MEMO

TO: Ed Rockwell, Sound Transit Project Manager

FROM: Kareem Grace, P.E., Russell Goettel, LC

SUBJECT: **PIMS Sounder - Mukilteo Station Passenger Information Signs**

DATE: **January 11, 2021**

Dear Mr. Rockwell,

This memorandum outlines our professional opinion related to the installation of electronic Passenger Information signs at the Sound Transit (ST) Sounder Mukilteo Station. Specifically, the professional opinion provided herein relates to the lighting/glare impacts on the built environment including the residential homes located on the bluff adjacent to the ST station.

Background

As part of the ST Passenger Information Management System (PIMS) program, ST plans on installing electronic passenger information signs at six (6) locations at the Mukilteo station. The signs are used by ST to provide enhanced customer signage including real time information on train arrival and departure time. The planned locations and product data for the signs are attached for reference.

The City of Mukilteo has informed ST that electronic signs are not allowed in a coastal zone due to concerns of light pollution and glare and has requested that ST apply for a code variance to allow for the installation of the signs.

Evaluation/Findings

WSP USA engineers and lighting designers have reviewed the information including planned sign locations, sign product data including screen brightness and operational strategies for the signs. *Our professional opinion is that the proposed electronic signs will have little to no measurable negative impact on the built environment* . The professional opinion offered is based on the information outlined below.

Please find attached to this memorandum a plan/ map view showing the proposed locations of the Information Signs. The cones indicate the possible viewing angles based on visibility information provided by the manufacturer. The gradient of the cone indicates decreasing legibility based on distance away from the signs. Distances to nearby viewpoints are indicated with dimensions. All the signs are oriented parallel to the platform and perpendicular to adjacent homes, which reduces their visibility. Some sign locations will be concealed by canopies, buildings, or vegetation. The signs near the ends of the platform are oriented toward the station building, reducing visibility from outside the station.

The elevation view illustrates the proposed mounting heights of Information Signs and indicates the height difference between the sign location and nearby viewpoint. The heights are based on

existing plans of Mukilteo Station, proposed height of signs, and USGS maps showing elevation change. The field of view indicated considers a slight downward tilt of the signs towards viewers on the platform.

The third attachment is a street view from a nearby viewpoint, showing visibility of existing station light poles, where some signs will be attached. The station is far enough away that the signs will not be legible and will be small enough to be barely visible like the platform lights. Due to the elevation change, the entire station is below the view to the Puget Sound.

Our professional opinion offered above is based on the following.

Display Brightness – The display brightness is listed on the attached product data as 1200 cd/m2 however the signs include an "Ambient Light Sensor" which reduces the display brightness from 1200 cd/m2 to 350 cd/m2 when ambient light levels are at their lowest. This type of technology is similar to that used on a mobile phone. Additionally, it is our understanding from ST that the sign displays are proposed as a largely black colored background with white lettering showing train arrival/departure times and this approach will also mitigate the sign brightness. Based on this information we are concluding that the brightness of the displays will be insignificant in relation to the brightness of the existing luminaires at the Station and the adjacent Ferry Terminal.

