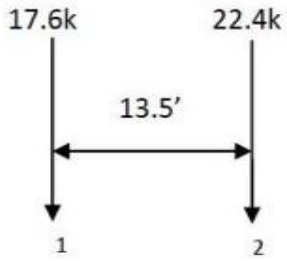
APPENDIX TO ADVANCING BRIDGE LOAD RATING: STATE OF PRACTICE AND FRAMEWORKS – SAMPLE STATE TRUCK CONFIGURATIONS

Some States have additional trucks used during the legal load level evaluation based on the local traffic needs as governed by State regulations and laws. A sample of these trucks includes the following:

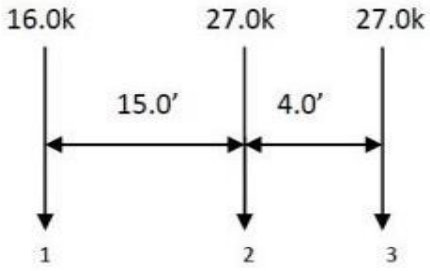
- S220, S335, S437, T330, T435, and T540 (Delaware)
- LA Type 3, LA Type 3-S2, LA Type 6, and LA Type 8 (Louisiana)
- Maine Legal Load Configurations 1 through 5 and 7 and 8 (Maine)
- H-15, Type 3, Type 4, HS-20, and 3S2 (Maryland)
- Ohio Legal Loads 2F1, 3F1, 4F1, and 5C1 (Ohio)
- SC-SHV1A (65k), SC-SHV1B (70k), SC-SHV3A (85k), SC-SHV3B (90k), SC School Bus, and SC-SU2 (40k) (South Carolina)
- FAST Act emergency vehicles (EVs): EV2 and EV3 (all States)

Figure 1 through Figure 8 show the above truck configurations.

S220 (DE 2 Axle Single Unit) 20 Ton



S335 (DE 3 Axle Single Unit) 35 Ton



S437 (DE 4 Axle Single Unit) 37 Ton

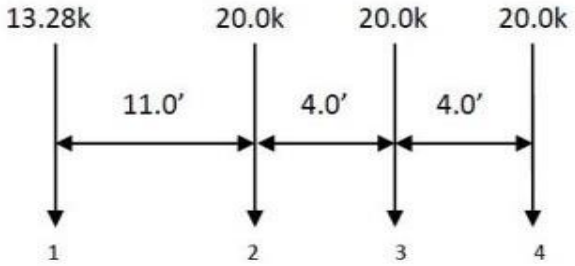
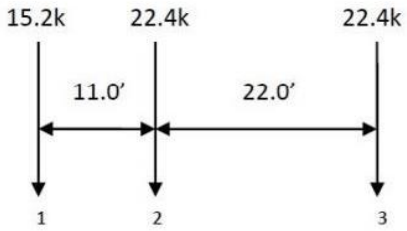
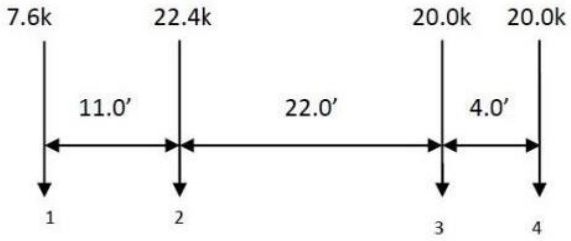


Figure 1. S220, S335, and S437 (Delaware)

T330 (DE 3 Axle Semi) 30 Ton



T435 (DE 4 axle Semi) 35 Ton



T540 (DE 5 Axle Semi) 40 Ton

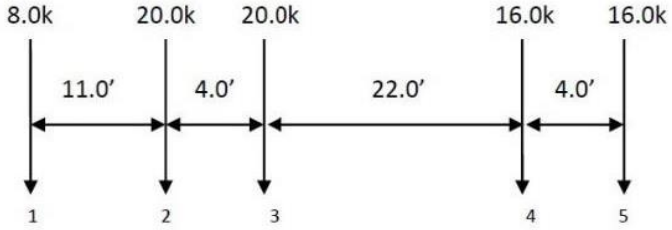
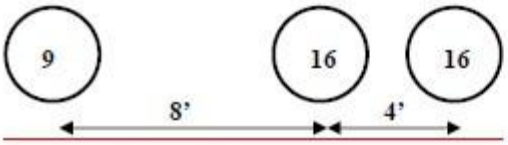
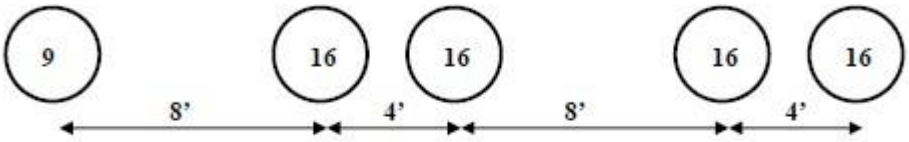


