



S E A T T L E S T R E E T C A R
Network Development Report
Appendix D

Seattle Department of Transportation
May 2008



LTK Engineering Services
Seattle Office

MEMORANDUM

To: Denny Porter

File: C3576

From: David Winter

Date: April 25, 2008

Subject: **OCS Study**

I have finished the requested rough study of proposed 1st Hill Street Car alignment focusing on how the Street Car OCS might be constructed alongside the existing ETB OCS. Attached please find graphic copy of the results. Appendix B, 1st Hill Street Car Study Existing ETB Dwg shows existing ETB OCS as it is now. Appendix C, 1st Hill Street Car Study Prop St Car Dwg shows a proposed solution to the OCS design problem.

Along the length of Broadway, the sketches propose Street Car tracks and its OCS at center of street with 14 ft to 16 ft track spacing and a required relocation of the existing ETB OCS 3 ft towards existing curbs to obtain a 7 ft to 8 ft spacing between ETB positive wire and Street Car contact wire. The exact figure used for this spacing could be as low as 6 ft. See Appendix, A, page 5 of draft report on this subject titled "First Hill Alternatives-Overhead Contact System and Traction Power Considerations for a Streetcar System" prepared for Sound Transit by PBQD, Inc on June 14, 2006.

Depending upon the actual design spacing required for each element, the existing ETB OCS may move less than the 3 ft shown on the sketches. If existing ETB requires a shift towards existing curbs then Metro KC will need to agree to the proposal if parking is not eliminated along the route. Standard Metro KC practice dictates ETB contact wires at 12 ft and 14 ft from existing curbing if parallel parking is allowed in the curb lane.

Placing Streetcar in middle of the street eliminates most concerns about crossing contact wires of the two systems hence doing that is the recommendation. The following paragraphs address concerns intersection by intersection along the route starting from north and working to the south end.

E Aloha St turn-back works well if the northbound track moves to the west curb of Broadway Ave E north of the required Streetcar crossing and ETB crossing at E Roy St (see AD-1317, AD-1318, AD-1319 & AD-1320). The Streetcar tracks make the 90 degree turn at E Aloha St and

Broadway Ave E if they are placed along the west curb of Broadway and the north curb of Aloha. The 90 degree turn onto 10th Ave E should be made from the north curb of Aloha to center of 10th Ave E if a curb cutback is to be avoided.

At Broadway Ave E & E John/Olive Way (see AD-1311) there are on apparent difficulties but at least 6 of 7 ETB crossings will require reconstruction when ETB wires shift 3 ft toward existing curbs.

Broadway Ave E & E Pine St is the most problematic intersection (see AD-1312) of the alignment due to the long ETB turnout lane wiring for the turn from northbound Broadway to Westbound Pine St. That turnout must relocate to exact center of the street (if that even works). It would be better to eliminate the long turnout, or perhaps the same movement could be accomplished by installing new ETB wire to turn right a block early at Pike St with another new right at 10th Ave followed by a new right onto E Pine St to accomplish the same movement in another way. Whatever choice is made this intersection will require reconstruction of at least 8 existing ETB crossings.

Broadway Ave E & E Madison St (see AD-1104) should not present any problems, but at least 10 existing ETB crossings will require reconstruction because of the 3ft shift in ETB wire location towards existing curbs.

Broadway Ave E & E Jefferson St (see AD-1112) should be similar to Broadway Ave E & E Madison St but requires 7 to 8 existing ETB crossing reconstructions because of the 3 ft ETB wire shift toward existing curbs.

Broadway Ave & Boren Ave is included (see AD-1427) to show the necessary crossing of Streetcar wires and ETB wire for curb running of the Streetcar from here to the south terminus of the alignment at 5th & Jackson St. There is no parking to eliminate along either Boren Ave or 12th Ave S so curb running should be okay.

At 12th Ave S & S Jackson St (see AD-1401) layout of the eastbound to northbound turn works in either the curb to curb alignment or the middle of street to curb alignment is shown. The southbound turn could be from the curb to curb (requiring property acquisition and reconstruction of the sidewalk) or curb to center of street (requiring a move to the curb before arriving at 5th Ave S for the turn there. The existing ETB southbound right turn will require reconstruction so it is not under the Streetcar wire.

Parking will need to be eliminated along S Jackson St (see A-1418) in the area of 5th Ave to facilitate making necessary outside curb to outside curb movement affecting the least amount of existing ETB wiring in a crowded intersection. If the 60 ft turn is laid out towards street center, then the resulting turn falls almost directly under the same ETB turn which will not work.

The three return loop turns at 5th Ave S & S Weller St and 8th Ave S & S Weller St and 8th Ave S & S Jackson St were not evaluated in this study. It is assumed that there will be minimal wire conflicts here. At 8th & S Jackson St the right hand turn heading northbound should be made to middle of street crossing existing ETB as done on AD-1320 at Aloha St & 10th Ave E so parking is not an issue on south side of Jackson St.

In summary, the attached rough design will introduce 45 new Streetcar ETB crossing into the system which at present contains 6 similar crossings. SDOT and Metro KC should be prepared to become experts at design and maintenance of such crossings quickly or the project should not be attempted. The parallel wire clearances may not be an issue depending upon what values can be agreed to as minimum between the designers. Other alignments may be possible but were not studied.

DOW:jjd

Attachments

C: Ethan Melone