Chapter 3

Plan Development and Submittals

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3.0 Plan Development and Submittals

3.1 OPERATIONAL AND SAFETY ANALYSIS REQUIREMENTS

Capital improvement projects should be identified through an operational and/or safety evaluation. The approach to the evaluation will be unique to each type of project and should be based on collaboration with County Engineering staff. The following considerations may be integrated into the decision-making approach:

- Review of existing conditions (operational capacity and crash history)
- Review of community feedback
- Review of the County Rural Transportation System Plan (RTSP)
- Benefit/cost analysis
- Project goals/intentions
- Direction from County Board of Commissioners

Identifying and documenting the original intended outcomes of the project can support project teams with understanding the motivations and reasons for the proposed improvements. As a project progresses through the various project development stages, project teams should verify that the project continues to meet the original project goals. For additional guidance on performance-based design, see Chapter 2: General Policies and Standards.

3.2 SURVEYING

For information on surveying, including existing and new monumentation, refer to Chapter 2.

3.3 CONSTRUCTION PLAN DEVELOPMENT

When an EOR is required for a private development project, and for all capital improvement projects, a construction-ready project shall, at a minimum, include a complete set of the following items:

- Construction plans
- Standard details
- Construction specifications and special provisions
- List of construction bid items with engineer’s cost estimate.

Additional documentation and reporting may also be required depending on the project specifics and be confirmed with County staff.

Construction plans shall be prepared in accordance with the following requirements:

A. Plans shall be configured on 11x17 sheets (preferred sheet size), unless 22x34 sheets are agreed upon at the start of the project.

B. All text on construction plans is to be ALL CAPS, minimum 0.08-inch font height, and abbreviations are without periods. Text of embedded standard detail drawings shall be legible.
C. Road names on construction plans shall consist of the road name and type (RD, ST, AVE), but not the direction (NE, SW), unless confusion is likely.
D. Plans shall have a vicinity map showing surrounding roads, including existing and proposed roads.
E. Plans shall have a north arrow, generally pointing to the top or right side of the sheet.
F. Horizontal position shall be based on either a local coordinate system identifying the basis of bearings, Oregon State Plane (North Zone) or the Oregon Coordinate Reference System (Salem Zone), identifying the appropriate datum and epoch.
G. Elevations shall be based on the NAVD88 datum used for the topographic survey, except areas within FEMA's mapped Special Flood Hazard Area shall use NGVD29, identifying the geoid for the datum used.
H. Where feasible, general notes shall be consolidated on a single page. Repetition of general notes or inclusion of standard details requires redundant review and affords unnecessary opportunities for oversight.
I. Plans shall show a typical section of all road sections and/or channel improvements with centerlines, rights-of-way, and easement lines shown.
J. Stationing shall run from left to right on the plan and profile.
K. Stationing shall commence (usually 10+00) at the south or west end of the project and end at the north or east end of the project.
L. Plan and profile generally shall be drawn at a standard engineering scale of not larger than 1 inch equals 40 feet horizontal and 1 inch equals 4 feet vertical.
M. Profiles shall show existing ground along the proposed centerline.
N. Where cut or fill slopes extend outside of the right-of-way, slope easements should be considered. Easements, including those for temporary construction, shall extend a minimum of one foot outside of the toe of slope and be shown on plans.
O. At all vertical curves, plans shall show curve length, stations and elevations of points of vertical inflection (PVI), beginning of vertical curve (BVC), end of vertical curve (EVC), and high-or low-points, when appropriate. Both K and AD values shall also be given.
P. On all horizontal curves and curb returns, plans shall show length of curve, radius, deflection angle and stations of point of curve (PC) and point of tangent (PT). All curb returns shall have profiles with elevations shown at the PC and PT.
Q. Pipe bedding and trench backfill should be specified on the plan or profile and should follow Standard Drawings.
R. Roadside ditches shall be shown on plan view.
S. Pipe diameter, pipe material, and class shall be indicated on the plan and profile. Pipe material and class may be omitted if a pipe data table is provided.
T. Plans shall show slopes and invert elevations on all pipes and channels.
U. Plans shall show all existing utility locations. New utilities in public rights-of-way must comply with the locations shown on County Standard Detail – Standard Utility Location for Urban Roads or Standard Utility Location for Rural Roads, whichever is applicable.