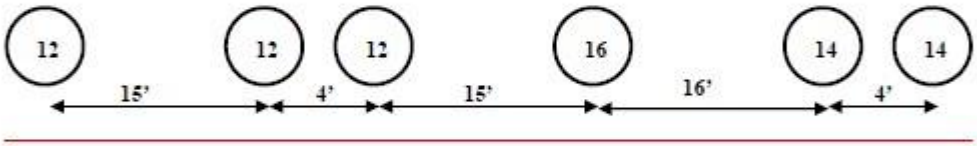
Figure 2. T330, T435, and T540 (Delaware)



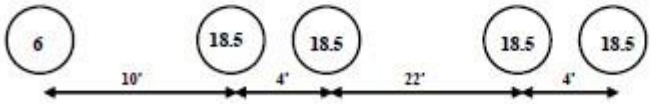
LA Type 3 GVW = 41 kips



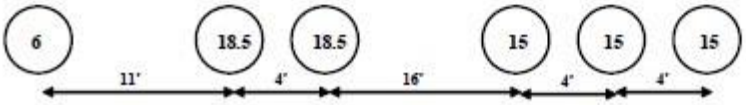
LA Type 3-S2 GVW = 73 kips



AASHTO Type 3-3 GVW = 80 kips



LA Type 6 GVW = 80 Kips



LA Type 8 GVW = 88 Kips

Figure 3. LA Type 3, LA Type 3-S2, LA Type 6, and LA Type 8 (Louisiana)

