



October 23, 2018

Ms. Angie Hughes
District Manager
Fripp Island Public Service District
291 Tarpon Boulevard
Fripp Island, SC 29920

RE: Fripp Inlet Bridge – Load Posting Reduction

Dear Ms. Hughes,

Johnson, Mirmiran, and Thompson (JMT) has evaluated the current posted weight restriction for the Fripp Inlet Bridge as well as the procedures for trucks weighing more than the posted 27 Tons. Below are JMT's recommendations for the bridge weight restriction based on the recent substructure analysis results with the 2017 borings.

The substructure analysis was performed due to additional channel bottom scour observed at several bents during the post Hurricane Matthew Emergency Bridge Inspection. The substructure analysis determined that the piles could structurally support the applied loads. However, the additional scour has reduced the amount of residual soils that provide resistance to the applied loads. This reduces the allowable load carrying capacity of the substructure.

Standard industry practice uses a geotechnical Factor of Safety 2.0. However, JMT's analysis (see attached table) shows that several bents now have an actual geotechnical factor of safety of less than 2.0. The worst-case Factor of Safety is 1.18 at Bent 18. Due to the reduced factor of safety at Bent 18, JMT recommends that the bridge weight restriction be reduced to ensure safe operation of the bridge.

The Reduction Factor (RF) is the ratio of the actual factor of safety to the recommended factor of safety. $RF = 0.59 = 1.18 / 2.0$. Therefore, the weight restriction posted would be reduced from the current 27 Tons to 16 Tons. Additionally, the procedures for trucks weighing more than 27 Tons would also be adjusted with the Reduction Factor.

In response to the scoured condition and reduced geotechnical factor of safety, Fripp Island Public has authorized JMT to perform special inspections on a quarterly basis (normal inspection frequency is 24 months) to help monitor the bents until the bridge retrofit construction has been completed.

JMT understands that a reduction in the posted weight limit to 16 Tons may cause significant disruption of service to the island. Therefore, a lower recommended geotechnical factor of safety of 1.5 instead of the normal 2.0 would be reasonable for a temporary condition until the retrofit bents are built. Additionally, the quarterly special inspections will help to mitigate the risk with a factor of safety less than the normal 2.0.

With the lowered recommended geotechnical factor of safety of 1.5, the Reduction Factor $RF = 0.79 = 1.18 / 1.5$. JMT recommends reducing the weight restriction posted from the current 27 Tons to 21 Tons. Please refer to the attached revised procedures and weight limits.

Fripp Inlet Bridge Pile Check				
	Results Based on Original Borings		Results Based on 2017 Borings	
Bent	Safety Factor, FS	Repair Time Frame Recommendation	Safety Factor, FS	Repair Time Frame Recommendation
4	1.43	Within 1 Year	1.32	Within 1 Year
18	1.17	Within 6 Months	1.18	Within 6 Months
32	1.96	Within 3 to 5 Years	4.25	No Repair Needed
33	1.84	Within 3 to 5 Years	3.66	No Repair Needed
34	1.81	Within 3 to 5 Years	2.05	No Repair Needed
35	1.72	Within 3 to 5 Years	1.97	Within 3 to 5 Years
36	1.50	Within 3 to 5 Years	1.57	Within 3 to 5 Years
37	1.49	Within 1 Year	1.96	Within 3 to 5 Years
38	1.75	Within 3 to 5 Years	1.42	Within 1 Year
39	1.07	Within 6 Months	1.32	Within 1 Year
40	1.06	Within 3 to 5 Years	1.39	Within 1 Year
41	1.20	Within 3 to 5 Years	1.36	Within 1 Year
42	1.17	Within 6 Months	1.71	Within 3 to 5 Years
43	1.12	Within 6 Months	1.59	Within 3 to 5 Years
44	1.25	Within 1 Year	1.75	Within 3 to 5 Years

JMT appreciates the opportunity to provide engineering services to Fripp Island Public Service District. Should you have any questions regarding this report, please do not hesitate to call me at 843-556-2624.

Very truly yours,
Johnson, Mirmiran, and Thompson



Thai Trinh, P.E.
 Project Manager

FRIPP ISLAND PUBLIC SERVICE DISTRICT

PROCEDURES FOR TRUCKS WEIGHING MORE THAN 21 TONS CROSSING THE FRIPP ISLAND BRIDGE

Based on the recommendation of the Fripp Island Public Service District's independent bridge engineers, the following procedures have been created for handling trucks over 21 tons that wish to use the Fripp Island bridge.

Before coming on the island, all trucks over 21 tons must be weighed. This must include total weight plus split weights both front and back. No split weight may exceed 16 tons regardless of length. These weights and the distance between axles must be phoned/faxed into the FIPSD office for approval to cross the bridge. FIPSD will determine the maximum load the truck may carry with every effort made to equalize the weight distribution. Charts in one-ton increments will be utilized for loads from 22 to 31 tons. Loads of 32 tons must be equally balanced with 16 tons in front and 16 tons in back. All charts, including a chart showing where to measure load points, are available on the District website at <http://www.fipsd.org/bridgeerosioncontrol.html>, or upon request at the District office.

