

# AASHTOWare Bridge Design and Rating

## Load Rating for Special Hauling Vehicles (SHV)

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Rating and Design User Group (RADBUG) Meeting  
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2016 RADBUG

# What is a SHV?

- **Special Hauling Vehicle**
- **It is a legal truck**
- **SU designation = Single Unit**



# Federal Bridge Formula

		Permissible Gross Loads for Vehicles in Regular Operation <sup>1</sup>									
		Based on weight formula				$W = 500 \left[ \frac{LN}{N-1} + 12N + 36 \right]$					
		Maximum load in pounds carried on any group of 2 or more consecutive axles <sup>2</sup>									
		L	N=	2 AXLES	3 AXLES	4 AXLES	5 AXLES	6 AXLES	7 AXLES	8 AXLES	9 AXLES
Tandem Axle Weight (see pages 3 & 4)	4			34,000							
	5			34,000							
	6			34,000							
	7			34,000							
	8			34,000							
	9	More than 9	38,000		38,000						
	10			39,000							
	11			40,000							
	12			44,000							
	13			45,000		50,000					
14			45,500		50,500						
15			46,500		51,500						
16			47,000		52,000						
17			48,000*		52,500						
18			48,500		53,500						
19			49,500		54,000						
20	Example (see page 2)			50,000		54,500					
21				51,000		55,500		66,000			
22				51,500		56,000		61,000			
23				52,500		56,500		61,500			
24				53,000		57,500		62,500			
25				54,000		58,000		63,000			
26				54,500		58,500		63,500			
27				55,500		59,500		64,000			
28				56,000		60,000		65,000			
29				57,000		60,500		65,500			
30				57,500		61,500		66,000			
31				58,500		62,000		66,500			
32				59,000		62,500		67,500			
33				60,000		63,500		68,000		90,000	
34				64,000		68,500		74,000		90,500	
35				64,500		69,000		74,500		91,000	
36				65,500		70,000		75,000		91,500	
37			Exception (see page 9)	66,000		70,500		75,500		92,000	
38				66,500		71,000		76,000		93,000	
39				67,500		71,500		77,000		93,500	
40				68,000		72,000		77,500		94,000	
41				68,500		73,000		78,000		94,500	
42				69,500		73,500		78,500		95,000	
43				70,000		74,000		79,000		95,500	
44				70,500		75,000		80,000		96,000	
45				71,500		75,500		80,500		96,500	
46				72,000		76,000		81,000		97,500	
47				72,500		76,500		81,500		98,000	
48				73,500		77,500		82,000		98,500	
49				74,000		78,000		83,000		99,000	
50				74,500		78,500		83,500		99,500	
51				75,500		79,000		84,000		100,000	
52				76,000		80,000		84,500		100,500	
53				76,500		80,500		85,000		101,000	
54				77,500		81,000		86,000		101,500	
55				78,000		81,500		86,500		102,000	
56				78,500		82,500		87,000		102,500	
57			Interstate Gross Weight Limit (see page 2)	79,500		83,000		87,500		103,000	
58				80,000		83,500		88,000		104,000	
59				84,000		84,000		89,000		104,500	
60				85,000		85,000		89,500		105,000	

<sup>1</sup>The values in this table reflect FHWA's policy of rounding down when calculated weights fall exactly halfway between 500-pound increments. Because the Bridge Formula is designed to protect highway infrastructure, FHWA determined that this conservative policy is consistent with the statutory mandate.

<sup>2</sup>Fig. 2. The Federal Highway Administration (FHWA) revises its guidance pamphlet *Bridge Formula Weights* (August 2006). Specifically, footnote 2 on page 6 of the guidance is superseded and replaced with the following: "Pursuant to 23 CFR 650.3.13, all bridges must be inspected, rated to its safe load-carrying capacity, and if required, posted or restricted with respect to the maximum allowable weight."

$$\text{Bridge Formula: } W = 500 \left( \frac{LN}{N-1} + 12N + 36 \right)$$

- Limits
- Single Axle (max) = 20,000 lbs.
- Tandem Axle (max) = 34,000 lbs.
- Gross Weight (max) = 80,000 lbs.

Enacted 1975



# What is a SHV?



Load Rating for SHV

# What is a SHV?



# What is a SHV?



Load Rating for SHV

# What is a SHV?



# What is a SHV?





# What is a SHV?



# What is Required?

- **NCHRP 12-63 showed current AASHTO truck configurations don't capture demand from the SHV's.**
- **A simple comparison of ODOT Legal trucks with SHV's shows a need to load rate for these vehicles.**



# What is required?

- **FHWA requires load rating for these vehicles to be completed.**
- **ODOT has prepared a proposed plan to load rate for SHV's.**
  - Plan is posted on ODOT's OSE web site.



# What is Required?



## Memorandum

Subject: **ACTION:** Load Rating of Specialized Hauling Vehicles  
/s/ Original Signed by  
From: Joseph S. Krolak  
Acting Director, Office of Bridge Technology  
Date: November 15, 2013  
In Reply Refer To:  
HIBT-10  
To: Federal Lands Highway Division Engineers  
Division Administrators

The purpose of this memorandum is to clarify FHWA's position on the analysis of *Specialized Hauling Vehicles* (SHVs) as defined in the AASHTO Manual for Bridge Evaluation (MBE) during bridge load rating and posting to comply with the requirements of the *National Bridge Inspection Standards* (NBIS). The intent of the load rating and posting provisions of the NBIS is to insure that all bridges are appropriately evaluated to determine their safe live load carrying capacity considering all unrestricted legal loads, including State routine permits, and that bridges are appropriately posted if required, in accordance with the MBE.

The SHVs are closely-spaced multi-axle single unit trucks introduced by the trucking industry in the last decade. Examples include dump trucks, construction vehicles, solid waste trucks and other hauling trucks. SHVs generally comply with Bridge Formula B and are for this reason considered legal in all States, if a States' laws do not explicitly exclude the use of such vehicles.

NCHRP Project 12-63 (Report 575, 2007) studied the developments in truck configurations and State legal loads and found that AASHTO Type 3, 3-S2 and 3-3 legal vehicles are not representative of all legal loads, specifically SHVs. As a result, legal load models for SHVs were developed and adopted by AASHTO in 2005, recognizing that there is an immediate need to incorporate SHVs into a State's load rating process, if SHVs operate within a State. The SHV load models in the MBE include SU4, SU5, SU6 and SU7 representing four- to seven-axle SHVs respectively, and a Notional Rating Load (NRL) model that envelopes the four single unit load models and serves as a screening load. If the load rating factor for the NRL model is 1.0 or greater, then there is no need to rate for the single-unit SU4, SU5, SU6 and SU7 loads. However, if the load rating factor for the NRL is less than 1.0, then the single-unit SU4, SU5, SU6 and SU7 loads need to be considered during load rating and posting.



# What is Required?

2

The SHVs create higher force effects, and thus result in lower load ratings for certain bridges, especially those with a shorter span or shorter loading length such as transverse floor beams, when compared to AASHTO Type 3, 3-S2 and 3-3 legal loads and HS20 design load. Therefore, SHVs, i.e., SU4, SU5, SU6 and SU7 or NRL, are to be included in rating and posting analyses in accordance with Article 6A.2.3 and Article 6B.9.2 of the 1<sup>st</sup> Edition of the MBE (Article 6B.7.2 of the 2<sup>nd</sup> Edition of the MBE), unless one of the following two conditions is met:

**Condition A:** The State verifies that State laws preclude SHV use; or

**Condition B:** The State has its own rating vehicle models for legal loads and verifies that the State legal load models envelope the *applicable* AASHTO SHV loading models specified in Appendix D6A and Figure 6B.9.2-2 of the 1<sup>st</sup> Edition of the MBE (Figure 6B.7.2-2 of the 2<sup>nd</sup> Edition of the MBE), and the State legal load models have been included in rating/posting analyses of all bridges. The SHV types, e.g. six- or seven-axle SHVs, precluded by State laws need not be considered.

The SHV load models apply to Allowable Stress Rating, Load Factor Rating, and Load and Resistance Factor Rating in accordance with Section 6A and 6B of the MBE.

