Guidelines for Traffic Impact Analysis

City of Kyle Transportation & Public Works

October 2025

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Background

The purpose of the Transportation Impact Analysis (TIA) Guidelines is to provide a consistent framework for evaluating the potential transportation impacts of proposed developments.

A TIA is required to assess the transportation impact of a proposed development that is expected to produce additional vehicular demand on the transportation network. This includes new sites as well as redevelopment and change in land use. The analysis must demonstrate that the proposed development aligns with the City's adopted plans and does not adversely affect the transportation network.

A traffic impact analysis must:

- Be signed and sealed by a professional engineer with demonstrated experience in traffic or transportation engineering,
- Provide key information about proposed development, including size, location, buildout assumptions, and anticipated trip generation (daily and peak hour)
- Evaluate the impact of the proposed development on nearby intersections and roadways
- Include recommended mitigation strategies, conceptual plans (if applicable), and cost estimate for improvements related to operations, site access, circulation and safety
- Propose the development's contribution to the identified mitigations and improvements
- *Remain valid for a period of up to five (5) years from the date of City approval or until significant changes occur to the project scope or surrounding network*

Determination

City uses three (3) levels of analysis depending on the scale and expected **unadjusted** trip generation of the project:

- **Driveway Analysis:** Required for developments expected to generate between *1,000 to 2,000 daily trips*
- **Traffic Impact Analysis (Neighborhood Scale):** Required for developments expected to generate between *2,000 to 5,000 daily trips*
- **Traffic Impact Analysis (Regional Scale):** Required for developments projected to *exceed 5,000 Daily trips*

To initiate the process, the applicant must submit the *Traffic Study Determination Worksheet* as provided by City staff or found on the City website, which will be reviewed by the City to determine whether a transportation study is required, and if so, what level of analysis is appropriate. The worksheet must include:

- The proposed land use(s) and development intensity (e.g. square feet, dwelling units),
- Any existing land uses and their respective intensities on the site, and whether they will remain or be replaced
- The project location along with proposed or existing site access points.

An applicant shall submit a TIA Determination Worksheet prior to requesting a scoping meeting. City will complete the trip generation sections of the worksheet. Based on the thresholds outlined above, inform the applicant of the required level of analysis, if any. A scoping meeting request or a Driveway Analysis will not be accepted without a city signed *Determination Worksheet*.

Trip Generation

The 11th Edition (or latest) of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* should be used to determine the number of trips generated by a proposed development in the TIA Determination Worksheet.

Trip reductions for pass-by trips or internal capture will not be assessed as part of the determination process. The only allowable reduction at this stage is for existing, occupied land uses on the site.

If proposed land use(s) does not match an ITE Land Use category, the applicant may discuss alternative trip rates with the City. In such cases, the applicant must provide data from at least three (3) comparable sites that reflect the proposed land use and surrounding context, with a strong preference for sites located in Texas. The studies should be both comparable and context-sensitive, considering factors such as land use types, intensity and location.

Process

City aims to follow a general schedule for reviewing submittals, but review times may change depending on the depth and complexity of the site in review. Review timelines will only begin when all required documents have been submitted, and all fees have been paid. The following outlines the typical review timeframes once a completed submittal has been accepted:

Submission

The applicant must submit to City the items specified below as follows:

Traffic Study Determination and Scoping Document

- All determination and scope correspondence will take place via e-mail with City of Kyle (CoK) Transportation & Public Works (TPW) staff

TIA and Driveway Analysis:

- TIA and Driveway Analyses to be submitted as part of a land development application. For example, a PUD, DA, or Rezoning

Fees

All applicable fees must be paid in full before any transportation review can begin. The 2025 - 2026 fee schedule, updated annually, is available online. Please refer to the schedule to verify the most up-to-date fees for reviews and related services.

Study Requirements and Guidance

Standard Analysis Requirements

These analyses represent the typical evaluations that should be conducted and included as part of any transportation study, as identified by the City Engineer. This section provides guidance for reference and serves as a framework to support the TIA preparation. Not all analyses listed will be required for every report; however, any analysis included in the approved study scope must be completed and included in the final report.

Any deviation from these standards must be discussed and agreed upon with the City Engineer.

