



# Carson City Planning Division

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## MEMORANDUM

Planning Commission Meeting of January 27, 2021

**TO:** Planning Commission **Item E.1**

**FROM:** Hope Sullivan, AICP  
Planning Manager

**DATE:** January 12, 2021

**SUBJECT:** ZA-2020-0010: For Discussion Only: Discussion regarding Carson City Development Standards (CCDS) Division 12.13: Traffic and Impact Study Requirements.

CCDS Division 12.13 addresses traffic and impact study requirements. Carson City Public Works is seeking ways to address existing issues and identify alternative processes to better address and account for transportation related impacts resulting from development projects. Transportation staff will present options that have been developed, analyzed and recommended by the Regional Transportation Commission.

Transportation staff has observed that the implementation of existing requirements has a number of challenges including:

- Inconsistencies in traffic impact study (TIS) methodologies and results;
- Inconsistencies with proposed development improvements to existing roads;
- Cost of completing a TIS with sometimes limited use of the results;
- Limited opportunity to address other types of transportation impacts, including impacts to transit ridership and demand on downtown parking and/or the bicycle and pedestrian network;
- A focus mainly on roadway capacity;
- Lack of ways to address gaps and inefficiencies in the transportation system.

Transportation staff's goals is reviewing the requirements are:

1. Provide potential development projects a clearer picture of how and when they participate in transportation improvements;
2. Ensure consistency in the way impacts are measured and assessed;
3. Provide a consistent framework to offset and mitigate transportation system impacts, gaps, and deficiencies; and
4. Allow for flexibility to facilitate transportation improvements that are based on the particular location, land use and development type.

Transportation staff will provide a summary of options being considered by the Regional Transportation Commission.

This agenda item is for discussion item only. Should there be an amendment to the Development Standards, the formal text amendment will be scheduled for review by the Planning Commission. The Commission will conduct a public hearing on the proposed text amendment and make a recommendation to the Board of Supervisors consistent with CCMC 18.02.

Attachment:  
CCDS 12.13: Traffic and Impact Study Requirements

The minimum width for bicycle lanes on roadways where on-street parking is prohibited will be four feet (4') as measured from the edge-of-pavement where curbs and gutters are not present and five feet (5') as measured from face-of-curb where curbs and gutters are present.

**12.12.10 Bicycle and Pedestrian Paths.** The design of bicycle and pedestrian paths will conform to the AASHTO "Guide for Development of Bicycle Facilities," bicycle section of the transportation plan, city ordinances, "Standard Specifications for Public Works Construction," and this section. Bicycle and pedestrian paths will be constructed at locations designated in the master plan.

The minimum width for two-directional bicycle and pedestrian paths shall be ten feet (10'). All bicycle and pedestrian paths will be designed as two-directional facilities. All bicycle and pedestrian paths will have a minimum two-foot wide graded shoulder which consists of a minimum of four inches (4") of type 2 class B aggregate base.

The structural section for these facilities shall be based on a soils engineering report recommendation unless waived by the city engineer. The minimum structural section for paths shall be two inches (2") of asphalt concrete, AC-20 using type 3 aggregate with fog seal over four inches (4") of type 2, class B aggregate base.

**12.12.11 Obstructions.** Obstructions shall not be located at intersections or other locations, such as driveways, that interfere with sight distance.

Obstructions such as power poles, pull boxes, mail boxes, pedestals, transformers, and telephone boxes shall be placed in easements adjacent to the right-of-way. Where obstructions exist in areas of proposed improvements, it shall be the responsibility of the developer to relocate existing obstructions out of sidewalk and pedestrian areas, and other areas of improvements.

**12.12.12 Cut and Fill Slopes.** Cut and fill slopes shall be set back a minimum of two feet (2') from the back of the sidewalk. If no sidewalk exists the setback shall be a minimum of seven feet (7') from back of curb. Back of curb drainage shall be installed as necessary. The right-of-way and/or slope easement shall extend at least two feet (2') beyond where the natural surface of the ground must be excavated or covered with fill dirt or materials in constructing cuts, fills, curb and gutter, sidewalk, and drainage improvements.