The FHWA recognizes that there are bridges in the inventory that have not been rated for SHVs and that it is not feasible to include SHVs in the ratings for the entire inventory at once. FHWA is establishing the following timelines for rating bridges for SHVs, if neither Condition A or B is met:



# What is Required?

**Group 1:** Bridges with the shortest span not greater than 200 feet should be re-rated after their next NBIS inspection, but no later than December 31, 2017, that were last rated by:

- a) either Allowable Stress Rating (ASR) or Load Factor Rating (LFR) method and have an operating rating for the AASHTO Routine Commercial Vehicle either Type 3, Type 3S2, or Type 3-3 less than 33 tons (English), 47 tons (English), or 52 tons (English) respectively; or
- b) Load and Resistance Factor Rating (LRFR) method and have a legal load rating factor for the AASHTO Routine Commercial Vehicle, either Type 3, Type 3S2 or Type 3-3, less than 1.3.

**Group 2:** Rate those bridges not in Group 1 no later than December 31, 2022.

For either group, if a re-rating is warranted due to changes of structural condition, loadings, or configuration, or other requirements, the re-rating should include SHVs.

The selection of load rating method should comply with FHWA's Policy Memorandum *Bridge Load Ratings for the National Bridge Inventory*, dated October 30, 2006.

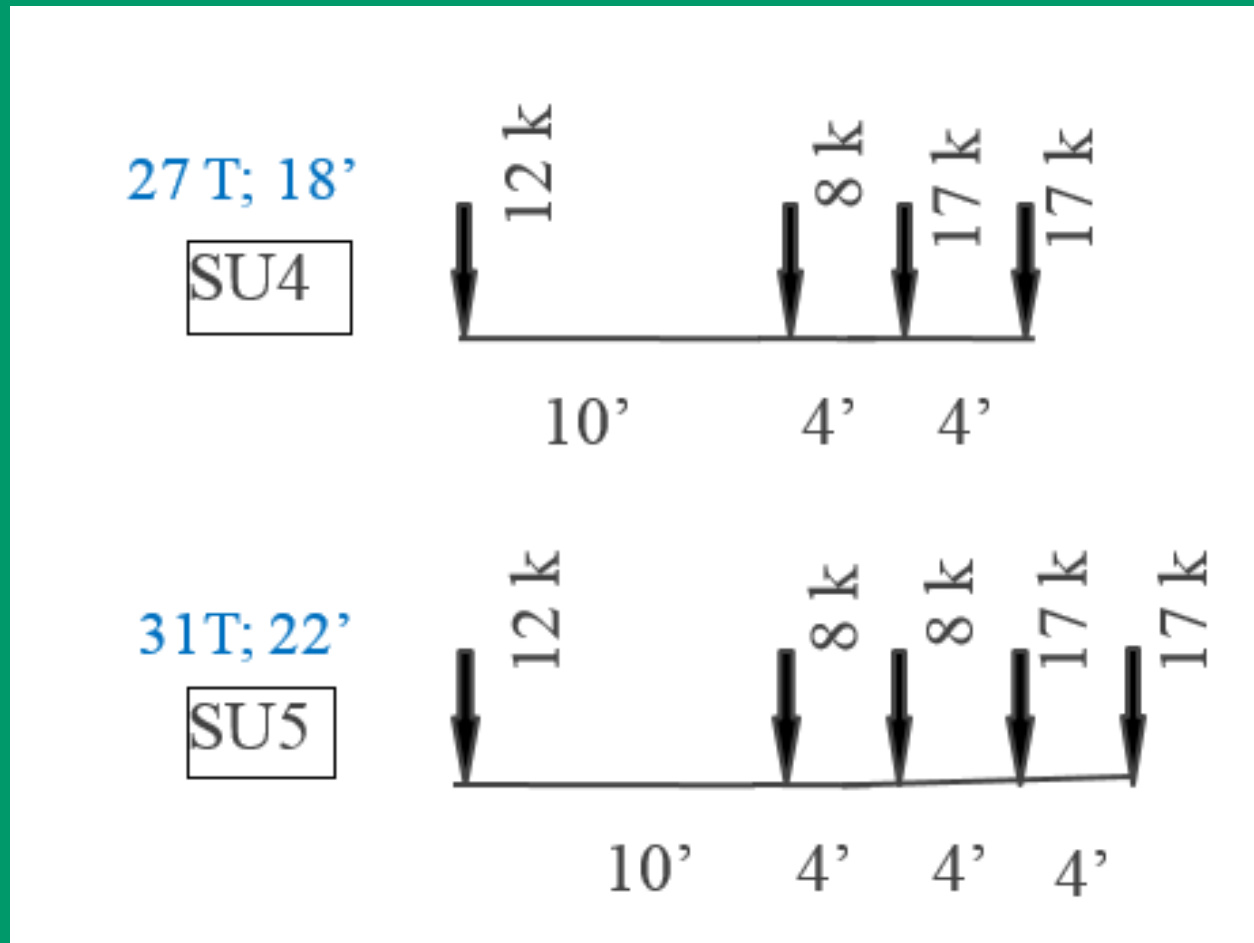
A State may utilize an alternative approach in lieu of the above to address the load rating for SHVs for bridges in their inventory; however, the approach must be reviewed and formally accepted by FHWA.

The timeline presented above will be incorporated into the review of Metric 13 under the National Bridge Inspection Program (NBIP); specifically, it is expected that all bridges meeting Group 1 criteria be load rated for SHVs by the end of 2017. Please work with your State to assist them in developing appropriate actions to meet those timelines. If your State is currently developing or implementing a Plan of Corrective Actions (PCA) for load rating bridges, the PCA should be reviewed and modified as necessary to take into account the rating of SHVs for those bridges and these timelines.

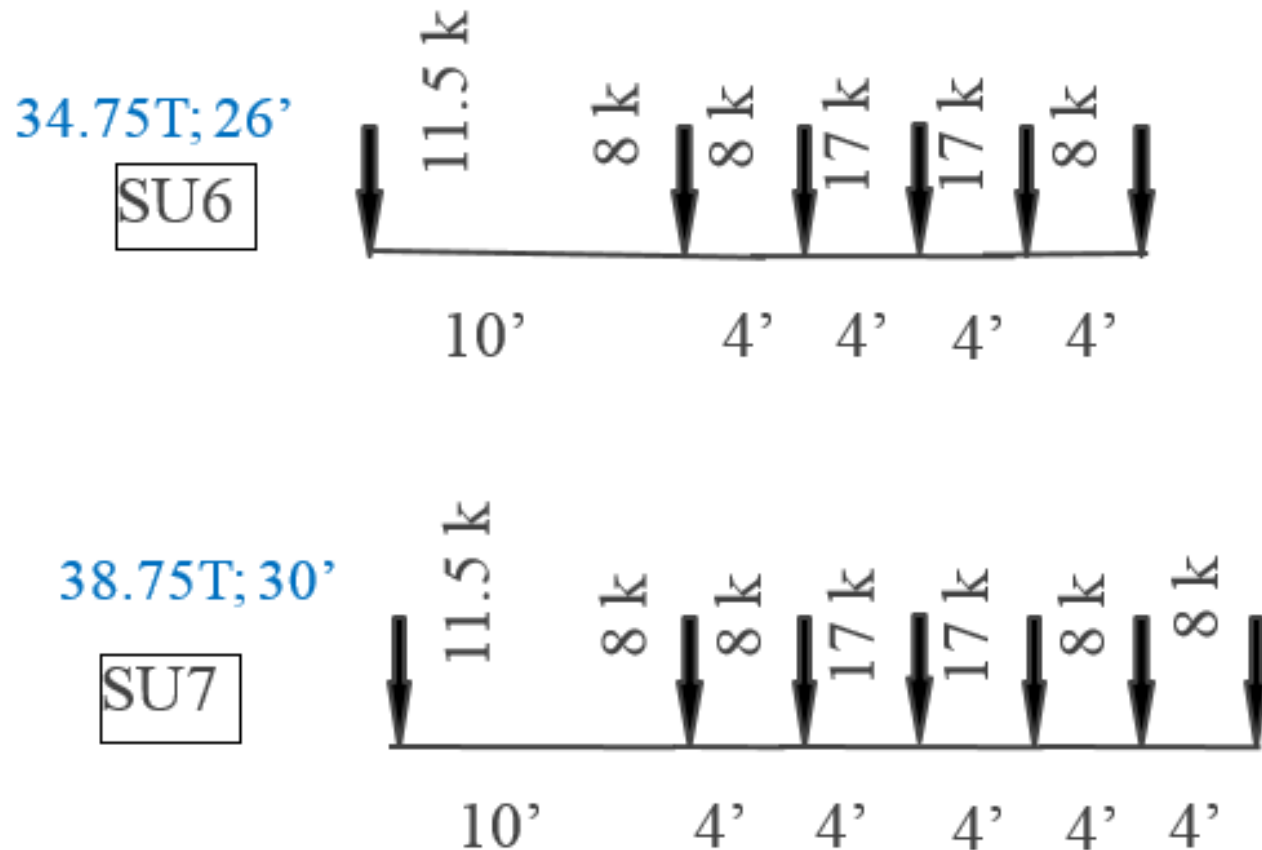
We request that you share this memorandum with your State or Federal agency partner. All questions that cannot be resolved at the Division Office level should be directed to Lubin Gao at [lubin.gao@dot.gov](mailto:lubin.gao@dot.gov) or at 202-366-4604.