Trip Generation

As noted above, trip generation shall follow the latest edition of the ITE *Trip Generation Manual*. The ITE *Trip Generation Handbook*, 3rd Edition, should be used to select the appropriate method, average rate or fitted curve, based on land use and development intensity. Vehicle trip reductions will be considered as part of a driveway study and should be applied in the following order to calculate *adjusted trips*: Internal Capture, Pass-by Reductions, and Existing Trip Reductions. Guidance for the categories for these reductions is described below:

- **Internal Trip Capture:** Internal capture generally comes from trips that stay within a single development site or between adjacent uses within the same development. The percentage of internal trip capture should be estimated using NCHRP (e.g. NCHRP Report 684), and the reports should be included as part of the report.
- **Pass-by Trips**: Pass-by trips are trips that stop while already traveling on the adjacent road, rather than generating a new trip on the street network. Pass-by trips should be estimated using the 3rd Edition of the ITE *Trip Generation Handbook*.
    - *Note: If internal capture and pass-by reductions are both being taken, pass-by reductions should be shown after the internally captured trips have been removed.*
- **Existing Trips**: Existing trips should be based on the latest edition of the ITE *Trip Generation Manual* and will be considered for any land use being replaced on the proposed site.

Turn Lane Analysis

Turn Lane Analyses shall be conducted in accordance with NCHRP criteria and should be performed for every proposed driveway taking access to City or County maintained roads. When evaluating driveways along TxDOT maintained roadways, the analysis must follow the criteria and standards outlined in the TxDOT Roadway Design Manual.

The following figures should be included as part of this section, as applicable:

- Build out volumes at site driveways (Growth + Site Trips)
- Appropriate NCHRP Spreadsheet (*NCHRP Report 457*)
- TxDOT Turn Lane Analysis (Table or Graph as required)

Turn Lane Design

If a turn lane is warranted on a County or City roadway based on the turn lane analysis, its design and length shall comply with the criteria established by AASHTO. For turn lanes on TxDOT roadways, design lengths and configurations shall conform to the requirements set forth by the TxDOT Roadway Design Manual.

Modified turn lane lengths may be considered when driveway spacing, site constraints, or location limitations exist; such modifications shall be reviewed and discussed with the City and any other applicable jurisdictional staff.

The following figures should be included as part of this section, as necessary:

- Proposed Turn Lane Schematic

Driveway Spacing

For driveways taking access to City and County roads, minimum driveway spacing should follow the minimum spacing requirements of the City.

Driveways taking access to TxDOT controlled roadways shall consider TxDOT standards established in TxDOT's Access Management Manual.

A warranted right or left turn lane at a driveway or intersection will determine the minimum separation distance to the next access point. New driveways should not be placed within a right turn lane nor should they interfere with the full length of a left turn lane.

The following figures should be provided as part of this section, as applicable:

- Map or site plan illustrating driveway spacing along with spacing to adjacent and opposing roadways

Intersection Sight Distance

For each proposed site driveway, the analysis must document available intersection sight distance (ISD). The analysis should include scaled plans and profiles documenting both horizontal and vertical sight lines. ISD criteria are to be determined using the latest edition of the AASHTO guidelines. If the required sight distance cannot be achieved at the proposed driveway location, the analysis should identify measures to improve safety at the driveway.

The following figures should be provided as part of this section, as applicable:

- Map to scale showing ISD sight lines
- Profile showing vertical ISD sight lines

Methodology for Phased Developments

When a project is planned in multiple phases, the following assumptions should guide the analysis.

Site Trips

Each subsequent phase must account for the site trips generated by all previous phases in all analysis scenarios, No-Build, Build, and Mitigated, unless otherwise directed by the Engineer during Scoping.

Mitigations

Signal timing adjustments should be assumed in the No-Build condition for phases beyond the first but does not apply to the initial phase.

Improvements should be tied to the specific phase in which they are required and should only be carried forward into the No-Build or Build conditions of later phases if they are 100% paid for in a previous phase and are necessary for the prior phase to meet minimum required LOS or safety. Clear documentation must demonstrate that the proposed mitigations will be constructed and operational in time to support the development of the subsequent phase.

