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METRO

Agenda

MEETING: METRO COUNCIL WORK SESSION
DATE: March 17, 2009
DAY: Tuesday
TIME: 2:00 PM
PLACE: Metro Council Chamber

CALL TO ORDER AND ROLL CALL

2:00 PM	**1.**	**DISCUSSION OF AGENDA FOR COUNCIL REGULAR MEETING, MARCH 19, 2009/ADMINISTRATIVE/CHIEF OPERATING OFFICER COMMUNICATIONS**	
2:15 PM	**2.**	**HIGH CAPACITY TRANSIT BUILD-A-SYSTEM TOOL DEMONSTRATION**	Withrow
2:30 PM	**3.**	**WILLAMETTE RIVER BRIDGE**	TriMet/Wieghart
3:00 PM	**4.**	**TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS PLAN**	Platman
3:30 PM	**5.**	**COUNCIL BRIEFINGS/COMMUNICATION**	

ADJOURN

Agenda Item Number 2.0

HIGH CAPACITY TRANSIT BUILD-A-SYSTEM TOOL DEMONSTRATION

Metro Council Work Session
Tuesday, March 17, 2009
Metro Council Chamber

Agenda Item Number 3.0

WILLAMETTE RIVER BRIDGE

Metro Council Work Session
Tuesday, March 17, 2009
Metro Council Chamber

METRO COUNCIL

Work Session Worksheet

Presentation Date: **March 17, 2009** Time: **2:15 p.m.** Length: **30 minutes**

Presentation Title: **Portland-Milwaukie Light Rail Project update, including Willamette River Bridge recommendation**

Service, Office, or Center: **Corridor Planning**

Presenters (include phone number/extension and alternative contact information):
Dave Unsworth, TriMet, 503.962.2147

Metro project contact (but not presenting), Bridget Wieghart, Transit Project Manager, x1775

ISSUE & BACKGROUND

In July, the Metro Council adopted the Locally Preferred Alternative (LPA) for the Portland-Milwaukie Light Rail Project. An application to enter Preliminary Engineering (PE) was submitted to the Federal Transit Administration on July 31, 2008 for a 7.3-mile project from Portland State University to SE Park Avenue. Project staff has continued to work on the project to resolve issues raised in the LPA process and to select an appropriated bridge type for the Willamette River Crossing.

Willamette River Bridge update. The Portland-Milwaukie Light Rail project will include a new multi-use transit bridge across the Willamette River, located between the Marquam Bridge and the Ross Island Bridge. In July, TriMet convened the Willamette River Bridge Advisory Committee (WRBAC) to determine feasible bridge types. The committee is made up of key stakeholders and property owners and is chaired by former mayor Vera Katz. The committee met monthly and, working with information from consulting bridge architects and bridge engineers, identified criteria that the new bridge must meet. At the beginning of the process the committee was presented with many types of bridges for screening and evaluation. In October the committee applied criteria to narrow the number of feasible bridge types down to five. On December 16, 2008, TriMet presented to Metro Council the five bridge types: wave frame, tied arch, thru arch, 2-pier cable-stayed and a 4-pier cable-stayed. Through further evaluation and refinement committee narrowed the feasible bridge types to two, wave frame and cable-stayed.

On February 5, 2009 WRBAC recommended to the Steering Committee that a cable-stayed bridge type be advanced into the Final Environmental Impact Statement and Preliminary Engineering. Councilor Liberty sits on the project Steering Committee; Councilor Collette serves as his alternate. The recommendation from WRBAC and supporting materials are attached. In addition to the materials provided, all WRBAC materials are available at www.trimet.org/WRBAC/wrbac_meeting.

Preliminary Engineering (PE) status. In August, TriMet, with Metro's assistance, submitted a PE and New Starts application, which has been under Federal Transit Administration (FTA) review since then. TriMet expects to gain approval to enter PE in March. TriMet and Metro will enter into an Intergovernmental Agreement to provide

Metro funding for staff and consultants necessary to develop the project's Final Environmental Impact Statement and participate in the PE process.

OPTIONS AVAILABLE

This is a project update. Background materials are attached and more detailed information will be provided during the work session.

IMPLICATIONS AND SUGGESTIONS

Information items, no action needed at this time.

QUESTION(S) PRESENTED FOR CONSIDERATION

Does Metro Council concur with the Willamette River Bridge Advisory Committee's recommendation?

LEGISLATION WOULD BE REQUIRED FOR COUNCIL ACTION _Yes _X_No
DRAFT IS ATTACHED ___Yes ___No

PORTLAND-MILWAUKIE
LIGHT RAIL PROJECT

Fred Hansen, Chair and the
Portland-Milwaukie Light Rail Project Steering Committee

Dear Fred:

I am pleased to convey to you the recommendation of the Willamette River Bridge Advisory Committee. The recommendation and supporting information are included in the attached report Willamette River Bridge Selection Process.

For the past 18 months, it has been my privilege to lead a group of stakeholders charged with determining the location and design type for a new Willamette River Bridge. The work began in August of 2007 with the convening of the Willamette River Partnership Committee. That group was charged with developing a recommendation on the location of a new bridge that would carry light rail, streetcars, pedestrians and bicyclists. The Committee presented its recommendations to the Portland City Council and to the Portland Milwaukie Light Rail Steering Committee in June 2008.

With the location settled, we turned our attention to determining the bridge type. A new committee—The Willamette River Bridge Advisory Committee—was formed. It included many members from the Partnership Committee as well as respected members of Portland architectural and engineering community. Our charge was to recommend a bridge type that is right for the context, embodies the Portland aesthetic, and is functional and affordable.

From July 2008 to February 2009 we met seven times. In our first meetings, we developed criteria to apply in the selection process. The criteria addressed key issues such as urban context, aesthetics, greenway impacts, navigational clearances, cost and risk. During the course of our meetings, we narrowed the list of bridge types to two: wave frame and cable-stayed.

Many members of the Committee initially preferred the wave frame because of its aesthetic qualities for this particular location. At the same time, the Committee felt that the cable-stayed would also be a remarkable bridge type. A challenge for the wave frame turned out to be its costs. The consultant team and TriMet staff estimated that the wave frame would cost 30 to 40 percent more than the cable-stayed type. The Committee asked tough questions about the underlying assumptions and requested the consultants and staff to explore every opportunity to bring the wave frame costs in line with the project budget. We are satisfied that the TriMet team thoroughly researched the cost issues.

