Washington State Department of Transportation

# Task Order

*All terms and conditions of this agreement are in full force and effect for this Task Order document.*

**Agreement No.** *(To be filled in by Agreement Manager)*: Y 9273

**Task No.**: AN

## On-Call Agreement Manager Information

| Agreement Manager | Phone | Org. | Mailstop |
|---|---|---|---|
| Erik Jonson | 360-705-7106 | 308010 | 47323 |

| Mailing Address | | | |
|---|---|---|---|
| PO Box 47323 | Olympia | WA | 98504-7323 |

## Project Manager Information *(If different from On-Call Agreement Manager)*

| Project Manager | Phone | Org. | Mailstop |
|---|---|---|---|
| Douglas P. Ficco | 360-737-2726 | 441101 | S 15 |

| Mailing Address | | | |
|---|---|---|---|
| 700 Washington Street, Suite 300 | Vancouver | WA | 98660-3177 |

## Project Information

| Project Title | |
|---|---|
| Columbia River Crossing Project | |
| State Route No(s). | County(s) |
| I-5 | Clark |

## Task Schedule

| Task Start Date | Task End Date |
|---|---|
| December 1, 2009 | April 15, 2010 |

← No payment will be made for work done **PRIOR** to Task Start Date or for work done **AFTER** Task End Date

## Task Cost

| | | | | | This section required if there is Fed. Aid Part. | |
|---|---|---|---|---|---|---|
| **Work Order No.** | **Org. Code** | **Amount** | **Fed. Aid Part.?** | | **Fed. Aid Project No.** | **Fed. Aid Part. %** |
| XL 3679 | 441101 | $56,000.00 | ○ Yes | ◉ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| | | | ○ Yes | ○ No | | |
| **Total Task Amount →** | | **$56,000.00** | | | | |

## Consultant Information

| Prime Consultant | Contact |
|---|---|
| HDR Silver Springs MD | Khalid Bekka Ph.D, MBA |

| Address | | | |
|---|---|---|---|
| 8403 Colesville Road, Suite 910 | Silver Springs | MD | 20910-3313 |

| Phone | Fax | E-Mail | Federal I.D. No. |
|---|---|---|---|
| 240-485-2605 | 240-485-2635 | khalid.bekka@hdrinc.com | 47-0680568 |

Are there any Subconsultants working on this project? ☐ Yes ☒ No
If Yes, complete the Subconsultant Worksheet and return with signed Task Order.

## Approval Signatures

****Note: Two original signed Documents are required.****

Khalid Bekka — Consultant

Washington State Department of Transportation

Agreement Manager *(Signature required for execution of document ONLY for Communications and Public Involvement and Environmental Services Agreements)*

DOT Form 130-010 EF
Revised 11/2003

Agreement No. Y 9273
Task No. AN

## Scope of Task Order

*Provide description of work and reference attachments for prime consultant and all subconsultants (to include detailed description of work schedule and estimate).*

Report Due Date

Perform preferred alternative Cost Benefit Analysis in accordance with the attached scope and budget.

Distribution: Originals: ☒ Consultant ☐ Accountant
Copies: ☒ File ☒ Task Manager ☒ Consultant Services ☒ Other B. McMullen, R. Funkhouser

DOT Form 130-010 EF
Revised 11/2003

## Project Understanding

### Study Objectives

The HDR | Decision Economics team understands the issues and objectives as defined by CRC Team to update the previously conducted cost benefit analysis to assess the worthiness of the preferred alternative currently under consideration. Our experience conducting the original CRC cost-benefit analysis, married with our strong expertise in assessing highway and transit benefits for well over 50 agencies in the US and Canada uniquely qualifies us to perform the tasks required

### Highway Benefits Assessment

For this project, we intend to apply the customized algorithms from StratBENCOST model, which was developed for the National Cooperative Highway Research Program (NCHRP) by HDR to evaluate highway projects. The model, which was applied to the original CRC CBA, incorporates an analysis of the network of highways and surrounding roads. The model allows strategic level planners to integrate highway user costs and benefit-cost analysis into a broad-based highway investment evaluation tool. The analysis will be conducted at the roadway network level while incorporating risk analysis techniques to account for uncertainty inherent in the methodology and data underlying the analysis. This part of the model will assess the effects on the CRC on surrounding/alternative roadways in terms of travel times, travel distances, and other performance data, and develops economic investment and decision criteria based on those results. In particular the highway investment analysis will take into accounts:

- Demand estimation traffic models (network roadways);
- Value of time models based on economic data;
- Vehicle operating cost models;
- Safety and accident cost estimation;
- Environmental effects;
- Construction and disruption costs;
- Risk analysis element to account for uncertainty; and
- Economic evaluation criteria.

StratBENCOST uses an extensive set of default user cost values, which provide information on such various issues related on travel time savings, vehicle operating costs, safety savings, and environmental savings. As before, the analysis will rely on these defaults value when ever existing data are not available.

### Transit Benefits Taxonomy

Federal Transit Administration (FTA) research[1] reveals that transit-oriented development in the United States yields social and economic benefits for communities. These gains include,

- Increased demand for walking and biking;
- A corresponding decline in the demand for motorized trips;

[1] Federal Transit Administration, 1996 Report: An Update. U.S. Department of Transportation

- Reduced dependence on automobiles;
- Greater demand for commercial floor-space and correspondingly higher commercial property values; and
- More highly valued residential property due to the locational and environmental benefits of transit-oriented development, yet without higher residential taxes.

Taken together, all these characteristics of public transportation make a positive contribution to the regional economy. More specifically the benefits of transit fall into three main categories that can be defined as follows:

- **Affordable Mobility/Sector Sector Benefits** – These are the benefits from providing low-cost mobility to transit depend households. The benefits include income from employment made possible by transit, the economic value to access services such as healthcare, education, retail, and attractions (transit fare is typically lower than taxi fare and vehicle ownership and operating cost), and budget savings for welfare and social services due to the presence of transit.
- **Congestion Management Benefits** – Congestion management benefits are the savings in vehicle ownership and operating cost, travel time, accidents and environmental emissions due to less congestion and fewer miles traveled by personal vehicles due to the transit system. These savings in resources imply greater disposable household income for other purposes. The two principal benefits are the reduction in travel by personal vehicles, and, travel in less congested conditions by vehicles remaining on the roadway.
- **Economic Development Benefits** – Proximity to transit has a positive effect on residential property values and the commercial activities due to the increased availability of travel opportunities, and, the ability of others to access the residence and commercial centers by transit.

Table 1 presents the benefits of public transportation taxonomy categorized above. HDR proposes to assess all these benefits within this project with a thorough concentration on assess alternative options. The estimation of public transportation affordable mobility and cross sector benefits employs state-of-the-art methods of consumer surplus analysis in application to distinct income, demographic and transit-dependent groups. The estimation of benefits also includes methods of estimating the reduction in transfer payments due to reduced unemployment and reduced reliance on home-based healthcare and nutrition social services.

**Table 1: Transit Benefits Taxonomy**

| Economic "Benefits" | Beneficiaries | Link to Economic "Impacts" | Economic Impact Metrics |
|---|---|---|---|
| **Congestion Management Benefits** Reduced congestion costs (reduced travel time, vehicle operating costs, and other ancillary travel expenses; reduced accident costs; reduced emissions) | Existing and induced transit users (other than low-income)<br><br>People and businesses (freight shippers /carriers) who travel on road network adjacent to transit lines | Reduced commuting delays lead to lower labor costs and increased demand for labor. | Number of jobs created or retained<br><br>Change in value of sales / output<br><br>Change in labor and other income<br><br>Change in tax collection (including sales, income and business taxes) |
| | | Reduced work-related travel delays lead to increased labor productivity and reduced production costs. | |
| | | Reduced highway congestion leads to reduced logistics and production costs. | |
| | | Increased trip-making lead to increased demand and economic activity. | |
| | | Reduced out-of-pocket travel expenses lead to increased purchasing power. | |
| **Affordable Mobility Benefits** Induced demand and change in consumer surplus associated with availability of low-cost transportation (accessibility) | Low income households and people with special needs, with access to transit network | Increased trip-making lead to increased demand and economic activity. | |
| **Cross-Sector Benefits** Reduced budgetary outlays on assistance programs (such as home care, meals on wheels, etc.) | Sponsoring agencies and taxpayers | Budgetary resources are made available for other, more productive uses. | Program / budgetary cost savings |
| **Liveable Community Benefits** TOD and agglomeration economies | Households residing, and businesses located, in vicinity of transit stations | Proximity (access) to labor pools, suppliers, customers, etc. enhances productivity / reduces production costs. These impacts are capitalized in property values. | Change in property values<br><br>Change in property taxes |