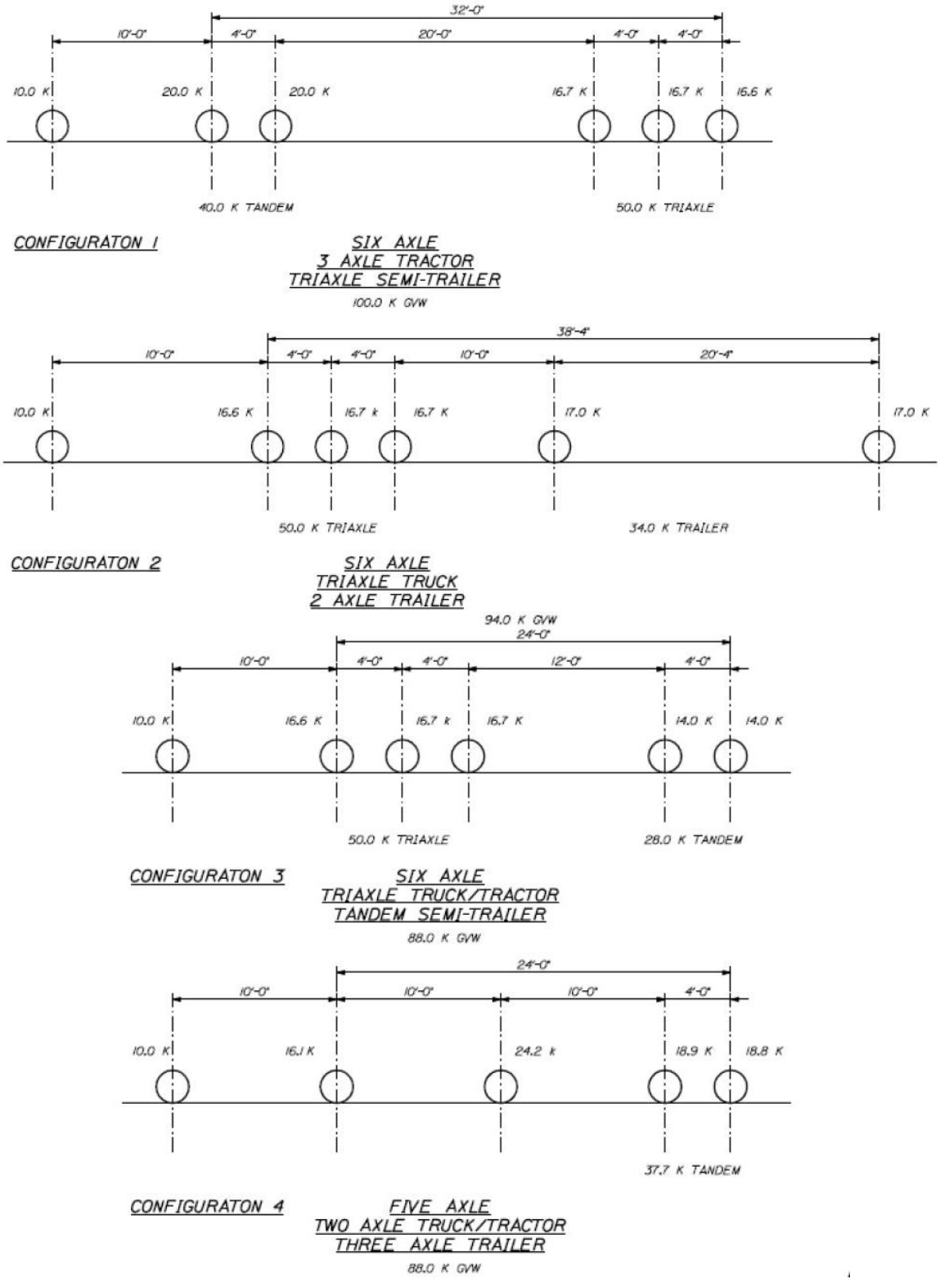


Figure 4. Maine legal load configurations 1 through 4 (Maine)

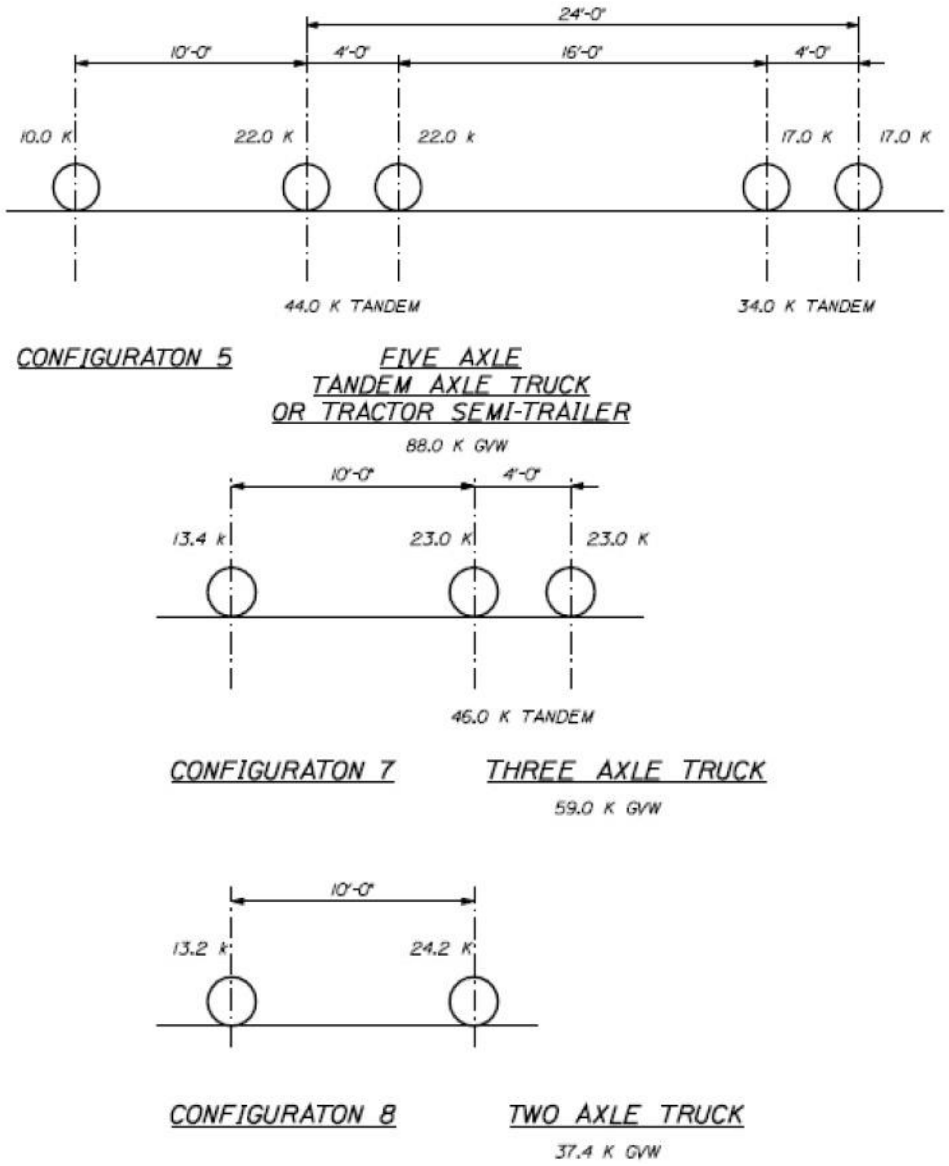


Figure 5. Maine legal load configurations 5, 7, and 8 (Maine)

