

Chicago Red-Light Enforcement Program Intersection Prioritization Steps for Relocations

Relocation of red-light enforcement cameras involves a two-step process. In step 1, intersections with existing red-light cameras are evaluated to identify candidate intersections for removal of the red-light camera. In step 2, intersections to receive the relocated red-light camera must be identified.

CDOT's continuing program to evaluate existing red-light camera intersections is based on crash data for a minimum two years prior to install (the pre-install period) and on crash and violation data for a minimum two years after install (the post-install period). Intersections where red-light cameras have been in place for less than two years should not be considered for relocation.

Red-light camera relocations are based on the reductions in crashes and violations experienced at the intersection since the red-light camera was installed. Existing red-light camera intersections are ranked based on the number of total crashes, angle crashes, and the angle crash rate. The angle crash rate is the primary criteria to identify red-light cameras for potential relocations. The number of violations recorded by the red-light camera after two years operation is used as secondary criteria. Field inspections are conducted at red-light cameras identified for possible relocation to confirm relocation potential.

Intersections with existing red-light cameras are prioritized for removal and relocation based on the following procedures:

1. Rank-order all intersections by intersection-related crashes using the most recent full year crash data available.
2. Select intersections above a threshold value for intersection-related crashes and all existing red-light intersections for crash statistical analysis.
3. Consider red-light intersections as candidate relocations starting from red-light intersections with the lowest angle crash rate based on the current year crash data.
4. Red-light intersections where the angle crash rate is zero based on the current year crash data are possible relocations.
5. Examine the average red-light violations per month in the two most recent years as a secondary indicator of changes in driver behavior at the intersection.
6. Consider red-light relocations to an alternate approach at an existing red-light intersection based on violations by approach.
7. Conduct field inspections at red-light intersections with zero angle crash rate and reductions in violations.
8. Identify intersections where red-light cameras may be relocated to using the procedure for new installations.

Chicago Red-Light Enforcement Program Intersection Prioritization Steps for New Installations

1. Intersections with the highest number of intersection-related Total Crashes are identified based on data from the Chicago Crash Database using the most recent crash data provided by the Chicago Police Department.
2. Information on the Type of Crashes (*Angle, Rear-End, Head-On etc.*) is assembled for the high crash intersections.
3. Traffic volumes for the intersections are assembled from the Chicago Average Daily Traffic (ADT) database. ADT counts for locations north, south, east and west of the intersection are used to estimate the total traffic passing through the intersection (Intersection ADT).
4. The crash and ADT information is used in the Red-Light Prioritization Model to calculate each intersection annual Total Crash Rate and Angle Crash Rate as:
 - **Crash Rate:** $(\text{Total Number of Crashes} * 1,000,000) / (\text{Intersection ADT} * 365)$
 - **Angle Crash Rate:** $\text{Number of Angle Crashes} / (\text{Total Number of Crashes} * \text{Crash Rate})$
5. Intersections are Rank-Ordered in descending order of Angle Crash Rate (highest to lowest) of the top Total Crash intersections).
6. The Rank-Ordered list is cross-checked against locations with an existing Red-Light camera.
7. Rank-Ordered intersections with no existing Red-Light camera are identified as potential new Red-Light camera installations. Intersections with the highest Angle Crash Rank-Order are given higher priority for a new install.
8. Field inspections and analysis are conducted to determine the constructability of a Red-Light camera install. Constructability factors include sight-lines, pavement condition, power sources, locations of near-by Red-Light cameras, etc.
9. Critical data including speed limit on all approaches are collected during the field evaluation for all intersections identified for red-light installation so that appropriate traffic engineering standards are applied to the signal timing and operations to insure public safety.