DRAINAGE REPORT CHECKLIST

The listed requirements apply to all Final Drainage Reports. The column labeled "Prelim" identifies requirements for projects that involve a Preliminary Drainage Report to identify and define the conceptual solutions to drainage problems that will occur on-site and off-site.

REPORT REQUIREMENTS

A. Title Page

Yes	No	Prelim	Requirement
		X	1. Subdivision Name
		X	2. Address
		X	3. Property Owner & Property Jurisdiction
		X	4. Developer/Project Owner
		X	5. Engineer
		X	6. Submittal date and revision dates, as applicable
			7. Include Certification Statement from a Registered Professional Engineer in the State of Colorado and the project Developer

B. General Location and Description

Yes	No	Prelim	Requirement
1. Name of Project			
		X	1. Site Vicinity Map
		X	2. Township, Range, Section, and ¼ Section
		X	3. Streets, roadways, and highways adjacent to the proposed development, or within the area served by the proposed drainage improvements
		X	4. Names of adjacent developments and jurisdictions
2. Description of Property			
		X	1. Total developed area and disturbed area in acres
		X	2. Ground cover, vegetation, site topography and slopes
		X	3. NRCS Soils Classification Map and description
		X	4. Major and minor drainageways
		X	5. Floodplains delineated by FEMA FIRM Maps, City adopted floodplain, draft floodplains, or other City adopted documents.
		X	6. Existing irrigation ditches
		X	7. Existing and proposed land use
		X	8. Groundwater investigations and results (Geotech Report or Groundwater Report)
			9. Provide separate underdrain report (Refer to Section 300 of the City Standards and the underdrain report checklist)

C. Drainage Basins and Sub-Basins

		X	1. Major Drainage Basins On-site and off-site major drainage basin characteristics for historic/existing patterns and paths

Yes	No	Prelim	Requirement
			2. On-site and off-site minor drainage characteristics of each sub-basin including total area, imperviousness, flow patterns and paths, design points, and receiving Permanent Stormwater Control (PSC) facility
		X	3. Phase/Filing improvements
		X	4. Irrigation facilities that will influence or be impacted by the site drainage
		X	5. Impacts of the off-site flow patterns and paths, under fully developed conditions

D. Drainage Design Criteria

Yes	No	Prelim	Requirement
1. Regulations			
		X	1. City Standards Section 300 criteria, Urban Drainage & Flood Control District Criteria Manual, Volume 3, FEMA regulations, USACOE regulations, State of Colorado regulations and optional provisions selected when applicable.
3. Hydrology			
		X	1. UDFCD runoff calculations method(s) – runoff coefficients, % imperviousness, flow rate
		X	2. Design storm events including water quality capture volume
		X	3. Design rainfall
		X	4. Detention Pond calculation (Historical Release rate, storage calculation, hydrograph data, peak flow rate)
4. Hydraulics			
			1. Street & Inlet Capacity
			2. Ditch/Swale Capacity and Flow Calculations
		X	3. Open channel or swale capacities
			4. Weirs, Dams, Bridges, other specialized hydraulic structures

E. Stormwater Management Facility Design and Management

Yes	No	Prelim	Requirement
1. Stormwater Conveyance Facilities			
		X	1. Determining scope of stormwater quality infrastructure on project site
		X	2. General conveyance concepts and schematic for storm sewer system
		X	3. Methods used to determine conveyance facility capacities
			4. Maintenance aspects of the design and easements and outlots that are required for stormwater conveyance and storage purposes
			5. Responsibilities of the PSC Permittee upon conclusion of the construction phase of the development.
			6. Design of all permanent stormwater quality control measures including tributary areas, facility sizing, treatment volumes, design features, base design standards, site constraints, etc.
		X	7. Implementation and calculations for Low Impact Development (LID) strategies, including measures to "minimize directly connected impervious areas" (MDCIA).
			8. Stormwater control measure details (outlet structure, BMPs, etc)
		X	9. Permitting items (PSC, 404)
		X	10. Erosion Control (See erosion control checklist)

I. Overall Drainage Plan			
Yes	**No**	**Prelim**	**Requirement**
		X	1. Is an overall drainage plan sheet required?
		X	2. 24" x 36" in size, 22" x 34" also acceptable when half size sets will be produced
		X	3. Title block, legend, north arrow
		X	4. Scale 1"= 20' to 1"= 100', as required to show sufficient detail
		X	5. Property / Project Site boundary line
		X	6. Existing and proposed streets, roadways, or highways
		X	7. Basin delineations, including off-site basins when feasible
		X	8. Offsite flow entering project site
		X	9. Proposed and existing contours (1' increment)
		X	10. Callouts of existing stormwater management facilities and major water bodies
		X	11. Overlay or figure showing layout of Detailed Drainage Plan sheets (viewports)

J. Detailed Drainage Plan (Can be combined with overall drainage plan depending on complexity of project)			
Yes	**No**	**Prelim**	**Requirement**
		X	1. 24" x 36" in size, 22" x 34" also acceptable when half size sets will be produced
		X	2. Title block, legend, north arrow
		X	3. Scale 1"= 20' to 1"= 100', as required to show sufficient detail
		X	4. Proposed and existing contours (1' increment)
		X	5. General labels
		X	6. Road linework
		X	7. Basin delineation and flow arrows
		X	8. Callout existing stormwater management facilities and major water bodies
		X	9. Floodplain checks
		X	10. Quick Checks / required CAD object/lines
		X	11. Common items shown that should not be seen

Electric Service Request

Project Name or Address: _____

Primary Contact Name and Phone Number: _____

Submit this document with initial Site Plans or Public Improvement Plans into the City of Longmont's Design Review process or prior to applying for a Building Permit Application where electric utility service is required. This form initiates the engineering and design process for an electric service extension or revision of existing electric services within the City of Longmont.