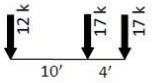
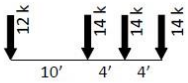
OHIO LEGAL LOADS		
Load Designation	**Load Configuration**	**Gross Weight**
2F1		15 Tons
3F1		23 Tons
4F1		27 Tons
5C1		40 Tons

Figure 6. Ohio legal loads 2F1, 3F1, 4F1, and 5C1 (Ohio)

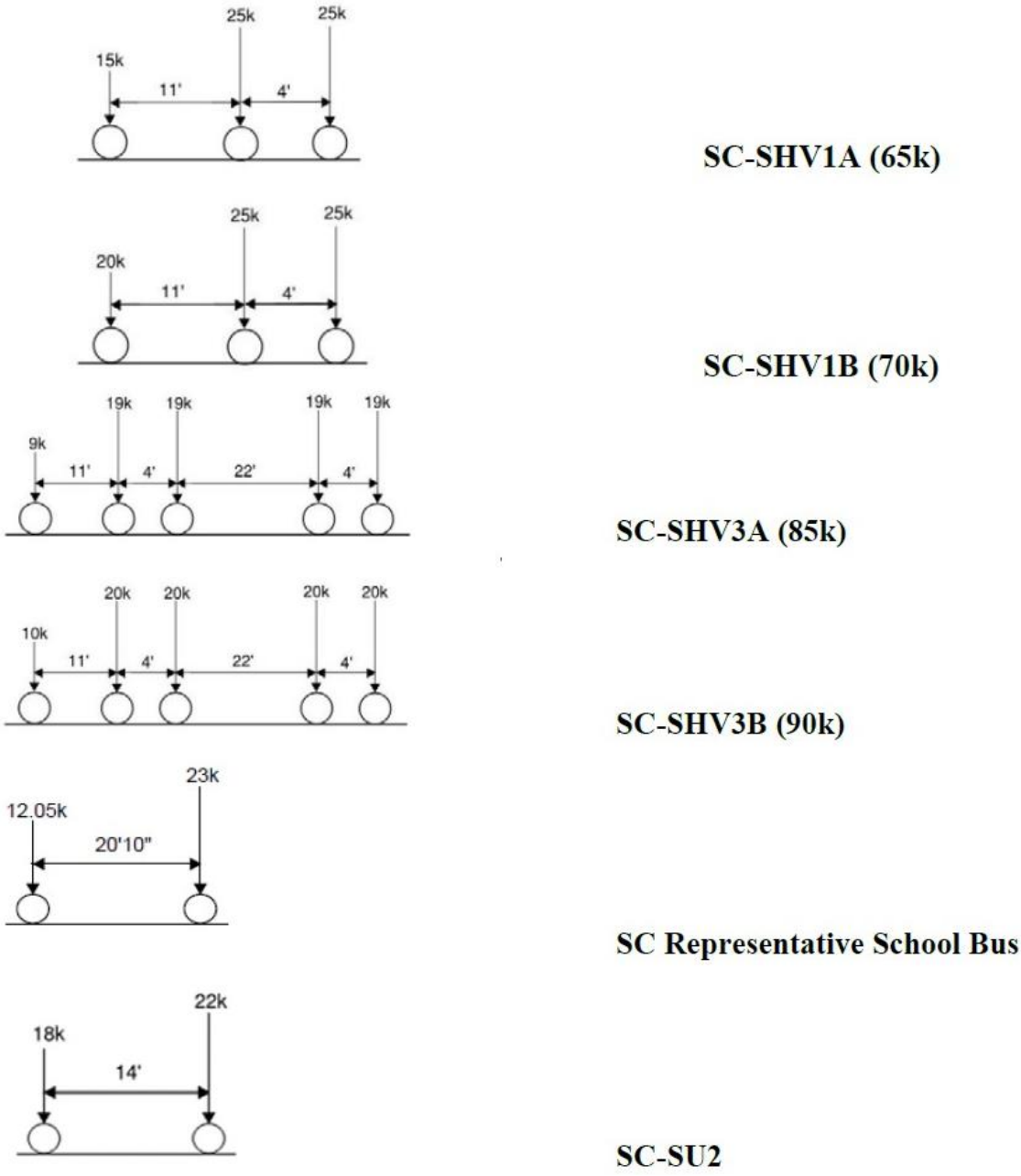


Figure 7. SC-SHV1A (65k), SC-SHV1B (70k), SC-SHV3A (85k), SC-SHV3B (90k), SC School Bus, and SC-SU2 (40k) (South Carolina)

