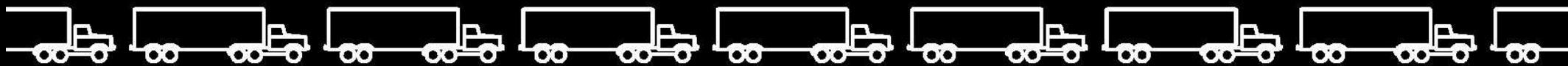
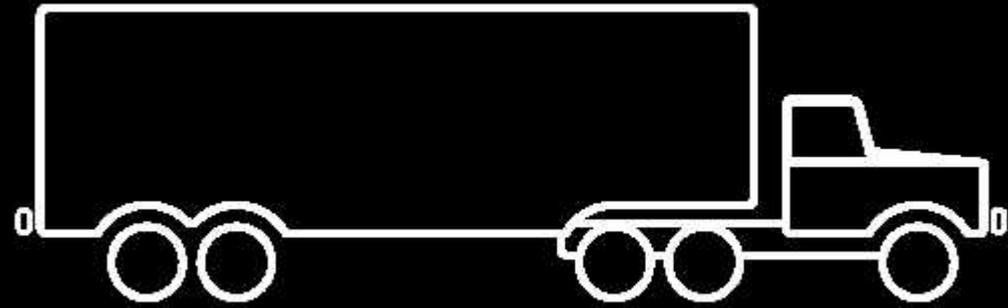
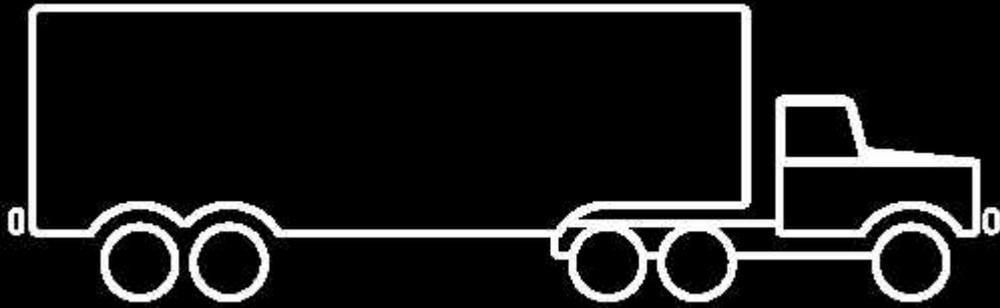


# **LONGSPAN LIVE LOAD STUDY**

**Dana.Feng@la.gov**

# **TRUCK PLATOONS & EV LOADS**

**Andrew.DeVault@dot.state.fl.us**



**TRUCK PLATOON/CONVOY**

## PROS

- Reduce fuel costs, ~10%
- Reduce labor costs
- Improve reaction time

## CONS

- Traffic interaction: enter, exit, and passing
- Fractious state-to-state regulations
- Unquantified impacts, like overloading

# **PLATOONING (CONVOY)**

**PLATOON  
FOLLOWING  
DISTANCE?**



**100' +**



**50'**



**10'**

“The two trucks traveled at a separation distance of approximately 65 feet...”

<https://www.ccjdigital.com/peloton-holds-1000-mile-platooning-demo-in-florida/>

“...45 to 50 feet at 55 mph...”

<http://www.ttnews.com/articles/fhwa-demonstrates-3-truck-platoon-virginia>

~~“It is unlawful for the driver of any motor truck... ..follow within 300 feet of another motor truck,”~~

2018 FL SB 1104 <https://www.flsenate.gov/Session/Bill/2018/01104/?Tab=BillText>

**FOLLOWING DISTANCE?**

**LEGAL LIMITS,  
SINGLE TRUCK**

**VS**

**LEGAL LIMITS,  
PLATOON TRUCKS**

**PLATOON LOADING?**

**DO PLATOONS  
REALLY OVERLOAD  
BRIDGES?**



2016 06-15 India. Gujghata. Pirojpur, Mathbaria Road over Canal (two truck platoon)



2012 08-23 China, Harbin, Yangminshan Bridge over Songhua River (overload four-truck platoon)



