

## Chapter 2

### Section 2.03

Ministry of Transportation

# Winter Highway Maintenance

Follow-Up on *April 2015 Special Report*

RECOMMENDATION STATUS OVERVIEW					
	# of Actions Recommended	Status of Actions Recommended			
		Fully Implemented	In Process of Being Implemented	Little or No Progress	Will Not Be Implemented
Recommendation 1	3	1	2		
Recommendation 2	1	1			
Recommendation 3	1	1			
Recommendation 4	1	1			
Recommendation 5	3		3		
Recommendation 6	5	2		2	1
Recommendation 7	4	2	2		
Recommendation 8	1		1		
<b>Total</b>	<b>19</b>	<b>8</b>	<b>8</b>	<b>2</b>	<b>1</b>
<b>%</b>	<b>100</b>	<b>42</b>	<b>42</b>	<b>11</b>	<b>5</b>

## Background

Winter highway maintenance in Ontario was done by employees of the Ministry of Transportation (Ministry) and by private contractors up to 2000, when the work was more fully outsourced to private contractors.

From 2000 to 2009, the Ministry used two kinds of contracts for winter highway maintenance work: Managed Outsourcing contracts, where it hired multiple contractors (that had winter equipment)

to provide specific services such as plowing, salting and sanding, and Area Maintenance Contracts, which required one contractor to do all summer and winter highway maintenance work in a given geographic area using the Ministry's standards and best practices.

In 2009, the Ministry sought to cut costs by eliminating the Managed Outsourcing contracts and using "performance-based" Area Maintenance Contracts only. Under the new contracts, contractors were no longer told *how* to do the work—only the *outcomes* expected of them. This change resulted in roads not being cleared as effectively as before.

Instead of having to follow the Ministry's historically proven best practices on, for example, the amount of equipment (snow plows, and salt and sand spreaders) required to effectively clear highways, contractors could decide independently how much equipment to use.

In addition, the Ministry procured private contractors primarily on the basis of the lowest price bid, without properly ensuring that winning bidders were fully equipped to provide effective service.

All of these factors led to a decrease in service levels for winter highway maintenance across the province, resulting in less safe driving conditions. Highway maintenance during storms also declined, and the Ministry reduced services for highway shoulders, ramps, and truck-climbing and passing lanes.

While service levels for winter highway maintenance declined with the introduction of the new performance-based contracts, the Ministry did achieve significantly lower costs, and kept costs from rising as much as they would have under the old contracts.

Beginning in late 2012, the Ministry began to negotiate increased equipment and service levels with contractors in an effort to improve winter highway maintenance.

In February 2014, the Standing Committee on Public Accounts requested that we review the winter road maintenance program from one year before it was privatized. Among our findings included in our *2015 Winter Highway Maintenance* special report:

- **Contractors used less equipment under performance-based contracts, resulting in service reductions**—One of the most important factors in adequately maintaining highways in winter is having enough equipment, such as plows and spreaders. The old contracts set out numerous best practices for contractors with respect to how much equipment to use to do an adequate job. However, the Ministry's lowest-bid procurement process for the new contracts created a natural incentive to cut costs in order to win contracts. Most contractors aggressively minimized their

winter equipment fleets, reducing their ability to meet contract requirements and leading to reduced service.

- **Contractors used less treatment material to service highways under performance-based contracts**—Spreading treatment materials such as salt, sand and anti-icing liquids over highways is important for winter maintenance. The Ministry's lowest-bid procurement process again created a natural incentive for contractors to cut costs by using less treatment material. Under the old contracts, contractors had to reimburse the Ministry if they did not use minimum stipulated amounts of treatment materials, ensuring that contractors would at least use these minimums. Under the new contracts, this reimbursement requirement was eliminated, so contractors no longer had any incentive to use the same amount of salt or sand. For anti-icing, some contractors chose to use none at all.
- **Contractors were unable to meet contract requirements**—Ministry audits identified about 1,100 instances in 2013/14 where contractors did not meet multiple outcome targets of their contracts. About half of these related to contractors being unable to complete highway-clearing circuits on time. The failure to meet this target could often be attributed to insufficient equipment, which put the safety of the public and of emergency-services providers at risk because contractors did not plow or salt at all, did so too infrequently, or drove equipment too quickly for the plowing and salting to be fully effective.
- **The procurement process did not adequately factor in contractors' ability to deliver required services**—The procurement process had two stages for contractors that met the minimum pre-qualification requirements. In the first, contractors submitted winter maintenance strategies, which the Ministry scored on a set of criteria. Any contractor