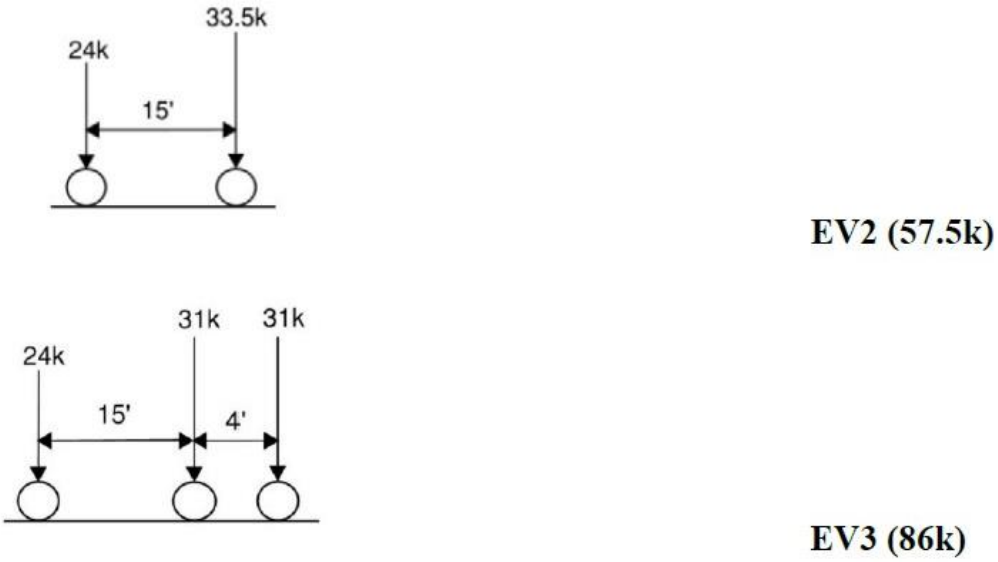
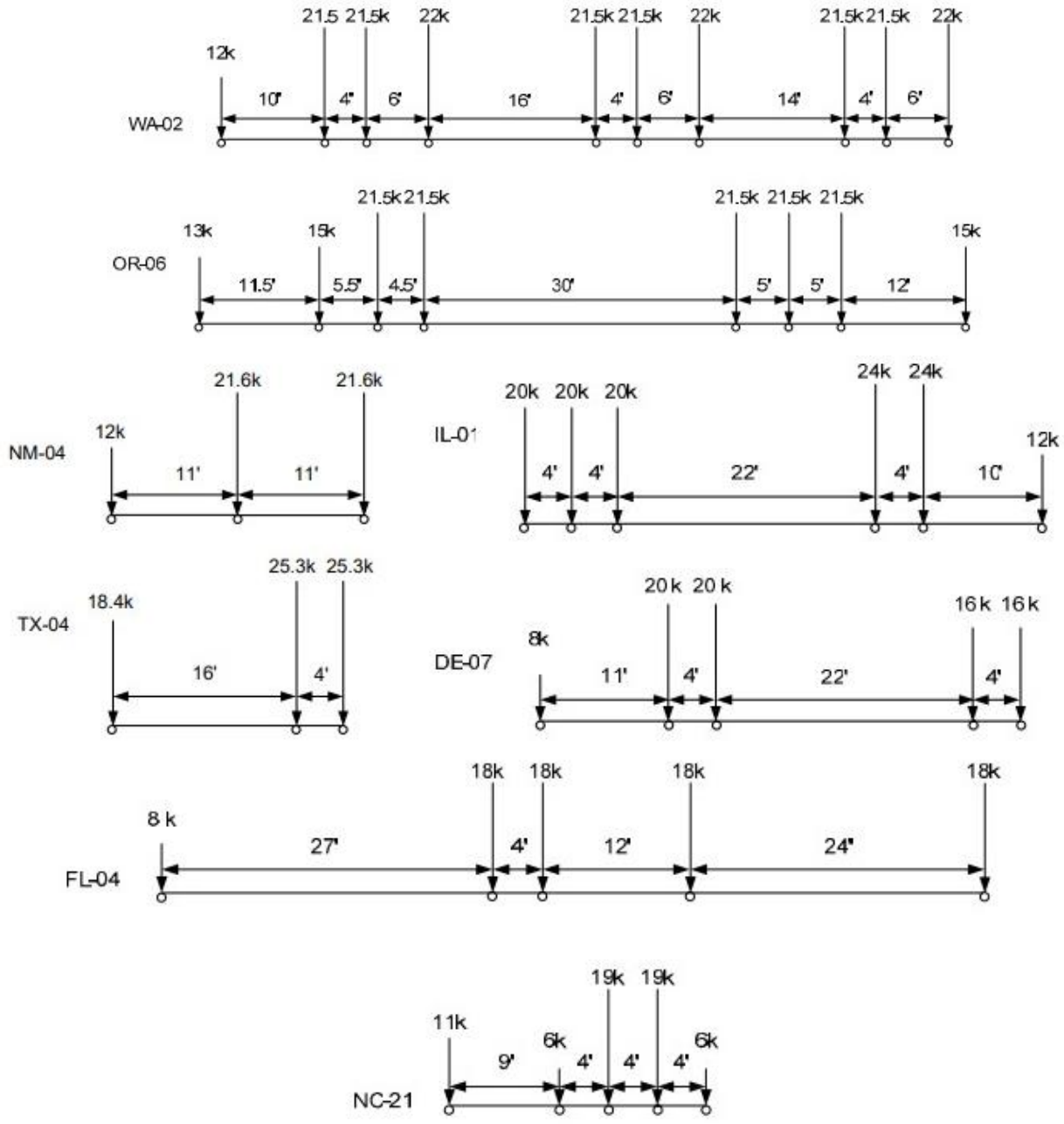