V. When the data is available, all crossings and potential conflicts between storm sewers and other underground utilities shall be shown on the profile.
W. All traffic control devices, pavement markings, and road signs shall be shown on plans. For private development projects the cost of signs and installation shall be the responsibility of the developer, but signs may be installed through a work order by County forces on a time available basis.

3.4 AS-CONSTRUCTED PLANS

At the completion of construction, and as a condition of facility acceptance for privately developed infrastructure, the engineer of record (EOR) shall be responsible for providing as constructed drawings (as-constructed plans) and Computer Aided Design (CAD) files for all improvements including all construction changes, added and deleted items, location of utilities, etc. The as-constructed plans shall be submitted to the County upon project completion and shall, at a minimum, include the following:

A. Revised plans that address redline markups from the contractor and project inspector. When required, field survey data by a land surveyor that provides the actual invert and rim elevations of sanitary and storm sewer systems within the project shall be provided.
B. EOR shall submit one set of stamped as-constructed plans with "AS-CONSTRUCTED" across the signature. Plan sheets not involving verification of infrastructure features (i.e., Traffic Control, Construction Staging, Existing Conditions, Demolition, Erosion Control) are not required for the as-constructed plans. As-constructed plans shall be submitted via email, flash drive, or non-rewritable CD in dwg and pdf formats.
C. As-constructed plans shall include the following text on the first page of the plan set: *"This as-constructed drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable and represent actual improvements constructed, a post-construction topographic survey of the improvements was not conducted. Engineer assumes no responsibility for the accuracy and completeness of these as-constructed drawings. Parties relying on this document are advised to obtain independent verification."*

3.5 PRECONSTRUCTION CONFERENCE

A preconstruction conference shall be required for all public improvements involving an EOR. At the discretion of the County Engineer, a preconstruction conference may be required for other types of projects. The conference shall include representatives of the following groups:

- Contractor
- Department of Public Works
- Utility Providers
- Developer (private development projects only)
- Other groups involved in the project

3.6 CAPITAL IMPROVEMENT PROJECTS

A designated County project manager will oversee each capital improvement project. Project design teams may be made up of internal County staff or a team comprised of external design consultants, managed by County staff. Capital improvement projects may require discipline experts in areas, including, but not limited to, transportation planning, survey, roadway, stormwater and water resources, structural, geotechnical, rights-of-way, and public involvement. Each project should be evaluated and include appropriate County representatives based on the specific discipline needs.

3.6.1 Capital Improvement Project Submittals

Capital improvement projects shall adhere to a submittal process that provides opportunity for design reviews at each milestone. Gathering input early in the project development phase and at regular intervals during design allows for the team to adjust course while limiting re-design efforts.

Table 3-1 provides an outline of a typical project submittal process. The items in **Table 3-1** will not apply to every capital improvement project. Each project should evaluate the specific plan and submittal needs during the scoping phase and develop a project-specific submittal plan.

Table 3-1: Typical Project Submittal Process and Items for Capital Improvement Projects

Design Submittal	Submittal Items
30% Design Submittal	• Draft Geotechnical Report • Draft Stormwater Report • Draft Structural Analysis • Design Vehicle Checks • Sight Distance Exhibits • Fastest Path Performance Checks (Roundabouts Only) • Existing Utilities Map (1st Notification) • Draft Right-of-Way Impact Map and Legal Descriptions • 30% Design Plans • Preliminary Cost Estimate
60% Design Submittal	• Final Geotechnical Report • Updated Draft Stormwater Report • Final Structural Analysis • Preliminary Utility Conflict Map (2nd Notification) • Right-of-Way Impact Maps & Appraisals • 60% Design Plans • 60% Cost Estimate • Draft Erosion Control Plans • Draft Special Provisions • Documentation of 30% Comment Responses
90% Design Submittal	• Final Stormwater Report • Updated Utility Conflict Map • Updated Right-of-Way Impact Map • 90% Design Plans • 90% Cost Estimate • Erosion Control Plans (Submit 1200-CA, if required) • Recorded Right-of-Way Legal Descriptions • Revised Special Provisions • Documentation of 60% Comment Responses
100% Design / Bid Ready PS&E Submittal	• 100% Stamped and Signed Design Plans • Final Cost Estimate • Final Erosion Control Plans • Final Right-of-Way Certification (or Prior to Bid) • Final Special Provisions • Documentation of 90% Comment Responses • Bid Documents • Utility Coordination Verification

3.6.2 Capital Improvement Project Schedules

Project design and construction schedules will vary widely based on project type. A detailed project schedule should be prepared by the County project manager during the scoping stage. Schedules may be updated as the project progresses.

