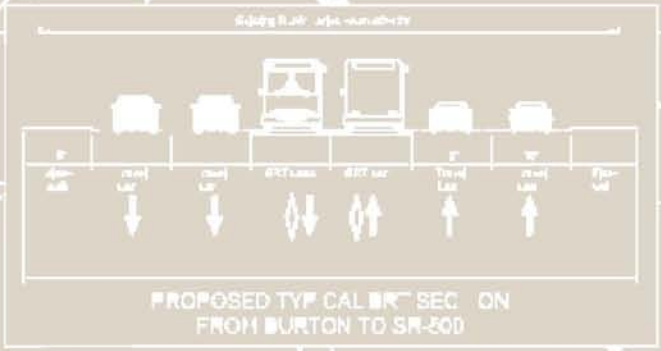
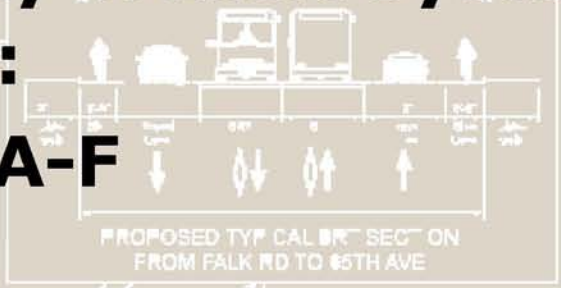
Clark County
High Capacity Transit System Study
Final Report:
Appendices A-F





Moving People -

Connecting Our Community

December 2008

Southwest Washington Regional Transportation Council

Appendices

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Appendix A

New Starts Program

New Starts Program

New Starts refers to a federal program available to provide capital funding for high capacity transit projects. Officially known as the Section 5309 Capital Investment Grant Program, it was established by congress to assist local agencies to fund meritorious transit capital projects (including light rail, commuter rail and bus rapid transit). It is a discretionary and competitive grant program and over the years FTA has established guidance for applications that include extensive requirements regarding technical analysis that is aimed at demonstrating the merits of the various projects.

FTA's guidance includes standard templates for reporting a variety of the technical analyses which are used by FTA to compare and rank project applications. FTA staff works closely with each applicant to ensure that the analysis is prepared in a consistent manner so that they can be compared with other applicants from across the country. Promising corridors identified through the Clark County High Capacity Transit System Study may be considered for New Starts funding.

The 5309 Grant Program (New Starts) is authorized to fund up to 80 percent of a project's capital cost, but typically FTA will not provide more than 60 percent funding and has expressed a strong preference for projects requesting no more than 50 percent federal funding.

New Starts Program Project Categories

FTA has defined three project categories that are eligible for Section 5309 funding:

- **Very Small Starts** – Projects with total capital cost of less than $50 million and less than $3 million per mile (excluding vehicles).
- **Small Starts** – Projects with a total capital cost of less than $250 million with no greater than $75 million requested in federal 5309 funding. Small Starts must have at least 50 percent of the project length in a fixed guideway or be a corridor BRT project with substantial stations, signal priority, low-floor vehicles, 10-minute peak frequency and at least 14 hours of service per day.
- **New Starts** – Projects with a total capital cost of more than $250 million. *(Note: the term "New Starts" refers to this specific funding category but it is also used to refer to the overall Section 5309 Capital Investment Grant Program).*

Project Ranking

Because it is a competitive grant program, FTA has developed a method for comparing and ranking the submitted project proposals. A project must receive at least a medium ranking in the following categories to be considered for funding:

- **Cost-Effectiveness** – Project cost-effectiveness is measured using a formula developed by FTA known as cost per hour of transportation system user benefit (TSUB). This is calculated using regional travel demand model to compare a proposed project with a Baseline Alternative (similar to No-Build). To perform well with this measure, the proposed project needs to show improved travel time for transit system users in the corridor.
- **Land Use** – There are three categories of land use evaluation: 1) existing land use; 2) transit-supportive plans and policies; 3) past performance of transit-supportive policies. To perform well in this measure there needs to be substantial existing and planned densities within the corridor, existing transit-supportive land use policies in place and a demonstrated history of success with transit-supportive land use policies.
- **Local Financial Commitment** – To perform well in this category, potential sources of local (non-federal) funding must be identified and must be considered to be potentially feasible. Local funding does not need to be fully committed at the early stages of a project, but increasing commitment to a funding plan is expected as a project becomes more fully developed.

Application of these rankings varies by project category and includes the following:

- **Very Small Starts** – If a project can meet certain criteria (at least 3,000 daily existing transit riders in the corridor, less than $50 million total cost and less than $3 million per mile) it is automatically assigned a medium ranking for cost effectiveness and land use.
- **Small Starts** – Cost-effectiveness ranking is based on travel demand model analysis of the projected opening year rather than a 20-year forecast. The land use analysis requires slightly less detail than for New Starts.
- **New Starts** – Most rigorous analysis required. Cost-effectiveness is based on a 20 to 25-year travel demand model forecast using adopted regional plans. Land use analysis requires a little more detailed analysis than Small Starts.

New Starts Analysis Process and Timelines

Congress and FTA have established guidance for a New Starts or Small Starts project grant request. Figure A-1 displays the process that is required, beginning with preparing a system plan and concluding with project construction. While the process can be shorter for less complex projects, it can take up to ten years to complete the process from system planning through to the completion of construction.

The Clark County HCT System Study and RTC's ongoing role as the MPO for the Clark County region provides the basis to meet system plan requirements. The system plan must be incorporated into the regional plan, RTC's Metropolitan Transportation Plan (MTP), and adopted by the MPO.

99th Street Transit Center, Vancouver

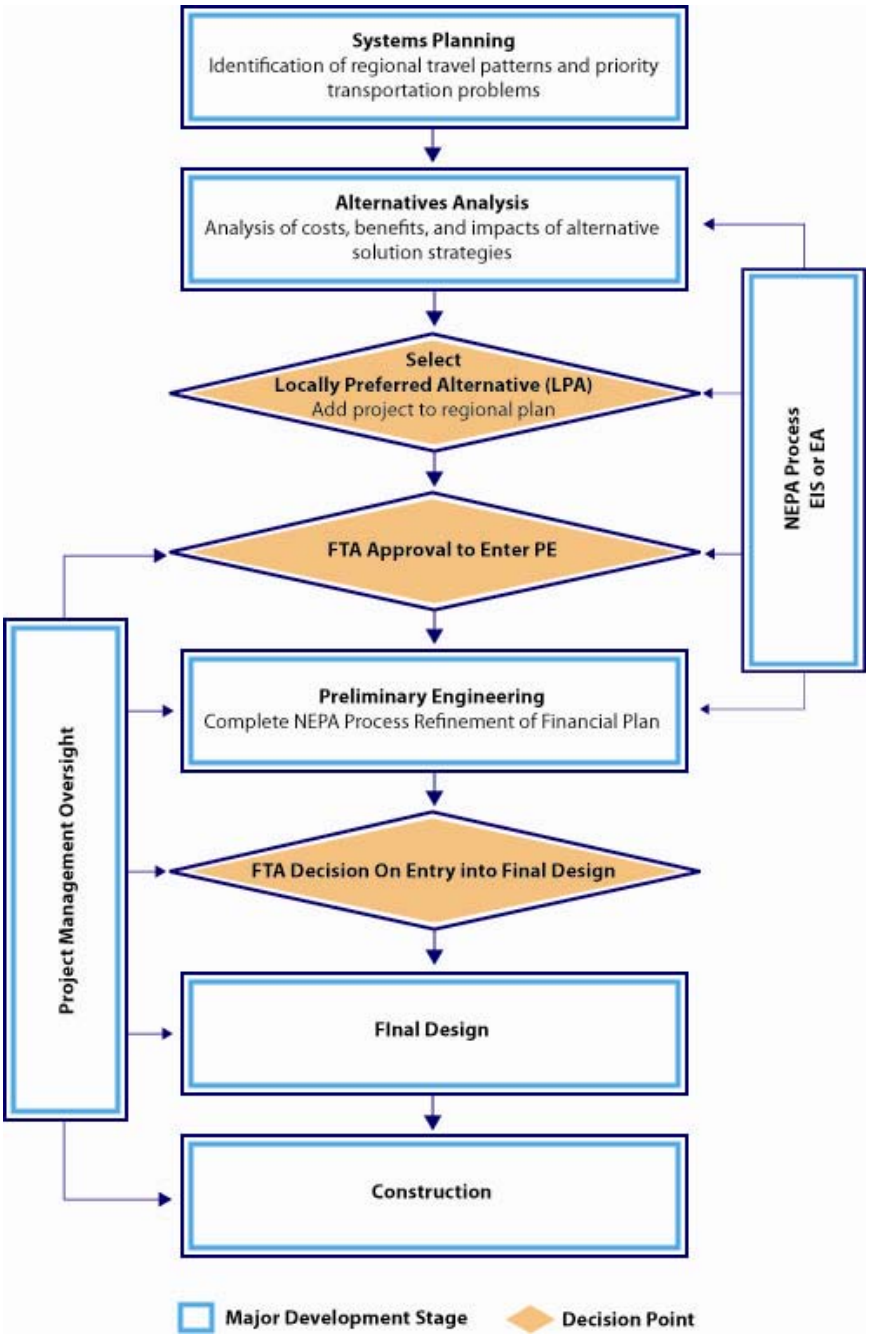
The following items describe the major steps in the New Starts process and define key terms.

- **System Plan** – A system plan refers to an effort similar to this study that evaluates travel corridors, identifies transportation problems and assesses whether high-capacity transit solutions might be appropriate. A system plan should be prepared collaboratively with the appropriate jurisdictions and agencies using data that is consistent with the adopted regional plan.

- **Priority Corridor** – Based on the system plan analysis and the local decision-making process, a region selects a transportation corridor to advance into the New Starts process.

- **Alternatives Analysis (AA)** – The project sponsor is required to perform an alternatives analysis that evaluates the mode and alignment options for a corridor. This analysis informs local officials and community members on the benefits, costs and impacts of high-capacity transit options, so that the community can identify a preference. This phase is complete when local and regional decision-makers select a preferred HCT mode and alignment (the locally preferred alternative or LPA), and it is adopted by the MPO into the region's long-range transportation plan. This can be completed prior to initiating a federal National Environmental Policy Act (NEPA) process or in conjunction with the NEPA process.

Figure A-1
Planning and Project Development Process for New Starts Projects



- **Locally Preferred Alternative (LPA)** – This is the outcome of the alternatives analysis. FTA allows the local decision-makers to determine which transit strategies best meet the needs of the region to serve a particular corridor. However, FTA requires that the locally preferred alternative represent a potentially cost-effective solution

prior to providing approval to begin preliminary engineering.

- **Project Management Plan (PMP)** – Prior to receiving FTA approval to initiate preliminary engineering, a grantee is required to prepare a Project Management Plan. The PMP establishes the engineering approach, procedures, and roles and responsibilities for undertaking the project and prepares engineering surveys and studies necessary to determine construction needs and requirements. The PMP also identifies required real estate, utility, railroad and other third party agreements and validates capital and operating and maintenance costs.
- **National Environmental Policy Act (NEPA)** – NEPA requires that any project that receives federal funding undergo an evaluation of potential environmental impacts. The evaluation typically covers a broad range of environmental issues including wetlands, air quality, water quality, noise, traffic, etc. The level of analysis can range from a Documented Categorical Exclusion (DCE – least amount of detail) to an Environmental Assessment (EA – moderate level of detail) or to an Environmental Impact Statement (EIS – highest level of detail).
- **Preliminary Engineering (PE)** – Following completion of an AA, selection of the LPA and preparation of a PMP, FTA must approve a project to continue into the preliminary engineering stage of project development. During preliminary engineering, local project sponsors consider design options to refine the locally preferred alternative and complete the NEPA process. Preliminary engineering hones the estimates of project costs, benefits, and impacts.
- **Environmental Impact Statement (EIS) or Environmental Assessment (EA)** – Typically a New Starts project will be required to complete an EIS or EA in order to meet the requirements of the NEPA process. An EIS is required for more complex projects that are likely to have significant environmental impacts. An EA can be used for less complex projects where the likelihood of significant impacts is low. In either case the NEPA analysis is based on refined designs and operating plans developed during preliminary engineering.
- **New Starts Report** – Projects that plan to compete for Section 5309 capital funding must submit an annual report to FTA. This report describes the project and provides information on the project performance with regards to ridership forecasts, cost-effectiveness, local financial commitment, land use and environmental measures. The information submitted can be the same from year to year if

nothing significant has changed, but it must be reviewed annually and updated when new data is available. FTA issues an annual report to congress that summarizes the information on all potential New Starts projects.

- **Before and After Study** – In order to gain insight as to which elements of New Starts projects work well and which ones do not, FTA requires that project sponsors collect and document information developed and used during various stages of project development. The project development data is then compared with actual performance following the initial year of operation.

Appendix B

Public Involvement Summary

Background

The Clark County High Capacity Transit System Study was initiated in October 2006 to identify a high capacity transit system that would provide efficient and high quality transit service connecting county residents with where they want to go. The study included several interrelated elements including coordination with partner jurisdictions and agencies, technical analysis and evaluation of high capacity transit strategies, public information dissemination, public involvement opportunities and a political decision-making process.

Through the public involvement program, RTC staff and consulting team participated in over 50 public events, giving people a face-to-face opportunity to learn about the study and provide meaningful input. A list of study committee meetings and other public involvement opportunities are included within this appendix. The program also enabled significant involvement for those who are unable to attend public events. Extensive outreach has been conducted through dissemination of written information, including dissemination of information by the study web site, e-mail updates, surveys, press releases, newspaper articles, traveling display board, and by staff attending public events.

Through implementation of the public involvement program, public comments have been received on a range of topics, including potential HCT alignments and modes. The comments have contributed to the development of the final Clark County High Capacity Transit System recommendations.

Appendix B provides a description of the public information, public involvement and decision-making strategies that were used throughout the study. Summary reports of the public surveys conducted throughout the study are included at the end of Appendix B.

Goals for Public Involvement

The primary goal of public outreach is to increase public awareness and understanding of High Capacity Transit and build public confidence in the Clark County High Capacity Transit System Study. The specific goals are to:

- Educate the general public, highly-interested stakeholders, local elected officials, and other decision-makers about what HCT is and how it will address Clark County's transportation needs.
- Instill public confidence in the validity and transparency of the study process.
- Ensure that public and stakeholder values, concerns and suggestions are reflected in the study.
- Demonstrate how public opinion and values are being integrated into the planning process.
- Maintain consistency with messages and procedures for Federal Transportation Administration New Starts projects.

Stakeholder Interviews (October 2006 – January 2007)

The first major public involvement task was to identify who would be interested in, affected by, utilize, or otherwise have a stake in the Clark County High Capacity Transit System Study. One-on-one phone interviews were conducted with potential participants on the study Task Force and Steering Committee. The interviews helped to develop a sense of the community issues, concerns, and conditions to address with the study. Many of these issues helped to form the basis for the study Goals and Objectives.

Steering Committee Meetings (October 2006 – October 2008)

The HCT Steering Committee included elected representatives or executive staff from the various study partner agencies and jurisdictions. This group received regular briefings from staff, provided policy direction for the study, and served as a focal point for consensus building between jurisdictions. In addition, the committee helped draft and refine the study purpose statement and Goals and Objectives that were used as the basis for narrowing the study modes and corridors. The committee provided study direction regarding the system plan scenarios and also prepared recommendations to the RTC Board of Directors regarding the most promising system plan elements. The members recommended forwarding the proposed HCT System Plan to the RTC Board at their October 2008 meeting.

The Steering Committee met twelve times through October 2008. Meetings were open to the public.

Meeting #1 (October 24, 2006)

- The team provided an overview of a draft study purpose.
- Developed committee protocols and reviewed committee charges.

Meeting #2 (January 4, 2007)

- Reviewed information on coordination with other major planning efforts, new starts funding, and modes.
- Began development of evaluation framework.

Meeting #3 (April 5, 2007)

- Adopted study goals & objectives.
- Recommended modes to carry forward for more analysis.
- Recommended corridors to carry forward for more analysis.

Meeting #4 (July 25, 2007)

- Reviewed preliminary analysis of the Chelatchie Prairie RR and background information on HCT on the I-205 Bridge.
- Reviewed initial corridor design concepts, comparative cost estimating methods, and the HCT system modeling approach.

Meeting #5 (October 4, 2007)

- Reviewed the status of the design concepts.
- Reviewed the role and importance of land use in transit project decision making.

Meeting #6 (November 28, 2007)

- Reviewed the corridor technical analyses for the SR 14 and SR 500 corridors.
- Reviewed the evaluation approach for comparing within and among corridors.

Meeting #7 (February 28, 2008)

- Reviewed the corridor technical analyses for the I-5, I-205, and Chelatchie Prairie corridors.
- Reviewed corridor evaluation methodology and compared with CRC methods.
- Developed a System Plan Strategy and discussed potential system scenarios.

Meeting #8 (May 28, 2008)

- Reviewed the HCT conceptual alignments.
- Reviewed initial system scenario findings.

Meeting #9 (June 25, 2008)

- Reviewed findings from the technical analyses of the system scenarios.

Meeting #10 (July 10, 2008)

- Reviewed information on federal transit capital funding.
- Reviewed HCT System Plan findings and report.
- Provided preliminary mode and corridor recommendations.

Meeting #11 (October 1, 2008)

- Reviewed findings from technical analysis of Scenario #6.
- Heard presentation on HCT supportive Plans and Policies in Clark County.
- Reviewed study decision making process.

Meeting #12 (October 30, 2008)

- Reviewed proposed 2030 HCT System.
- Recommended proposed High Capacity Transit System.
- Provided guidance on selection of a priority corridor.

Task Force Meetings (February 2007 – October 2008)

The HCT Task Force included 13 individuals representing a range of community interests. The Task Force served as an advisory group that provided input on public values and issues and recommendations to the study Steering Committee. The Task Force was presented with new study information, public involvement activities, survey results, and other public outreach information at each meeting.

The Task Force included representatives from Clark County Neighborhoods, Human Services, the Vancouver Building Industry Association, Identity Clark County, Friends of Clark County, Leadership Clark County, Neighborhood Traffic Safety Alliance, School Transportation, Clark College, Vancouver Neighborhoods, C-TRAN, Youth Council, and C-VAN.

The committee helped to draft and refine the study purpose statement and Goals and Objectives that were used as the basis for narrowing the study modes and corridors. The committee recommended the initial system strategy map that formed the basis for the system scenarios and unanimously recommended forwarding the final proposed HCT system plan to the study Steering Committee at their Oct. 20 meeting.

The Task Force met fifteen times through October 2008. Meetings were open to the public.

Meeting #1 (February 5, 2007)

- The team provided an overview of the study purpose.
- Developed committee protocols and reviewed committee charges.
- "Issue exercise" to begin development of study goals and objectives.

Meeting #2 (March 8, 2007)

- Finalized committee protocols.
- Reviewed draft study Goals & Objectives.
- Reviewed mode and corridor narrowing process.

Meeting #3 (March 19, 2007)

- Finalized study Goals & Objectives.
- Recommended modes to carry forward for more analysis.
- Recommended corridors to carry forward for more analysis.

Meeting #4 (April 23, 2007)

- Reviewed information on the Regional Travel Model.
- Reviewed information on the Detailed Corridor Analysis process.

Meeting #5 (May 21, 2007)

- Provided feedback on narrowing alignment options within each corridor.
- Reviewed Evaluation Criteria.

Meeting #6 (July 16, 2007)

- Reviewed Chelatchie Prairie RR preliminary analysis.
- Reviewed initial corridor design concepts, comparative cost estimating methods, and the HCT system modeling approach.

Meeting #7 (September 17, 2007)

- Reviewed corridor design concepts for the SR 500, I-5, and I-205 corridors.
- Reviewed transit operating concepts derived from the concept designs.

Meeting #8 (November 13, 2007)

- Reviewed the corridor technical analyses for the SR14 and SR 500 corridors.
- Reviewed the evaluation approach for comparing within and among corridors.

Meeting #9 (January 21, 2008)

- Review the corridor technical analyses for the I-5, I-205, and Chelatchie Prairie RR corridors.
- Reviewed corridor evaluation methodology.

Meeting #10 (February 18, 2008)

- Reviewed the corridor technical evaluation.
- Recommended modes, alignments, and corridors to carry forward into the system plan analysis.

Meeting #11 (May 19, 2008)

- Reviewed System Plan Scenarios and concepts.
- Reviewed refined streetcar and BRT concepts.
- Reviewed initial System Scenario findings.

Meeting #12 (June 2, 2008)

- Reviewed findings from system scenario technical analyses.

Meeting #13 (June 16, 2008)

- Reviewed findings from system scenario technical analyses.
- Provided mode and corridor recommendations to Steering Committee.

Meeting #14 (September 15, 2008)

- Reviewed findings from technical analysis of Scenario #6.
- Heard presentation on HCT supportive Plans and Policies in Clark County.

Meeting #15 (October 20, 2008)

- Review study milestones and proposed system plan.
- Recommended proposed High Capacity Transit System.
- Provided guidance on selection of a priority corridor.

Sounding Board Meetings (February 2007 - June 2008)

Because of the size of the study area and the challenges associated with involving a large number of neighborhoods and other interested groups, a series of Sounding Board meetings were held so as to encourage a broader range of participation in the study process. Each Sounding Board was preceded by a letter of invitation directed to a list of individuals and organizations approved by the study Task Force and Steering Committee. Sounding Boards were also advertised in Columbian newspaper, noted on the study website, and email invitations were sent to the study mailing lists.

Though the public is welcome at Task Force and Steering Committee meetings, the Sounding Board meetings are intended as a specifically public forum.

Sounding Board 1 (Feb. 2008) – The meeting introduced the study and included a workshop that explained the various HCT modes under consideration. Visitors were encouraged to share their views on the future role of HCT in Clark County. The event was recorded and broadcast by CVTV. The meeting was attended by 30 people.

Sounding Board 2 (June 2007) – Sounding Board attendees received an update on the study progress and shared their opinions of the evaluation criteria that the study team used for the corridors and alignment analysis. The event was recorded and broadcast by CVTV. The meeting was attended by 13 people.