Excessive vehicle loads may require shutting down all other bridge traffic to allow passage. Based on the charts mentioned above, if a load falls into the area where the bridge must be shut down, then the following procedure will apply. The driver must get permission from the FIPSD to pass over the bridge after the truck is weighed and its weight distribution is determined. The truck driver must have a cell phone and call Fripp Island Security when he is at the Hunting Island end of the bridge. Security will send someone across the bridge to check the weight tickets and then stop traffic going off the island and tell the truck driver to proceed. Copies of the weight tickets for all loads over 21 tons will be dropped off at the PSD office.

Loads over 21 tons going off the island that require the bridge to be shut down will have to coordinate with PSD and Security ahead of time so they may arrange to shut off traffic on the North end of the bridge. Due to their short wheelbase, the limit on cement trucks will remain at 21 tons.

Carolina Storage (10 Neil Rd, Beaufort, 843-524-5800) has a 70ft load cell scale and can provide certified weight tickets for a minimal fee. Pilot Travel Center at Exit 5 on Hwy. 95 is able to provide both total and split weight tickets. Truckers must show these weight tickets with dates and descriptions to Security and provide copies to the PSD office. Other certified scales may also be used.

Any loads that do not meet these requirements will be dealt with on an individual basis. Truckers who violate this policy may be fined an appropriate amount.

Fripp Island Public Service District
291 Tarpon Blvd., Fripp Island, SC 29920
Telephone # 843-838-2400 / Fax # 843-838-4900

Fripp Island Security—Telephone # 843-838-2334, Fax # 843-838-2101

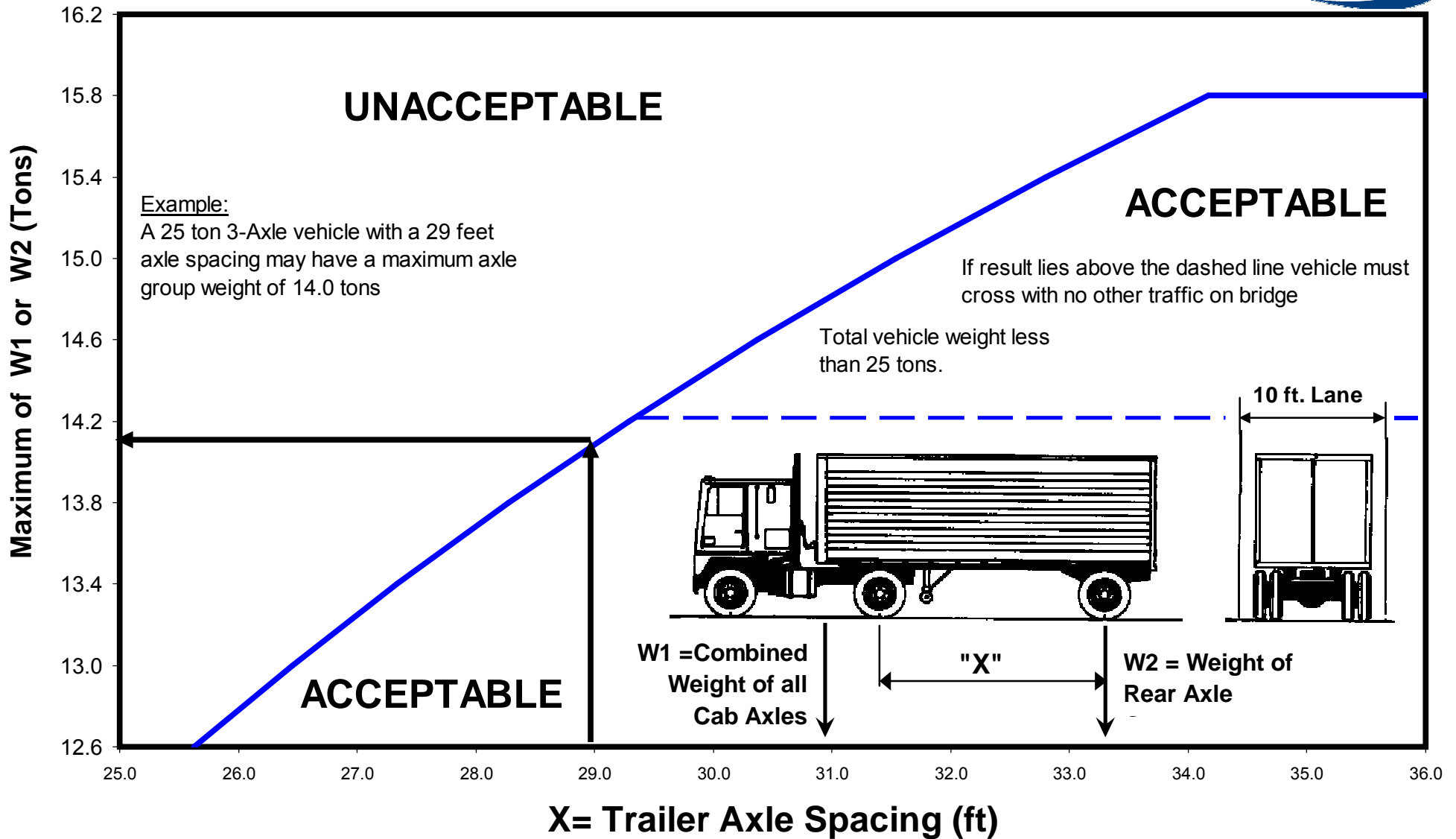
Fripp Island Inlet Bridge Vehicle Restrictions

