Night Work

Some Bright Ideas

NOVA SCOTIA

PROS

- Reduced Traffic
- No rush hour
- Cooler temperatures
- Jobs finish quicker when working 24 hours
- Better chances of getting a road closure

CONS

- Low lighting
- Shadows
- Glare
- Higher Traffic Speed
- Quality of Life/shift work issues.
- Visibility of Drivers
- Impaired Drivers

RISKS OF NIGHTWORK

- Vehicle intrusion In worksite due to reduced visibility
- Workers struck by construction equipment due to reduced visibility.
- Construction equipment re-entering traffic flow
- Irresponsible driver behavior day compared to night
- Higher speed of traffic

RISKS OF NIGHTWORK

- Potential safety hazard to workers due to fatigue/poor visibility
- Inadequate lighting
- Driver confusion/impairment/ distraction/impairment
- Glare

Illumination

(Plain English)

Illuminance

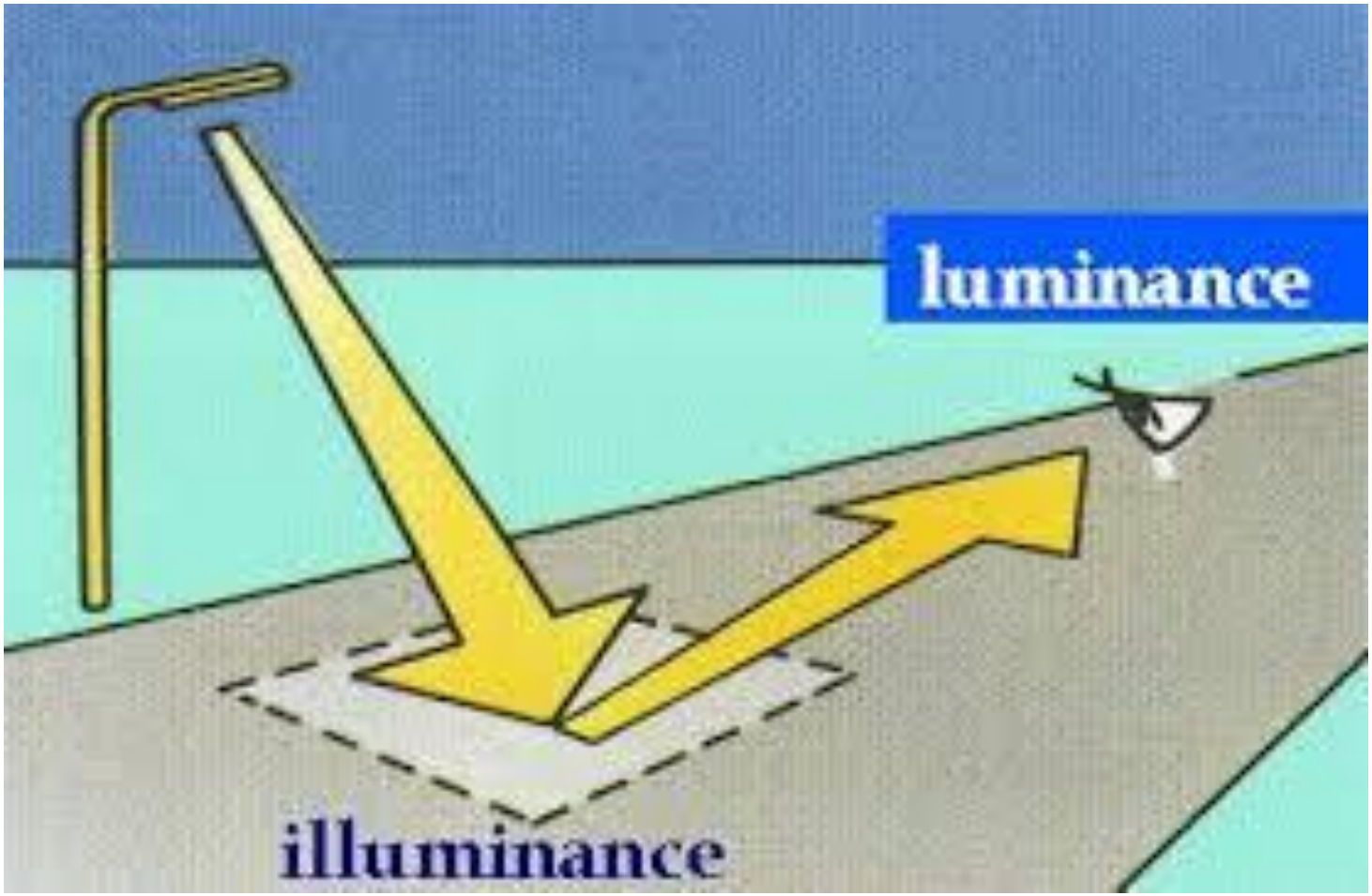
The level of lighting, similar to using a dimmer switch to increase light levels in a room.

