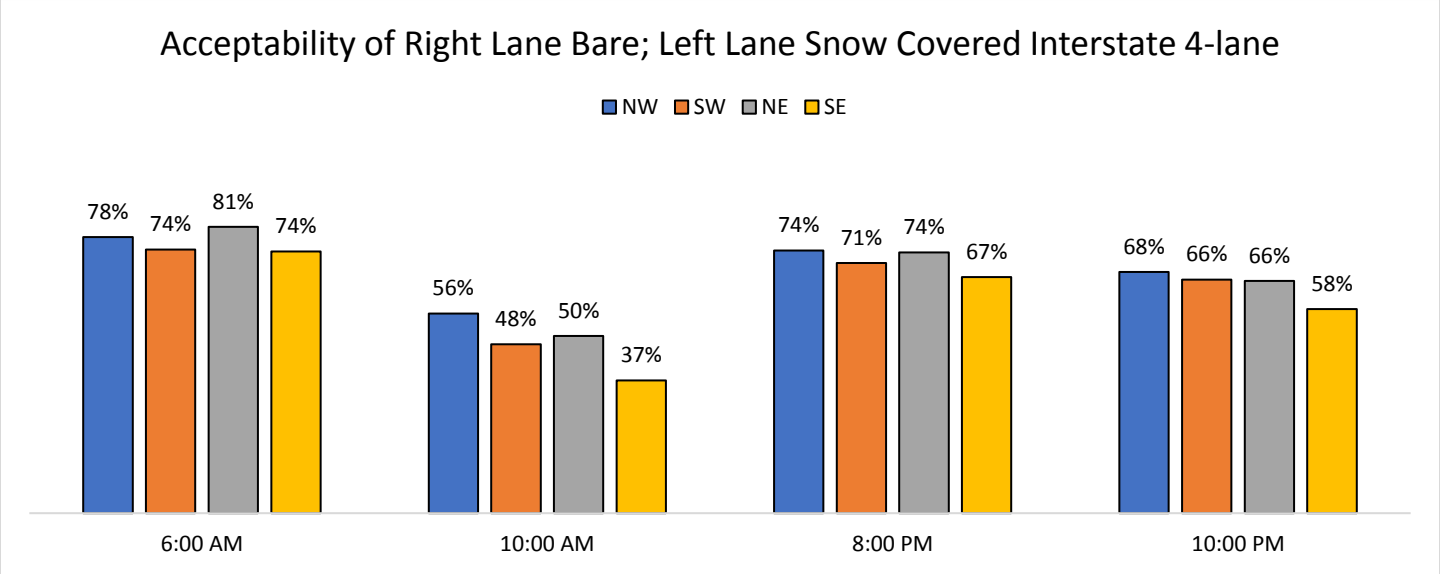


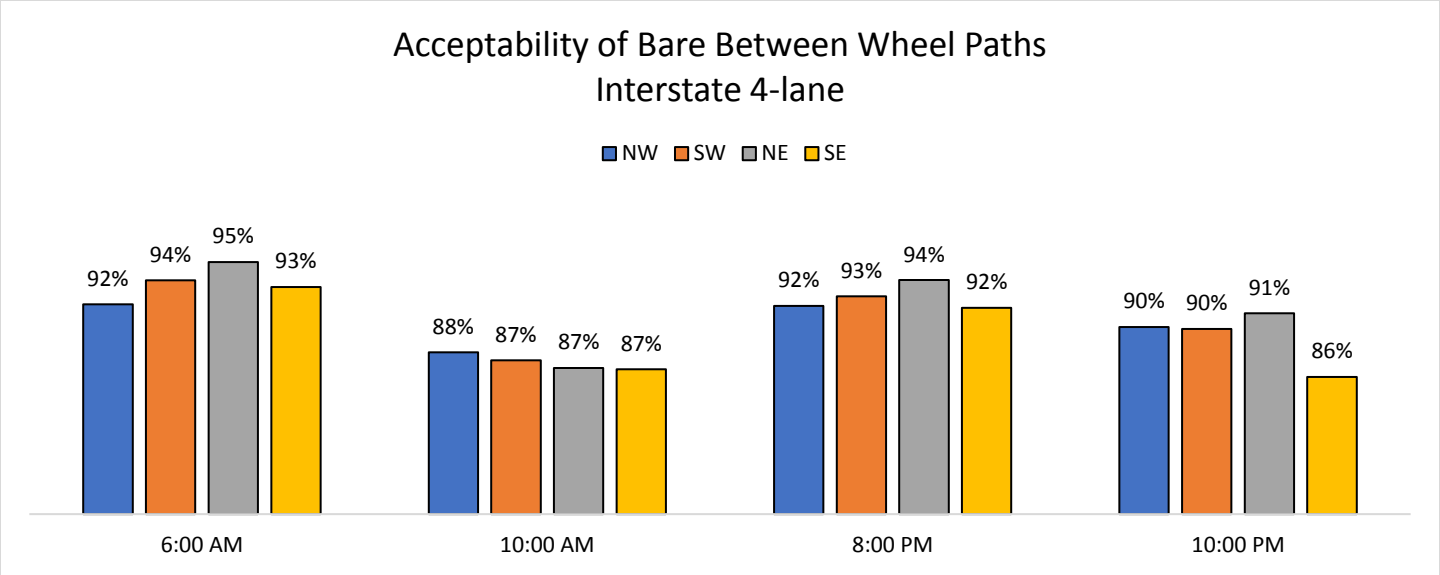
Interstate 4-lane by Region

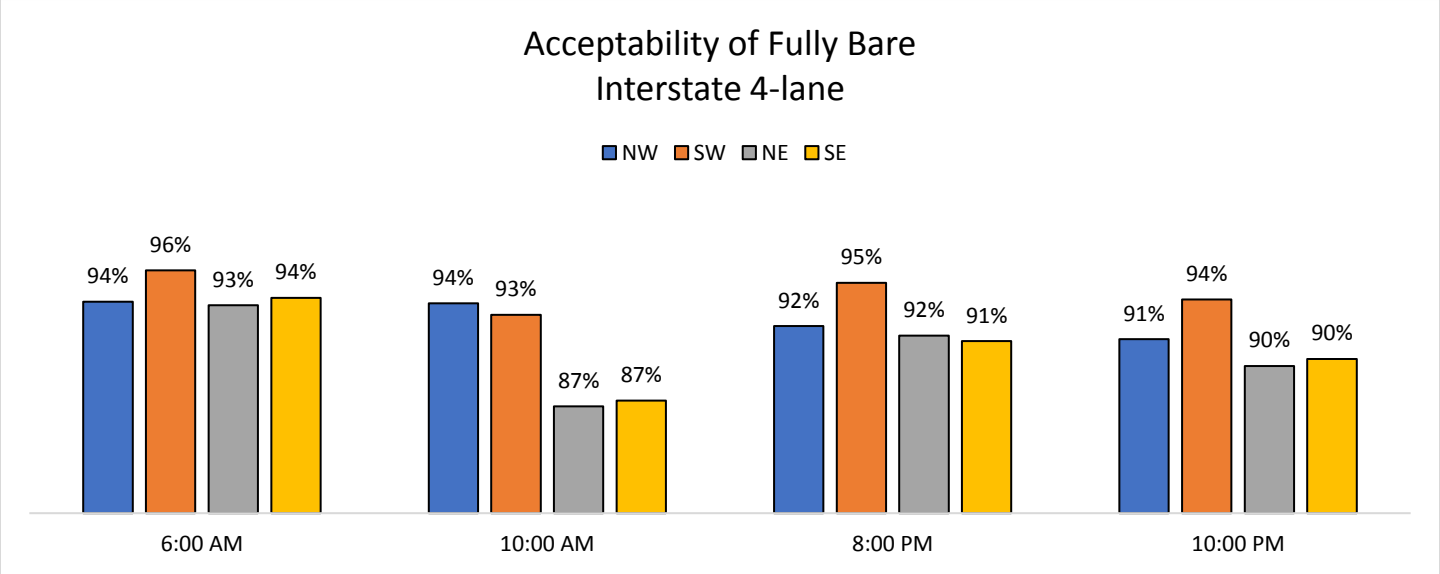


Respondents from the NE are more accepting of snow covered, but respondents of the SW most accepting of fully bare.

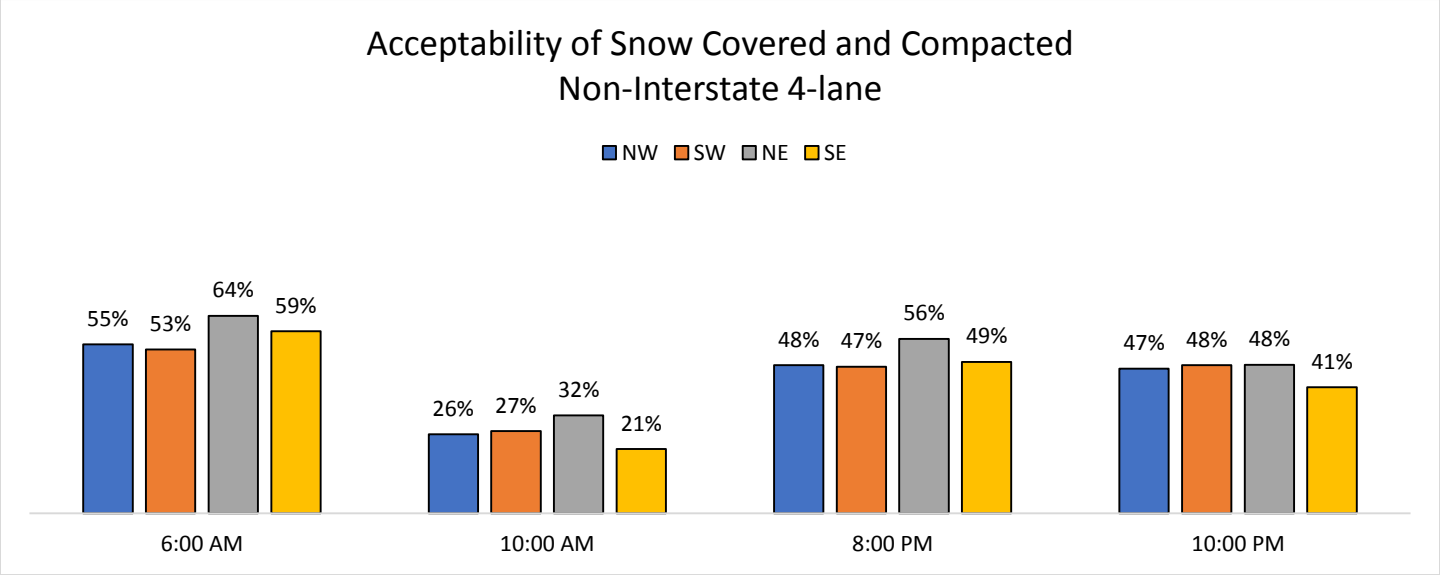

Acceptability of 1 or 2 Intermittent Wheel Paths
Interstate 4-lane
NW SW NE SE
81% 78% 83% 74%
61% 52% 52% 41%
75% 67% 76% 65%
72% 62% 64% 57%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