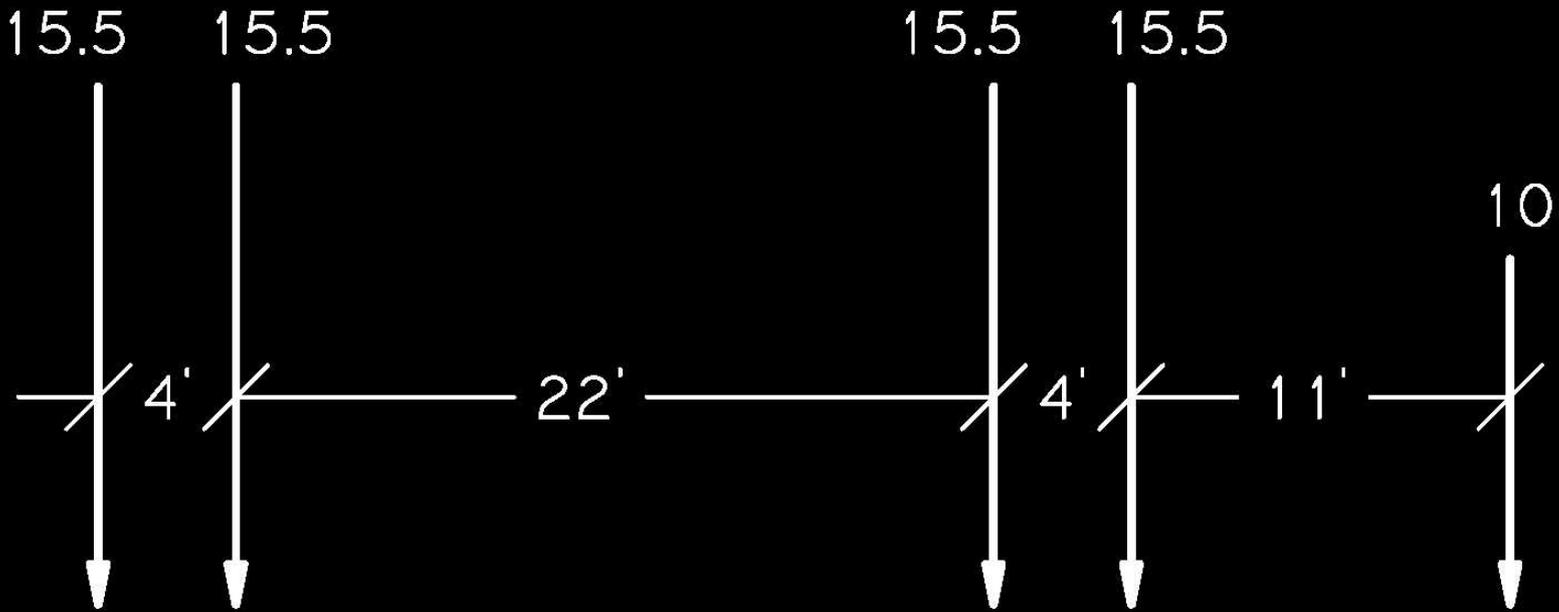
2015 06-20 China. Heyuan. Guangdong-Jiangxi Expressway (four truck platoon?)

- \* **LOAD RESTRICTED.**
- \* **SPEED LIMIT 15 KM PER HOUR.**
- \* **DO NOT APPLY BRAKES OVER THE BRIDGE.**
- \* **ONLY ONE LOADED/EMPTY TRUCK AT A TIME.**
- \* **PEDESTRIANS AND OTHER PRIVATE VEHICLES ARE PROHIBITED TO USE THIS BRIDGE.**
- \* **FOLLOW THE INSTRUCTIONS OF SECURITY PERSONNEL ON DUTY.**