Provide one paper copy and an electronic file to include the items listed below. Refer to the City of Longmont Design Standards for electronic file requirements and LPC submittal requirements.

	Residential Development		Commercial / Industrial	
	Single Family	Multi Family	Subdivision	Site Plan-Single Location
Utility Plan with Existing and Proposed Utilities; Sewer, Water, Storm Drainage, Electric, Gas, Communications	X	X	X	X
Landscape Plan	X	X	X	X
Electric Meter(s) Location	NA	X	When available	X
Electric Transformer(s) Location	NA	X	When available	X
New / Upgrading Electric One-Line Diagram	Square Footage Ranges Electric Heat *(yes or no)*	X	When available	X

Party responsible for payment of temporary electric facilities

Temporary Electric Facilities ❑ **NA**	**Temporary Metering** ❑ **NA**
Name:	Name:
Address:	Address:
Phone:	Phone:
Email:	Email:

Party responsible for payment of final electric facilities

Final Electric Facilities	**Final Metering** ❑ **NA**
Name:	Name:
Address:	Address:
Phone:	Phone:
Email:	Email:

Party responsible for payment of energy usage

Temporary Energy Usage ❑ **NA**	**Final/Permanent Energy Usage** ❑ **NA**
Name:	Name:
Address:	Address:
Phone:	Phone:
Email:	Email:

Applicant: _____ **Date:** _____

1100 South Sherman Street, Longmont, CO 80501
303-651-8386 ● FAX: 303-651-8796 ● www.longmontcolorado/lpc

REQUEST FOR AN EXCEPTION TO CITY STANDARDS

Project Name & Location _____

Date: _____

Developer: _____

Engineer of Record (EOR): _____

DIRECTIONS

All exceptions submitted must be on company letterhead and follow this format.

Attach supporting documentation and calculations for the requested design exception.

Unless otherwise approved by the City Engineer, design exceptions must be signed and sealed by a registered Professional Engineer licensed to do work in the State of Colorado.

See Section 100 of the Longmont Public Improvement Design Standards and Construction Specifications for more information.

EXCEPTION REQUEST

The applicant is requesting an exception to [list the section of the design standards the request is referencing].

JUSTIFICATION

Provide justification for the exception request. The applicant must include calculations, references to other industry standards, how the intent of the standards are being met, and any other information needed to justify the exception.

The applicant shall demonstrate compliance with the following three (3) criteria (per Section 100):

1. Special circumstances or conditions exist which are outside of the control of the applicant and which limit the ability of the design to meet the City Standards outlined in the document. Financial difficulties, loss of prospective profits and previously approved exceptions in other developments shall not be considered special circumstances.
2. The exception represents an alternative design that mitigates the special circumstances or conditions while meeting the intent of the City Standards set forth in this document.
3. The exception will not be detrimental to the public interest or other property, nor in conflict with Envision Longmont or applicable provision of the Longmont Municipal Code, and will not endanger public safety, health or welfare.

LIST OF ATTACHMENTS

Provide a list of the attachments and exhibits supporting the exception request.

SIGNATURE AND STAMP OF ENGINEER OF RECORD

Note: *Approval of construction plans by the City, which contain design elements not in compliance with the City Standards, and for which an exception request has not been specifically requested and approved, does not imply approval of an exception from these City Standards. Only those exceptions submitted in writing and approved by the City Engineer are granted exception.*

GEOTECHNICAL REPORT CHECKLIST

The City of Longmont requires a geotechnical report for all proposed construction within the City's Easements or Right-of-way. The reports are to include information necessary to determine the characteristics of soils encountered within the project limits, and make recommendations on how to deal with problem areas.

REPORT REQUIREMENTS

A. Investigation and Recommendation Requirements (by geotechnical engineer)

Yes	No	N/A	**Requirement:** The soils engineer shall investigate and recommend solutions to problems of**:**
			1. Expansion of cohesive soils
			2. Frost heave in silty soils
			3. Potential ground water problems
			4. Partially constructed streets
			5. Use of sub-base filter fabric
			6. Any other matter that may adversely affect the project design

B. Soil Sample Requirements

Yes	No	N/A	**Requirement**
			1. Soil samples shall be taken at the proposed subgrade elevation and shall represent the soil of the subgrade.
			2. All boring depths shall extend a minimum of three (3) feet below the proposed subgrade elevation.
			3. The boring locations shall not exceed a distance of 500 ft. between borings, with a minimum of two (2) borings per roadway.
			4. If more than one soil type is encountered in the boring, they shall be logged and tested separately.
			5. All design shall be based on the worst soil encountered from the standpoint of subgrade support.
			6. All subgrade shall have a minimum of ninety-five percent compaction at ± 2% of optimum moisture content to a depth of twelve inches.
			7. The geotechnical report must demonstrate the adequateness of the structural section.