Example of Phasing Approach:

Phase	Scenario	Trips	Mitigation Pro-Rata	Roadway netowrk
Phase 1	NB	existing+BG		NB
	Build	E + BG + Ph1		NB + DWY
	Mit	E + BG + Ph1	Ph1/Build	NB + DWY + PH1 Mit
Phase 2	NB	E + BG + Ph1		NB + PH 1 DWY
	Build	E + BG + PH1 + Ph2		NB + PH 1 DWY + PH 2 DWY
	Mit	E + BG + PH1 + Ph2	Ph2/Build	NB + PH 1 & 2 DWY + Ph 2 Mit*
*Ph 2 Mitgation may include similar or the same measures utilized in the Ph 1 analysis.				

Driveway Study

For developments generating *1,000 to 2,000* daily trips a driveway study should contain the information described in the following six (6) sections.

Executive Summary

This section should contain a brief overview of the site location, site description, and existing/proposed site driveways. The key results of this study should be presented, including principal findings, conclusions, and identified mitigation improvements, if any.

Introduction and Background

This section should contain a brief overview of the purpose of the study. Information such as site location, land use and intensity, trip generation, site access and buildout year should be included.

The following figures should be included as part of this section, as applicable:

- A map providing site location
- A site plan showing land use information and driveway locations.

Trip Generation

Trip generation must follow the latest ITE *Trip Generation Manual* and the *Trip Generation Handbook, 3rd Edition* for selecting methods. Adjusted trips should account for reductions in the following order: internal capture, pass-by, and existing trips. See Standard Analysis Requirements above for detailed guidance.

Data Collection

Daily (24-hour) traffic volumes should be collected and provided for roads identified as access points for proposed driveway locations. Counts should be taken while schools are in session.

Growth

When establishing background traffic on the roadways for the buildout year, the applicant should calculate annual growth rate. Estimated annual growth rates can be determined by comparing historical data. The calculations and methodology performed should be included in the report.

Turn Lane Analysis

Turn Lane Analyses at site driveways should be conducted using NCHRP criteria at driveways taking access to local or county roads, while driveways accessing TxDOT roadways should adhere to TxDOT standards. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be included as part of this section, as applicable:

- Appropriate NCHRP Spreadsheet (*NCHRP Report 457*)
- TxDOT Turn Lane Analysis (Table or Graph)

Turn Lane Design

If a turn lane is warranted, design and length shall follow AASHTO criteria for City or County roadways, and the TxDOT Roadway Design Manual for TxDOT facilities. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be included as part of this section, as necessary:

- Proposed Turn Lane Schematic

Intersection Sight Distance

Driveway analyses must document intersection sight distance (ISD) using AASHTO criteria, with scaled plans/profiles of sight lines. If minimum ISD cannot be met, safety improvements should be identified. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be provided as part of this section, as applicable:

- Map to scale showing ISD sight lines
- Profile showing vertical ISD sight lines

Driveway Spacing

Driveway spacing must follow City/County minimums (per table provided above) or TxDOT Access Management Manual, with added separation where turn lanes are warranted. See the guidance provided in Standard Analysis Requirements for more information.

. The following figures should be provided as part of this section, as applicable:

- Map to scale providing driveway spacing

Traffic Impact Analysis (TIA)

Scope Guidance

A TIA Scope should be completed, accepted, and signed before the preparation of an official TIA report. The purpose of the scope is to establish ***study intersections, background projects, growth rate, trip distributions,*** **and any** ***additional analysis*** that will be necessary as part of the study.

A scope shall include the following, as applicable:

- Site Vicinity Map
- Proposed Site Plan
- Land use, size, and intensity of the proposed development.
- Trip Generation
  - Trip Generation should follow the guidance provided in the Driveway Analysis section of the Guidelines above.
- Proposed phasing and anticipated opening year for each phase of development
- Estimated annual growth rate based on historical data
- Background Projects
- Relevant roadway realignments or major construction projects in the study area
- Trip Distribution
  - Trip distribution assumptions should be supported by existing traffic data and informed by the functional classification of study roadways, their role in subregional connectivity, and the relative throughput of key corridors within the study area. Distributions should reflect observed or anticipated travel patterns where available.
- Study intersections to be analyzed

As part of the scoping process, the City may identify additional analyses that are required. These may include, but are not limited to:

- Sight Distance Analysis
- Turn Lane Analysis
- Signal Warrant Analysis
- Roundabout Warrant Analysis
- ICE Analysis
- Queuing Analysis

Selection of Study Intersections

Study Intersection selection will depend on the number of trips being generated and be context sensitive to the location of the proposed project site.

