

Lighting Justification

Lighting is required at the locations defined per [FDM 231](#). Where applicable, lighting justification is based on MUTS Chapter 14 and the [FHWA Lighting Handbook](#).

The initial lighting justification is based upon key factors. The following factors can be used in the analysis:

Justification Factors

Conditions described in the FHWA Lighting Handbook are roadway conditions under which lighting may be considered warranted, but they do not necessarily describe the sites where lighting is specifically justified. The factors below can change the analysis of the justification.

Geometric Factors for the roadway’s entire length to which the analysis is being applied:

- Number of lanes
- Lane width
- Number of median openings per mile
- Driveways and entrances per mile
- Horizontal curve radius
- Vertical curve
- Sight distance

- Parking

Operational Factors for the roadway’s entire length to which the analysis is being applied:

- Signalized intersections
- Left turn lanes
- All major or one-way intersections
- Substantial number of major intersections
- Median width
- Operating or posted speed.
- Pedestrians

Environmental Factors for the roadway’s entire length to which the analysis is being applied:

- Percentage of development adjacent to the roadway
- Area classification
- Distance from development to roadway
- Ambient lighting (see MUTS for definitions)
- Raised median curb (see MUTS for more definitions)
- **Collision Factors** - If the night-to-day crash ratio is 2:1 or greater, lighting is automatically warranted regardless of the overall point score. Crashes reported as dawn or dusk should be considered as night crashes.

Net Present Value Analysis

Net Present Value (NPV) is a calculation used to determine if lighting is justified for a project. The MUTS shows exactly how the NPV is calculated and when using the HSM Methodology is applicable as well as when it's not. This can be found in the [MUTS section 14.3](#).

If crash cost reduction resulting from adding lighting is equal to or greater than the cost of construction, maintenance, and operation of the lighting project, then lighting is justified for high crash locations (HCL) as identified by the State Safety Office. For other locations, the NPV is used to rank projects according to their value in benefit to the public.