D. Contact Information (Must be included on front page of report)			
Yes	**No**	**N/A**	**Requirement**
			1. Development/Project Name
			2. Location/Address
			3. Firm Name
			4. Submitted By
			5. Contact Person
			6. Contact Phone Number
			7. Submittal Date In Date order of 1st, 2nd, 3rd, etc. submittal
			8. Date Approved
C. Geotechnical Report Requirements and Format			
Yes	**No**	**N/A**	**Requirement**
			1. The geotechnical report must be prepared by a professional engineer, whose expertise is geotechnical engineering registered in the State of Colorado.
			2. The report must be submitted to the City Engineer for review and approval prior to the final approval of any construction drawings.
1. Report Format			
			1. Title page with project address
			2. 8 ½" x 11" report, bound or in a folder
			3. Dated, checked, signed and sealed by a professional engineer
			4. Original and revision dates
2. Soils Information			
			1. Boring locations on site plan
			2. Boring logs
			3. Gradation tests/Atterberg limits
			4. Compaction tests
			5. Percent swell (If percent swell exceeds 1.5%, the report shall include the proposed methods(s) to deal with swelling soil characteristics)
			6. Soil classification (AASHTO)
			7. Problem areas on the site
			8. Groundwater levels
			9. Trenching restrictions
3. Construction Methods			
			1. Retesting after rough grading
			2. Construction sequence
			3. Lift thickness
			4. Recommendations for planned construction

PAVEMENT DESIGN REPORT CHECKLIST

The City of Longmont requires a pavement design report for all proposed construction within City Easements or Rights-of-Way. The report is to include information necessary to determine the characteristics of soils encountered within project limits and make recommendations on how to deal with problem areas. The pavement design report may be included in the geotechnical report.

REPORT REQUIREMENTS

A. Contact Information (Must be included on front page of report)

Yes	No	N/A	Requirement
			1. Development/Project Name
			2. Location/Address
			3. Firm Name
			4. Submitted By
			5. Contact Person
			6. Contact Phone Number
			7. Submittal Date In Date order of 1st, 2nd, 3rd, etc. submittal
			8. Date Approved

B. General

Yes	No	N/A	Requirement
			1. The pavement design report must be prepared by a professional engineer, registered in the State of Colorado, whose expertise is geotechnical engineering.
			2. The report must be submitted to the City Engineer for review and approval prior to the final approval of any construction drawings.

C. Format

Yes	No	N/A	Requirement
			1. Title page with project address and approval block
			2. 8 ½" x 11" report, pdf
			3. Dated, checked, signed and sealed by a professional engineer
			4. Original and revision dates

D. Soils Information

Yes	No	N/A	Requirement
			1. Boring locations on site plan
			2. Boring logs
			3. Gradation tests/Atterberg limits
			4. Compaction tests
			5. Percent swell (If percent swell exceeds 1.5%, the report shall include the proposed methods(s) to deal with swelling soil characteristics)
			6. Soil classification (AASHTO)
			7. Problem areas on site
			8. Groundwater levels
			9. Trenching restriction

E. Design Criteria			
Yes	**No**	**N/A**	**Requirement**
			1. Roadway classification
			2. Forecast traffic volumes
			3. Construction traffic forecast
			4. 18 KIP EDLA or DTN (Proof roll criteria)
			5. Serviceability Index
			6. Regional factor

F. Pavement Criteria			
Yes	**No**	**N/A**	**Requirement**
			1. Weighted structural number
			3. Design R value
			4. Subgrade properties
			5. Base course
			6. Pavement
			7. Alternatives

G. Construction Methods			
Yes	**No**	**N/A**	**Requirement**
			1. Retesting after rough grading
			2. Paving sequence
			3. Lift thickness
			4. Recommendations for planned construction
			5. Construction traffic control plan

TRANSPORTATION IMPACT STUDIES

This document outlines the policies and requirements for the preparation of Transportation Impact Studies (TIS) for development proposals in the City of Longmont. These requirements exist to ensure consistent traffic analysis practices for developments being considered.

The responsibility for evaluating the traffic impacts associated with a proposed development rests with the applicant. The applicant is responsible for retaining a qualified transportation professional to provide an accurate and complete accounting of probable traffic impacts related to the proposed development. All transportation impact studies should be signed and stamped by a Professional Engineer.

The City of Longmont Planning and Public Works staff are responsible for review of transportation impact studies to ensure that the study is completed accurately and in accordance with these requirements.

1. WHEN IS A TRANSPORTATION IMPACT STUDY REQUIRED?

A. Unless waived by the City Engineer, the City requires a TIS for any new development proposal that could potentially have a significant impact (as determined by the City) on the transportation system. Any of the following may be considered significant impacts:

(1) Daily trip generation is projected to be 500 or more vehicles,

(2) Peak hour trip generation is projected to be 50 more vehicles,

(3) Traffic from a development will impact adjacent residential neighborhoods,

(4) Driveway impacts on public streets related to turning movements or signal timing/progression,

(5) Significant citizen concern due to expected traffic impacts.

