

1 Intersection Significance Methodology

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

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

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

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26 1. The project volumes will be adjusted by dividing the project volume
27 by the PHF for the lane group being analyzed.
- 28 2. The significance threshold for DRI's with existing development orders
29 (DO) specifying a "10 percent of LOS "C" service volume"
30 significance test will be calculated as the lane group capacity X
31 $0.4375 \times .10$. This represents 10 percent of the theoretical Level-of-
32 Service "C" service volume for each lane group based upon Exhibit
33 16-2 (Level-of-Service Criteria for Signalized Intersections) of the
34 current Highway Capacity Manual.
- 35 3. All other projects will calculate significance based on 5 percent of the
36 lane group capacity at the adopted level of service from the local

¹ 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.

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government’s comprehensive plan². 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

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

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

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

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

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² 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.

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

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- 71 A. No significantly impacted turn lane groups below the adopted
72 level of service.
- 73 B. No through lane groups with a level of service below the
74 adopted arterial LOS.
- 75 C. No new volume to capacity (v/c ratio) changes that would
76 reduce the LOS to below the adopted standard that were not
77 present in Step 3 (Step 2 if no new signal timing adjustments
78 were accepted by the maintaining agency). For turn lane
79 groups not addressed in A., the LOS cannot be reduced below
80 the adopted level of service or, where the LOS was already
81 below E, the v/c ratio cannot be increased as compared to
82 Steps 2 and/or 3. Through lane groups cannot be reduced
83 below the adopted LOS, or if the existing LOS is already below
84 the adopted LOS, the v/c ratio cannot be increased above the
85 v/c ratio achieved from Step 3 (Step 2 if no new signal timing
86 adjustments were approved).
- 87 D. The v/c ratio on failing lane groups which are not significantly
88 impacted is not increased above the v/c ratio from Step 3 (Step
89 2 if no new signal timing adjustments were accepted).

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

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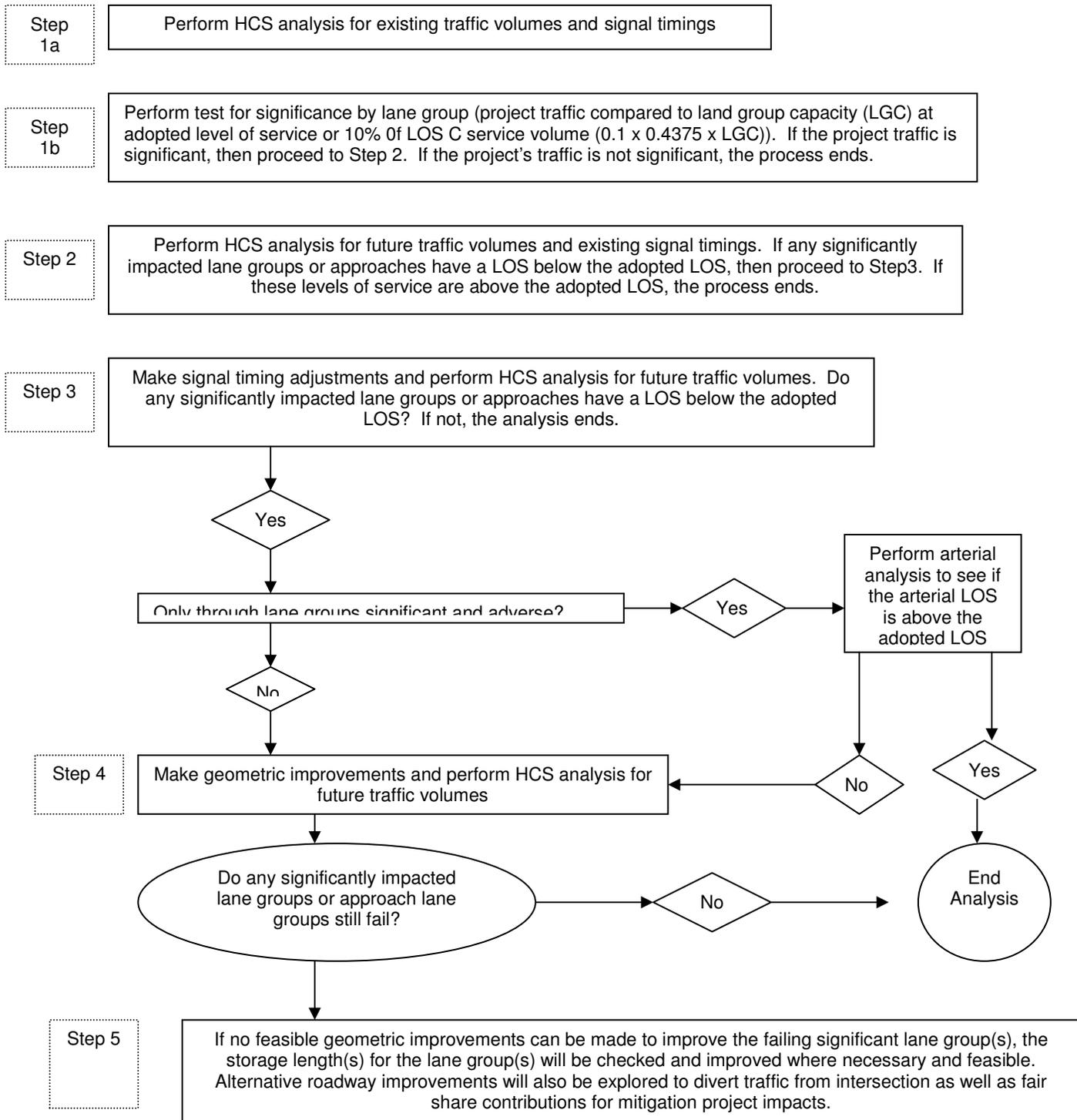
98 A flow chart of the procedure is attached.

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

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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).