# AASHTO SHV Configurations

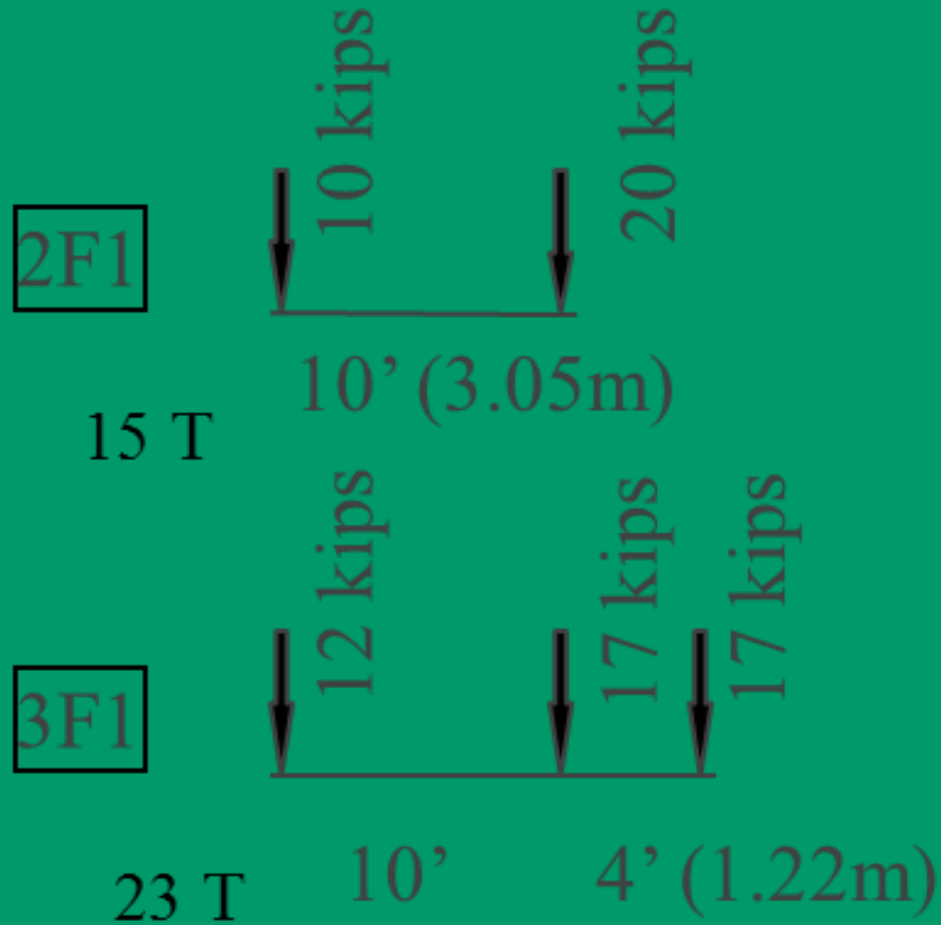


# AASHTO SHV Configurations

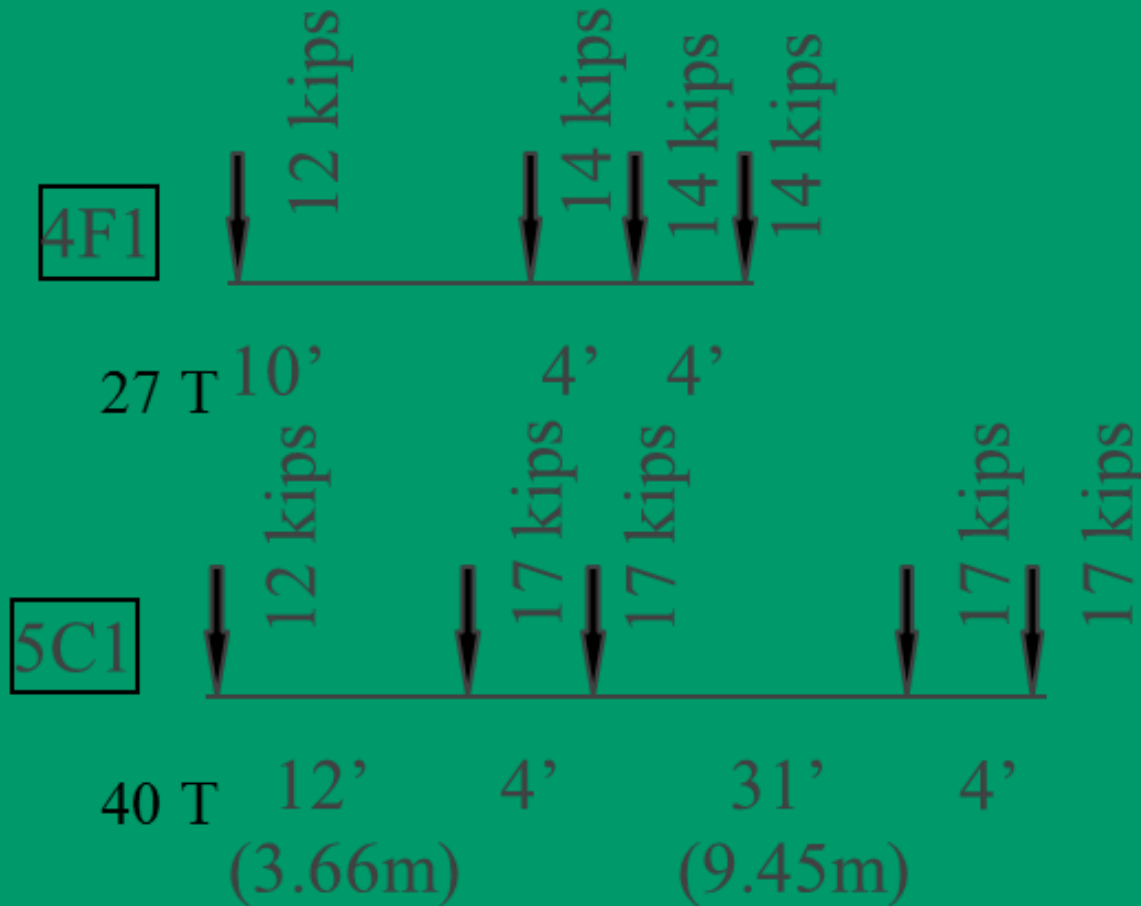




# Ohio Legal Loads



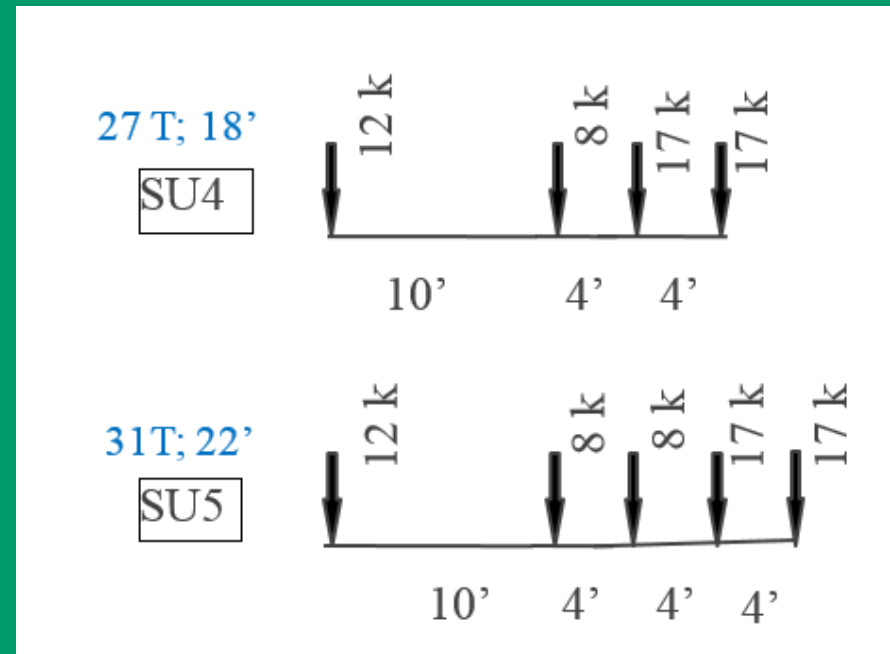
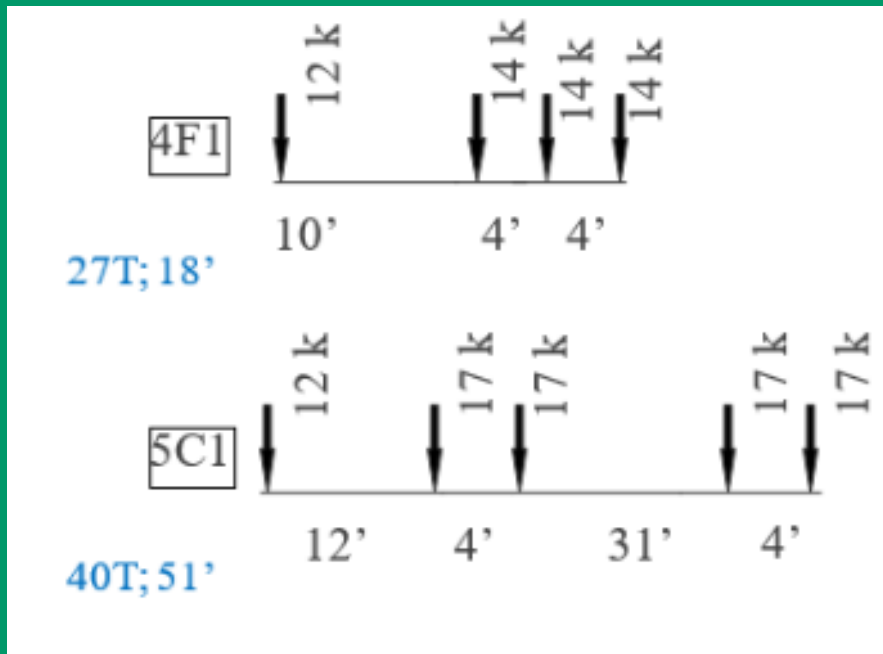
# Ohio Legal Loads



# Ohio Legal Loads

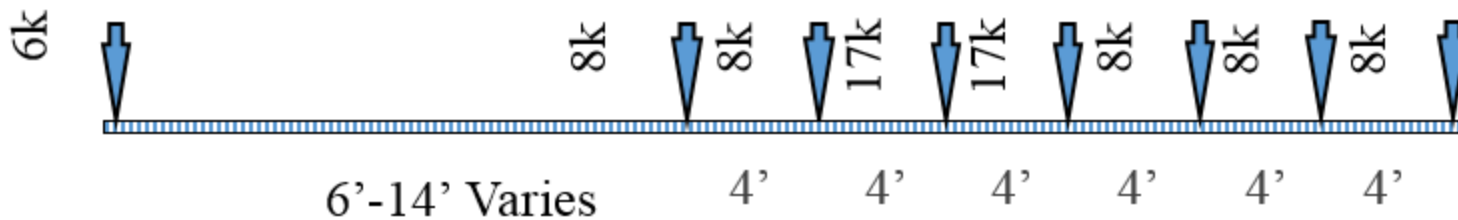
## Ohio Legal Loads

## AASHTO SHV




# SHV Configurations

Notional Rating Load (NRL); 40T; 30'-38'



# Existing Bridge Inventory

Rank	States	Amount	
# 1	<a href="#">Texas:</a>	48,492	
# 2	<a href="#">Ohio:</a>	27,901	
# 3	<a href="#">Illinois:</a>	25,661	
# 4	<a href="#">Kansas:</a>	25,620	
# 5	<a href="#">Iowa:</a>	24,992	
# 6	<a href="#">Missouri:</a>	23,787	
# 7	<a href="#">California:</a>	23,764	
# 8	<a href="#">Oklahoma:</a>	23,249	
# 9	<a href="#">Pennsylvania:</a>	22,176	
# 10	<a href="#">Tennessee:</a>	19,490	
# 11	<a href="#">Indiana:</a>	18,138	
# 12	<a href="#">New York:</a>	17,382	
# 13	<a href="#">North Carolina:</a>	17,193	
# 14	<a href="#">Mississippi:</a>	16,830	
# 15	<a href="#">Alabama:</a>	15,715	
# 16	<a href="#">Nebraska:</a>	15,455	
# 17	<a href="#">Georgia:</a>	14,456	
# 18	<a href="#">Wisconsin:</a>	13,651	
# 19	<a href="#">Kentucky:</a>	13,523	
# 20	<a href="#">Louisiana:</a>	13,394	