Sounding Board 3 (Feb. 2008) – The meeting was an open house format which offered attendees the opportunity to provide input and guidance on which alignments, modes, and combinations, should be carried forward for analysis in an HCT system plan. The open house featured evaluation summaries of the corridors and modes, including ridership and relative cost estimates. Members of the public could drop in at any time. Staff members were available to answer questions about the corridor options. The meeting was attended by 31 people.

Sounding Board 4 (June 2008) – Attendees received an overview presentation before viewing a sequence of corridor related stations and providing comments. Feedback was sought regarding which alignment and mode combinations were perceived as the most promising to carry forward as part of a plan for the next couple of decades. The open house style meeting was attended by 18 people.

Email Updates (January 2007 – December 2008)

E-mail updates provided participants with information about milestones, upcoming events, meetings, and new website features such as the online quiz and surveys. Updates were sent out on an as-needed basis. The email list grew to nearly 1,000 e-mail addresses during the study.

Traveling Display Board (January 2007 – September 2008)

An informational display was created in order to bring project information to a wider audience. The display was located at various locations throughout the county:

June 20 - July 12, 2007	*La Center City Hall*
July 13 - August 1	*Fishers Landing Transit Center*
October 25 - November 30	*Three Creeks Community Library*
November 29 - December 13	*Cascade Park Community Library*
December 13 - December 27	*Vancouver Mall Community Library*
February 4 - February 29, 2008	*Legacy Salmon Creek Hospital*
March 17 - March 31	*Clark County Public Service Center*
April 1 - April 18	*Southwest Washington Medical Center*
May 1 - May 22	*The Columbian Newspaper*
July 25 – August 6	*Vancouver Chamber of Commerce*
August 6 – August 20	*Washington Department of Transportation*
August 27 - September 23, 2008	*Vancouver City Hall*

The display featured updated study materials as well as general information and answers to frequently asked questions about HCT.

Website (January 2007 – December 2008)

The study website served as a primary resource for providing the public with study information. Webpage updates were made as necessary during key study milestones and as new materials were developed. Printed materials and media outreach directed visitors to the website and all printed materials were posted online. The website included the following:

Study description – Introduced and explained the purpose of the study and discussed how the outcomes will be used.

Schedule of major project events and milestones – Allowed people to track the study process and anticipate future opportunities for public involvement and major milestone announcements.

Online comment form – Provided a general comment form throughout the study. Online comments were stored in a study comment database.

Online quiz and surveys – The online quizzes helped to educate visitors about HCT and current conditions in Clark County. The website also served as a gateway for intermittent surveys that sought public input on issues associated with upcoming decisions.

Contact information – Provided telephone and email contact information for study representatives who could answer questions and direct people to appropriate study information resources.

Archive of study information – Housed all study information resources, including fact sheets, FAQs, news, technical documents, and other materials.

Online journal – A regularly updated online journal provided ongoing updates of the study status. The journal included regular entries and allowed study newcomers to review chronological synopses of study activities and decisions.

Surveys (January 2007 – August 2008)

Surveys were generally provided in advance of major study milestones so as to obtain feedback and help guide the decision making process. Survey responses were captured in the study comment database and are provided in report form to the Task Force and key decision makers to help inform study decisions.

Survey 1 (Jan. 2007 – Sept. 2007) – The initial study survey was available online and as a self-addressed postcard form that distributed through the traveling display board. The survey asked respondents to rate the relative importance of various HCT values, such as convenience, cost, and environmental impacts. Respondents also indicated where they would like to travel using an HCT system. The survey had 352 respondents.

Survey 2 (June 2007 – Feb. 2008) – The second survey continued the line of questions posed at the second Sounding Board meeting. Respondents were asked to allocate hypothetical funding towards specific HCT benefits in order to indicate priorities. The survey had 299 respondents.

Survey 3 (Feb. 2008 – May 2008) – The third survey provided an extension to the questions posed by the comment form at the third Sounding Board meeting. Respondents were asked to indicate whether they believed the candidate alignments made sense to advance for study as part of a system plan. The survey had 172 respondents.

Survey 4 (June 2008 – August 2008) – The fourth survey extended the questions posed at the fourth Sounding Board meeting. Respondents were asked which alignment and mode combinations were perceived as the most promising to carry forward as part of a plan over the next couple of decades. The survey had 156 respondents.

Press Releases

Press releases were issued via email to 46 print and broadcast media sources prior to public events related to the study, including the Task Force and Sounding Board meetings.

HCT in the News

Several news articles reported on the Clark County HCT study. These included:

- "High-capacity transit options getting fresh look"
  January 10, 2007, The Daily Insider
- "Study will look at new ways to move people in Clark County"
  January 12, 2007, The Oregonian
- "Regional council will study transit options across county"
  January 12, 2007, The Columbian
- "What another study?"
  January 14, 2007, The Columbian editorial
- "Can buses compete with light rail?"
  February 16, 2007, Vancouver Business Journal
- "Transit group to trim options"
  April 2, 2007, The Columbian

- "Two groups driving future of transit in Clark County"
  June 3, 2007, The Columbian
- "Area officials to go on bus tour"
  October 25, 2007, The Columbian
- "Clark County seeks input on high-capacity transit corridors"
  June 19, 2008, The Oregonian
- "Task force gets on the bus for transit"
  July 5, 2008, The Columbian
- "Highway 99, Fourth Plain eyed for transit corridors"
  October 2, 2008, The Columbian
- "Plans to shape county's transit future gain approval"
  December 3, 2008, The Columbian
- "More bus lines?"
  December 7, 2008, The Columbian editorial

Informational Handouts

The study team prepared and maintained a variety of informational handout materials for general use at meetings and events. These included:

- Frequently Asked Questions (January 2006)
- Study Process (December 2006)
- Modes and Corridors (December 2006 & June 2007)
- Coordination of Clark County Transit Studies (December 2006)
- Milestones and Coordination with Other Transit Studies (January 2007)
- Committee Talking Points (April 2007)
- Study Status Folio (June 2007, February 2008)
- HCT System Plan - Early Findings Postcard (July 2008)

Eugene BRT Tour (October 2007)

The study led Clark County elected officials on a tour of the recently opened (January 2007) Eugene, Oregon EMX Bus Rapid Transit system. The tour provided attendees with the opportunity to gather information and ask questions of area experts regarding how the project planning process proceeded, construction issues and initial operations. The day long bus tour included several Steering Committee members and was open to city and county officials.

On the way to Eugene, attendees received a briefing on the project and participated in a guided discussion of how HCT can influence economic development. Jonathon Schlueter with the Westside Economic Alliance in Washington County discussed how the MAX system to Hillsboro has impacted the county and discussed plans for the Wilsonville to Beaverton Commuter Rail scheduled to open in the Fall of 2008. In Eugene, officials from Lane Transit District (LTD) provided information on the development and implementation of the EMX and led a guided tour of the system.

Public Outreach (January 2007 – December 2008)

RTC staff visited neighborhoods, community organization, and attended other community events in order to connect with a broader range of people. These outreach opportunities provide the general public with an opportunity to engage in dialogue with the study team, view study information, and learn about upcoming study milestones and public involvement opportunities. In the spring of 2008 a focus effort was made to inform the west side Vancouver neighborhoods about the study and how the long-range HCT corridors may connect to the Columbia River Crossing project. Presentations were modified based on the event and the allowed time; presentation were generally 10-20 minutes in length.

Public presentations on the HCT Study included the following:

- Growth Forum (January 31, 2007)
- SR-502 Open House (May 9, 2007)
- Arnada Neighborhood (May 10, 2007)
- Clark County Fair (August 3 and 4, 2007)
- Lincoln Neighborhood (September 10, 2007)
- Highway 99 Open House (September 27, 2007)
- CRC Open House (October 20, 2007)
- Three Creeks Planning Council (January 12, 2008)
- Lyons Club (February 7, 2008)
- BIA Dinner (March 18, 2008)
- West Minnehaha Neighborhood (April 7, 2008)
- Hudson Bay Neighborhood (April 8, 2008)
- Arnada Neighborhood (April 10, 2008)
- Lincoln Neighborhood (April 14, 2008)
- Camas/Washougal Chamber of Commerce (April 17, 2008)
- Rose Village Neighborhood (April 22, 2008)
- Northwest Neighborhood (April 24, 2008)
- Shumway Neighborhood (May 1, 2008)
- Lewis River Rotary Club (May 6, 2008)
- Uptown Village Business Association (May 15, 2008)
- Esther Short Neighborhood (May 15, 2008)
- CRC Open House (May 28, 2008)
- Clark County Fair (August 1 and 2, 2008)
- Neighborhood Association of Clark County (November 10, 2008)
- Three Creeks Planning Council (December 11, 2008)

Public Agency Presentations (January 2007 – November 2008)

RTC staff made presentations to public agencies throughout Clark County to keep local governments informed about the study process. The presentations focused on the history of the study and the development of the proposed HCT system plan. Copies of the proposed system plan map were available at each meeting.

Public agency presentations on the HCT Study included the following:

- RTC Board (regular presentations throughout the study)
- C-TRAN Board (regular presentations throughout the study)
- Bi-State (regular presentations throughout the study)
- Vancouver Planning Commission (October 23, 2007)
- La Center City Council (October 8, 2008)
- Ridgefield City Council (October 9, 2008)
- Vancouver City Council (November 10, 2008)
- Three Ports Meeting (Vancouver, Ridgefield, Camas/Washougal) (November 13, 2008)
- Camas City Council (November 17, 2008)
- Battle Ground City Council (November 24, 2008)
- Washougal City Council (November 24, 2008)

Summary of Survey Results

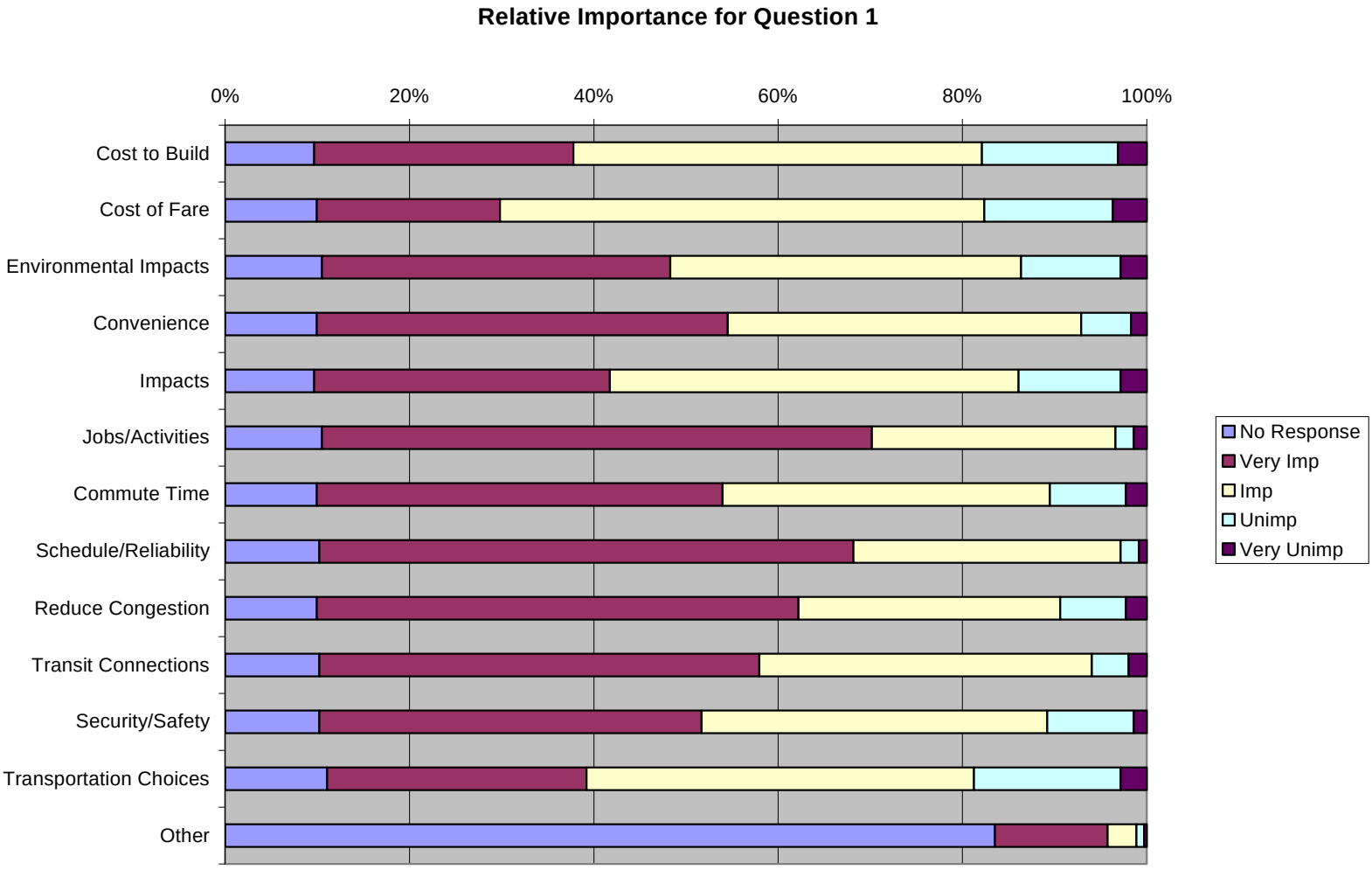
This summary reflects all survey responses and additional comments received via the Clark County High Capacity Transit System Study website as of September 25, 2007.

Survey Responses

Number of survey responses (both website and postcard): 352

Question 1: As we consider different types of high capacity transit (street car, light rail, bus rapid transit, etc.) and different locations, tell us what you think by rating the importance of each item.

The following chart compares survey responses across all thirteen items included in this question. Items that respondents were asked to rate are listed along left side of the graph and the colored bars show what proportion of respondents selected each possible rating (i.e. "Very Important" or "Unimportant") for each question.



Question 2: If high capacity transit was available, from what area to what area would you like to travel? (For example, from Orchards to Downtown Vancouver)

The following table reflects the five most popular corridors selected by respondents using a list of pre-set origins and destinations. Overall, survey respondents selected more than one hundred and fifty different possible corridors.

Five Most Popular Corridors

Possible HCT Study Corridor	*Number of Respondents Who Selected Given Corridor*
Downtown Vancouver – Central Portland	58
Salmon Creek – Central Portland	30
Downtown Vancouver – Salmon Creek	27
Downtown Vancouver – Inner East Portland	26
Downtown Vancouver – Vancouver Mall	24

Comments

The study has received 203 comments. The five most popular comment categories and a brief synopsis of the comments received are shown below.

Light Rail – 87 comments

- The majority of these comments supported light rail, though almost a quarter of light rail comments expressed opposition to light rail in favor of either bus service or road system improvements
- Many comments indicated which destinations should be connected by light rail (e.g. the airport) and the majority emphasized connecting to the existing light rail system in Portland

Destinations & Corridors – 77 comments

- Many respondents asked for improved and increased connections between downtown Vancouver and downtown Portland
- Other destinations included the Portland Airport, Vancouver Mall, Clark College, Portland Rose Garden and cities such as Battle Ground, Camas, and Brush Prairie

Travel to Portland – 45 comments

- Many comments mentioned improving the commute into Portland
- Several comments praised the efficiency of a connection to Portland's existing transportation infrastructure

Growth & Development – 34 comments

- Most comments advocated planning for the future and some suggested that transportation investments will become increasingly expensive
- Other comments emphasized the county's long-term transportation needs and maintaining flexibility in the transportation system

General Bus Service – 34 comments

- The majority of these comments argued that bus service is the most flexible and efficient mode of public transportation and would be preferable to more costly rail infrastructure
- Several comments advocated increased express bus service or improved general bus service; a few expressed concerns about the safety and comfort of bus service

Final Summary of Public Input – Survey 2

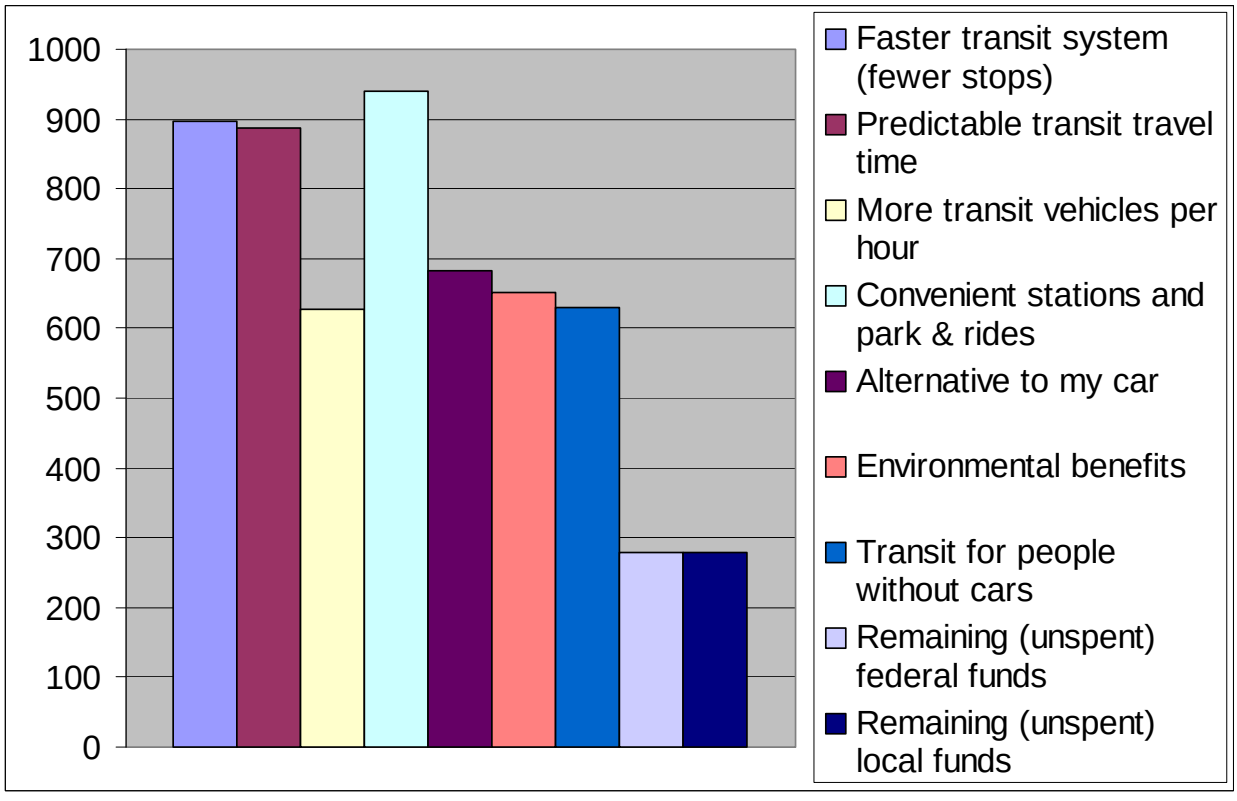
This summary reflects all survey responses and additional comments received via the Clark County High Capacity Transit System Study website as of February 29, 2008.

Survey Responses – Survey #2

Number of survey responses: 299

Question 1: You have 20 tokens to allocate towards HCT transit benefits. 10 tokens represent local transportation funds and 10 tokens represent federal transportation funds. How would you spend these funds? You have the option not to spend all the tokens. Any unspent tokens will be divided equally between the two funding sources, because federal funds must be matched by local funds.

The chart below compares the number of tokens allocated between the different HCT benefits, as well as the number of tokens that remained unspent by survey participants.



Additional Survey Detail & Analysis

- Number of participants who spent all 20 tokens on HCT benefits: 236 (79% of survey participants)
- Number of participants who allocated some number of tokens to the following benefits (or to unspent funds):

Faster Transit	Predictable Transit	More Vehicles	Convenient Stations	Alts. to Car	Env. Benefit	Transit w/o Car	Unspent Federal	Unspent Local
209	229	187	244	184	178	183	61	61

- "Convenient stations and park & rides" received the greatest number of tokens (941) and was also the benefit selected by the largest number of respondents (244).
- "Faster transit system (fewer stops)" received the second greatest number of tokens (896) but was selected by the third largest number of respondents (209).
- "Predictable transit travel time" received the third greatest number of tokens (887) but was selected by the second largest number of respondents (229).

Comments

The study has received 209 comments since the study began. The five most popular comment categories and a brief synopsis of the comments received are shown below.

Light Rail – 92 comments

- The majority of these comments supported light rail, though almost a quarter of light rail comments expressed opposition to light rail in favor of either bus service or road system improvements
- Many comments indicated which destinations should be connected by light rail (e.g. the airport) and the majority emphasized connecting to the existing light rail system in Portland

Destinations & Corridors – 78 comments

- Many respondents asked for improved and increased connections between downtown Vancouver and downtown Portland
- Other destinations included the Portland Airport, Vancouver Mall, Clark College, Portland Rose Garden and cities such as Battle Ground, Camas, and Brush Prairie

Travel to Portland – 48 comments

- Many comments mentioned improving the commute into Portland
- Several comments praised the efficiency of a connection to Portland's existing transportation infrastructure

Growth & Development – 36 comments

- Most comments advocated planning for the future and some suggested that transportation investments will become increasingly expensive
- Other comments emphasized the county's long-term transportation needs and maintaining flexibility in the transportation system

General Bus Service – 36 comments

- The majority of these comments argued that bus service is the most flexible and efficient mode of public transportation and would be preferable to more costly rail infrastructure
- Several comments advocated increased express bus service or improved general bus service; a few expressed concerns about the safety and comfort of bus service

HCT Study Corridors Evaluation Survey Summary

5/19/2008

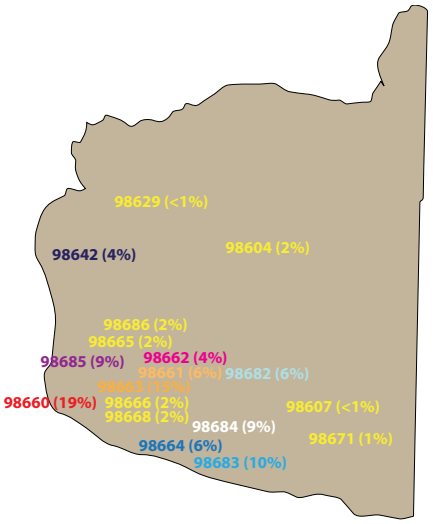
Comment Summary

The following summary is based on the comments received between the February 26, 2008 Sounding Board open house and May 14, 2008. This summary contains information gathered in hardcopy at the open house as well as from the online version of the survey. Eleven response forms were received at the open house and 161 responses were submitted online.