that scored 70% moved to the second stage, in which the contractor proposing the lowest price won the contract. Because of how points were assigned for the different criteria, it was possible for contractors to score 70% and pass on to the bid stage without meeting all the requirements needed to deliver adequate service. For example, the proper amount of equipment is crucial for maintaining winter highways, but having enough equipment accounted for only 15% of the scoring criteria in the first stage. Once at the second stage, qualitative differences between contractors were irrelevant in choosing the winning contractor—the only factor considered from this point on was how low a price the contractor bid.

- **Procuring the lowest bidder can cost more in the long run**—We noted one case where the second-lowest bidder had a much bigger equipment fleet than the lowest bidder, which won the contract. Specifically, for an annual price of only \$700,000 more, the second-lowest bidder proposed the use of 22 more pieces of equipment than the winning contractor. As the winning bidder ultimately failed to meet required service levels, the Ministry incurred an annual additional cost of \$1.7 million for 13 additional pieces of equipment. Had the second-lowest bidder won the contract, the area could have been served with significantly more equipment for roughly \$1 million less.
- **Over-reliance on contractors' self-reporting their performance**—Verifying whether contractors met certain outcome targets can be done only in the field during and immediately after snowstorms. However, we noted that most audits conducted by the Ministry were “desk audits,” conducted a few weeks after a storm, using GPS tracking data and information from contractors self-reporting their own performance. This presented a potential conflict of interest: it was not in the contractors' interest to report that they have not achieved

outcome targets, and contractors were aware that the Ministry has only a minimal presence in the field. Although this was the case, Ministry desk audits still found many instances of inaccurate or incomplete information reported by contractors.

We made a number of recommendations for improvement and received commitments from the Ministry that it would take action to address them.

## Status of Actions Taken on Recommendations

The Ministry of Transportation (Ministry) provided us with information in summer 2016 on the current status of the recommendations in our *2015 Winter Highway Maintenance* special report. Based on our review of the information, the Ministry has fully implemented 42% of our recommendations. These recommendations relate to improving contractor performance and public awareness of winter road conditions. For example, the Ministry is providing additional tools on the Ontario 511 website to help people monitor actual road conditions and the progress of road clean-up.

The Ministry has also made significant progress on 42% of the other recommendations. It has already begun to make some swift, needed changes to how it manages contractors that perform winter maintenance. Nevertheless, since the performance-based contracts are in effect until 2026, it will take the Ministry until then to fully implement all of our recommendations.

The status of each of our recommendations is as follows.

### Quantities of Equipment

#### Recommendation 1

*To ensure effective winter highway maintenance and enhance road safety, the Ministry of Transportation should:*

- *verify that contractors have a sufficient quantity of each type of winter equipment, in good working order, in all contract areas (this might include introducing guidance for contractors to use in their equipment calculations relating to circuit times, circuit lengths and equipment speeds);*
- *if it determines that an area has an insufficient quantity of each type of winter equipment for effective highway maintenance, work with that area's contractor to resolve issues and bring winter road maintenance to effective levels;*  
**Status: In the process of being implemented by fall 2017.**

### Details

The pre-2009 Area Maintenance Contracts required that the minimum amount of equipment needed to properly plow and salt highways be calculated using a formula based on the Ministry's best practices. However, our 2015 audit had found that the new contracts removed this requirement, thereby allowing contractors to use less equipment. Contractors working under the new contracts were found to be using 22% less equipment than they previously used, which led to a reduction of service. Our audit had also found that plowing and salting service levels in a few contract areas had decreased because contractors used poorly functioning equipment.

