Introduction

This document describes how to add the Fast Act vehicles (EV2 and EV3) to the list of the Agency Vehicles in AASHTO BrR.

Note the following:

As per FHWA’s Memorandum titled “Load Rating for the FAST Act’s Emergency Vehicles” dated Nov. 3, 2016, two FAST Act vehicles (EV2 and EV3) have been added to VDOT load rating templates. These two vehicles follow the AASHTO MBE, Third Edition with two exceptions:

1. Multiple presence: If necessary, when combined with other unrestricted legal loads for rating purposes, the emergency vehicle needs only to be considered in a single lane of one direction of a bridge (this is to account for low probability of side by side presence of EVs on a bridge).
2. Live load factor: A live load factor of 1.3 may be utilized in the Load and Resistance Factor Rating (LRFR) or Load Factor Rating (LFR) method.

To comply with both FHWA and MBE in AASHTO BrR models, two sets of EV2 and EV3 trucks need to be created.

EV2 – Set 1: Single-lane (EV2 One_Lane)
   Set 2: With an adjacent unrestricted legal vehicle (EV2 w/SU7v)

EV3 – Set 1: Single-lane (EV3 One_Lane)
   Set 2: With an adjacent unrestricted legal vehicle (EV3 w/SU7v)

The EV vehicles are legal vehicles, but due to BrR program limitations (adjacent vehicles cannot be added under the legal load category) both sets of EV2 and EV3 should be added under the permit load category rather than legal load category in the Vehicle Analysis Template and the override box should be selected in advanced settings.

Per MBE section 6A.3.2, the multiple presence factor for single lane loadings should not be used when checking for special permit loads; therefore, the Permit Live Load Factor for single-lane requires an adjustment in BrR’s advanced settings to account for this requirement. A live load factor of 1.56 = (1.2x1.3) should be used to account for multiple presence factor in this single-lane loading (Refer to VDOT VEHICLE ANALYSIS TEMPLATES FOR LRFR).

Per FHWA’s Q&A document published in March 2017 for the Fast ACT Vehicles, AASHTO LRFD Section 3.6.1.2.5 may be used in lieu of better information to calculate the tire contact width. Wheel Contact Width in the tables below are based on P/0.8, where number of tires per axle taken as 2 for the steer axle and 4 for the drive and/or tandem axles.
Creating Fast Act Vehicles in BrR Library:

1. Select Bridge Explorer.

![Bridge Explorer screenshot]

For Help, press F1
2. Highlight Agency folder under Vehicles\Standard Gage. The list of vehicles to be used in each rating will display on the right. Follow the following steps to add EV vehicles.
3. From File, select New to add new vehicle.

4. The following window will appear.
5. Fill out the information as displayed below in this new window and click Save.

**EV2 One_Lane:**

Wheel Contact Width:

Front: \( \frac{24}{2 \times 0.8} = 15.00 \text{ in} \)
Rear: \( \frac{33.5}{2 \times 0.8} = 20.94 \text{ in} \)

Use 21.00 in

**EV2 w/SU7v:**

For Help, press F1
**EV3 One _Lane:**

Wheel Contact Width:
Front: \( \frac{24}{2 \times 0.8} = 15.00 \text{ in} \)
Rear/Tandem: \( \frac{31}{2 \times 0.8} = 19.38 \) use 19:00 in

Note: For simplicity to calculate the Wheel Contact Width, the gap between the tandem tires were ignored and assumed 2 wider tires per axle versus 4 narrower tires with a gap.

**EV3 w/SU7v:**