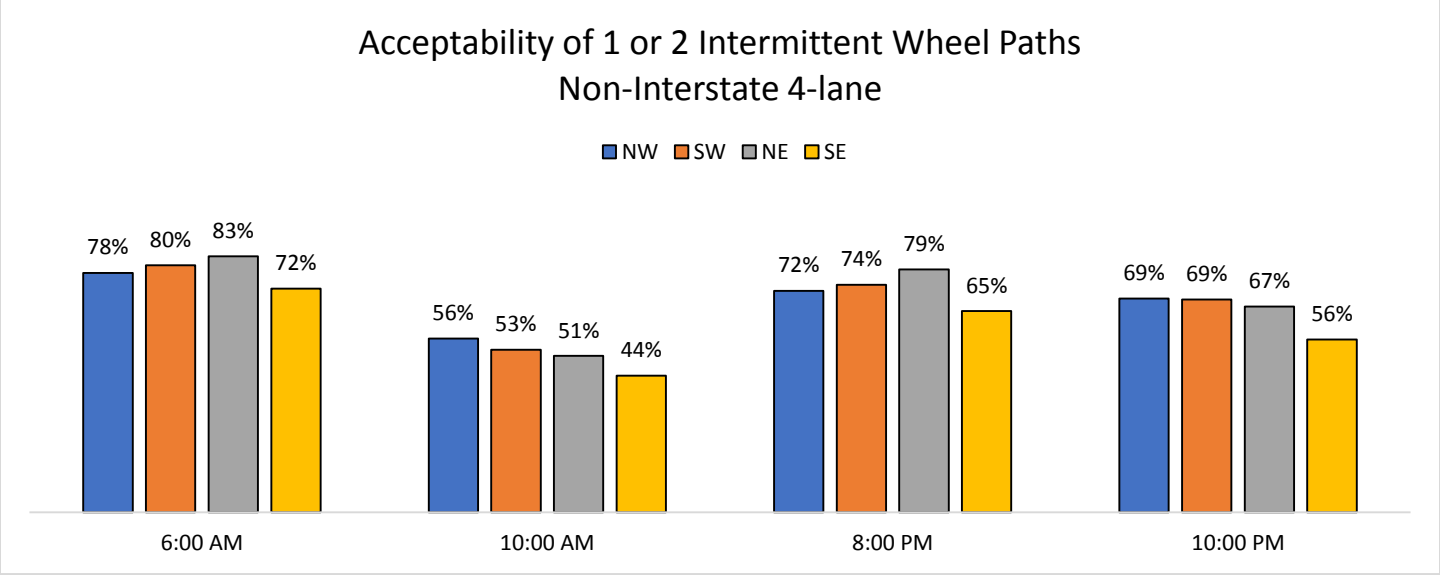

Acceptability of Right Lane Bare; Left Lane Snow Covered Interstate 4-lane
NW SW NE SE
78% 74% 81% 74%
56% 48% 50% 37%
74% 71% 74% 67%
68% 66% 66% 58%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

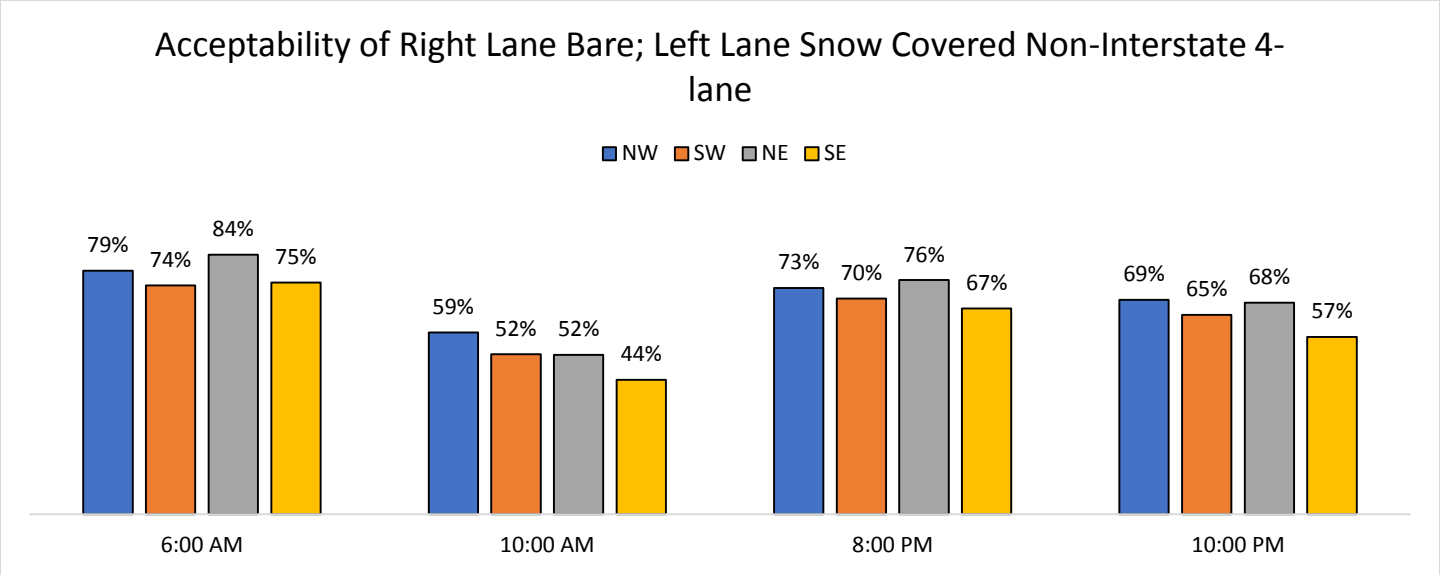

Acceptability of Bare Between Wheel Paths
Interstate 4-lane
NW SW NE SE
92% 94% 95% 93%
88% 87% 87% 87%
92% 93% 94% 92%
90% 90% 91% 86%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

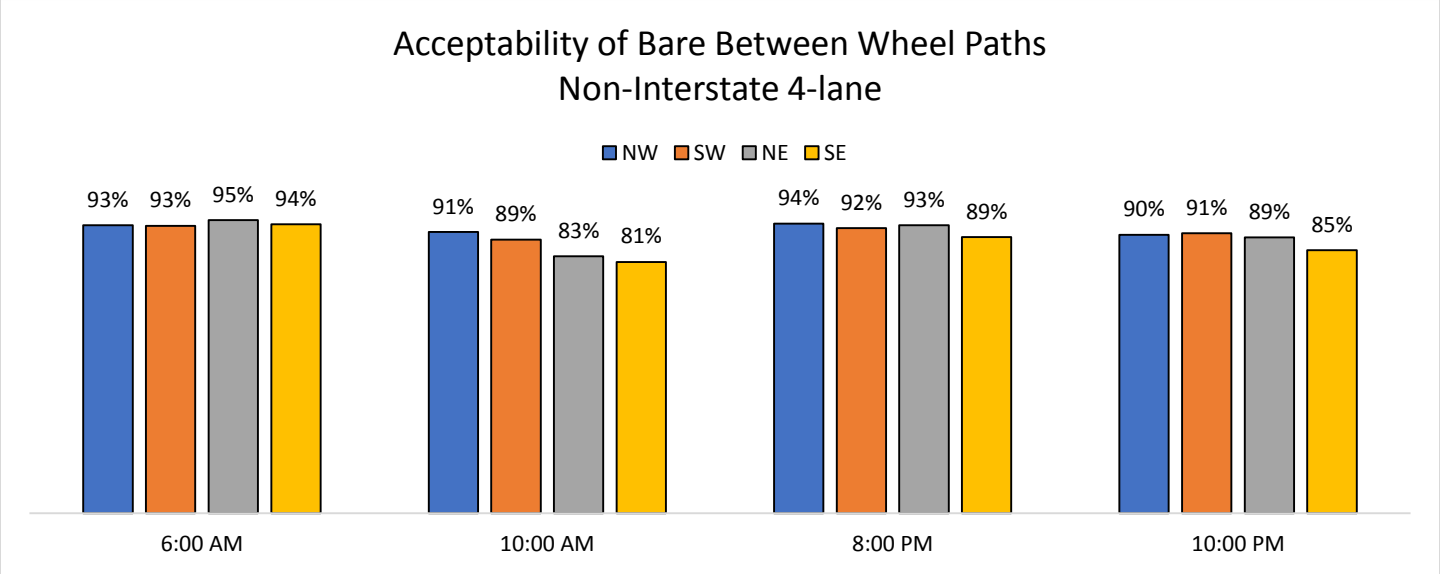

Acceptability of Fully Bare
Interstate 4-lane
NW SW NE SE
94% 96% 93% 94%
94% 93% 87% 87%
92% 95% 92% 91%
91% 94% 90% 90%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