**12.12.13 Alleys.** Alleys required to serve a development shall be improved and conform to city standards. Alleys shall have a minimum right-of-way width of twenty-five feet (25'), minimum pavement width of twenty feet (20'), and comply with city drainage requirements.

**12.12.14 Alley Grades.** Longitudinal grades shall conform to standards for streets, with a cross slope of two percent (2%) minimum from the property line toward the center of the alley. Alleys shall be an inverted crown and if the longitudinal grade is less than one and nine-one-hundredths percent (1.09%) than a concrete valley gutter shall be provided.

(Ord. 2001-23, Development Standards).

### **12.13 - Traffic and impact study requirements.**

**12.13.1 General.** Traffic engineering and impact studies are required for the purpose of analyzing the impacts of development or improvement on the existing transportation system. The transportation system is composed of primarily surfaced streets, but also includes elements such as pedestrian paths, bike paths and lanes, bus routes, highways or other means of transportation. Traffic engineering studies shall be prepared and submitted to the city to identify and mitigate traffic impacts of development activity. All traffic studies for proposed development on now vacant land shall be prepared based on Carson City master plan land uses and densities.

Traffic engineering studies shall be presented in written format, accompanied by appropriate drawings, plans, or maps needed to clearly present the material. The study shall clearly list all assumptions and criteria upon which the analysis is based. All references shall be listed by author, publications, name and date. Traffic engineering studies are required if one or more of the following conditions are met:

1. The proposed development shall generate eighty (80) or more peak hour trips as determined using the Institute of Traffic Engineers (ITE) trip generation rates or other such sources accepted by the city engineer.
2. The proposed development shall generate five hundred (500) or more trips per day.
3. The proposed development contains phasing, and impacts from the cumulative phasing have net effects of items 1 or 2. In this case, a traffic study shall be required with the first phase of the development.
4. The city engineer determines that a traffic study is required. For example, a traffic engineering study may be required for small developments that do not satisfy one of the above requirements if they are near a school, community shopping or recreation area, near a historic area, or shall generate truck traffic. On small developments, the city may require an analysis of the proposed access, safety issues, and the internal street system or parking.
5. The proposed development contributes to the need for a traffic signal.

12.13.2 Scope of Work and Method. The city shall approve the scope of work and method of analysis prior to the start of any traffic engineering study. For all projects a scoping meeting with the city shall be conducted prior to the start of any traffic engineering study. All traffic engineering studies shall be prepared by, or under the direct supervision of, a professional engineer licensed in Nevada with adequate experience in transportation or traffic engineering. The study area shall include all portions of the transportation network that the city or the traffic engineer believe may be affected by the project. The analysis shall include all segments and intersections of the surrounding transportation system.

12.13.3 Traffic Engineering Study Requirements. In reviewing the scope of work proposed by the consultant for the traffic engineering study, the criteria in the following sections shall be considered by the city:

12.13.3.1 Previous Traffic Studies. Applications shall include a copy(ies) of previously approved studies applicable to the project or referenced in the new study. If a previously approved traffic engineering study exists for a portion of the study limits, then an analysis of the differences in results shall be included as part of the scope of the current traffic engineering study. Simply referencing previous studies shall not be sufficient.

12.13.3.2 Master Plan, Zoning and/or Tentative Map Applications. The traffic engineering study shall be based on the Carson City master plan designations, zoning and/or tentative map configurations, at the maximum allowable densities and uses.