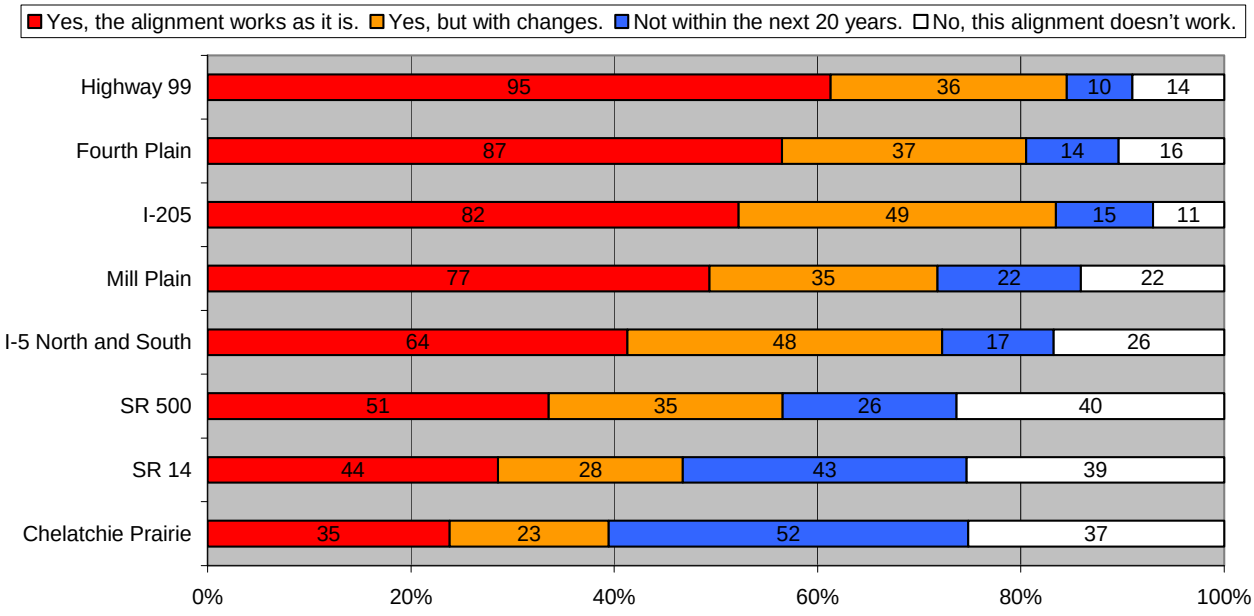
Survey Purpose

The survey was intended to seek feedback regarding which corridors and alignments were perceived as the most viable, which are the least viable, what refinements might be necessary to the alignments, and which options should be carried forward into analysis as part of a system plan.

Respondents were asked to explain the reasoning behind how they categorized each alignment. These responses are summarized on the reverse and have been separated into *benefits*, *concerns*, and *other comments*. *Benefits* generally include references to specific advantages or opportunities that are apparent in the alignment, and *concerns* typically refer to apparent weaknesses or potential problems to address. *Other comments* include suggestions that may not be specifically negative or positive about the alignment. The top five examples of each are included.



Survey respondents by zip code



Benefits	Concerns	Other Comments/Suggestions
Highway 99		
▪ Development potential ▪ BRT potential ▪ Improves connections to Portland ▪ Serves expected growth ▪ Good connections to activity centers	▪ Less appropriate for LRT ▪ Poor bike/ped accessibility ▪ Low cost/benefit ▪ Should not include Main Street ▪ Low ridership potential	▪ Connect to Hazel Dell ▪ Connect to the Salmon Creek park-and-ride lot ▪ Build southern section first ▪ Should be the same mode as CRC and should connect at Kiggins Bowl ▪ Highway 99 Study findings should be considered
I-5 North and South		
▪ LRT potential ▪ BRT potential ▪ Serves downtown Vancouver ▪ Improves connections to Portland ▪ Good potential ridership	▪ Poor bike/ped accessibility ▪ Highway 99 preferable ▪ Poor connections to activity centers ▪ Serves fewer trips within Clark County ▪ Neighborhood/business impacts	▪ Consider another Columbia River bridge ▪ Build southern section of I-5 first ▪ Connect to medical center ▪ Connect to Clark College ▪ Build sooner than 20 years
I-205		
▪ LRT potential ▪ Improves connections to Portland ▪ Connection to Portland airport ▪ Serves expected growth ▪ BRT potential	▪ Poor bike/ped accessibility ▪ Poor connections to activity centers ▪ Glen Jackson Bridge capacity ▪ Less appropriate for LRT ▪ I-5 preferable	▪ Connect Portland Airport to Van Mall ▪ Automated demand-response vehicles could be more economical ▪ SR 500 is good northern end of route ▪ Fourth Plain good northern end
SR 14		
▪ BRT potential ▪ Completes transit loop with I-5 ▪ Serves commuters well ▪ LRT potential ▪ Serves south/east county	▪ Low priority relative to other alignments ▪ Poor potential ridership ▪ Less density/growth potential ▪ Poor bike/ped accessibility ▪ Low cost/benefit	▪ Preserve right of way ▪ Should extend further east ▪ Serve Boise Cascade properties ▪ Try modified bus service
Mill Plain		
▪ BRT potential ▪ LRT potential ▪ Serves east/west intra county trips ▪ Streetcar potential ▪ Potential connection to SW Medical	▪ Current bus service or improved service adequate ▪ HCT effect on traffic ▪ Current congestion effect on HCT ▪ Neighborhood/business impacts ▪ Low priority relative to other alignments	▪ Consider a tunnel to avoid steep grade ▪ Consider larger streetcars ▪ Use as a feeder route
Chelatchie Prairie		
▪ Serves expected growth ▪ Commuter rail potential ▪ LRT potential ▪ BRT potential ▪ Low capital cost	▪ Low ridership potential ▪ Low cost/benefit ▪ Low growth/density ▪ Low priority relative to other alignments ▪ Detracts from auto related improvements	▪ Preserve for long term ▪ Should include multi-use path ▪ Start with buses ▪ Focus on industrial development ▪ HCT is preferable to a trail
SR 500		
▪ Completes loop between I-5 and I-205 ▪ LRT potential ▪ BRT potential ▪ Serves commuters well ▪ Serves expected growth	▪ Fourth Plain preferable ▪ Poor bike/ped accessibility ▪ Low cost/benefit ▪ Limited park-and-ride options ▪ Mill Plain preferable	▪ Connect to Van Mall ▪ Connect to Hazel Dell ▪ Use elevated system
Fourth Plain		
▪ BRT potential ▪ LRT potential ▪ Good potential ridership ▪ Development potential ▪ Streetcar potential	▪ Neighborhood/business impacts ▪ Detracts from auto related improvements ▪ LRT inappropriate ▪ Low cost/benefit ▪ Mill Plain preferable	▪ Encourage park-and-ride lots ▪ Integrate with SR 500 and Mill Plain ▪ Connect to Port of Vancouver ▪ Connect to I-205 before going farther east

HCT Study Corridors Evaluation Survey Summary

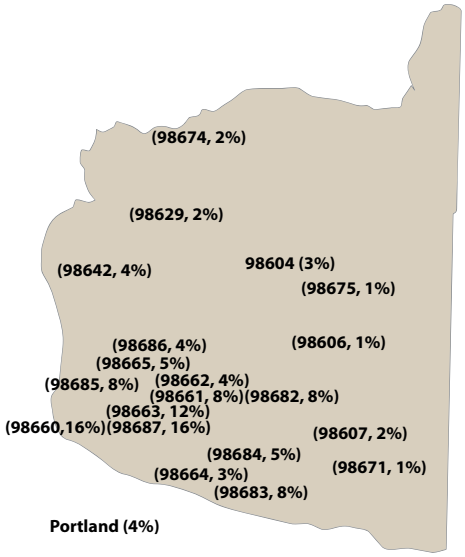
9/15/2008

Comment Summary

The following summary is based on the comments received between the June 26, 2008 Sounding Board open house and August 29, 2008. This summary combines the information gathered in hardcopy at the open house with feedback from the online version of the survey. Seven response forms were received at the open house and 152 responses were submitted online.

Survey Purpose

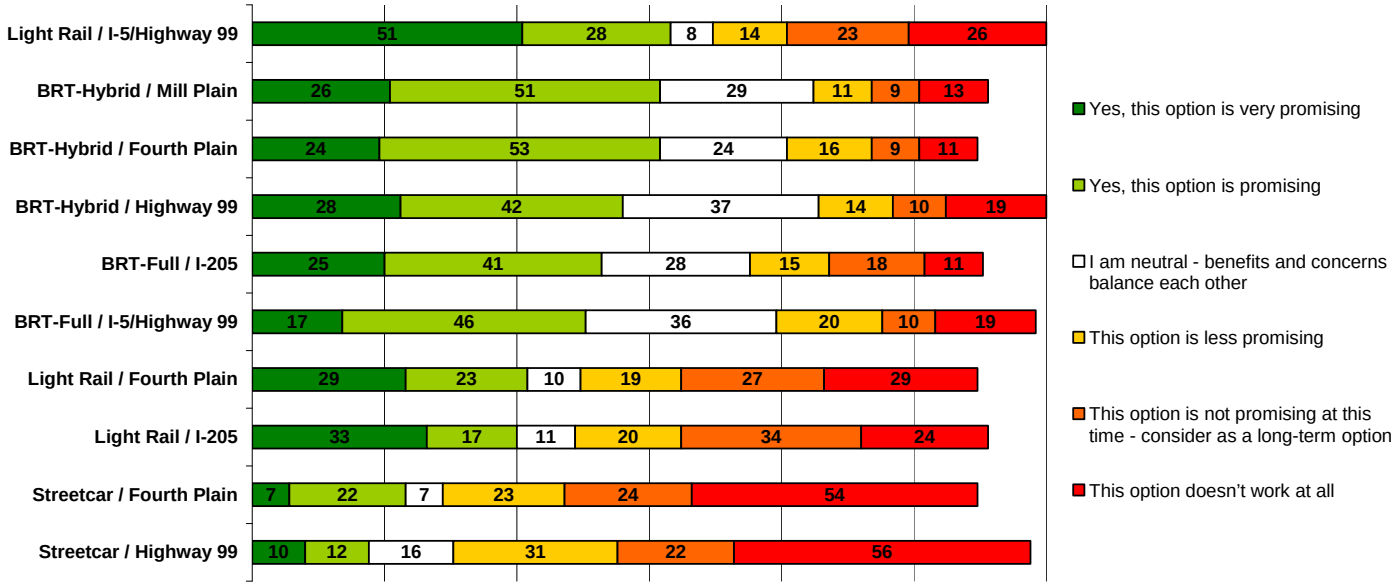
The survey was intended to seek feedback on which alignments and modes were perceived as the most promising to take forward into the system plan.



Response distribution by Zip code

Respondents were asked to explain the reasoning behind how they categorized each mode/alignment combination. These responses have been compiled as *favorable* comments, or *concerns*. *Favorable* comments generally include references to specific advantages or opportunities that are apparent in the alignment, while *concerns* typically refer to apparent weaknesses or potential problems to address. The six most popular responses for each option are included. Checkmarks (✓) or Xs (✗) indicate that the comment was repeated more than once. Full comments are included at the end of this report.

Preliminary survey results were presented to the study Steering Committee on July 10, 2008. The order of mode and alignment preference has remained unchanged with the exception of Light Rail on Fourth Plain becoming slightly more preferred(ranked as very promising or promising) than Light Rail on I-205.



***Question 2:* Do you think that BRT-Hybrid on Highway 99 is worth considering as part of this system plan?**

Favorable

- Good interim option ✓✓✓✓✓✓✓✓
- Cost/fundability ✓✓✓✓✓
- Flexible service ✓✓✓✓
- Serves population centers ✓✓
- Redevelopment opportunities ✓
- Better than existing options ✓

Concerns

- Transfer required to reach Portland ××××××
- BRT is less attractive ××××
- High fuel costs ×××
- Cost/fundability ×××
- Negatively affects auto traffic ××
- Moderate ridership ××

***Question 3:* Do you think that Streetcar on Highway 99 is worth considering as part of this system plan?**

Favorable

- Less polluting ✓✓
- Serves intra-county travel ✓✓
- Aesthetically pleasing ✓
- Non-exclusive lane ✓
- Preferable to LRT ✓
- Appropriate for area

Concerns

- Cost/fundability ××××××××××××××××××××
- Prefer LRT or BRT ××××××××××
- Negatively affects auto traffic ××××××
- Transfer required to reach Portland ×××
- Inflexible ×××
- Low to moderate ridership ×××

Question 4: Do you think that BRT-Full on I-5/Highway 99 is worth considering as part of this system plan?

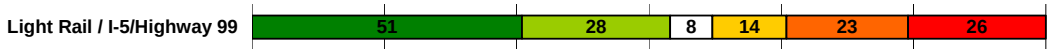
Favorable

- Cost/fundability ✓✓✓✓✓
- Good ridership ✓✓✓
- Good travel times ✓✓✓
- Park and Ride ✓✓
- Preferable to LRT ✓
- Flexible

Concerns

- Prefer LRT ××××××
- Transfer required to reach Portland ××××××
- Cost/fundability ××××
- Maintenance required ×××
- Neighborhood/business impacts ×××
- High fuel costs ××

***Question 5:* Do you think that Light Rail on I-5/Highway 99 is worth considering as part of this system plan?**



Favorable

- Better connection to Portland ✓✓✓✓✓✓✓✓✓✓
- Long term goal ✓✓✓✓✓✓
- More environmentally friendly ✓✓✓✓
- Good travel times ✓✓✓✓
- Good ridership ✓✓✓✓
- Promotes development ✓✓✓

Concerns

- Cost/fundability ××××××××××××
- Should connect to Clark College ××××
- Neighborhood/business impacts ××××
- Inflexible ×××
- Increase in crime/security concern ×××
- Travel times ××

***Question 6:* Do you think that BRT-Hybrid on Fourth Plain is worth considering as part of this system plan?**

Favorable

- Good ridership ✓✓✓✓✓
- Cost/fundability ✓✓✓✓✓
- Good population to serve ✓✓✓✓
- Good interim option ✓✓✓
- Fourth Plain is a priority corridor ✓✓
- Serves intra-county travel ✓

Concerns

- Negatively affects auto traffic ×××
- Not commuter oriented ××
- Prefer LRT or Streetcar ×
- Corridor unnecessary ×
- Misplaced emphasis on mall ×
- Does not promote development as well ×

Question 7: Do you think that Streetcar on Fourth Plain is worth considering as part of this system plan?

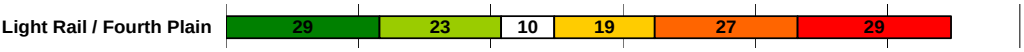
Favorable

- Serves intra-county travel ✓✓✓
- Better than BRT ✓
- Attractive mode ✓
- Fewer impacts to businesses and residences ✓
- Creates development opportunities
- Consistent with Fourth Plain goals

Concerns

- Cost/fundability ××××××××××××××××
- Low ridership ××××××××
- Impractical ××××
- Inappropriate for area ×××
- Limited service range ××
- Prefer improved regular bus service ××

Question 8: Do you think that Light Rail on Fourth Plain is worth considering as part of this system plan?



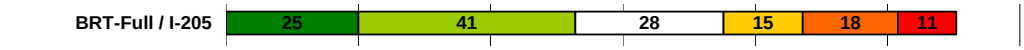
Favorable

- Better connection to Portland ✓✓✓✓✓✓✓✓✓✓
- Long term goal ✓✓✓✓✓✓✓✓✓✓
- Serves intra-county travel ✓✓✓✓✓
- Good travel times ✓✓✓
- Good ridership ✓✓✓
- Promotes development ✓✓

Concerns

- Cost/fundability ××××××××××××××××
- Low ridership ×××
- Business/neighborhood impacts ××
- Lower priority than north/south corridors ××
- Prefer improved regular bus service ××
- Poor travel times ××

Question 9: Do you think that BRT-Full on I-205 is worth considering as part of this system plan?



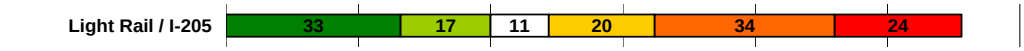
Favorable

- Cost/fundability ✓✓✓
- Easier to implement ✓✓
- Serves inter-county travel ✓
- Better than existing service ✓
- Serves growing area ✓
- Alleviates congestion ✓

Concerns

- Prefer LRT ×××
- Transfer required to reach Portland ××
- Lower priority than other corridors ×
- Not as youth friendly ×
- Less development potential ×
- Low demand

Question 10: Do you think Light Rail on I-205 is worth considering as part of this system plan?



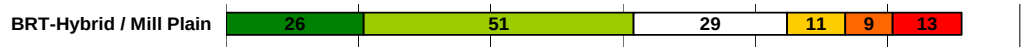
Favorable

- Better connection to Portland ✓✓✓✓✓✓✓✓
- Long term goal ✓✓✓✓✓
- Serves growing area ✓✓
- Promotes development ✓
- Better than existing service✓
- Serves commuters ✓

Concerns

- Cost/fundability ××××××××××××××××
- Lower priority than other corridors ××××××××
- Low demand ××××
- Not as youth friendly ×
- Prefer improved regular bus service ×
- Increase in crime/security concern ×

Question 11. Do you think that BRT-Hybrid on Mill Plain is worth considering as part of this system plan?



Favorable

- Cost/fundability ✓✓✓✓✓✓✓✓
- Good ridership ✓✓✓✓✓✓✓✓
- Appropriate mode for the corridor ✓✓✓
- Growing area ✓
- Good interim solution ✓
- Serves intra-county travel ✓✓✓

Concerns

- Prefer improved regular bus service ×××
- Redundant with service on Fourth Plain ×××
- Prefer streetcar ×
- Cost/fundability ×
- Business impacts
- Negatively affects auto traffic

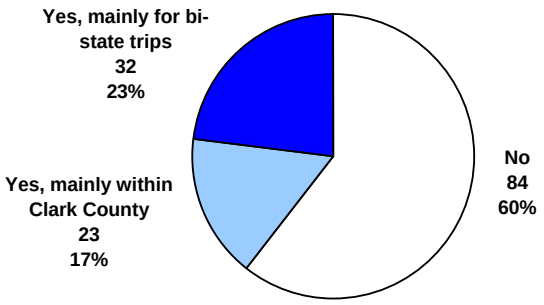
Question 12: Do you have any other comments on the alignments or modes?

Respondents described the need for some form of effective transit, and several wanted to see improvements as soon as possible. Respondents suggested that HCT should have longer operating hours than regular bus and that dedicated lanes should be used where possible to improve travel times and avoid automobile related conflicts.

Many respondents considered LRT to be an expensive and long-term option, though many appreciated the prospect of accessing LRT from Vancouver if possible.

Respondents encouraged that a number of factors be considered when planning HCT in Clark County, including: the impacts from park and ride facilities, connections to future river crossings, transit cost-effectiveness, and rising fuel prices.

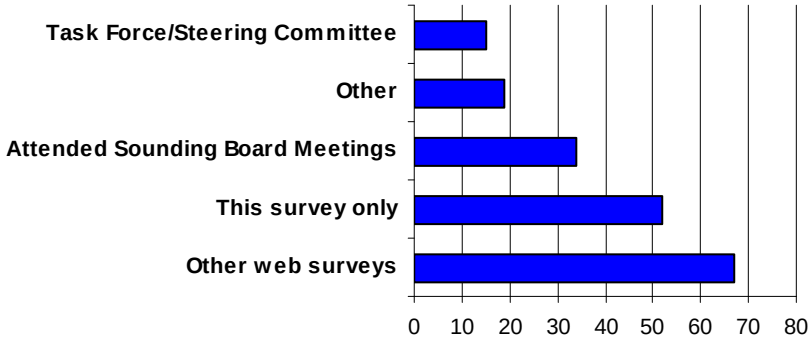
Question 13: Do you currently ride transit?



Question 14: How have you been involved in the HCT Study? (Check all that apply.)

"Other" responses included:

- The Columbia River Crossing Project
- The HCT Study website
- Community meetings
- City Council
- News
- Email notices



Appendix C

Study Fact Sheets

Fact Sheet: Clark County High Capacity Transit - Study Process

What is the Clark County High Capacity Transit System Study?

The Clark County High Capacity Transit (HCT) System Study will analyze a range of possible transit corridors and types of High Capacity Transit that could operate within those corridors. HCT includes bus rapid transit, streetcar, light rail, monorail, commuter rail, and other types of transit that move large numbers of people quickly and efficiently. All these types of HCT use a fixed guideway system, which means they use a track or lane that is separated from automobile traffic or – in the case of streetcars – use a defined track in a lane shared by automobiles. In Clark County, HCT can provide residents with an alternative to backups on congested roads and highways by traveling in an exclusive transit right of way. The study will take a fresh look at transit needs and possibilities in Clark County and find the most promising corridors and types of HCT: those that most effectively connect the community with the most important destinations.

Why is the study needed?

Clark County has grown significantly over the past 25 years and that growth is expected to continue. Although growth has resulted in economic prosperity, it has also outpaced transportation investment. This has resulted in significant increase in roadway congestion and travel delays throughout the county. This study will find ways to help maintain the growth and prosperity of Clark County by providing new options for travel between major population, employment, and activity centers.

Who is conducting the study?

The Southwest Washington Regional Transportation Council (RTC), along with local jurisdictions, is conducting this study of transit options for Clark County. The RTC Board is seeking a broad range of new ideas by gathering input from Clark County residents, elected officials, community groups, and other interested parties.

How is the study funded?

The Clark County HCT System Study is funded by a Federal Transit Administration (FTA) grant, with matching funds contributed by local jurisdictions and partner organizations. To assure eligibility for future funding from the FTA, this study follows FTA guidelines. These guidelines include finding feasible corridors for HCT, identifying transportation problems in those corridors and their underlying causes, finding options for addressing those problems and analyzing their costs and benefits.

