



MEMORANDUM

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TO: Planning Commission

THRU: Jason Reynolds, Planning Division Manager

FROM: Ceila Rethamel, Engineering Services Division Manager

DATE: February 4, 2025

SUBJECT: Development Review of Traffic Impacts and Infrastructure Study Session



Background

Over the last couple of months, several questions have come up in Planning Commission meetings regarding traffic and infrastructure improvements. The Engineering Services Division is the group responsible for reviewing land use applications to ensure that roadways and storm water are constructed to the County’s standards. Impacts to traffic are included in that review. This Study Session is aimed at answer questions that have been raised at Planning Commission by either the public or Commissioners, provide an overview of the traffic components that are required during the land use applications, and describe how roadways are improved in Unincorporated Arapahoe County. This study session will cover the following topics:

- Answer recent questions regarding traffic and infrastructure improvements
- Overview of Development Review Process with respect to traffic and infrastructure
- Highlight Traffic Impact Studies
- Describe Traffic Warrants
- Touch on Transportation Master Plan and capital improvement projects

Attachment

1. Traffic Impacts and Infrastructure Powerpoint Presentation



Development Review of Traffic Impacts and Infrastructure

Planning Commission
Study Session – February 4, 2025

Background

- Infrastructure Design and Construction Standards define the minimum standards for public and private roadways within Unincorporated Arapahoe County
- Roadway Characteristics and Design Specifics are utilized for both land development cases and capital improvement projects
- Impacts to traffic and infrastructure are a primary focus for the Case Engineers who review land use applications



Questions Heard During Planning Commission

- Road is congested now. How can you add more development?
- The infrastructure can't handle the volume. When will the roadway/interchange/intersection be improved?
- They are adding so many more houses, why is a traffic impact study not required?
- When is this 4-way stop going get changed to a traffic signal?

Agenda

- Goal of this study session is to answer recent questions regarding traffic and infrastructure improvements
- Development Review Process
- Highlight Traffic Impact Studies
- Describe Traffic Warrants and Level of Service for Roadways
- Touch on Transportation Master Plan and capital improvement projects

Development Review Process

- Traffic impact study or Traffic conformance letter is required for all new land development proposals (good for 2 years)
- Traffic Impact Study can be waived
- Frontage improvements along unincorporated Arapahoe County ROW is requested (two lanes, curb, gutter & sidewalk)
- Additional ROW may be required



Traffic Impact Studies

B. When is a TIS required?

Traffic Impact Studies are generally required for all new land development proposals. TIS requirements for redevelopment or change in use of existing sites will be determined on a case-by-case basis. Mitigation or improvements by the Developer may be required regardless if a TIS is required.

The need for a TIS should be assessed as early as possible in the development process to ensure maximum flexibility for eliminating traffic-related problems. The TIS is dependent on site specific characteristics such as location, trip generation, existing road conditions, and type of development proposed, as such the requirements of a TIS may vary from site to site.

The need for a TIS, TIS update or TIS waiver will be determined by the Department of Public Works and Development, Engineering Services Division in accordance with the intent of these guidelines. The County reserves the right to waive or modify the requirements of a TIS as outlined within these guidelines. However, **the Developer may still be required to mitigate traffic delays or complete roadway improvements necessary to ensure acceptable traffic operations, regardless of whether or not a TIS is required.**

Excerpt from IDCS, Appendix B, Guidelines for Traffic Impact Study



ARAPAHOE COUNTY

Traffic Impact Studies

- Pre-Study Meeting
- Trip Generation
- Trip Distribution and Assignment
- Existing and Future Conditions
- Capacity Analysis
- Traffic Signal Needs
- Safety Analysis
- Queuing Analysis
- On-Site Circulation
- Improvement Analysis



Traffic Impact Studies - Waived

B.1 Waiver Requirements

A TIS requirement may be requested to be waived if **all** the following conditions are met:

- The average trip generation of the proposed project is less than 250 trips per day or 25 trips in the peak hour
- The combination of the proposed development traffic plus existing traffic does not exceed an average of 150 vehicles per day on any unpaved road
- Access is not being requested to either a State Highway or County arterial roadway No current traffic problems or local area concerns, such as an offset intersection or a high accident data.