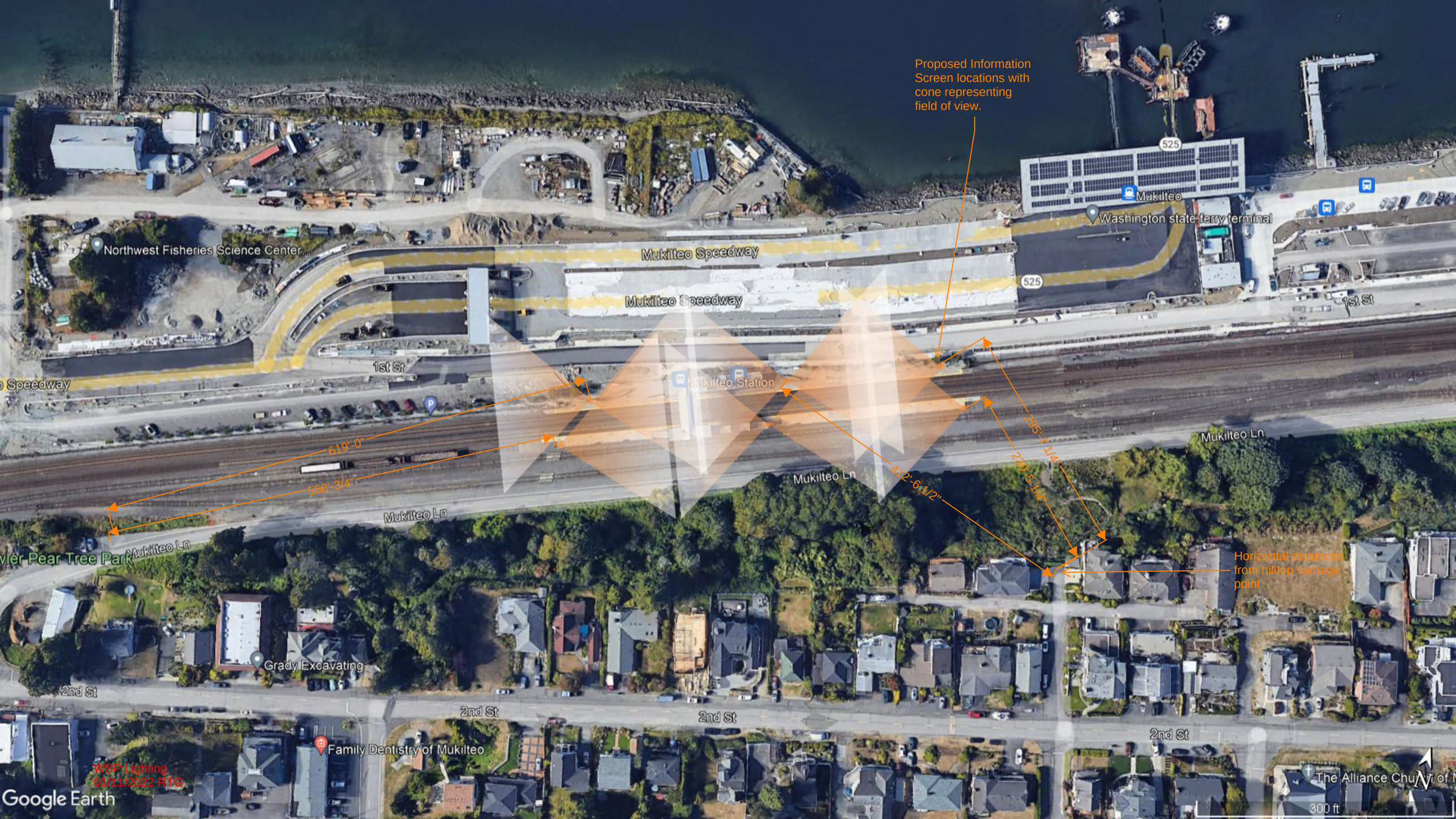
Sign Location/Orientation – The sign display orientation is perpendicular with the train tracks with the signs installed at a height of approximately 12'-0" above the platform. The signs are also installed in a slightly canted orientation (tilted towards the ground). The adjacent homes on the bluff are oriented parallel with the tracks. Based on this, we are concluding that the sign displays will not be visible from the adjacent homes.

Thank you

Grace, Kareem (Grace)

Digitally signed by Grace, Kareem (Grace)
DN: E=K.Grace@wsp.com, CN="Grace, Kareem (Grace)", OU=Active, OU=Users, OU=US, OU=WSPObjects, DC=corp, DC=pbwan, DC=net
Date: 2022.01.11 09:26:50-08'00'

Kareem Grace, P.E.
Supervising Electrical Engineer


Proposed Information Screen locations with cone representing field of view.
Horizontal distances from hilltop vantage point
619'-0"
568'-3/4"
412'-6 1/2"
295'-7 1/4"
290'-5 1/4"
Northwest Fisheries Science Center...
Mukilteo Speedway
Mukilteo Speedway
Mukilteo Speedway
1st St
1st St
1st St
Mukilteo Station
Mukilteo
Washington state ferry terminal
525
525
Mukilteo Ln
Mukilteo Ln
Mukilteo Ln
Mukilteo Ln
Grady Excavating
2nd St
2nd St
2nd St
2nd St
Family Dentistry of Mukilteo
WSP Lighting
01/11/2022 RTG
Google Earth
300 ft


60'-0"
Proposed Information Sign locations with cone representing field of view.
Elevation change approximately 60' from USGS maps.
Google Earth
WSP Lighting
01/11/2022 RTG
Image Landsat / Copernicus
N
20 ft


Location of proposed
Information Sign on
platform poles.
Google Earth
WSP Lighting
01/11/2022 RTG
© 2022 Google
4.62 ft