25 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



Wilbur Smith Associates



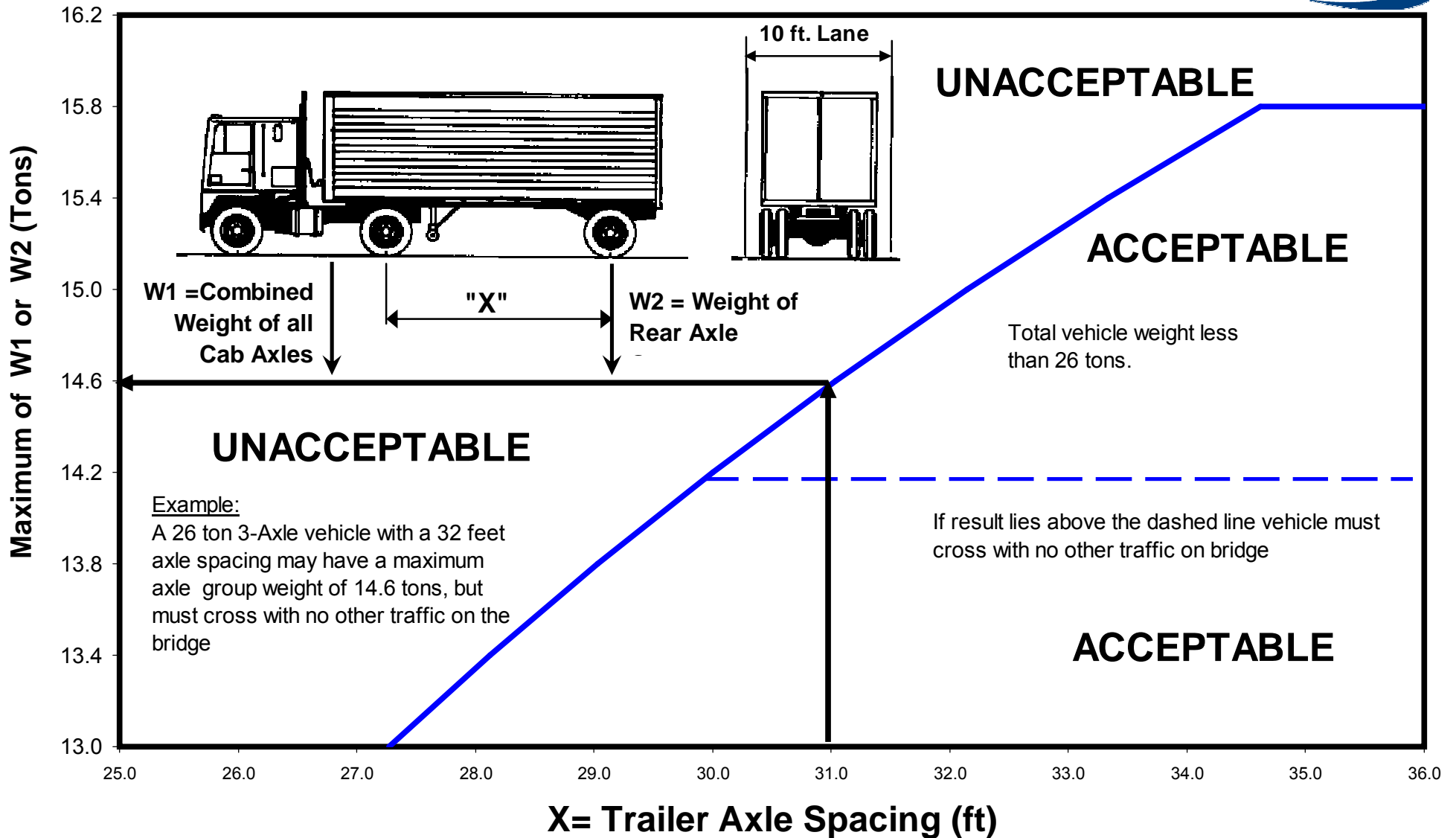
Fripp Island Inlet Bridge Vehicle Restrictions