12.13.3.3 Scope of Traffic Engineering Study. A sample table of contents for a traffic engineering study report is shown in Table 12.15. The traffic engineering study shall include the following items as a minimum:

1. Project Description.
  - a. Include site plans and location maps.
  - b. Describe and quantify the existing and proposed land uses and zoning, development intensities, and uses of the project site as follows:
    - (1) Existing Conditions: The traffic engineering study shall generate traffic volumes based on the existing land uses and densities based on existing street and transportation configurations. This shall be the basis for further comparison of the proposed project impacts on the existing transportation system. The existing traffic loading shall be based on current traffic counts, either conducted specifically for this study, or as approved by the city.
    - (2) Existing Conditions Plus Project: The traffic engineering study shall generate traffic volumes based on the existing land uses and densities plus the proposed project land uses and densities based on the existing street and transportation configurations. This

shall indicate the amount to which the project shall impact the existing transportation system.

(3) Long-Term Transportation Model: The traffic engineering study shall generate traffic volumes based on the existing land uses and densities, and city approved projects in the study area. This shall indicate the amount to which this project and all other proposed future projects shall cumulatively impact the existing transportation system.

c. Discuss the project phasing and timing of proposed and anticipated future development.

d. Submit site plans which shall include the location, separation distance, and number of proposed driveways and intersections. Include all existing and proposed collector, arterial, and expressway facilities through and within three hundred feet (300') of the project.

e. Describe the relationship of all access points to the transportation network including separation distance. The descriptions shall include existing driveways and intersections within three hundred feet (300') from the project site, and all intersections within the project site.

f. Describe bicycle and pedestrian facilities.

g. Discuss existing and proposed public transit service and bus stop improvements.

h. Describe all other features that affect traffic flow including crosswalks, school bus stops, and postal cluster boxes.

2. Trip Generation.

a. Trip generation for average daily trips (ADT), a.m. peak hour trips (including in and out traffic split), and p.m. peak hour trips (including in and out traffic split) shall be based on type and intensity of land use.

b. Trip generation shall be based on data published in "Trip Generation," by the ITE. If published data, or local trip generation studies are not available, the engineering firm shall obtain approval from the city for estimated trip rates.

c. Indicate how peak periods were identified.

d. Provide traffic counts for a typical day; include dates, times, and weather conditions. Traffic counts shall not be more than twelve (12) months old.

e. Provide traffic volume maps for all roads and intersections.

3. Trip Distribution and Assignment.

a. Describe trip distribution for a.m. and p.m. peak periods, noon hour, and existing and future scenarios evaluated in the traffic study.

b. Describe the methods used to distribute and assign trips.

c. Trip distributions and splits shall be approved by the city.

4. Impact Analysis.

a. Prepare an impact analysis including effects to level of service (LOS) for the affected roads and intersections for the following time periods for the a.m. and p.m. peak hours:

(1) Existing conditions without project.

(2) Existing conditions plus project (at project buildout).

(3) Carson City master plan build-out plus project.

b. For affected intersections, the "critical movement" method of analysis shall be used. An example of this analysis is provided in Figure 5-8 of the "Traffic Engineering Handbook, 4th Edition," (9).

- c. Pedestrian movements shall be considered in the analysis.
- d. Roadway operational characteristics and analysis techniques shall be based on the MUTCD by the Federal Highway Administration, "Guidelines for the Design of Streets and Highways" by AASHTO, and the "Highway Capacity Manual" by the Transportation Research Board.
- e. Analyze the adequacy of storage space for turning vehicles considering signal phasing, signal length, and traffic volumes.
- f. Analyze the adequacy of site driveways and internal circulation. Driveway design shall be based on the type of traffic that shall use the driveway and adjacent street. Service vehicle access shall be reviewed and based on the size and operating characteristics of service vehicles, particularly turning radii.
- g. Safety and neighborhood impacts shall be analyzed. Obtain and review traffic accident data for the study area.
- h. Analyze parking and pertinent site distances.
- i. Analyze the impact of the project on existing road structures. Analysis shall include:
  - (1) Both the site-generated traffic and the construction traffic associated with the project.
  - (2) An estimate of the total number of equivalent single axle loads (ESALs) generated by the project at completion of the project (including construction traffic), at five (5) years following initiation of construction, and at the year 2015.
  - (3) An estimate for each affected road, of the remaining life (in both ESALs and years) of the road both with (including construction traffic) and without the project. Non-destructive testing, such as falling-weight deflectometer testing, may be required for this analysis. Carson City shall, upon request, provide available information (if any) for this analysis. The traffic report may require a geotechnical engineering supplement to address traffic impacts.