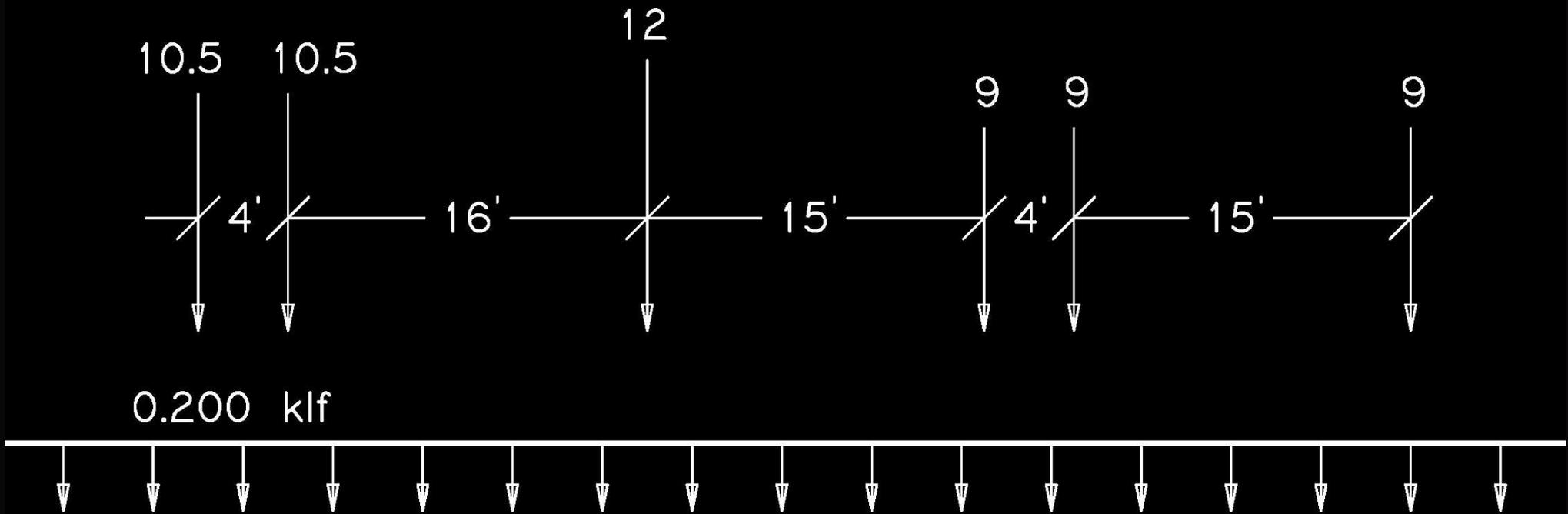
JoeGoatUk



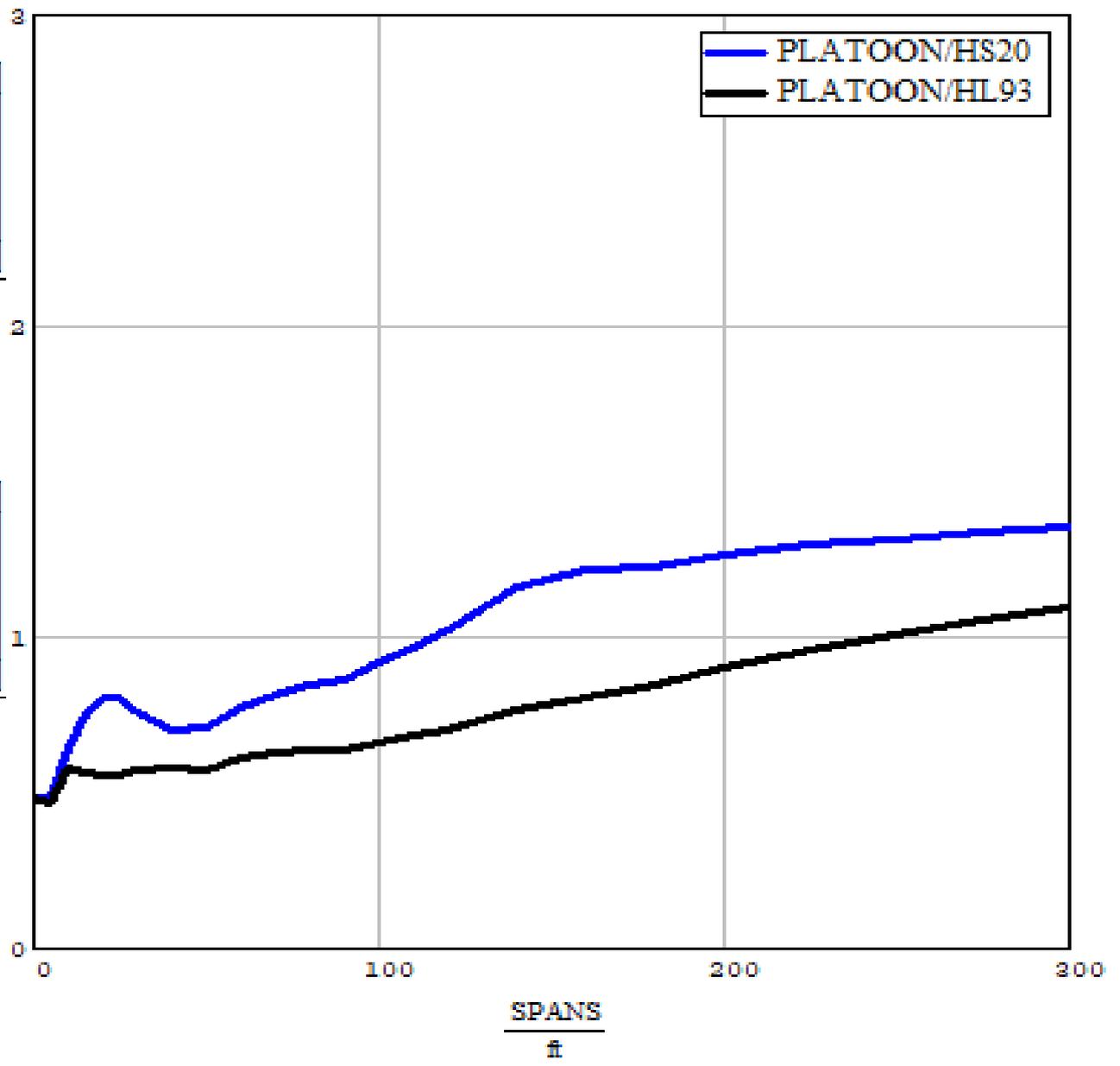
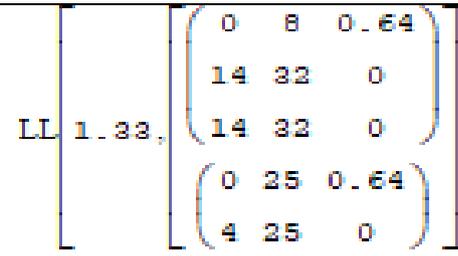