TriMet also explored some design concepts for the cable-stayed type. TriMet presented a cable-stayed-suspension hybrid that was particularly attractive. TriMet's work convinced the Committee that a cable-stayed design would not only be acceptable for this location and budget, but with some additional effort could also be designed to be special.

The Committee's recommendation to the Steering Committee is that a cable-stayed bridge type be advanced into the Final Environmental Impact Statement and Preliminary Engineering. We do so with the following considerations in mind and I ask you to include them in your approval of this bridge type:

- There must be additional design refinement substantially influenced or led by a architect. The purpose of this is to ensure that the project continues to exercise maximum creativity in the refinement of design
- WRBAC should continue to meet on an occasional basis to review design work as the design advances to and through Preliminary Engineering.

The Willamette River Crossing is an exciting and unique opportunity for Portland to demonstrate its commitment to transit, pedestrian and bicycle connectivity and mobility. I look forward to working with the Steering Committee as the design for the bridge progresses.

Sincerely,

Vera Katz
Chair
Willamette River Bridge Advisory Committee

City of Portland

Design Commission

1900 SW Fourth Ave., Suite 5000
Portland, Oregon 97201
Telephone: (503) 823-7300
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FAX: (503) 823-5630
www.portlandonline.com/bds

March 3, 2009

Portland-Milwaukie Light Rail Project Committee
c/o Fred Hansen, Chair
TriMet
4012 SE 17th Avenue
Portland, OR 97202

Dear Mr. Hansen,

On behalf of the City of Portland Design Commission, I would like to thank Sean Batty of TriMet for returning to the Commission February 19, 2009 to brief the Commission on the Willamette River Transit Bridge. His presentations have been inspiring and informative as they continue to illustrate the evolution of what will be Portland's next great river crossing.

The Design Commission was most enthusiastic about the hybrid suspension/cable stay bridge option that emulates Portland's personality and complements our collection of bridges. It represents Portland's personality in that it displays thematic elements found in Portland's culture and geography that promote the City's identity and image. The Commission endorses the design and encourages you to move forward with the hybrid alternative and is available for future consultation and briefings.

The Portland Design Commission recognizes that the Portland/Milwaukie line will contribute to enhancing social equity and preservation of our region's livability. We recognize that time is of the essence especially given the demand for transit service, rising cost of travel and the goals to reduce carbon emissions by 2050.

The Commission would like to thank the Stakeholder Advisory Committee for their time and effort invested in helping to make this monumental decision for our city and region.

Sincerely,
Lloyd Lindley, FASLA

Chair, Portland Design Commission

cc: Willamette River Crossing Stakeholder Advisory Committee Members
Design Commissioners

February 25, 2009

Portland-Milwaukie Light Rail Project Citizens Advisory Committee

Fred Hansen, Chair and
Members of the Portland Mall Light Rail Project Steering Committee

Dear Steering Committee members:

The Portland Milwaukie Light Rail Citizen's Advisory Committee (CAC) understands that the Project Steering Committee will make a decision regarding the Willamette River Bridge type during its March meeting. We are also aware the Willamette River Bridge Advisory Committee (WRBAC) has recommended that the "wave" design bridge option be removed from further analysis and review. We unanimously concur with this recommendation based on our concerns regarding the risks associated with the wave design, its engineering, constructability and cost.

The reasoning underlying our strong support for the WRBAC recommendation is that it is consistent with the CAC's system wide view of the entire light rail project and our highest priority, which is to extend the line to Park Avenue in Clackamas County. Building the light rail line as far south as possible for purposes of ridership, community building and regional mobility are essential to the CAC's definition of the "success" of the project.

Moving forward, we realize that as the bridge design process evolves more issues will arise, and variations of the cable-stayed option will emerge. Getting to a great design is important and refining the cable-stayed concept is something the CAC looks forward to. "Great design" is, however, a very subjective term. As such, we would urge that clear guiding principles be established for the next phase of the bridge study. These principles should be reinforced and set the context for the overall project as well as the next steps of the bridge design process.

To this end, the CAC would urge the Steering Group to assure that any cable-stayed bridge design be grounded in the following:

- The bridge crossing is but one part of a larger, regional project. Therefore, the bridge must be affordable and within the project budget.
- Every effort must be made to get to Park Avenue in Clackamas County and create stations and access within the numerous neighborhoods that lie along the way. This is a key to ridership, community building and project success.
- Build a bridge that is functional. The design must meet all the functional needs of access for light rail, streetcar, bike, pedestrians and durability.

- The bridge should complement both its surroundings and the vision for a complete system between Park Avenue and the downtown.

The CAC understands those who would argue the wave design is more elegant, but the WRBAC and CAC recommendations to remove the wave design from further consideration recognized that the design team has done a marvelous job in providing the project, and the community, with a cable-stay bridge crossing for which Portland can be proud. It also is a design that will contribute to a *project* that the region can be proud of as well.

Thank you for taking the time to consider our input and recommendation. If there is more that you would like from our committee, please ask and we will respond promptly.

Sincerely,

Rick Williams
Chair, Portland-Milwaukie Light Rail Project
Citizens Advisory Committee

PORTLAND-MILWAUKIE
LIGHT RAIL PROJECT

February 2009

Portland-Milwaukie Light Rail Project

WILLAMETTE RIVER BRIDGE TYPE SELECTION PROCESS

Project partners:

CLACKAMAS COUNTY
METRO
MILWAUKIE, OREGON FOUNDED 1847
MULTNOMAH COUNTY
The Oregon Department of Transportation
City of Portland
PDC PORTLAND DEVELOPMENT COMMISSION
TRIMET

WILLAMETTE RIVER BRIDGE ADVISORY COMMITTEE (WRBAC)

Mayor Vera Katz
Committee Chair

David Knowles
Facilitator
David Evans & Associates, Inc.

Bob Durgan
Andersen Construction

Thomas Hacker
THA Architecture Inc

Art Johnson
KPFF Consulting Engineers

Sue Keil
Portland Bureau of Transportation

Pat LaCrosse
Oregon Museum of Science and Industry

Guenevere Millius
SRM Architecture and Marketing, Inc.