5. Impacts and Mitigation.

- a. A traffic LOS D or better, in the context of providing a safe, efficient and convenient transportation system, shall be maintained through mitigation of impacts from all conditions on all city maintained arterial, and collector roads and at city road intersections, except as noted in the Carson City master plan. The engineering traffic study shall include recommendations for mitigation of project traffic impacts, including timing of improvements, and schematic drawings for recommended mitigation.
- b. The engineer shall determine the feasibility of constructing the mitigation measures. The feasibility analysis is not to be determined from the standpoint of the single project. In the case of existing or master-planned roads through or adjoining the project, recommended mitigation measures shall include dedication of right-of-way and construction of improvements identified in the transportation element of the Carson City master plan, and adopted transportation improvement plan and five (5) year plans.

6. Results.

- a. The traffic engineering study shall be presented in a neat professionally written form. The language used in the traffic study shall be straightforward, clear and concise. Technical terms and jargon, when used shall be kept to a minimum, and shall be clearly defined. Traffic studies shall include executive summaries at the beginning of the report, and technical appendices at the end of the report.
- b. The engineering traffic study shall further contain the following information:
  - (1) Basic Discussion: The traffic engineering study shall be prepared so that minimal reference to other sources of information is required to understand the study results.

Tables and figures shall be used where necessary to clearly list and itemize numbers and details of the study assumptions and results.

- (2) Existing Streets and Intersections: The impacts on the existing transportation system, without the proposed improvements shall be clearly explained. This shall be the basis for comparison of the developed conditions. It shall also provide a check against other sources of information such as the transportation element of the Carson City master plan, provide recommendations, based on this analysis of the required improvements needed to meet the Carson City master plan and LOS requirements for traffic capacity at all conditions.
- (3) New Streets and Intersections: The traffic engineering study shall clearly justify the proposed transportation system improvements and show how they meet the Carson City master plan criteria and policies. Additional improvements required to meet the Carson City master plan criteria and policies, not indicated in the original project assumptions and proposal shall be clearly detailed. The financial responsibility for all proposed improvements shall also be clearly detailed. Compare the results of this analysis with the capabilities of the proposed Carson City master plan build-out improvements. Where cost sharing is anticipated, all contributing parties shall be identified and a pro-rata share, both in percentage and dollar amount, shall be provided.

**Table 12.14**  
**Sample Table of Contents for Site Traffic Access and Impact Study Report**

- I. Introduction and Summary
  - A. Purpose of Report and Study Objectives
  - B. Executive Summary
    - 1. Site Location and Study Area
    - 2. Development Description
    - 3. Principal Findings
    - 4. Conclusions
    - 5. Recommendations (Specific mitigation measures and/or contributions)
- II. Proposed Development (Site and Nearby)
  - A. Summary of Development
    - 1. Land Use and Intensity
    - 2. Location
    - 3. Site Plan
    - 4. Zoning
    - 5. Phasing and Timing
- III. Area Conditions
  - A. Study Area
    - 1. Areas of Influence
    - 2. Areas of Significant Impact (may also be part of Division IV)
  - B. Study Area and Land Use
    - 1. Existing Land Uses

## Summary of Topic

- Carson City Public Works is considering changes to how traffic impact studies are conducted and is evaluating Traffic and Transportation Impacts related to development projects.
- Public Works Staff will show a presentation on:
  - What is a Traffic Impact Study and why are we reviewing them?
  - Current “Toolbox” - Codes and Practices
  - Goals for new process
  - Role of the Planning Commission
  - Options considered
  - Work Plan / Next Steps

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## Traffic Impact Study Options Considered