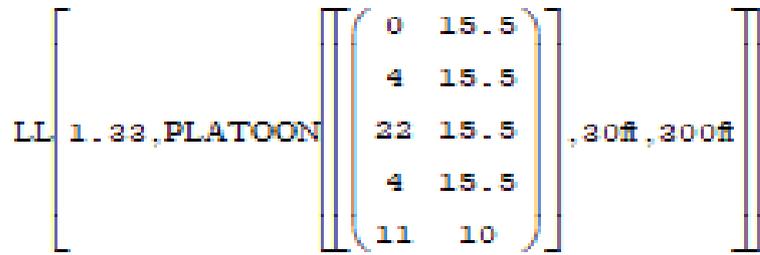
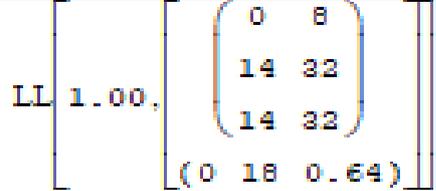
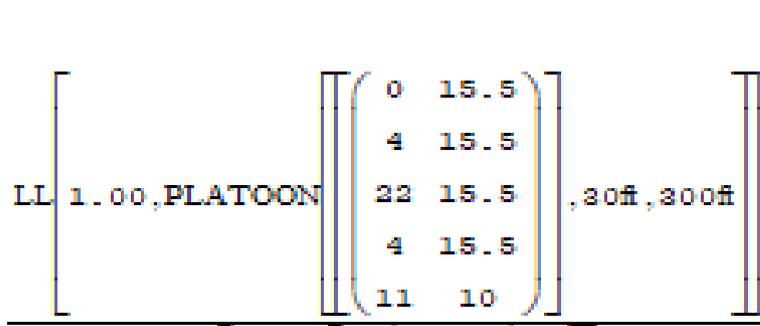
**DOES LEGAL  
LOADING DESCRIBE  
PLATOONS?**