## Scope of Services

Within the coordination framework outlined above, we propose to conduct the Cost Benefit Analysis Update for the CRC preferred alternative in conformance with the task structure described below.

**TASK 1: UPDATE OF THE BASELINE CONDITION AND IDENTIFICATION OF THE PREFERRED ALTERNATIVE**

The team will review all existing documents under this task to ensure our understanding and analysis of the baseline conditions in terms of socioeconomic and traffic growth is consistent with current CRC project team understanding.

The team will review all documentation and collect additional information through CRC team interviews on the refinements to the preferred alternative.

The main goal for baseline identification is to Guarantee "Incrementality" and avoid any potential double counting. Therefore, any minor infrastructure improvement planned or under way in the corridor should be taken into consideration under the baseline conditions in the analysis. The cost benefit analysis updated would not be complete without a comprehensive assessment of the preferred alternative.

**TASK 2: IDENTIFICATION AND MEASUREMENT OF BENEFITS AND COSTS**

Benefit-Cost Analyses (BCA) of highway and transit projects develop monetary measures of benefits for comparisons against cost. BCA attempts to capture all public benefits and costs regardless of who realizes the benefits and costs or what form that they take. All benefits and costs will be identified and quantified in this task, employing the principles and methodologies outlined earlier. Optimal statistical techniques will be employed in the process.

The following categories of benefits and costs would be reviewed, quantified and risk-assessed in relation to **the Base Case and the Preferred Alternative**:

- Capital costs;
- Life-cycle operating costs;
- Time savings to motorists and transit users due to new roadway and transit facilities;
- Time savings to motorists avoiding bridge lift delays
- Reliability improvements to motorists and transit users;
- Low cost mobility benefits;
- Social service efficiency benefits;
- Liveable community, station-specific benefits;
- Vehicle operating cost savings for autos, trucks and buses;
- Safety costs and benefits, including life, limb and property effects;
- Environmental effects, including air quality, noise and greenhouse gases; and
- Infrastructure maintenance and capacity costs.

For each benefit category HDR will review the findings in the preliminary CBA, update the assumptions used to calculate each benefit category and collect updated inputs.

**TASK 3: STATION AREA DEVELOPMENT**

For the original CBA, we applied a methodological approach given in Section 8, *Technical Report 2: Transit-Oriented Development Benefits of LRT Alignments.* We employed hedonic price studies from the many rail corridors we have assessed for FTA to estimate station-area value improvements due to station location and design along the designated line.

For this update we will review real estate trends and development programs for similarly sized transit investments in other US cities to update our "benchmarks." We will also review our analysis of land development patterns, public and private sector development plans and existing and proposed zoning to understand the true market and potential for TOD development.

The result of our review and update will be a revised assessment of the market potential for transit-oriented development within the station areas. Information is to include the potential order of magnitude absorption rate of development by use type, mix, and intensity given the projected start-up date of the project. The task will also assess the market strengths and weaknesses of the station area as it relates to other potential growth areas in the region.

**TASK 4: COMPUTATION OF NET BENEFITS**

We propose to present measures of investment worth (net present value, rate of return and BC ratio) **and** measures of optimal timing. Having coded the analysis as Benefit-Cost Analysis Simulation Model, will we be in a position to assess the policy and planning questions posed by the CRC team. Based on this analysis, we will be in a position to establish whether the ridership and development effects needed to ensure an adequate return can reasonably be expected in light of experience in other cities.