- Carson City Public Works considered five options :
  - Option 1 – Modified Existing Process
  - Option 2 – Qualified Consultant List
  - Option 3 – TIS Completed by City
    - 3a) Consultant Task Order Agreement
    - 3b) City Staff
  - Option 4 – Fee Collection – no TIS
  - Option 5 – Impact Mitigation
- Agency and Consultant Outreach occurred

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## Option 1: Modified Existing Process

- Enhancement of existing TIS process
  - City provides additional oversight with a more active role
  - Additional definition of when TIS is needed and level of analysis
  - Some enhancement of impact mitigation



PROS	CONS
<ul style="list-style-type: none"> <li>- Common industry process to assessing traffic related impacts</li> <li>- More defined coordination role with City</li> <li>- Additional definition for TIS requirements could provide for additional mitigations</li> <li>- Developer remains in control of who they want to hire</li> </ul>	<ul style="list-style-type: none"> <li>- Inconsistencies remain in how TIS methodologies are applied</li> <li>- Remains focused on roadway capacity</li> <li>- Developer / Consultant costs</li> <li>- Limited accepted guidance on how to assess multi-modal impacts</li> <li>- Unable to account for improvements outside of development frontage</li> </ul>

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## Option 2: Qualified Consultant List

- City Develops a list of qualified Consultants
  - SOQ Consultant Selection
  - Developers select from that list for their project
  - Option follows much of Option 1



PROS	CONS
<ul style="list-style-type: none"> <li>- City ensures only qualified consultants do the TIS</li> <li>- More consistent and defined coordination with the City</li> <li>- Common industry process to assessing traffic related impacts</li> <li>- Additional definition for TIS requirements</li> </ul>	<ul style="list-style-type: none"> <li>- Limits large national companies to use their consultants.</li> <li>- Potentially some inconsistencies still remain in how TIS methodologies are applied</li> <li>- Remains focused on roadway capacity</li> <li>- Potential for conflict with developer and consultant</li> <li>- Others similar to Option 1</li> </ul>

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## Option 3: TIS Completed by City



- City completes the TIS. Two sub-options:
  - 3a – City Hires Consultant 3b – City Completes in-house
  - Results of TIS and mitigation requirements given to development to construct
  - City charges a fee for this effort

PROS	CONS
<ul style="list-style-type: none"> <li>- City controls process and ensures consistent TIS per City defined requirements</li> <li>- Complete understanding of a project's impact to the transportation network</li> <li>- Better definition of development needed improvements</li> <li>- Potentially lower cost (3b)</li> </ul>	<ul style="list-style-type: none"> <li>- Unusual method</li> <li>- Potential for conflict with the results. A dispute resolution process needed</li> <li>- Would require creation of new fee structure accounting for City of consultant costs</li> <li>- City lacks staff and software need to complete TIS</li> <li>- Unable to account for improvements outside of development frontage</li> </ul>

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## Option 4: Fee Collection



- Implementation a fee for transportation improvements based on a defined schedule or set of defined parameters:
  - Specific Requirements governed by NRS

PROS	CONS
<ul style="list-style-type: none"> <li>- No longer a need to complete a TIS</li> <li>- A new revenue opportunity with impact fees going directly to constructing the roadway network or a specific project instead of to creating a TIS.</li> <li>- Some flexibility for transportation improvements</li> <li>- Developers spend less money on Consultants</li> <li>- Could be a simple, consistent and clearly defined process</li> <li>- Common practice</li> </ul>	<ul style="list-style-type: none"> <li>- A new cost for development on Carson City</li> <li>- Requires creation of new committee to oversee process</li> <li>- City has more responsibility to perform analysis on road network as a result of development projects</li> <li>- Additional data collection needed to be completed by City to understand the scope and cost of a capital project</li> <li>- Additional NRS requirements and limitations</li> </ul>