How will the study be conducted?

The study will consider a wide range of HCT options and narrow them down to the most promising choices to meet Clark County's transit needs. To accomplish this, the study team will seek community ideas for new transit corridors and types of transit and identify the crucial connections needed between destinations in the county. The study will also analyze possible HCT types and produce a guide for local decision-makers that shows different transit types and locations and their associated benefits and costs.

Exclusive Bus Ramp in Puget Sound

The following steps will be included in the study process:

- Collect existing population, employment, land use and transportation planning, and other data to form a base of information about Clark County's transportation needs and challenges.
- Consult the project task force, other transit agencies, local elected officials, and Clark County residents for suggestions of corridors, types of transit, and community values to be considered in the study.
- Analyze travel patterns and find the best corridors for future transit options.
- Examine possible HCT choices and their opportunities and challenges if used along different corridors. Use both input from citizens and technical information to understand the pros and cons of different transit types.
- Provide decision-makers in Clark County with the knowledge they'll need to plan for the future. Present a fresh and updated guide to HCT options shaped by both technical analysis and community values.

How can I learn more or become involved with the study?

Input from the Clark County community is essential to the success of this study effort. You can get more information and share your comments in the following ways:

- Visit our Web site for an online comment form, fact sheets and other project information.
- Request a study briefing for your business or community group.
- Attend Sounding Board meetings and share your comments.
- Join the study e-mail list and receive periodic updates

Contact Information:

Web Site: http://rtc.wa.gov/hct
E-mail: hct@rtc.wa.gov
Phone number: (360) 397-6067

Light Rail

Commuter Rail

Fact Sheet: High Capacity Transit System Study Milestones and Coordination with Other Transit Studies

To better understand the future role of transit in Clark County and to meet the travel demands of its residents, the High Capacity Transit (HCT) System Study will coordinate with the Columbia River Crossing (CRC) Project and the C-TRAN 20-Year Transit Development Plan. Below is a description of key milestones for the High Capacity Transit System Study and the strategy for coordination with the CRC project and C-TRAN 20-Year Transit Development Plan at major milestones.

HCT Study Milestone 1 – Select Corridors for Further Study (April 2007)

This milestone will identify the most promising HCT corridors in the county to be evaluated in more detail. It will be based on technical information from a countywide Travel Market Analysis that will use the adopted Metropolitan Transportation Plan (MTP) and the plan's 2030 travel demand model data.

The MTP 2030 model network is based on the financially constrained MTP and does not include additional river-crossing capacity in the I-5 corridor. The MTP model data will be used to characterize general travel patterns in the county and to evaluate potentially promising HCT corridors.

Coordination with other studies:
The C-TRAN 20-Year Transit Development Plan technical analysis should be completed by April 2007 and will be evaluated and used to support the HCT System Study's Travel Market Analysis. CRC anticipates the selection of the transit alternatives to be included in the Draft Environmental Impact Statement (DEIS) to be available by this time.

HCT Study Milestone 2 – Select Modes to be Studied in Each Corridor (April 2007)

This milestone will focus on the most promising HCT modes to be developed further in the selected corridors. It represents an initial screening step, which will allow the study to focus on the most promising HCT mode applications in the selected corridors.

Coordination with other studies:
The CRC Project anticipates the identification of the transit alternatives to be included in the DEIS to be available by this time. This milestone represents an initial screening step for the HCT System Study, and the study will consider the analysis and conclusions from the CRC Project in identifying promising modes outside of the I-5 Corridor (south of Kiggins Bowl).

HCT Study Milestone 3 – Select Corridors and Modes to be Included in HCT System Plan (November 2007)

This milestone will identify the corridors and modes to be included in preparing the HCT System Plan. The HCT System Plan will bring the corridors together and evaluate the issues related to operating as an integrated system. Additionally, it will develop policies that will help to support and facilitate HCT in Clark County.

Coordination with other studies:
The C-TRAN 20-Year Transit Development Plan will be completed prior to this HCT System Study milestone. Technical analysis and policies included in the C-TRAN 20-Year Transit Development Plan will be used to inform decisions on corridors and modes for inclusion in the HCT System Plan. On-going technical work for the CRC DEIS may be available.

HCT Study Milestone 4 – HCT System Plan Policies (April 2008)

This milestone will identify high capacity transit supportive policies to be included in the MTP and local plans.

Coordination with other studies:
The adopted C-TRAN 20-Year Transit Development Plan may include transit policies that relate to and support policy direction in the HCT System Plan. The HCT System Plan may recommend additions or modifications to policies included in the C-TRAN 20-Year Transit Development Plan and other local and regional policy documents.

The completion of the CRC DEIS is scheduled in a similar time frame to this milestone. The HCT System Study will evaluate the work completed for the CRC DEIS to determine if the DEIS would influence Clark County HCT policy direction.

HCT Study Milestone 5 – Select a Priority Corridor(s) (April 2008)

This milestone will identify one or two corridors to develop further as a priority HCT corridor, potentially leading to the initiation of a federal Alternatives Analysis.

Coordination with other studies:
The adopted C-TRAN 20-Year Transit Development Plan may include technical analysis that can support this key milestone. The CRC DEIS is scheduled to be completed at this time and the technical analysis from the CRC DEIS will be evaluated to determine its relevance to the selection of a priority HCT corridor(s) in Clark County.

Streetcar

Bus Rapid Transit

Light Rail

Fact Sheet: Coordination of Clark County Transit Studies

Introduction

As the Clark County High Capacity Transit (HCT) System Study gets underway in the fall of 2006, there are two other study efforts that relate to the future role transit will play in meeting the travel needs of Clark County residents. The Columbia River Crossing (CRC) Project will determine transportation improvements for the five-mile segment of Interstate 5 (I-5) between State Route (SR) 500 in Vancouver and Columbia Boulevard in Portland, including the bridges across the Columbia River (the I-5 Bridge Influence Area). Improvements are expected to address highway, vehicular freight, transit, pedestrian, and bicycle needs. The C-TRAN 20-Year Transit Development Plan will recommend a 20-year, long-range policy direction for the C-TRAN system within current revenue streams.

Below is a description of the studies, the timing of key decisions and how they will be coordinated with the Clark County HCT System Study.

Columbia River Crossing Project

The CRC Project is the culmination of over eight years of study and analysis that has determined a need to improve highway capacity and transit service in the I-5 corridor across the Columbia River. The CRC project is currently evaluating a range of transit alternatives (in conjunction with highway bridge alternatives) to improve mobility, reliability, and accessibility for automobile, freight, transit, bicycle, and pedestrian users of the I-5 corridor from State Route 500 in Vancouver to Columbia Boulevard in Portland. The transit alternatives under consideration for the CRC Project include light rail transit (LRT), bus rapid transit (BRT) and express bus.

Commuter Rail

The major milestones for the transit element of the CRC Project include:

- Selection of transit alternatives to be included in the Draft Environmental Impact Statement (DEIS) (March 2007)
- Select a Locally Preferred Alternative (LPA) (February 2008)
- Complete the DEIS (April 2008)
- Complete the Final Environmental Impact Statement (FEIS) (Fall 2008)
- Record of Decision (Early 2009)

C-TRAN 20-Year Transit Development Plan

The C-TRAN 20-Year Transit Development Plan will determine policies and strategies as the C-TRAN system grows within current revenue sources over the next twenty years. The study will utilize travel demand model projections to identify growing markets for existing routes and emerging new markets within the county.

The milestones for the C-TRAN 20-Year Transit Development Plan include:

- Study Initiation (January 2007)
- Recommended Plan (April 2007)
- Board Adoption (May/June 2007)

Coordination of HCT System Study with CRC and C-TRAN 20-Year Transit Development Plan

The Clark County HCT System Study will identify promising high capacity transit corridors and modes within Clark County and develop HCT policies for inclusion in the Metropolitan Transportation Plan (MTP) and local plans.

General Principles

The following are general principles that the Clark County HCT System Study will use to coordinate with the two other studies and avoid conflicts or inconsistencies. The principles are organized in three categories, HCT Modes and Alignments, C-TRAN Bus Network and Travel Demand Modeling and Analysis.

HCT Modes and Alignments

- The HCT System Study will not evaluate alternative HCT modes and alignments in the I-5 corridor south of the Kiggins Bowl area. Direction on modes and alignments in this area will come from the CRC study.

- The HCT System Study will evaluate HCT modes and alignments that would function as feeders into the I-5 Corridor south of Kiggins Bowl (such as I-5 –north of Kiggins Bowl and the SR500/Fourth Plain corridors). Modes will be considered that can function as extensions of the CRC modes or as modes that would require a transfer between an HCT mode outside of the I-5 Corridor (south of Kiggins Bowl) to a different HCT mode within the I-5 Corridor (south of Kiggins Bowl).

Bus Rapid Transit

C-TRAN Bus Network

- The HCT System Study may identify the need for bus routes and supporting facilities beyond those identified in the C-TRAN 20-Year Transit Development Plan. The HCT System Study will evaluate and include additional routes and facilities in the system analysis to support HCT corridors as appropriate.

Travel Demand Modeling and Analysis

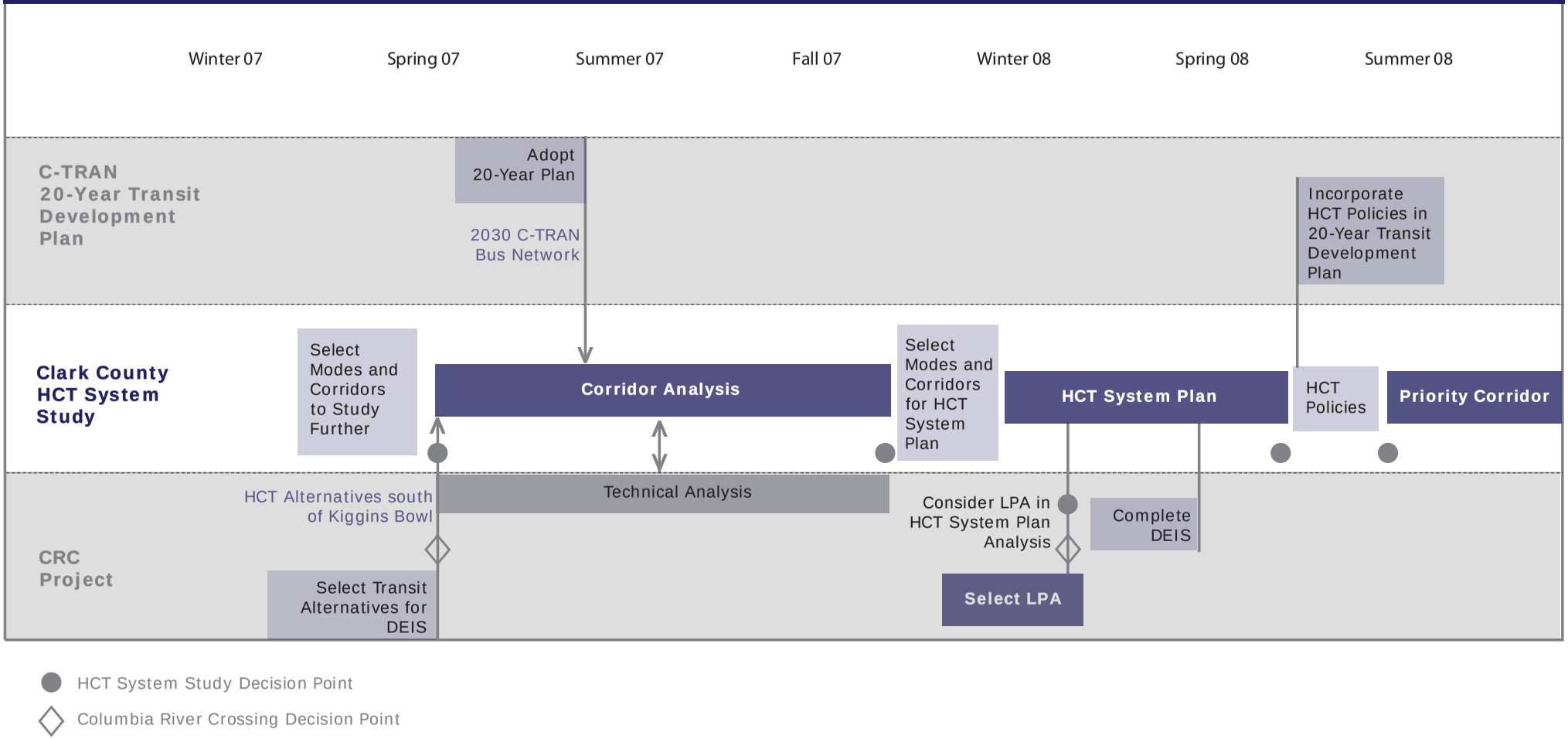
- The HCT System Study will not prepare new travel demand forecasts prior to the adoption of the C-TRAN 20-Year Transit Development Plan. Any travel forecasts prepared following the 20-Year Plan will use the newly adopted C-TRAN network as the base future-year transit network.

- The travel demand forecasts prepared for the HCT System Study (after April 2007), where feasible, will utilize population and employment forecasts, highway networks and transit networks that are consistent with those used for the CRC Project. If this is determined to not be feasible, the HCT System Study will explain the rationale to the HCT System Study Steering Committee and recommend an alternate approach.

- The CRC Project plans to extrapolate the new Clark County 2024 Growth Management Act (GMA) land use out to 2030 and use this forecast as the basis for the DEIS analysis (this is expected to be completed by March 2007).

- The HCT System Study will coordinate with the CRC project to identify the appropriate travel demand model transit assumptions in the I-5 Corridor south of Kiggins Bowl to use for HCT System Study modeling. Travel demand modeling for the HCT System Study will occur following the selection of transit alternatives to be studied in the DEIS but prior to the identification of a locally preferred alternative (LPA). The modeling strategy could include a sensitivity analysis to test how different modes in the I-5 Corridor (south of Kiggins Bowl) might impact the viability of HCT modes in corridors that would connect to the I-5 Corridor (south of Kiggins Bowl). This approach could lead to the identification of one or more high capacity transit "representative alternatives" in the I-5 Corridor (south of Kiggins Bowl).

Coordination with Columbia River Crossing Project and C-TRAN 20-Year Transit Development Plan



Fact Sheet: High Capacity Transit, Modes and Corridors

Why focus on high capacity transit?

Traffic congestion comes along with being one of the fastest growing counties in Washington. Long-term trends indicate that Clark County will continue to experience an increase in its population and jobs which will drive evaluation of other transportation options. A study of high capacity transit (HCT) will identify opportunities for its use to move people safer and faster by:

- providing additional travel options,
- improving mobility and accessibility, and
- offering cost saving efficiencies.

These opportunities will help meet the county's growth and economic development goals while enabling more efficient and reliable alternatives to getting around the county along the major travel corridors.

What is HCT?

High capacity transit is a term used to describe many types or modes of transit that move large numbers of people quickly and efficiently. High capacity transit includes bus rapid transit, streetcars, light rail, monorail, commuter rail, and other types of transit. In Clark County, high capacity transit would help create a network of transit options that let residents travel easily throughout the county while avoiding crowded roads and highways.

Commuter Rail Concept

Examples of HCT modes

The HCT System Study is examining possible modes and corridors in Clark County to determine what is best for meeting the future transit needs of residents. Many travel modes were considered early in the study process and the following have been recommended for further analysis.

Bus rapid transit (BRT)/BRT Lite – Bus rapid transit can include a range of bus improvements from providing bus priority at traffic signals to providing a completely separated roadway for buses. BRT systems are developing in several U.S. cities.

Examples of BRT include: Eugene, Oregon EMX System, Los Angeles, Orange Line, and Seattle, Bus Tunnel.

Light rail transit – Light rail systems are urban rail systems powered by electricity. They have a separated trackway and can operate in mixed traffic operations on city streets or on their own right-of-way. Light rail is typically slower than heavy rail because of mixed traffic operations.

Examples of light rail systems include: Portland's MAX system, Tacoma's LINK system, and numerous systems around the U.S.

Streetcar – Streetcars typically operate as cars on tracks embedded in city streets. Auto traffic usually shares a lane with streetcar operations and the operation is subject to vehicle congestion on the roadway. Some streetcar systems have been in operation since early in the 20th century while some cities are building modern streetcar systems with new vehicles.

Examples of streetcars include: The Portland Streetcar, the Seattle Waterfront Streetcar and the San Francisco trolley.

Commuter rail – Commuter rail is rail transit service that uses an existing rail line connecting outer areas with a downtown area or other major attractor. Commuter rail serves longer distance trips and stations are relatively far apart (5+ miles between stations).

Examples of commuter rail systems include: the Seattle-Tacoma Sounder service, Long Island Railway, Chicago's Metra system, and Washington County, Oregon in 2008.

Choosing corridors: Where will HCT routes be located?

A corridor is an overall travel shed or travel demand market area that uses a common set of transportation facilities (freeway, arterial roadway, transit line, etc.) to reach a common general destination.

This study is gathering detailed information to understand the land use and transportation context for potential corridors. Corridors are comprehensively evaluated to examine land use plans and policies, planned roadway improvements, existing transit services, major activity centers, and potential transit system improvements. The following corridors have been recommended for further study:

- I-5 South (Columbia River to 219th Street/SR 502)
- I-205 South (Columbia River to NE 134th Street)
- SR-500/Fourth Plain (from Downtown Vancouver to 137th on Fourth Plain and to Padden Parkway on SR-500)
- SR-14/Mill Plain (from Downtown Vancouver on Mill Plain to 192nd Street and on SR-14 to 164th Avenue)
- Chelatchie Prairie Railroad for preliminary evaluation and potential

Light Rail

Determining the right choices for Clark County

Through a comprehensive analysis and evaluation, the Southwest Washington Regional Transportation Commission (RTC) wants to make sure that the HCT System Study develops the right choices for Clark County residents by:

- Ensuring strong community involvement
- Addressing transit and capacity needs
- Increasing the level of transit services
- Considering cost
- Identifying potential environmental impacts

How can I learn more or become involved with the study?

Input from the Clark County community is essential to the success of this study effort. You can get more information and share your comments in the following ways:

- Visit our Web site for an online comment form, fact sheets and other project information.
- Request a study briefing for your business or community group.
- Attend Sounding Board meetings and share your comments.
- Join the study e-mail list and receive periodic updates.

Contact Information:

Web Site: http://rtc.wa.gov/hct
E-mail: hct@rtc.wa.gov
Phone number: 360-397-6067

Current Study Status – Summer 2007

The Southwest Washington Regional Transportation Council (RTC) is partnering with local jurisdictions and agencies to study Clark County's future high capacity transit (HCT) options, such as bus rapid transit, streetcars, light rail and other modes. Clark County has grown significantly over the past 25 years and will continue to grow, bringing economic benefits as well as increased roadway congestion and travel delays throughout the county. The Clark County HCT System Study is taking a fresh look at the county's future HCT needs and possibilities.

The study is moving forward with its second phase of analysis. This information sheet provides an update on the study's status, recent study milestones, and other important developments. Further details are available on the study website at http://rtc.wa.gov/hct.

The following "staircase" shows the study schedule, progress made to date, and anticipated next steps:

Purpose Statement

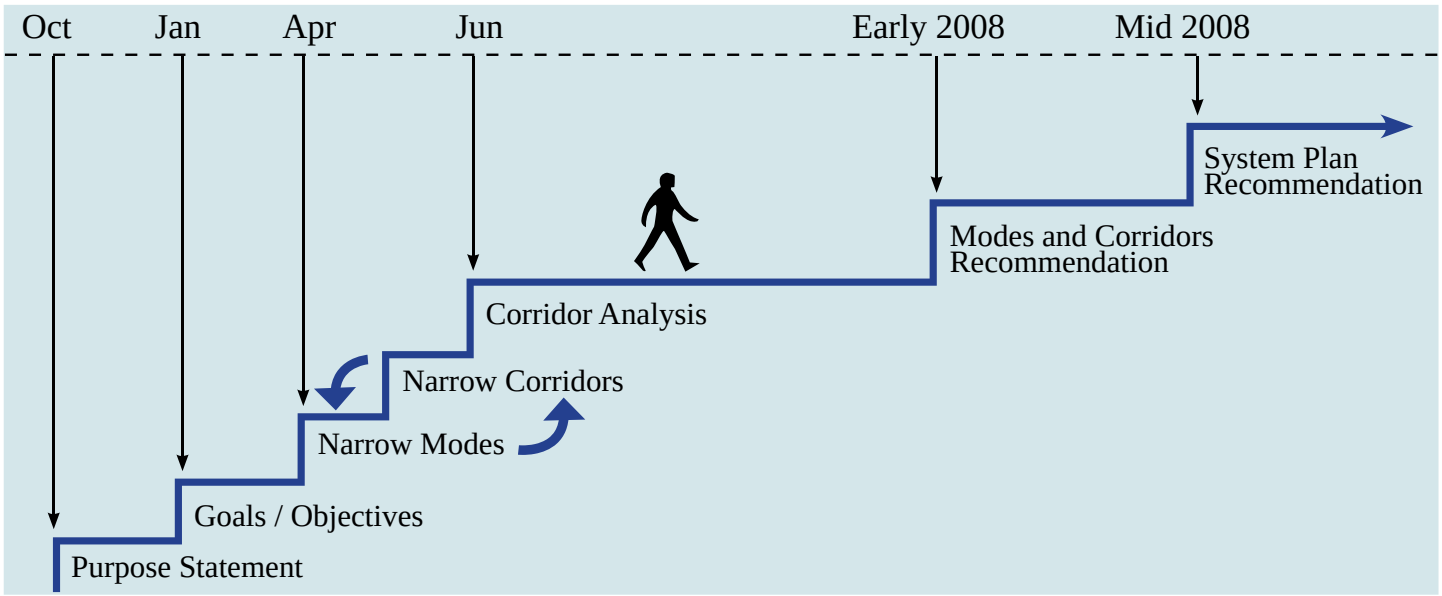
The Southwest Washington Regional Transportation Council (RTC) with input received from the study's Steering Committee developed the study's purpose statement to guide the overall study process. The purpose statement reads:

The purpose of the Clark County High Capacity Transit System Study is to identify a high capacity transit system that provides efficient and high quality transit service connecting county residents with where they want to go.

