THE CORPORATION OF THE MUNICIPALITY OF NORTH GRENVILLE

BY-LAW NO. 46-04

A By-Law to Establish Roadway Service Standards
for the Municipal Road System within the Jurisdiction
of the Corporation of the Municipality of North Grenville

WHEREAS Ontario Regulation 239/02 establishes minimum maintenance standards for municipal highways;

AND WHEREAS the Corporation established roadway service standards for the municipal highway system within the jurisdiction of the Corporation of the Municipality of North Grenville with the passing of By-Law 28-02;

AND WHEREAS the Council of the Corporation of the Municipality of North Grenville deems it expedient to amend the roadway service standards policy for the Municipality of North Grenville;

NOW THEREFORE the Council of the Corporation of the Township of North Grenville enacts as follows:

1. All operational services of the Public Works Department be directed to provide services, where applicable, that meet the minimum standard of care 100% of the time.

2. Neither the Corporation nor its officials make any promise of assurance that roadway services will be in excess of the minimum standard herein provided, however, the Public Works Department will strive to provide services, where applicable, that meet the desired standard of care the majority of the time.

3. Where situations arise or applications be made which fall outside the scope of these standards, the Manager of Public Works shall respond as he/she deem appropriate, with respect to budgetary constraint and reasonable practice.

4. Schedule "A" constitutes part of this by-law.

5. By-law 28-02 and the policy attached thereto are hereby repealed.

6. This by-law shall come into force and effect on the date of passing.

READ A FIRST AND SECOND TIME
THIS 12TH DAY OF OCTOBER, 2004.

READ A THIRD TIME AND PASSED
THIS 12TH DAY OF OCTOBER, 2004.

BILL GOOCH
Mayor

CAHL POMINVILLE
Clerk

Schedule "A" to By-Law 46-04

CORPORATION OF THE MUNICIPALITY OF NORTH GRENVILLE

ROADWAY SERVICE STANDARDS POLICY

North Grenville

GLOSSARY OF TERMS

AADT - Average Annual Daily Traffic... is a technical measurement of traffic volume on a road, in both directions. Conversion factors, which vary depending on time of year and week, extrapolate daily traffic counts into AADT.

Ambient Conditions... are *conditions* that are commonly found in a stabilized environment. Normally in ambient conditions there are no negative effects actively reducing the existing conditions (ie: storm, excess traffic or construction effects are not in evidence.) See *storm conditions*.

Bare... conditions refer to *winter road conditions* where all travelled lanes are effectively clear of snow build-up or general ice *conditions* that might impair the safe travel on the *road* below the travel speed under *ambient conditions*.

Centre/Track Bare... conditions refer to *winter road conditions* where one wheel track of each of the *travelled lanes* is substantially clear of snow and ice *conditions* allowing the user to negotiate safer travel than if *snow packed* or general ice *conditions* prevail.

Conditions... defines the state in which the subject matter is found. The standard indicates the condition being measured.

Continuous Lighting... describes illumination in place to generally improve driver visibility while travelling the road at night.

Class... in the context of these *standards* refers to the criteria for classifying *roadways* developed in the preamble to the *standards*.

Clearance... is the zone measured horizontally and vertically from the centre line of the road in which no obstructions should be permitted, except those that improve the *safety* of the *roadway* user. Exceptions may be defined in the *standards*. See encroachments.

Cycle... is that time interval between *inspections* conducted for a specific purpose. Consideration can still be made for inspection cylce time adjustments at the discretion of the supervisor for mitigating circumstances, which are of an uncommon or unpredictable nature.

Day... is a calendar day, measured to the end of the following day (See also *working day*).

Desirable... describes that level of *service standard* the roadway authority has established as an objective for road department *operations*. See preamble of *standards* for further explanation.

Effect... is the acting of an external influence on the *condition* of any *aspect* of the roadway.

Encroachment... in an obstacle inside the *clearance* zone, which may or may not be permitted by these *standards*.

Hardtop... refers to a *road surface*, which is relatively hard in nature, by treatment with either a bonding agent or cement, which effectively prevents reshaping by conventional motor grader.

Horizontal Clearance... is an obstruction free zone measured from the centre line of a *road* or the left edge of the *shoulder lane* for 3+ lane *roads*.

Inspection... is the activity performed by a person authorized and directed by the *roadway authority* to investigate and report on the relevant *conditions* of the *roadway*. Qualifications for inspector shall be determined by the *roadway authority* and are relevant to the nature of the inspection performed. General inspection has regard for *road surface* and *roadside standards*. *Winter* inspection has regard for *winter road surface standards*.