B. TIS may also be required when a previously approved development changes or expands in such a way that the approved access to the site is affected or trip generation estimates increase by more than 20% over the original estimates.

C. A TIS may need to be updated or redone in its entirety for unapproved development applications with large time gaps between submittals as determined by the City Engineer. Field counts must be considered current (less than a year old) at the time of review or approval.

D. A TIS may also be required for each phase of a large phased development. In this situation, an overall TIS would be completed for the overall proposal followed by an addendum prior to the development of each phase.

2. TRANSPORTATION IMPACT STUDY PREPARATION AND REVIEW PROCESS

A. The Developer is responsible for contacting the Planning Division before a development application is submitted to determine if a TIS will be required. The need for a TIS will be determined as part of the pre-application conference with the DRC.

B. Prior to the commencement of the TIS, a pre-submittal meeting must be held between the City and the transportation professional retained by the developer to discuss the scope of the study and the requirements for the study content and format. The pre-submittal meeting is intended to provide a firm base of cooperation and communication between the City, the developer, and the transportation consultant. At a minimum, topics discussed at such meetings will include study area, proposed land uses, trip generation, trip distribution, traffic projection year(s), intersections requiring analysis, street sections requiring analysis, signal timing assumptions, and background traffic assumptions. The requirements for transportation study requirements are included in this document.

C. If the study fails to comply with the technical requirements and the scope of the study outlined in the pre-submittal meeting, the Developer will be advised in writing through the City's normal development review process. A study must be submitted and accepted by the City before the City Planning and Zoning Commission schedules the project for consideration.

D. The City will review the transportation impact study in conjunction with the Development Review Committee (DRC) schedule. The draft study and original SYNCHRO files must be submitted with the initial DRC material for review if the DRC schedule is to be maintained. If the study is required for a project that is not involved with the DRC review process, the City will review the draft study within 15 working days of the date of submittal. If study revisions are needed, the City will normally review the revised study within 10 working days of submittal. A longer review period will be necessary if the Colorado Department of Transportation (CDOT) or other agencies are involved in the review process.

3. REQUIREMENTS FOR TRANSPORTATION IMPACT STUDIES

A. Study Purpose and Site Description – The study shall include a brief description of the development application proposal (i.e. annexation, rezoning, subdivision, site plan application etc.) It shall also include a brief description of the development proposal including the site location, the size of the land parcel, general terrain features, the types of land uses being proposed and the proposed access points.

B. Study Area – The boundaries of the study area will be based on engineering judgment and an understanding of existing traffic conditions surrounding the site. The limits should be agreed upon at the pre-submittal meeting with staff. The boundaries of the study area shall be based on the size and extent of the proposed development and its relation to significant streets and intersections. Large developments may require a study area extending beyond one mile due to the magnitude of potential impacts. As a minimum, the study area will include:

(1) Adjacent streets

(2) Adjacent arterial/arterial or arterial/collector intersections, including, at minimum, all signalized intersections within a ½-mile radius of the site

(3) Site access points

(4) Internal roads

(5) A vicinity map that shows the site and the study area boundaries in relation to the surrounding transportation system must be included in the study. All arterial and collector streets in the study area and access points to the site should be shown on the map.

(6) Key intersections in the study area that will be analyzed in the study shall be identified at the pre-submittal meeting. The key intersections should be identified on the map.

C. Study Horizons – Three study horizons are required for analysis: The current conditions, short term and long term.

(1) The current (existing) conditions should be analyzed to establish a baseline of traffic conditions.

(2) The short-term horizon represents the planned opening year of the project. Both a background analysis and analysis with the project completed should be completed to assess the short-term impacts of the project. Assumptions about street improvements not associated with the study project in the short term should be based on the projects shown in the City's Capital Improvement Program or projects that have already been financially obligated to a developer.

(3) The long-term planning horizon represents conditions at 80% build out of the Longmont Planning Area as shown in the Longmont Area Comprehensive Plan (LACP). For Land uses in compliance with the LACP

this analysis should be completed using forecast volumes and roadway improvements as shown in the LACP. For land uses that are not in compliance with the LACP analyses for both the adopted land uses in the LACP and the proposed land uses should be completed so that the impact of the land use change can be evaluated.

(4) When an overall transportation impact study is completed for a phased development the study shall look at all three study horizons. Addenda for each phase of development should only look at the current conditions and the short-term horizons.

D. Analysis Time Periods – Normally, the analysis time periods will be the weekday a.m. and p.m. peak hours. Under some circumstances, the City may require analyses to occur at other times as appropriate.

E. Existing/Base Conditions

(1) Existing and Proposed Land Uses – A complete description (including a map) of the existing land uses in the study area as well as their current zoning, shall be included in the study. In addition, the future uses of all vacant land within the study area that may be developed within the projection year of the project must be identified. For the short-term horizon only land where development applications have been approved should be considered as developed within the projection year. For the long-term horizon, land uses shown in the LACP should be assumed as developed within the projection year.