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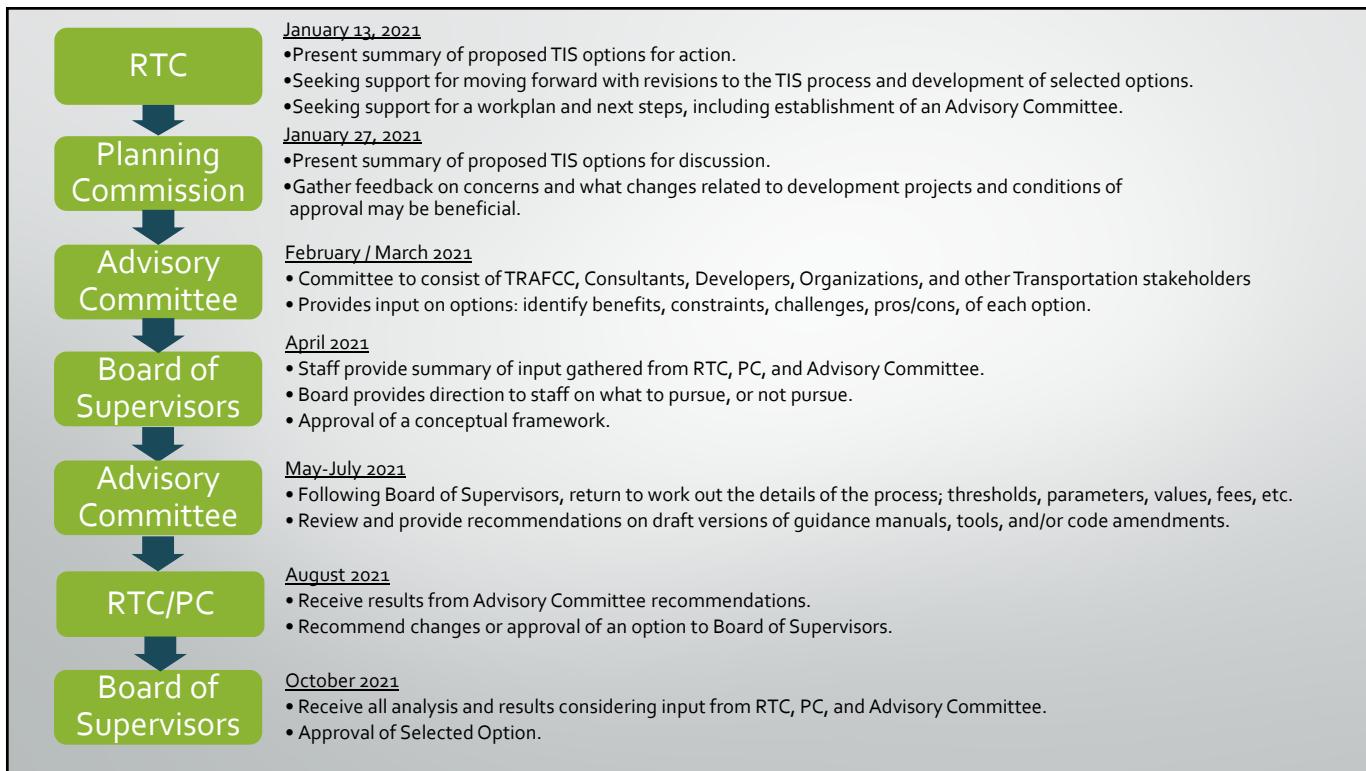
## Option 5: Impact Mitigation

- Mitigate / Offset transportation impacts by choosing from a menu of improvement options
  - Mitigate all trips generated
  - Level of mitigation based on project type / size



PROS	CONS
<ul style="list-style-type: none"> <li>Limits need to do a TIS</li> <li>Can be applied to all types of development projects</li> <li>More flexibility in what options are available to City and to Developer</li> <li>Ability to enhance the transportation network beyond traffic impacts to address nearby needs</li> <li>Development projects assist in constructing the RTP projects lessening the costs required by the City</li> </ul>	<ul style="list-style-type: none"> <li>Depending on type of development, may still need a TIS</li> <li>Potential for new costs for certain development projects</li> <li>Might construct features that are not specifically needed</li> <li>New, unique, concept not widely used in the industry</li> <li>Lots of details to determine and tools to create</li> </ul>

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