In our current follow-up, we found that the Ministry has implemented requirements for calculating equipment complements into a new contract awarded for the Kenora area, the only new contract since our audit in 2015. The contract for Kenora also required the contractor to develop and follow an equipment maintenance strategy that ensures that equipment will be in good working order throughout the winter season. For instance, this strategy required that the contractor have on hand spare equipment equal to 10% of its actively used equipment.

For the 19 other contracts already in place elsewhere in the province, equipment counts were brought to sufficient levels through change orders or contract amendments that required additional plows, salt spreaders and combination units. A total of 22 plows, 16 salt spreaders and 20 combination units have been added in these 19 contract areas.

As of the winter of 2015/16, the Ministry began ensuring that equipment is in good working order by requiring that contractors' equipment meet reliability criteria for about 20 different inspection components. For example, one requirement is that plow blades should be undamaged and hydraulic systems to lift and move them should be properly working. These contractor self-inspections are required to be done at the start of the winter, and then monthly throughout the winter season.

For the 2015/16 winter, contractors in two areas did not perform these inspections at the start of the winter; and contractors in 10 areas either did not perform monthly inspections during the winter, or their equipment was not reliable. For those contractors that performed the inspections, the Ministry gave them an incentive of \$4,000 to regularly inspect and maintain each piece of equipment. We encourage the Ministry to continue finding ways to ensure that contractors in the remaining areas conduct these inspections and have the required equipment in good working order.

### AUDITOR GENERAL'S RECOMMENDATION

We recognize that the Ministry has taken action to ensure that equipment is in good working order throughout the winter season by providing contractors with a financial incentive for the existing 19 areas. However, we recommend that the Ministry re-evaluate the necessity of providing incentive payments to contractors given that keeping equipment in good working order should be included in the cost of doing business with the government.

- *establish protocols for appropriately and consistently responding to requests from its staff for increased winter highway maintenance.*

**Status: Fully implemented.**

### Details

In 2015, we found that Ministry staff and engineers could make requests for more frequent plowing in certain areas such as ramps, shoulders and passing lanes. However, when such requests were made, there was no formal process to approve them, and no guidelines or protocols for accepting or refusing them. In addition, requests were accepted or denied on an inconsistent basis.

Since our audit, the Ministry implemented a process in October 2016 where requests for increased plowing frequencies would be assessed using common assessment criteria. For example, while reviewing these requests, staff are required to determine whether the existing plowing frequencies have fallen below its own best practices and standards. If it is determined that this is the case, staff are required to look for the most economical way to bring up service levels.

A guideline implemented in October 2016 under this new process also requires that staff document a reason when any request for increased plowing frequencies is not approved.

The guideline also says that staff should review the list of requests for consistency and to identify trends that can be incorporated into best practices and standards as required. The list is required to be maintained for each contract area.

## Proactive Use of Materials

### Recommendation 2

*To help ensure that contractors use treatment materials proactively to perform effective winter highway maintenance, the Ministry of Transportation should re-establish cost-sharing arrangements and other measures that encourage such proactive use of materials in all contract areas.*

**Status: Fully implemented.**

### Details

In 2015, we found that under the new performance-based Area Maintenance Contracts, contractors no longer had to pay the Ministry if they failed to use a minimum amount of salt. This created an incentive for contractors to save money by using less salt.

In addition, the amount of anti-icing liquid to use was left entirely up to the contractor, as long as outcome targets relating to ground frost and slippery road conditions were met.

Since the audit, sand and salt cost-sharing thresholds have been re-established in all contract areas. The minimum amount of salt that a contractor should use is based on the five- to 10-year average historical salt usage in that area. If the salt used by the contractor is less than this minimum amount, the contractor is required to reimburse the Ministry for the low usage.