Figure 8. FAST Act's emergency vehicles (EVs): EV2 and EV3 (all States)

With respect to the issuance of permit trucks, Mlynarski et al. (2011) indicated that a wide range of truck loads are being used to rate bridges for "typical" permit vehicles throughout the United States. Furthermore, the American Association of State and Highway Transportation Officials (AASHTO) Manual of Bridge Evaluation (MBE) does not list the truck types for evaluating permit loads.

Mlynarski et al. (2011) narrowed down the large number of trucks in four regions across the country resulting in a total of eight trucks that are somewhat representative of the standard permit trucks in each region: WA-02 and OR-06 for the northwest region, NM-04 and TX-04 for the southwest region, IL-01 and DE-07 for the northeast region, and FL-04 and NC-21 for the southeast region. The trucks identified by Mlynarksi et al. represent an "average truck" and a "heavy truck" for each region. Figure 9 shows the typical permit trucks in the four regions across the country as summarized by Mlynarski et al (2011).



Mlynarski et al. 2011, NCHRP

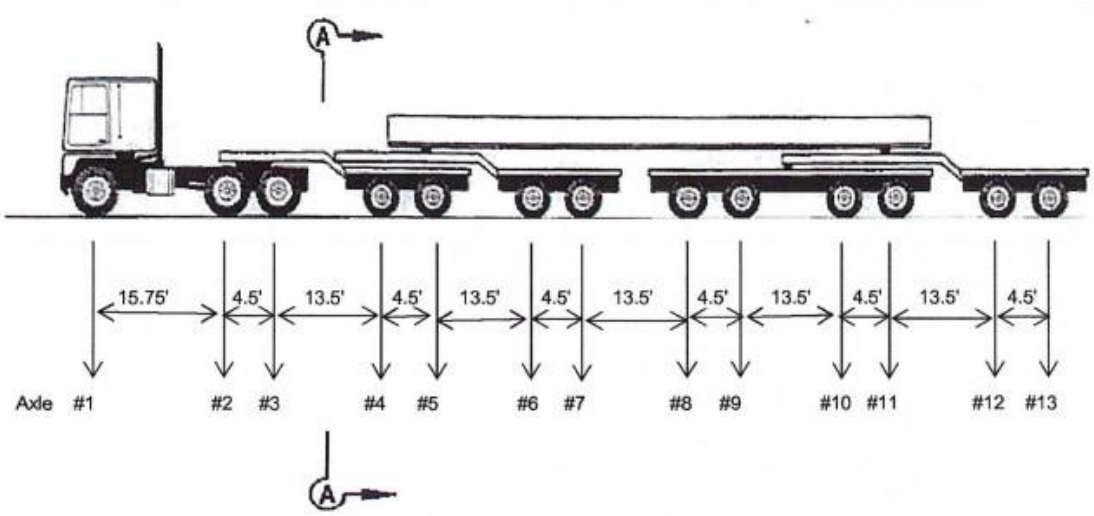
Figure 9. "Typical" permit vehicles

In addition, a sample of trucks that are listed in various State manuals are summarized as follows:

- California permit vehicles P13, P11, P9, P7, and P5 (Californian and Nevada)
- AC2, AC3, AC4, and AC5 (Delaware)
- 90 kip six-axle vehicle (Kentucky)
- 136 kip (A) seven-axle truck with triple-axle configuration (Kentucky)

- 136 kip (B) seven-axle truck with quad-axle configuration (Kentucky)
- 156 kip eight-axle truck with a quad-axle (Kentucky)
- UT-P6, UT-P7, UTP8, UT-P9a, and UT-P9b (Utah)
- OL1 and OL2 (Washington)

Figure 10 through Figure 13 show the above truck configurations. Note that this list is not all encompassing.