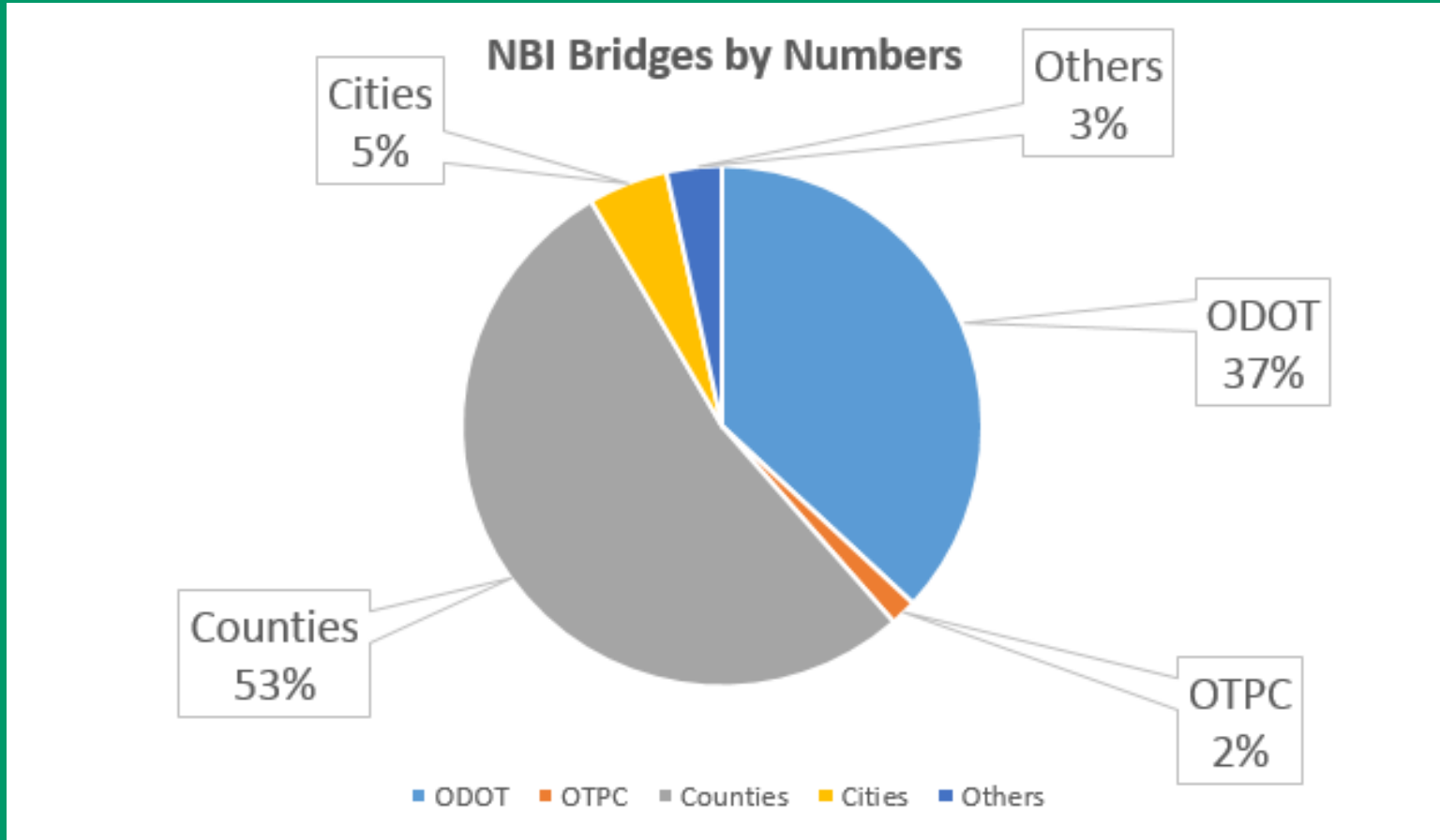
# Existing Bridge Inventory

# 21	<a href="#">Virginia:</a>	13,055	
# 22	<a href="#">Minnesota:</a>	12,975	
# 23	<a href="#">Arkansas:</a>	12,451	
# 24	<a href="#">Florida:</a>	11,451	
# 25	<a href="#">Michigan:</a>	10,654	
# 26	<a href="#">South Carolina:</a>	9,149	
# 27	<a href="#">Colorado:</a>	8,097	
# 28	<a href="#">Washington:</a>	7,427	
# 29	<a href="#">Oregon:</a>	7,202	
# 30	<a href="#">Arizona:</a>	6,955	
# 31	<a href="#">West Virginia:</a>	6,862	
# 32	<a href="#">New Jersey:</a>	6,377	
# 33	<a href="#">South Dakota:</a>	5,966	
# 34	<a href="#">Montana:</a>	5,098	
# 35	<a href="#">Massachusetts:</a>	4,999	
# 36	<a href="#">Maryland:</a>	4,994	
# 37	<a href="#">North Dakota:</a>	4,518	
# 38	<a href="#">Connecticut:</a>	4,172	
# 39	<a href="#">Idaho:</a>	4,053	
# 40	<a href="#">New Mexico:</a>	3,835	
# 41	<a href="#">Wyoming:</a>	3,038	
# 42	<a href="#">Utah:</a>	2,793	
# 43	<a href="#">Vermont:</a>	2,686	
# 44	<a href="#">Maine:</a>	2,364	
# 45	<a href="#">New Hampshire:</a>	2,352	
# 46	<a href="#">Nevada:</a>	1,612	
# 47	<a href="#">Alaska:</a>	1,174	
# 48	<a href="#">Hawaii:</a>	1,097	
# 49	<a href="#">Delaware:</a>	841	
# 50	<a href="#">Rhode Island:</a>	748	
# 51	<a href="#">District of Columbia:</a>	247	
Total:		590,111	

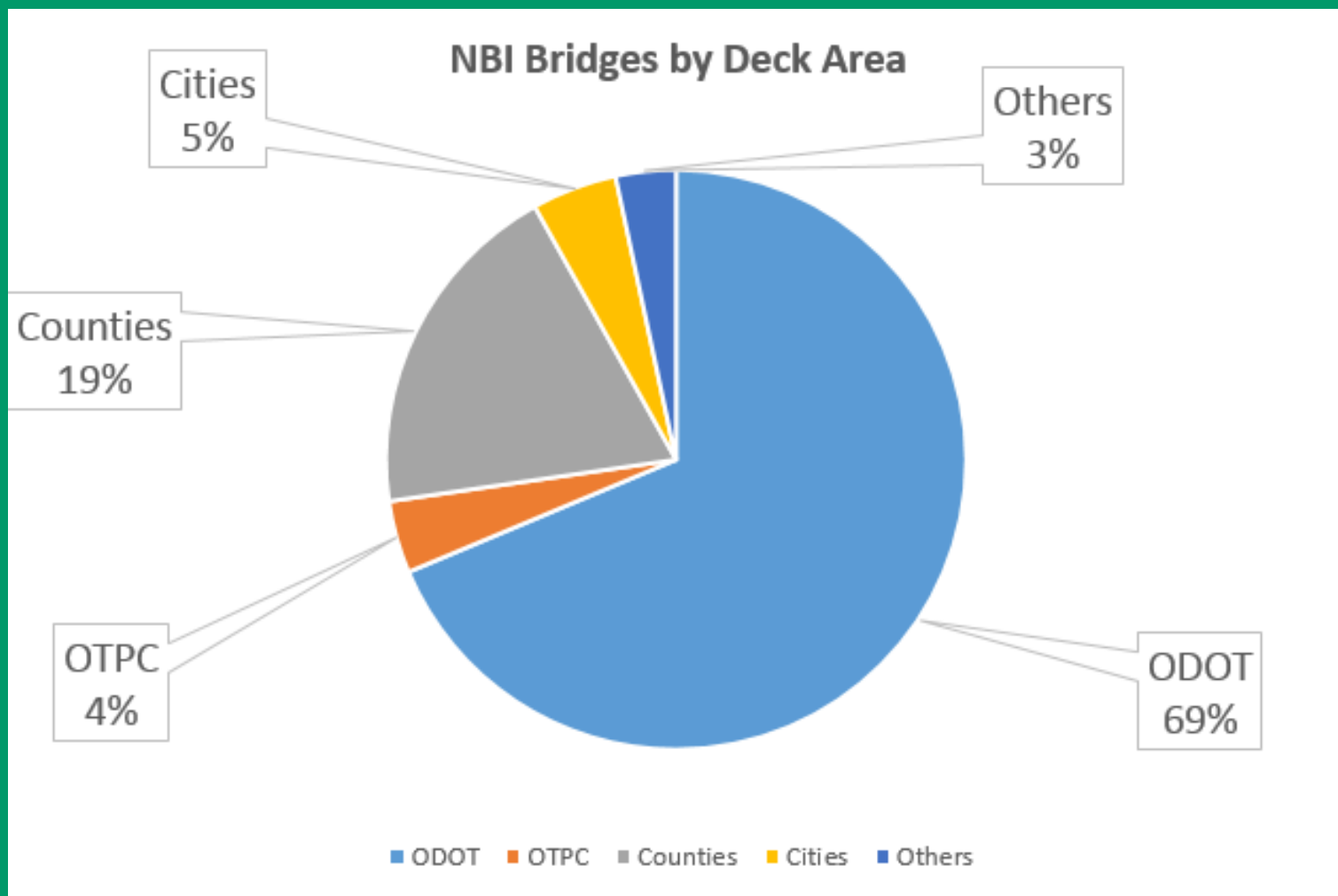
Source: [www.statemaster.com](http://www.statemaster.com)



# Existing Bridge Inventory



# Existing Bridge Inventory





# Load Rating – New Bridges

## Legal and Posting Load Rating Trucks

**All new legal & posting load ratings performed after December 1, 2015 shall include SHVs (SU4, SU5, SU6 & SU7) as well as current Ohio Legal Loads (2F1, 3F1, 4F1, 5C1)**



# Load Rating – Existing Bridges

## Group Inventory into 3 Groups:

- **Group A – Ohio Legal RF  $\geq 1.35$**
- **Group B – Ohio Legal RF  $\geq 1.0$  and RF  $< 1.35$**
- **Group C – Ohio Legal RF  $< 1.0$  (posted bridges)**



# Load Rating – Existing Bridges

## Group A

- **No Action Required**
- **ODOT to prepare and submit study to FHWA to verify Ohio Legal Loads RF threshold of 1.35**



# Load Rating – Existing Bridges

## Group B

- Re-rate per current method of analysis (LFR or LRFR)
- Prepare an updated BR-100
- Update Bridge Inventory
- Post the bridge if needed
- Complete by Dec. 31, 2022



# Load Rating – Existing Bridges

## Group C

- **Re-rate per current method of analysis (LFR or LRFR).**
- **Prepare an updated BR-100**
- **Update Bridge Inventory**
- **Install new posting sign**
- **Complete by Jan. 1, 2018**



# Load Rating – Existing Bridges

## Group B - NBI Bridges only

<b>Inspection Responsibility</b>	<b>COUNT Structure File Number</b>
<b>ODOT</b>	608
<b>OTPC</b>	100
<b>CEAO</b>	6157
<b>MUNI</b>	335