Goals & Objectives Adopted

The study Task Force and Steering Committee developed and adopted study goals and objectives to guide the study team in their assessment of potential high capacity transit (HCT) modes and travel corridors.

Study Schedule



Study goals and objectives include:

- Enhance overall transportation opportunities for Clark County residents and businesses
- Provide transit riders with an accessible, efficient and well-connected regional transit system
- Support a vibrant and sustainable Clark County economy
- Support livable communities
- Support a healthy environment
- Develop a system that can be funded and demonstrates stewardship of public funds
- Provide for the long-term viability of the HCT System Plan

Narrowing Modes & Corridors

The study team, with approval from the RTC Board of Directors and consensus from Task Force and Steering Committee members, reached a major study milestone by narrowing the potential modes and corridors under consideration using the following criteria:

Modes Criteria

- Alignment with study purpose and goals
- Proven technologies
- Economic development impacts
- Capital costs
- Land use compatibility

Corridors Criteria

- Travel demand (i.e. anticipated vehicle trips, existing transit riders, and number travelers connecting the same destinations)
- Travel conditions (i.e. congestion and travel times)
- Land use and growth (i.e. existing support in local land use plans, anticipated population growth and density, anticipated employment growth and density, and existing activity centers and travel destinations)
- Environmental and socio-economic concerns

Light Rail

Photo © Ken Gutmaker 2007

Bus Rapid Transit

The study team will continue to analyze the following modes and corridors:

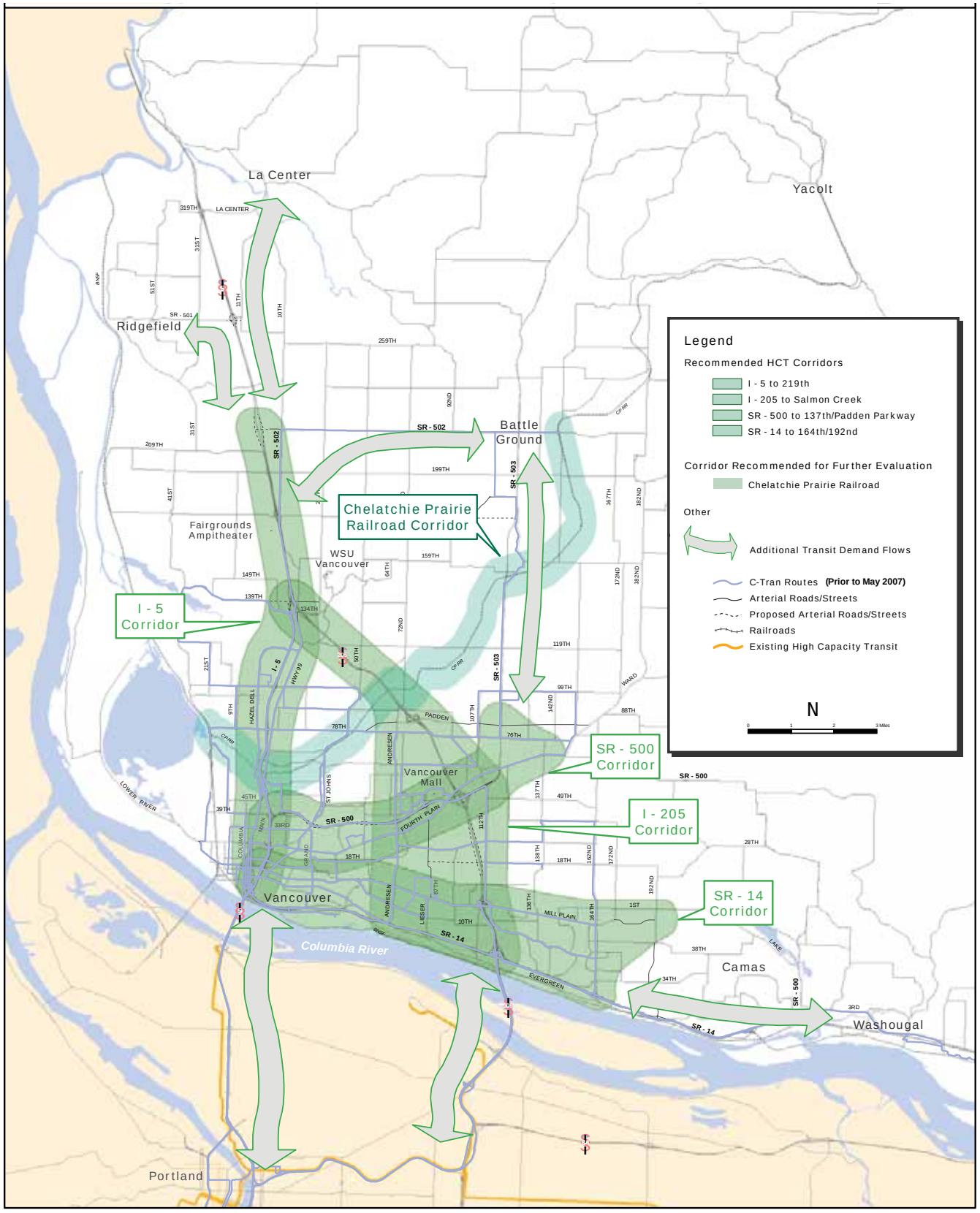
Modes

- Bus rapid transit (BRT)
- BRT lite
- Commuter rail
- Light rail transit (LRT)
- Street car

Corridors

- I-5 *(Columbia River to 219th Street/SR 502)*
- I-205 *(Columbia River to NE 134th Street)*
- SR-500 *(from Downtown Vancouver to 137th on Fourth Plain and to Padden Parkway on SR-500)*
- SR-14/Mill Plain *(from Downtown Vancouver on Mill Plain to 192nd Street and on SR-14 to 164th Avenue)*
- Chelatchie Prairie Railroad for Preliminary Evaluation and Potential

This image shows the travel corridors currently under consideration, along with other desired travel paths between important destinations in Clark County.



Next Steps

Having narrowed the modes and corridors, the study team is analyzing which HCT modes would work best in which corridors. The detailed corridor analysis will include:

- General design concepts for HCT
- Land use and transportation issues
- Ridership potential
- Comparative HCT cost estimates

After completion of the detailed corridor analysis, the study will focus on the best way for the corridors to work together as a complete system. This part of the study will focus on issues such as:

- Which modes and alignments have the most potential?
- How are the modes compatible across corridors and with the Columbia River Crossing (CRC) Project?
- What are the strategies to integrate the Clark County HCT system with the CRC Project, C-TRAN, and the TriMet system?
- What are the appropriate set of corridors and potential HCT improvements to include in the system plan?

The outcome of the study will be a comprehensive HCT plan for Clark County that will include:

- Promising HCT corridors
- Potential HCT modes and alignments within the corridors
- Identification of a priority corridor(s)
- Recommended HCT policies

Columbia River Crossing & C-TRAN Coordination

The Clark County HCT System Study strives to provide all travelers with a well-connected regional transit system. To accomplish this aim, project team members are working closely with the CRC Project and C-TRAN team members to assure smooth connections and seamless integration of travel options in the future.

The CRC Project is working to improve highway capacity and transit service in the I-5 corridor across the Columbia River. CRC is currently evaluating a range of transit alternatives (in conjunction with highway bridge alternatives) to improve mobility, reliability, and accessibility for automobile, freight, transit, bicycle, and pedestrian users of the I-5 corridor from State Route 500 in Vancouver to Columbia Boulevard in Portland. C-TRAN, Clark County's regional transit agency, will provide the crucial local connection for any future HCT services and are currently developing their 20-Year Transit Development Plan. The Clark County HCT System Study is coordinating with CRC and C-TRAN in the following specific areas:

- Project team members from each agency or organization regularly share project information, technical analyses and assumptions, coordinate schedules, discuss community feedback and conduct other actions to assure project coordination.
- The Clark County HCT System Study is coordinating with the CRC Project regarding furture transportation data and transit operations needed to assure logical and efficient transit connections in the future.
- The Clark County HCT System Study also coordinates specifically with C-TRAN's long-range planning efforts to assure seamless transit connections between any future HCT system and local transit routes and modes.

Get Involved

Comments and questions from the Clark County community are essential to the success of this study effort. Please get involved and share your comments by:

- Visiting the study website at http://rtc.wa.gov/hct for more study information, public event announcements, new online surveys and quizzes, and our comment form

- Sharing your comments by email or calling:
  Dale Robins at the Southwest Washington Regional Transportation Council
  hct@rtc.wa.gov
  (360) 397-6067

Current Study Status – Winter 2008

The Southwest Washington Regional Transportation Council (RTC) continues to work with local jurisdictions and agencies to study Clark County's future high capacity transit (HCT) options. The Clark County HCT System Study is working toward a final System Plan of recommendations for the future HCT service that will best serve Clark County residents. This information sheet provides an update on the study's status, recent study milestones, and other important developments. Further details are available on the study website at http://rtc.wa.gov/hct.

Study Purpose

Clark County has grown significantly over the past 25 years and will continue to grow, bringing economic benefits as well as increased traffic congestion and travel delays. The Clark County HCT System Study's purpose is to identify a high capacity transit system that provides efficient and high quality transit service connecting county residents with where they want to go.

Study Update

Since the HCT System Study began over a year ago, the study team has collaborated with the study's Task Force and Steering Committee and the RTC Board of Directors to complete a number of tasks. In the spring of 2007, they developed and adopted the study's goals and objectives to guide the assessment of potential HCT modes and travel corridors. The goals and objectives became the foundation for the criteria used to narrow the modes and corridors to those best suited for use in Clark County.

The study team also conducted a travel market analysis to identify the most promising corridors for potential development of an HCT system. In the summer of 2007, using the travel market analysis and other criteria, the study reached a major milestone by narrowing the potential modes and corridors. The modes carried forward for further consideration included bus rapid transit (BRT), BRT Lite, commuter rail, light rail transit (LRT), and streetcar. The corridors carried forward for further consideration included I-5/Hwy 99, I-205, SR-14/Mill Plain, SR-500/Fourth Plain, and Chelatchie Prairie Railroad.

Possible HCT Modes

After studying many modes of transit, the study team narrowed the field to those modes that best fit Clark County's transit needs. The following modes are being evaluated for possible inclusion in the final HCT System Plan:

Bus rapid transit (BRT) – BRT is a strategy to reduce travel time for bus riders and improve bus efficiency in congested corridors. BRT would operate in an exclusive lane for buses. In addition, BRT includes signal preemption, in-line station, and would have a distinct brand identity.

BRT "lite" –BRT "lite" is bus service that operates mixed with traffic, but includes improvements to increase bus reliability. Other improvements could include bus priority at traffic signals or queue jumps at intersections.

Light rail transit – Urban rail systems powered by electricity that operates on its own exclusive track. Would include in-line stations and would have a distinct brand identity.

Streetcar – Streetcar transit is similar to LRT, but operates in shared vehicle lanes in city streets. It uses electrically powered rail cars.

Commuter rail – Transit service using an existing heavy rail line connecting outer areas with a downtown area or other major destination. Includes fewer stops and best serves longer trips.

Bus Rapid Transit

Possible HCT Alignments

The study team is currently sharing technical analysis of the transit corridors and alignments with the study Task Force, Steering Committee, and the general public. The team has identified priority system plan strategies for implementation before 2030 and other options for future analysis after 2030. The system strategy map on the opposite page shows these possible HCT options and has been approved by the Task Force, Steering Committee, and the RTC Board of Directors.

Proposed Mid-Term HCT (2030)

- *I-5/Hwy 99 (Lincoln to Salmon Creek)* - Continue to study transit options traveling in an exclusive lane or mixed with traffic.
- *I-205 (Columbia River to Salmon Creek)* - Continue to study bus rapid transit along I-205 and possible conversion to light rail in the long-term.
- *Fourth Plain Blvd (from Vancouver on Fourth Plain Blvd, ending on Fourth Plain Blvd or SR 503)* - Focus on HCT improvements on Fourth Plain Blvd and continue to study transit options traveling in an exclusive lane or mixed with traffic.
- *Mill Plain (ending at Fishers Landing)* - Continue to study bus rapid transit and bus rapid transit "lite" options.

Proposed Long-Term HCT (beyond 2030)

(These are options that could be incorporated into the long-term vision and may become viable in the future, but do not warrant further study at this time)

- *I-5/Hwy 99 (Salmon Creek to 219th Street)* - Continue to study transit options traveling in an exclusive lane or mixed with traffic.
- *SR 14* - Continue to study bus rapid transit or bus rapid transit "lite" options and possible extension of an exclusive transit lane on SR 14.
- *SR 500* - Possible extension of an exclusive transit lane on SR 500.
- *Chelatchie Prairie* - Preserve corridor for future commuter rail service by identifying commuter service needs and ensuring that trail and freight rail use do not preclude future commuter service.

Alignment and Mode Recommendations

Having narrowed the modes and corridors, the study team is in the final stages of their detailed corridor and alignment analysis. They will use an evaluation matrix to prioritize which corridors will provide a long term plan for a potential HCT system for Clark County. The evaluation matrix uses the study goals and objectives to evaluate each possible corridor and possible alignment.

The following are the study goals:

- Enhance overall transportation opportunities for Clark County residents and businesses
- Provide transit riders with an accessible, efficient and well-connected regional transit system
- Support a vibrant and sustainable Clark County economy
- Support livable communities
- Support a healthy environment
- Develop a system that can be funded and demonstrates stewardship of public funds
- Provide for the long-term viability of the HCT System Plan

Next Steps

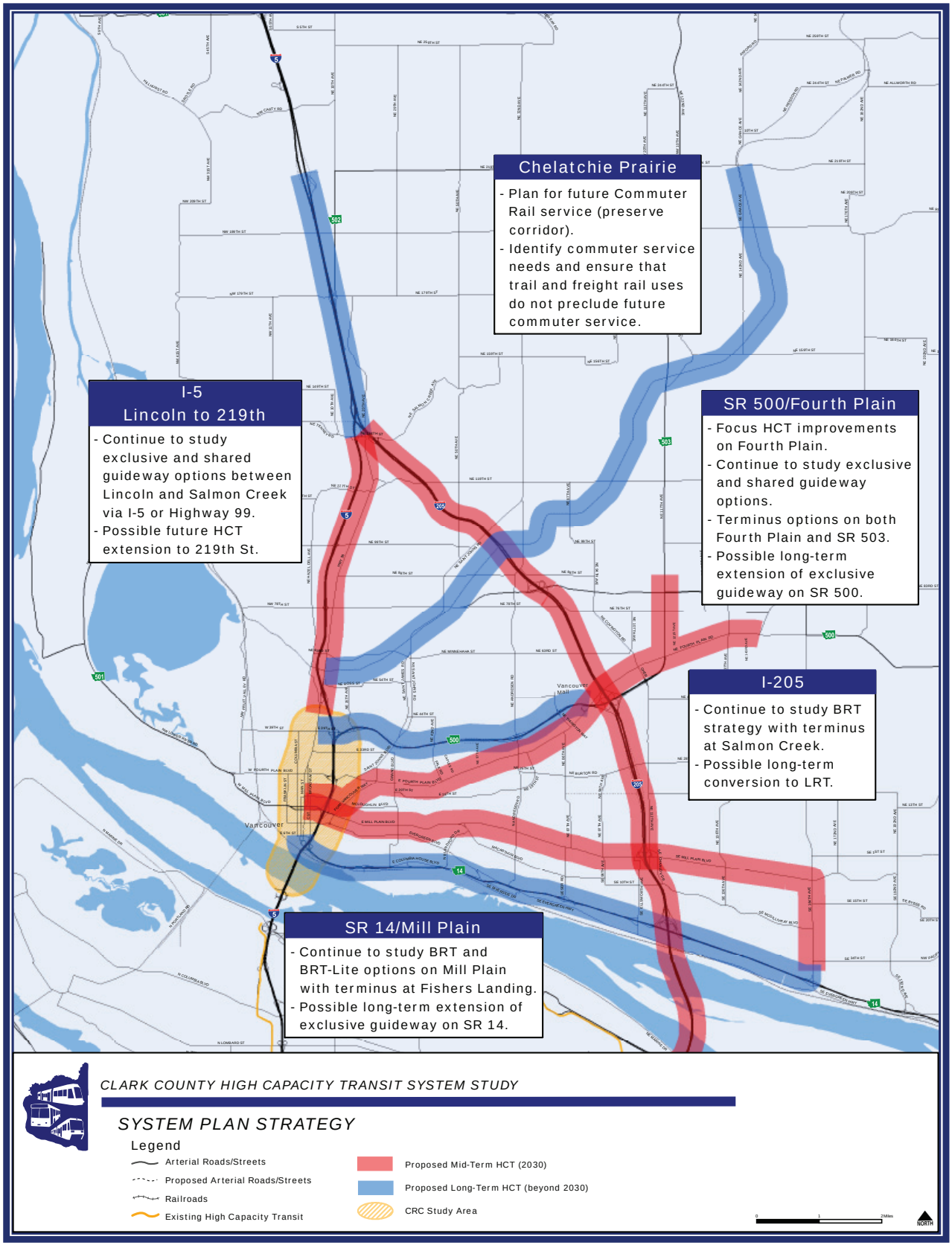
After reviewing the proposed corridors and modes using the evaluation matrix and input received from the Task Force, Steering Committee, and general public, the study team will begin to analyze system plan elements during the spring 2008. They will:

- Match selected corridors with the modes that are the most promising
- Develop a final System Plan that outlines the HCT options that address Clark County's future transportation needs

The final System Plan will be a comprehensive plan for Clark County and will include:

- Potential HCT modes and alignments within those corridors
- Identified priority corridor(s) to move forward in an Alternative Analysis
- Recommended HCT policies and other corridors for further analysis

This image shows the travel corridors and possible alignments the study team is currently evaluating.



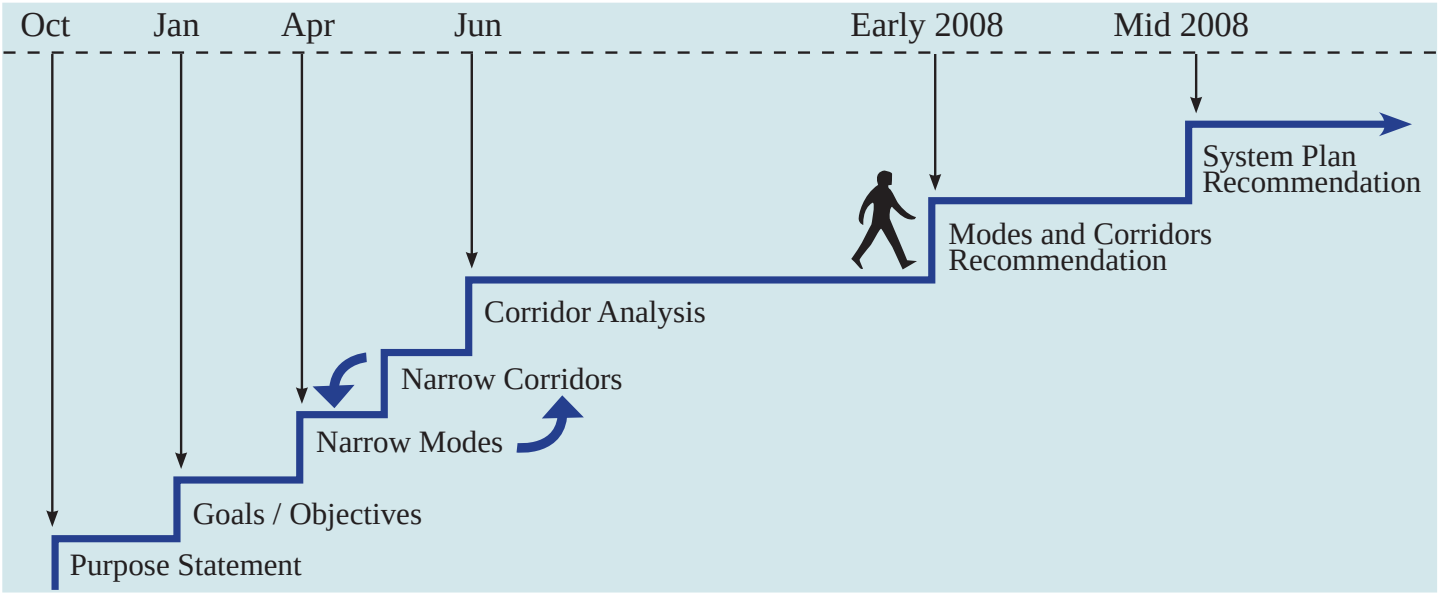
Columbia River Crossing & C-TRAN Coordination

The Clark County HCT System Study continues to coordinate with the Columbia River Crossing (CRC) Project and C-TRAN to plan an effective regional transit system. CRC is working to improve highway capacity and transit service in the I-5 corridor across the Columbia River. C-TRAN will provide the crucial local connections for any future HCT services in Clark County.

CRC plans to release a Draft Environmental Impact Statement (DEIS) in March 2008. The DEIS will include transit alternatives designed to reduce congestion on I-5 from SR 500 in Vancouver to Columbia Boulevard in Portland. CRC is considering bus rapid transit paired with express bus service or light rail paired with express bus service and is investigating several possible alignments. The Clark County HCT System Study is examining alignments designed to connect with a future CRC transit project and expand transit service to more areas of Clark County. The study team is working closely with CRC to share data and ensure efficient transit connections in the future.

C-TRAN continues developing a 20-year Transit Development Plan for Clark County. The Clark County HCT System Study is coordinating with C-TRAN's long-range planning efforts to assure seamless transit connections between any future HCT system and local transit routes and modes.

The schedule below shows the current status of the study.



Get Involved

Comments and questions from the Clark County community are essential to the success of this study effort. Please get involved and share your comments by:

- Visiting the study website at http://rtc.wa.gov/hct for more study history, current study information, public event announcements, and to share your comments with the study team
- Sharing your comments by email or calling:
  Dale Robins at the Southwest Washington Regional Transportation Council
  hct@rtc.wa.gov
  (360) 397-6067

Study Summary (2006 – 2008)

Study Purpose

Clark County has grown significantly over the past 25 years and will continue to grow, bringing economic benefits as well as increased traffic congestion and travel delays. The Clark County High Capacity Transit System Study's purpose is to identify a high capacity transit system that provides efficient and high quality transit service connecting county residents with where they want to go.