The Ministry has also made changes to encourage the contractor to use anti-icing liquids. In the Kenora area contract, the only new contract awarded since our audit, the Ministry began requiring the contractor to use anti-icing liquids, and also specifies the minimum amount to use.

For the remaining 19 contract areas, the Ministry offered the contractor similar cost-sharing incentives for the use of anti-icing liquids. The incentives require contractors to pay the full cost of the first and second applications of liquid. After that, the Ministry begins to pay a sliding share of the cost that reaches 75% after the seventh application. We noted that contractors in 13 out of the 19 areas used anti-icing liquids. Contractors in the remaining six areas did not use anti-icing liquids; instead, they implemented other measures such as faster deployment of plows and salters, which they believed were more effective than applying anti-icing liquids in their contract areas.

## Contractor Responsibilities

### Recommendation 3

*To ensure that winter highway maintenance activities are timely and effective, and to ensure that highway*

and weather conditions are accurately reported to the Ministry of Transportation (Ministry), the Ministry should prescribe in detail the responsibilities of contractors for patrolling and ensure it obtains the information necessary to assess the contractors' ability to meet those responsibilities.

**Status: Fully implemented.**

### Details

Our 2015 audit found that there were no outcome targets for patrolling by contractors—the only requirement, not tied to any minimum number of hours of operation, was that they “be aware” of road and weather conditions.

Since our audit, patroller training for contractors was provided in fall 2015. We obtained attendance sheets for the training, and noted that representatives from all 20 contract areas were in attendance. The training addressed patroller responsibilities, areas requiring high attention, and use of various online tools to monitor weather conditions.

Changes in patrol requirements were made only for those contract areas where patrolling was an issue. In the Kenora area contract, the only new contract awarded since our audit, the Ministry included prescriptive requirements for patrolling, including patrols at least once every 12 hours for Class 1 and 2 highways, and once every 24 hours for all other classes of highways. In addition to these minimums, contractors are required to perform additional patrols as needed at times of unfavourable weather events, emergencies and unusual situations, such as special events.

For those contracts already in place at the time of the audit, the Ministry identified six areas where the level of patrolling was an issue. It added new and improved patrolling requirements in these areas. For the remaining 13 areas, the Ministry informed us that patrolling was not identified as an issue, so no changes were made. However, it will continue to monitor these areas to ensure that patrolling is at an acceptable level.

The Ministry also added about 70 dashboard cameras to patrol vehicles in six contract areas to

help obtain information required to verify road conditions reported by patrollers. In addition, a total of about 54 stand-alone roadside cameras were installed: 25 in the West Region, 23 in the North East Region, and six in the East Region. An additional 12 were in the process of being installed in the North West Region.

The Ministry added about 69 smart phones and 12 tablets in six contract areas to support reporting of road conditions, collisions and circuit times. These devices generate emails that track the time that weather conditions were observed, location, and details such as visibility, wind, precipitation, cloud, fog, and primary and secondary road conditions.

## Ontario 511 Reliability

### Recommendation 4

*To improve the reliability of the Ontario 511 website, the Ministry of Transportation should monitor when information is collected in each area and update the website regularly, clearly indicating the time at which the information on road conditions was observed by the contractor.*

**Status: Fully implemented.**

### Details

In 2015, we found that highway conditions reported on the Ontario 511 website did not accurately reflect when the conditions were observed. In turn, the Ministry was incorrectly reporting data on its Ontario 511 website, which the public consults for information on highway conditions.

In our current follow-up, we noted that the Ministry added time stamps to road-condition updates on Ontario 511 to indicate the time the contractor observed the road condition. Road conditions include bare, partly covered, covered and reduced visibility.

The Ministry also added four new Road Weather Information Systems (RWIS) and 16 cameras to existing RWIS systems. Camera footage from these systems is uploaded for the public to view.