Lag Time... means the period of time when any *aspect* of a *roadway* may be in a *substandard condition*. It is typically measured from when the *condition* occurs. In the case of continuing *effects* (eg: Storm) causing the *condition*, the lag time is measured from the end of that *effect* happening. Typically it is the time in which the department may deliver *operational* responses to *improve* the *condition* if necessary. Unless otherwise specifically qualified in the *standard*, the *condition* or *effect* is deemed to have been identified at time of inspection or when *notice* was given.

Lane... is that portion of the *road* designated for a single file of vehicles to travel over, in one direction. For *roads* where two-way traffic is permitted, the lane width is half the road width unless otherwise delineated by pavement marking.

Localized... conditions, for the purpose of these *standards*, that occur on short lengths of *roadway* specifically on bridges, intersections, curves and hills.

Loosetop... refers to a *road surface* that is of a granular manufactured product, which can reasonably be shaped by a motor grader, and includes *road surfaces* under reconstruction.

Maximum... in the context of these *standards* refers to the lowest level of *service* set by the *roadway authority*, which the *roadway user* can reasonably expect. In effect it is the *minimum service*.

Minimum... in the context of these *standards* refers to the lowest level of service set by the *roadway authority*, which the *roadway user* can reasonably expect. Sometimes *maximum* defines the minimum service.

Notice... of an *effect* or *condition* is considered given when received by an appropriate *supervisor* of the *road authority*.

Primary Safety Devices... have regard for the *safety* and traffic regulation of the *roadway*. They address matters referred to in the *Highway Traffic Act*, including traffic signals, flashers and *regulatory signs*.

Regulatory Signs... those signs that are so referred to in the *Ontario Manual of Uniform Traffic Control Devices*.

Repair Lag Time... applies to *primary safety devices*, *traffic control devices* and *vehicle attenuation devices* which, due to damage, are not providing the protection for which they were installed. Repair re-instates the existing system to functional service. Installation of temporary devices is deemed to constitute repair.

Response... describes that action taken by the *roadway authority* when informed of an *effect* or *condition*. Monitoring an *effect* or *condition* may constitute a response. A reasonable response takes into account the relevant *standards*.

Restoration Lag Time... refers to time to restore *primary safety devices*, *traffic control devices* and *vehicle attenuation devices* where they have deteriorated below original effectiveness or have ceased to be in compliance with current standards.

Right of Way (R.O.W.)... describes the corridor of land reserved for roadway improvements and under the jurisdiction of the *roadway authority*. Certain rights of way infer a right of passage to the public. However, in the context of these *standards*, only rights of way with assumed public roadways are considered. Rights of way solely for non-vehicular traffic are not addressed in these standards (e.g.: pedestrian, equestrian, bicycle).

Road... refers specifically to the travelled road *surface* on a *roadway* assumed by a *roadway authority*, but not including on-street parking or stopping zones.

Roadside... refers to all the elements or *conditions* that make up the *roadway* within the jurisdiction of the *roadway authority*, except for the *road surface* itself.

Roadway... in the context of these *standards* means any public assumed road *right of way*, intended for vehicular traffic. It refers not only to the travelled road *surface*, but to all *services* relevant to the road, within the *right of way*. Roadway = road + roadside

Roadway Authority... indicates the public agency accountable for the status and *condition* of the *roadway*. This refers to the Corporation of the Municipality and it's designated officials or agents.

Safety... a general term identifying the concept of mitigating bodily injury or death of persons, or direct damage (beyond wear and tear) to vehicles or contents. The obligation to safety in the context of *service standards* requires that the user operates in a safe manner giving consideration to the relevant effects and conditions, the vehicle is in good condition, satisfies any load restrictions, and contents are properly secured.

Safety Devices... a general term referring to all improvements that have traffic safety as their primary objective, including *primary safety devices*, *traffic control devices* and *vehicle attenuation devices*.

Section... refers to a portion of *roadway* with a distinct classification, and homogeneous character. A *roadway* section is commonly used for construction costing, inventory control in Maintenance Management Systems, Road Needs Studies, Pavement Management Studies, and Priority Planning and Budgeting.

Service... in the context of these *standards*, "service" refers to *aspects* of a *roadway* and their condition.