3.6.3 Quality Control Review Process

Each capital project shall complete a quality control process. Refer to the County Quality Control Plan for Capital Projects for guidance on completing quality control.

3.7 PRIVATE DEVELOPMENT PROJECTS

All proposed private development construction projects that impact public rights-of-way and/or County easements shall submit plans for approval to the County Land Development Engineering & Permits (LDEP) section. Such plans shall be prepared under the supervision of and stamped by a Registered Civil Engineer in Oregon (refer to Chapter 2, Section 2.6 for details when an EOR is required). Project teams may contact the County to request example plans for various project types to support project teams in developing plans that align with the County's expectations. Construction shall not begin prior to plan approval and issuance of LDEP permit(s).

3.7.1 Private Development Project Submittals

Construction plans and calculations for the proposed improvements shall be submitted as follows:

A. In accordance with Marion County Code Chapter 11.15 Improvement of Public Rights of Way, the initial submittal shall be accompanied by a completed Plan Check Form, evidence of utility coordination (may include documented requests), and the required fees.
B. The initial submittal shall be shared electronically and consist of PDFs of sewer, water, road, and drainage plans, profiles, and detail sheets and one set of drainage area plans and drainage calculations. The County Department of Public Works will review the first submittal and indicate the required revisions.
C. The EOR shall revise the plans as required and make a subsequent, typically final, submittal which shall consist of PDFs of the sewer, water, road and drainage plans, profiles, and detail sheets and be submitted electronically with EOR electronic stamp. Upon the approval by the County Department of Public Works, the County will email an approved PDF of the plans to the Development Team. Hard copies of the approved plans may be provided at the request of the Development Team.
D. Any design changes made after final approval shall be approved by the County Department of Public Works prior to construction. For each change, the County, in consultation with the EOR, will determine if the particular change warrants an immediate plan sheet update, an exhibit, or as-constructed.
E. In accordance with Marion County Code Chapter 11.15, prior to beginning construction, a Construction Permit shall be obtained from the County Department of Public Works and the required fees shall be paid.

3.7.2 Private Development Project Fees

Project fees are based on current County Board of Commissioners adoption.

3.8 TRANSPORTATION REPORT OR IMPACT ANALYSIS REQUIREMENTS

Depending on the size of a private development project, a site transportation report (STR) or transportation impact analysis (TIA) may be required to assess the impacts of a proposed project or land use action on the transportation system and to identify any needed mitigation to address capacity, multimodal, or safety deficiencies. In approving a land use action that requires a TIA, the County may condition that approval on identified mitigation measures.

3.8.1 Type of Study Required

The following vehicle trip generation thresholds shall determine the level and scope of the study required for a proposed project or land use action, unless otherwise determined by the County Engineer. To determine the type of study required, applicant shall analyze the higher of the AM or PM peak hour of development. Contact Marion County Traffic Engineering to determine if the trip generation for the development meets the thresholds for a STR or TIA.