26 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



Wilbur Smith Associates



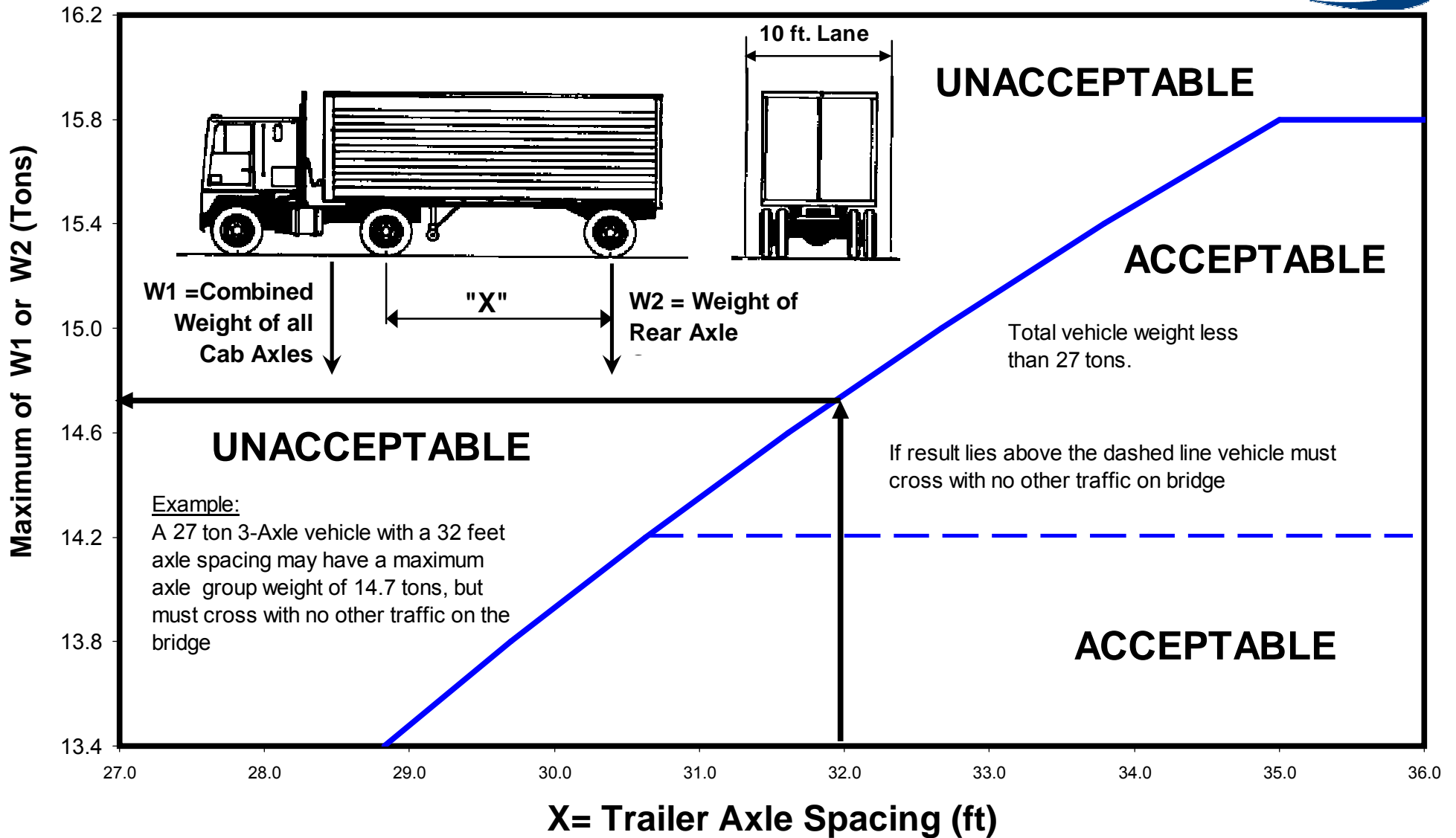
Fripp Island Inlet Bridge Vehicle Restrictions

