



Memorandum

DATE: January 17, 2012

TO: Ralph Gleffe
Project Manager

FROM: Brad Stein, P.E., S.E.
ECC Design Manager

SUBJECT: WSDOT Proposed Revisions to the 92nd Avenue NE Interchange
ECC Design Team Review Comments, Questions, Assumptions, and Additional
Information Needed

PROJECT: SR 520 Eastside Transit and HOV Project

COPIES: ECC, Project File

The ECC Design Team has performed a cursory review of WSDOT's conceptual layout of the proposed revisions to the 92nd Avenue NE Interchange provided to ECC on January 4, 2012. Summarized below according to discipline, are our initial comments on the proposed interchange revisions along with a list of the questions, assumptions, and additional information needed.

General/ Management

Questions:

- What is the desired schedule for this work?

Basis of Design Estimate Assumptions:

- The RFC'd drawings will have to be revised and reissued to eliminate the current 92nd roundabout design.
- There will be minimal, if any, revisions made to the current interchange design to the south of the back of pavement seat for the lid structure.
- No public involvement or outreach is anticipated or included.
- No presentations to City Councils, Elected Officials, Committees, or any other 3rd Party meetings are included.
- Lighting design and/or revisions are to be performed by others and are not included.
- Roadway, Drainage, and Landscaping disciplines will go through a single milestone review, not two reviews, with 3rd parties included in the single review.
- Structures, Geotechnical, and Transit/ Urban disciplines will go through an NDC process with a single Over-the-Shoulder (OSR) review.
- WSDOT will perform all environmental documentation/permit re-evaluation.



Roadway

There are several technical issues with the layout as shown on the conceptual drawing provided by WSDOT including the following:

- To accommodate the turning radius of a WB-50 design vehicle, the curb return radius of each leg of the intersection will need to be increased or a deviation prepared for vehicle encroachment.
- With the increased curb returns, the spacing between the adjacent intersections of the SR 520 WB off-ramp and NE Points Drive gets very small, if any.
- The offset tee intersection is not an ideal configuration.
- There is a possible vertical clearance issue at the corner of the pedestrian tunnel and off-ramp (crossing of ramp over tunnel moved further east by this design concept).
- There is not sufficient room for a standard concrete barrier along the ramp at the SE corner of the pedestrian tunnel.
- There is a possible issue with the stop bar locations due to turning paths of larger vehicles.
- This configuration will require adjustments to the retaining walls between the regional path and the WKX ramp.
- The intersection is within limited access. Therefore approval from FHWA will be required for a number of deviations associated with the proposed design.
- It is unclear whether northbound 92nd Avenue NE traffic are allowed to make left turns into the the Kiss'n'Ride area.
- Potential non-standard elements needing deviations/MEFs include:
 - a. Design Vehicle/Turning Radius/Lane encroachment for turning vehicles from SR 520 off-ramp.
 - b. Lane alignment between off-ramp and NE 33rd street (off-ramp currently points into the oncoming lane instead of with the potential receiving lane).
 - c. Driveway approaches within limited access limits.
 - d. Spacing of intersections and proximity of Points Drive to off-ramp begin with 130' full control area, (depending on classification and if Points is considered more of an approach rather than an intersection; plans did not indicate if this was a 3-way stop or if Points just had a stop sign).
 - e. Turning roadway/lane widths for local streets with tight radii near intersections, (33rd and Points Drive).
 - f. Local street shoulder widths.
 - g. ADA compliance on curb ramps/ crosswalks.

Questions:

- Is there a crosswalk across Points Drive? Where are pedestrians to be provided for along local streets?
- Has WSDOT identified any other deviations in addition to those listed above? Has WSDOT had any discussions with the ASDE or FHWA on these deviations?

Basis of Design Estimate Assumptions:

- City is agreeable to the 12% slopes shown.
- The profile of 92nd Avenue NE will need to be adjusted so there are no profile changes on the 92nd lid structure, (i.e. profile will match RFC'd profile at back of pavement seat for lid structure).
- Design will go through a single milestone review, including 3rd parties.