Karl Rohde
Bicycle Transportation Alliance

David Soderstrom
Portland Opera Board

Chuck Steinwandel
Ross Island Sand and Gravel

Mark Williams
Oregon Health and Science University

Rick Williams
Project Citizens Advisory Committee

Mike Zilis
Walker Macy

SENIOR STAFF

Neil McFarlane, Rob Barnard and Sean Batty
TriMet

Richard Brandman and Ross Roberts
Metro

2008 PORTLAND-MILWAUKIE LIGHT RAIL PROJECT STEERING COMMITTEE

Fred Hansen, Steering Committee Chair
General Manager
TriMet

Sam Adams
Councilman
City of Portland

Jim Bernard
Mayor
City of Milwaukie

Robert Liberty
Councilor
Metro

Alice Norris
Mayor
City of Oregon City

Lynn Ann Peterson
Chair
Clackamas County Board of Commissioners

Jason Tell
Region 1 Manager
Oregon Department of Transportation

Bruce Warner
Executive Director
Portland Development Commission

Rick Williams
Chair
Project Citizens Advisory Committee

CHANGES TO STEERING COMMITTEE FOLLOWING NOVEMBER 2008 ELECTION:

Sam Adams
Mayor
City of Portland

Jim Bernard
Commissioner
Clackamas County Board of Commissioners

Deborah Kafoury
Commissioner
Multnomah County Board of Commissioners

City of Milwaukie Mayor pending May 2009 election

TRIMET

Capital Projects & Facilities

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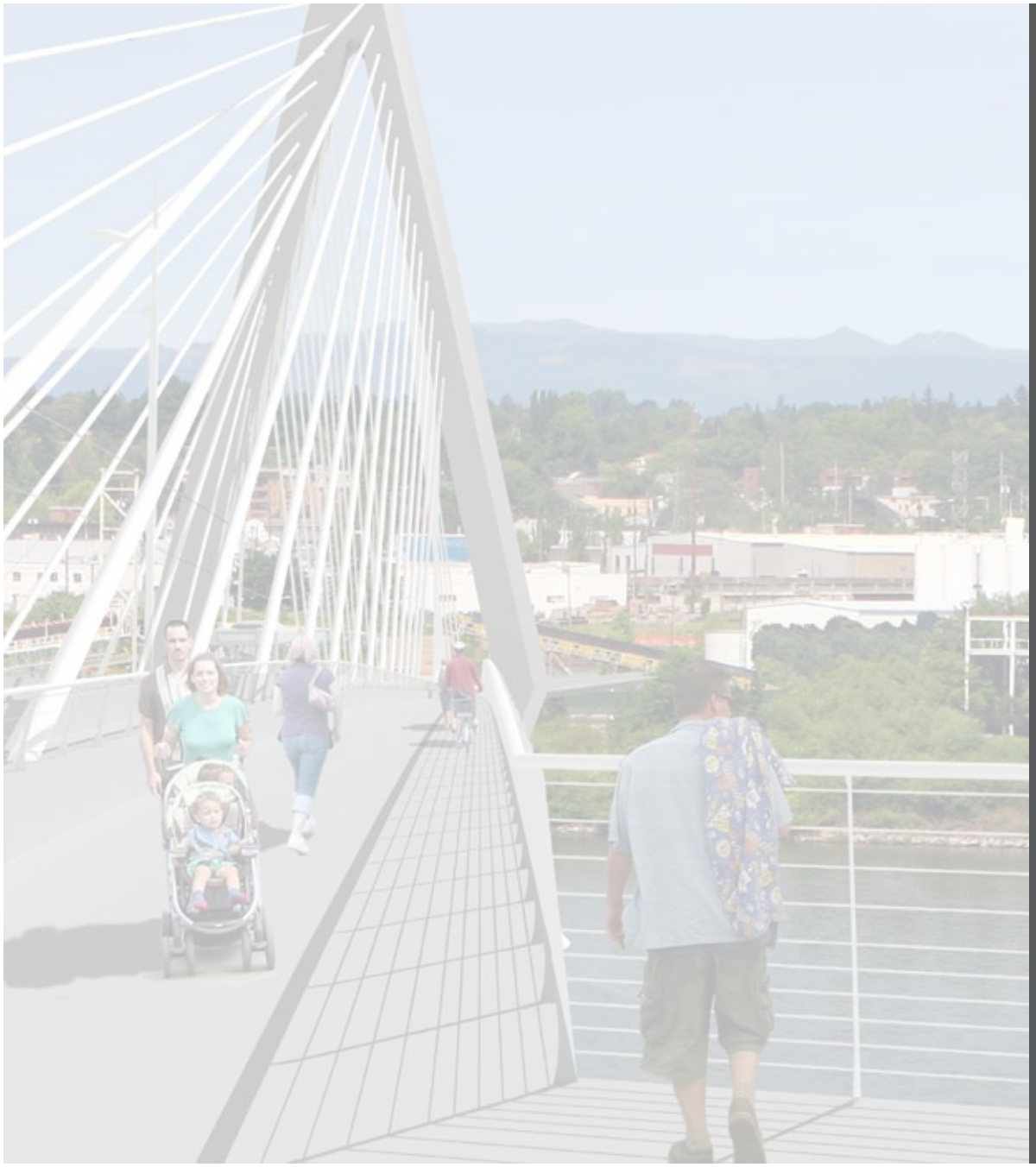
Portland, OR 97232

503-962-2150



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Executive summary

The Portland-Milwaukie Light Rail Project will create a 7.3-mile light rail line between downtown Portland, Milwaukie and Oak Grove in north Clackamas County. Metro forecasts one million new residents in the four-county Portland region by 2030, and this corridor is expected to experience significant growth in both population and jobs.

When service begins, currently planned for 2015, the project will include 10 new stations and two Park & Ride facilities with 2,000 parking spaces. The Portland-Milwaukie light rail line is expected to carry an estimated 27,400 daily trips by 2030.

A critical component of the project is a new multi-use bridge across the Willamette River between the existing Marquam (I-5) and Ross Island (Hwy 26) bridges. This new bridge will link vital employment, education and research centers in downtown Portland, South Waterfront and inner Southeast Portland with each other and with Milwaukie and Clackamas County.