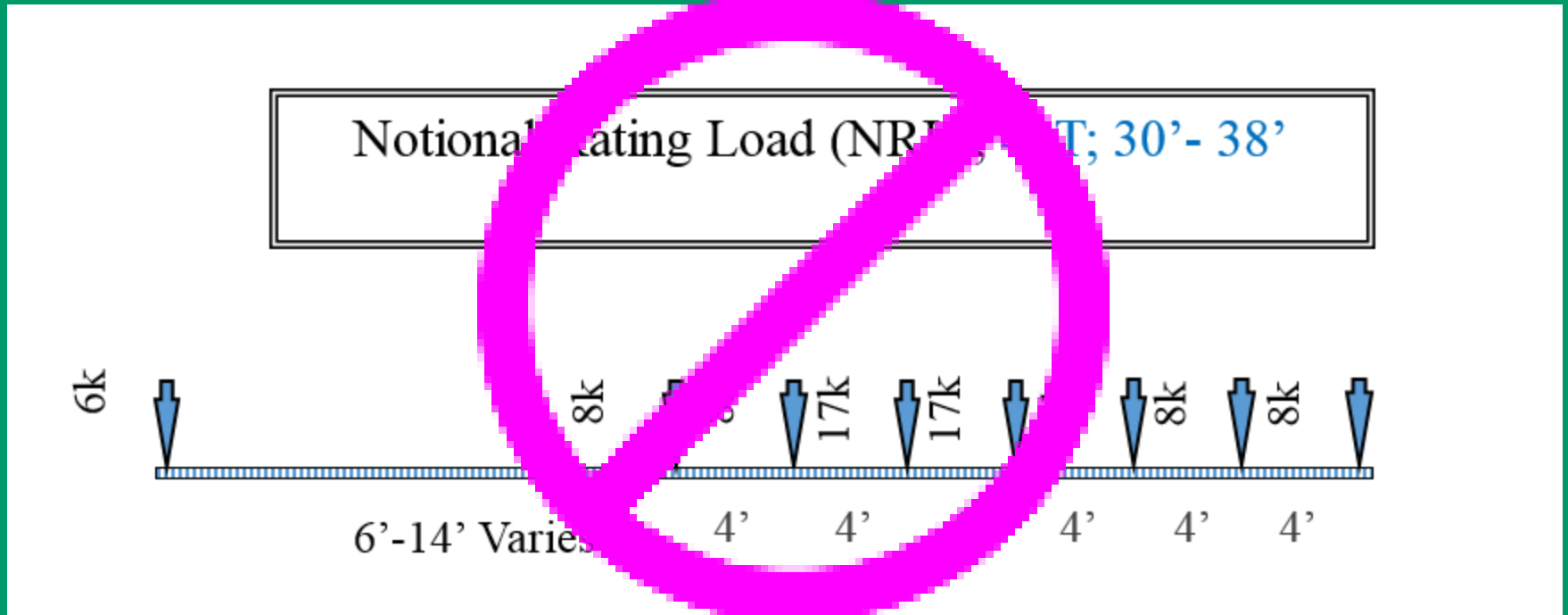
# Load Rating – Existing Bridges

## Group C - NBI Bridges only

<b>Inspection Responsibility</b>	<b>COUNT Structure File Number</b>
<b>ODOT</b>	20
<b>OTPC</b>	1
<b>CEAO</b>	1,172
<b>MUNI</b>	52



# SHV Configurations





# WEIGHT LIMIT



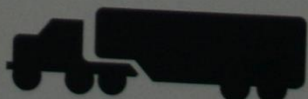
15T



16T



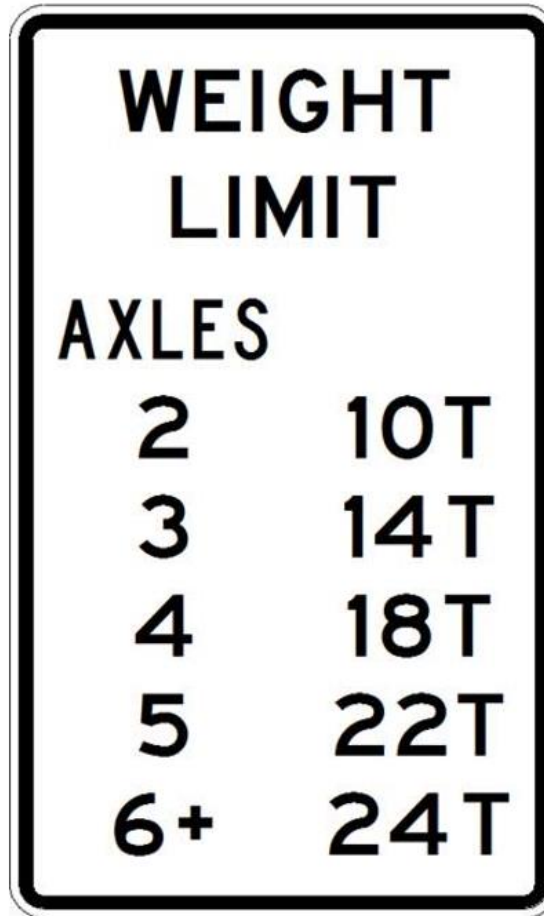
17T



30T



# New Load Posting Sign



A rectangular sign with a black border and rounded corners. The text is in bold, black, sans-serif font. At the top, it says 'WEIGHT LIMIT' in two lines. Below that, it says 'AXLES'. Then, it lists five rows of axle counts and their corresponding weight limits: 2 axles for 10T, 3 axles for 14T, 4 axles for 18T, 5 axles for 22T, and 6+ axles for 24T.

WEIGHT LIMIT	
AXLES	
2	10T
3	14T
4	18T
5	22T
6+	24T

NEW BRIDGE LOAD POSTING SIGN

(Size: 36 inches by 60 inches)







# Load Rating – Existing Bridges

## Proposed Plan

- ODOT will identify bridges in Groups A, B, & C (first cut)
- ODOT will keep track of completed load ratings
  - Counties/Cities/Consultants will update SMS
  - All completed work will be notified:
    - OTPC will notify Amjad Waheed (ODOT)
    - Counties will notify Mark Stockman (CEAO)
    - Cities will notify Omar Abu-Hajar (ODOT)



# Load Rating – Existing Bridges

## Proposed Plan For ODOT

- All ODOT bridges will be load rated by ODOT Central office
- **Expectations**
  - ODOT Districts assist in providing the plans and information
  - ODOT expects to meet the deadlines



# Load Rating – Existing Bridges

## Proposed Plan For OTPC

- The Ohio Turnpike Commission get their bridges by OTPC
  
- **Expectations**
  - Consultants hired by OTPC will assist
  - OTPC will meet the deadlines



# Load Rating – Existing Bridges

## Proposed Plan For Counties

- CEAO will manage the projects for bridges that were previously load rated by a consultant
  - Counties may hire consultants individually to complete the work
- **Expectations**
  - Use same consultant who originally load rated a bridge wherever and whenever it is possible





# Load Rating – Existing Bridges

## Proposed Plan For Counties

- **Additional funds of \$460,000 were approved by ODOT/FHWA**
- Counties will administer their contracts
- Preferably use the same consultants who originally load rated the bridges
- ODOT and County will split the cost of load rating equally
- Funds are solely for load rating work.  
Inspections cannot be done using these funds



# Load Rating – Existing Bridges

## Proposed Plan For Cities

- ODOT/Cities will manage the projects for bridges that were previously load rated by a consultant
  - Cities may hire consultants individually to complete the work
- **Expectations**
  - Use same consultant who originally load rated a bridge wherever and whenever it is possible



# Load Rating – Existing Bridges

## How will ODOT help?

- **Spread Sheets have been updated**
  - Testing is being done by a few counties
  - Will be posted to ODOT FTP site within a week
- **New BR-100 Load Rating Summary Form has been posted on ODOT FTP**



# Load Rating Spreadsheets with SHV

Load Rating Summary - Ohio Legal Trucks				
Loading Type	GVW (Tons)	Rating Factor - RF		Safe GVW (Tons)
		Inventory	Operating	
HL-93	36	0.319	0.413	15
Ohio Legal - 2F1	15	<del>0.319</del>	0.900	14
Ohio Legal - 3F1	23	<del>0.319</del>	0.616	14
Ohio Legal - 4F1	27	<del>0.319</del>	0.555	15
Ohio Legal - 5C1	40	<del>0.319</del>	0.633	25
Ohio Legal Loads Overall Minimum Rating Factor				
55%				
Ohio Legal Loads Overall Controlling Truck				
Ohio Legal - 4F1				

Load Rating Summary - Specialized Hauling Vehicles (SHV)			
Loading Type	GVW (Tons)	Rating Factor - RF	Safe GVW (Tons)
		Operating	
SU4	27	0.550	15
SU5	31	0.510	16
SU6	34.75	0.462	16
SU7	38.75	0.432	17



# Load Rating – New Bridges

## How will ODOT help?

- Load rating requirements for SHV is incorporated in ODOT's BDM in the July 2016 release.
- New Load Posting Sign is included in Ohio Manual of Uniform Traffic Control Devices (MUTCD) the January 2016 release.