In order for drivers to obtain even more detailed information on the estimated completion time of snow removal, the Ministry launched the “Track My Plow” feature. This map-based feature allows drivers to track, on a real-time basis, where plows are on their highways, and which sections of highways were recently plowed. For the 2015/16 winter season, it was implemented across seven contract areas (Bancroft, Chatham, Durham, Huntsville, Kingston West, Owen Sound and Simcoe). In the 2016/17 winter season, the Ministry intends to expand it to an additional six contract areas (Kingston East, London, Niagara-Hamilton, Ottawa, Peel/Halton and Toronto/York). All information is available through a link from Ontario 511.

In addition, as previously mentioned under the details of Recommendation 3, the Ministry provided training to patrollers on the importance of accurately reporting changing road and weather conditions: 476 Area Maintenance Contract staff attended 18 training events covering all 20 contract areas.

## Procurement of Contractors

### Recommendation 5

*To ensure that the Ministry of Transportation (Ministry) procures contractors that can provide effective winter highway maintenance, the Ministry should:*

- *require tendering contractors to submit detailed and appropriate information in their proposals that demonstrates their ability to meet the required level of service;*

**Status: Fully implemented for only the Kenora area. In the process of being implemented for all other contract areas by 2026.**

#### Details

In 2015, our audit found that contractors were winning contracts based on having submitted the lowest bid price; final selection did not distinguish between better-equipped, adequately equipped and inadequately equipped contractors. Once winter maintenance was increasingly being delivered

under this approach, service levels began deteriorating, and there was an increase in the number of collisions on Ontario highways where snow, slush or ice was a factor.

Since our audit, the Ministry has begun using a Route Analysis Form to calculate the quantity of equipment needed to meet the required level of service, based on its best-practice circuit lengths, equipment speeds and times. It used this form in awarding a new contract in Kenora (the only new contract awarded since our audit in 2015).

The remaining contracts will expire over several years, with the last contract expiring in 2026.

- *develop an evaluation process that appropriately weights critical factors and includes assessing proposals against the Ministry’s historically proven best practices to ensure that the contractor can effectively deliver the required level of service; and*
- *select the winning proposal using a best-value approach that considers both the price and quality of the proposal.*

**Status: Fully implemented for only the Kenora area. In the process of being implemented for all other contract areas by 2026.**

#### Details

In 2015, we found that the award of winter highway maintenance contracts would benefit from a best-value rather than lowest-bid approach, as contractors that bid the lowest are not necessarily the most qualified with the right level of equipment.

During our follow-up, we noted that the Ministry put in place an evaluation process that weighs significant aspects of road maintenance in a point system that ultimately decides the award. To ensure consistency among evaluators, the Ministry developed very detailed explanations for each area to be scored. In order of priority and weighting, categories to be scored include winter vehicles, patrolling, labourers and operators, quality management, contract management personnel, ground

frost strategy and slippery conditions strategy. Best practices, such as speed while spreading and plowing for each highway class, are taken into account. For example, best practice indicates that the optimal speed for equipment while spreading on a Class 1 highway is 32 kilometres per hour. The total amount of equipment needed would be based on this speed.

The Ministry awarded the Kenora area contract in April 2015 using the above criteria; this has been the only contract awarded since our audit. The remaining contracts will expire over several years, with the last contract expiring in 2026.

It also attempted to procure three other contracts using this approach; however, bids came in higher than expected and, therefore, the procurement tenders were cancelled and the contracts were never awarded. The Ministry informed us that the bids were likely high because contractors submitted quotes that included higher-than-required service levels in order to maximize bid scores. As a result, the Ministry is now in the process of developing a revised model for use on future tenders. The Ministry informed us that the revised model will continue to have minimum equipment requirements similar to the ones found in the Kenora contract (as discussed earlier in this recommendation).