In May 2008, the Willamette River Crossing Partnership recommended a specific alignment for the bridge to cross the Willamette River. On the river's east bank, this alignment begins at the former SE Sherman St right-of-way just north of Portland Opera, crossing the river to land on the west bank north of the property line between OHSU's future South Waterfront campus and Zidell Marine Corp. property. This recommended alignment was adopted in the project Locally Preferred Alternative (LPA) in July 2008.

The new bridge will carry light rail trains, buses, pedestrians, bicyclists and potentially streetcars, making it a unique long-span bridge in the United States. This bridge also will interface with two riverbank greenways (one existing and one planned), the navigational users of the Willamette River and riparian wildlife habitat.

Given the multi-use purpose of the bridge, its location and its vital importance to Portland-Milwaukie light rail, the project asked a committee of design, transportation, business and community leaders to study all bridge types and recommend to the community only those types appropriate for the context and the budget. From July 2008 through February 2009, a volunteer citizen committee, called the Willamette River Bridge Advisory Committee (WRBAC), under the leadership of former Portland Mayor Vera Katz, met to advise project partners on bridge type selection.

During this eight-month period, the WRBAC studied a wide variety of bridge types and ultimately made its recommendation based on several selection criteria: cost, risk, navigation, fundamental performance, architectural, urban context, greenway impact, environmental-sustainability, operations, miscellaneous technical considerations and opportunities. By considering these criteria, the committee systematically narrowed the list of appropriate bridge types through a series of steps to arrive at its recommendation.

The Willamette River Bridge Advisory Committee recommends the following bridge type for the Portland-Milwaukie Light Rail Project: cable-stayed bridge.

The committee's recommendation on bridge types is being presented to the public at project open houses in February and March 2009. The WRBAC also will make a formal bridge type recommendation to the Portland-Milwaukie Light Rail Project Steering Committee. Design development will occur during the Preliminary Engineering phase of the project in 2009-2010. Construction of the bridge is expected to begin as early as 2011. The PMLR project is currently planned to begin revenue service in 2015.

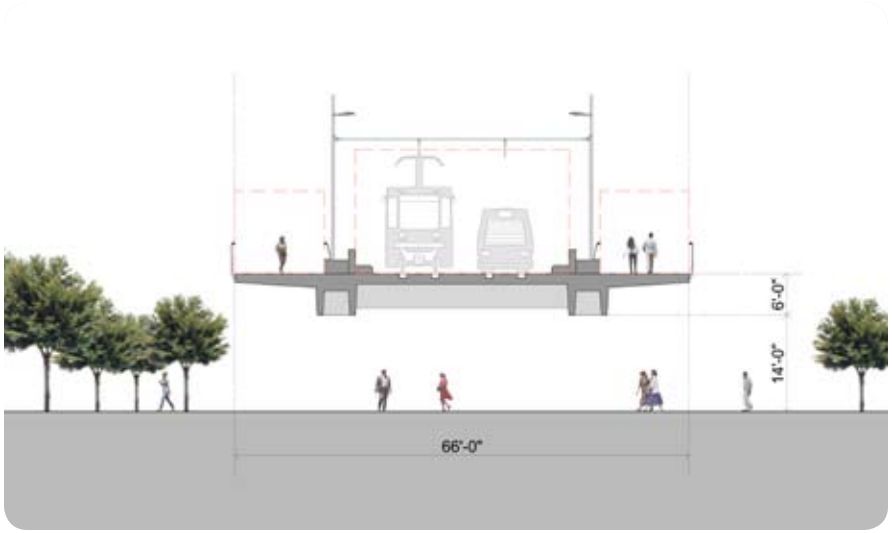
Bridge type study purpose and key issues

Purpose

The opportunity to design a new crossing over the Willamette River in Portland—the City of Bridges—is a rare occurrence. When completed, the bridge portion of the Portland-Milwaukie Light Rail Project will be a significant addition to the city and its riverscape. Additionally, this bridge will carry light rail, buses, pedestrians, bicycles and potentially streetcars, but not private vehicles.

During the course of an eight-month bridge study, the Willamette River Bridge Advisory Committee (WRBAC) considered several key issues in order to recommend bridge types that best met the objectives of project partners and the citizens of the region. The committee, working with technical staff, then used the key issues as a basis for developing bridge type selection criteria.

Bridge study participants agreed on this vision statement to summarize their goal: Deliver a bridge type that embodies the Portland aesthetic, is functional and affordable.



Cross-section design of a conceptual bridge type over a Willamette River greenway.

Key Issues

Environmental Impact

The environmental impact of the bridge raises several concerns and involves many jurisdictions and stakeholders. The bridge will cross over shoreline and the habitat of green sturgeon and endangered salmon species. The bridge approaches and abutments, and the number, location and type of piers in the river were carefully evaluated for their avoidance and minimization of effects on shallow water and riparian habitat, water quality, greenway development and the ability to support plans for hazardous materials clean up in South Waterfront.

Navigation

The bridge study needed to anticipate key factors driving future Coast Guard and Army Corps of Engineers approval of the bridge design. Both entities are concerned with ensuring that the bridge does not present an unreasonable impact to navigational use of the river. Research of navigation conditions, including input from river users, provided minimum horizontal and vertical clearances needed for navigation.

Bridge type study purpose and key issues

Greenway features

The bridge will pass over existing and planned trails and park and recreation facilities on both the east and west Willamette River banks. The bridge provides a major opportunity to extend and enhance the recreational and transportation value of these existing and planned investments in the area. The bridge types recommended needed to artfully reconcile this major new element with the existing features and maximize opportunities for the realization of future plans.

Aesthetics

Portland enjoys an international reputation as the City of Bridges. Adding a new crossing to the existing bridges has important implications for the city's skyline. In addition, the specific location for this bridge has implications for how it will "fit" with other bridges, existing and future development, and natural features. Bridge types considered offered different aesthetics and each had to meet architectural and urban context criteria.

Design and construction cost

The cost for any bridge type must remain within the budget parameters established to date. Cost estimates must account for inflation that occurs over the life of the project, and this inflation is included in a year of expenditure (YOE) budget. The YOE budget for the bridge portion of the project is $134.6 million for design and construction.

