

## Intersection Significance Methodology

The purpose of this procedure is to define whether an intersection will experience a significant impact from a Development of Regional Impact (DRI). The methodology defines the analysis techniques necessary to evaluate potential solutions to any intersection deficiencies, which are identified. Reviewing agencies have the right to ask for more detailed analysis of an intersection including storage length capacity.

Step 1a – An HCM analysis (using the latest HCS version or other acceptable software) will be conducted for existing traffic volumes with existing signal timings for intersections at the ends of significantly impacted links (field observations or from controller timings).<sup>1</sup> In certain cases, intersections will also be included where the impact on the link is nearly significant and an unusually high percentage of the project trips turn at the adjacent intersection.

Step 1b – A significance test will be performed for each lane group. Project impacts (actual project volumes for each lane group and % significance level based on the following criteria) should be neatly hand printed adjacent to the lane group capacity column on the HCS analysis sheet (see example). Determination of significance is as follows;

1. The project volumes will be adjusted by dividing the project volume by the PHF for the lane group being analyzed.
2. The significance threshold for DRI's with existing development orders (DO) specifying a "10 percent of LOS "C" service volume" significance test will be calculated as the lane group capacity X  $0.4375 \times .10$ . This represents 10 percent of the theoretical Level-of-Service "C" service volume for each lane group based upon Exhibit 16-2 (Level-of-Service Criteria for Signalized Intersections) of the current Highway Capacity Manual.
3. All other projects will calculate significance based on 5 percent of the lane group capacity at the adopted level of service from the local

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<sup>1</sup> Freeway and interstate ramp termini (at stop controlled or signalized intersections on the surface roadway network) will also be analyzed along with ramp levels of service. If the ramp is significantly impacted, then a ramp merge and diverge analysis with the freeway or interstate is necessary if the mainline is operating below its adopted level of service.

government's comprehensive plan<sup>2</sup>. For this calculation, the appropriate lane group capacity service volume shall be determined based on the following formula: (lane group capacity x 0.05 x n) with n being established to be the following;

Adopted LOS	n
A	0.125
B	0.25
C	0.4375
D	0.6875
E	1.00
F	1.00

Source: derived from time delay percentages Exhibit 16-2. of the 2000 Highway Capacity Manual.

As noted in the flow chart, if none of the lane groups have a significant impact, the analysis procedure ends.

Step 2 – When there is a significantly impacted lane group, the HCS analysis will be performed using future target volumes with existing signal timings. If the significantly impacted lane group operates at or better than the applicable LOS, then no further analysis is necessary.

Step 3 – If there is a significantly impacted lane group or approach LOS that is below the adopted LOS, signal timing adjustments will be made based upon reasonable engineering judgement. Care must be given not to disrupt progression on a coordinated system and minimum green times must be maintained. If, after making signal timing adjustments, a significantly impacted turn-lane group or approach is still operating below the adopted level of service, additional turn lanes will be added if feasible. If a significantly impact through lane group is still operating below the adopted LOS, an arterial analysis will then be performed to determine if the roadway sections containing the intersection have an arterial LOS below the adopted LOS. If the agency responsible for the signal timing accepts the proposed signal timing, and there are no lane groups below the adopted level of service, the analysis will end.

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<sup>2</sup> In this step and in the following steps, if the intersection being analyzed is on an FIHS roadway, then the term adopted LOS shall mean the FDOT FIHS level of service standard (unless otherwise authorized). If the intersection being analyzed is the intersection of an FIHS and non-FIHS roadway, then the term adopted LOS shall mean the non-FIHS LOS standard unless a ramp queue would back up onto an FIHS facility.

Step 4 – If one or more lane groups fail Step 3, additional intersection improvements will be tested using HCS analysis. An acceptable improvement will be identified by the following conditions:

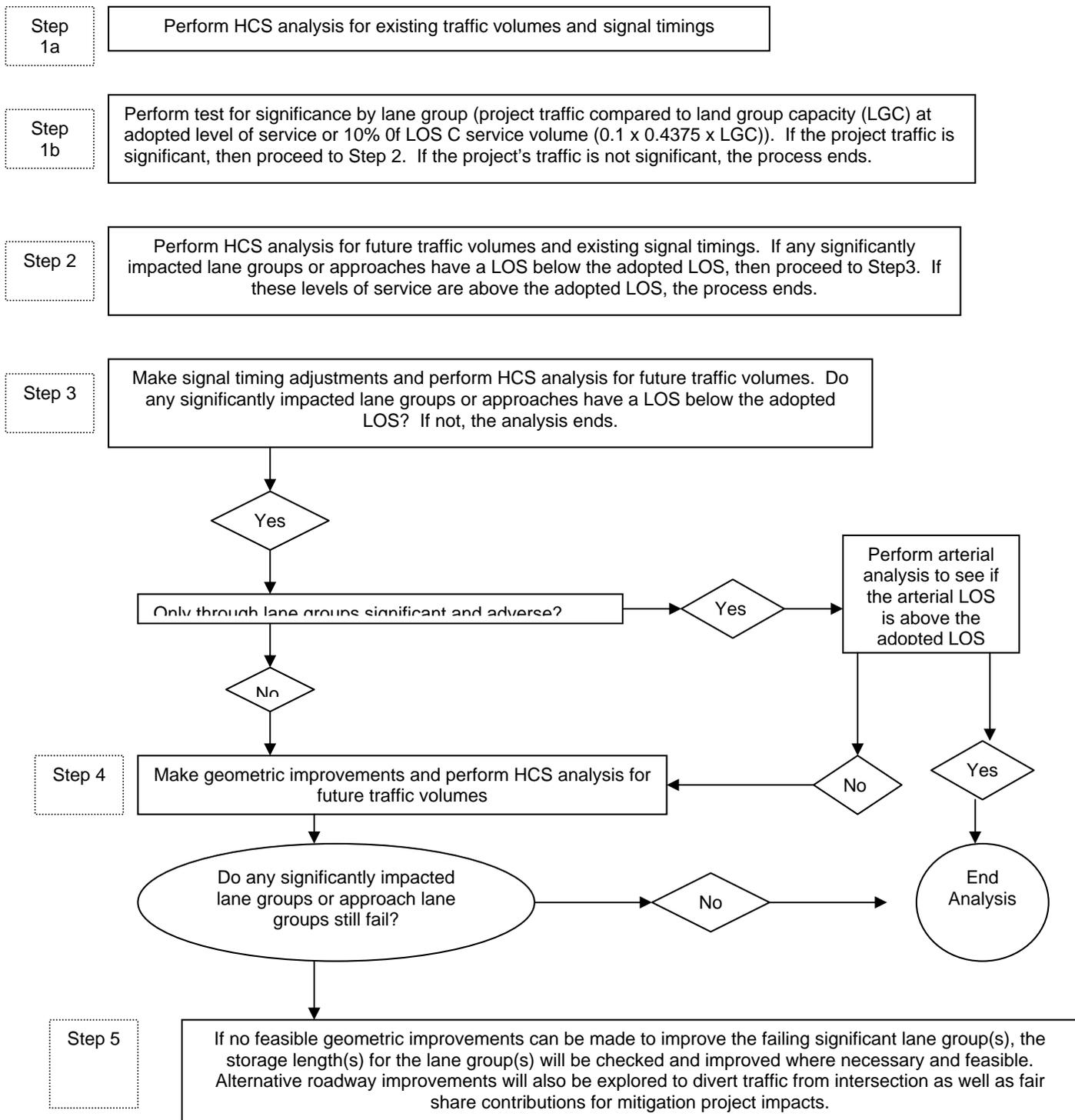
- A. No significantly impacted turn lane groups below the adopted level of service.
- B. No through lane groups with a level of service below the adopted arterial LOS.
- C. No new volume to capacity (v/c ratio) changes that would reduce the LOS to below the adopted standard that were not present in Step 3 (Step 2 if no new signal timing adjustments were accepted by the maintaining agency). For turn lane groups not addressed in A., the LOS cannot be reduced below the adopted level of service or, where the LOS was already below E, the v/c ratio cannot be increased as compared to Steps 2 and/or 3. Through lane groups cannot be reduced below the adopted LOS, or if the existing LOS is already below the adopted LOS, the v/c ratio cannot be increased above the v/c ratio achieved from Step 3 (Step 2 if no new signal timing adjustments were approved).
- D. The v/c ratio on failing lane groups which are not significantly impacted is not increased above the v/c ratio from Step 3 (Step 2 if no new signal timing adjustments were accepted).

Step 5 – If no feasible geometric improvements can be made to the intersection to solve the significantly impacted lane group(s) deficiency, the storage lengths for the lane group(s) will be checked and improvements to the storage improved where necessary and feasible. Alternative roadway improvements will be explored to divert traffic from the intersection and fair share contributions will also be considered for mitigation of impacts.

A flow chart of the procedure is attached.

Programmed improvements (first three years) will be considered when performing future year analysis. Any planned improvements will be considered when providing recommendations.

# Significance Test Methodology Flow Chart



**NOTES:**

1. No significantly impacted turn lane groups below the adopted level of service
2. No through lane groups with an arterial level of service below the adopted level of service.
3. No new volume to capacity (v/c) changes that would reduce the level of service to below the adopted standard, and that were not present in Step 3 ( Step 2 if no new signal time adjustments were permitted by the maintaining agency). For turn lane groups not addressed in (1), the level of service can not be reduced below the level of service E, or where the level of service was already below e, the v/c can not be increased as compared to steps 2 and/or 3. Through lane groups can not be reduced below the adopted level of service, or if the existing level of service is already below the adopted level of service, the v/c ratio can not be increased above the v/c ratio from step 3 (Step 2 if no new signal timing adjustments were approved).
4. The v/c ratio on failing (i.e., stars in the HCS analysis) lane groups which are not significantly impacted is not increased above the v/c ratio from Step 3 (Step 2 if no new signal time adjustments were approved).