The Southwest Washington Regional Transportation Council (RTC) along with its partner agencies has completed a two-year effort to develop a High Capacity Transit (HCT) System Plan. The Plan includes bus rapid transit (BRT) in the Highway 99, Fourth Plain, and Mill Plain corridors and significant bus improvements in the I-205 corridor.

The plan will serve as a guide for C-TRAN and the communities in Clark County as they move forward with improvements in the planned HCT corridors. Local jurisdictions and transportation agencies will also be asked to consider the plan as they prepare capital improvement programs and work plans.

Background

High Capacity Transit can include services such commuter rail, subway, bus rapid transit, light rail transit, and streetcars. These are all considered HCT because they can move more people at higher speeds than conventional buses.

The Clark County High Capacity Transit System Study was initiated in late 2006 to develop a plan for how HCT could serve the future transportation needs of Clark County.

Although there has been discussion of extending light rail into Vancouver since the early 1990's, this is the first comprehensive planning process that looks at potential service for the entire county and the viablity of all HCT modes, not just light rail. The study also examined how to best connect to the Columbia River Crossing Project, as well as bi-state connections within the I-205 corridor.

The Public Process

Several committees were established to guide and oversee the progress of the HCT study.

The **Steering Committee** included elected representatives and staff from the study partner agencies and jurisdictions. The group provided policy direction for the study, and served as a focal point for consensus building among jurisdictions.

The **Task Force** included citizens and business leaders representing a range of community interests. The Task Force provided input on public values and provided recommendations to the Steering Committee. The Task Force was integral to developing the study purpose statement.

The **Sounding Board** included groups of active citizens and the general public. Meetings involved workshops and open houses at key milestones where the public was able to hear study updates and provide feedback.

Information from the public outreach process, including study goals, fact sheets, meeting summaries, reports, and videos, may be found on the study website at *http://rtc.wa.gov/hct*.

Sounding Board

Modes

The study team identified and evaluated nine potential HCT modes (or types of transit vehicles) based on how well they satisfied the study purpose and goals. The team considered factors such as whether the modes were proven technologies, affordable, and whether they were compatible with land uses in Clark County. Based on the initial assessment, the study committees recommended removing four modes (monorail, heavy rail, personal rapid transit, and water transit) from consideration because they were not considered viable. The five remaining modes included:

- **BRT-Lite** *(bus rapid transit operating primarily in mixed traffic)*
- **BRT-Full** *(bus rapid transit operating primarily on exclusive guideway)*
- **Streetcar**
- **Light Rail**
- **Commuter Rail**

In addition to the modes above, **BRT-Hybrid**, was developed later in the study process. BRT-Hybrid would operate in mixed traffic as well as on cost-effective sections of exclusive guideway. BRT-Hybrid would result in lower capital costs than BRT- Full concepts while still saving significant travel time over BRT-Lite and conventional bus.

Bus Rapid Transit

Bus Rapid Transit (BRT) is a strategy to reduce travel time for bus riders and improve bus efficiency in congested corridors. BRT uses features such as exclusive lanes, signal preemption, in-line stations, and a distinct brand identity.

Corridors

Fifteen travel corridors were identified as possible locations for HCT alignments within Clark County. An initial assessment of the corridors helped the study committees to narrow the options to five promising corridors that merited more detailed analysis. The five corridors included:

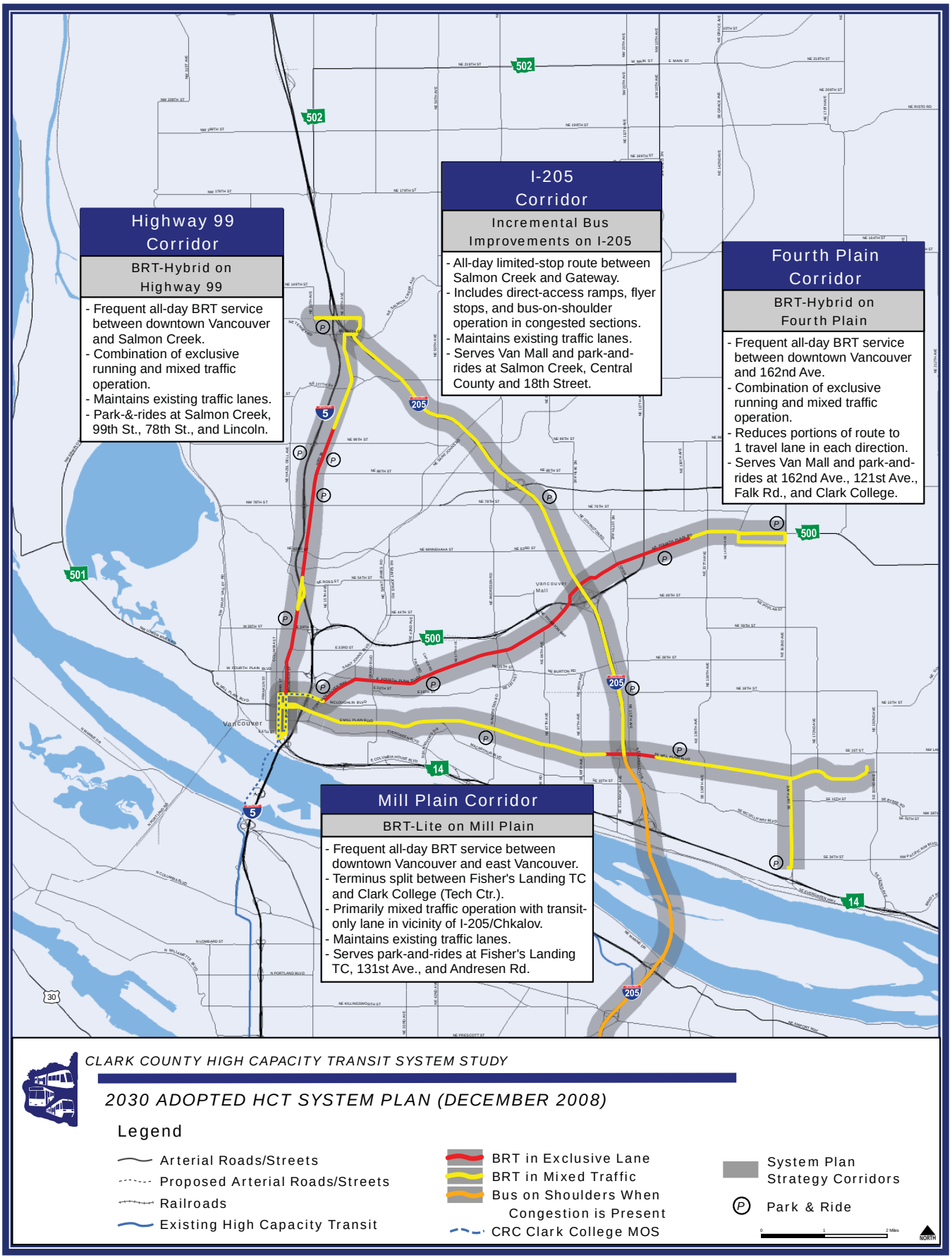
- **I-5/Highway 99**
- **SR-500/Fourth Plain**
- **I-205**
- **SR-14/Mill Plain**
- **Chelatchie Prairie**

HCT System Plan Recommendations

The study team reviewed the recommended corridors and modes using input from the Task Force, Steering Committee, and general public, as well as an evaluation matrix that considered how well each system element satisfied the goals of the study. The team then analyzed potential system plan scenarios in order to determine which combinations of corridors and modes were the most promising to carry forward into a final system plan that would most effectively address Clark County's future transportation needs.

The System Plan alignment recommendations are shown on the next page.

- **Highway 99** – *Serves intra-county and bi-state trips while retaining express bus service on I-5 and supporting redevelopment efforts on Highway 99.*
- **Fourth Plain** – *Serves intra-county trips and some bi-state trips while supporting Fourth Plain redevelopment plans.*
- **I-205** – *Serves intra-Clark County trips and bi-state trips through incremental improvements to bus service and park and rides while preserving the freeway median for future transit use.*
- **Mill Plain** – *Serves primarily intra-county trips with the addition of a transit-only lane near Chkalov and I-205.*


Highway 99 Corridor
BRT-Hybrid on Highway 99
- Frequent all-day BRT service between downtown Vancouver and Salmon Creek.
- Combination of exclusive running and mixed traffic operation.
- Maintains existing traffic lanes.
- Park-&-rides at Salmon Creek, 99th St., 78th St., and Lincoln.
I-205 Corridor
Incremental Bus Improvements on I-205
- All-day limited-stop route between Salmon Creek and Gateway.
- Includes direct-access ramps, flyer stops, and bus-on-shoulder operation in congested sections.
- Maintains existing traffic lanes.
- Serves Van Mall and park-and-rides at Salmon Creek, Central County and 18th Street.
Fourth Plain Corridor
BRT-Hybrid on Fourth Plain
- Frequent all-day BRT service between downtown Vancouver and 162nd Ave.
- Combination of exclusive running and mixed traffic operation.
- Reduces portions of route to 1 travel lane in each direction.
- Serves Van Mall and park-and-rides at 162nd Ave., 121st Ave., Falk Rd., and Clark College.
Mill Plain Corridor
BRT-Lite on Mill Plain
- Frequent all-day BRT service between downtown Vancouver and east Vancouver.
- Terminus split between Fisher's Landing TC and Clark College (Tech Ctr.).
- Primarily mixed traffic operation with transit-only lane in vicinity of I-205/Chkalov.
- Maintains existing traffic lanes.
- Serves park-and-rides at Fisher's Landing TC, 131st Ave., and Andresen Rd.
CLARK COUNTY HIGH CAPACITY TRANSIT SYSTEM STUDY
2030 ADOPTED HCT SYSTEM PLAN (DECEMBER 2008)
Legend
Arterial Roads/Streets
Proposed Arterial Roads/Streets
Railroads
Existing High Capacity Transit
BRT in Exclusive Lane
BRT in Mixed Traffic
Bus on Shoulders When Congestion is Present
CRC Clark College MOS
System Plan Strategy Corridors
Park & Ride
NORTH

Policy Recommendations

In addition to recommending modes and corridors, the adopted HCT System Plan includes policy recommendations that will help guide how the corridors develop so they are supportive of an HCT System. Transportation policy recommendations include:

- **Maximizing ridership** by serving both intra county and bi-state transit trips,
- Designing the system in a way that ensures the HCT vehicles move through the corridors **faster than conventional bus**,
- **Maximizing access** to the system, and
- **Balancing trade-offs** between ridership and cost.

Land use policy recommendations include:

- Moving towards **transit-supportive** land uses,
- Promoting a **mix of land uses** (including retail, business, and residential),
- **Parking management** strategies, and
- **Transit oriented design** which results in improved access to transit.

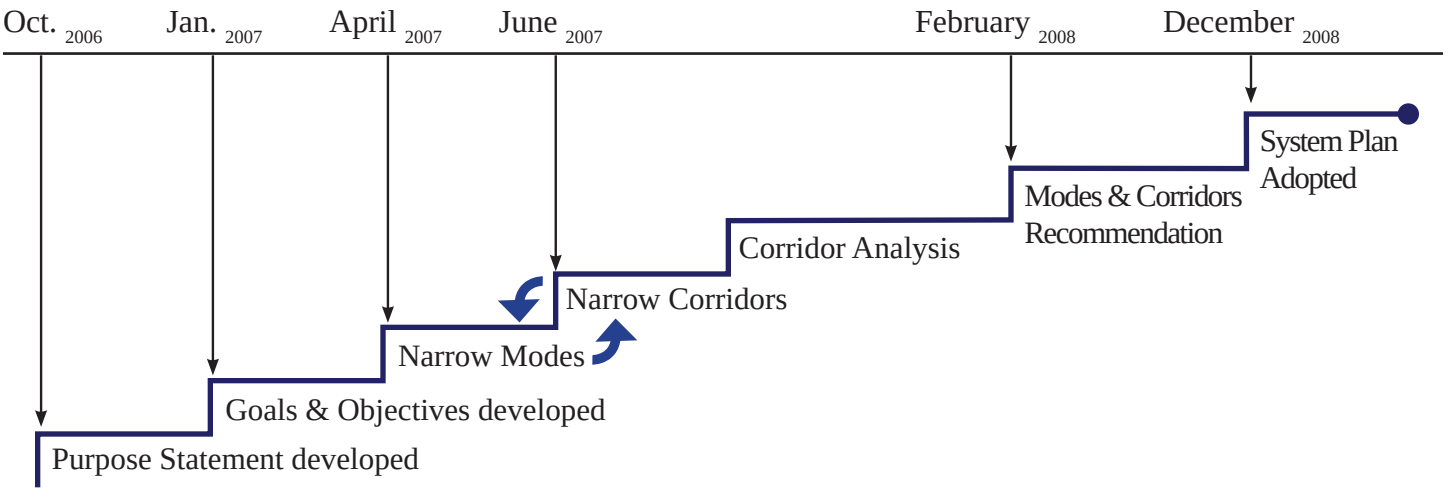
Next Steps

The HCT System Plan was approved by the study Task Force and Steering Committee and adopted by the RTC Board on December 2, 2008. The plan provides a blueprint for how local governments and C-TRAN can move forward to implement HCT within the corridors recommended in the plan. Next steps include:

- **Identifying a priority corridor** - C-TRAN will lead the effort to determine which HCT corridor should be developed first. The Study committees have identified the Highway 99 and Fourth Plain corridors as having the highest priority.
- **Making the region competitive for federal funding** through transit funding programs like *New Starts* or *Small Starts*.
- **Performing an Alternatives Analysis** for the priority corridor to identify the most appropriate HCT mode and alignment.
- **Preparing an HCT Funding Strategy**.

Implementing the plan will also require significant cooperation between RTC, WSDOT, C-TRAN, Clark County, and local governments as well as support from neighborhoods and businesses in the community.

Study Process Steps



For more information

Visit the study website at ***http://rtc.wa.gov/hct*** or contact **Dale Robins** at the Southwest Washington Regional Transportation Council: ***hct@rtc.wa.gov*** or ***(360) 397-6067***.

Appendix D

Feasibility of Adding HCT to the Glenn Jackson (I-205) Bridge

High Capacity Transit System Study
Technical Memorandum
Feasibility of Adding HCT to the Glenn Jackson (I-205) Bridge
August 13, 2007

Executive Summary

This technical memorandum provides a detailed analysis of technical issues that are key to understanding whether high-capacity transit (HCT), either light rail or bus rapid transit (BRT), could be accommodated on the Glenn Jackson (I-205) Bridge across the Columbia River. These issues are, by their nature, highly technical and somewhat complex; however, a careful reading of the analysis in this memo can lead to some fundamental conclusions. The key conclusions regarding whether light rail or BRT could be accommodated on the Glenn Jackson Bridge are summarized below.

Some elements of this summary focuses on light rail rather than BRT because light rail vehicles are heavier and wider than BRT buses, thus if light rail is found to be viable, we can assume that BRT would also be viable. This summary does discuss a situation where if light rail is not viable, whether BRT might be viable.

- There are really two different questions regarding light rail on the Glenn Jackson Bridge:
  1) Can the bridge hold the weight of light rail vehicles?
  2) Is there room to put light rail on the bridge?

- Can the bridge hold the weight of light rail vehicles?

  Several past studies have evaluated whether the bridge as designed could accommodate the weight (live load) associated with light rail vehicles. The bridge loading standards changed in the mid-1990's which complicates the answer to this question.
  - Early studies, particularly the 1991 HCT Study (prepared by Berger ABAM), concluded that the live loads associated with light rail could be accommodated with the existing bridge structure.
  - More recent studies, noting the more stringent loading standards in use today, have found that the early ABAM conclusion is less clear, but that light rail loading could still be marginally within acceptable limits, however with little wiggle room left.
  - Conclusion for the 2008 Clark County HCT Study:

    Light rail loadings could be accommodated on the existing Glenn Jackson Bridge structures.

- Is there room to put light rail on the bridge?

  Light rail would need to be accommodated either in one of the existing four travel lanes or using the inside or outside shoulders (or some combination of both).

- Using one existing travel lane could maintain adequate shoulder width but would compromise existing and/or future traffic operations. The Glenn Jackson Bridge carried 139,000 vehicles per day in 2006 and restricting this level of traffic to three lanes in each direction would exacerbate existing congestion.
- The 1991 Berger ABAM study assumed a cross-section with light rail that maintained four regular traffic lanes, but reduced the shoulder width to 3' 6" for both the inside and outside shoulders. There are other shoulder strategies that could be employed, but all would result in shoulder widths that would be substantially below current standards.
- ODOT and WSDOT have reviewed all of the previous studies and analyses and both agencies have consistently stated their strong desire to maintain the current four travel lanes and standard shoulders. Both agencies do operate freeways with substandard shoulder or lane widths, but they recognize that those compromises can increase congestion, reduce system reliability and create safety problems.
- Conclusion for the 2008 Clark County HCT Study:

  An effort to find room for light rail on the Glenn Jackson Bridge by reducing the number of traffic lanes or narrowing the shoulders would require design exceptions from both WSDOT and ODOT and would likely face strong opposition from those agencies.

- **How about accommodating BRT on the Glenn Jackson bridge structures?**

BRT has the flexibility to operate both in mixed traffic and in an exclusive guideway. Exclusive guideway operation is preferred when traffic congestion would significantly delay or disrupt BRT operations. Three options for accommodating BRT on the Glenn Jackson Bridge are discussed below:

- BRT could operate in mixed traffic across the Glenn Jackson Bridge. This would result in decreased reliability for BRT service.
- Another BRT option on the Glenn Jackson Bridge would be a guided bus BRT system. The guided bus BRT would require exclusive use of a shoulder, but the guided bus function would minimize the amount of shoulder width required to as little as 8' 8". A number of strategies could be used to for the remaining shoulder width and travel lanes, but leaving the 12 foot travel lanes would leave a 2-foot shoulder between the BRT guideway and the adjacent traffic lane and an 8-foot shoulder on the inside (this and other strategies are shown in cross-sections on pages 10 and 11).
- Bus-on-shoulder operations could be allowed when adjacent traffic speeds fall below a particular threshold. Minnesota allows buses to use shoulders when adjacent traffic falls below 35 mph. Bus-on-shoulder operations would require only minimal capital improvements.

Introduction

This technical memorandum provides background and evaluation of the design capacity of the Glenn Jackson (I-205) Bridge and its ability to carry different forms of high-capacity transit (HCT).

On May 1, 2007 the RTC Board endorsed the narrowing of corridors and modes to be included in the Clark County HCT System Study. That recommendation included four corridors to be studied further as potential HCT corridors, including the I-205 corridor. The recommendation also identified five HCT modes to evaluate further, BRT-full, BRT-lite, light rail, streetcar and commuter rail.

The purpose of this evaluation is to determine if the Glenn Jackson Bridge is a potentially feasible alignment for either light rail or BRT. This initial assessment provides background information and evaluates the feasibility of BRT or LRT utilizing bridge. Light rail and BRT are the two primary HCT modes being considered in this corridor. A primary consideration of this assessment is whether the bridge design loading can accommodate light rail as light rail vehicles (LRVs) are considerably heavier than buses used for a typical BRT system.

The feasibility investigation is focused on two primary aspects: the structural capacity of the existing bridge to carry light rail (BRT buses would be considered as part of the highway loadings) and the geometrical constraints of the existing bridge to carry either form of HCT.

This memo acknowledges past studies that have provided cursory exploration of the feasibility of remodeling the existing bridges to accommodate HCT, however, this document focuses on the structural capacity and geometric constraints associated with the existing bridge and it's ability to carry highway and light rail loadings.

Existing Bridge and Original Design Parameters

The existing Glenn Jackson Bridge is actually comprised of separate bridges; the Glenn Jackson Bridge and the South Channel Bridge. They are connected via an at-grade embanked roadway on Government Island. Additionally, the Northbound and Southbound directions of these two bridges are separate 68 foot wide bridges, approximately 10 feet apart with a concrete slab for the bikeway in the center space. For simplicity, this document will refer to these four bridges as the Glenn Jackson Bridge.

The Glenn Jackson Bridge was designed in the late 1970s, using the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges. The bridge superstructure (deck and box beams) was designed for applicable loads, including dead load (i.e. the weight of the bridge itself) and live load (the weight of the bridge in full use including vehicles using the highway).

In the design year the live load was designed for HS-20-44 loading, which represents a notional design truck with a Gross Vehicle Weight (GVW) of 72,000 pounds. The - 44 denotes 1944 – the year the standard was established. Although the HS-20 is not the largest load expected to travel across this bridge, the bridge is designed to carry the HS-20 truck an infinite number of times in its lifetime without structural degradation.

Per design code, at the time, the live load value could also be adjusted to account for two factors; impact and multi-lane use. The live load was increased to account for moving vehicles exerting additional force (impact) to the superstructure. The increase for impact was between 7-12 percent of the live load value, depending on the length of the span considered. The live load values could also be decreased to account for the infrequency of multiple lanes simultaneously loaded with trucks of the GVW (multi-lane use credit). Each bridge was designed to carry 5 lanes of traffic, which would have earned a decrease in Live Load of 25 percent; however, design documents reveal that no multi-use credit was taken. This essentially resulted in a live load capacity 25 percent greater than per code provisions.

Past Studies

I-205 High Capacity Transit Study, Task II-B (Dec. 31, 1990, rev. Dec.13, 1991)

In 1990, the Intergovernmental Resource Center (IRC), a predecessor of RTC, conducted a high-capacity transit study. A key task in that study was exploring the feasibility of adding light rail to the Glenn Jackson Bridge. This study analyzed replacing one of the five HS-20 design lanes with an LRV live loading of 536,000 lbs. This case was then compared to the original design.

This study indicated that the bridge was originally designed for an additional lane of live load, in anticipation of a future addition of rail transit. It is assumed that this was stated in the original design calculations, but coincidentally, the design code requires that the design account for 12-feet-wide lanes across the entire width of the roadway surface. This code provision requires the bridge to be designed for 5 highway lanes anyway.