For developments generating *2,000 to 5,000* daily trips, the study area may include intersections up to *1 to 1.5 miles* from the site. For developments generating *more than 5,000* daily trips, the study area shall be defined at the *discretion of the city staff*. The table below summarizes the study types and corresponding guidance.

Study Type	Daily Trips Generated	Study Area Guidance
Neighborhood Scale	2,000 to 4,999 daily trips	*1 to 1.5 miles from the site*
Regional Scale	5,000+ daily trips	*Discretionary coverage*

TIA Requirements and Guidance

All TIAs must, at a minimum, contain the following sections:

Executive Summary

The Executive Summary should include an overview of the study, the site location, list the study intersections, evaluated peak hours, driveway access, trip generation, and proposed land uses. It should also summarize the study results, identified mitigations, and outline the developer's contribution to the roadway network.

Table of Contents

The Table of Contents should list the major sections of the report, as well as all included tables, figures, and appendices.

Intro/Background

The Introduction/Background section of the report should provide a brief overview of the purpose of the study. This section should identify the site location, land use and intensity. Daily trips and peak period trips, build out year(s), site access and driveway controls should also be summarized.

The following figures should be provided as part of this section, as applicable:

- Site location map showing the selected study intersections
- A site plan that shows the site access points

Methodology for Intersection Capacity Analysis

A capacity analysis should be conducted for all scenarios relevant to the study, including the No-Build, Build, and Mitigated conditions. If a project phasing or land use mix is not defined, updated analysis may be required when future site plans are submitted.

The capacity analysis is to be performed using *Synchro* for the study periods established at the time of scoping (e.g. *AM, PM, midday, weekend, etc.)* All intersections within the study area should be modeled using a single Synchro file, using real world coordinates. Signal timing plans should be obtained from the agency that controls each signal, typically TxDOT, and must be included in the appendix. For proposed signals, reasonable timing plans must be proposed.

Results must report using the latest HCM methodology, with previous editions used only if necessary, and should be documented in the report. Synchro outputs for each scenario should include the following: for ***signalized intersections*****,** capacity results should be reported by ***movement*****;** for ***unsignalized intersections,*** results should be reported by **approach.** Required outputs include the following:

- Volume/Capacity (V/C) ratio,
- 95th Percentile Queue (ft),
- Existing and Proposed storage lengths (ft),
- Delay (s), and
- Level of Service (LOS)

Below is an example of the format for presenting intersection capacity analysis results.

[YEAR] [SCENARIO]							
Node Number	**Intersection Name**	**Movement/ Approach**	**V/C Ratio**	**95th Queue (ft)**	**Existing/Proposed Storage Lengths (ft)**	**Delay (s)**	**Level of Service**
1	Main St & 1st Ave	EBL	0.75	50	100	51.0	F

Mitigation shall be shown to achieve LOS D or better at all study intersections, with a V/C < 1, and with 95th percentile queues not exceeding the existing or proposed turn-bay storage lengths. For signalized intersections, mitigations should be proposed for any movement that does not meet this standard, and for unsignalized intersections, mitigations should be proposed for any approach that does not meet this standard. Mitigations are expected for any movement or approach operating at LOS E or F.

If an intersection or approach is already operating at LOS E or F under the **No-Build condition**, the proposed mitigated condition must, at a minimum, maintain the LOS and delay of the No-Build scenario. All proposed improvements should be documented clearly in the report.

When physical constraints or inadequate right-of-way prevent construction of additional capacity, justification for the constraints shall be provided with approximate right-of-way based on parcel data from Hays Central Appraisal District (Hays CAD) in an exhibit.

Existing Operating Conditions

This section should summarize the existing conditions of the surrounding roadway network. The discussion should highlight key findings from the Synchro analysis, including any failing movements/approaches under *existing conditions*, and should address the following elements:

Surrounding Thoroughfare Characteristics

This section of the report should provide a brief description of the existing roadway network within the approved study area. The description should include roadway classifications and identify the controlling jurisdiction (City, County, TxDOT, or Private). Additional details such as posted speed limits, number of lanes, and geometric features (e.g., sidewalks, bike lanes) should be included.