27 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



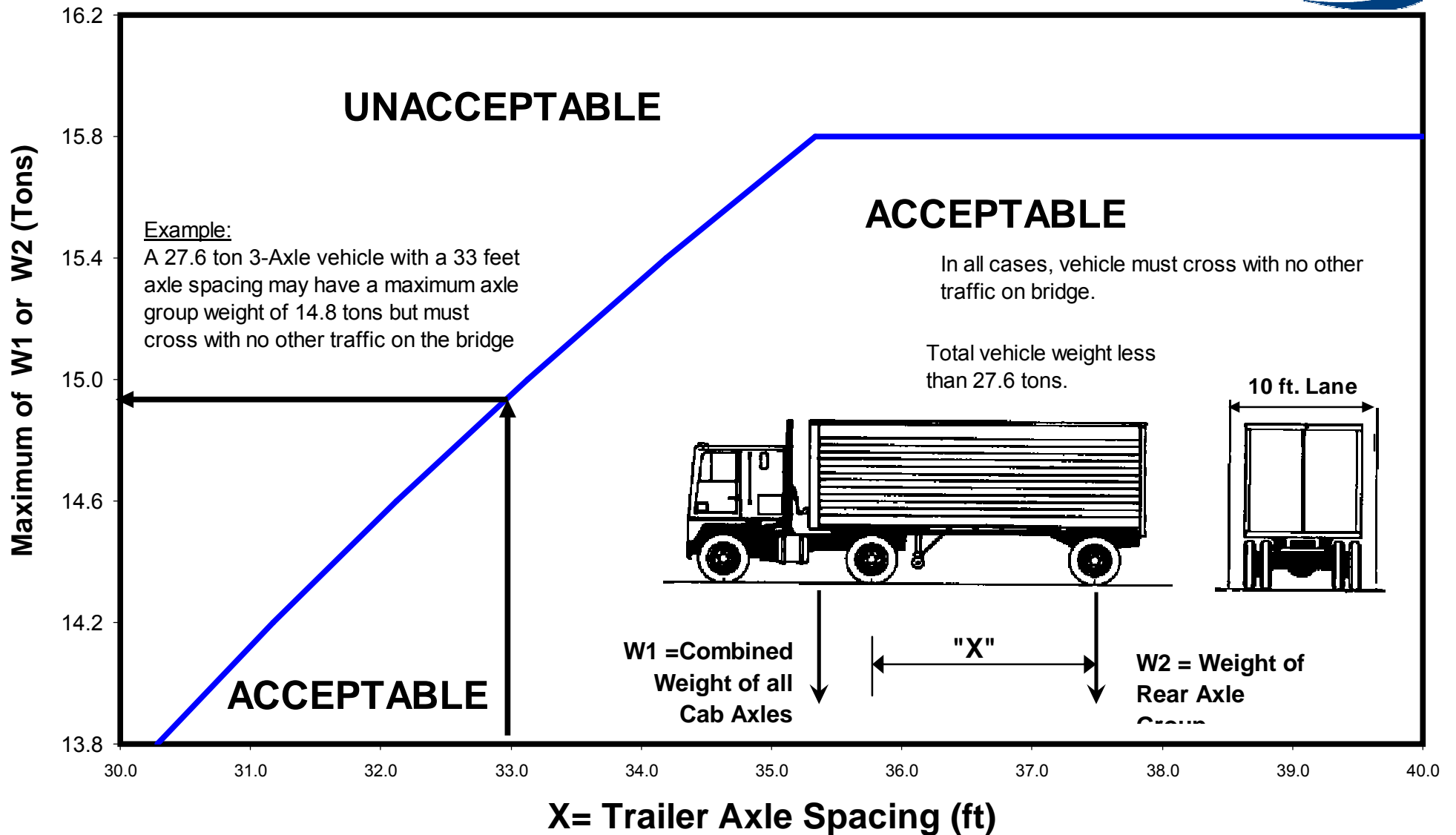
Wilbur Smith Associates



Fripp Island Inlet Bridge Vehicle Restrictions

27.6 Ton Vehicle Weight - 3 Axle

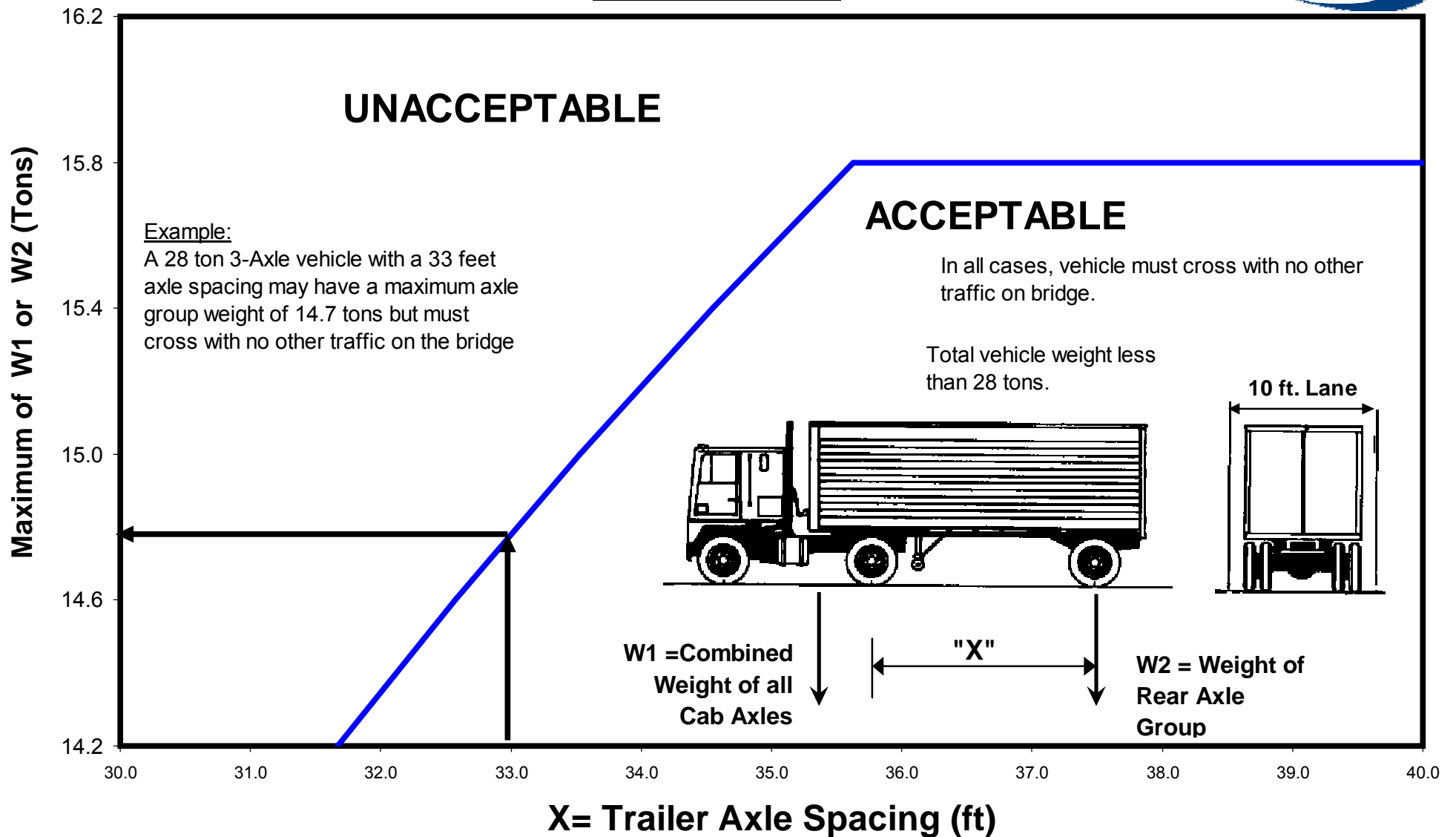
