

## Bridge Type Selection

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This memorandum summarizes the evaluation of bridge types for the Gibbs Street Pedestrian Bridge during August and September, 2008, and the design team's recommendation for a preferred bridge type to advance for more detailed design. Several 3-D model concept images are attached; additional images from other viewpoints will be available at the CAC/TAC meeting on September 24, 2008.

### Bridge Types

The Gibbs Street Pedestrian Bridge design team evaluated a range of bridge types during the design charrette in June 2008. The design charrette offered community members and CAC/TAC members the opportunity to review and comment on four bridge types with a variety of span configurations including:

- ◆ Box girder
- ◆ Cable stayed
- ◆ Truss
- ◆ Arch

After the design charrette and open house, the Oregon Department of Transportation (ODOT) determined that the City of Portland could construct a new bridge with one pier in the ODOT right-of-way. This information allowed the design team to better estimate costs and constructability of the various bridge types. Input on bridge types from the charrette and open house showed a strong preference for the cable stayed and box girder options. Although the design team determined that even a two-span cable stayed bridge would likely exceed the project construction budget, refined cost estimates indicated an extradosed bridge, that combines features of cable stayed and box girder structures, could be considered further.

During July and August 2008, the design team compared the following bridge types with one pier in the I-5 right-of-way between Hood Avenue and I-5:

- ◆ Concrete box girder
- ◆ Steel box girder
- ◆ Extradosed

## Selection Criteria

The design team used the planning framework adopted by the CAC in April 2008 as a basis for comparing the concrete box girder, steel box girder, and extradosed bridge types. The key differentiators included:

- ◆ Aesthetics
  - Design is compatible with the tram and the historic district
  - Bridge and landings are aesthetically pleasing from the surrounding community on both sides of I-5 for viewers from street level and from taller buildings
  - Bridge is an attractive gateway from I-5 northbound and the last view as drivers leave the central city on I-5 southbound
- ◆ Cost
  - Project design meets budget requirements and allows for initiation of South Portland Circulation Plan improvements
  - Project has low operations and maintenance costs.

In addition to the elements of the planning framework, the design team considered the ease of constructing each bridge type. The ease of construction, particularly the amount of work required on I-5 and the length of closures of I-5 approaches to the Marquam Bridge and I-405 ramps, influences the difficulty of obtaining construction permits from ODOT.

The remaining evaluation criteria listed for cost and aesthetics and all of the criteria in the user experience, safety and sustainability categories were not differentiators between bridge types at this level of detail. They will be used by the design team during the final design process.

## Evaluation

Summary of evaluation

Criteria	Concrete box girder	Steel box girder	Extradosed
<b>Aesthetics</b>			
Compatible with tram and historic district	●	○	●
Pleasing views from community	○	●	●
Pleasing views from I-5/gateway	●	○	●
Attractive screening	●	●	●

<b>Cost</b>			
Meets design budget	●	○	●
Low operations and maintenance costs	●	○	○
<b>Construction</b>			
Limits disruptions to I-5 traffic	○	●	●
<b>TOTAL EVALUATION SCORE</b>			
	●	○	●

● High    ● Medium    ○ Low

## Recommended Bridge Type

The design team recommends advancing an extradosed bridge for detailed design work. The extradosed bridge:

- Offers pleasing views from the community.
- Has vistas from the extradosed bridge that frame Mt. Hood to the east and the tram tower on the hill to the west.
- Frames the view and creates a gateway to the city for northbound drivers on I-5.
- Has short towers that are subservient to, yet compliment the tram tower.
- Creates fewer impacts to traffic on I-5 and I-405 during construction.
- Is expected to have similar construction cost to the box girder bridge types.