(2) Existing and Proposed Transportation System – The study shall describe the existing roadways and intersections in the study area including the road geometry and intersection traffic control. For the short-term horizon, assumptions about road improvements not related to the development shall be based on the City's Capital Improvement Program and on improvements already financially obligated to a developer. For the long-term horizon, all improvements shown in the LACP within the study area should be assumed.

(3) Existing Traffic – Current a.m. and p.m. peak hour traffic volumes shall be obtained for the roadways and intersections within the study area. "Current" means counts less than a year old. A map or series of maps of the existing roadway network shall be prepared showing the existing conditions and volume counts including lane geometry, traffic control, access points, turning movement volumes and calculated peak hour factors.

(4) Background Traffic – For the short-term horizon, background traffic shall be the sum of existing traffic volumes plus the addition of traffic from any not yet built but approved developments in the study area plus background traffic growth. Background traffic growth should be calculated from historical 24-hour volume counts in the City of Longmont in the vicinity of the proposed development. Staff will provide this information when it is available. The annual percentage of background traffic growth should be agreed upon at the pre-submittal meeting.

a. For the long-term horizon, background traffic shall be based on the most recent traffic forecasts from the City's long-range transportation model.

b. Maps of both the short-term and long-term roadway network shall be prepared showing the projected conditions and projected volume counts including lane geometry, traffic control, access point, a.m. and p.m. peak hour turning **movement volumes and calculated peak hour factors.**

F. Site Related Traffic

(1) Trip Generation – A summary table listing each type of land use, the size or amount involved, the trip generation rates used and the resultant total trips must be provided. Trip generation rates shall be calculated using data contained in the latest edition of the Institute of Transportation Engineers' (ITE) Trip Generation Manual or from a local trip generation study following procedures prescribed in the ITE Trip Generation Manual. If a local trip generation study is used to determine the trip generation rate,

documentation of the trip generation study and the resulting rate should be included in an appendix of the transportation impact study.

(2) The ITE Trip Generation Manual presents data on trip generation rates in various formats. A weighted average trip generation rate is shown. Also, when possible, a regression equation is presented that defines the line representing "best fit" of the data. Trip generation rates should be determined as outlined below.

a. Use Regression Equation when:

- A regression equation is provided,
- The independent variable is within range of data and either the data plot has a least 20 points, or
- The R2 is greater than or equal to 0.75, equation falls within the data cluster in the plot and the standard deviation is greater than 110% of the weighted average rate.

b. Use the Weighted Average Rate when:

- At least three data points,
- Independent variable is within range of data,
- Standard deviation is less than or equal to 110% of the weighted average rate,
- R2 is less than 0.75 or no equation provided,
- Weighted average rate falls within data cluster plot.

c. Collect Local Data when:

- Study site is not compatible with ITE land use code definition,
- Only 1 or 2 data points; preferably when five or fewer data points,
- Independent variable does not fall within range of data,
- Neither weighted average rate line or fitted curve fall within data cluster at size of development.

(3) Trip making reduction factors may be used after first generating trips at full ITE rates. These factors fall into two categories: those that reassign some portion of generated trips to the background stream of traffic, and those that remove or move generated trips. In all cases, the underlying assumptions of the ITE Trip Generation rates must be recognized and considered before any reductions are claimed.

a. The first category is when trips to the proposed development currently exist as part of the background traffic stream, referred to as pass-by trips. Pass-by percentages identified by ITE or in other industry publications may typically be used. But, the source of the percentages must be identified and the City must approve use. Pass-by traffic must continue to be assigned to site driveways and access points, but is not additive to the background traffic stream. An appendix that illustrates the assignment of pass-by trips must be included in the report.

b. The second category for adjustments is for internal site trips, transit use, and transportation demand management (TDM) actions. Reductions of these types may be allowed if analytic support is provided to show how the figures were derived. The City must approve any reductions that are claimed. Optimistic assumptions regarding transit use and TDM actions will not be accepted unless accompanied by specific implementation proposals that will become a condition of development approval. Such implementation proposals must have a high expectation of realization within a 3-year period after project initiation.

(4) Trip Distribution – The percentage of trips to/from the proposed development to/from destinations in the region must be clearly shown graphically in the new report. The consultant shall be responsible for estimating trip distribution. Marketing studies, sub-area transportation studies, documented existing

traffic patterns and professional judgement may be used to make trip distribution assumptions. Whatever method(s) are used, the procedures and rationale used should be fully explained and documented in the study.

Different trip distribution assumptions can be used for different land uses in mixed-use developments. If more than one set of distribution assumptions are made they should be shown on separate graphics.

(5) Trip Assignment – Site generated traffic shall be assigned to the street system according to the trip distribution percentages determined in the previous step. The traffic assignment must be clearly shown graphically in the report.

G. Analysis and Identification of Impacts

(1) The project impacts shall be determined through an analysis procedure that follows the sequence of tasks outlined below:

a. Assessment of existing conditions,

b. Assessment of short term background conditions,

c. Assessment of short term conditions with the planned land use shown in the LACP for the land being proposed for development (this task is only needed when the proposed development is requesting a land use amendment),

d. Assessment of short term conditions with the proposed development,

e. Assessment of long term background conditions,

f. Assessment of the long-term conditions with the proposed development when a land use amendment is being requested.