By: Taylor 11/10/04



Fripp Island Inlet Bridge Vehicle Restrictions

28 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



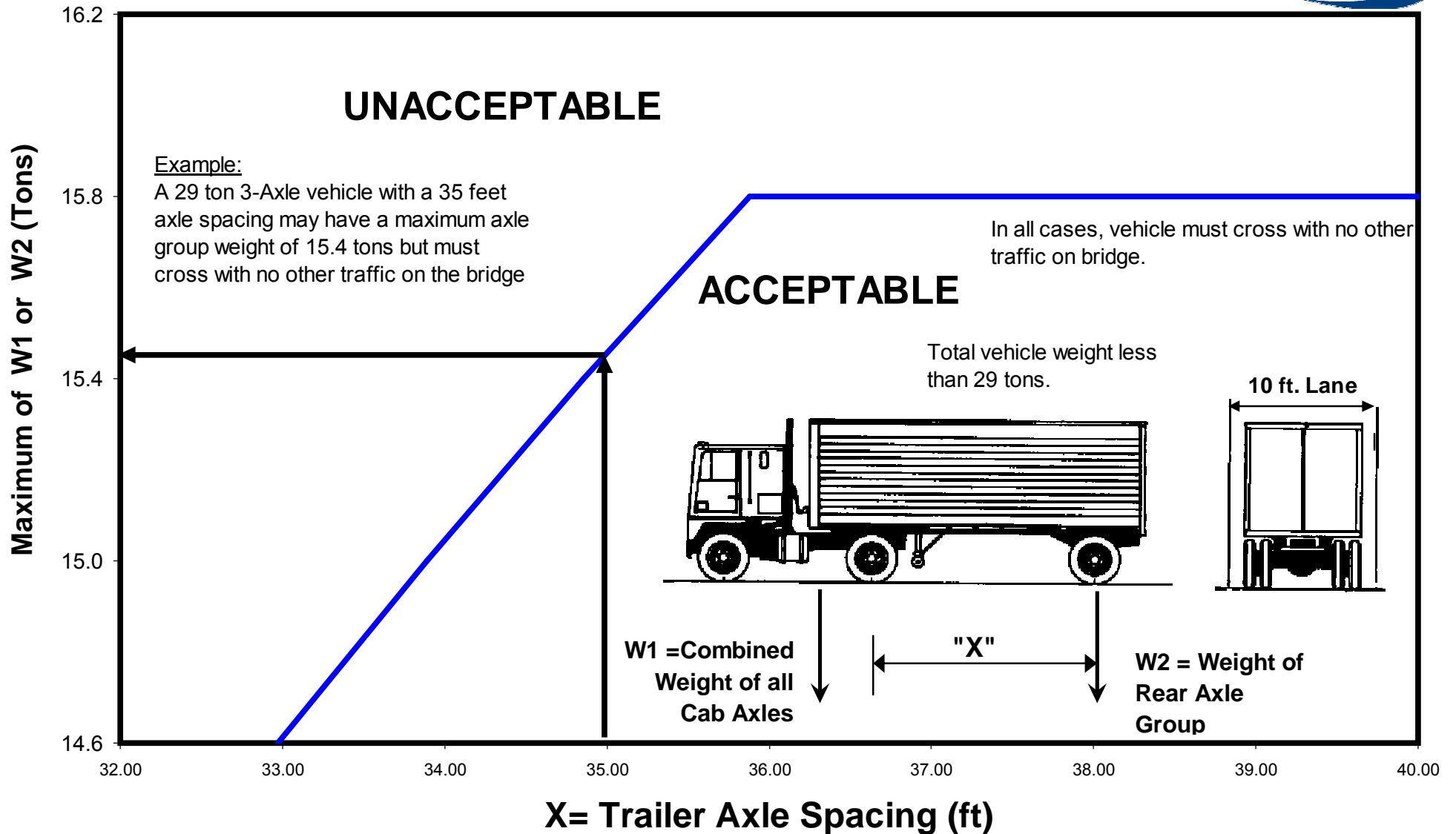
Fripp Island Inlet Bridge Vehicle Restrictions