Shoulder... that maintained *surface* immediately adjacent to the travelled *surface* of the *road*. The shoulder may be partially or fully *hardtop*, *loosetop*, grassed, or *earth*. It is not considered a part of the *road* for these *standards*.

Shoulder Width... measured from the edge of the actual outside travelled lane except for *loosetop road surfaces*, where the measure is from the outside edge of the *minimum* lane width. Width is measured to the beginning edge of a rounding, where the *surface* ceases to be maintained for emergency or temporary vehicle use.

Snow Packed... *conditions* refer to *winter road conditions* where the travelled *surface* of the *road* is covered with a build up of snow and/or ice and allows the *user* to manage *safe* travel.

Speed... refers to the average speed at which an average automobile can *safely* travel on a *road* of reasonable length, without the effects of traffic. This does not refer to design speed or legal speed unless specifically qualified. Posted speed is either legal or advisory.

Standards... quantified statements, defining the nature of a product or activity. Usually such standards are minimum or desirable, and in this context refer specifically to the *roadway service standards* adopted as policy, by a *roadway authority*.

Storm... *conditions* or *effects* are when natural or external *effects* are acting upon the *roadway* to reduce the *condition* as defined by one or more *roadway service standards*. It does not refer to weather *conditions* that do not impact on the infrastructure. Storm conditions could include wind, rising and moving water, precipitation, cold temperatures (below -15C), snowfall, freezing rain, hail, blowing snow, etc.

Supervisor... refers to a manager in a road department who is accountable for the deployment of *operations* that impact on the *condition* of *roadway services*.

Surface... the exposed top of the travelled *road* and includes adjacent surfaces for turning or stopping, but not parking or *shoulders*.

System... refers to a collection of *roadways*, typically of various *classifications*, owned by a single *road authority*.

Traffic Control Devices... have regard for the advising and routing of traffic including non-regulatory signs, pavement markings, and hazard markers.

User... refers to any person travelling on or over the *roadway*, including vehicle operators, passengers and pedestrians.

Vehicle Attenuation Devices... guide and attenuate errant vehicles and their occupants to reduce damage and personal injury (e.g.: barriers, guiderail, inertia barriers).

Vertical Clearance... an obstruction free zone measured from any point on the *surface* of the road and above the projection of the horizontal clearance width.

Winter... that season when cold weather *effects* on *road conditions* can be reasonable expected. The road authority can specifically define this season.

Zone Lighting... describes illumination strategically located at intersections and areas of increased traffic congestion as determined by the *road authority* (e.g.: crosswalks, major entrances, “blind” corners).

In all charts throughout this policy, shaded boxes represent categories that do not currently apply to any roads in the Municipality of North Grenville road system.

Highway Maintenance Priority Class Categories

Traffic Volume (AADT)	Posted Speed (km/h)						
	100	90	80	70	60	50	40
15000 +	1	1	1	2	2	2	2
12000-14999	1	1	1	2	2	3	3
10000-11999	1	1	2	2	3	3	3
8000-9999	1	1	2	3	3	3	3
6000-7999	1	2	2	3	3	3	3
5000-5999	1	2	2	3	3	3	3
4000-4999	1	2	3	3	3	3	4
3000-3999	1	2	3	3	3	4	4
2000-2999	1	2	3	3	4	4	4
1000-1999	1	3	3	3	4	4	5
500-999	1	3	4	4	4	4	5
200-499	1	3	4	4	5	5	5
50-199	1	3	4	5	5	5	5
0-49	1	3	6	6	6	6	6

Note: This Policy does not apply to Class 6 Highways within the jurisdiction of the Corporation of the Municipality of North Grenville.

1.0 ROAD SURFACE

The service standards included in section 1 cover those activities required to maintain the surface of paved (hardtop) and non-paved (loosetop) roads over an entire year. For hardtop roads, these activities include but are not limited to: frost heave, base and utility cut repairs and hot and cold mix patching. For loosetop, the activities covered by the standard include grading and dust control.