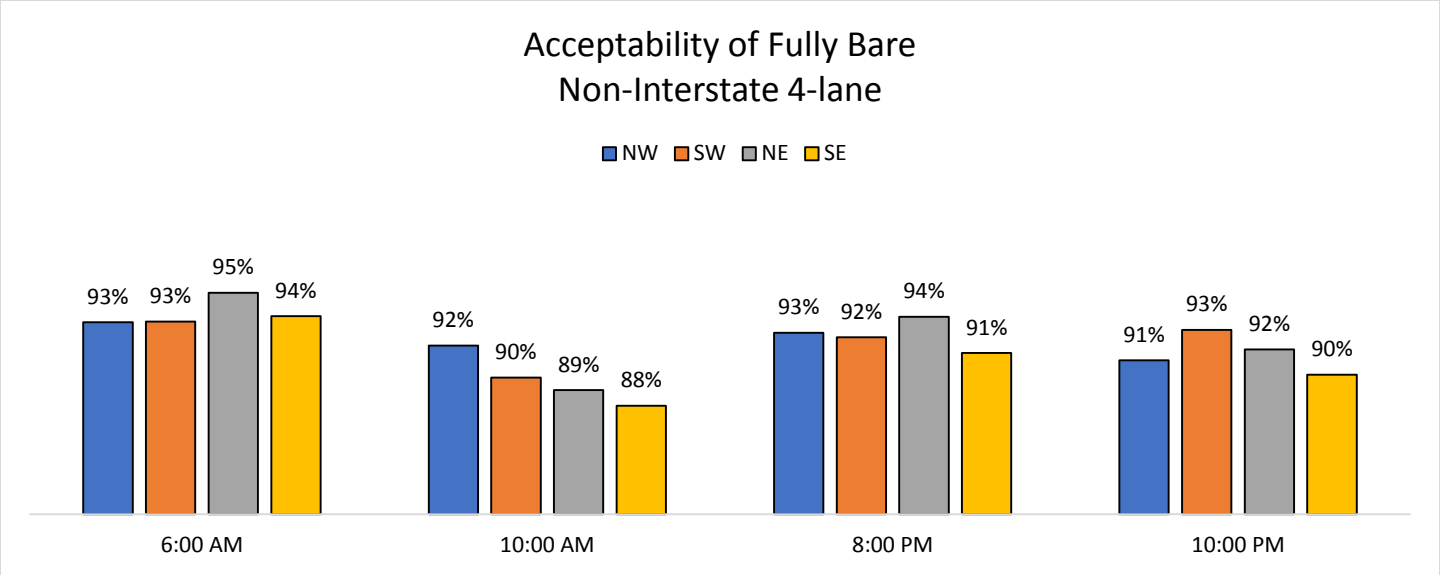
Non-Interstate 4-lane by Region



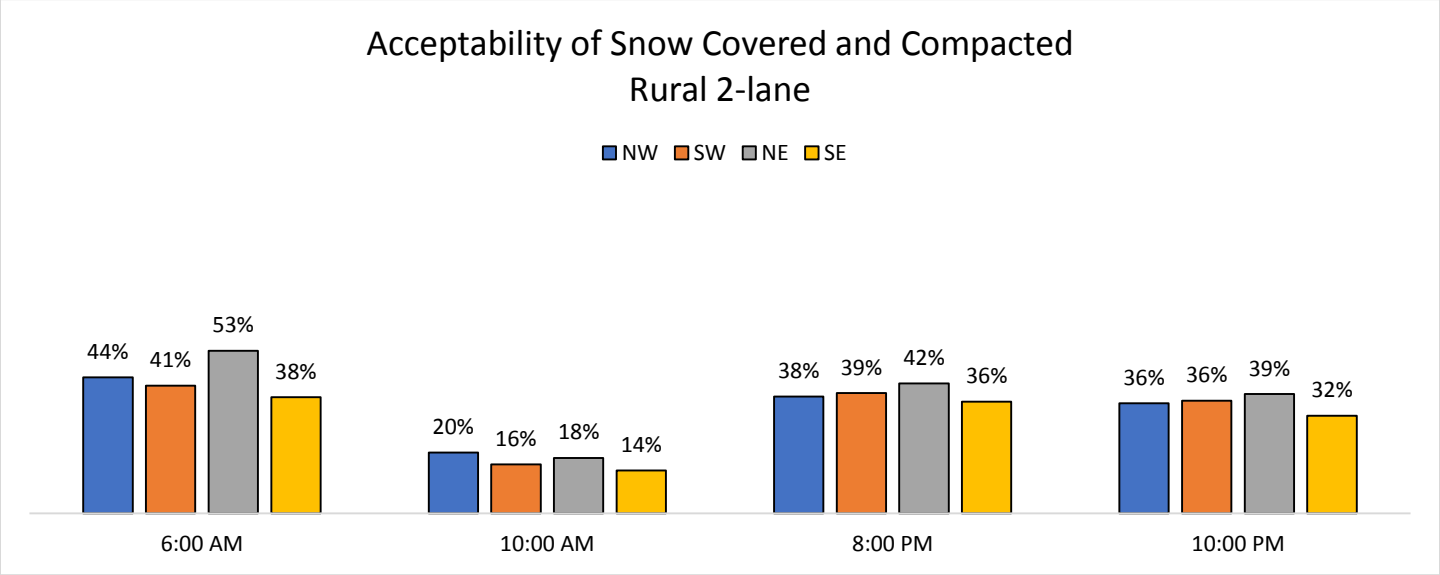


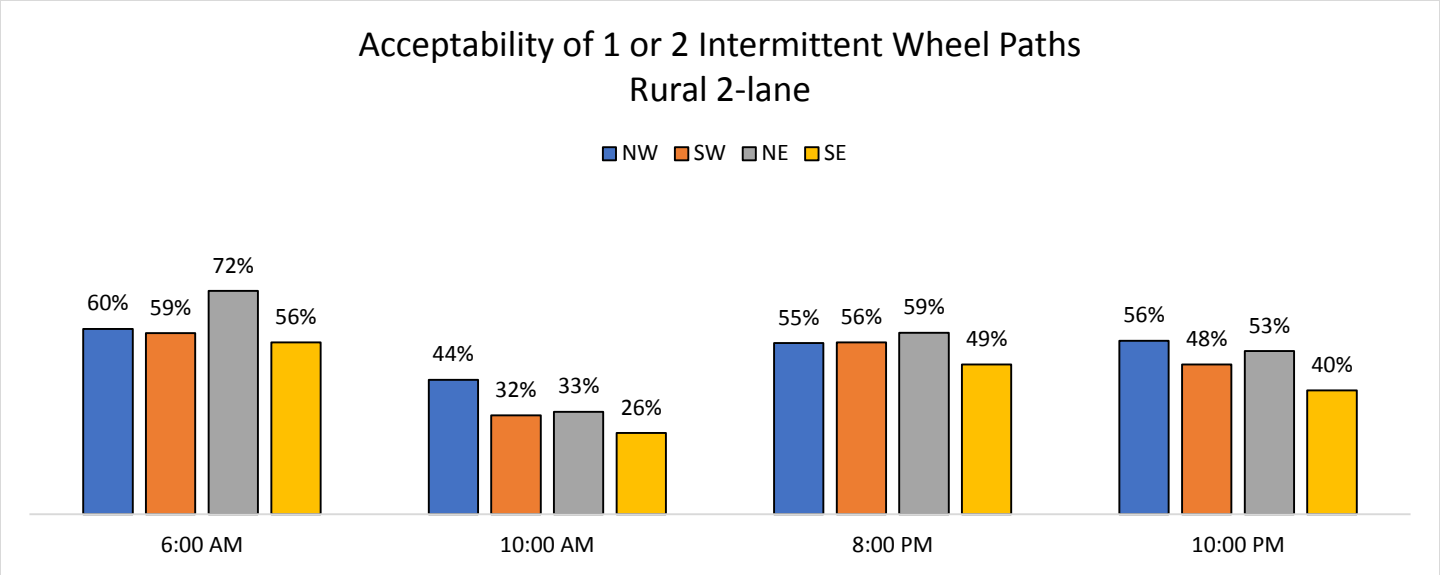

Acceptability of Right Lane Bare; Left Lane Snow Covered Non-Interstate 4-lane
NW
SW
NE
SE
79%
74%
84%
75%
59%
52%
52%
44%
73%
70%
76%
67%
69%
65%
68%
57%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

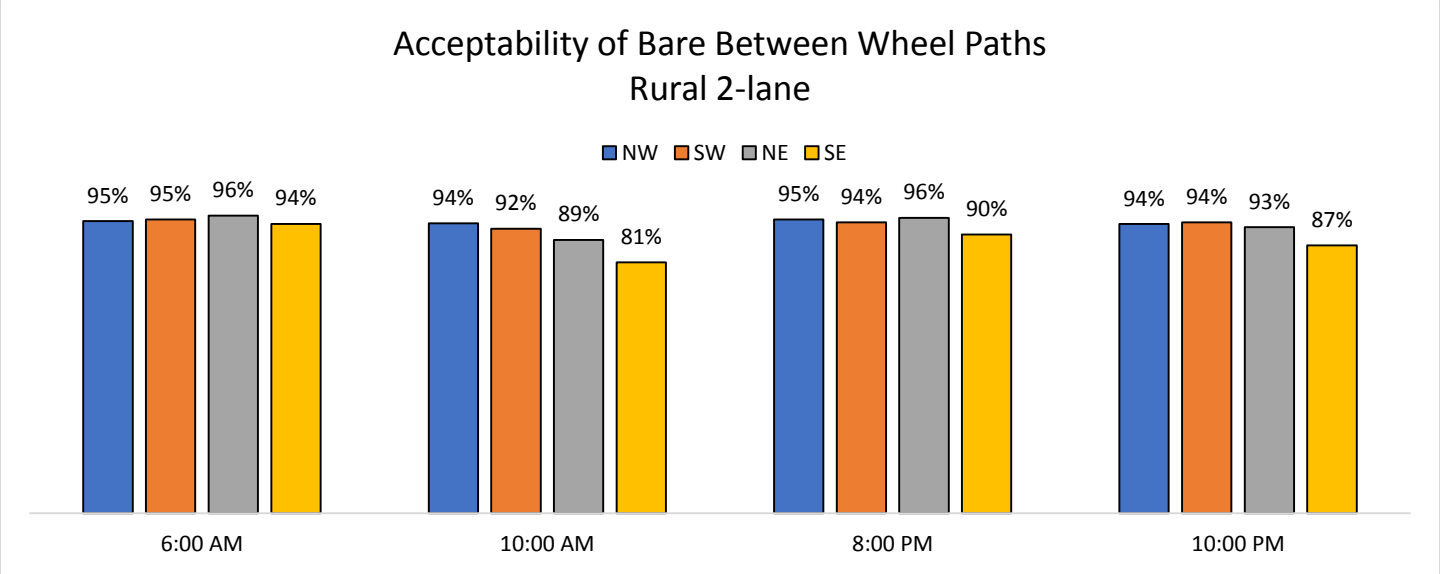

Acceptability of Bare Between Wheel Paths
Non-Interstate 4-lane
NW
SW
NE
SE
93%
93%
95%
94%
91%
89%
83%
81%
94%
92%
93%
89%
90%
91%
89%
85%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