29 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



Wilbur Smith Associates



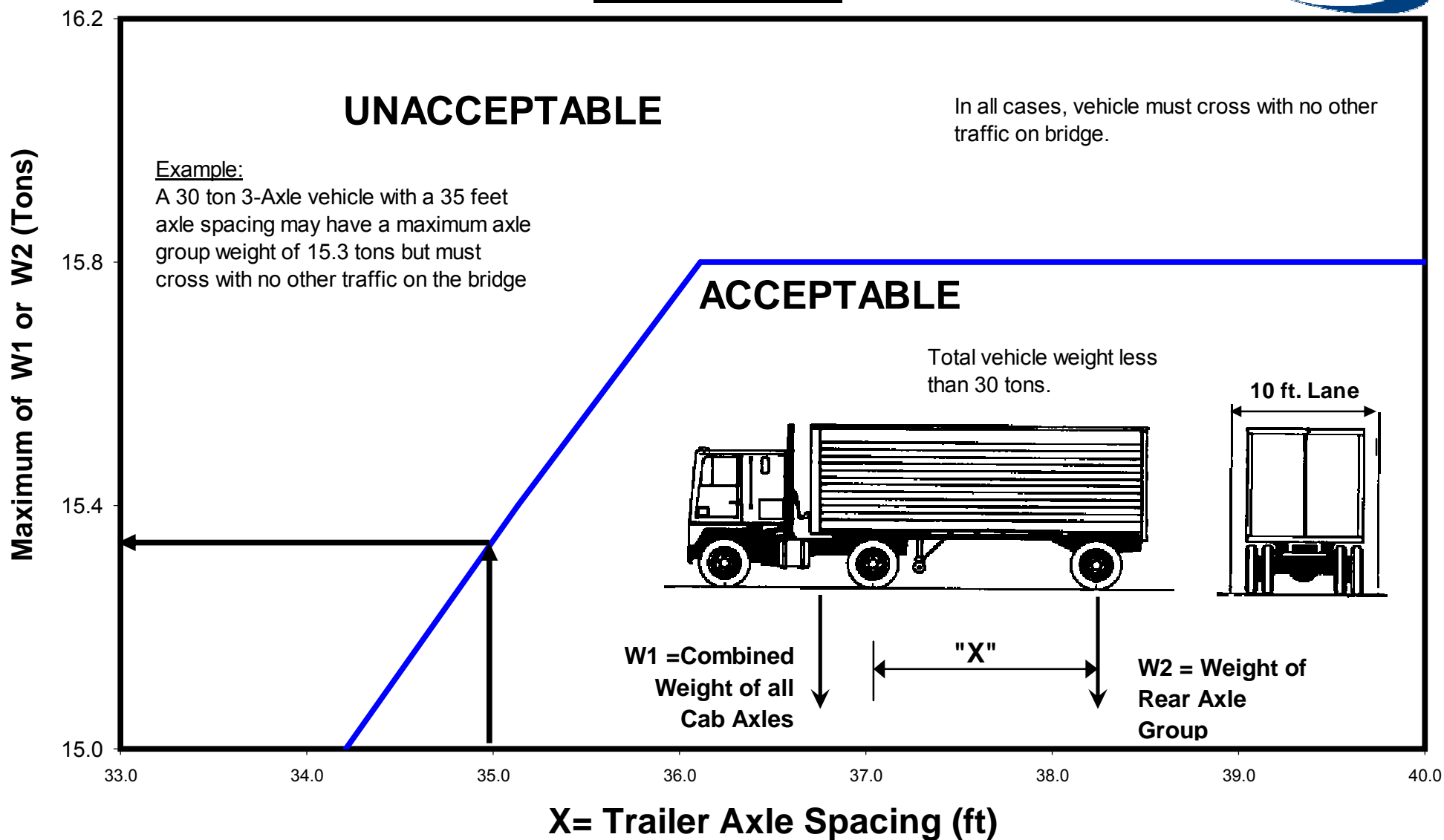
Fripp Island Inlet Bridge Vehicle Restrictions

30 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04



Wilbur Smith Associates



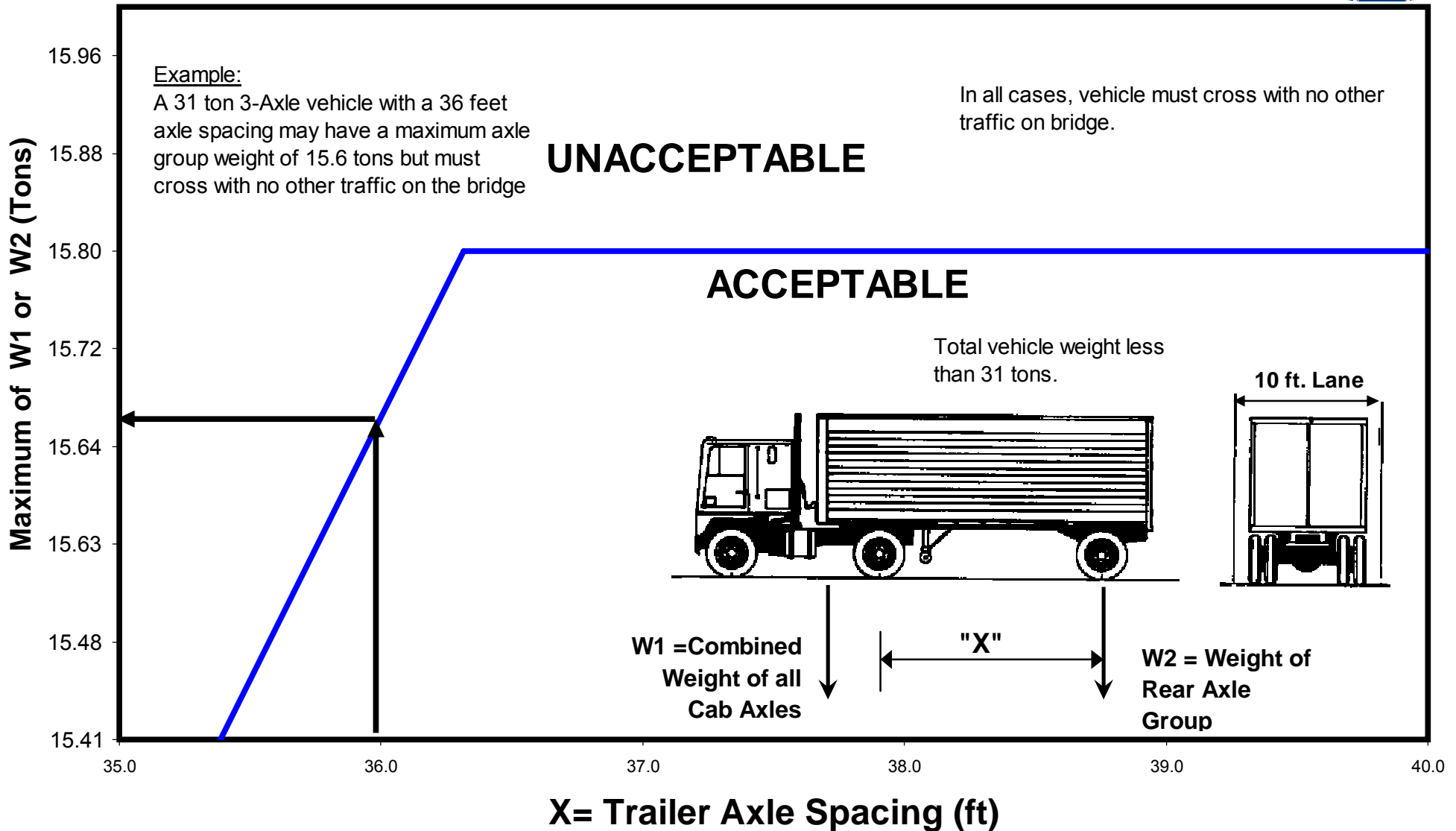
Fripp Island Inlet Bridge Vehicle Restrictions

