

directions, if an independent time interval is allowed during the signal cycle for the left-turn movement.

4. Those involving excessive speed, in cases where signal coordination will restrict speed to a reasonable rate.

Traffic control signals cannot be expected to reduce the following types of accidents:

1. Rear-end collisions, which often increase after signalization.
2. Accidents involving pedestrians and turning vehicles when both move during the same interval.
3. Other types of pedestrian accidents, if pedestrians or drivers do not obey the signals.
4. Collisions between vehicles proceeding in the same or opposite directions, one of which makes a turn across the path of the other. This is particularly true if no independent signal interval is provided for these turn movements.

#### **402-4 Unwarranted Existing Signalized Intersections**

Every effort should be made to encourage removal of an existing unwarranted signal installation. The designer should realize that all existing unwarranted signals cannot always be removed, most often because of public or political pressures on the maintaining agency. If the removal of signals and the placement of STOP signs is agreed to, the work should be at normal project participation.

If the local agency insists that a large number of unwarranted signals be retained, the **State** should reevaluate if the project should continue. Reasons for retention of existing unwarranted signals shall be documented.

If an existing unwarranted signalized intersection is retained, the following applies:

1. All work and equipment at the intersection shall be at 100 percent local cost. Written confirmation is required from the local agency.
2. If within a system, signal control equipment shall be upgraded to be compatible with the system (same manufacturer for all controller software).
3. If within an area approved for special design considerations (such as mast arms, aesthetically designed poles, etc.), the unwarranted intersection shall be upgraded to these standards.
4. If it is not necessary to upgrade equipment except for the controller, the existing intersection signals, signs and pavement markings shall be in conformance with the **OMUTCD**. Deficiencies may be corrected by the project (at 100 percent local cost) or by the local maintaining agency. The intersection shall conform to the **OMUTCD** by the final inspection of the construction project.

#### **402-5 Removing Right-Turn Vehicles from Signal Warrant Analysis**

At intersections under **ODOT's** jurisdiction, the following procedure should be used to determine how much, if any, right-turning traffic from the minor street to remove from the signal warrant analysis. This does not apply to traffic signal warrant analyses on state route extensions in villages or on projects within local jurisdictions that require **ODOT** oversight.

From the "Minor Street Analysis Parameters" (*see Tables 497-7 and 497-8*) select the closest minor-leg lane configuration. Enter the configuration number under the MINOR STREET column on the "Right Turn Factorization Sheet" (*see Forms 496-12 and 496-13*). If both minor legs are being studied and have different configurations, include both and note next to the hour which leg or direction is being selected.

Note the number of lanes on the critical mainline approach. The critical mainline approach is the major-street leg whose through movement is in conflict with the right turn from the minor leg. Turn lanes on the major street are not usually considered a lane in this instance because a turn lane on the major route does not conflict with a right-turning vehicle from the minor leg.

Calculate the Critical Mainline Approach Volume per Lane. This is the hourly through volume of the critical mainline approach divided by the number of through lanes on the approach plus the hourly right-turning volume if it is not served by an exclusive right-turn lane on the mainline. Record this number in the Mainline Approach Volume per Lane column on the "Right Turn Factorization Sheet."

Determine the Base Right Turn Reduction Percentage or Base Reduction. After determining which lane configuration best represents the leg that is being studied and based on the movements for each hour, calculate the percent reduction "R" or Base Reduction for each hour and record in the Base Reduction column on the "Right Turn Factorization Sheet." Transfer this same number to the Base Right-Turn Reduction % column on the same sheet.

Calculate the Mainline Congestion Factor. This is a reduction of the Base Right-Turn Reduction. Its purpose is to allow for the vehicles which are unable to turn right during exceedingly high volume on the major street. This reduction is five percent for mainline approach volumes of 400 vehicles per hour per lane and is increased by five percent for every 100 vehicles per hour per lane. The Mainline Congestion Factors for Limiting Right-Turn Reductions are shown at the bottom of the "Minor Street Analysis Parameters" sheet. Select the appropriate reduction based on the mainline volume per lane and record the reduction in the Mainline Congestion Factor % column on the "Right Turn Factorization Sheet."

Calculate the Adjusted Right-Turn Reduction. This is the Base Right-Turn Reduction minus the Mainline Congestion Factor. If less than 0, then the Adjusted Right-Turn Reduction equals 0%. Record this number in the Adjusted Right-Turn Reduction % column for each hour.

Calculate the Adjusted Right Turns. This is  $(1 - \% \text{ Adjusted Right-Turn Reduction})$  multiplied by the Right-Turn Volume from the selected minor leg. Record this number in the Adjusted Right Turns column.

Determine the new Adjusted Minor-Street Volume by adding the Adjusted Right Turns to the through and left-turn volumes for each hour. Record this number in Adjusted Minor-Street Volumes column on the "Right Turn Factorization Sheet" for each hour. This number shall be used in the signal warrant analysis.