

Concept Design Methodology (Task 3.3)

FOR: Lane Transit District (LTD)
City of Eugene

FROM: CH2M

DATE: June 2, 2015

OVERVIEW

The purpose of this memo is to establish the level of detail for conceptual designs developed in Tasks 5.2 and 5.3 (Level 1 Screening), and 6.1 (Level 2 Alternatives Refinement and Evaluation) of the MovingAhead project. This memo will include how land use context, right-of-way impacts, and costs including capital costs, and operations and maintenance costs will be captured during these two phases.

LEVEL 1 SCREENING (TASKS 5.2 AND 5.3)

The Level 1 screening task will explore mode alternatives for BRT or enhanced corridor improvements on each of the 7 identified corridors for study. The purpose is to identify corridors that are most ready for BRT improvements and, therefore, are ready to be advanced to the Level 2 Alternatives Analysis (Level 2 AA) and, ultimately, near term capital improvements programming. Corridors that are not ready for BRT improvements but are ready for enhanced corridor improvements would be advanced to capital improvements programming. Corridors that are not ready for BRT or enhanced corridor improvements would be considered again in five to 10 years.

Up to 4 mode concepts per corridor will be developed, for a total of up to 28 total build concepts. This includes a No-Build concept for each corridor. The concepts will consist of some combination of typical cross sections developed in Task 3.2 and applied along each corridor to achieve transit and community objectives based on land use, existing corridor cross section, and results of public outreach efforts.

The deliverable for Task 5.2 will be one smart-line map per concept (up to 28 total), scale 1" = 1/2 mile, similar to the concept shown in Figure 1. The smart line maps:

- Will include a single line that will vary by color depending on the selected cross section type for each portion of the corridor.
- Will include cross section references either by letter (e.g. cross section A) or as a sidebar numbers. The total length of each cross section applied in each concept will be tabulated.
- Will reflect approximate station location areas but will not reflect specific station locations, pedestrian crossing locations or intersection treatments.
- Will not reflect routing options but may include "dotted line" routing options that may be explored in the development of conceptual alternatives for the Level 2 AA.
- Will include termini based on general footprint assumptions for corridors that are not loops.

These maps will be used in Task 5.3 to screen the concepts and determine which concepts will be moved forward into the Level 2 AA for refinement and evaluation.

Task 5.3 deliverables will include an order-of-magnitude capital costs estimate (bus infrastructure construction; vehicles and any facility upgrades) for each concept developed in Task 5.2. Costs will be based on a per mile cost for each cross section type. Costs will include:

- Construction costs for cross section type (per mile).
- Pre-established contingencies for each proposed cross section.
- Typical costs for stations, pedestrian crossings or intersection treatments assuming 1/3 mile station spacing and 500 feet mid-block crossing spacing.
- Estimated number of additional buses needed to serve corridor.
- Signal modifications at all intersections, assuming a percentage of major intersections will require reconstruction and the remaining percentage will require modification. Estimated costs for signal modifications will be based on a percentage of the total cost estimate for each concept.
- Threshold that triggers need for operations and maintenance facility and estimated cost to acquire and construct facility.
- Threshold that triggers need for park and ride facilities and estimated cost to acquire and construct facility. Note: park and ride facilities may be included as part of the project cost estimate or may be a separate cost if determined to be a regional STIP project.

Cost estimate contingencies are divided into two types, allocated and unallocated. Unallocated contingencies will be included to cover unexpected changes in project scope, higher than predicted inflation, and any such items that cannot be identified at this level of development. An unallocated contingency of 5 percent will be used for anticipated special circumstances for the MovingAhead Project.

Allocated contingencies will be applied to each major construction category based on the level of design detail. These contingencies will account for the general level of detail available upon which to complete the estimate, cover items not quantified, or for which a cost cannot currently be determined. The level of allocated contingency is applied at the following rates (these rates may be adjusted based on LTD’s documented experience with similar projects and/or other factors):

Item	Percentage
Guideway	20%
Stations	25%
Systems	30%
Sitework	35%
Right- of- way	20%
Utility Relocation	50%
Vehicles	10%

Under Task 5.3, the Consultant will prepare a technical memo documenting the process and the screening level evaluation leading to the project team's recommendations: (1) corridors to advance to the Level 2 AA (could include both BRT and enhanced corridor mode alternatives for these corridors), (2) corridors that should advance directly to capital improvement programming (those where BRT is not advanced as an option), and (3) corridors that should be reconsidered in five to 10 years. The memo will also include a summary screening matrix and technical appendix explaining capital costs estimating assumptions.