Planned Network Improvements

If any major thoroughfare projects are planned or expected to be implemented within the analysis horizon, they should be described in this section of the report. Additionally, if any proposed roadway plans are anticipated to result in a realignment that reroutes major traffic, this should be identified, along with a description of the methodology that will be used to redistribute traffic.

Turning Movement Count Data

This section should include a description of the traffic counts collected, including the dates and peak periods during which they were taken. Any adjustment factors established during the scoping process (e.g., seasonal adjustments) should also be documented and explained. Typically counts will include two of the following peak hours, unless directed otherwise by the city:

- AM Peak Hour (7am – 9am)
- PM Peak Hour (4pm – 6pm)
- PM Peak Hour Near a School Site (3pm – 5pm)
- Saturday Peak Hour (12pm – 2pm)

The following figures should be provided as part of the Existing Operations, as applicable:

- Existing traffic volume figure

No-Build Operating Conditions

This section should provide an overview of the roadway network and traffic conditions projected for the build-out year, assuming the site is not developed. The discussion should highlight key findings from the Synchro analysis, including any failing movements/approaches under *no-build conditions*. This section should also address the future traffic conditions and roadway characteristics prior to the site coming online, and include the following elements:

Background Projects

Background projects identified at the time of scoping should be described, including planned land uses and intensities, and the projected build out year(s), and/or the proportion of the project that has been constructed, if relevant. These background projects should be included as-is in the TIA and do not need to be grown using the established growth factor. The methodology for incorporating these projects into the traffic analysis should be clearly explained. Site generated background trips that would pass through any given intersection should follow the flow patterns established in the background TIA. Volumes should be assigned across all relevant study intersections in a manner that maintains network continuity and prevents the creation of artificial sinks and/or sources. Aerial imagery or other reliable sources should be consulted to verify the construction timeline for all background projects.

Improvements associated with background projects may only be included if there is reasonable certainty that they will be completed and operational within the analysis period. Any potential mitigations from background projects that are proposed for inclusion in the report should be reviewed and coordinated with the City Engineer.

Growth

The report should present the growth rate calculations and document the growth rate that was established at the time of scoping.

The following figures should be provided as part of the No-Build Operations, as applicable:

- A site map showing the location of the background projects in relation to the site location
- A volume figure showing the background project trips per peak period routed through the site's study intersections.
- For more than one (1) background project, volume figure required for each one and a combined total volume figure for all background projects.
- No-Build traffic volume figure illustrating the background projects added to the forecasted growth (Growth + Background Trips)

Build Conditions

This section should provide an overview of the roadway network and projected traffic conditions for the build-out year, assuming the proposed development is constructed. The discussion should highlight key findings from the Synchro analysis, including any failing movements/approaches under *build conditions*. It should describe future traffic patterns and roadway characteristics with the site in place, including the following elements:

Trip Generation

Trip generation shall be based on the guidance provided in Standard Analysis Requirements and should reflect the agreed-upon assumptions established during scoping. All applicable vehicular trip reductions will be applied and must be documented. Please contact the City Engineer if a major variance from the agreed-upon trip generation is anticipated.

Trip Distribution and Assignment

Trip distribution shall be based on existing data, roadway classification, subregional connectivity, and roadway throughput, and should reflect observed or anticipated travel patterns. The distributions established during the scoping process should be documented in the report.

The following figures should be provided as part of the Build Operations, as applicable:

- Trip Distributions & Assignments Figure illustrating the % of Traffic coming in and out of the site
- Pass-By Trip Assignment figure showing the % of pass-by traffic at the site driveways
- Pass-by traffic volume illustrating the pass-by trips per peak period
- Site Trip traffic volume figure illustrating the site trips per peak period
- A Build-Out traffic volume figure (No Build – Pass-by Trips + Site Trips)

Mitigated Conditions

This section should summarize the proposed improvements per phase(s) designed to mitigate the development's impact on the study area. It should highlight key results from the Synchro analysis, including any movement or approaches that continue to operate at failing levels under *mitigated conditions*.

Identified improvements must be described and feasibility should be assessed. *When physical constraints or inadequate right-of-way prevent construction of additional capacity, justification for the constraints shall be provided with approximate right-of-way based on parcel data from Hays Central Appraisal District (Hays CAD) in an exhibit.*

The following figures should be provided as part of the Mitigation-Operations, as applicable:

- Exhibit(s) detailing and dimensioning any major geometric improvement proposed.
- Exhibit(s) detailing physical constraints or inadequate ROW that prevents the construction of the proposed improvements.