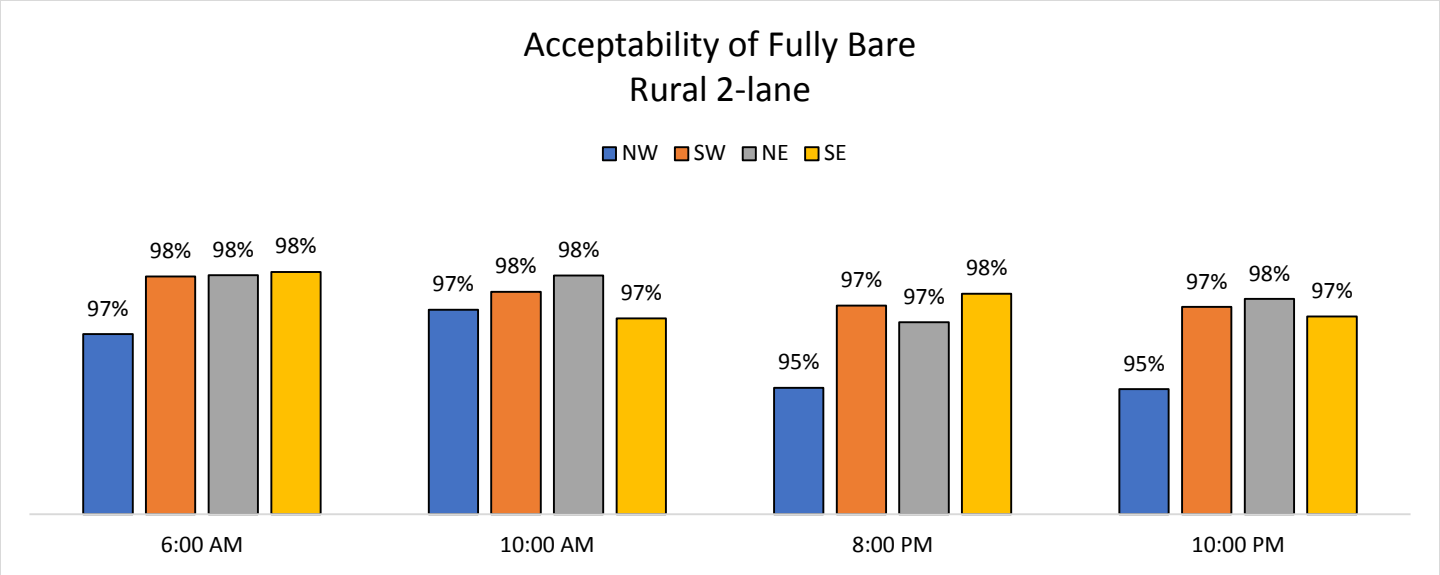


Rural 2-lane by Region

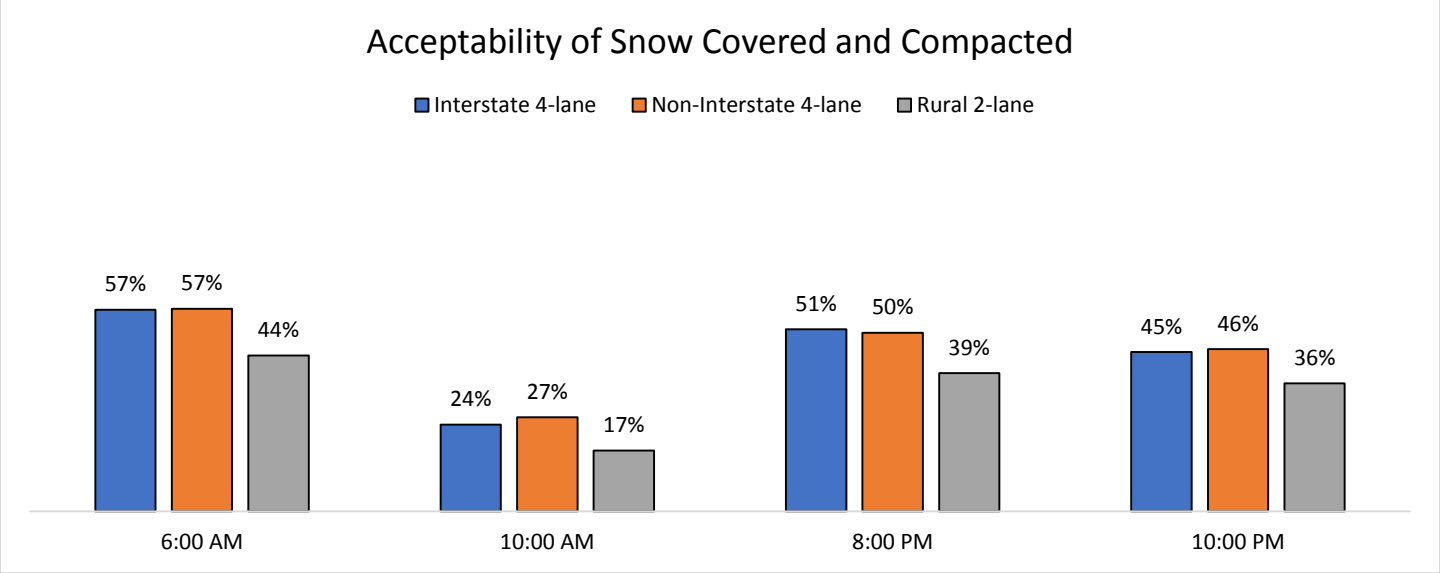



Acceptability of 1 or 2 Intermittent Wheel Paths
Rural 2-lane
NW SW NE SE
60% 59% 72% 56%
44% 32% 33% 26%
55% 56% 59% 49%
56% 48% 53% 40%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

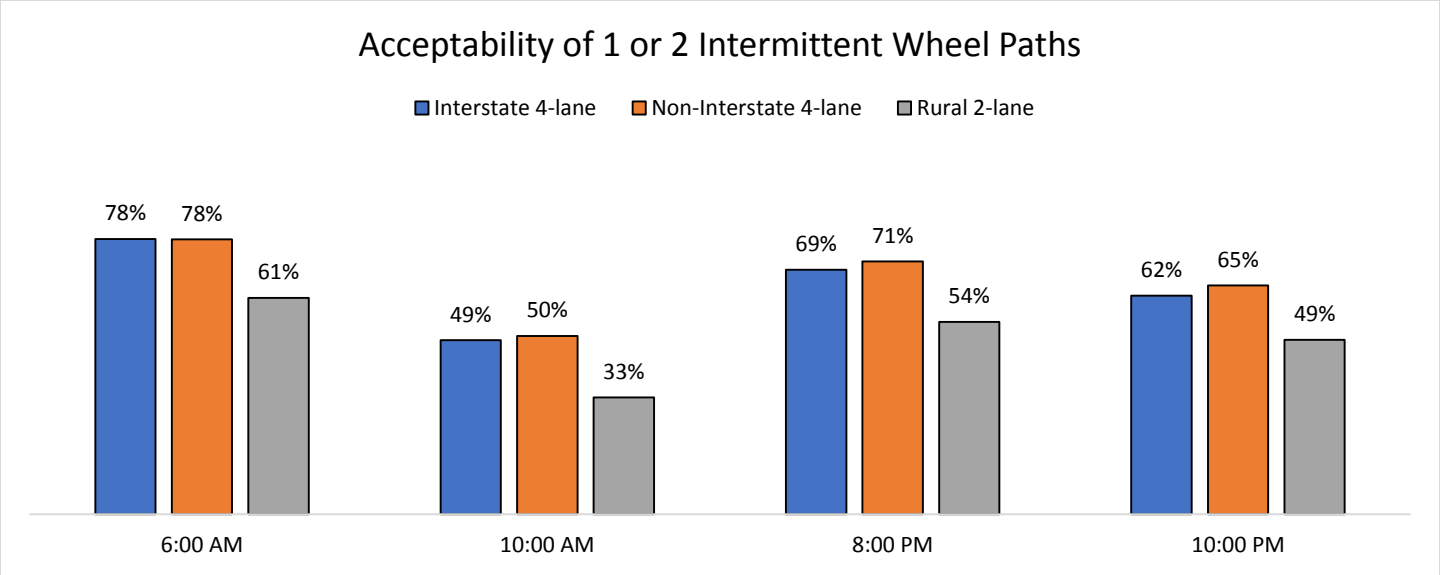

Acceptability of Bare Between Wheel Paths
Rural 2-lane
NW SW NE SE
95% 95% 96% 94%
94% 92% 89% 81%
95% 94% 96% 90%
94% 94% 93% 87%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

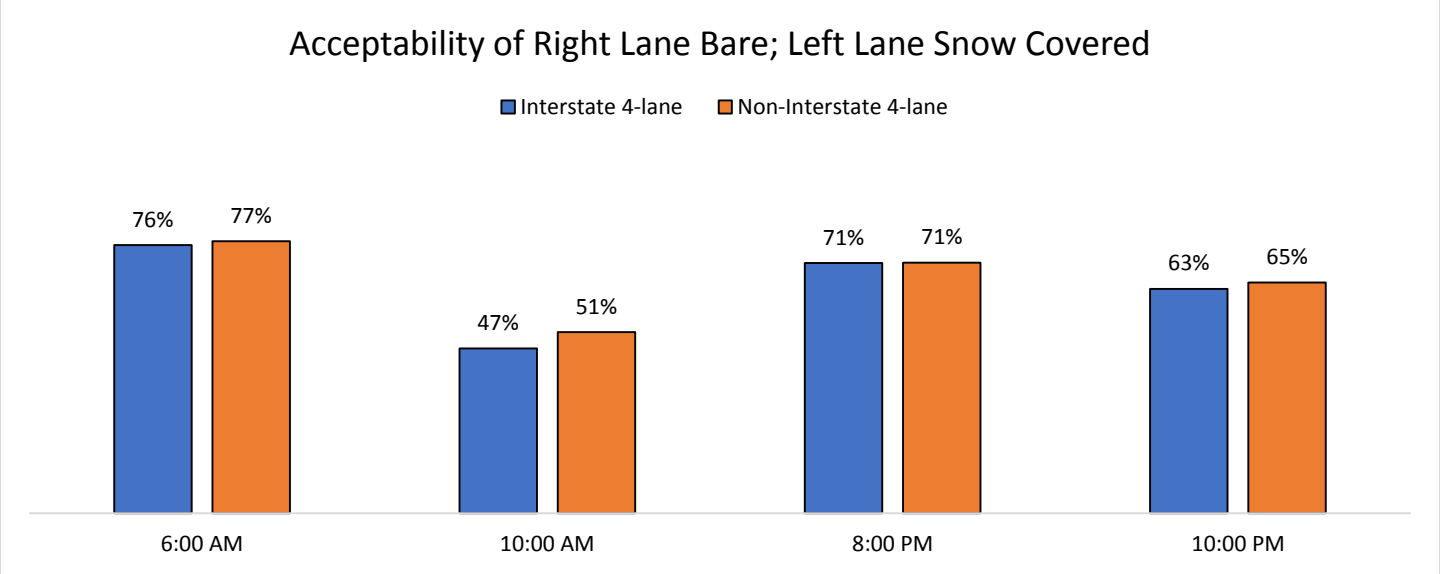


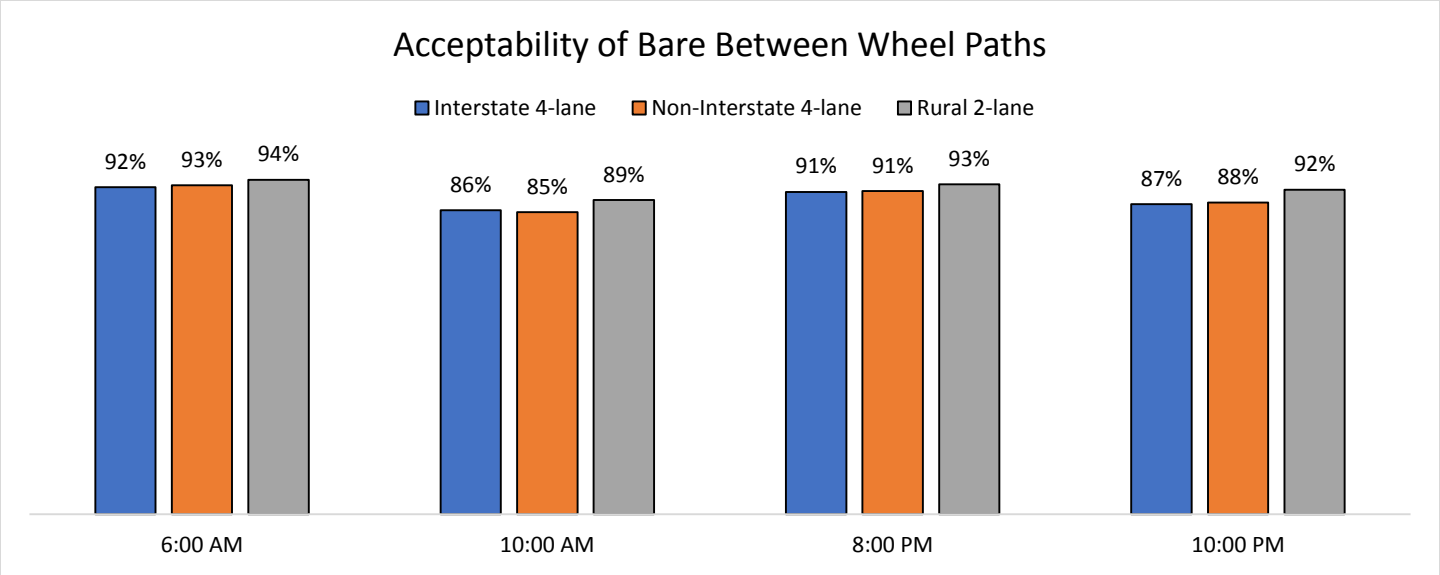
Acceptability of Road Conditions by Road Type