A. **No study** is required if there are fewer than 50 trips per peak hour generated, unless 10 or more vehicles per day exceed 20,000 pound gross vehicle weights.
B. **Site Transportation Report (STR):** If the development or change in use will cause the site to generate 50-100 peak hour trips, an STR will be required. A STR will also be required for a proposal that results in 10-30 vehicles per day exceeding 20,000 pound gross vehicle weights.
C. **Transportation Impact Analysis (TIA):** If the development or land use action will generate more than 100 peak hour trips and/or more than 30 vehicles per day exceeding 20,000 pound gross vehicle weights, a TIA shall be required.
D. **City Required TIA:** Any development or land use action within an Urban Growth Boundary that meets the city's criteria for requiring a TIA must also submit a TIA for the County.
E. **State Required TIA:** Any development or land use action that meets the state's criteria for requiring a TIA due to impacts to a state facility must also submit a TIA for the County.
F. **Zone Change and Comprehensive Plan Amendment TIA:** A TIA shall be required as necessitated by Oregon Administrative Rule (OAR) 660-012-0060, the Transportation Planning Rule (TPR), for any proposed zone change or comprehensive plan amendment that results in an increase in 400 or more daily trips. Per the 1999 Oregon Highway Plan (OHP) Policy 1F.5, an amendment or zone change that results in a less than 400 daily trip increase does not constitute a significant effect per the TPR and does not require

Examples of 50 peak hour trips:

- 50 single family homes
- 70 apartments, condos, or townhouses
- 12,000 sq ft floor area retail
- 55,000 sq ft floor area industrial
- 6,000 sq ft floor area plant nursery

preparation of a full TIA for the County. Refer to the current edition of the OHP for the most up-to-date guidance.

Projects proposing to use an existing access to a roadway under County jurisdiction are evaluated for crash patterns by Public Works. If a crash pattern is identified mitigation measures shall be required to bring the access into conformance with these standards to the maximum extent feasible.

3.8.2 Minimum Requirements for All Studies

Preapplication Meeting & Written Scope

If a study is required, the applicant shall participate in a preapplication meeting with County Engineering staff to develop a written scope that will define the study requirements and methodology of the type of study required.

Study Approval Process

The required study shall be submitted concurrently with the land use application and shall be prepared by a registered professional engineer who is licensed in the State of Oregon. The County Engineer shall determine when the report has satisfied all the requirements of the development's impact analysis. Incomplete reports shall be returned for completion.

All studies shall provide:

A. A vicinity map showing the location of the project in relation to the transportation system of the area;
B. A complete description and drawing of the proposed development;
C. A description of the TIA study area, including roadway names, locations and functional classifications, intersection lane configuration and traffic control (including signal timing), transit routes and stops (if any), pedestrian and bicycle facilities, and planned transportation system improvements;
D. Trip generation forecast using data from the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, unless more appropriate data is available and approved by the County Engineer;
E. Trip distribution;
F. Trip assignment; and
G. Safety analysis of the site accesses

Study Trip Generation & Trip Distribution

The peak hour and daily vehicular trip generation associated with a proposed development or land use action shall be calculated based upon the latest edition of the ITE's *Trip Generation Manual* and *Trip Generation Handbook.*

If a trip generation rate similar to the proposed development or land use action is not available within the *Trip Generation Manual*, applicant shall get approval of alternate rate by County Engineer. In

general, the procedures outlined in the *Trip Generation Handbook* regarding obtaining local trip rates should be used.

The trip generation and distribution of those trips to the road network shall be confirmed through the written scope agreed upon by the applicant and County Engineer.

Study Area & Trip Assignment

After consulting with other affected jurisdictions, the County Engineer shall determine the impact analysis area for the STR or TIA. The study area shall include, at a minimum:

A. All site access points to the public roadway system via either a driveway or private roadway shall be studied;
B. Nearest intersecting collector or arterial roads to the development that would experience an increase of 25 or more additional peak hour trips; and
C. Any other collector or arterial intersection requested by a city and/or Oregon Department of Transportation (ODOT).

Safety Analysis & Sight Distance

STRs and TIAs shall analyze the safety of the transportation network, including:

A. Evaluation of sight distance at the site access(es),
B. Crash history at the study intersections and site access locations,
C. Access spacing, and
D. Heavy vehicle circulation/access (when applicable).

Regardless of study required, developments that propose a drive-through service shall provide a queue analysis that evaluates the impact of queues on public roadways.

3.8.3 Additional Requirements for Transportation Impact Analysis (TIA)

Transportation Impact Analysis Scenarios

In addition to requirements above, a TIA shall provide PM peak hour intersection analyses for the accesses and study intersections for the following analysis scenarios.