Additional Analysis

Any additional analysis should be included as relevant, or if it was required as part of the approved study scope. Additional may include the following:

Intersection Sight Distance Analysis

Sight Distance reports should adhere to AASHTO standards, and should follow the guidance provided in Standard Analysis Requirements.

The following figures should be provided as part of this section, as applicable:

- Map to scale showing ISD sight lines
- Profile showing vertical ISD sight lines

Turn Lane Analysis

Turn Lane Analyses at site driveways should be conducted using NCHRP criteria at driveways taking access to local or county roads, while driveways accessing TxDOT roadways should adhere to TxDOT standards. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be included as part of this section, as applicable:

- Appropriate NCHRP Spreadsheet (*NCHRP Report 457*)
- TxDOT Turn Lane Analysis (Table or Graph)

Turn Lane Design

If a turn lane is warranted, design and length shall follow AASHTO criteria for City or County roadways, and the TxDOT Roadway Design Manual for TxDOT facilities. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be included as part of this section, as necessary:

- Proposed Turn Lane Schematic

Signal Warrant Analysis

A signal warrant analysis must be completed for any intersection where a signal is recommended or where the approved study scope requires it. The assessment should follow the Texas MUTCD procedures for all applicable warrants, using traffic volumes from the Existing, No-Build and Build conditions when a signal is warranted based on the analysis.

The detailed Signal Warrant Analysis should be provided as part of the Appendix.

Driveway Spacing

Driveway spacing must follow City/County minimums (per table provided above) or TxDOT Access Management Manual, with added separation where turn lanes are warranted. See the guidance provided in Standard Analysis Requirements for more information.

The following figures should be provided as part of this section, as applicable:

- Map to scale providing driveway spacing

Queuing Analysis

A queuing analysis shall be conducted at all site driveways and study intersections defined at the time of scope. The analysis should identify the project's queues and ensure that both on-site and off-site storage can accommodate the demand generated by the site.

Queues shall be reported as part of the Capacity Analysis. The 95th percentile queues shall not exceed the existing or proposed turn bay storage lengths, this condition must be clearly identified and considered when proposing mitigations.

Recommendations and Conclusion

This section should summarize the proposed improvements per phase(s) designed to mitigate the development's impact on the study area. A cost estimate per improvement should be included, and a pro-rata contribution must be provided in a table.

Mitigation Contributions

The City of Kyle will accept developer contributions to fund mitigations improvements through either **direct construction improvements (*preferred)*** or a **pro-rata contribution.** Developers are encouraged to construct required improvements whenever feasible to support timely implementation and meet mitigation obligations.

Turn Lanes providing access into the site are considered fully the responsibility of the developer and must be constructed improvements.

Similarly, pro-rata contributions will not be accepted for signal timing optimization; the full cost of signal timing adjustments is the responsibility of the developer.

Cost Estimate (Current 2025)

All construction improvements included in the analysis must be supported by detailed cost estimates. Estimates should be referenced in the *Recommendation and Conclusion* section of the report; calculations should be provided in an Appendix and include the source of each cost along with an itemized breakdown per bid item.

The following are examples of accepted cost estimates for the City of Kyle and ***may be used as reference when preparing TIA cost estimates***:

Improvement	Unit	Accepted Unit Cost
Signal Installation	Signal (each)	$500,000
One Lane Roundabout	Per Roundabout (each)	$2,000,000
Two Lane Roundabout	Per Roundabout (each)	$3,000,000
Signal Timing Adjustment	Per Signal (each)	$7,500
Approximate cost per linear foot (LF) of proposed roadway	Linear Foot (LF)	$350

Mitigations should be described in the report but must also be provided in the form of a table. The following is an example of the improvement table required for the *Recommendations and Conclusions* section of the report:

Intersection	Improvement	Pro-Rata Method	Unit Cost	Total Estimated Cost	% Site Traffic at Location	Pro-Rata Cost Share
Main St & 1st Ave	Install Signal	Intersection	$500,000 per signal	$500,000	5%	$25,000
Main St & 2nd Ave	Adjust Signal Timings	Intersection	$7,500 per signal	$7,500	2%	$7,500
Main St & 3rd Ave	Install EB 340' Left Turn Lane	EBL	$350 per LF	$119,000	65%	$77,350

Pro-Rata Calculations

Typically, financial participation for improvement can be based on the greater proportional share of site traffic (Pro-rata Share = Site Volume/(Build Volume)) in each condition during the AM or PM peak hours. However, this may not cover all cases. In general, total financial participation is to be based on the applicant's cost estimates of the proposed mitigation multiplied by the Pro-rata percentage calculated and will be reviewed and approved by the Engineering & Capital Improvements Department.