- Assumes 4 new deviations and significant revisions to MEF #1 and Deviation #14.
- A noise reanalysis is not required and is not included.
- Development of alternative roadway concepts and configuration options are not included.
- A roadway design kick-off meeting will be held to confirm all deviations needed and identify pedestrian facility locations.
- No additional revisions to 92nd will be required if NB left-turns are prevented from entering the Kiss'n'Ride.
- No left-turn lanes are provided along 92nd Avenue NE.

Additional Information Needed:

- What design vehicles and turning movements are required for the different streets in this configuration? With the curb return radii shown, it appears that mainly it would be a 'P' for the design vehicle.

Structures & Geotechnical

- Reconfigure the north approach slab to accommodate the configuration and profile of the KX line north of Pier 3.
- The KX alignment remains unchanged on the lid and the profile has a minor adjustment north of STA 16+69.50.
- Update the 92nd Pedestrian Tunnel design to accommodate the shallow fill depths.
- Update the east end of the 92nd Pedestrian Tunnel design to accommodate Wall 4B-10 (SEW) changes.
- Modify the geotechnical recommendations for Wall 4B-67.

Questions:

- None

Basis of Design Estimate Assumptions:

- No elevation changes on the lid deck or increases in the superimposed loads on the structure; all lid elevations will match the RFC'd layout at the back of pavement seat.
- No changes to pedestrian tunnel length. A design of a custom traffic barrier is required where sufficient room behind roadway barrier cannot be provided such as at the SE corner of the tunnel.
- No changes to Walls 4B-07, 4B-09, and 4B-12.
- Minor changes to Wall 4B-10 but it remains a SEW wall.
- Wall 4B-67 is eliminated, not modified.
- All changes will go through the NDC process with a single OTS review, not a formal milestone review.

Additional Information Needed:

- None

Maintenance of Traffic (MOT)

- The WB SR 520 off-ramp may back-up if the intersections get congested with the result being impacts to mainline.
- If the ramp is only partially backed-up, there may be a safety issue created if a vehicle exits at 60 mph, but has reduced deceleration length available because of a congested ramp.



- There may be more throw-away pavement unless detouring is allowed for some of the local streets for some time to build the new roadway section.
- A WB-50 design vehicle will not be able to make all of the turning movements. Will be able to move from off-ramp southerly across SR 520, but may not always be able to make turn onto northbound 92th Ave NE.

Questions:

- None

Basis of Design Estimate Assumptions:

- A WB-50 design vehicle will not make all turn movements at ramp intersections.
- An 'SU' will be the desirable design vehicle for all movements.
- A design vehicle 'P' will make all movements.
- No traffic operations analysis or intersection capacity analysis is required for this MOT staging.
- No traffic signals will be required for this MOT staging.
- The design speed for MOT staging will be 20 MPH.
- No special graphics or presentations will be required. The plans will be developed per the project QMP.

Additional Information Needed:

- None

Transit & Urban/ Landscaping

The following is the list of anticipated transit and urban work items and impacts based on the potential revisions to the 92nd Avenue NE interchange:

- Lid hardscape layout revisions: 1) changes to how the lid path intersects with 92nd Avenue NE in northeast and northwest corners of the lid. Assumes no changes to the bus drop off or kiss-and-ride areas will be needed.
- Revised planting plan based upon hardscape layout revisions (minor only for northeast and northwest corners).
- Revised irrigation plan based upon hardscape layout revisions (minor only for northeast and northwest corners).
- Adjust for urban layout changes where revised trajectory of lid path intersects with 92nd Avenue NE in NE & NW corners of the lid.

Questions:

- None

Basis of Design Estimate Assumptions:

- The UDPP will not be reopened. No UDPP process/meeting(s) are included.
- No changes to any lid features, details, or grading, (paving materials, surfacing finishes, portal columns, etc), except a minor alignment revision for the pedestrian path connection to the off-ramp terminal intersection.
- Pedestrian lighting adjustments are not included; any roadway lighting changes made by others will not affect the pedestrian lighting.



