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# Internal Memorandum

DATE: July 29, 2015  
TO: Mark Bishop, Don Demers  
FROM: Brady Busselman, Earth Evans  
SUBJECT: Executive Order 13690 Summary and Recommendations

The following memorandum provides a brief summary of the impacts to SWLRT of Executive Order 13690, which includes establishment of the Federal Flood Risk Management Standard (FFRMS) and Revised Guidelines for Implementing Executive Order 11988, Floodplain Management.

## Summary

Executive Order (EO) 13690 (including the FFRMS) was issued on January 30, 2015; issuance of the final revised EO 11988 is pending. It is our understanding that the FTA has already indicated SWLRT will be required to comply with EO 13690, and that discussion of the EO will be incorporated in the Final Environmental Impact Statement (FEIS). However, Section 3 of EO 13690 states that “prior to any action to implement the Standard, additional input from stakeholders shall be solicited and considered.” Additionally, the Introduction section of the revised EO 11988 states that “agencies shall not issue or amend existing regulations or procedures until after Water Resource Council has issued amended Guidelines informed by stakeholder input”. The public comment period closed on May 6, 2015 and agencies have 30 days to implement the requirements of the EO.

FFRMS enhances EO 11988 as follows:

- Encourages the use of natural features and nature-based approaches in the development of alternatives for Federal Actions.
- Provides a higher vertical elevation and corresponding floodplain, where appropriate, to address current and future flood risks (FFRMS elevation). Three approaches are outlined for determining the higher vertical elevation.
  - Climate informed science approach
  - Freeboard approach
  - 500-year elevation

The intent of this memo is to identify the approach used by SWLRT to establish the higher vertical elevations and corresponding floodplains.

## Determination of FFRMS Elevation and Flood Hazard Area

The FFRMS flood hazard elevation (FFRMS elevation) is defined as the level to which a structure or facility must be resilient, which may include elevating the structure or designing it to withstand or

otherwise quickly recover from a flood event. Three approaches are outlined for establishing the FFRMS elevation (detailed steps for implementing these approaches are outlined in Part II.1.B of EO 11988):

1. Climate-informed science approach: utilizing the best-available, actionably hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science.
2. Freeboard Approach: Base Flood Elevation (BFE) + Freeboard. Freeboard is required to be two (2) feet, except in the case of Critical Actions in which case the freeboard is required to be three (3) feet.
3. 500-year Elevation: Available “500-year” flood data may be used as the basis of the FFRMS elevation.

Critical Actions are defined as an activity for which even a slight chance of flooding would be too great. EO 13690 and the Federal Transit Authority give the regional planning authority the discretion to determine what is a Critical or Non-Critical Action. In this case the Metropolitan Council is the regional Metropolitan Planning Organization (MPO). The SWLRT-related improvements have been deemed as Non-Critical Actions by the Metropolitan Council for the following reasons:

- The MPO has not identified the project as a critical link in its 2040 Transportation Policy Plan
- The Metropolitan Council operates bus bridge links for LRT with operating issues. A flood that prevented rail transit would result in operation of the bus links on adjacent roadways and serve as a mitigation measure.

The climate-informed science approach is noted as the preferred approach, when data is available. This approach is further broken down into two categories: coastal and riverine. Only riverine flooding applies to SWLRT. However, it is noted in the FFRMS that a data and information gap exists in the riverine climate-informed science approach. The information gap refers to the lack of data available to predict future weather patterns and flood elevations.

The freeboard approach relies on FEMA’s Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs) to establish the base flood elevation (BFE). The base flood is defined as the flood which has a one percent chance of being equaled or exceeded any given year (also known as the 100-year flood). The 500-year elevation also relies on FIRM and FIS to establish the 500-year floodplain. It is noted in the FFRMS that if an agency is not using the climate-informed science approach, then either the freeboard or 500-year approach may be used, and the agency is not required to use the higher of the two elevations.

Part II.1.B of EO 13690 states that if local standards exceed FFRMS, the Federal agency shall apply those standards, if application of the standards is determined reasonable in light of the goals of EO 13690.

### **Implementation on SWLRT**

As noted above, it is our understanding that SWLRT will be required to conform to EO 13690, which includes establishing a higher vertical floodplain elevation. The preferred method of establishing the FFRMS elevation is the climate-informed science approach. Local watersheds along the SWLRT corridor either have adopted or are in the process of adopting Atlas 14 precipitation frequency estimates. As a result, the 100-year, 24-hour rainfall event used for the project will increase from the TP-40 estimate, 5.9 inches, to 7.5 inches. However, according to the FAQ section of the National Oceanic and Atmospheric Administration (NOAA) website (<http://www.nws.noaa.gov/oh/hdsc/FAQ.html#1.5>), Atlas

14 volumes are “based on the assumption of stationary climate.” It appears that the project’s use of Atlas 14 precipitation frequencies would not qualify as a climate-informed science approach based on NOAA guidance. In the absence of a riverine climate-informed science option, it is necessary to implement the freeboard approach and/or the 500-year elevation approach.

Below is a summary of the project areas near or adjacent to floodplains. This table includes the FFRMS elevation, the approach used to determine the FFRMS elevation, and the allowable HWL based on SWLRT Design Criteria. The table shows that at all locations, the allowable HWL level of the project is either higher than the FFRMS elevation, or the floodplains are not hydraulically connected to the project.

	FFRMS Elevation	Approach	Adjacent Top of Rail	Maximum Allowable HWL*	Note
<b>Purgatory Creek Crossing</b>	826.0	BFE+2'	827.25	827.25**	Rail Station: 2074+81 FIS 27053C0430E
<b>Flying Cloud Drive Crossing (South Fork Nine Mile Creek)</b>	849.0	BFE+2'	879.6	877.0	Rail Station: 2226+00 FIS 27053C0435E
<b>Opus Hill (wetland MTA-MTA-09)</b>	883.6	BFE+2'	895.0	892.4	Rail Station: 2347+00 FIS 27053C0343E
<b>North Fork Nine Mile Creek Crossing</b>	901.6	BFE+2'	909.7	907.1	Rail Station: 2439+00 FIS 27053C0341E
<b>Cedar Lake Trail Crossing (Minnehaha Creek)</b>	901.2	500 YR	912.2	909.6	Rail Station: 2601+00 FIS 27053CV001A
<b>Louisiana Station (Minnehaha Creek)</b>	890.7	500 YR	891.6	889.4	Rail Station:2644+90 FIS 27053CV001A, <b>Not Hydraulically Connected</b>
<b>Beltline Station (Bass Lake)</b>	881.2	BFE+2'	885.3	882.7	Rail Station:2717+00, <b>Not Hydraulically Connected</b>
<b>Bassett Creek</b>	809.9	500 YR	820.4	817.9	Rail Station: 2903+00 FIS 27053CV001A

\*Maximum Allowable HWL = 31" below top of rail for ballasted track (these elevations are not specifically the Atlas 14 HWL, but rather an indication of what high water elevation that would still comply with the BFE+2' criteria)

\*\* Track section at this location is proposed to be direct fixation which has a Maximum Allowable HWL of 15" below the top of rail

**Conclusions/Recommendations**

1. Assuming it is determined that EO 13690 applies to SWLRT, the above table demonstrates that the project complies with the higher floodplain elevations required by the executive order.
2. Our method for determining the FFRMS is to use the 500-year floodplain elevation where available and to use the BFE+2 where the 500-year floodplain elevation is not available.

Attachments:

EO 13690

Revised Guidelines for implementing EO 11988