Luminance

The amount of light that is reflected off an object.

Glare

Is Luminance that affects a person's vision


luminance
illuminance

Lighting Enhances Safety

- During nighttime construction, lighting is required to ensure construction quality and reduce the likelihood of incidents.
- Adequate lighting helps workers perform tasks in a productive and safe manner.
- Lighting must also be established so it does not create glare for motorists entering the work zone and, therefore, create an unsafe condition for the travelling public.

Lighting

- Illuminance: The level of illuminance required for various tasks will be defined in three ‘levels’. Luminaires must be of sufficient wattage and quantity to provide a minimum average maintained horizontal illuminance as follows:

	TIR	OHSA
Level 1	60 Lux	54 lux
Level 2	110 Lux	108 Lux
Level 3	220 Lux	216 Lux

Lighting Plan

- Descriptions and sketches of the layout of light towers including spacing, luminaire height, lateral placement and anticipated illuminance provided.
- Photometric and physical specifications of all lighting equipment.
- Calculated glare levels and methods to be employed to reduce glare.
- Detailed description of all lighting to be used on construction equipment.
- Contractor's frequency and procedure for checking illumination levels.

Work Area

Level 1:

- Illumination where workers and inspection staff regularly carry out tasks.

- Minimum of 120M ahead to 250M behind the paver.

- Cold Planing and Shouldering - minimum of 120M ahead to 250M behind these operations.

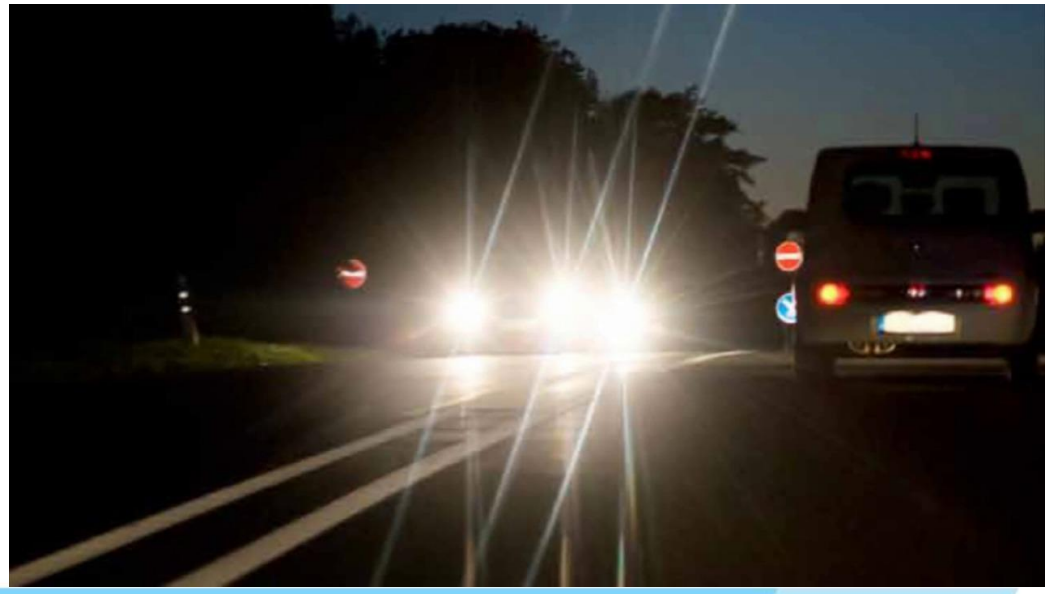
- Guard Rail Operations - minimum of 100M ahead to 100M behind the section under construction.

Level 2:

- Paving Operations: minimum of 15M ahead of material transfer vehicle and 30M behind the paver.

Glare

All luminaires shall be located and directed in such a way to minimize glare to both motorists and work vehicles . If severe glare is noted from any travel path, the Contractor shall adjust the lighting to reduce the glare to an acceptable level.



Measurement of Illluminance

- Measurements to be taken at a height of 500mm above the roadway, in a uniform pattern at 3 meter spacing throughout test area. Tester must be familiar with the use of a photometer and must ***not*** wear reflective materials while taking the tests.

- Contractor must test levels on site each time lighting configuration changes or at least once every 5 working days. Results must be provided to Engineer within 24 hours.

- Contractor must provide a photometer for the use of the Engineer on site.

Lighting Maintenance

The contractor shall replace non-functioning lamps immediately. The luminaire aiming shall be checked daily. The luminaires shall be cleaned regularly.