## Oversight of Contractors' Performance

### Recommendation 6

*To improve its oversight of contractors' performance and to ensure consistent oversight across the province, the Ministry of Transportation should:*

- *develop a standardized process for conducting audits (integrating in-storm observations) and issuing fines, and ensure that staff are adequately trained and equipped with all the tools needed to implement this process;*

**Status: Fully implemented.**

### Details

In 2015, we found that risk factors, such as highway traffic volumes, weather patterns, and the number of fines previously issued to a contractor, were not the basis for audit selection. In addition, the Ministry, since the adoption of Area Maintenance Contracts in 2009, had yet to develop standards for conducting audits and documenting results.

Since our audit, the Ministry retained an independent consultant to develop a risk-based assessment. The consultant created a strategy that assesses audit frequency based on the following categories: 50% on past performance of contractors, 10% on severity and frequency of weather-related traffic conditions, 10% on class of highway, 10% on issues management, 5% on road closures, and 5% on communication and corrective actions. Once this was created, the Ministry provided training based on the new strategy in September and November 2015. We reviewed the training materials and noted there were detailed explanations of how contractors should be rated, on a scale of one to five, under each category. For example, a contractor would be considered high risk (5/5) for the past-performance indicator if it needs to improve because of a chronic issue, or if it frequently misses outcome targets. How frequently a contractor is audited depends on its risk rating. For instance, a contractor rated high risk is to be audited twice per winter on all of its routes with respect to each outcome target.

If these planned audits show there is a large variance between a contractor's outcome target and actual performance, the Ministry will conduct a focused audit to review what occurred. For example, if the target was to achieve bare pavement in eight hours but the contractor took 20 hours, the focused audit would attempt to determine the reasons for the large variance.

The Ministry also conducts ad hoc audits if a special request is received or investigation required. This request can come from a variety of sources, such as the OPP.

In addition, the Ministry added 20 new oversight staff to increase in-storm monitoring: one

Maintenance Co-ordinator and 19 Contract Services Inspectors.

- *ensure that decisions to waive fines are appropriately justified and documented, and are consistently applied throughout the province;*  
**Status: Will not be fully implemented.**

### Details

In 2015, we found that Ministry staff at regional offices had the discretion to waive financial consequences (fines) that should be levied against contractors for not meeting their outcome targets. This undermines the effectiveness of fines and has resulted in inconsistencies in how the Ministry responds to service failures in the province.

Since the audit, the Ministry has created a process and provided training to assist staff in dealing with non-compliance by contractors. For example, if an audit shows that a contractor has not met outcome targets, Ministry staff are required to consider prior performance and other relevant factors in determining whether further action should be taken. If so, a notice of non-conformance is prepared and provided to the contractor, which is to provide a response.

In reviewing contractor responses, the Ministry has implemented new procedures to ensure consistency in applying fines. Large fines (those above \$50,000) are now required to be reviewed for consistency by a central committee consisting of the province's five Regional Maintenance Engineers and other senior managers.

For fines below \$50,000, the Ministry has not implemented specific procedures to ensure provincial consistency. However, it did implement procedures to ensure regional consistency—in other words, ensuring consistency within one region across different contract areas. It now requires all fines below \$50,000 to be reviewed by the Regional Maintenance Engineer within that region. The Ministry informed us that, instead of standardizing the issuance of these fines, the Ministry would like to allow latitude for regional staff to make these decisions. This is because fines can be reduced for a number of

reasons such as contractor responses and extreme weather conditions. As a result, the Ministry will not be fully implementing this recommendation.

## AUDITOR GENERAL'S RESPONSE

Although some degree of discretion is definitely appropriate, it is important that consistent decision-making on fines be in place. Although steps have been taken to outline a decision-making process, it is still important that rules around issuing and waiving fines guide decisions.