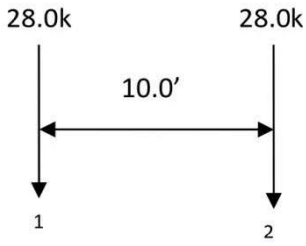
Standard Permit Rating and Design Vehicles with Purple Loads

Load Rate	Axle Purple Loads (Unbonused)												
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
P5	26k	24k	24k	24k	24k	-------	-------	-------	-------	-------	-------	-------	-------
P7	26k	24k	24k	24k	24k	24k	24k	-------	-------	-------	-------	-------	-------
P9	26k	24k	24k	24k	24k	24k	24k	24k	24k	-------	-------	-------	-------
P11	26k	24k	24k	24k	24k	24k	24k	24k	24k	24k	24k	-------	-------
P13	26k	24k	24k	24k	24k	24k	24k	24k	24k	24k	24k	24k	24k

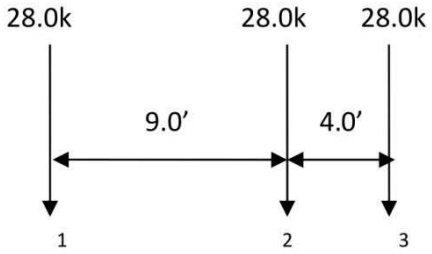
Load Rate P5 = Minimum Vehicle
Load Rate P13 = Maximum Vehicle

Figure 10. California permit vehicles P13, P11, P9, P7, and P5 (Californian and Nevada)

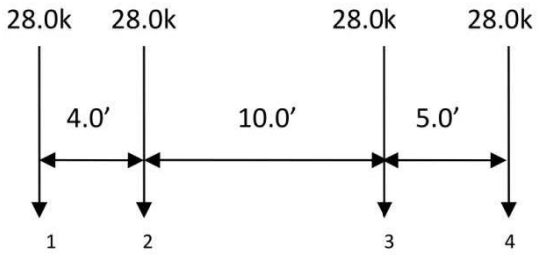
AC2-2 Axle Annual Permit Crane



AC3-3 Axle Annual Permit Crane



AC4-4 Axle Annual Permit Crane



AC5-5 Axle Annual Permit Crane

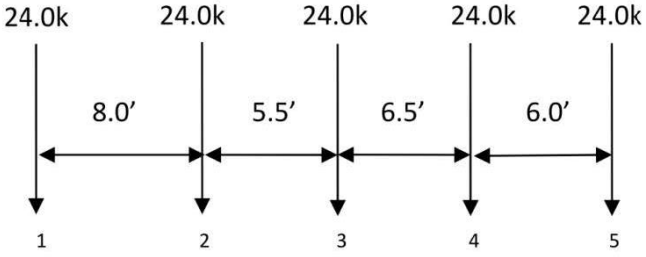


Figure 11. AC2, AC3, AC4, and AC5 (Delaware)