1.1.1 Potholes – Hardtop Driving Surface

Class	Surface Area	Maximum Depth	Maximum Response	Desirable Depth	Desirable Response
1	600 cm^2	8 cm	4 days	4 cm	1 day
2	800 cm^2	8 cm	4 days	4 cm	2 days
3	1000 cm^2	8 cm	7 days	6 cm	4 days
4	1000 cm^2	8 cm	14 days	8 cm	7 days
5	1000 cm^2	8 cm	30 days	8 cm	14 days

1.1.2 Potholes – Loosetop Driving Surface

Class	Surface Area	Maximum Depth	Maximum Response	Desirable Depth	Desirable Response
3	1500 cm^2	8 cm	7 days	6 cm	7 days
4	1500 cm^2	10 cm	14 days	8 cm	14 days
5	1500 cm^2	12 cm	30 days	8 cm	14 days

1.1.3 Potholes – Hardtop and Loosetop Shoulder

Class	Surface Area	Maximum Depth	Maximum Response	Desirable Depth	Desirable Response
1	1500 cm^2	8 cm	7 days	4 cm	7 days
2	1500 cm^2	8 cm	7 days	4 cm	7 days
3	1500 cm^2	8 cm	14 days	6 cm	7 days
4	1500 cm^2	10 cm	30 days	8 cm	14 days
5	1500 cm^2	12 cm	60 days	8 cm	14 days

The minimum standard is to repair a pothole that exceeds both the surface area and maximum depth (set out in 1.1.1, 1.1.2, and 1.1.3) within the time frame, after becoming aware of the fact. A pothole shall be deemed to be repaired if its surface area and depth is less than or equal to that set out in 1.1.1, 1.1.2, and 1.1.3.

1.1.4 Cracks

Class	Maximum Width	Maximum Depth	Maximum Response	Desirable Width	Desirable Depth	Desirable Response
1	5 cm	5 cm	30 days	2.5 cm	5 cm	30 days
2	5 cm	5 cm	30 days	2.5 cm	5 cm	30 days
3	5 cm	5 cm	60 days	2.5 cm	5 cm	60 days
4	5 cm	5 cm	180 days	5 cm	5 cm	180 days
5	5 cm	5 cm	180 days	5 cm	5 cm	180 days

A crack in the hardtop surface of a roadway, which exists for a continuous length of 3 m or more and is greater than both the maximum width and depth, the minimum standard of time after becoming aware of the cracks existence in which to repair the cracks that appear in the hardtop surface of a roadway within the time set out in 1.1.4.

A crack shall be deemed to be repaired if its width and depth is less than or equal to the width and depth set out in 1.1.4.

1.1.5 Surface Discontinuities

"Surface Discontinuity" means a vertical discontinuity at joints or cracks in the paved surface of the roadway creating a step formation.

Class	Height	Response Time
1	5 cm	2 days
2	5 cm	2 days
3	5 cm	7 days
4	5 cm	21 days
5	5 cm	21 days

The minimum standard is to repair a surface discontinuity, except on bridges, that exceeds the height set out in table 1.1.5, within the time frame, after becoming aware of the fact, set out in table 1.1.5.

Surface discontinuity on bridges (deck joints, expansion joints, approach slabs to bridge, cracks in bridge decks) in excess of 5 cm requires the deployment of resources as soon as practicable to repair.

As surface discontinuity shall be deemed to be repaired if its height is less than or equal to that set out in table 1.1.5.

1.1.6 Shoulder Drop-Off

Shoulder drop-off means the height difference between the paved surface of the roadway and the surface of the shoulder or the unpaved surface of the roadway and the surface of the shoulder between the paved surface of the roadway and the paved or non-paved surface of the shoulder.

Class	Maximum Drop-off	Time	Desirable Drop-off	Time
1	8 cm	4 days	4 cm	4 days
2	8 cm	4 days	4 cm	4 days
3	8 cm	7 days	8 cm	7 days
4	8 cm	14 days	8 cm	14 days
5	8 cm	30 days	8 cm	30 days

If a shoulder drop-off is deeper, for a continuous distance of 20 metres or more, than the depth set out in 1.1.6, the minimum standard is to repair the shoulder drop-off within the time, after becoming aware of the fact, set out in 1.1.6.

A shoulder drop-off shall be deemed to be repaired if its depth is less than or equal to that set out in 1.1.6.

1.2 Flooding

Class	Maximum Depth	Maximum Frequency	Desirable Depth	Desirable Frequency
1	10 cm	5 years	0 cm	50 years
2	10 cm	5 years	5 cm	25 years
3	10 cm	1 year	5 cm	25 years
4	10 cm	1 year	10 cm	5 years
5	15 cm	6 months	10 cm	5 years

A flood condition exists where water, either flowing or standing, covers more than half of a lane width. The minimum standard where flooding exceeds the maximum depth is to post a warning that the flooding condition exists. This warning should be posted on class 1 & 2 roads within 4 hours of becoming aware that the condition exists and on class 3,4 and 5 within 12 hours of becoming aware that the condition exists.