- *establish a target number of audits for each contract area based on appropriate risk factors;*  
**Status: Fully implemented.**

### Details

In 2015, we found that the number of audits conducted depended on the level of staff available at the time of the audit, rather than the need for an audit. Targets were based on audits per Co-ordinator, but since staffing levels fluctuate, so did the number of audits. Instead, the number of audits should be set according to a predetermined plan of audits to be completed based on each area's assessed level of need, with staffing managed to ensure that the plan is followed.

Following the audit, in December 2015, the Ministry used the risk-based model created by its consultant that calculates the number of audits based on risk level per contract area for winter 2015/16. The risk assessment is to be recalculated every winter, which in turn will affect this calculation annually.

- *develop and implement a robust centralized system that tracks the results of all audits and fines to better enable provincial analysis of contractors' performance; and*  
**Status: Little or no progress.**

### Details

In 2015, the Ministry was in the process of completing the development of a central database to store

information gathered from audits; however, at the time of the audit, the data was incomplete and inaccurate.

Since the audit, the Ministry has made no changes or updates to address this recommendation. The Ministry intends to begin developing a new web-based contract management system in fall 2016. This new system would better allow it to track results of audits and fines than the current system that is being used.

- *consider incorporating contractor liability for inadequate winter highway maintenance in performance-based contracts to the extent that it is reasonable and possible.*

**Status: Little or no progress.**

### Details

In 2015, we found that the Ministry bears the legal responsibility to maintain and keep in repair provincial highways, and bears the legal liability for failure to do so. Under the government-operated road liability insurance program, primarily the Province, not contractors, may be exposed to paying damages if inadequate road maintenance is a contributing factor in vehicle collisions.

Since the audit, the Ministry has met with the Risk Management and Insurance Services Branch (within the Ministry of Government and Consumer Services) to discuss material non-compliance and indemnity clauses. It plans to review information from this meeting as part of the development of future contract models; however, it has done little work on this action to date.

## Reportable Information

### Recommendation 7

*To monitor contractors' performance against its bare-pavement standard and to provide meaningful reports to the public on the effectiveness of winter highway maintenance, the Ministry of Transportation (Ministry) should:*

- *correct any information that it has determined is inaccurate before publicly reporting its results;*

**Status: Fully implemented.**

### Details

In our 2015 audit, we were concerned about the accuracy of the information the Ministry received from contractors, as we noted that Co-coordinator audits identified over 200 instances of contractors submitting inaccurate information to the Ministry.

According to the Ministry, three groups of people are best able to identify inaccurate information: contractors themselves, the regional communication centre operators who collect the information from the contractors, and the Ontario 511 website operators. Since the audit, the Ministry has provided training to contractors and to the regional operators who collect information from the contractors. Each of these contractors and operators is to assess the information for any trends that may contradict weather information submitted.

The Ministry is continuing to look at ways to further ensure the accuracy of the information submitted. For instance, it is considering the reasonability of requiring the regional communication centre operators to view camera footage to verify that the information received is, in fact, accurate. This is currently not a standard requirement, although some operators choose to do so because it is their job to collect, organize and assess for reasonability the information collected from contractors.

- *consider publicly reporting contractors' performance against its bare-pavement standard by contract area;*

**Status: Fully implemented.**

### Details

In 2015, we found that the Ministry publicly reports whether its target for achieving bare pavement was reached across the province. The target is that bare pavement be achieved within the time limit for each class of highway for 90% of the storms in a winter season. However, we noted that this

achievement rate reported by the Ministry was the average for the province as a whole, and that the achievement rate for each contract area was not publicly reported. During our audit, we had found that six of the 20 contract areas did not achieve the performance target.

Since the audit, in September 2016, the Ministry has begun publicly releasing bare-pavement results for each contract area starting with the 2015/16 winter season. This is also supplemented with a winter severity index (WSI). A WSI takes into account snowfall, surface ice, rainfall with low temperatures, cold days, blowing snow and warm weather adjustment factors to calculate a number that signifies how severe the winter was. The Ministry worked with the University of Waterloo to develop this index. Having the WSI information for each contract area will help the Ministry and public put contractors' performance results into context—for instance, some winter storms may be so severe that restoring bare pavement within required time limits may be beyond the control of the contractor. As a result, it will be useful for the public to know how severe the winter was in a contract area when contractors' performance results are being reviewed.