(2) Highway Capacity Analysis – Assessment techniques for existing conditions, short-term background and short term with the development will include a capacity and level of service (LOS) analysis for the key intersections identified in the study area during the identified analysis time periods. For signalized intersections, the analyses shall be completed using the operational analysis methodology shown in the latest edition of the Highway Capacity Manual published by the Transportation Research Board. Both volume to capacity ratio (v/c) ration and level of service for each movement shall be reported in a table or diagram for each signalized intersection analyzed. The overall intersection level of service shall also be reported. The City of Longmont's benchmark for traffic congestion states that all signalized intersections should be maintained at overall LOS D or better. In addition, the benchmark requires that all movements that have 5% or more of the total entering intersection volume should be maintained at LOS D or better and have a volume to capacity ratio less than 1.0. Therefore, any signalized intersections or movements at signalized intersections that exceed these thresholds should be noted. The capacity and level of service analysis at signalized intersections shall be performed using the following assumptions:

a. Peak hour factors should be calculated on an approach-by-approach basis from the turning movement count data collected for the analysis,

b. Right turn on red should not be considered unless specific data documenting the percentage of turns on red is collected,

c. Unless approved by the City at the pre-submittal meeting all arrival types shall be assumed to be type 3 as defined in the Highway Capacity Manual,

d. Signal controller unit extension should be assumed to be 3.0 for through movements and 2.0 for left turn movements unless otherwise approved by the City,

e. Startup lost time should be assumed to be 2.0 seconds unless otherwise approved by the City,

f. Extension of effective green should be assumed to be 3.0 seconds unless otherwise approved by the City,

g. Traffic signal timing parameters for the existing conditions will be the actual signal timing in effect unless determined otherwise by the City. Traffic signal timing parameters for the short-term background conditions and the short-term conditions with the development will use signal cycle lengths between 80 and 120 seconds. Cycle lengths and individual green intervals will be calculated to provide the least overall intersections delay while maintaining all movements below benchmark thresholds whenever possible. Clearance intervals shall be the actual times currently in effect for all scenarios analyzed. Where different signal phasing from the existing is used for the analysis, this change shall be noted in the list of traffic impacts. Where traffic signals are part of a coordinated signal system or where proposed new signals are within a half mile of another signal the cycle lengths used for analysis should be the same at all intersections analyzed.

h. Saturation flow rate will be assumed to be 1900 pcphgpl.

i. Lane widths should be assumed to be 12 ft. wide unless other data shows otherwise.

j. 2% trucks should be assumed for all movements unless approved otherwise by the City.

k. Saturation flow adjustment factors should be as per the Highway Capacity Manual.

l. Where dual left turns exist or are proposed they shall be assumed to operate in a protected-only mode.

m. Free running right turns that are not affected by the signal timing should be excluded from the analysis.

(3) Level of service analysis for unsignalized intersections shall be done in accordance with the methodology for unsignalized intersections in the latest edition of the Highway Capacity Manual. The results of the unsignalized intersection analysis should be shown in the table or diagram used for signalized intersection results. The following assumptions should be used for the analysis of unsignalized intersections:

a. Duration of analysis period is assumed to be .25 hour,

b. Peak hour factors should be calculated on an approach-by-approach basis from the turning movement count data collected for the analysis,

c. 2% trucks should be assumed for all movements unless approved otherwise by the City,

d. Saturation flow rate will be assumed to be 1700 pcphgpl,

e. Critical gap and follow up time shall be in accordance with the values given in the Highway Capacity Manual.

(4) Assessment techniques for both long-term background and long term with the proposed development will require analysis using the planning methodology for signalized intersections and the unsignalized intersection methodology for unsignalized intersections as outlined in the latest edition of the Highway Capacity Manual. The condition (i.e. under capacity, near capacity, over capacity, etc.) for signalized intersections and the level of service for unsignalized intersections should be reported in a table or diagram.

a. The following assumptions shall be used for the long-range signalized intersection analysis:

b. A peak hour factor of 0.9 shall be used

c. Cycle lengths between 80 and 120 seconds shall be used

d. Assumptions for the long-range unsignalized intersection analysis shall be the same as for the short-term analysis.

(5) Access Evaluation – Assessment techniques for existing conditions, short-term background, short term with the development, long-term background and long term with the development will also include an evaluation of each proposed access point. Accesses should be considered intersections and included in the level of service/capacity analysis described above.

a. Safety is the top priority at access points. The City has developed standards for the spacing and design of access points to provide optimum safety. Accesses should be reviewed to ensure compliance with City (and CDOT if on a State Highway) standards. Proposed access points that do not meet the pertinent standards should be noted.

b. In addition, all access points should be evaluated to determine what auxiliary lanes are required in accordance with City standards and State Highway Access Code (where applicable).