Analyzing a configuration of 4 HS-20 highway lanes and 1 LRV lane, this study concluded:

> "Increases in design shear and moment in the bridge beams due to additional dead and live loads from an LRT system are 8 percent or less. These increases do not take into account that available lane load reductions (25 percent reduction due to multilane) have not been used in the original superstructure design."

I-205 Glenn Jackson Bridge LRT Retrofit Study Summary Report (Dec. 1991)

In the Executive Summary, this Report concluded that the bridge can (structurally) support busway or light rail operations. This report also acknowledged that discussions with the Oregon Department of Transportation (ODOT) and the Washington State Department of Transportation (WSDOT) revealed a concern with the reduced shoulder widths that would result from a cross-section of one LRT and four highway lanes, in each direction of the bridge.

Transportation Futures Committee Report (1996)

This report noted the prevailing notion that it may be structurally feasible for the bridge to carry LRV loading, but acknowledged concern for the geometric complexities of adding LRT and maintaining highway capacity. Page 28 of the report provides a synopsis of the *I-205 Glenn Jackson Bridge LRT Retrofit Study Summary Report*, "This study concluded that the I-205 bridge can structurally support busway or light rail operations under either of the following conditions:

- I-205 light rail transit (LRT) and four travel lanes in each direction could only be accommodated by encroaching or removing the current inside and outside emergency lane shoulders;
- with LRT and only three travel lanes, the existing emergency lane shoulders could be retained."

South/North Transit Corridor Study (1996)

On August 8, 1996, a memorandum was written by Parsons Brinckerhoff that provided a cost comparison of other bridges for independent and combined LRT/auto bridges. In that memo, Table 1 stated that the engineering feasibility of converting the Glenn Jackson Bridge into a combined LRT/Auto bridge was "Low". The summary of similar bridge studies for the I-205 Columbia River Bridge included the statement that:

> "Typically, single-unit decks for segmental bridges do not exceed approximately 70-feet in width. The Glenn Jackson parallel structures are at the upper limit of this width."

I-5 Trade Corridor Study Phase II, Analysis of the Glenn Jackson Bridge Constraints on LRT (October 12, 2001)

This memorandum provided an evaluation of the past studies related to the design capacity of the Glenn Jackson Bridge. It also provided updated information on the design code (as of 2001) and discussed pending issues and possible cross sections.

This memorandum indicated that Highway Live Loading standards had changed since the 1991 Study. The notional highway loading changed from HS-20 to HS-25. This new notional live load, with a GVW of 90,000 pounds, represents an acknowledgement of a nationwide weight increase in the "typical" truck.

The LRV loading had also increased in weight, since the 1991 Study, from a 4 car total of 536,000 pounds to 596,800 pounds.

Pending issues noted in the memo included the fact that the bridges do not have a current Load Rating. A bridge Load Rating calculates both the load capacity of the bridge and the demand (dead and live load) placed on the bridge. As bridges age, deteriorate and lose load capacity, this reduction in capacity is accounted for in the Load Rating calculation. A load rating is expressed as the current capacity divided by the demand and a load rating of 1.0 or

greater indicates that the bridge can safely carry the live load under consideration. Without a current load rating, the feasibility of the Glenn Jackson Bridge to adequately carry LRV loading, could not be fully quantified.

This memorandum provided the following conclusions:

- The existing bridge superstructure was designed for 25 percent more than required by code.
- Current standards require use of HS-25 loading, which is 25 percent more than HS-20.
- Five lanes of HS-25 would increase Live Loads by 25 percent. By replacing one of these lanes with current a two-vehicle set of the TriMet Type 2 LRV, the percentage increase would be higher.

The memorandum acknowledged ODOT and WSDOT's preference to hold any reserve capacity that the bridges may have for undocumented overloaded trucks, as opposed to using this reserve capacity for LRV loading.

Review of Prior Studies Regarding the Feasibility of LRT on the I-205 Glenn Jackson Bridge (Columbia River Crossing Project, June 12, 2007)

This memorandum provided summary of the past studies related to the feasibility of adding light rail on the Glenn Jackson Bridge.

This memorandum considered structural and geometric issues and provided the following finding:

> "Scenario 1, LRT on Existing Bridge: This original finding from the Berger ABAM report was evaluated for more than a decade and we draw the conclusion that it is not structurally feasible given the change in live load inputs in the mid-1990s. Even if this issue is addressed a retrofit of the structure would require either reducing the shoulders to 3-feet in width, or eliminating a travel lane in each direction. This would require approval from FHWA, WSDOT, and ODOT and under this option all bicycle and pedestrian access across the bridge would be eliminated. Give these two issues, we can reasonably conclude that the original Berger ABAM alternative is not feasible."

Current Feasibility Analysis

Current Design Code Changes

Several design parameters have changed, since the 2001 Study (*I-5 Trade Corridor Study Phase II, Analysis of the Glenn Jackson Bridge Constraints on LRT* (October 12, 2001).

The largest change occurred in the AASHTO design code itself, with a philosophical change of the design code. The previous design code (Load Factor Design) accounted for highly variable loads, such as live loading, by increasing them by a factor. The overall design margin of safety (or level of conservatism) was inconsistent from bridge type to bridge type. The newly adopted AASHTO design code (Load Resistance Factor Design) applies a series of factors that provide a more consistent design margin of safety, from bridge to bridge.

Although this feasibility study does not quantify the capacity difference between the LFD and LRFD design codes, it is possible for LRFD calculations to provide a slightly higher design capacity than LFD calculations.

Within the new LRFD design code, the Live Load, impact factor and the multi-lane use credit have all changed. The new notional highway loading is now the HL-93 load, instead of the HS-25 load. This new notional load is a uniform 640 lbs/ft load plus a HS-20 truck, placed in each design lane. The HL-93 load accounts for the increased bridge stress caused by trucks and fully loaded lanes of cars on the longer bridge spans.

In addition to the Live Load changing, the live load impact factor changed from a value which was span length dependent to a set value. For the Glenn Jackson Bridge the live load impact factor (as designed) ranged from 7 percent to 12 percent. The LRFD set value is 33 percent.

The multi-lane use credit has also changed. The available credit at the time of the original design was 25 percent (a 0.75 factor), but as previously mentioned, was not taken. The LRFD allows a larger multi-lane use credit of 35 percent (a 0.65 factor).

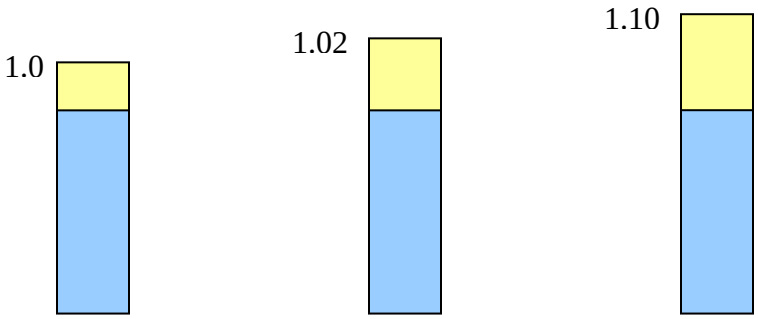
Structure Analysis

The analysis provides a feasibility assessment of the bridge's overall capacity to carry HCT, and in particular LRT. The bridge's overall capacity includes both dead load and live load portions. For a bridge the size of the Glenn Jackson Bridge, the dead load is approximately 85 percent of the total load, with live load only comprising 15 percent. Significant increases in live load can result in relatively small increases in the overall load to the bridge. For example, if a desired live load increases the original designed live load by 50 percent, it would only increase the overall load demand by 7.5 percent.

This analysis investigated the 600' span, which is the longest span on the bridge. The original design was used as the base case and normalized to the value of 1.0. For the original design, five lanes of HS-20 live load were considered with a 7 percent impact factor and no multi-lane use credit.

This normalized base case was compared to today's highway design, which considered five lanes of HL-93 live load, with a 33 percent impact factor and a 0.65 multi-lane use credit. For this case the normalized factor was calculated at 1.02. This indicates that the increase in live load and impact is offset by the multi-lane use credit and that the original design capacity is approximately equivalent to the loading demand of today. As mentioned above, the philosophical change in the design code may also have some affect on this comparison.

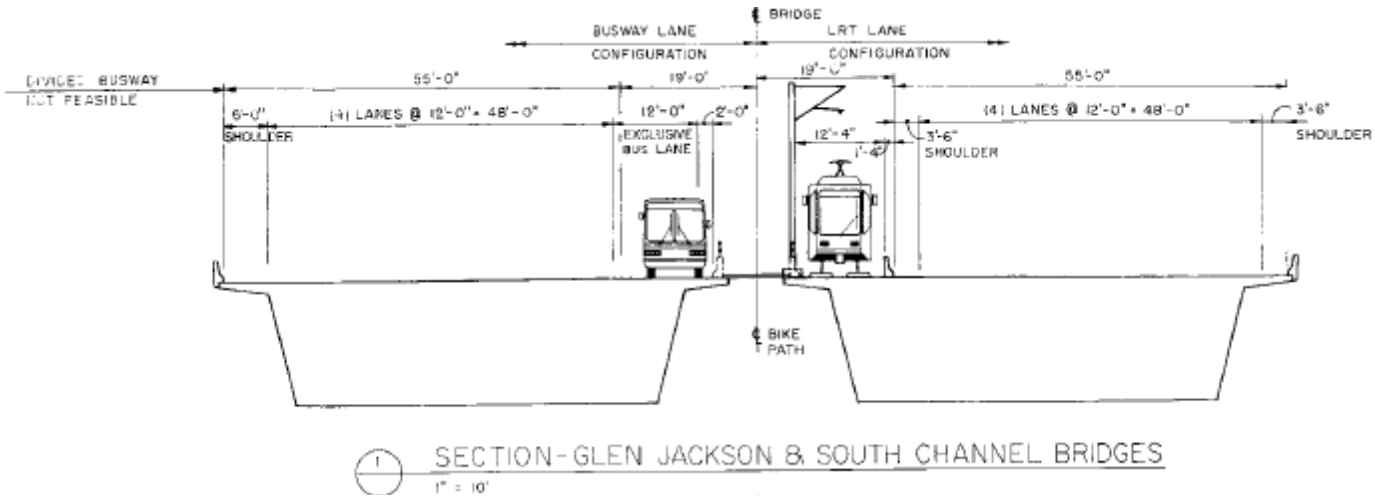
The normalized base case was also compared to a configuration which consisted of 4 lanes of HL-93 live load, with a 33 percent impact factor and a 0.65 multi-lane use credit and one lane of LRV live load. For this case the normalized factor was calculated at 1.10. This indicates that the increase in live load is significantly higher due to the LRV live load than the case of highway loading only. Despite the significant live load increase, the demand on the bridge was increased by only 10 percent, which is still considered within the "feasible" realm.



	Original Design	Today's Hwy Design	With LRT
Live Load	**5 Lanes HS-20**	**5 Lanes HL-93**	**4 Lns HL-93, 1 Ln LRT**
Multi-Lane Credit	**1.0**	**0.65**	**0.65**
Impact Factor	**1.07**	**1.33**	**1.33**
Normalized Factor	**1.0**	**1.02**	**1.10**

Geometric Analysis

The *I-205 Glenn Jackson Bridge LRT Retrofit Study Summary Report* (Dec. 1991), discussed a cross section which included 4 highway lanes and 1 HCT lane in each direction. The section is shown below.



For light rail, the cross section shows an arrangement with shoulder widths of 3'-6' on each side of the four 12-feet-wide highway lanes. This report contrasts the arrangement's sub-standard shoulder widths with those of new Interstate Highway construction, which are 10

feet for the right shoulder and 4 feet for the left shoulder. By today's Interstate Highway standards, the right shoulder should be 12 feet wide and the left shoulder should be 12 feet wide.

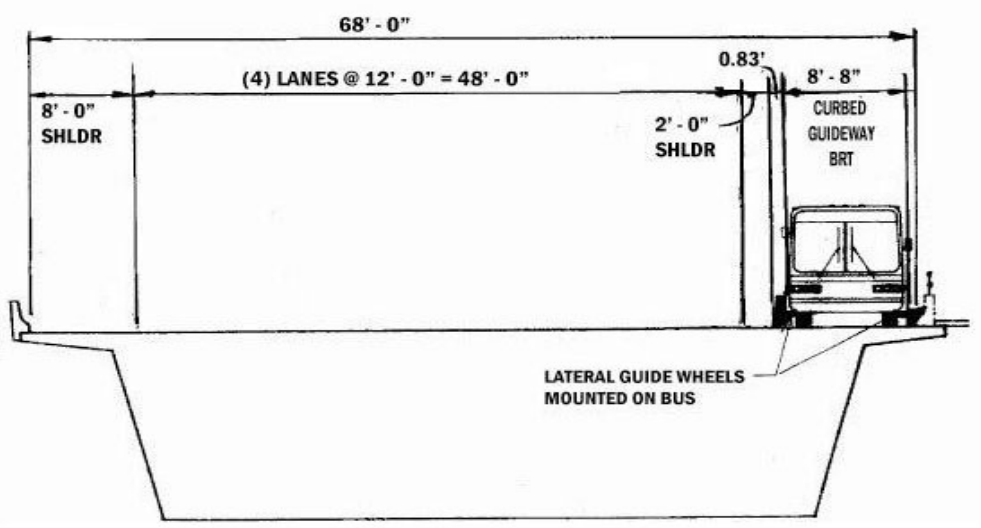
Solutions to increase the shoulder width include reducing the two interior traffic lanes to 11 feet in each direction or reducing the standard LRT clearance envelope to its absolute minimum.

This report indicates that there is a precedent for approval of transit ways with below standard geometrics, but also acknowledges WSDOT's and ODOT's stated concern over the reduced shoulder widths without extensive study.

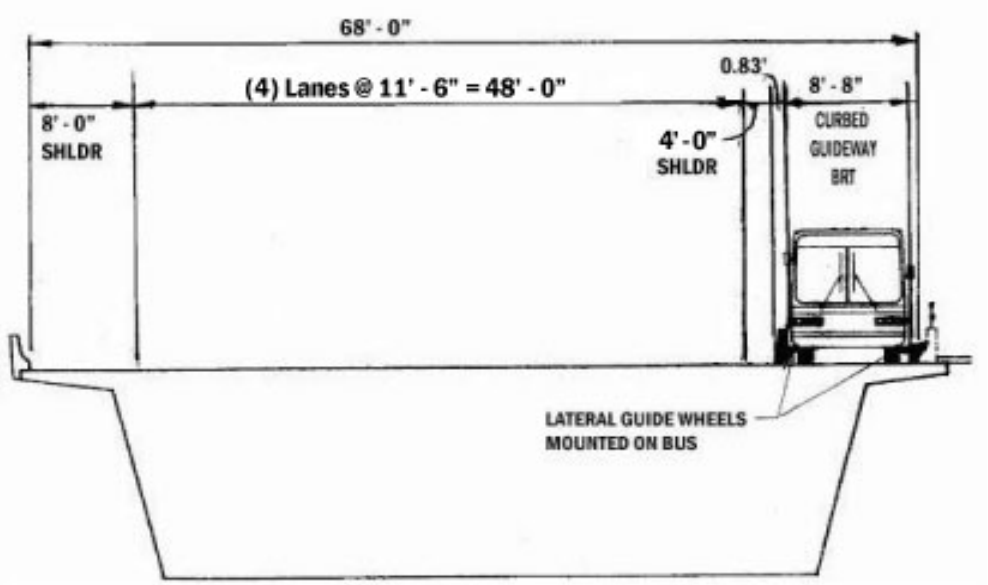
Bus Rapid Transit (BRT) Configurations

As noted earlier, typical BRT bus would easily fall within acceptable live loads under any circumstance. The following discussion relates to the geometric configuration of a potential BRT exclusive lane on the bridge.

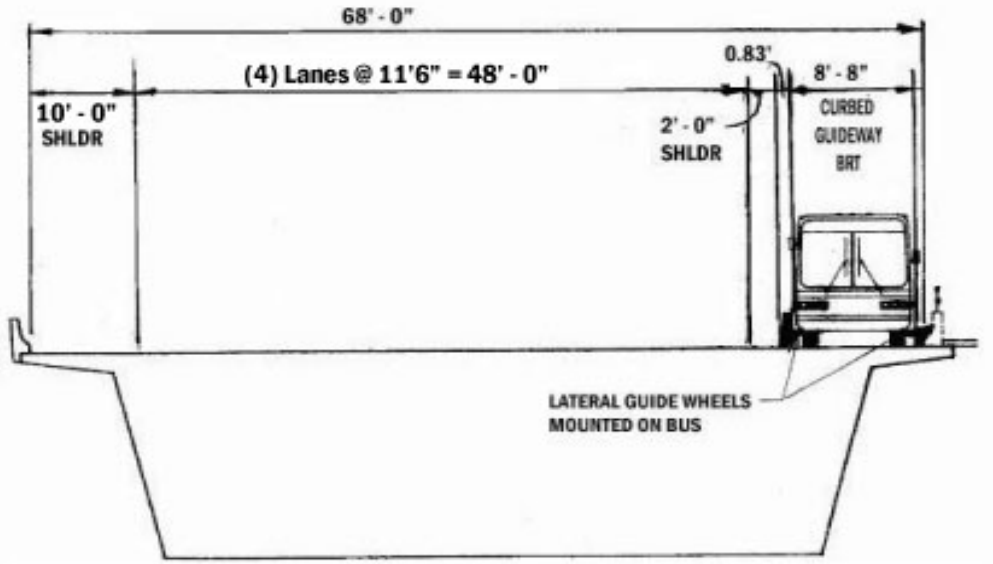
Utilizing lane guidance or a lane keeping technique could allow the lane width required for the BRT bus vehicle to be reduced considerably, thereby reducing the encroachment on the shoulders. These potential treatments include a mechanical guide wheel mounted 2 inches beyond the bus chassis, a magnetic guidance system where the bus tracks embedded magnets in the roadway surface, optical guidance in which a bus-mounted camera tracks a series of precision-applied lane markings, or a highly accurate Global Positioning Satellite (GPS) system that receives a signal in frequent intervals to establish a track. The mechanical guide wheel system has been in use reliably for over 12 years on other BRT systems. Several configurations for BRT have been explored and are shown below assuming a mechanical guide wheel lane keeping treatment.



Curbed Bus on Median - Option 1

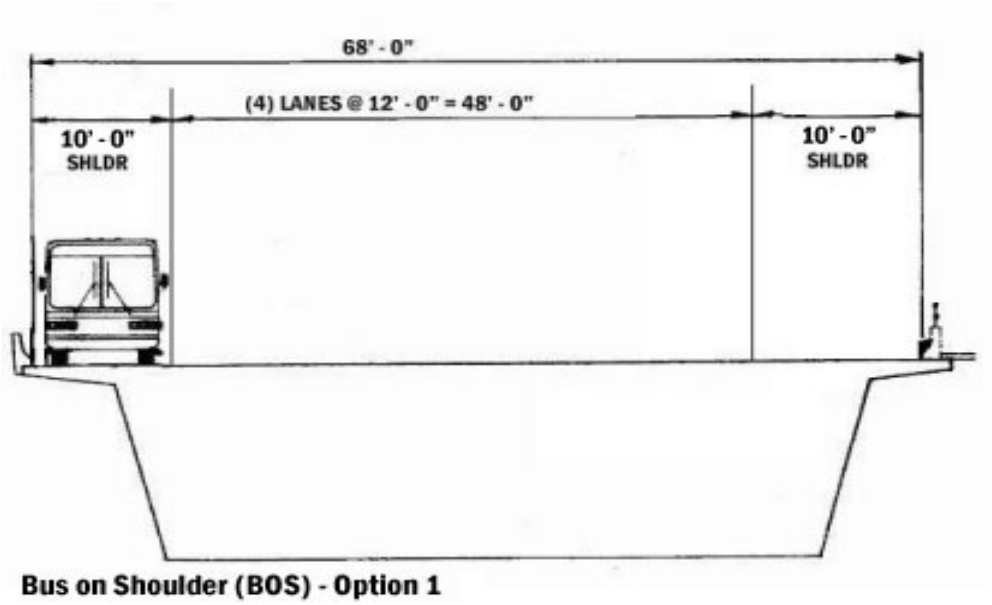


Curbed Bus on Median - Option 2

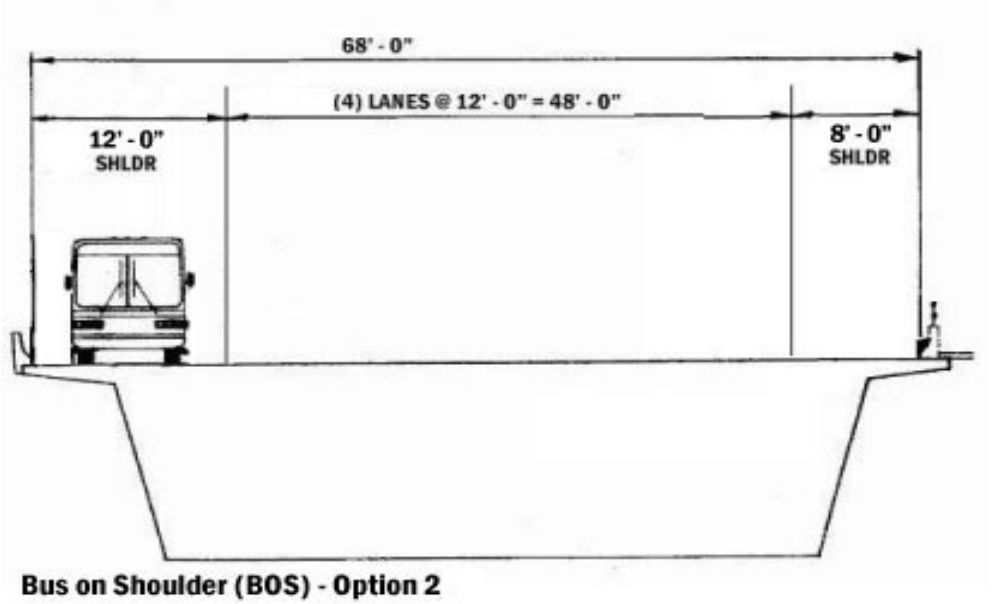


Curbed Bus on Median - Option 3

Another BRT option on the Glenn Jackson Bridge would be to permit buses to operate on the 10-feet wide shoulders when traffic speeds in the general purpose lanes fall below a certain threshold. In Minnesota, bus-on-shoulder operations are allowed when adjacent traffic speeds fall below 35 mph.