# New BR-100

BRIDGE LOAD RATING SUMMARY REPORT									
OFFICE OF STRUCTURAL ENGINEERING									
OHIO DEPARTMENT OF TRANSPORTATION									
SFN		BRIDGE NUMBER		DISTRICT					
6800203		PRE-035-0963		8					
ORIGINAL CONSTRUCTION	REHABILITATION YEAR	OVERALL STRUCTURE	FEATURE INTERSECTION						
1932		22 ft	Trib of Seven Mile Creek						
SPECIAL ASSUMPTIONS & COMMENTS	It is a CON/SPAN culvert built in 1932. It was not load rated at that time. No software available to accurately model it. The culvert is in very good shape with GA=8 and performing well. A load rating is being assigned to this structure based on the original design load.								
<b>PLEASE SELECT ON RIGHT, WHERE APPROPRIATE, BY USING THE DROP DOWN ARROW BUT</b>									
LOAD RATING PURPOSE:		1 - Initial Load Rating							
LOAD RATING SOFTWARE:		0 - Assigned rating (No calculations were done)							
RATING SOURCE:		1 - Plan information available for load rating analysis (Default)							
RATING METHOD:		6 - Load Factor (LF) rating reported by rating factor (RF)							
ORIGINAL DESIGN LOADING:		6 - HS20-44 & Alternate Military Loading							
STRUCTURE RATING SUMMARY									
OHIO LEGAL				SPECIALIZED HAULING VEHICLES (SHV)					
Loading Type	GVW (Tons)	Rating Factor - RF		Legal Weight (Tons)	Loading Type	GVW (Tons)	Rating Factor - RF		Legal Weight (Tons)
		Inv.	Oper.				Oper.		
HS20 Loading	36	1.000	1.250	36.00					
Ohio - 2F1	15	<del>X</del>	1.500	15.00	SU4	27		1.500	27.00
Ohio - 3F1	23	<del>X</del>	1.500	23.00	SU5	31		1.500	31.00
Ohio - 4F1	27	<del>X</del>	1.500	27.00	SU6	34.75		1.500	34.75
Ohio - 5C1	40	<del>X</del>	1.500	40.00	SU7	38.75		1.500	38.75
Overall Posting Rating					Sign Posting Recommendation :				
150%									
BRIDGE POSTING REQUIRED BY RATING									
No load posting is recommended									
AGENCY/FIRM		OSE, ODOT			REPORT DATE:		7/28/2016		
RATED BY		PE #	PHONE NUMBER		EMAIL				
Amjad Waheed		55865	6147529972		<a href="mailto:amjad.waheed@dot.ohio.gov">amjad.waheed@dot.ohio.gov</a>				
REVIEWED BY		PE #	PHONE NUMBER		EMAIL				



# New BR-100

## No Posting Required

STRUCTURE RATING SUMMARY								
OHIO LEGAL					SPECIALIZED HAULING VEHICLES (SHV)			
Loading Type	GVW (Tons)	Rating Factor - RF		Legal Weight (Tons)	Loading Type	GVW (Tons)	Rating Factor - RF	Legal Weight (Tons)
		Inv.	Oper.				Oper.	
HS20 Loading	36	1.000	1.250	36.00				
Ohio - 2F1	15	<del>1.000</del>	1.500	15.00	SU4	27	1.500	27.00
Ohio - 3F1	23	<del>1.000</del>	1.500	23.00	SU5	31	1.500	31.00
Ohio - 4F1	27	<del>1.000</del>	1.500	27.00	SU6	34.75	1.500	34.75
Ohio - 5C1	40	<del>1.000</del>	1.500	40.00	SU7	38.75	1.500	38.75
Overall Posting Rating					Sign Posting Recommendation:			
150%								
BRIDGE POSTING REQUIRED BY RATING								
No load posting is recommended								



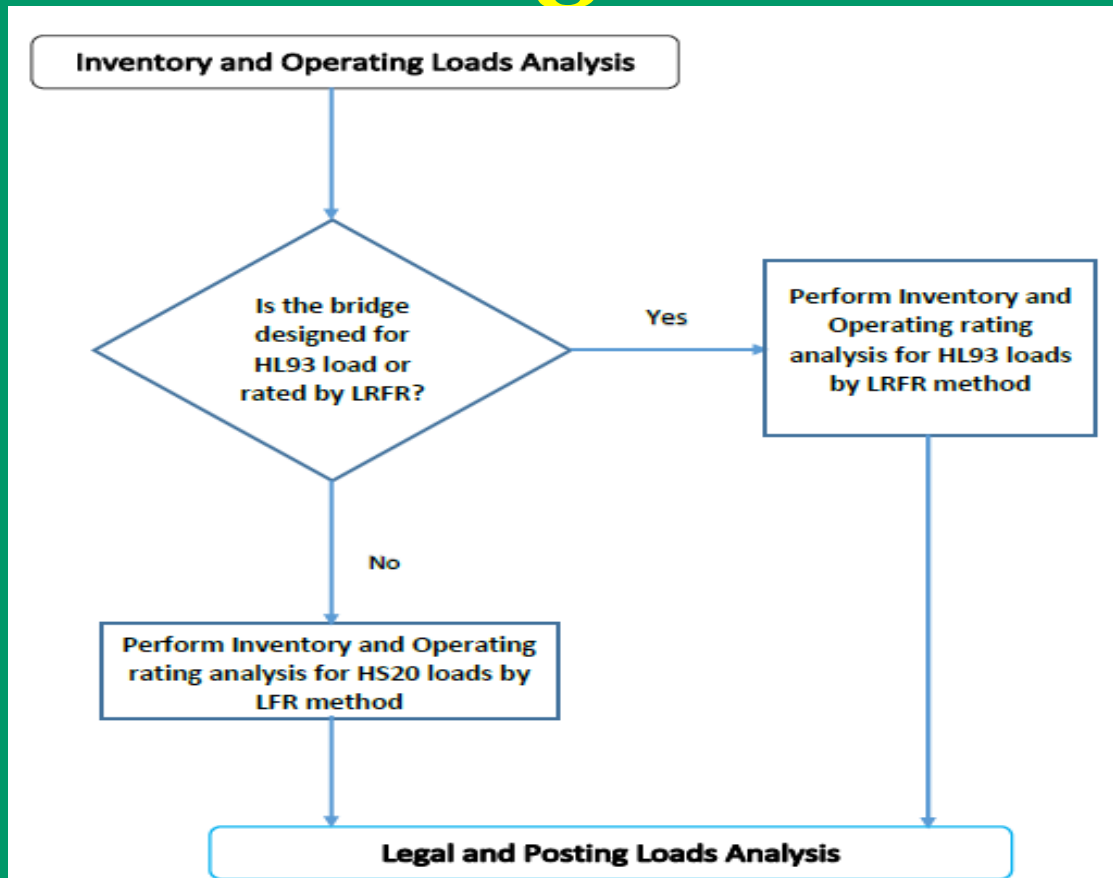
# New BR-100 Posting Required

STRUCTURE RATING SUMMARY																					
OHIO LEGAL					SPECIALIZED HAULING VEHICLES (SHV)																
Loading Type	GVW (Tons)	Rating Factor - RF		Legal Weight (Tons)	Loading Type	GVW (Tons)	Rating Factor - RF														
		Inv.	Oper.				Oper.	Legal Weight (Tons)													
HS20 Loading	36	0.244	0.408	14.69																	
Ohio - 2F1	15	<del>0.244</del>	0.653	9.80	SU4	27	0.418														
Ohio - 3F1	23	<del>0.244</del>	0.490	11.27	SU5	31	0.404														
Ohio - 4F1	27	<del>0.244</del>	0.437	11.80	SU6	34.75	0.391														
Ohio - 5C1	40	<del>0.244</del>	0.490	19.60	SU7	38.75	0.391														
<b>Overall Posting Rating</b>					<b>Sign Posting Recommendation:</b>  <table border="1"> <thead> <tr> <th colspan="2">WEIGHT LIMIT</th> </tr> <tr> <th>AXLES</th> <th></th> </tr> </thead> <tbody> <tr> <td>2</td> <td>10 T</td> </tr> <tr> <td>3</td> <td>11 T</td> </tr> <tr> <td>4</td> <td>11 T</td> </tr> <tr> <td>5</td> <td>13 T</td> </tr> <tr> <td>6+</td> <td>14 T</td> </tr> </tbody> </table>			WEIGHT LIMIT		AXLES		2	10 T	3	11 T	4	11 T	5	13 T	6+	14 T
WEIGHT LIMIT																					
AXLES																					
2	10 T																				
3	11 T																				
4	11 T																				
5	13 T																				
6+	14 T																				
40%																					
<b>BRIDGE POSTING REQUIRED BY RATING</b>																					
LOAD POSTING IS RECOMMENDED																					
<b>AGENCY/FIRM</b>	ODOT CEN OSE			<b>REPORT DATE:</b>	7/27/2016																
<b>RATED BY</b>	<b>PE #</b>	<b>PHONE NUMBER</b>		<b>EMAIL</b>																	
Cindy Wang	pe # 67618	(614) 466-1973		<a href="mailto:cindy.wang@dot.ohio.gov">cindy.wang@dot.ohio.gov</a>																	
<b>REVIEWED BY</b>	<b>PE #</b>	<b>PHONE NUMBER</b>		<b>EMAIL</b>																	