A. Existing Conditions, based on existing turning movement counts;
B. Background Conditions, without the proposed project during the year in which the development is proposed to be constructed and occupied (including approved, but not yet built developments as identified by the County Engineer);
C. Total Traffic Conditions, including the proposed project during the year in which the development is proposed to be constructed and occupied (background conditions plus site generated traffic); and
D. Findings and Conclusions, including a recommendation and evaluation of potential mitigation for off-site impacts due to the proposed project.

Analysis of proposed developments and land use actions may also require AM and/or Saturday midday conditions. The evaluation of the required peak periods shall be confirmed through the written scoping process.

Zone Changes and/or Comprehensive Plan Amendments will also require an analysis of traffic conditions in a twenty-year horizon.

In addition, the following shall be provided.

A. Safety analysis of the site accesses and study intersections based on the most recent five years of crash history available from ODOT;
B. When needed, warrant analysis for traffic control devices;
C. Evaluation of impacts on bicycle, pedestrian, and transit access, circulation, and facilities; and a response to any previously identified comments by others.

Intersection Turning Movement Count Data

Turning movement counts to be used in the intersection analyses should be based upon counts collected within twenty-four months of the completed land use application. Turning movement counts shall include vehicular (truck vs. non-truck). Bicycle and pedestrian volumes may be required based on location and use; requirements will be identified in written scope.

Growth Rates

For short-term analysis of five years or less, linear growth rates shall not be less than 2% per year unless verifiable evidence is submitted or known which indicates that the local growth rate is less than 2% per year. For long-term analysis of six years or more, growth rates shall be applied from the current version of ODOT's Analysis and Procedures Manual (APM). In-process traffic, or developments that have been approved and have current land use approval yet are not occupied or fully built-out, shall be included in addition to growth projections. That information may be omitted for zone changes and comprehensive plan amendments. Requirements and methodology will be identified in written scope.

Intersection Operational Analyses

All TIAs shall include intersection operational analyses performed using the most recent version of the *Highway Capacity Manual* (HCM) methodologies.

The minimum operational standards for use on the County's system are:

A. Two-Way Stop Controlled (TWSC) Intersections – the critical approach should operate at Level of Service (LOS) "E" or better; LOS "F" is permissible if the critical approach operates under capacity and a traffic signal is not warranted at the intersection;
B. All-Way Stop Controlled (AWSC) Intersections – LOS "E" shall be maintained;
C. Signalized Intersections – LOS "E" shall be maintained;
D. Roundabouts – the critical approach shall operate with a volume-to-capacity ratio of 0.85 or less;

E. For intersections under ODOT jurisdiction, the applicable ODOT mobility targets apply; and
F. For intersections within a city's UGB, the city's LOS standards apply, unless determined otherwise by the County Engineer.

Queue Analysis

All TIAs shall provide a queuing analysis that evaluates the impact of queues on public roadways. Traffic backing onto public roadways could create safety concerns.

Turn Lane Warrants

It may be required for TIAs to provide right-turn and left-turn lane warrants, as identified in the written scope. When required, applicants shall conduct turn lane warrants using the current version of ODOT's APM.

Applicable Mitigation Measures

In approving an action that requires a TIA, the County may condition that approval on identified mitigation measures needed to protect the safety of the transportation system from potentially adverse impacts of the proposal. Measures may include but are not limited to:

- Multimodal facility changes;
- Intersection safety mitigation measures;
- Intersection geometric and traffic control changes; and/or
- Proportionate share contributions toward a previously identified deficiency.

Proportionate Share Contributions

All proportionate share contributions shall be based on the development's share of future growth in volumes at the intersection (i.e., future volumes less existing volumes). Mitigation measures and proportionate share contributions must be roughly proportional to the identified impacts. Refer to the County RTSP for additional information.

3.9 CHECKLISTS

The following plan development and submittal checklists can support project teams in verifying the required information is included for each project type. Checklists can be found in **Appendix E.**

- Subdivision Plan Checklist
- Survey Checklist
- Utility Checklist
- Plans Development Checklist
- Horizontal and Vertical Clearance Checks
- ADA Curb Ramp Design Checklist(s)
- Erosion Prevention and Sedimentation Control Checklist

- Stormwater Quality Treatment Submittal Checklist
- Other

3.10 REFERENCES

None.