LEVEL 2 ALTERNATIVES REFINEMENT AND EVALUATION (TASK 6.1)

During the Level 2 AA, the Consultant will evaluate up to four corridors with up to two mode concepts and a No-Build concept in each corridor for a total of 8 build concepts and 4 No-Build concepts. The intent of this phase of analysis is to inform the selection of a Locally Preferred Alternative (one mode and alignment concept) for each of the 4 corridors to advance to capital project development and corridor-level environmental documentation. During Level 2 Alternatives Refinement, a footprint for each corridor concept will be developed.

The Task 6.1 deliverable will be 1" = 100' layout roll plots over aerials with existing right-of-way lines displayed for each concept as show in Figure 2. The plots will detail the following:

- Transit route and termini locations with proposed roadway cross section extents and limits. Plans will use representative concepts developed in Task 3.2 (multi-modal toolbox) plus station typologies. Specific designs tailored to the individual corridor will not be developed (this is done after the NEPA analysis when the project is advanced to engineering and development).
- An approximate right-of-way footprint based on overall cross section widths and additional widths needed at intersections, stations, and other points. This will consist of a thick offset line on the aerial image. Specific intersection design will not be conducted (this is done after the NEPA analysis when the project is advanced to engineering and development). The intent of the estimated footprint is to provide a conservative estimate of right-of-way requirements. General assumptions used to establish the offset width of this line will be recorded in the Level 2 AA Appendix required as a deliverable under this task. In specific, unique situations where more or less right-of-way acquisition is expected, or the acquisition is sensitive in terms of area context or cost implications (e.g. wetland/park impacts or impacts to historic buildings that are obvious and generally unavoidable at this level of alternatives refinement), plan annotation will be used to highlight these locations.
- General station locations identified based on desired stop spacing and existing and future land use and area contexts. Refined geometry will not be shown in this phase, but text annotation and blocks developed in Level 1 Screening will show proposed improvements and areas needing further study in later phases.
- Pedestrian and bike improvements proposed as a part of each corridor concept will be accounted for in establishment of the right-of-way footprint.

- Mid-block pedestrian crossings will be identified for each corridor using the toolbox concepts (Task 3.1). Right-of-way impacts for mid-block crossings will be accounted for in establishment of the approximate footprint.
- Plots will be intended for internal technical use only and not for public viewing or display. Generalized figures will be developed for public review.

A planning-level capital costs estimate for each concept will be developed based on roll plots. Cost estimates will be based on unit costs and calculated in 2015 dollars. Costs will include all cost categories and tabulations in accordance with the most recent Small Starts Standard Cost Categories (SCC) worksheets issued by FTA. Estimates will include right of way acquisition costs based on typical Eugene land costs by land use type (provided by City of Eugene). The Consultant will use LTD's estimated number of vehicles and unit costs and operational and maintenance cost estimates, and service plans to fully capture the costs of each alternative. Cost estimate contingencies will be the same as those identified in Level 1.

Given the multimodal focus of MovingAhead, the Consultant will work with the City and LTD to determine which bike and pedestrian improvements identified in each corridor are included as part of the transit project cost and which are identified for separate funding. Based on this agreement, the planning-level cost estimates will be separated into transit project costs (including agreed-upon bike and pedestrian improvements) and other bike and pedestrian project costs.

The planning-level cost estimates will inform the Level 2 AA financial analysis which will consider currently available revenue, O&M costs, capital costs, potential shortfalls, additional revenue sources, LTD cash flow, risks and uncertainties, and implementation.

The financial analysis will include a discussion of the shortfall and risk and uncertainties and other funding opportunities. The Consultant will assess funding opportunities and produce a discussion of the financial implications each alternative is likely to have on local finances (cash flow). Potential funding and financing opportunities will include those mechanisms that the City and LTD already employ and those that there may be an opportunity to utilize.

Financial analysis will consider the impact each alternative would have on LTD's finances in terms of the estimated capital costs and long-run operations and maintenance costs. Financial analysis will be consistent with the documentation requirements of Section 5309 Small Starts Grants

Under Task 6.1, the Consultant will prepare a Level 2 AA report documenting the process and the alternatives evaluation. The report will include a trade-offs analysis to aid in the selection of LPA's for each of the 4 corridors. The Level 2 AA will also include an appendix with the technical memos supporting the evaluation.