# Load Rating – Flowchart



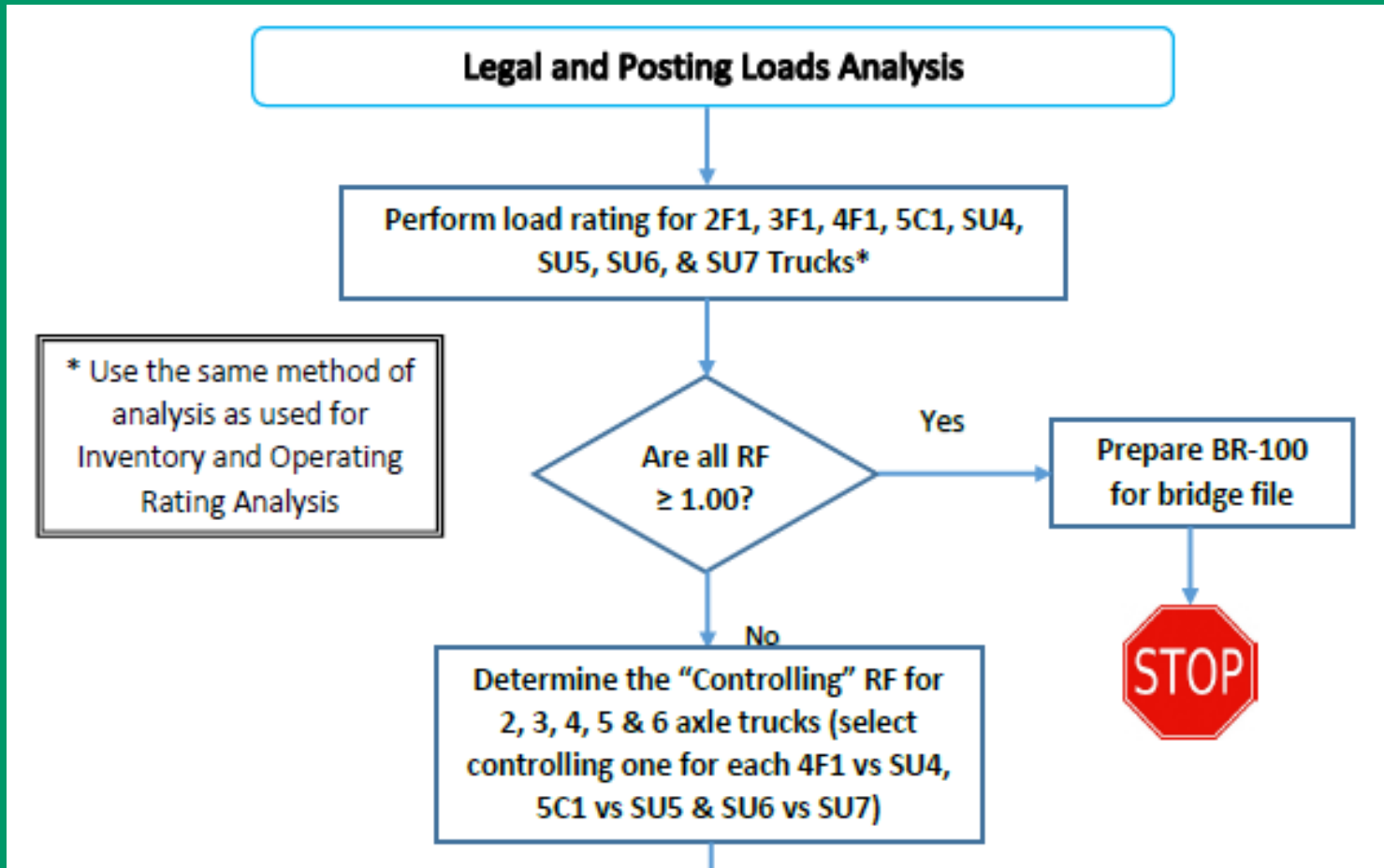
Flow Chart for Load Rating Analysis

(Continued on next page)

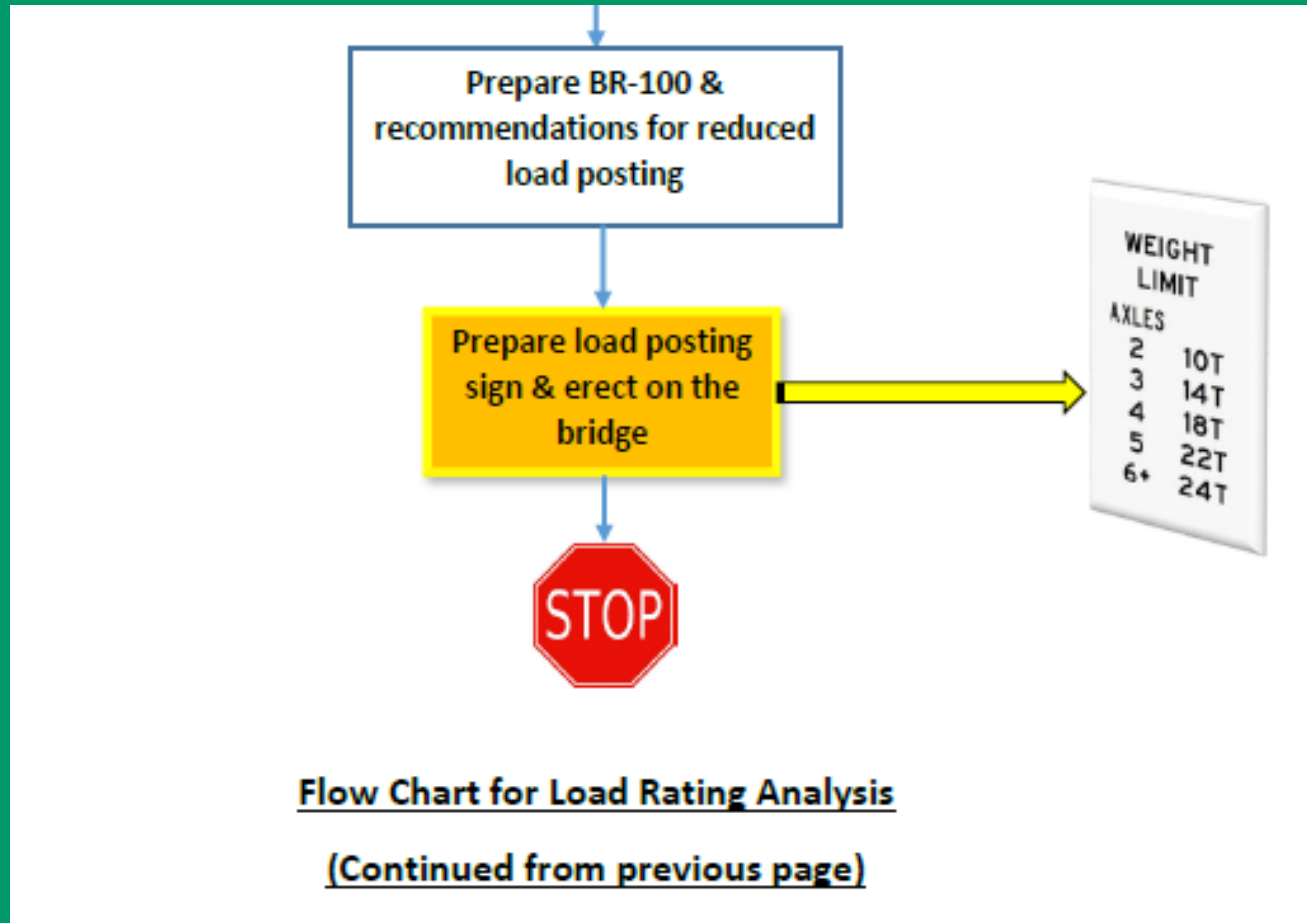
Load Rating for SHV



# Load Rating – Flowchart



# Load Rating – Flowchart



# Special Cases

- Trusses
  - Treat it like other bridge types
- Gusset Plate Analysis
  - If gusset plate analysis controls the bridge rating, re-analyze for SHVs
- Special Bridge Load Postings
  - No change in policy
- Exempt from Load Rating
  - No change in policy
- Non-Highway Bridges
  - No change in policy



# Questions?

**Amjad Waheed, PE**  
**Bridge Management and Load Rating**  
**Engineer**  
**Ohio Department of Transportation**

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