To calculate the financial participation for a roadway improvement for a specific movement, (e.g. turn lane), a pro-rata calculation should be used. The site traffic must be divided by the Build traffic $(Pro-Rata\ Share = Site\ Volume \div (Build\ Volume))$ for the movement or approach which has caused the need for the improvement, or the 'Pro-Rata Method'.

To calculate the financial participation for signals, the typical method is to use the pro-rata share of the movement with the highest percentage of site traffic, the 'critical movement'. However, often it is difficult to determine the appropriate financial participation required for a signal. In many cases, engineering judgment must be used to determine the correct contribution if signal improvements are needed. The pro-rata share should be based on the "critical impact", the approach or movement, with the highest percent of site traffic, which is causing the need for a signal. Typically, the need for a signal is caused by volumes on the major street, volumes on the minor street, and to facilitate left turn movements. Therefore, the pro-rata share will be based on the highest ratio of the site traffic to Build traffic for the approach or movement which is driving the need for a signal. Pro-Rata Share presented in the report table must agree with those presented in the excel calculations. Some other items to consider are:

- Current Signalized Location - Tee Configuration (new 4th leg): applicant is 100% responsible for all modifications/upgrades required for proper functionality when development is attaching 4th leg.

- Currently No Signal and Existing, or No-Build conditions meets warrants - Applicant must demonstrate that signal is planned & funded by others to consider it installed at the time of project build-out for there to be no pro-rata % calculation. For these conditions, Pro-rata will be considered based on overall intersection unless the site traffic significantly changes the need for the signal then the pro-rata to be calculated as described above for the critical movement.
- Currently No Signal and No-Build conditions do not meet warrants but Build condition meets warrants: Because site traffic will contribute to volumes for meeting warrants or overwhelmingly meet warrants, a pro rata on that volume shall be used as described above for the critical movement.

Pro-Rata Exceptions

There are also several cases where the financial participation required is greater than the pro-rata share. In cases where there is a clear safety risk to the public if improvements are not made, the impact of the site traffic in isolation is clearly causing the need for the improvement, or if the improvement is needed to provide connectivity to the site, the financial participation required may be greater than pro-rata.

The Developer contribution shall be 100% for the following exceptions to the calculated pro-rata:

- Any improvements that will only serve the proposed development.
- Any off-site turn lane improvements where:
    - A left turn where site traffic for the proposed movement is greater than or equal to 100 peak hour vehicles.
    - For a right turn where the site traffic is greater than or equal to 150 peak hour vehicles.
- Clear safety risk results from the development's impact to the system if improvements identified in the TA are not implemented.
- ROW dedication, favorable for system improvements.
- Signal timing/phasing improvements.
- 100% contribution for a signal or Pedestrian Hybrid Beacon is required if:
    - The signal is required to provide adequate access to the proposed development (e.g. at the development's driveway, for pedestrian access)
    - The signal is required due to the addition of an additional approach, needed for the development, at the intersection. (e.g. an additional leg at the intersection due to the development, site access, boundary roadways constructed to facilitate the site)
    - The modification to an existing signal is required due to the addition of an additional approach, needed for the development, at the intersection. (e.g. an additional leg at the intersection due to the development, site access, boundary roadways constructed to facilitate the site)
    - The signal is required for safety reasons (e.g. school crossing, grade crossing, high number of crashes).

Appendix

Supporting documentation, data and calculations are to be included in the report appendix. Sections may include, but are not limited to the following:

- *Signed* Traffic Study Determination Worksheet
- *Signed* Scoping Document
- Traffic Counts
- Signal Timing Sheets
- Trip Generation Calculations
- Synchro Outputs
- Turn Lane Analysis Reports
- Signal Warrant Studies
- Cost Estimates