Operating cost

The life cycle and operational costs of the bridges were considered. The materials used and the ways they are connected have implications for the on-going cost for the life of the bridge. As the bridge is expected to last for generations, annual increases in maintenance and operations costs, even if small, are of significant concern.

Selection criteria

With the key issues in mind, the Willamette River Bridge Advisory Committee and technical staff agreed upon detailed selection criteria to evaluate and narrow the bridge type options. These criteria included the following:

- **Cost:** The cost of the bridge was a fundamental consideration. The committee considered both the construction and life cycle (maintenance and operation) cost of each bridge type.
- **Risk:** Evaluating the risk factors associated with bridge types was a significant factor in the selection process. The committee evaluated the risk associated with construction cost inflation, bidding, schedule, design uncertainties and permitting risk (both environmental and navigational).
- **Navigation:** The group also considered impacts the bridge would have to river users, such as horizontal and vertical clearance and maneuvering.
- **Fundamental performance:** The bridges were evaluated based on the number, location and size of the piers required for each type in addition to seismic performance and comfort for the user.
- **Architectural:** The aesthetics of each bridge type were carefully examined. Renderings were created to place examples of each one across the river, so the committee could assess the bridge type as it related to its location. The renderings included views from a distance, from the water, from the greenway, as well as from, on and near the bridge.
- **Urban context:** Each type was examined as part of Portland's urban context. The group considered each bridge type's compatibility with the Ross Island and Marquam bridges, its relationship to all other Portland bridges, fit with current and proposed development on either bank of the river, and how it fit into Portland's core values and traditions.
- **Greenway:** How each bridge type accommodates the existing and planned greenways was an important evaluation criterion. The committee considered the depth of span over the greenways, the width of each bridge, the length of the span over the greenways, proximity of possible bridge piers to the greenways, and how these variables might affect the greenway users' experience.

Selection criteria

- **Environmental-sustainability:** The committee considered the environmental impacts of the bridge types, including how construction of each type would impact the environment. The resources required to build each bridge type and the availability of materials locally also was considered. Bridge type effects on fish habitat and issues with contaminated soils were also considered.
- **Bridge operations:** The committee considered which bridge types would function best with light rail, buses, bikes, pedestrians and potential future streetcar operations. The group considered such factors as sightlines, the complexity of installing the overhead catenary system, the ability for emergency response teams to serve bridge users, and the extent and degree of difficulty of bridge inspections.
- **Miscellaneous:** Other technical considerations included how easily utilities could be integrated into the bridge, proximity to underground utilities, how well the types accommodate asymmetric loading and curved greenway spans.
- **Opportunities:** Additionally, the committee discussed which bridge types are best at treating storm water, supporting wildlife and fish habitat, and incorporating alternative energy.

Bridge type evaluation documents presented during this process are posted on *trimet.org/pm*.

Willamette River bridge type study selection process

The WRBAC studied bridge type options from July 2008 to February 2009. A working group of technical staff representing project partners and project consultants met to evaluate selection criteria and developed reports and recommendations, which were made to the WRBAC. The committee also sought input from nationally recognized experts regarding river navigation, bridge engineering and construction, steel supply and steel fabrication.

WRBAC Meetings

July 15, 2008: Bridge familiarization

The technical staff assigned to the bridge process was introduced, and the committee learned of the "universe" of possible bridge types.

August 8, 2008: The universe of bridges

The committee reviewed the Bridge Study goals, process and core values. Details were provided regarding each example of known built bridge types. The committee agreed upon selection criteria for moving from the "universe" of bridge types to a group of many.

Committee discussion at the the August 8, 2008 WRBAC meeting.

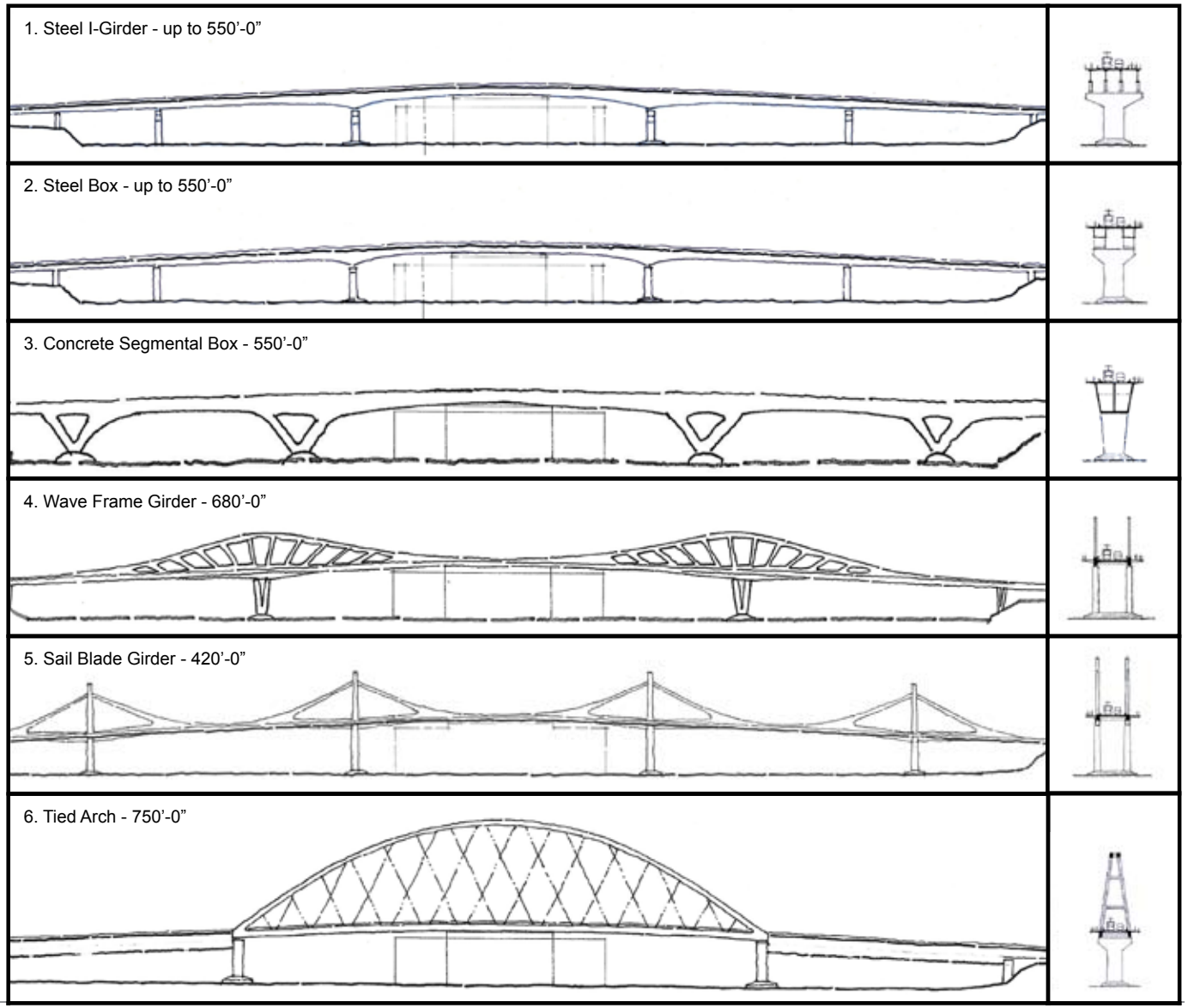
September 16, 2008: Narrowing from the universe to the many