- No changes to visual buffer/screening to the cell tower site and associated nearby elements are included.
- No changes to transit stations are included.

Additional Information Needed:

- None

Drainage

- Revise drainage conveyance to accommodate new road layout. Significant changes will include: 1) avoid conflict with changes with trail tunnel; 2) revise catch basin locations; and 3) revise storm pipe locations for most of the 92nd interchange area.
- Revise drainage plan and profile sheets for conveyance.
- Identify utility crossings, request pothole information, and adjust storm/utility grades as needed. Coordinate design with water, sewer and other utilities.
- Revise drainage details and storm connections.
- Revise Inlet Calculations and Pipe Conveyance Calculations.
- Drainage Pond Calculations and Pond Impacts – impervious area maps will need to be updated to demonstrate and document change in impervious areas.
- Coordinate with illumination to avoid conflicts with light foundations.
- Revise temporary storm conveyance plans for the area. Prepare supporting drainage calculations and prepare a roll plot of the area for each MOT phase associated with this design change.

Questions:

- Will potholing information be done for new utility crossings, and who will arrange this?
- Will updates to the temporary storm conveyance roll plot plans be desired?

Basis of Design Estimate Assumptions:

- No revisions to the drainage design for the lid including possible changes to low points on the lid, changes to collection and conveyance, and changes to catch basin locations on the lid to accommodate any grade changes.
- Drainage Pond Calculations and Pond Impacts – no changes to the pond design because there will be a slight reduction in impervious area that discharges to the pond.
- No redesign of the stormwater treatment because the net impervious area is a slight reduction as compared with the roundabout.
- No changes to drainage design and details on the lid.
- Design will go through a single milestone review, including 3rd parties.

Additional Information Needed:

- Pothole data for utility crossings, when requested.
- Location of illumination, electrical and signal, and their foundations (plans and details).



Utilities

- Re-evaluate the grade, length and cover depth of the tunnel to keep a minimum cover for the underground utilities.
- Revise the utility design to accommodate the minimum horizontal and vertical separation between the revised drainage conveyance system and the other underground utilities.
- Relocate the hydrant to accommodate new road layout; coordinate the location of hydrant with the fire department connection (FDC) and the standpipe design.
- Coordinate with the dry utility owners for the locations of the utility vaults and valves to accommodate new roadway layout.
- Some of the dry utility vaults have already been relocated. Re-relocation work might be needed to accommodate new roadway layout.

Questions:

- None

Basis of Design Estimate Assumptions:

- Changes to stand-pipe design is not anticipated nor included in the design estimate.

Additional Information Needed:

- Some of the dry utility vaults have already been relocated based on the roundabout design. To accommodate the new design, surveying of the new utility vaults will be needed.

Surveying

- Surveying of dry utility vaults that have already been relocated.
- Surveying of any additional potholing that is performed.

Traffic Operations

From an operational perspective, the interchange configuration may work, however the WSDOT concept results in an unusual set of closely spaced, un-signalized intersections. Specific concerns with the proposed concept include:

- Pedestrian accommodations across all legs of every intersection make intersection operation difficult.
- To meet FHWA requirements, an update to the existing Interchange Justification Report (IJR) will be required for the new interchange configuration.

Questions:

- None

Basis of Design Estimate Assumptions:

- No traffic visualizations of the new configuration are included in this estimate.

Additional Information Needed:

- None



The above list is a summary of the ECC Design Team's initial technical review comments regarding WSDOT's conceptual layout of the proposed revisions to the 92nd Avenue NE Interchange. The current 92nd Avenue NE Interchange design, including the roundabout, Kiss & Ride, mainline ramps, walls, superstructure, substructure, utilities, and staging MOT, have been released for construction.

A handwritten signature in blue ink that reads "Brad Stein".

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