- *supplement its public reporting on the bare-pavement standard with information on how highways are being maintained during a storm;*  
**Status: In the process of being implemented by fall 2017.**

### Details

In 2015, we noted that the bare-pavement target of eight hours on its own was not a measure of whether the winter maintenance activities undertaken during a storm leading up to the bare pavement being achieved had been effective.

Since the audit, the Ministry has made efforts to notify the public as to what is occurring during a storm, and also during the eight hours after a storm ends and before bare pavement is required to be achieved. (For some less-travelled highways, it can

be up to 24 hours after a storm ends before bare pavement is required to be achieved.)

The Ministry has drafted a model identifying potential performance measures that could be implemented in addition to bare pavement, such as deployment times, circuit times achieved, and return-to-normal operating speeds. However, further work is required to implement tracking and reporting on these measures.

However, the Ministry informed us that, in the meantime, other advancements it has made will assist the public in understanding contractors' in-storm performance. The Track My Plow feature was implemented in seven of the 20 contract areas for the 2015/16 winter, and in 13 of the 20 contract areas for 2016/17 winter. This feature can be easily accessed through the Ontario 511 website.

- *assess the adequacy of its bare-pavement time limits in light of the more stringent time limits of other jurisdictions and update its time limits accordingly.*

**Status: In the process of being implemented by fall 2018.**

### Details

In 2015, we found that Ontario's bare-pavement time limit of eight hours after a storm ends for Class 1 highways was longer than that of other jurisdictions at the time.

Since the audit, in July 2016, the Ministry has completed a jurisdictional scan to assess the adequacy of its bare-pavement time limits. The Ministry agrees that some jurisdictions had lower bare-pavement time limits for highways with high traffic volumes. As a result, the Ministry is reviewing its bare-pavement time limit for highways with high traffic volumes. It is currently gathering information that will assist it in determining what the new bare-pavement time limits could be for these highways.

## Impact of Remedial Measures

### Recommendation 8

*The Ministry should continue to monitor and assess the impact of the remedial measures taken to improve winter highway maintenance to determine whether additional measures are needed to restore highway maintenance and service to the levels delivered before the introduction of performance-based AMCs.*

**Status: In the process of being implemented by fall 2017.**

### Details

We noted during our 2015 audit that the Ministry had begun to take action to respond to poor contractor performance by restoring service levels and procuring more equipment for truck-climbing and passing lanes, conducting a high-level program review, procuring more equipment for freeway shoulder and ramp maintenance, adding more Ministry staff positions, and negotiating with contractors to improve service levels and address performance issues.

Since the audit, the Ministry implemented a number of changes to improve winter highway maintenance and restore service levels. These changes included adding 58 pieces of equipment over all contract areas, implementing cost-sharing initiatives for materials used in winter maintenance

in all contract areas, adding patrolling requirements in priority areas, increasing the reliability and accuracy of information provided to the public, adjusting the contract-awarding process away from the lowest bid, and creating an audit selection process based on risk.

Although the Ministry has awarded only one contract since our audit, it developed and included in the new contract certain standard additions, such as equipment quantity calculations, winter materials cost-sharing incentives, and patrolling requirements that will improve the effectiveness and performance of contractors.

Although there is still some work remaining to implement all recommendations, the Ministry continuously monitors and assesses the impact of its remedial measures. It continues to monitor maintenance concerns expressed by its staff and problems shared by contractors by having frequent discussions with them. The Ministry has also established a full-time director role to oversee maintenance activities and implement improvements as required. Since our audit, the Ministry has made significant improvements (that are discussed throughout this report) in many areas where a reduction in service levels (such as patrolling and insufficient winter equipment) had been experienced.