The flooding standard is deemed to be met if a warning is posted when the depth of flooding exceeds the maximum shown in 1.2. If the occurrence of flooding exceeds the maximum frequency an investigation should occur to determine the improvements required to achieve the desired frequency.

1.3 Road Debris

The minimum standard for debris on a roadway is to deploy resources to remove the debris, as soon as practicable after becoming aware of the existence of the debris.

Debris means any material or object on a roadway that is not an integral part of the roadway or has not been intentionally placed on the roadway by the municipality, and is likely (within reason) to cause damage to a motor vehicle or injure a person in a motor vehicle.

1.3.1 Litter and Other Roadside Debris

Class	Urban			Rural		
	Accumulation	**Max. Lag Time**	**Desired Lag Time**	**Accumulation**	**Max. Lag Time**	**Desired Lag Time**
1	3	1 year	6 months	3	1 year	6 months
2	3	1 year	6 months	3	1 year	6 months
3	3	1 year	6 months	4	1 year	6 months
4	2	6 months	2 months	4	1 year	6 months
5	2	6 months	2 months	4	1 year	6 months

Ratings for street litter are based on observations from the centre of the street to the edge of the right of way.

1. Street completely clean.
2. Street largely clean, a few pieces of litter observed by only in the form of isolated discarded items i.e. less than or equal to the volume of a large grocery bag on an urban block or kilometre of rural road section.
3. Litter lightly scattered along all or most of the street, or one heavy pile, but not considered large enough to indicate dumping (i.e. a volume no greater than a standard garbage can be on an urban block or kilometre of rural road section.)
4. Heavy litter, accumulation in piles or heavy litter distribution down nearly all the street, volumes greater than a standard garbage can on an urban block or kilometre of rural road section.

The standard is to remove litter and other debris on a roadside when the accumulation exceeds the rating for rural and urban accumulation within the maximum lag time.

1.3.2 Dust

Class	Maximum Lag Time	Desired Lag Time
4	2 months	1 month
5	6 months	1 month

Where dust caused by traffic on a loosetop road surface impacts on reasonable vehicle safety, relative to the ambient condition of the road, that condition should not occur for more than the maximum lag time per year.

This standard is not applicable where the condition occurs over a distance of less that 100 m. This standard does not apply to shoulders.

1.4 Routine Patrolling

Class	Ambient Condition Min. Standard		Winter Storm Condition Min. Standard	
	Maximum Cycle	Desirable	Maximum Cycle	Desirable
1	3 x every 7 days	3 x every 7 days	3 x every 7 days	2 x per day
2	2 x every 7 days	2 x every 7 days	2 x every 7 days	1 x per day
3	1 x every 7 days	1 x every 7 days	1 x every 7 days	1 x per day
4	1 x every 14 days	1 x every 14 days	1 x every 14 days	1 x every 3 days
5	1 x every 30 days	1 x every 30 days	1 x every 30 days	1 x every 7 days

In winter, patrolling of a representative sample of the road system may be sufficient to identify anticipated problem areas.

Routine patrolling shall be carried out by driving or electronically monitoring the highway to check for conditions.

Routine patrolling is not required between sunset and sunrise.

2.0 WINTER CONDITIONS

The service standards included in Section 2 cover those activities required to remove snow and ice from the surface of the road in winter. A winter event response is an occasion where staff has been called to respond to a winter condition. The activities covered by this standard include continuous plowing, spot plowing, continuous sanding/salting, spot sanding/salting, ice blading, winging back.

2.1 Snow Accumulation

Class	Response to Snow Accumulation		Surface Condition		
	Depth	Time	Lag Time	Desired Condition	Minimum Condition
1	2.5 cm	4 hours	12 hours	Bare	Bare
2	5 cm	6 hours	12 hours	Bare	Centre/Track Bare
3	8 cm	12 hours	18 hours	Bare	Centre/Track Bare
4	8 cm	16 hours	24 hours	Centre/Track Bare/ Snow Packed	Centre/Track Bare/ Snow Packed
5	10 cm	24 hours	24 hours	Snow Packed	Snow Packed

In this standard Snow Accumulation means the natural accumulation of new fallen snow, packed snow or wind blown snow that covers more than half a lane width of a roadway.

2.1.1 Storm Conditions – Minimum Standard

The minimum standard for snow removal is to deploy resources as soon as practicable to clear snow accumulation after becoming aware that the snow accumulation is greater than the depth set out in the table above.