River navigation issues in relation to the bridge alignment were explained, and the committee began exploration of what these issues meant for viable bridge types on the alignment.

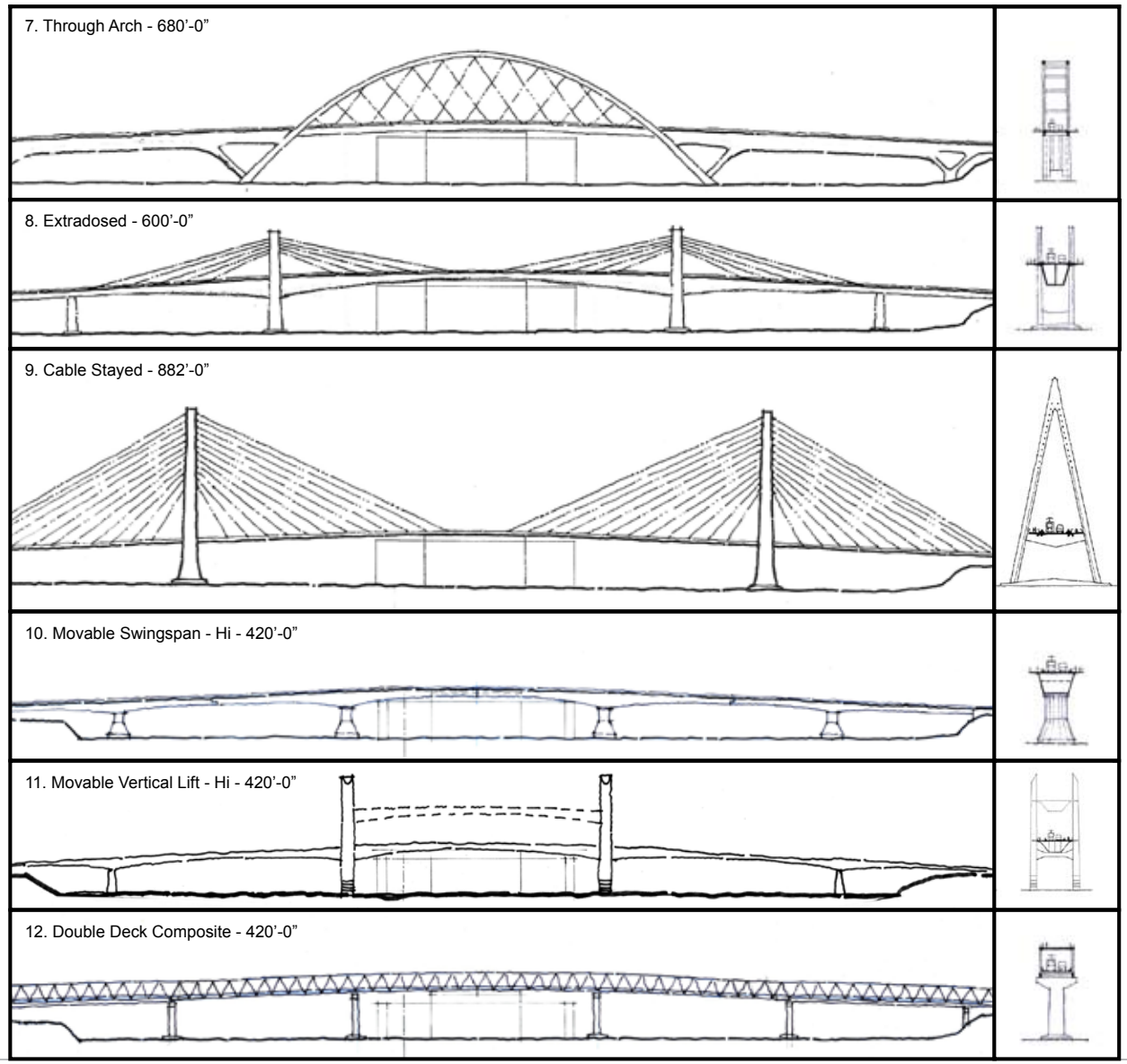
Bridge types that allowed the needed horizontal navigational clearance and met other selection criteria were presented and accepted by the committee, pending findings from independent experts regarding horizontal navigational clearance. Bridge types eliminated were the steel girder; steel box; sail blade girder; moveable swing span; moveable vertical lift; and double deck composite.

Willamette River bridge type study selection process

Right: Diagram showing the "many" bridge types narrowed down from the "universe" of bridge types. The figure on each title shows the maximum achievable span of the piers in feet.



Willamette River bridge type study selection process



Left: Diagram showing the "many" bridge types narrowed down from the "universe" of bridge types. The figure on each title shows the maximum achievable span of the piers in feet.

Willamette River bridge type study selection process

October 8, 2008: Narrowing from the many to some

Independent experts presented their findings on horizontal navigational clearance needs in relation to the bridge alignment, confirming the findings of technical staff. The committee agreed that a minimum span of 600 feet between the two center piers is required to serve existing river users at this location. The concrete segmental bridge type was eliminated. As a result, bridge types that met the selection criteria and remained under consideration included tied arch, through arch, two-pier cable-stayed, four-pier cable-stayed and wave frame.