(6) Evaluation of Signal Progression in Coordinated Signal Systems – According to City Standards, intersections with the potential for signalization should be spaced no closer than one half mile. If a development proposes an access or intersection that is projected to be signalized and is less than a half mile from other signals or other planned signals a progression analysis shall be conducted to demonstrate that a new signal can be installed without negatively impacting progression.

a. The analysis shall consider all existing signals or possible future signals within one mile in each direction from the proposed signal location. On existing coordinated arterials, it must be demonstrated that the existing bandwidth in each direction can be maintained with the new signal installed. Where a new coordinated system will occur as a result of the new signal it must be demonstrated that a bandwidth of at least 45% can be achieved in each direction unless otherwise directed by the City. The following assumptions shall be used for the progression analysis:

- A cycle length between 80 and 120 seconds should be used for analysis,
- Actual prevailing speeds on the arterial shall be used for travel speed in the analysis,
- Split assumptions shall be based on projected turning movement volumes and designed to maintain all movements with at least 5% or more of the total intersection traffic at LOS D or better and below v/c ratio of 1.0 in keeping with the City of Longmont Congestion Benchmark. Where pedestrian volumes are expected to be high (to be determined in the pre-submittal meeting), side street splits long enough to accommodate pedestrians shall be used assuming a 4.0 fps walking speed,

b. Where left turn arrows are anticipated, protected/permissive phasing should be assumed unless dual left turns are projected. Then, protected only left turn phasing should be assumed,

c. Lagging left turns will not be allowed for protected/permitted left turn phases,

d. Any access where the required bandwidth cannot be achieved should be noted. Any such access shall remain unsignalized and have turning movements limited by driveway design and/or median islands to prevent the need for signalization. Time-space diagrams shall be included in an appendix to the study.

(7) Other analysis required on a case-by-case basis – Where the City deems it appropriate, other types of analysis may be required in the transportation impact study. Other types of analysis may include by are not limited to: Sight distance evaluation, transit and TDM opportunities, pedestrian/bicycle needs, environmental evaluation and evaluation of neighborhood impacts.

4. IMPACT MITIGATION MEASURES

A. Summary of Analysis – A conclusions and recommendations chapter should be included in the transportation impact study.

(1) The results of the analysis should be summarized in this chapter. This summary should note all impacts to the transportation system and recommendations for site access, roadway improvements and travel demand strategies needed to maintain traffic flow safely and at a level of service in keeping with the City's congestion benchmark.

(2) In the event that the analysis indicates unsatisfactory levels of service or v/c ratio at any study intersection a description of proposed mitigation techniques or physical improvements to remedy deficiencies must be included.

(3) It should be noted if the recommended improvements are part of the City's Capital Improvement Program, are already financially obligated to another developer, or if there is currently no funding dedicated for the improvements.

(4) It is required that all improvements be presented in tabular format with information about which party is responsible for the improvement (applicant, City, CDOT, etc.) and when the improvement is anticipated to be completed.

B. Transportation Demand Management – If TCM measures are recommended to mitigate unsatisfactory traffic conditions a specific TDM Implementation Proposal shall be developed and presented to the City. If accepted, this Implementation Proposal will become a condition of approval of the land use action requested.

C. Evaluation of Proposed Improvements – If unsatisfactory levels of service or v/c ratios are predicted by the study and recommendations are made for mitigation. Additional analysis must be presented which demonstrates the effectiveness of the mitigation.

STATEMENT OF EXPECTED UTILITY NEEDS

Project Name & Location: _____

Date: _____

Developer: _____

Building Description _____

Code Section: International Plumbing Code, current edition as adopted by the City

DIRECTIONS

Attach fixture count and calculations for both the water and sewer demand. For developments with multiple buildings, complete one form for each building type with all applicable information filled in.

WATER DEMAND

Policy: Water meters and service lines shall be sized in accordance with the following table based on the current City adopted International Plumbing Code. If a combined domestic and irrigation meter are used, the higher water demand shall determine the water meter size.

Domestic Water Demand

Description	Existing Value (if any)	Proposed Value
Water Supply Fixture Units (wsfu)		
Flow Rate (gpm)		
Water Meter Size (in)		
Service Line Size (in)		
Velocity in Service Line (ft/s)		

Irrigation Water Demand

Description	Existing Value (if any)	Proposed Value
Irrigated Area (sf)		
Flow Rate (gpm)		
Water Meter Size (in)		
Service Line Size (in)		
Velocity in Service Line (ft/s)		

SANITARY SEWER DEMAND

Policy: Sanitary sewer service lines shall be sized in accordance with the following table based on the current City adopted International Plumbing Code.

Description	Existing Value (if any)	Proposed Value
Drainage Fixture Units		
Flow (gpm)[1]		
Sewer Service Pipe Diameter (in)		
Slope of Service Line (%) (2% min)		
Velocity (ft/s)		

[1] *Flow shall be calculated 70% of the estimated water demand based on IPC calculation for domestic water demand.*

ELECTRIC REQUIREMENTS

Policy: An (ECIF) Electric Community Investment Fee credit, will be given for an existing service and can be applied to an upgraded service at the same location.