31 Ton Vehicle Weight - 3 Axle

By: Taylor 11/10/04

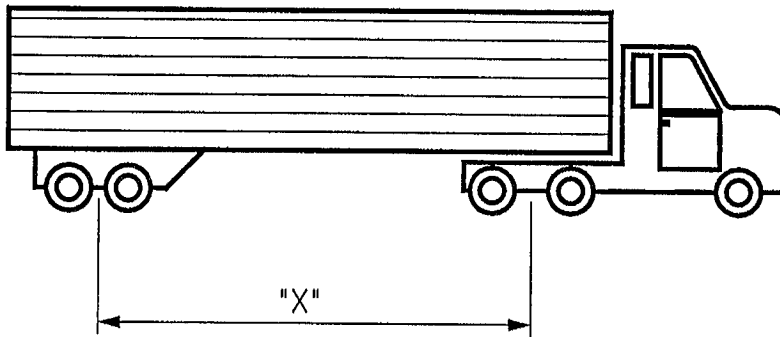
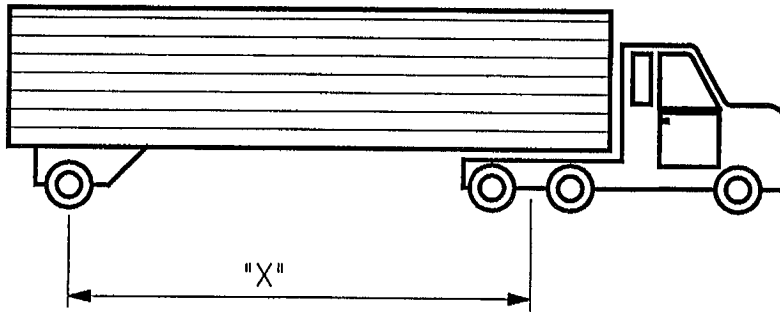
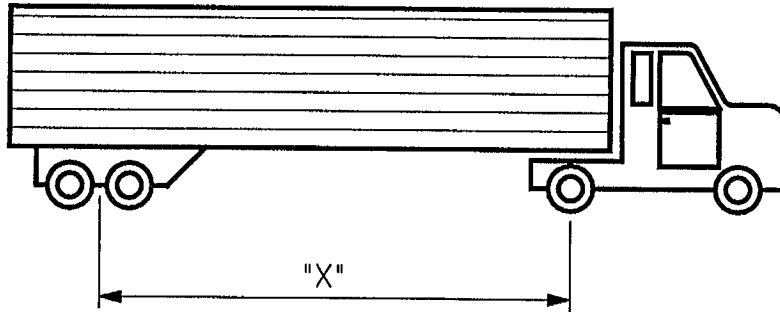
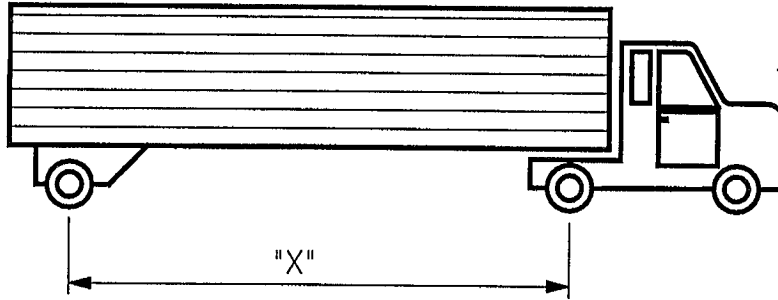


Wilbur Smith Associates



Fripp Island Inlet Bridge Vehicle Restrictions

BY: Taylor Date: 11/04



Measurement of Dimension "X"