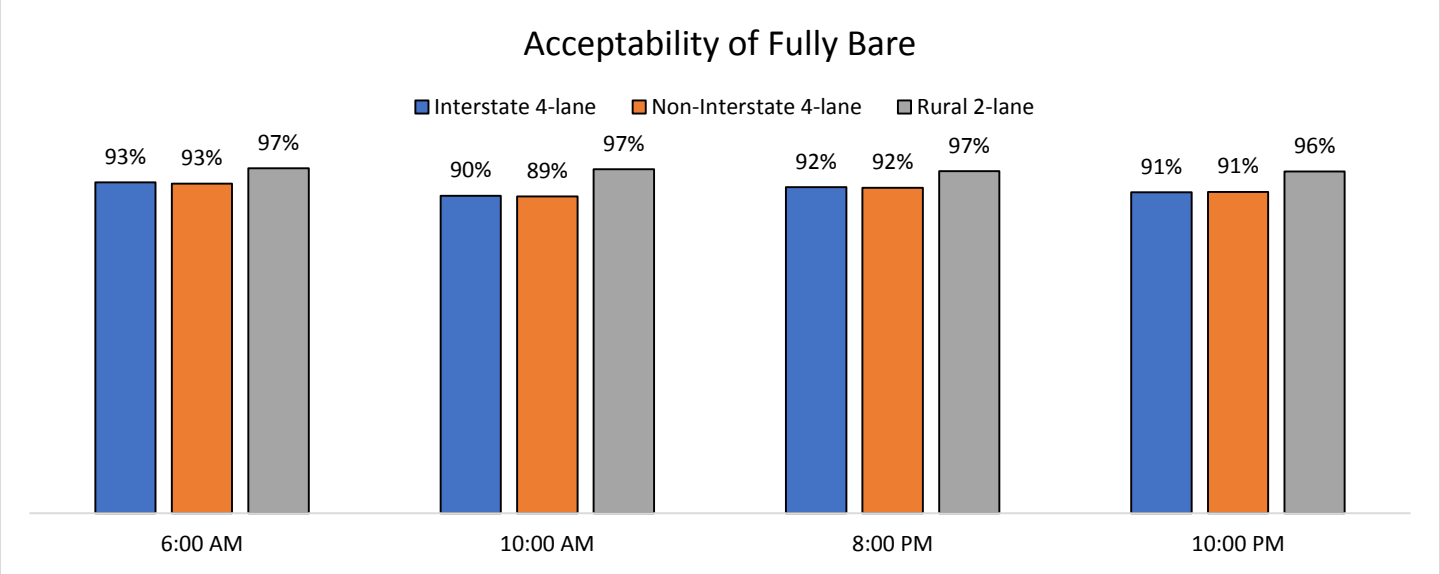


Respondents were less accepting of rural 2-lane roads to be snow covered on one or two intermittent paths.


Acceptability of 1 or 2 Intermittent Wheel Paths
Interstate 4-lane
Non-Interstate 4-lane
Rural 2-lane
78%
78%
61%
49%
50%
33%
69%
71%
54%
62%
65%
49%
6:00 AM
10:00 AM
8:00 PM
10:00 PM

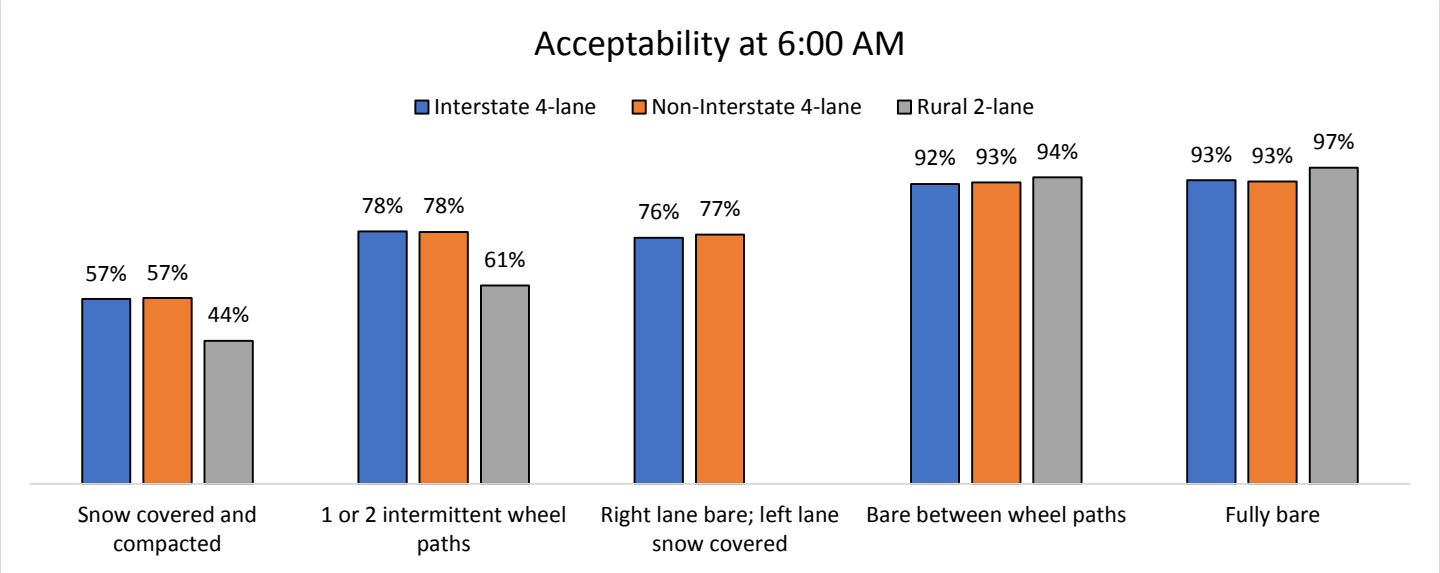

Acceptability of Right Lane Bare; Left Lane Snow Covered
Interstate 4-lane
Non-Interstate 4-lane
76%
77%
47%
51%
71%
71%
63%
65%
6:00 AM
10:00 AM
8:00 PM
10:00 PM



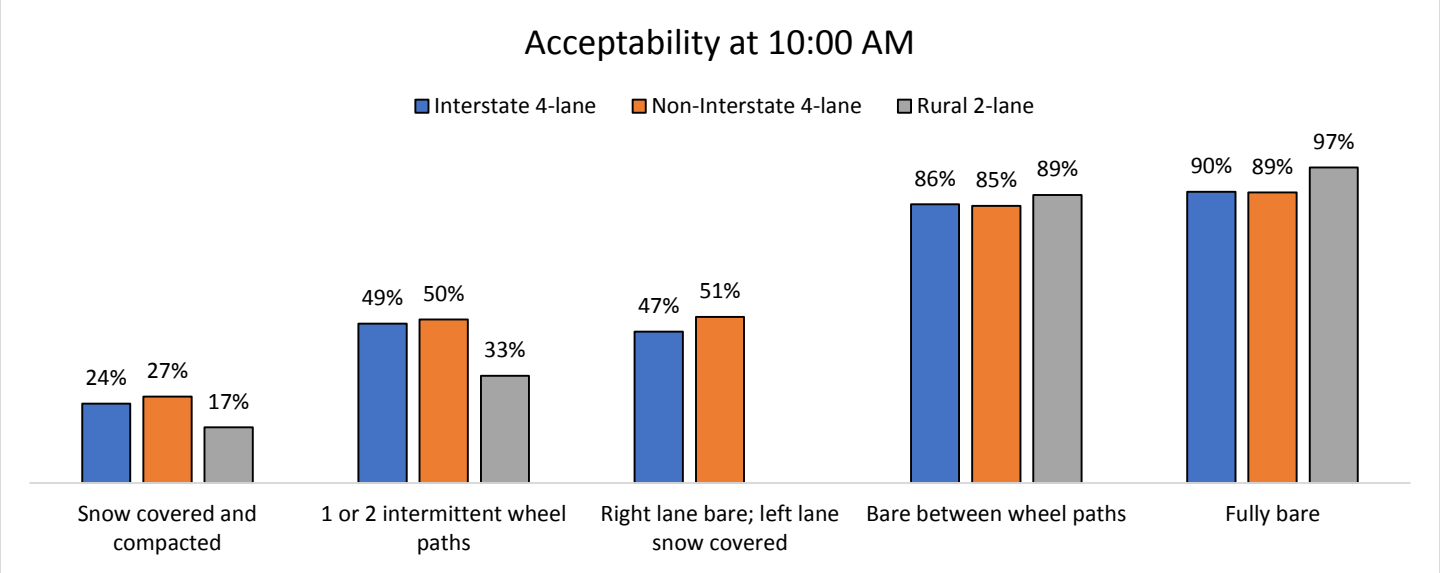


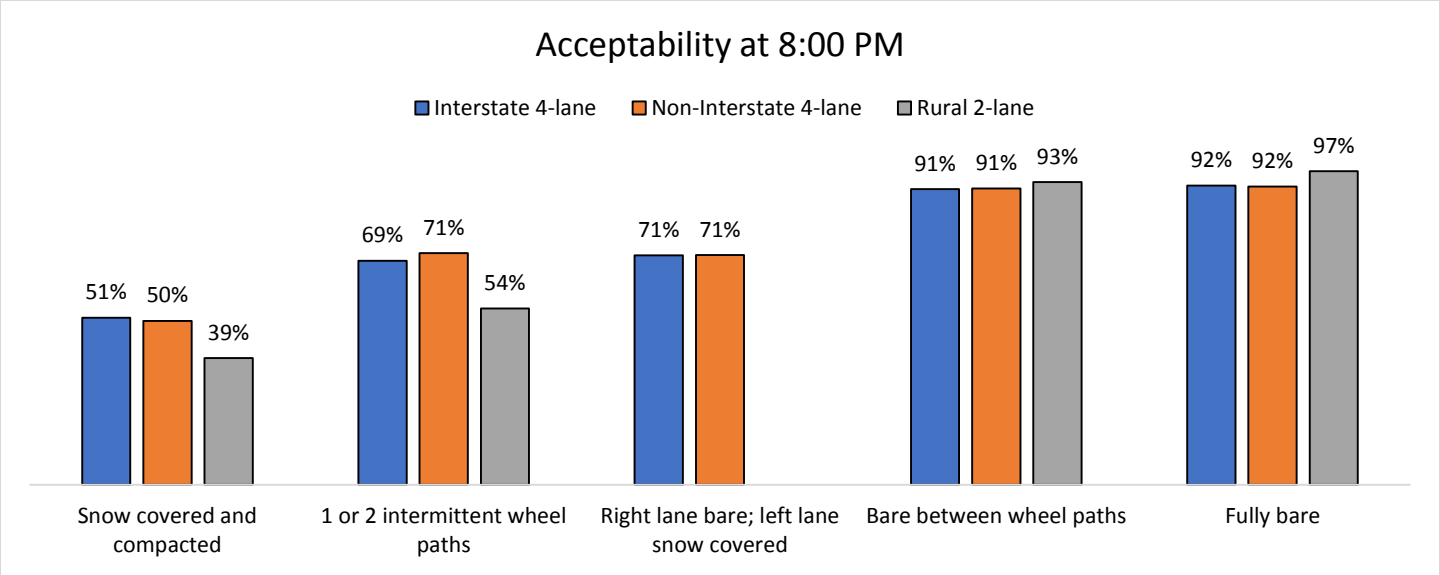
Respondents were less accepting of rural 2-lane to be snow covered or 1 or 2 intermittent paths.