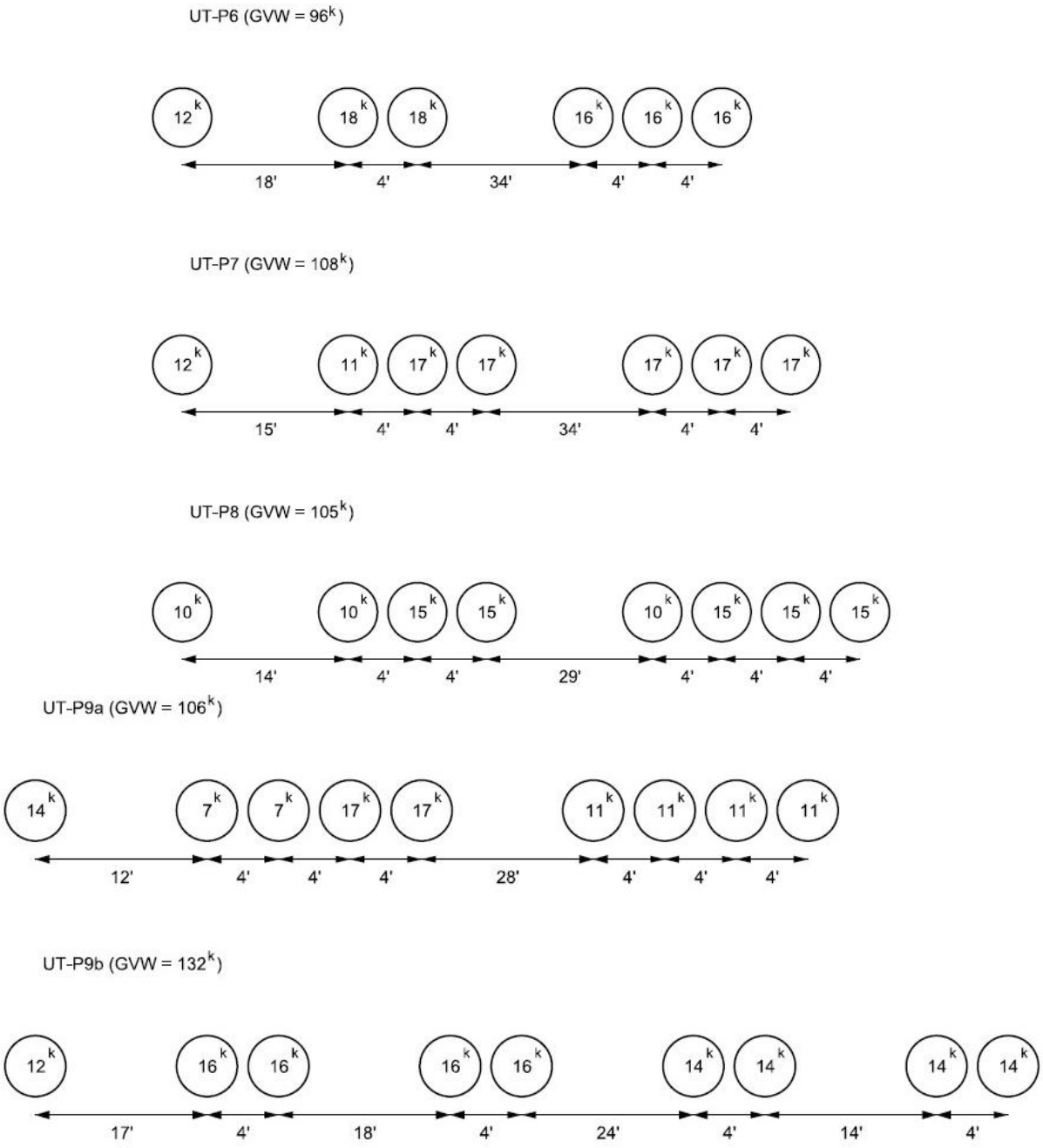


Figure 12. UT-P6, UT-P7, UTP8, UT-P9a, and UT-P9b (Utah)

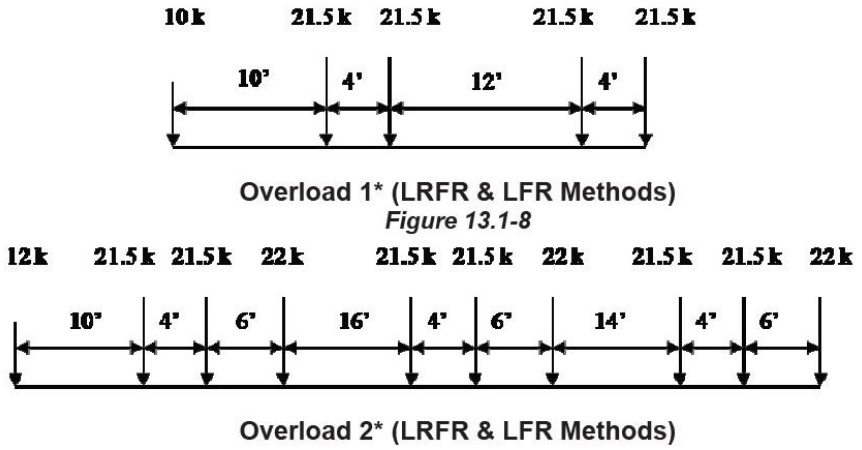


Figure 13. OL1 and OL2 (Washington)

References

AASHTO. 2008, 2011, 2015, 2018. *The Manual for Bridge Evaluation (MBE)*. American Association of State Highway and Transportation Officials, Subcommittee on Bridges, Washington, DC. (23 CFR 650.317).

Mlynarski, M., W. G. Wassef, and A. S. Nowak. 2011. *NCHRP Report 700: A Comparison of AASHTO Bridge Load Rating Methods*. National Cooperative Highway Research Program, Washington, DC.