Once the snow accumulation has ended, if it is greater than the depth set out in the table above, the minimum standard is to clear the snow accumulation to a depth less than or equal to the depth set out in the table above and to 0.6 m inward from the edge of roadway on class 1, 2 and 3 within the time, after becoming aware of the fact, set out in the table above. On class 4 and 5 roads each with two lanes, if after the snow accumulation has ended, the snow accumulation is greater than the depth set out in the table above, the minimum standard is to clear the snow accumulation to a depth less than or equal to the depth set out in the table above and to a width of at least 5 metres, within the time, after becoming aware of the fact, set out in the table above.

This standard does not apply to that portion of the road designated for parking and only applies to a municipality during the season when the municipality performs winter highway maintenance.

2.1.2 Surface Condition

After the snow accumulation has ended, and within the lag time shown in the surface condition section, roads shall be returned to at least the minimum surface condition as shown in the table 2.1.

2.2 Icy Roadways

Class	Minimum Standard to Treat Icy Roads	Surface Condition	
	Response Time	Desirable Lag Time	Ambient Speed
1	3 hours	6 hours	80 %
2	4 hours	6 hours	80 %
3	8 hours	12 hours	70 %
4	12 hours	12 hours	50 %
5	24 hours	24 hours	50 %

2.2.1 Icy Roadways – Minimum Standard

The minimum standard for treating icy roadways is to deploy resources as soon as practicable after becoming aware that the road was icy; and to treat the icy roadway within the time frame after becoming aware of the fact set out in the table 2.2.

2.2.2 Surface Condition

Within the lag time shown in the surface condition section, roads shall be returned to at least the ambient speed as shown in the table 2.2.

3.0 ROADSIDES

The service standards of section 3 look beyond the surface of the road to those activities carried out on the roadside. They include services for vegetation management, street light maintenance, traffic control device maintenance and trees.

3.1 Clearances

Class	Vertical		Horizontal	
	Overhanging Minimum	Grass/Brush Encroachment	Minimum	Desirable
1	5 m	0.3 m	5.5 m	6.5 m
2	5 m	0.3 m	5.5 m	6.5 m
3	4.5 m	0.3 m	5 m	5.5 m
4	4.5 m	0.5 m	5 m	5.5 m
5	4.5 m	0.5 m	5 m	5 m

Clearance are measured vertically from the crown of the road and horizontally from the centreline of the road.

Vertical and horizontal clearances recognize setback of obstacles that may cause damage when struck or may impair the visibility of motorists travelling on a road. Obstacles, which may impair visibility, may be localized and include: rock outcrops, earth embankments, guy cables, utility posts, bridge abutments, hydrants, trees, and so forth.

For the purpose of this standard: safety devices placed by the municipality, and all signing placed by th municipality (regulatory, warning, street name) are not to be considered as encroachments.

The maximum lag time to remove an encroachment into the clearance zone is two years. This would apply to the following:

1. For structures on replacement;
2. For utilities on replacement; and
3. For temporary conditions such as overhanging limbs.

3.2 Illumination

Class	Rural		Urban		Response Time
	Minimum	Desirable	Minimum	Desirable	
1	Zone	Continuous	Zone	Continuous	7 days
2	Zone	Zone	Zone	Continuous	7 days
3	Zone	Zone	Continuous	Continuous	30 days
4	No lighting	Zone	Continuous	Continuous	30 days
5	No lighting	Zone	Continuous	Continuous	30 days

This standard has regard for illumination as it improves safety and visibility for the vehicle operator. Illumination is divided into 3 categories: no lighting, zone lighting and continuous lighting.

In this standard, luminaire means a complete lighting unit consisting of a lamp and parts designed to distribute light, to position and protect the lamp and to connect the lamp to the power supply.

For conventional illumination (which typically consists of one luminaire per pole), if three or more consecutive luminaires on a highway are not functioning, the minimum standard is to repair the luminaires within the time, after becoming aware of the fact, set out in 3.2.

For high mast illumination, which typically consists of several luminaries per pole, if all of the luminaries on two or more consecutive poles are not functioning, the standard is to deploy resources as soon as practicable after becoming aware of the fact, to repair the luminaries.

If 30 percent or more of the luminaires (high mast or conventional) on any kilometre of highway are not functioning the minimum standard is to repair the luminaires within the time, after becoming aware of the fact, set out in 3.2.

If 50 percent of the luminaries (high mast or conventional) on any kilometre of class 1 highway with a speed limit of 90 kph or more are not functioning, the minimum standard is to deploy resources as soon as practicable to repair the luminaires.