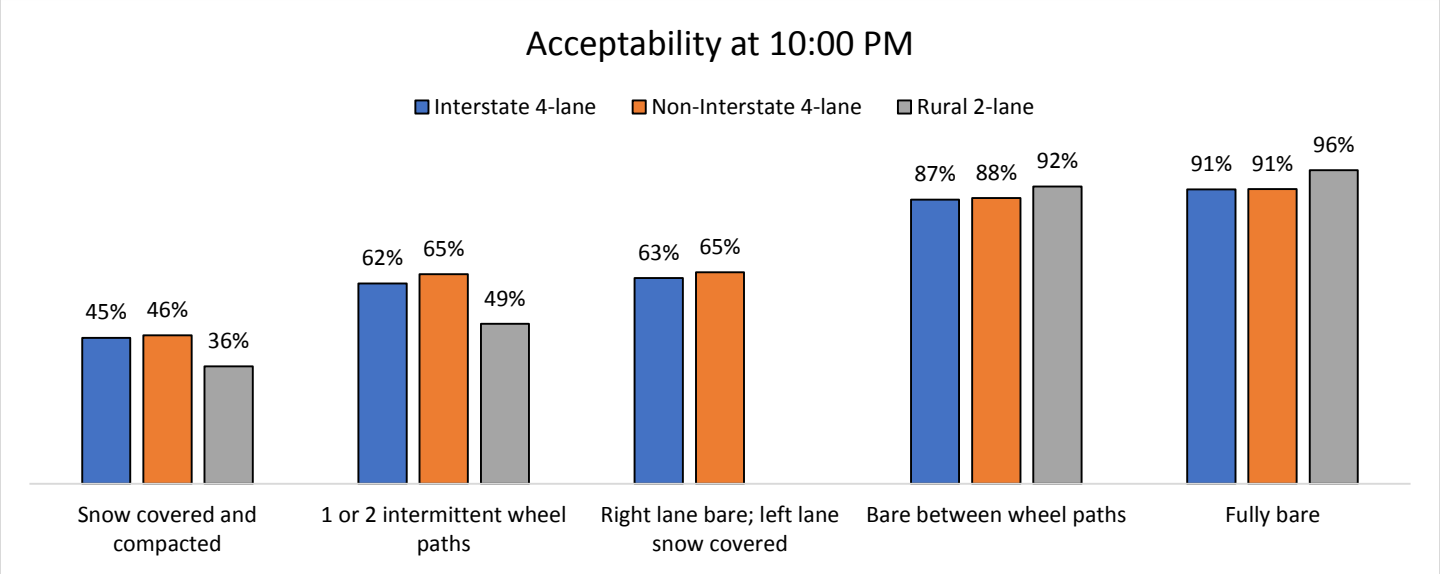
Overall Acceptability of Road Conditions



One- or two-wheel paths is acceptable to more than three of four respondents. Respondents were less accepting of poor road conditions on rural 2-lane roads.

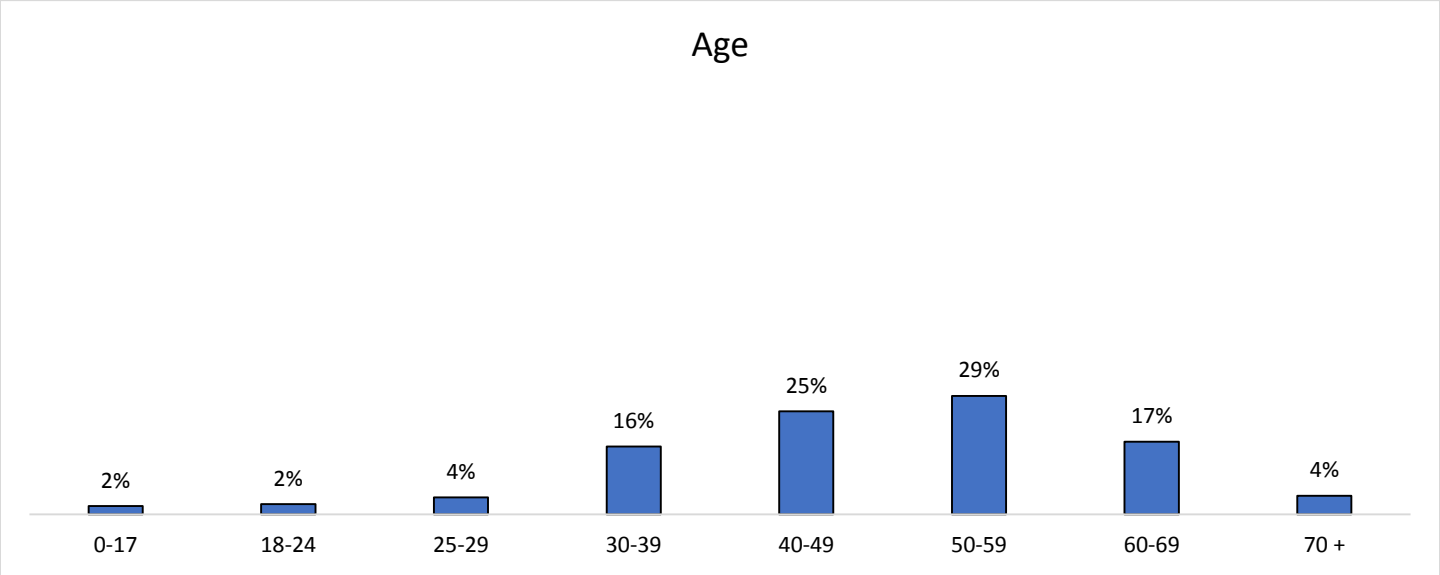



Acceptability at 8:00 PM
Interstate 4-lane
Non-Interstate 4-lane
Rural 2-lane
51%
50%
39%
69%
71%
54%
71%
71%
91%
91%
93%
92%
92%
97%
Snow covered and compacted
1 or 2 intermittent wheel paths
Right lane bare; left lane snow covered
Bare between wheel paths
Fully bare

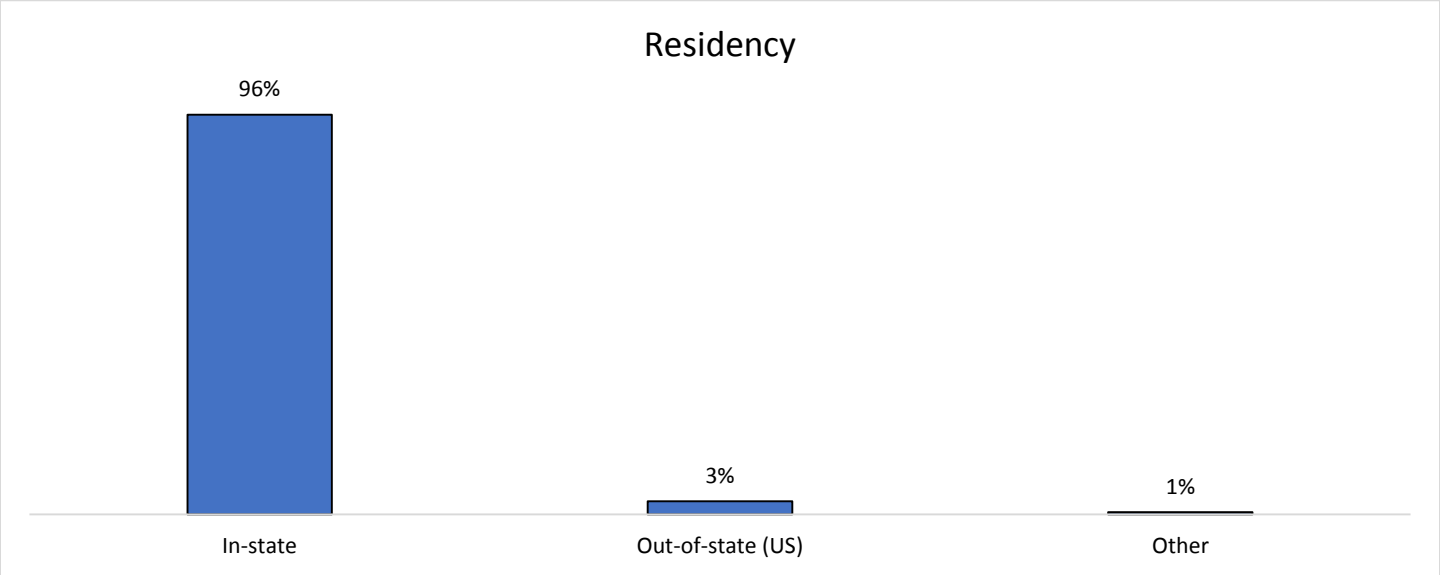

Acceptability at 10:00 PM
Interstate 4-lane
Non-Interstate 4-lane
Rural 2-lane
45%
46%
36%
62%
65%
49%
63%
65%
87%
88%
92%
91%
91%
96%
Snow covered and compacted
1 or 2 intermittent wheel paths
Right lane bare; left lane snow covered
Bare between wheel paths
Fully bare

Demographics

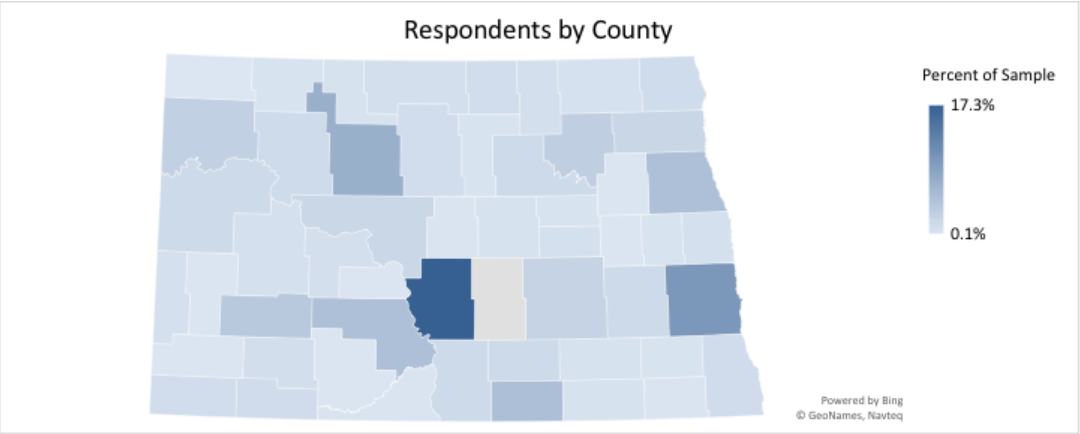
36. Age:



37. Residency:



38. If In-State, what is your county of residence?

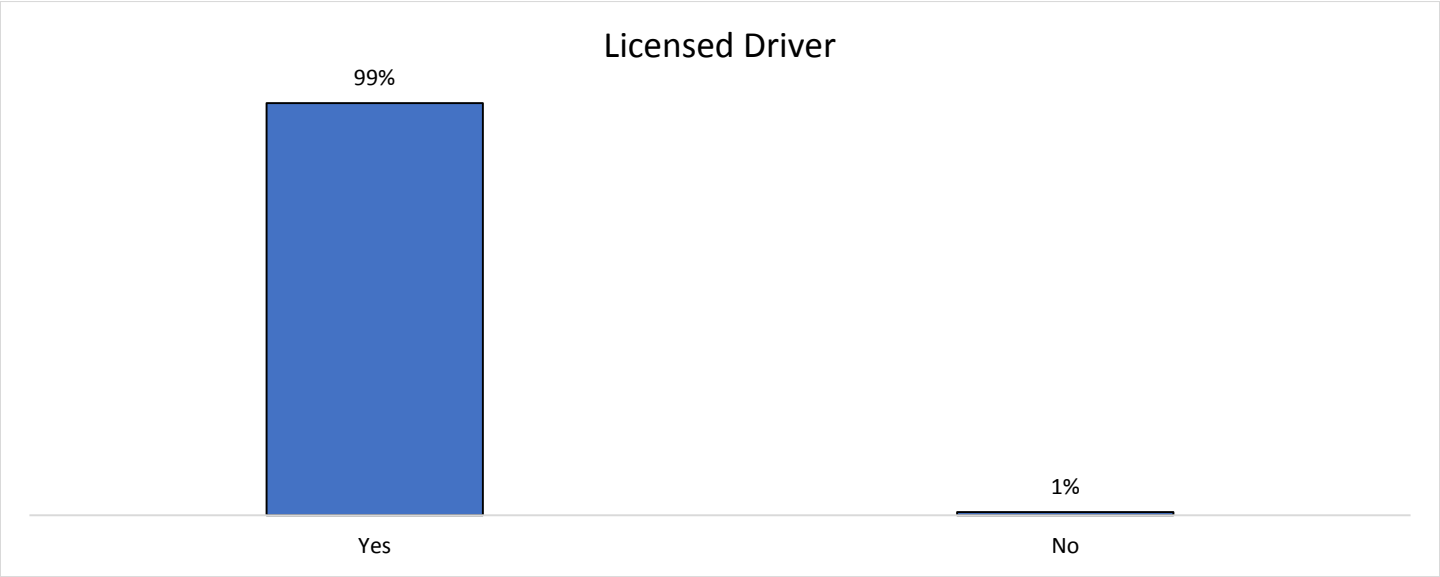


Burleigh County	17.3%
Cass County	10.2%
Ward County	7.1%
McIntosh County	5.1%
Grand Forks County	5.0%
Morton County	5.0%
Stark County	3.9%
Ramsey County	3.2%
Williams County	2.9%
Stutsman County	2.6%
Walsh County	2.2%
McLean County	2.1%
Benson County	1.7%
McKenzie County	1.7%
Logan County	1.7%
Emmons County	1.7%
Barnes County	1.7%
Mountrail County	1.6%
Pembina County	1.5%
Richland County	1.3%
Adams County	1.3%
Rolette County	1.2%

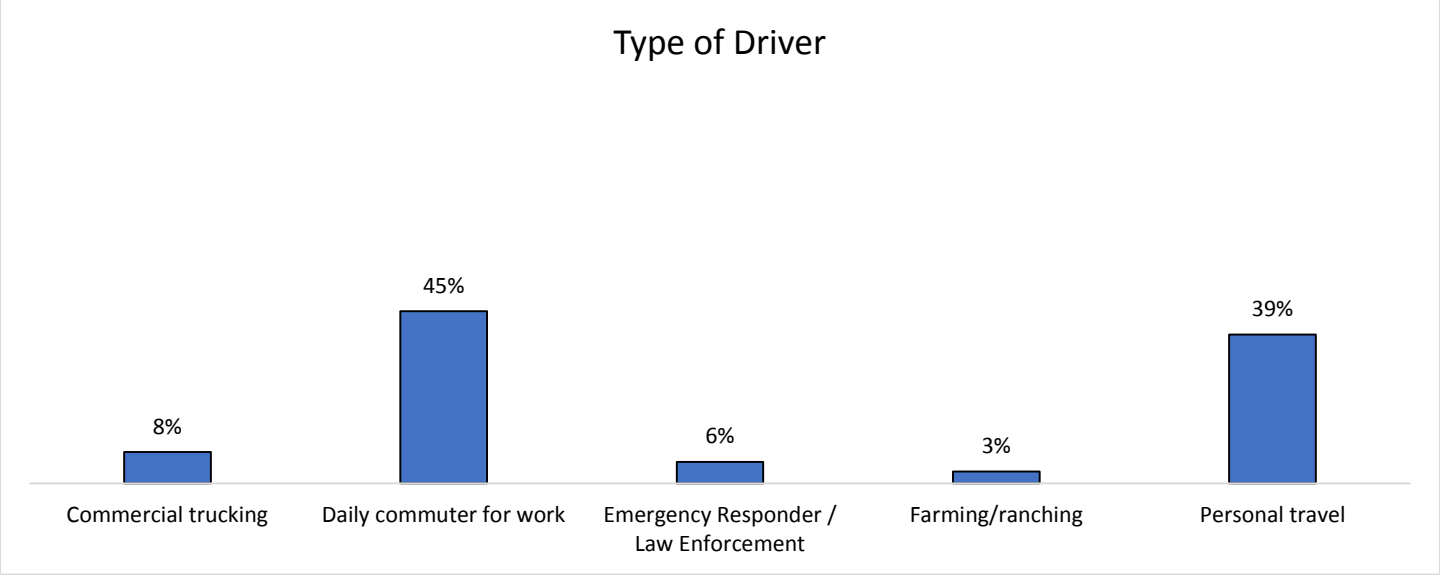
McHenry County	1.2%
Bowman County	1.2%
Hettinger County	1.1%
Towner County	1.0%
Bottineau County	1.0%
Mercer County	1.0%
Foster County	0.9%
Traill County	0.9%
Dunn County	0.9%
Golden Valley County	0.9%
Cavalier County	0.7%
Wells County	0.6%
Renville County	0.6%
Dickey County	0.6%
LaMoure County	0.6%
Eddy County	0.5%
Pierce County	0.5%
Steele County	0.5%
Burke County	0.5%
Ransom County	0.5%
Sheridan County	0.4%
Sargent County	0.4%
Sioux County	0.4%
Nelson County	0.2%
Griggs County	0.2%
Oliver County	0.2%
Slope County	0.2%
Billings County	0.2%
Grant County	0.2%
Divide County	0.1%
[2]Kidder County	0.0%

[2] NOTE: There were no submissions from Kidder County

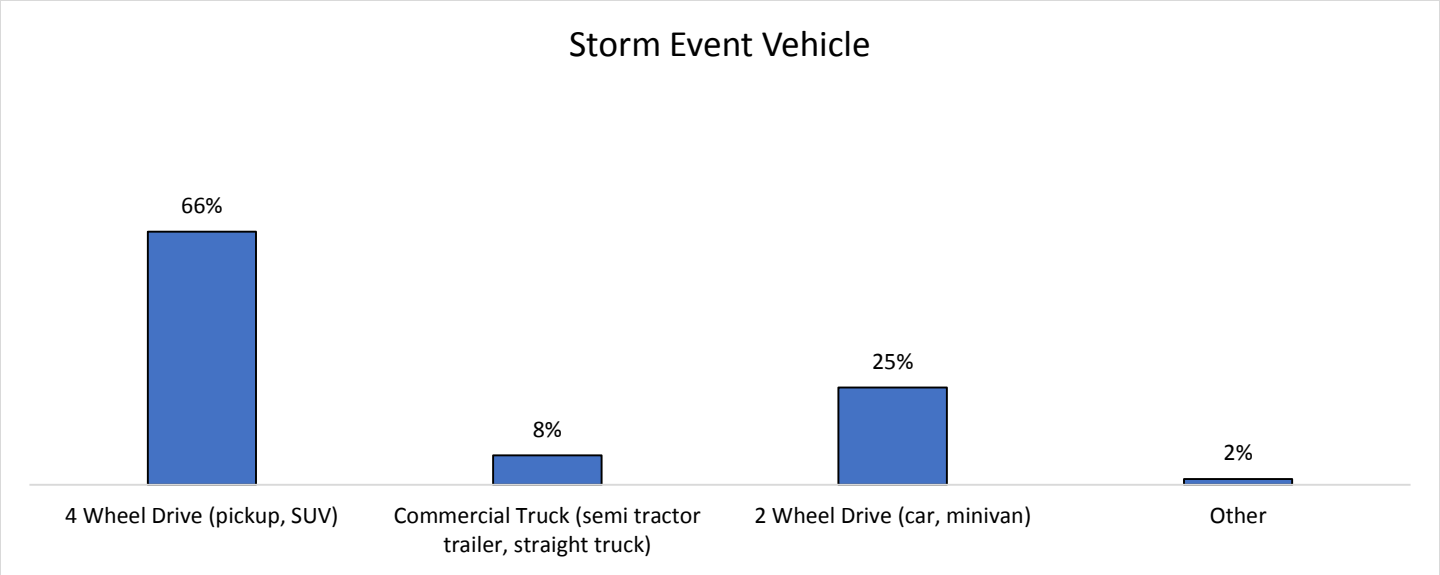
39. Are you a licensed driver?



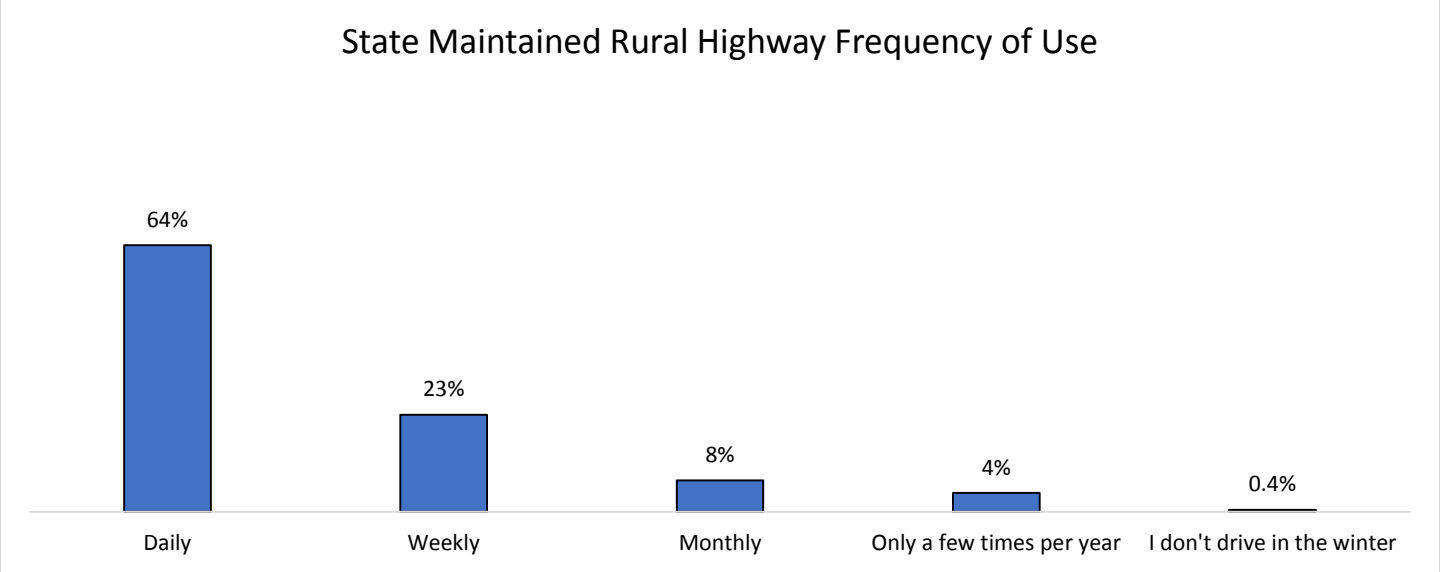
40. Choose how you most often use the state maintained rural highways, not including local, city, or county roads.