November 13, 2008: Narrowing list from some to a few

Technical staff further evaluated the remaining five bridge types and presented the committee with detailed reports on the risks associated with building each one. Examples of such risks include cost escalation, geotechnical issues, navigational permitting, construction schedule delay and in-water construction. The committee reached consensus on moving forward with consideration of the wave frame and two variations of the cable-stayed bridge types, eliminating the tied arch and through arch types. Both arches relied on four in-water piers making them perform poorly against key criteria such as environmental impacts. The wave frame and four-pier cable-stayed types both assumed two in-water piers and two piers on land. For the two-pier cable-stayed bridge type, both piers would be located in the water.

December 11, 2008: Reviewing design, cost and risk of few

Specific risk, constructability and cost estimates for the wave frame and cable-stayed bridge types were presented. Independent estimates were prepared by the project's bridge architect consultant and by a national construction consulting firm. Differences in the estimates led the committee to ask for more detail on the costs of the wave frame and cable-stayed options. Additionally, the committee requested staff to present more concepts on the best features of the two remaining cable-stayed options.

February 5, 2009: Bridge type recommendation

Staff provided the WRBAC with a detailed presentation on various design options and possibilities for a cable-stayed type. Staff also provided refined estimates on the cost to build the two- and four-pier cable-stayed bridges as well as the wave frame bridge. The estimates showed that the wave frame bridge type had a substantially higher estimated cost than the cable-stayed bridge type, due primarily to the greater quantity of steel and the difference in type of steel needed. Committee members considered the wave frame cost estimates prohibitive given the project budget. The committee recommended a cable-stayed bridge type for the project and charged project staff with ensuring that the final design of the bridge corresponds to the context in which the bridge will stand.

For agendas, presentations and meeting summaries from all of the WRBAC's meetings visit *trimet.org/pm/library/bridge.htm*

WRBAC bridge type recommendation

The Willamette River Bridge Advisory Committee recommends that a cable-stayed bridge type be implemented for the bridge alignment of the Portland-Milwaukie Light Rail Project. Cable-stayed bridges have been designed and built to fit a variety of settings around the world. A cable-stayed bridge over the Willamette River would be the first of its kind in Oregon and one of the few such bridges on the West Coast.

A cable-stayed bridge is a bridge that consists of one or more towers from which cables are strung to support the bridge deck. The cables are usually attached in one of two ways:

- In a harp design, the cables are attached to the towers so that the height of attachment of each cable on the tower approximates the distance from the towers along the deck to the cable's deck attachment.
- In a fan design, the cables all connect to or pass over the top portion of the towers.

Cable-stayed bridge types are efficient at spanning long distances, which allows a reduction of the number of piers in the water. Fewer in-water piers reduces the long-term environmental impact of the structure. In addition, the cantilevered construction reduces environmental impact during construction.

Less cable is needed for this bridge type, and in comparison with steel girder bridge types, less steel would be required. Cable-stayed bridges also can be designed with thinner decks than other bridge types, making possible a more transparent structure on the city skyline and a greater vertical navigation clearance.

Example of a harp design. Image used under a Creative Commons license.
Source: flickr.com/photos/sunnyuk/3280680745/

Example of a fan design. Image used under a Creative Commons license.
Source: flickr.com/photos/limowreck666/146131114/

WRBAC bridge type recommendation

Conceptual rendering of a cable-stayed-suspension hybrid bridge type as viewed from above.

Conceptual rendering of the deck of a cable-stayed bridge type.

Conceptual rendering of an overlook on a cable-stayed bridge type.

WRBAC bridge type recommendation

Pont de Bourgogne in Chalon, France. Image used under a Creative Commons license. Source: flickr.com/photos/timblair/2763890552/

Second Severn Crossing between England and Wales in the United Kingdom. Image used under a Creative Commons license.
Source: commons.wikimedia.org/wiki/File:Second_Severn_crossing.jpg

Conceptual rendering of a cable-stayed bridge type as viewed from the Ross Island Bridge.

Conceptual rendering of a cable-stayed bridge type as viewed from the Willamette River.

Next steps

During the Preliminary Engineering phase (spring 2009-spring 2010) of the project, staff will work closely with the WRBAC and the community on refining and customizing the cable-stayed design to meet the unique needs of this specific application. Elements focused on during this period include consideration of:

- The final arrangement of the span and piers and their relation to one another
- The vertical clearance
- The height of the bridge deck
- The width and configuration of the cyclist and pedestrian paths and the associated overlooks
- Generation of tower design and engineering options
- Design details for cable connections to deck
- Furnishings, such as benches on the overlooks
- Finishes (paint, no paint, etc.)

Design of the bridge will be evaluated from a variety of viewpoints, such as: from a distance, in close proximity on land and on water, and from on the structure. Design of the bridge will also include consideration of customization, integrated design, and transparency and intimacy.

Customization

The design of the bridge type will be customized to correspond with the context in which the bridge will stand, including:

- The scale of the surrounding planned development and spatial qualities of the area
- The greenways and other features on either bank of the Willamette River
- Environmental considerations and opportunities such as habitat and storm water runoff
- Portland's specific "identity" and history

Integrated design

The above contexts will influence all scales of the design and result in a unified design response, including attention to:

- Tower configuration and shape
- Connection detailing
- Finishes and furnishings (railings, poles, lighting, etc.)

Next steps

Transparency and intimacy

Designers will work to incorporate elements of transparency and intimacy into the bridge by exploring the development of a sequence of experiences when moving over the bridge. This will include consideration of:

- Location of cable attachments to deck
- Design of railings and crash-barriers
- Provision of overlooks and their locations
- Maximizing and optimizing views from the bridge
- Tower detailing to address pedestrian scale and experience

Project timeline

WRBAC bridge type recommendation ..... February 5, 2009

PMLR Citizens Advisory Committee
bridge type recommendation .....February 19

PMLR open houses.....February 20, March 4, March 10

Project Steering Committee receives
WRBAC recommendations..... March 5

Stakeholder group bridge briefings..... February–March

Final bridge type recommendation
reviewed by jurisdictional partners ..... March 2009

Project Steering Committee Final
Bridge Type Recommendation .....May 2009

Preliminary Engineering and Final
Environmental Impact Statement..... 2009-10

Final Design 2010–11

Full Funding Grant Agreement 2011

Construction..... 2011-15

Service begins.....2015

Appendix A

LIST OF WORKING GROUP MEMBERS

Kenny Asher
City of Milwaukie

Rob Barnard
TriMet

Steve Barrett
TriMet

Sean Batty
TriMet

April Bertelson
Portland Bureau of Transportation

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Metro

Patrick Sweeney
Portland Bureau of Transportation

Dave Tertadian
TriMet

Mark Turpel
Metro

Dave Unsworth
TriMet

Bridget Wieghart
Metro

WILLAMETTE RIVER CROSSING PARTNERSHIP COMMITTEE

In May 2008, the Willamette River Crossing Partnership recommended a specific alignment for the bridge to cross the Willamette River. This recommended alignment was adopted as part of the Locally Preferred Alternative in July 2008.