If the conditions listed above are met, the applicant may submit a waiver request to Engineering Services Division Case Engineer. The TIS waiver request must be prepared by the Developer's Transportation Consultant Engineer (stamped by a Colorado Professional Engineer).

Excerpt from IDCS, Appendix B, Guidelines for Traffic Impact Study



Traffic Conformance Letter

- Traffic Conformance Letter – statement by Traffic Engineer that traffic loading will not change significantly
- Background information of prior TIS is referenced
- Illustrates how the proposed changes/modification do or do not impact the prior TIS
- Still reviews traffic count, trip generation and potentially other traffic characteristics



Traffic Warrants

- Before a traffic signal is considered, the intersection must meet warrants
- Warrant is a threshold condition that must be satisfied under average or normal conditions
- Example: All-way Stop Control Warrant A: Crash Experience

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Section 2B.13 All-Way Stop Control Warrant A: Crash Experience

Option:

- 01 All-way stop control may be installed at an intersection where an engineering study indicates that:
- A. For a four-leg intersection, there are five or more reported crashes in a 12-month period or six or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of all-way stop control.
 - B. For a three-leg intersection, there are four or more reported crashes in a 12-month period or five or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of all-way stop control.



Traffic Warrants

Example: Signal Warrant 7, Crash Experience

- There are several warrants for signals that are used to justify the expense of a traffic signal

Section 4C.08 Warrant 7, Crash Experience

- Support:
- 01 The Crash Experience **signal warrant** conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.
- Guidance:
- 02 The need for a traffic control signal should be considered if an engineering study finds that all of the following criteria are met:
- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
 - B. At least one of the following conditions applies to the reported crash history (where each reported crash considered is related to the intersection and apparently exceeds the applicable requirements for a reportable crash):
 1. The number of reported angle crashes and pedestrian crashes within a 1-year period equals or exceeds the threshold number in Table 4C-2 for total angle crashes and pedestrian crashes (all severities); or
 2. The number of reported fatal-and-injury angle crashes and pedestrian crashes within a 1-year period equals or exceeds the threshold number in Table 4C-2 for total fatal-and-injury angle crashes and pedestrian crashes; or
 3. The number of reported angle crashes and pedestrian crashes within a 3-year period equals or exceeds the threshold number in Table 4C-3 for total angle crashes and pedestrian crashes (all severities); or
 4. The number of reported fatal-and-injury angle crashes and pedestrian crashes within a 3-year period equals or exceeds the threshold number in Table 4C-3 for total fatal-and-injury angle crashes and pedestrian crashes; and
 - C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major street and the more critical minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant (see Section 4C.05).

Table 4C-2. Minimum Number of Reported Crashes in a One-Year Period

Number of through lanes on each approach		Total of angle and pedestrian crashes (all severities) ^a		Total of fatal-and-injury angle and pedestrian crashes ^a	
Major Street	Minor Street	Four Legs	Three Legs	Four Legs	Three Legs
1	1	5	4	3	3
2 or more	1	5	4	3	3
2 or more	2 or more	5	4	3	3
1	2 or more	5	4	3	3

^a Angle crashes include all crashes that occur at an angle and involve one or more vehicles on the major street and one or more vehicles on the minor street

Infrastructure Improvements

- 2 lanes, curb, gutter and sidewalk is minimum
- Development agreements can require more improvements

For example:

- ✓ Underpasses
- ✓ Floodway or Drainage Improvements
- ✓ Interchange Improvements
- ✓ Shared Path and Trail Connections



Infrastructure Improvements

- TIS may also require additional infrastructure improvements based off project impacts
- Also considers current capacity of existing roadways
- Does the roadway require improvements due to asset at the end of its useful life?

Infrastructure Is Over Capacity

- Development is often used to augment County funding for roadway improvements.
- Roads that are not used frequently enough (ie. warrants are not yet met) can degrade at a much faster rate.
- The balance is to have the roadway improvements completed prior to the full build-out of the development.

Future Revisions

- Updated roadway cross-sections
- New Traffic Signal Design Standards and Specifications
- New Pavement Marking Standards
- Updates as needed from Transportation Master Plan updates

Questions?

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