Luminaires shall be deemed to be repaired, if the number of non-functioning consecutive luminaires does not exceed two, or if more than 70 percent of luminaires on any kilometre of highway are functioning.

This section applies to class 1 and 2 highways and those class 3, 4 and 5 highways with a posted speed limit of 80 km/hr or more.

3.3 Traffic Sign and Signal Service Standard

3.3.1 Regulatory and Warning Signs

Class	Maximum Response Time	Desired Response Time	Minimum Condition	Desired Condition
1	7 days	4 hours	1	1
2	14 days	4 hours	1	1
3	21 days	2 days	2	2
4	30 days	7 days	2	2
5	30 days	7 days	2	2

"Regulatory Sign" has the same meaning as in the Manual of Uniform Traffic Control Devices published in 1985 by the Ministry of Transportation.

"Warning Sign" has the same meaning as in the Manual of Uniform Traffic Control Devices published in 1985 by the Ministry of Transportation.

If a regulatory or warning sign is illegible, improperly oriented, missing or is rated below the minimum condition (other than a sign listed in 3.3.2), the minimum standard is to repair or replace the sign within the maximum response time, after becoming aware of the fact, as set out in 3.3.1.

Visual ratings of the readability and appearance of regulatory and warning signs are made from an automobile.

1. Conveniently visible
   a) sign head and support in good condition
   b) sign not defaced in any manner
   c) sign continuously visible for 160 m at 80 km/h or 85 m at 50 km/hr

2. Visible but somewhat inconvenient to see
   a) sign head or support slightly titled, twisted or bent by still readable
   b) sign partially or intermittently obscure
   c) sign defaced by readable

3. Missing, ambiguous, difficult to see, or not visible
   a) sign post broken off or sign missing or a major part of the sign defaced and difficult to read
   b) sign titled, twisted or bent more than 30 degrees
   c) sign totally obscured by a tree, bush, brush, pole, or another sign or object, so that it can not be seen within the approach distance mentioned above

3.3.2 Other Signs

This section applies to the following types of signs: checkerboard; curve sign with speed advisory tab; Do Not Enter; One Way; School Zone Speed Limit; Stop Ahead; Stop Ahead New; Traffic Signal Ahead New; Two-Way Traffic Ahead; Wrong Way; Yield; Yield Ahead; and Yield Ahead New.

Class	Minimum Response Time	Desired Response Time	Minimum Condition	Desired Condition
1	As soon as practicable	7 days	2	1
2	As soon as practicable	14 days	2	1
3	As soon as practicable	21 days	2	2
4	As soon as practicable	30 days	2	2
5	As soon as practicable	30 days	2	2

If a sign as listed above is illegible, improperly oriented, missing or is rated below the minimum condition, the minimum standard is to deploy resources as soon as practicable, after becoming aware of the fact, to repair or replace the sign.

A visual rating of readability and appearance of all regulatory signs other than stop signs and street name signs can be made from an automobile.

1. Conveniently visible
   a) sign head and support in good condition
   b) sign not defaced in any manner
   c) sign continuously visible for 100 m at 80 km/hr or 30 m at 50 km/hr

2. Visible by somewhat inconvenient to read or find
   a) sign head or support slightly tilted, twisted or bent but still readable
   b) sign partially or intermittently obscure within the approach distance of 30 m
   c) sign defaced but readable

3. Missing, ambiguous, difficult to see or read
   a) no street name sign on any corner
   b) sign post broken off or sign missing
   c) sign tilted, twisted or bent more than 30 degrees
   d) sign totally obscured by a tree, bush, brush, pole, another sign or object, so that it can not be seen within the approach distance of 30 m
   e) printing on sign not legible

3.3.3 Traffic Control Signal System

3.3.3.a) A traffic control system is defective if any of the following conditions should occur:

1. One or more of the displays show conflicting signal indications;
2. The angle of a traffic control signal or pedestrian control indication has been changed in such a way that the traffic or pedestrian facing it does not have clear visibility of the information conveyed or that it conveys confusing information to traffic or pedestrians facing other directions;
3. A phase required to allow a pedestrian or vehicle to legally travel through an intersection fails to occur;
4. There are phase or cycle time errors interfering with the ability of a pedestrian or vehicle to legally travel through an intersection;
5. There is a power failure in the traffic control system;
6. The traffic control signal system cabinet has been displaced from its proper position;
7. There is a failure of any of the traffic signal support structures;
8. A signal lamp or a pedestrian control indication is not functioning;
9. Signals are flashing when flashing mode is not part of the normal signal operation.