Mayor Vera Katz
Willamette River Crossing Partnership

Richard Brandman
Metro

Kurt Bruun
Lorentz Bruun Construction (LBC)

Bob Durgan
Andersen Construction, Inc.

Jim Gardner
South Portland Neighborhood Association

Sue Keil
Portland Bureau of Transportation

Gil Kelley
Portland Bureau of Planning

Wayne Kingsley
Portland Spirit

Pat LaCrosse
Oregon Museum of Science & Industry

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South Portland Neighborhood Association

Dean Marriot
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Portland Opera

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Oregon Museum of Science & Industry

Neil McFarlane
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Portland Opera

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Steve Stadum
Oregon Health & Science University

Peter Stark
Eastside Industrial Council

Nancy Steuber
Oregon Museum of Science & Industry

Bruce Warner
Portland Development Commission

Mark Williams
Oregon Health & Science University

Dan Yates
Portland Spirit

Jay Zidell
Zidell Marine Corporation

Additional reference

Reference materials for the Portland-Milwaukie Light Rail Project Bridge Study can be found on *trimet.org/pm*

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TRIMET

Agenda Item Number 4.0

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS PLAN

Metro Council Work Session
Tuesday, March 17, 2009
Metro Council Chamber

METRO COUNCIL

Work Session Worksheet

Presentation Date: March 17, 2009 Time: 3:50 p.m. Length: 30 minutes

Presentation Title: Regional Transportation System Management and Operations (TSMO) Plan

Service, Office, or Center: Long-range Planning

Presenter: Deena Platman, 503-797-1754

ISSUE & BACKGROUND

In 2007, Metro was awarded a Transportation and Growth Management (TGM) Grant to conduct a refinement planning process for regional transportation system management and operations (TSMO). The Regional TSMO Refinement Plan project officially kicked off in early September 2008 and is anticipated to be completed by August 31, 2009. The recommended plan will be brought to JPACT and the Metro Council for consideration in fall 2009.

The planning effort was deemed necessary in order to develop a comprehensive understanding of how system management and operations opportunities can help the region address its transportation challenges and to develop a regional vision and strategy for implementing TSMO to further advance system management policies adopted in the 2035 RTP. In addition, the Metro Council and JPACT have dedicated 2010-2011 and 2012-2013 regional flexible funds for a TSMO program. The plan will direct how this $6 million dollars in program funding is invested.

The plan is being developed in partnership with the Regional Travel Options (RTO) program and will incorporate the work of the 2008-2013 RTO Strategic Plan to provide a comprehensive 10-year strategic look at investment in TSMO. The plan's vision, goals, actions and investment priorities will be incorporated into the state component of the 2035 Regional Transportation Plan (RTP) later this year.

Project goals include:

- Refining the 2035 RTP policies, actions and investment priorities related to system management and operations;
- Developing policy direction on where, when, and how TSMO strategies are applied and financed in the region;
- Enhancing the region's capacity to consider TSMO in concert with more traditional capital projects during future corridor refinement planning and project development activities;
- Prioritizing TSMO projects for regional funding; and
- Actively engaging interested stakeholders with diverse perspectives on TSMO.

A sharp team of consultants and advisory groups guides the development of the plan. A seasoned consultant team lead by DKS Associates with assistance from Kittelson & Associates, Angelo

Planning, and Jeanne Lawson & Associates are working with Metro staff to craft the background reports and develop the plan. The Transportation System Management and Operations Policy Work Group (TSMO PWG) provides policy-level input throughout the process. The work group includes representatives from public and private organizations with a stake in effective management and operation of the transportation system. Attachment 1 lists the members of the TSMO PWG. TransPort, the TPAC subcommittee for system management and operations, provides technical expertise on traffic management and operations elements of the plan. The Regional Travel Options Subcommittee provides technical expertise on transportation demand management elements of the plan.

To date, the project has completed a draft policy framework (Attachment 2), a "toolbox" of possible TSMO strategies to apply in the region and a TSMO needs assessment.

OPTIONS AVAILABLE

The policy framework will guide the selection of TSMO strategies and investment priorities for the region. This work session is an opportunity for the Council to provide comments on the draft policy framework.

Council may decide to support the policy framework as written or choose to further refine the draft vision, goals, principles and objectives included in the framework.

IMPLICATIONS AND SUGGESTIONS

Staff recommends advancing the draft policy framework into the next phase of the TSMO plan development. With Council support, work will begin to develop the strategic action plan that will recommend an investment program for the regional flexible funds dedicated to TSMO and investment priorities for the 2035 RTP. In addition, it allows the TSMO plan elements to be incorporated into the RTP policy refinement and regional mobility corridor needs assessment work that is underway.

In April, staff will present the regional mobility corridors atlas and preliminary findings from the RTP needs assessment, providing an opportunity for Council members to discuss integration of the TSMO, HCT, freight and local aspirations work into the RTP investment strategy later this spring.

QUESTION(S) PRESENTED FOR CONSIDERATION

1. Does the Council have refinements to the draft TSMO policy framework as presented? Is the policy framework consistent with the Council's desired outcomes for the 2035 RTP?

2. Through the 2035 RTP work, Council has identified major challenges facing the region's transportation system. Does the Council have direction for staff on what major challenges the TSMO plan should emphasize?

LEGISLATION WOULD BE REQUIRED FOR COUNCIL ACTION __Yes X No
DRAFT IS ATTACHED ___Yes ___No