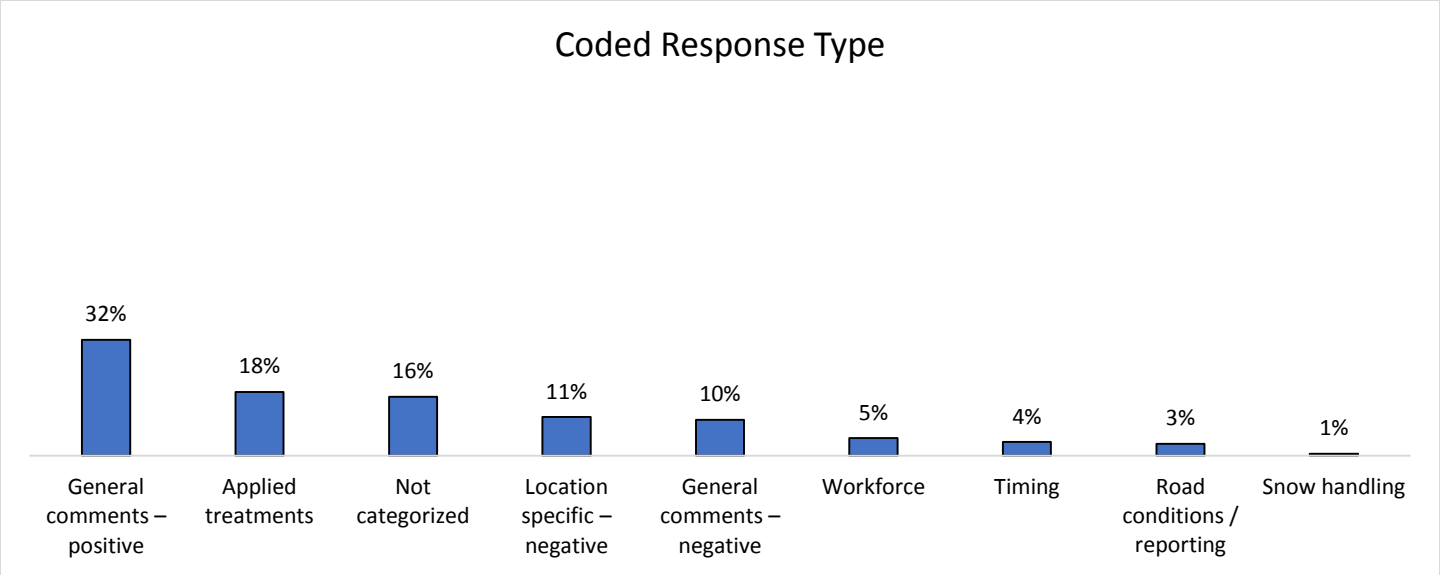
41. Choose the type of vehicle you most often drive during winter storm events?



42. How often do you drive on state maintained rural highways during the winter season, not including local, city, or county roads?



43. General Comments - Please provide any other comments you have about snow and ice control provided by NDDOT.



Examples of Coded Response Types:

General Comments – Positive

- I think the NDDOT Snow and Ice Control Maintenance Team is the best in the nation. The service they provide is above and beyond. Thank you for the outstanding service you provide.
- The ND Dot has substantially stepped up its winter road maintenance in recent years and this past winter was the best yet. I do feel however, winter road maintenance declines substantially west of Hwy 83. Especially on hwy 85 and hwy 2 west of Stanley, Tioga areas. It also seems like a section of hwy 52 between Velva and Carrington gets somewhat neglected. Overall, as a state all road maintenance has greatly improved and from a commercial truck driver, I appreciate all that the state has done to improve safety across the state. Thanks.

Applied Treatments

- A very good job plowing all roadways. I do not like the corrosive salts & sugar beet solution used on roadways. It makes the roads a sloppy mess, deteriorates concrete & vehicles are continually in need of being washed.
- I feel the solution that was used through the Fargo area does more harm than good. This past winter roads would be in pretty decent shape out of town, for going through town on the interstate was worse than the roads that were not pretreated. I think it gets icier than if nothing was done to pretreat not to mention the messiness. Lets just go back to putting salt/gravel down when it is needed rather that pretreating with the sugarbeet stuff or whatever is used to pretreat.

Location Specific – Negative

- Highway 83 between Max and junction at Hwy 23 is treacherous and largely unplowed compared to 83 from Minot to highway 23. It is night and day and the traffic crossing the highway is scary. I have come to a dead stop twice this year as semis cross 83 or pull out in front of me.
- The service you provide in our area is very good on I-29 and US-2. But each snow event should be judged on it's own merits as each one is different in their own ways. Our biggest concern on US-2 is usually the crossover's which can be very hard for some vehicles to navigate when having to cross. Not everyone has four wheel drives (even the farmers).

General Comments – Negative

- Roads were really bad this winter. Had a couple of incidents where I had to follow a snow plow for 15 miles at 20 mph because they would not pull over to let me around. Was very nervous about being rear-ended due to traveling so slow. One of the times, a pick- up passed 3 vehicles and the snow plow. Very unsafe.
- I work in public health and travel the entire county. We were def hurting with roads this past winter being down a worker. I worry about our elderly population a lot who have to go see specialists out of town and need good roads.

Workforce

- ND snow removale crews put in long days to keep our roads maintained and safe, they need to be able to get plenty of rest between shifts to allow them to safely do their job. Maybe we as the public should be a little more self-sufficient, if we do not have winter tires, proper vehicles for getting around in adverse weather conditions we should stay home until the weather clears and the road maintenance employees have finished their job to allow us to safely travel. (I'm a non-gov. employee)
- Private contractors and municipalities are our plowing shortly after a snow event. It's a service people pay for and expect snow removal as soon as possible. We should expect the same for the main and minor arteries between cities from our state. Higher pay and good drivers are needed to get the job done. There’re very capable people working for the state. Higher wages are needed to get better people that can get the job done. Allow overtime to get the job done in a timely manner. Have enough of a work force to so you don't burn out these people with the long hours. Higher pay will get better people in those trucks who can do the job quicker and better.

Timing

- I know it is a challenge to get the rural highways cleaned off after a snow event, but I think starting even an hour earlier would help. Have a concern about icy roads not being addressed sometimes for several days, especially hilly areas. Thanks for doing what you do. It is a tough job.

- Snow needs to be removed as it's coming down, so it doesn't get compacted & icy from all the traffic. Deicer makes roads icy during blowing snow as it catches the snow which then freezes on the roadway as ice.

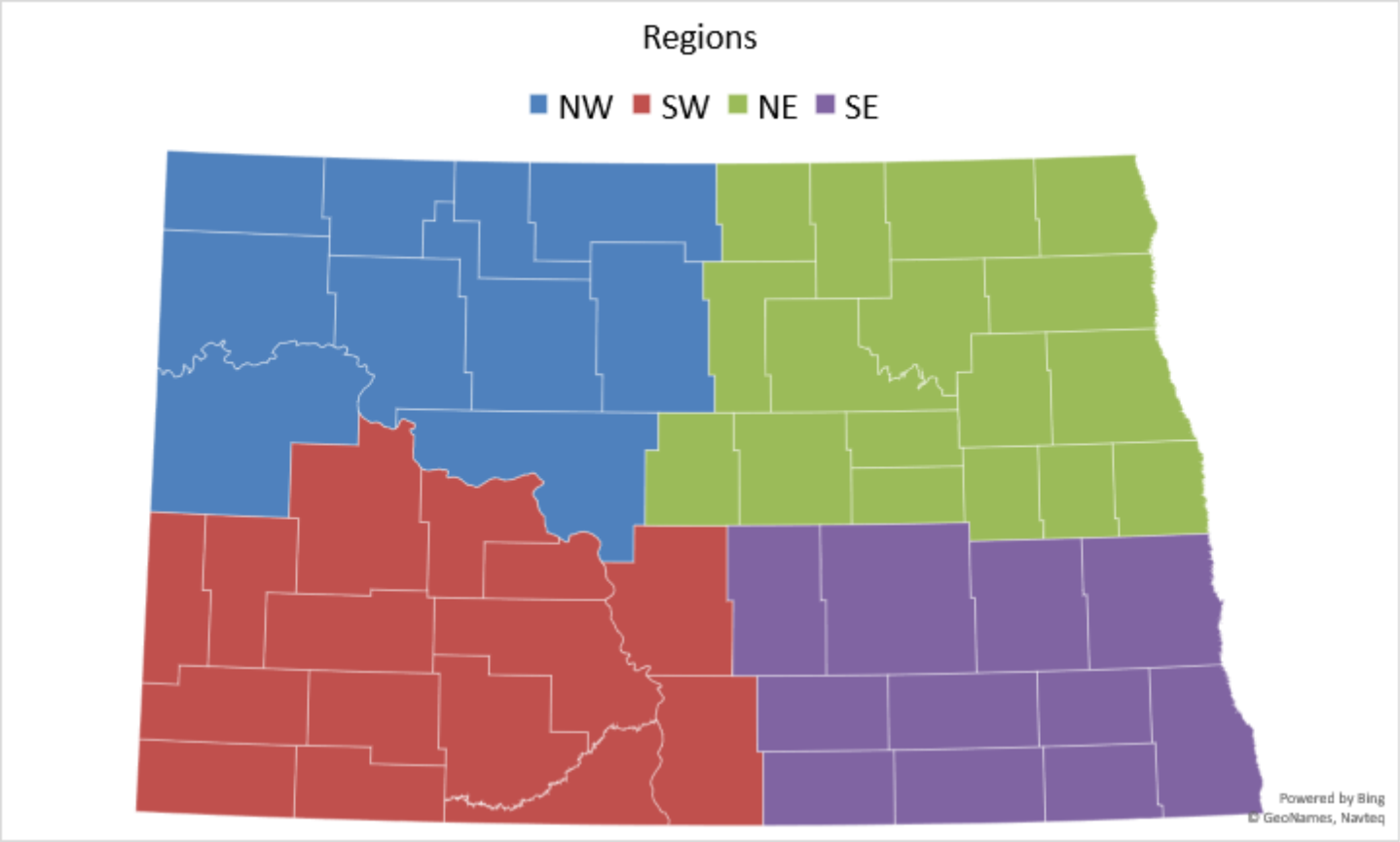
Road Conditions/Reporting

- More cameras that show road conditions throughout 4 lane highways and interstates. Road map is very good.
- I feel that you are not giving enough information in your pictures such what is the outside temps. and what are they going to be what time of the year is it what is the road temps a person needs more information and weather the section with two lane roads also have interstate road sections in them also how long the operators route is.

Snow Handling

- Stop pushing the snow into the center lanes on US85 especially in front of cities like Alexander and Arengard. People can't bust through these rows. At least leave a path at the major intersections like Co33 or 133rd Ave NW. All-in-all the winter of 2018 was the best snow removal I have seen out here in the last 5 years.

Appendix: Region Key



Region	County
NW	Divide County
	Burke County
	Renville County
	Bottineau County
	Williams County
	Mountrail County
	Ward County

	McHenry County
	McKenzie County
	McLean County
SW	Billings County
	Dunn County
	Mercer County
	Oliver County
	Burleigh County
	Emmons County
	Sioux County
	Grant County
	Morton County
	Stark County
	Hettinger County
	Adams County
	Bowman County
	Slope County
	Golden Valley County
NE	Rolette County
	Towner County
	Cavalier County
	Pembina County
	Pierce County
	Benson County
	Ramsey County
	Walsh County
	Nelson County
	Grand Forks County
	Traill County
	Steele County
	Griggs County

	Eddy County
	Foster County
	Wells County
	Sheridan County
SE	Kidder County
	Stutsman County
	Barnes County
	Cass County
	Logan County
	LaMoure County
	Ransom County
	Richland County
	McIntosh County
	Dickey County
	Sargent County