3.3.3.b) If a traffic control signal system is defective in any way as described above, the minimum standard is to deploy resources to repair the defective component of the traffic control signal system as soon as practicable after becoming aware of the defect.

3.3.3.c) Despite 3.3.3.b) and 3.3.3.a) 8., if the posted speed of all approaches to the intersection or location of the non-functioning signal lamp or pedestrian control indication is less than 80 kilometres per hour and the signal that is not functioning is a green or pedestrian walk signal, the minimum standard is to repair or replace the defective component by the end of the next business day.

3.3.4 Inspection of Traffic Signal Sub-systems

3.3.4 a) The minimum standard is to inspect, test and routinely maintain the following traffic control signal sub-systems every twelve (12) months;

i) The display sub-system, consisting of the traffic signal and pedestrian crossing heads, physical supports and support cables
ii) The traffic control sub-system, including traffic control signal cabinet and internal devices such as timer, detection devices, conflict monitor and associated hardware
iii) The internal detection system, consisting of detection sensors for all vehicles, including emergency and railway vehicles and pedestrian push-buttons

3.3.4 b) The minimum standard is to test conflict monitors every six (6) months.

In section 3.3.4:
"cycle" means a complete sequence of traffic control indications;
"display" means the illuminated and non-illuminated signals facing traffic;
"indication" has the same meaning as in the Highway Traffic Act;
"phase" means a part of a cycle from the time where one or more traffic directions receive green indication to the time where one or more traffic receive green indication;
"power failure" means a reduction in power or a loss in power preventing the traffic control signal system from operating as intended;
"traffic control signal" has the same meaning as in the Highway Traffic Act;
"traffic control signal system" has the same meaning as in the Highway Traffic Act.

3.4 Other Safety Devices

This section applies to delineator, chevron, flashers, pavement markings, vehicle attenuation devices such as guide rail or inertia barrier and other such safety devices.

Class	Maximum Repair Lag Time	Desirable Repair Lag Time	Maximum Restoration Lag Time
1	Annual	7 days	2 years
2	Annual	14 days	2 years
3	Annual	14 days	5 years
4	Annual	30 days	5 years
5	Annual	60 days	7 years

If other safety devices are damaged, illegible, improperly oriented or missing, the minimum standard is to repair or replace the other safety device within the maximum response time, after becoming aware of the fact, as set out in 3.3.4.

Where other safety devices are found to be deficient either by deteriorating beyond their effective usefulness or not in compliance with current standards, the minimum standard is to replace the safety device within the maximum restoration lag time.

3.3.5 Trees

This standard applies to the mitigation of treefall on a roadway.

Class	Maximum Lag Time	Desired Lag Time
1	6 Months	2 Months
2	6 Months	2 Months
3	6 Months	4 Months
4	Annual	6 Months
5	Annual	6 Months

If a tree has one or more of the following conditions present the minimum standard is to secure the tree from falling on a roadway. This should occur after becoming aware of the fact that the following conditions exist, and within the maximum lag time as shown in 3.3.5.:

A treefall on a roadway may occur if the following conditions are present:

1. The tree must appear dead as evidenced by no leaves during normal in-leaf season, and the tree must be on the R.O.W.;
2. The entire tree or a significant portion of the tree must appear dead, and the tree must be on the R.O.W.;
3. The trunk of the tree must be greater than 0.3 m in diameter, and the tree must be on the R.O.W.;
4. There must be a significant likelihood of the tree falling on the roadway, if it falls.

4.0 BRIDGES

4.1 Bridge Deck Spalls

A "bridge deck spall" means a cavity left by one or more fragments detaching from the paved surface of the roadway or shoulder of the bridge.

Class	Surface Area	Depth	Response Time
1	600 cm^2	8 cm	4 days
2	800 cm^2	8 cm	4 days
3	1000 cm^2	8 cm	7 days
4	1000 cm^2	8 cm	7 days
5	1000 cm^2	8 cm	7 days

The minimum standard is to repair a bridge deck spall that exceeds both the surface area and depth, measured from the paved surface of the roadway or shoulder, set out in table 4.1, within the time frame, after becoming aware of the fact as set out in table 4.1.

A bridge deck spall shall be deemed to be repaired if its surface area or depth is less than or equal to that set out in table 4.1.