Bus on Shoulder (BOS) - Option 1



Bus on Shoulder (BOS) - Option 2

Findings

The feasibility of the Glenn Jackson (I-205) Bridge to carry high-capacity transit focuses on two primary questions:

1. Whether the existing bridges have the design capacity to carry the load for the desired number of highway lanes along with an HCT lane.
2. Whether the desired number of highway lanes and shoulders, plus an HCT lane would geometrically fit within the confines of the existing bridge.

Finding #1 – Based on current load rating standards, it appears feasible that the existing bridges have the design capacity to carry 4 lanes of highway loading plus one lane of an LRV-based HCT system. The total load demand was estimated to be 10 percent higher than that of the original design, which still places it in the feasible realm.

Finding #2 – Both WSDOT and ODOT have expressed the opinion that either eliminating a traffic lane or substantially reducing the shoulder width would not be desirable due to existing and projected traffic volumes and safety considerations.

Recommendation: Further study of various HCT configurations should be performed to understand whether reduced lane or shoulder configurations would be acceptable to ODOT and WSDOT, before the question of HCT feasibility on the Glenn Jackson Bridge could be reasonably answered. Additionally, a load rating of the Glenn Jackson Bridges would need to be performed in order to better quantify the bridge load-carrying capacity.

Appendix E

Initial Evaluation of Chelatchie Prairie Railroad Right-of-Way

High Capacity Transit System Study
Technical Memorandum
Initial Evaluation of Chelatchie Prairie Railroad Right-of-Way
June 19, 2007

1. Introduction

This technical memorandum provides background and evaluation of the Chelatchie Prairie Railroad right-of-way (ROW). The purpose of this evaluation is to determine if the right-of-way should be considered as a potentially feasible high-capacity transit (HCT) alignment. This initial assessment focuses on providing background information and evaluating the suitability and availability of the current railroad right-of-way for consideration of HCT.

On May 1, 2007 the RTC Board endorsed the narrowing of corridors and modes to be included in the Clark County HCT System Study. That recommendation included four corridors to be studied further for HCT potential and it also included a recommendation for an initial evaluation of the Chelatchie Prairie Railroad ROW. The recommendation also identified five HCT modes to evaluate further, BRT, BRT Light, Light Rail, Streetcar and Commuter Rail. Only the portion of the Chelatchie Prairie right-of-way south of Battle Ground is being considered as a potential HCT corridor.

This memorandum provides background on the Chelatchie Prairie Railroad, a physical description of the ROW, a description of the current operations and the current legal framework with regards to ownership and operating rights. Chelatchie Prairie Railroad is the most commonly used name and is the name used in county legal documents. The railroad is also referred to as the Lewis and Clark Railroad and the Clark County Railroad. The current freight operator is the Portland-Vancouver Junction Railroad and the passenger excursion service north of Battle Ground is operated by the Battle Ground, Yacolt, Chelatchie Prairie Railroad (BYCX).

2. History

Construction on a railroad link through central Clark County began in 1888 with the intention to complete a route through the Cascades to Yakima. The line was completed as far as Brush Prairie by 1897 primarily serving logging operations. By 1903 the line was extended to Yacolt serving a growing number of logging companies. At this same time, the line began to carry passengers between Vancouver, Brush Prairie, Battle Ground and Yacolt. In 1948 the line was extended to Chelatchie Prairie to access new stands of timber and serve a new lumber mill and plywood plant. The mill and plant closed in 1979 and the rail line was sold to investors.[1]

In 1984, when the owners filed for abandonment, the county saw the opportunity to save a unique transportation right-of-way for future use and preserve rail service to commercial clients. The county purchased the line for $1.2 million and leased the line to the Lewis and Clark Railway Company for freight service and passenger/excursion service. A new 30-year lease

[1] http://www.bycx.com, Chelatchie Prairie Railroad History.

agreement (with two renewal options) was signed with the Columbia Basin Railroad Company Inc. (Portland-Vancouver Junction Railroad) in 2004.

3. Description

The Chelatchie Prairie Railroad is approximately 33 miles long, running from the Burlington Northern (BNSF) mainline in north Vancouver to Chelatchie Prairie north of Yacolt. The right-of-way width ranges from 50 feet to 150 feet. The county owns the majority of the alignment outright, but about 10 percent of the abutting properties have reversionary easements, whereby the property would revert to adjoining property owners if rail service ceased for a period of time. Most of the track is in relatively poor condition and is considered class 1 (plus or minus) with a 10 mph operating speed for freight.[2]

The alignment runs through of variety of terrain and land uses including Burnt Bridge Creek Greenway, commercial and industrial uses in the vicinity of St. Johns and 78th, semi-rural areas north of 78th, rural/agricultural uses east of SR 503, commercial uses in Battle Ground and rural/forest uses north of Battle Ground.

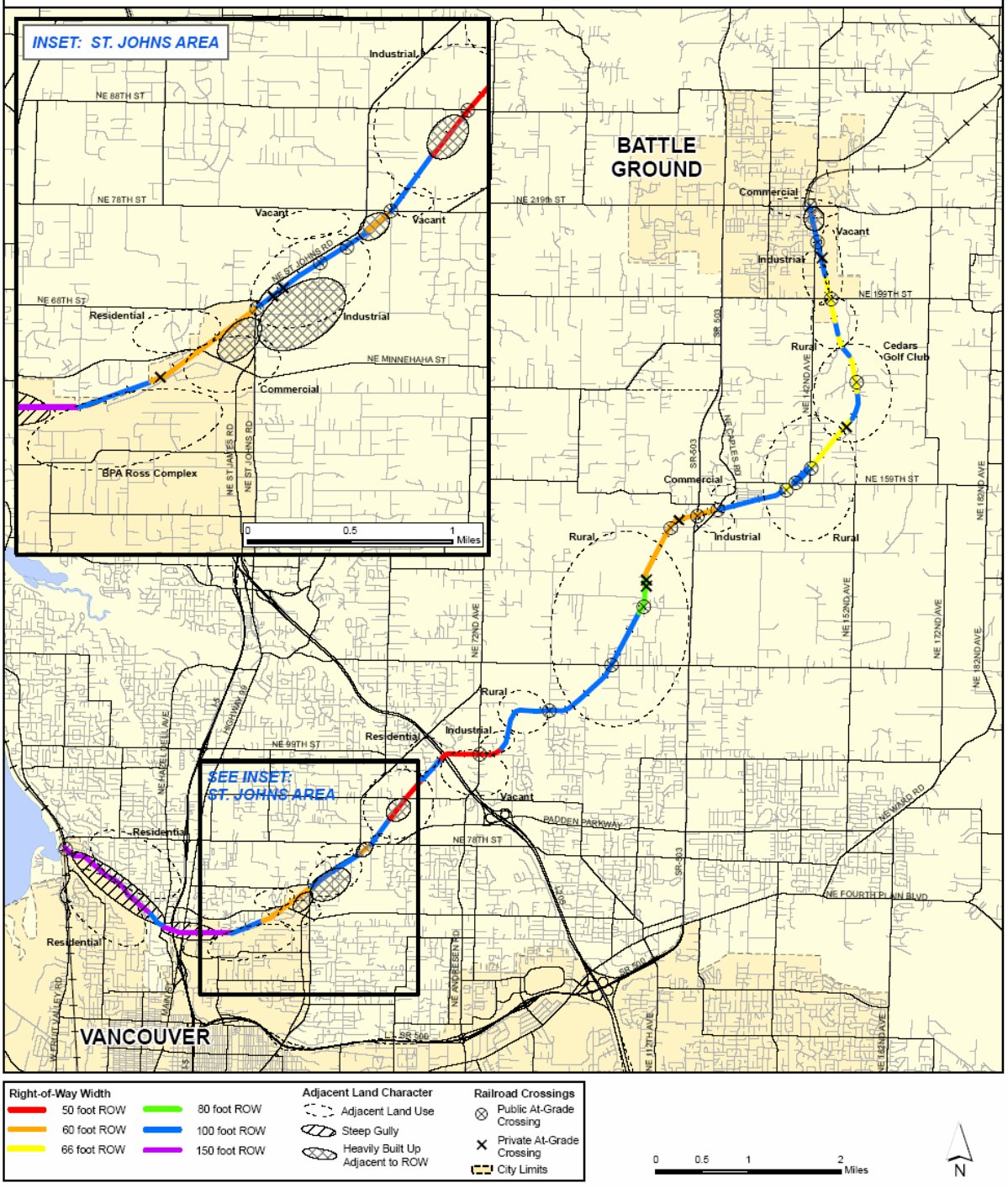
The Chelatchie Prairie Railroad branches off from the BNSF main line at Fruit Valley Road south of 78th Street. There is currently no connection to go southbound on the BNSF line. From the junction with the BNSF main line to the St. Johns area, the Chelatchie Prairie Railroad runs through a steep gully. While there is generally 100 to 150 feet of right-of-way, most of this is on a steep slope. The existing roadbed is designed for a single track and does not appear to be wide enough to add an additional track or guideway, without extensive retaining walls along the slope. The surrounding area is primarily residential and relatively high-density. Most of the roadway crossings in this area are grade separated.

Steep gully east of BNSF main line

[2] Conversation with Steve Schulte, Clark County, May 1, 2007.

CLARK COUNTY HIGH CAPACITY TRANSIT SYSTEM STUDY

FIGURE 1: CHELATCHIE PRAIRIE RAILROAD RIGHT-OF-WAY CHARACTERISTICS



The Chelatchie Prairie Railroad in the St. Johns area runs through industrial and commercial areas. The Rye Yard has 100 feet of right-of-way and is surrounded by heavy industrial uses. The area around St. Johns Road and 78th Street has a mix of industrial and commercial uses. There are also several large vacant lots in the area of St. Johns Road and 78th Street that could provide some redevelopment potential. The intersection of St. Johns Road and 78th Street is a major roadway intersection, with 78th Street connecting to the Padden Parkway just east of the Chelatchie Prairie Railroad grade crossing, and St. Johns Road connecting to 72nd Avenue to the north.


Rye Yard

North of St. Johns Road, there are several more light industrial and warehousing areas. Of particular note is the area around 88th Street, where the right-of-way is as narrow as 50 feet in an area that is built up with warehouses and other industrial uses. This area is also interspersed with several large vacant parcels.

North and east of I-205, the Chelatchie Prairie Railroad runs through flat and relatively undeveloped areas including a portion of the alignment that travels through the Cedars Golf Club. Property maps indicate that much of this area is divided into developed and vacant residential lots of approximately 1 to 5 acres. The right-of-way in this section ranges from 50 to 100 feet.


Undeveloped area east of I-205

There is light industrial development adjacent to the railroad as it enters Battle Ground north of 199th Street. The right-of-way is approximately 100 feet wide as it enters Battle Ground. The rail alignment is located at the far eastern end of the commercial portion of downtown Battle Ground.

4. Operations

The Columbia Basin Railroad Company's lease agreement with Clark County gives them full control over rail uses of the full right-of-way. Columbia Basin operates commercial service as the Portland Vancouver Junction Railroad, primarily serving shippers between the Vancouver and Battle Ground. Since acquiring the operating rights in 2004, Columbia Basin has grown the service to over 600 cars per year. The service is scheduled on an as-needed basis with approximately two to four runs per week on average.[3]

[3] Conversation with Steve Schulte, Clark County, May 1, 2007.

The Battleground, Yacolt, Chelatchie Prairie Railroad Association (BYCX) operates passenger excursion trains north of Battle Ground through the scenic Lewis River Valley. The excursion trains typically operate approximately one weekend per month between March and October, with special Christmas Tree trains in December. The BYCX has operating agreements with Clark County and Columbia Basin.[4]

5. Lease Agreement

Clark County's lease agreement with Columbia Basin Railroad Company is a 30-year lease with two additional renewal terms of 30-years each, which are at the "sole and exclusive option of the lessee." The lessee (Columbia Basin) pays the county rent based on the number of annual carloads, with no charge for the first 1,000 carloads and an escalating per carload rate after that. Columbia Basin has the right to terminate the lease with twelve months prior written notice.

There are several provisions in the lease agreement that are potentially relevant to consideration of HCT options utilizing the right-of-way.

- Section 4.A. states that the lessee (Columbia Basin) will not use the right-of-way for any use other than the provision of rail service.
- Section 4.B. states that the lessee "agrees to reasonably work with governmental agencies to establish rail transit on Leased Premises."
- Section 4.C. states that Columbia Basin agrees in good faith to accommodate future BYCX passenger operations, but that Columbia Basin has sole discretion to allow BYCX to operate.
- Section 4.F. states that the County agrees that no entity other than Columbia Basin can use the alignment for a railroad operation and that the County does not have the right to condemn for a railroad use by another operator.

The Lease Agreement appears to give Columbia Basin Railroad Company the right to approve (and potentially operate) any proposed passenger rail use of the existing tracks. Any proposals related to use of the existing tracks for HCT purposes would need to include both Clark County and Columbia Basin Railroad Company.[5]

6. Chelatchie Prairie Trail

Clark County has received a $450,000 federal transportation enhancement grant to develop a trail plan for the full length of the Chelatchie Prairie Railroad right-of-way and begin to implement a portion of the trail north of Battle Ground to Battle Ground Lake State Park. This trail planning effort is just getting underway and specific details of the trail plan are not yet available. A reasonable assumption for planning purposes is that a multi-use trail (12 feet wide) will occupy a portion of the right-of-way for the full length between Fruit Valley Road and Battle Ground.

[4] http://www.bycx.com, Chelatchie Prairie Railroad, Fares and Schedules,
[5] Columbia Basin Railroad – Clark County, Lease Agreement, December 20, 2004.

7. Right-of-Way Width and Clearance Requirements

As noted above in the description, the right-of-way owned by the county varies between 50 feet and 150 feet. One question for consideration of HCT in the right-of-way is whether there would be adequate space to develop a new and separate transit alignment within the existing county-owned ROW or whether HCT options would be limited to using the existing tracks.

Washington Administrative Code 480-60 defines the legal clearance requirements between railroad tracks and other tracks or structures. At a minimum, a railroad requires eight feet clearance between the track centerline and any adjacent structures, for a total freight rail width of 16 feet. The clearance requirement between an active freight railroad and an adjacent railroad track is defined in the code as 14 feet.[6]

The existing freight tracks are generally located at or near the center of the right-of-way. This means that in the narrowest sections of right-of-way (50 feet) there would be a maximum of 17 feet available for separate transit alignment within the right-of-way. If a separate rail transit alignment were considered, it would require a 14 foot clearance rather than 8 foot which would leave only 11 feet available in the 50-foot right-of-way sections.

With the 14 foot clearance required between active rail lines, there would not be room for a double track light rail (or other double-tracked section of a separate rail transit line) within the Chelatchie Prairie Railroad right-of-way in the 50, 60 or 66-foot right-of-way sections. Single-track light rail would not fit within the required clearances in the 50-foot right-of-way sections, but could fit within wider sections.

The clearance requirement for a paved transitway adjacent to the Chelatchie Prairie Railroad is 8-feet. This would leave 17-feet of right-of-way available in the narrowest (50-feet) sections. It could be possible to design a predominantly 2-way paved transitway that would operate with a single lane (using signage and other safety features) in the portions with the most constrained right-of-way.

In addition to the narrowest sections of right-of-way, there are other limitations to implementing a separate transit alignment within the existing Chelatchie Prairie right-of-way.

- West of I-5 the right-of-way ranges from 100 to 150 feet. However, the tracks are located at the bottom of a steep gully with only about 20 to 30 feet of flat grade at the bottom. Development of an additional transit alignment through this section would require widening the gully using retaining walls.

- There are numerous spur tracks that serve adjacent businesses. A new, adjacent transit right-of-way could require consolidation or closure of some rail spurs.

[6] AREMA Manual for Railway Engineering, American Railway Engineering and Maintenance-of-Way Association, 2004.

8. Conclusions and Recommendation

The purpose of this Technical Memorandum is to determine if the Chelatchie Prairie Railroad right-of-way could be available and might be appropriate to consider for a high capacity transit alignment. Based on the evaluation of the ownership, operations and physical right-of-way the following conclusions have been reached:

- The portion of the right-of-way west of I-5 would not be promising as a transit alignment due to the steep gully and the lack of access to any activity centers.

- Columbia Basin Railroad has the right to approve any passenger rail service in the right-of-way.

Recommendation: The Chelatchie Prairie Railroad alignment is a unique publicly-owned resource for Clark County. The cross-county alignment provides an opportunity to consider non-traditional transportation uses such as a separated busway, a rail transit alignment and a multi-use trail alignment. RTC and C-TRAN should continue to work with Clark County to preserve the potential long-term transportation use of the Chelatchie Prairie alignment.

Actions by the Clark County Commission and the Columbia Basin Railroad have indicated strong support for maintaining and enhancing the commercial rail service using this corridor. The county recognizes that a viable commercial railroad on the Chelatchie Prairie line can provide an important element in the county's economic development strategy. This support is evident in the following actions:

- The state legislature has provided $300,000 for track upgrades in the 2006-07 biennium and $1,100,000 in 2008-09.
- The county has funded and is seeking to hire a full-time Railroad Coordinator.
- The draft county comprehensive plan proposes a new zoning category of Railroad Industrial, which is proposed to be applied to former agricultural land near Brush Prairie.
- Columbia Basin Railroad has increased the number of shippers and overall carloads since taking over the line in 2004.
- Columbia Basin Railroad has a 30-year lease with two additional 30-year terms at their discretion.

Given this strong support for the continuation and enhancement of commercial rail service in the corridor, transit concepts that rely on the elimination of commercial rail service should not be considered.

The most promising potential for near-term HCT use of the alignment would be to utilize the existing railroad tracks and share operations with the freight rail operator. This service could use diesel multiple units (DMU) or locomotive propelled passenger cars and should be considered only between I-5 and Battle Ground.

Other long-term transit uses of the right-of-way should not be precluded by future actions and should be a consideration as plans for a multi-use trail are developed.

The next step would be to identify how such an operation on the Chelatchie Prairie alignment could integrate with the other HCT corridors and what the potential ridership demand might be. Other elements to be considered in a work scope for additional analysis include:

- Define the magnitude of track upgrades that would be required to bring the track up a standard that could operate at a reasonable speed for regular transit service (35 to 60 mph).
- Identify possible strategies for crossing treatments for both public and private crossings.
- Identify potential station locations and park-and-ride lots based on accessibility and potential ridership markets.
- Prepare a transit operations plan that would maximize the potential utility of the Chelatchie Prairie alignment, including potential connections to the Columbia River Crossing HCT improvements.

Appendix F

Priority Corridor Matrix

Corridor Comparison 10-16-08

Goals / Corridors	Highway 99 BRT-Hybrid	Fourth Plain BRT-Hybrid	I-205 Incremental Bus Improvements	Mill Plain BRT-Hybrid
Transportation				
Reliability Proportion of exclusive lane and approximate number of signals per mile.	Approx. 60% exclusive lane. Approx. 4.1 signals per mile (not including downtown Vancouver).	Approx. 80% exclusive lane. Approx. 4.1 signals per mile (not including downtown Vancouver).	Direct access ramps. No exclusive lane. Approx. 1.3 signals per mile.	Approx. 5% exclusive lane. Approx. 4.2 signals per mile (not including downtown Vancouver).
Traffic Amount of negative impact on traffic operations.	Median BRT limits left turns to signalized intersections throughout much of the corridor.	Median BRT limits left turns to signalized intersections throughout the corridor and reduces number of travel lanes in some sections.	No traffic restrictions as a result of bus improvements. Some increase in traffic conflicts.	Small section of median BRT in area with few driveways.
Access Ease of access to stations and pedestrian and bicycle environment in area adjacent to stations, based on existing conditions.	Poor connectivity to neighborhoods. Gaps in sidewalk network. Connectivity would improve with the Hwy 99 sub-area plan.	Good connectivity to neighborhoods.	Alignment in freeway median. Poor connections to station locations.	Good connectivity to neighborhoods.
Ridership Number of boardings on HCT line.	***Moderate ridership*** on BRT. High transit demand in corridor. Many bi-state trips served by express buses.	***High ridership.***	***High ridership.***	***Moderate ridership.***
Community				
Land Use Assessment of existing and planned land use in corridor.	Good projected densities. Hwy 99 sub-area plan envisions HCT.	Good projected densities. Fourth Plain sub-area plan envisions HCT.	Lowest projected densities and no active planning processes.	Good projected densities. No active planning processes.
Neighborhood Livability Potential to promote increased neighborhood vitality.	Would support sub-area plan and act as a catalyst to improve neighborhood accessibility and vitality.	Would support sub-area plan and act as a catalyst to improve neighborhood accessibility and vitality.	Would moderately improve accessibilty to adjacent neighborhoods.	Would act as a catalyst to improve neighborhood accessibility and vitality.
Economic Development Potential to promote economic growth in the corridor.	Less employment forecast than Fourth Plain and Mill Plain. Sub-area plan focuses on mixed use and transit-supportive development.	High number of jobs forecast. Sub-area plan projects significant business growth.	Few jobs close to alignment. Existing businesses tend to be auto-oriented.	High number of jobs forecast. No sub-area plan.
Feasibility				
FTA Fundability Ability to raise the funding necessary to construct and operate HCT in the corridor.	***$115 M. capital cost.*** Moderate ridership. Could make case for Small Starts funding due to ongoing transit-supportive planning effort.	***$152 M. capital cost.*** High ridership. Could make case for Small Starts funding due to ongoing transit-supportive planning effort.	***$80 M. capital cost.*** May not be eligible for Small Starts funding. Land uses would not likely help make the case for Small Starts funding.	***$60 M. capital cost.*** Could be eligible for Very Small Starts funding due to low cost of capital improvements.

Ratings:

- **Very Good**
- **Good**
- **Moderate**
- **Moderate to Poor**
- **Poor**

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