Description	Existing Service (if any)	Proposed Service
Residential or Commercial (Res or Com)		
1 Phase or 3 Phase (1ph or 3ph)		
Voltage: (120/240v, 120/208v or 277/480v)		
Main Panel Rating (Amps)		
Main Buss Rating (Amps)		

CERTIFICATION STATEMENT

I hereby certify that the information provided in this Statement of Expected Utility Needs is accurate, meets the requirements of the _____ International Plumbing Code, and was prepared by myself or under my direct supervision.

Name	P.E. Number	Date	Stamp

UNDERDRAIN REPORT CHECKLIST

If an underdrain collection system is required for a project based on recommendations made in the geotechnical engineering report then an underdrain report shall be submitted for review and approval.

REPORT REQUIREMENTS

A. Title Page

Yes	No	N/A	Requirement
			1. Subdivision Name
			2. Address
			3. Property Owner & Property Jurisdiction
			4. Owner
			5. Engineer
			6. Submittal date and revision dates, as applicable

B. General Location and Description

Yes	No	N/A	Requirement
1. Name of Project			
			1. Site Vicinity Map
			2. Township, Range, Section, and ¼ Section
			3. Streets, roadways, and highways adjacent to the proposed project, or within the area served by the proposed underdrain collection system
			4. Names of adjacent developments and jurisdictions
2. Description of Property			
			1. Total developed area in acres
			2. Ground cover, vegetation, site topography and slopes
			3. NRCS Soils Classification Map and description
			4. Major and minor drainage ways

C. Existing Condition

Yes	No	N/A	Requirement
			1. Groundwater investigation results including test bores (data only valid btw Apr. and Oct)
			2. Recommendations for groundwater mitigation per the geotechnical engineering report
			3. Impacts on the groundwater based on the proposed underdrain design

D. Underdrain Design Criteria

Yes	No	N/A	Requirement
1. General			
			1. Proposed groundwater mitigation based on the geotechnical engineering report recommendations
			2. Information on any existing underdrain collection systems in the area
			3. Design concept for the proposed underdrain collection system including discharge location and access points
			4. Criteria selected to calculate and design the underdrain collection system
			5. Installation, size and materials for the proposed underdrain collection system

Yes	No	N/A	Requirement
			6. Underdrain exceptions, if required, ie: lift stations, and sump pumps with no underdrain collection system, etc.
			7. Underdrain main calculations, plans and details including engineered designs for exceptions
			8. Approval from existing underdrain collection system owner for connection of proposed system to the existing system is required
			9. All tables, figures, charts, drawings, etc. that were used in design of underdrain collection system that are included in the appendix of the report
2. Additional Permitting Requirements			
			1. General Purpose Water Well Permit from Colorado Department of Water Resources

E. Underdrain Maintenance

Yes	No	N/A	Requirement
			1. Ownership and maintenance responsibilities of all structures, underdrain main, sump pumps or lift stations, if any, and the underdrain service lines from the main to the buildings
			2. The Owner/Homeowners Association (HOA) will be responsible for maintenance and repairs for the underdrain collection system and outfall at discharge locations including erosion protection. Reference Underdrain Construction notes in Appendix B

F. Conclusion

Yes	No	N/A	Requirement
1. Drainage Concept			
			1. Overall effectiveness of the proposed underdrain design to control groundwater
2. Exceptions			
			1. Identify provisions by section number for which exceptions will be requested, or have been approved
			2. Provide justification for each exception requested
3. Certification Statement			
			1. Include Certification Statement from a Registered Professional Engineer in the State of Colorado.

G. References

Yes	No	N/A	Requirement
			1. Reference all criteria, master plans, reports, or other technical information used in development of the concepts discussed in the underdrain report

H. Appendices

Yes	No	N/A	Requirement
1. Calculations, Exhibits & Details			
			1. Underdrain pipe sizing calculations and flow calculations at the specific design points including any existing flows contributing to the system
			2. Erosion control measure sizing calculations at discharge location
			3. Calculations and details for any proposed underdrain system facilities such as lift station, etc.
			4. Overall underdrain collection system map

2. Reference Information			
Yes	**No**	**N/A**	**Requirement**
			1. Copy of Geotechnical Report
			2. Copy of General Purpose Water Well Permit from Colorado Department of Water Resources
			3. Copies of all referenced materials or reports where pertinent sections are highlighted

WATER AND WASTEWATER PROJECT INFORMATION REPORT CHECKLIST

On commercial, industrial or mixed use developments over five(5) acres and residential developments over 50 acres or areas of limited capacity, the City Engineer may request a project information report to be submitted with the preliminary construction plans to analyze the ability to provide water and wastewater service to the proposed site

REQUIREMENTS

A. Report Information

Yes	No	N/A	Requirement
			1. The initial and ultimate area, in acres, to be developed.
			2. The estimated population densities and total population to be served.
			3. The estimated quality and quantity of any industrial waste to be discharged into the sanitary sewer.
			4. Design flow rates, average, maximum, and infiltration allowances for the sanitary sewer.
			5. If alternate methods of providing utility services are possible, the report shall give an evaluation of the alternative method.
			6. Estimated average daily water usage including landscaping.
			7. Estimated amount of water to be used by industrial and commercial facilities.
			8. Any other information that would affect the City's ability to service the new area, or any other information requested by the City Engineer.