Perhaps of even greater practical value, the risk analysis will reveal the probability of achieving an adequate rate of return given the underlying risk assessment of ridership, development effects and other factors, including uncertainties ascertained from experience in other cities. The model will also enable optimization in the event that this probability is considered too low. In other words, the model will enable decision makers to ascertain the LRT phasing options that would align construction with underlying population and traffic growth in such a way as to ensure a desirable return on investment.

**TASK 5: DRAFT AND FINAL REPORT**

HDR will prepare the following report deliverables:

1) Draft final report that incorporates all study elements, including an executive summary of key results and findings, and a technical appendix with model and data detail; and
2) Final report based on feedback on the Draft report from CRC.

| | | | |
|---|---|---|---|
| Project: | **CBA for CRC** | Date: | |
| Cost Estimate: | **HDR** | | |
| Agreement: | **Agreement #** | | < Enter data only in the yellow highlighted cells if applicable |
| Task Order: | **Task Order #** | | < Formula cells: Please do not enter data in these cells |
| Amendment: | **Amendment #** | | < For tips move cursor over red tags |

**HOURS:**

| WBS (MDL) | Tasks | Classification: | Principal | Senior | Economist | | |
|---|---|---|---|---|---|---|---|
| PC-10 | Cost Benefit Analysis | Res Name: | Khalid Bekka | Neil Pogorelsky | Hicham Haboussi | | Subtotals |
| PC-10.01 | | Rate ($/hr): | 105.36 | 60.41 | 30.15 | | (Hrs) |
| PC-10.01.01 | Review of the Project Documentation | | 4 | 4 | 16 | | 24 |
| PC-10.01.02 | Data Collection and analysis | | 2 | 8 | 24 | | 34 |
| PC-10.01.03 | Highway Benefit Modeling | | 4 | 8 | 24 | | 36 |
| PC-10.01.04 | Transit Benefit Modeling | | 4 | 8 | 24 | | 36 |
| PC-10.01.07-08 | Briefing material and results presentation | | 24 | 8 | 8 | | 40 |
| PC-10.01.12 | Draft Report | | 16 | 24 | 40 | | 80 |
| PC-10.01.13 | Final Report | | 16 | 24 | | | 40 |
| PC-10.01.14 | Follow Ups | | 16 | | | | 16 |
| | **Total hours (including 10.01.10)** | | 86 | 84 | 136 | 0 | 306 |

**COSTS:**

| ID # | CEVP® Workshop and Report Preparation | Res Name: | Khalid Bekka | Neil Pogorelsky | Hicham Habo | | Subtotals |
|---|---|---|---|---|---|---|---|
| | | Rate ($/hr): | 105.36 | 60.41 | 30.15 | | ($) |
| 1 | Overhead as % of direct labor | 168.40% | 177.43 | 101.73 | 50.77 | - | |
| 2 | Fixed Fee as % of direct labor | 30.00% | 31.61 | 18.12 | 9.05 | - | |
| 3 | Fully loaded rate | | 314.39 | 180.26 | 89.97 | - | |
| 4 | ***Total Direct Labor Cost (loaded rate x hours)*** | | *27,037.90* | *15,142.13* | *12,235.59* | - | *$ 54,416* |
| 5 | Per Diem totals for traveling resources | | $ 147.00 | | | | *$ 147* |
| 6 | Lodging totals for traveling resources | | $ 450.00 | | | | *$ 450* |
| 7 | Rental Car / Taxi | | $ 150.00 | | | | *$ 150* |
| 8 | Parking (rate x day) | | | | | | *$ -* |
| 9 | Air Travel | | $ 600.00 | $ - | | | *$ 600* |
| 10 | Postage | | | | $ - | | *$ -* |
| 11 | <Other costs (consultant to identify)> | | $ - | | $ - | | *$ -* |
| 12 | ***Total Other Costs*** | | *1347.00* | *0.00* | *0.00* | | *$ 1,347* |
| 13 | **Total Cost Est** | | 28,384.90 | 15,142.13 | 12,235.59 | | $ 55,763 |

**Rounded and c/fwd to Task Order** $ 56,000

**References**