Types Of Lighting

Balloon Lighting

- Cast light in 360 degrees
- Diffused Light Causes Less Glare

Light Towers

- More ‘targeted’ than balloon Lighting
- Can be positioned far from work site
- Can cause Glare

Types Of Lighting

High Masted Lighting

- Less Glare
- More Illuminance

TIR Night Work Requirements

Night Work Definition: Work performed from a half hour after sunset to a half hour before sunrise **(TCM)**

NOVA SCOTIA

Before You Start

Special Safety Elements

- Details of required personal protective equipment
- Details of equipment warning devices to be used
- Detailed Hazard Assessment for night work
- Emergency Response Plans

Sign Requirements

- **Materials:** All orange warning signs shall have retroreflective sheeting, ASTM Type III, Type I for white signs.
- **Placement:** According to the Traffic Control Manual.
- **Flashing Light Units:** Should be dimmable, burnt out lights replaced immediately, red and white reflective tape on edges.
- **FLU's** shall be erected and aimed so that it is clearly visible from the **greatest** distance **practical**.

Channelization Devices

- **Materials:** Retroreflective sheeting for all channelization devices shall meet the standard of the TCM.
- All cones shall be as detailed in the latest edition of the TCM.
- Ballast for all channelization devices shall be at ground level.
- **Placement:** Maximum distance permitted between channelization devices shall be 5 metres. Devices used at gores and intersections shall be spaced at 3 metre intervals.

Traffic Control Persons (TCP)

- **Training:** All TCP must have training that deals specifically with night work.

- **Illumination:** The TCP shall be illuminated on the vertical face which shows to oncoming traffic. Illumination shall not impair the vision of the TCP and shall be a minimum of Level III.
- If lighting fails, work must stop until it is corrected.

- **Visibility:** The TCP must also have a minimum of 80 cm. square on their hart hats, as well as a flashlight and semi-transparent cone.

- **Communications:** All TCP's shall be equipped with radios so that they can communicate with pilot vehicle operator.

Work Vehicles

- **Training:** Must receive specific night work training (covered in TCP course.)

- **Visibility:** Must wear hi-visibility apparel, including on their hard hats which is visible from all sides.

- **Flashing Lights:** All vehicles in the work area must have a rotating or flashing incandescent amber light. Strobe lights are not permitted.

Traffic Control Maintenance

- Contractor shall employ a full time traffic control supervisor with enough staff to ensue constant patrol and maintenance of all traffic control devices.

- Traffic Control devices: All signs, channelization devices shall be kept clean and in good condition.
- All traffic control devices shall be removed when not in use.

- Lane Openings: Prior to opening any lane to traffic, all the temporary pavement markings, hazard markers and low/high shoulder signs, must be in place.

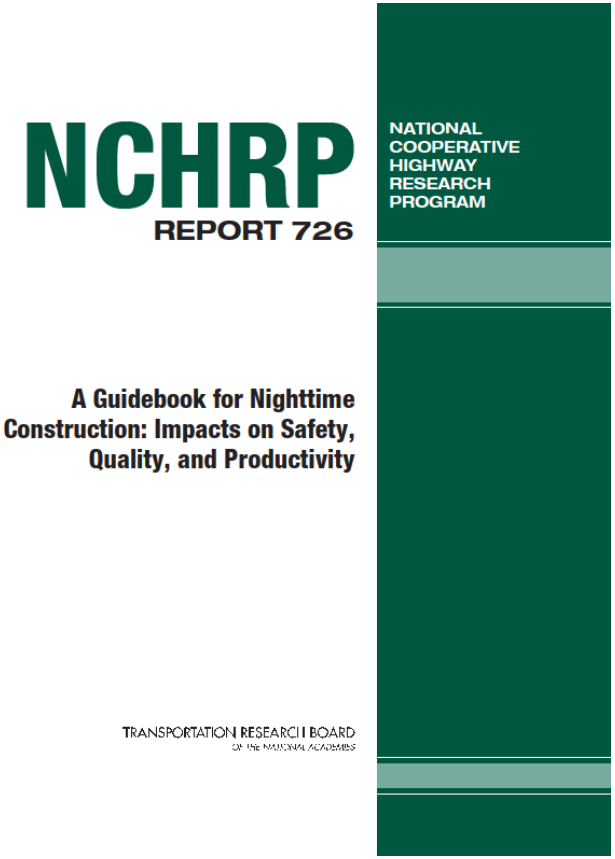
Traffic Control Trial

- Prior to the start of work, a traffic control trial shall be carried out for inspection by the Contractor and a Department representative.

- The trial shall involve setup and operation of the full traffic control system and work area lighting system. No work shall commence until approval is given by the Department to proceed.

The information in this presentation should be used as a ***guide*** only. Specific requirements from the Project Engineer may exceed the standards contained here.

Sources



http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_726.pdf

http://novascotia.ca/tran/publications/asphalt/NightWorkSpecification.pdf

NOVA SCOTIA