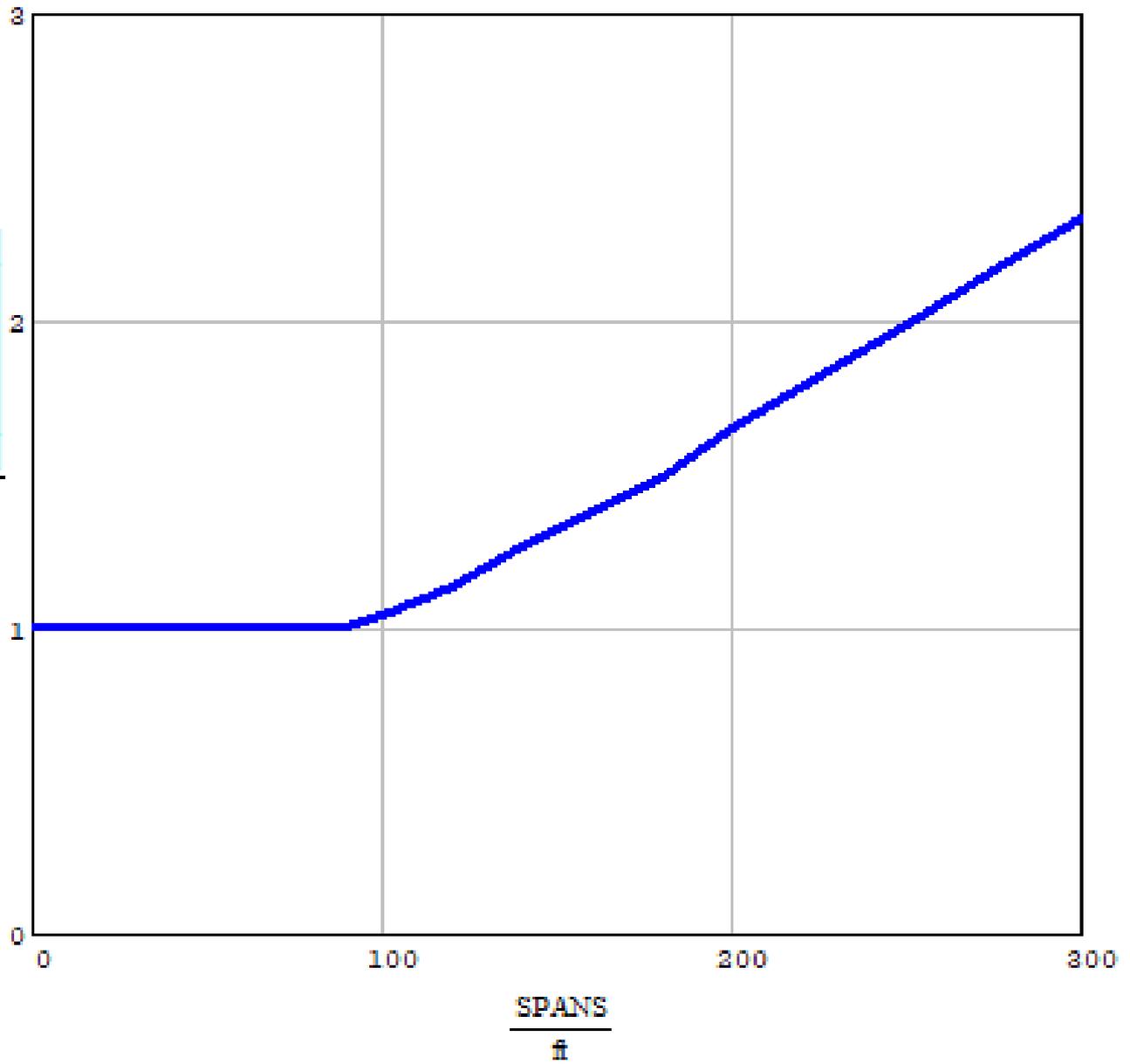
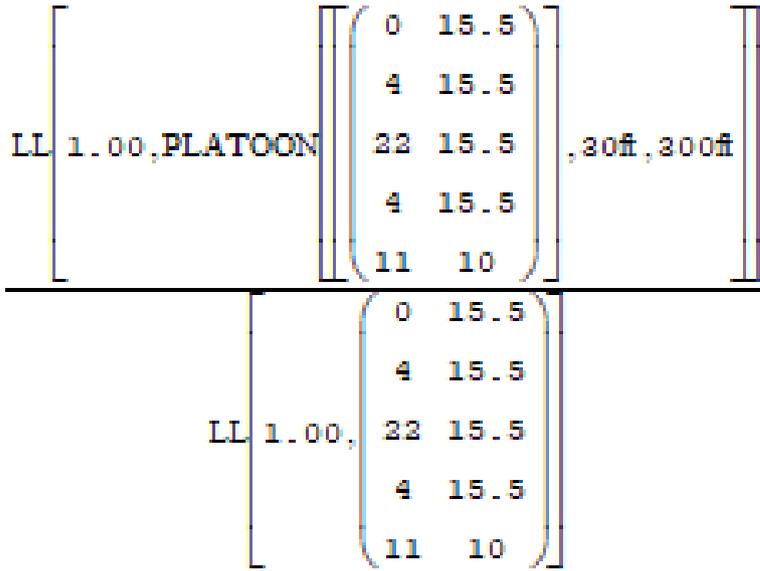
**MBE 3S2**



**LRFR MBE LANE LOAD**  
**SPAN > 200'**



**(PLATOON 3S2)/(DESIGN)**

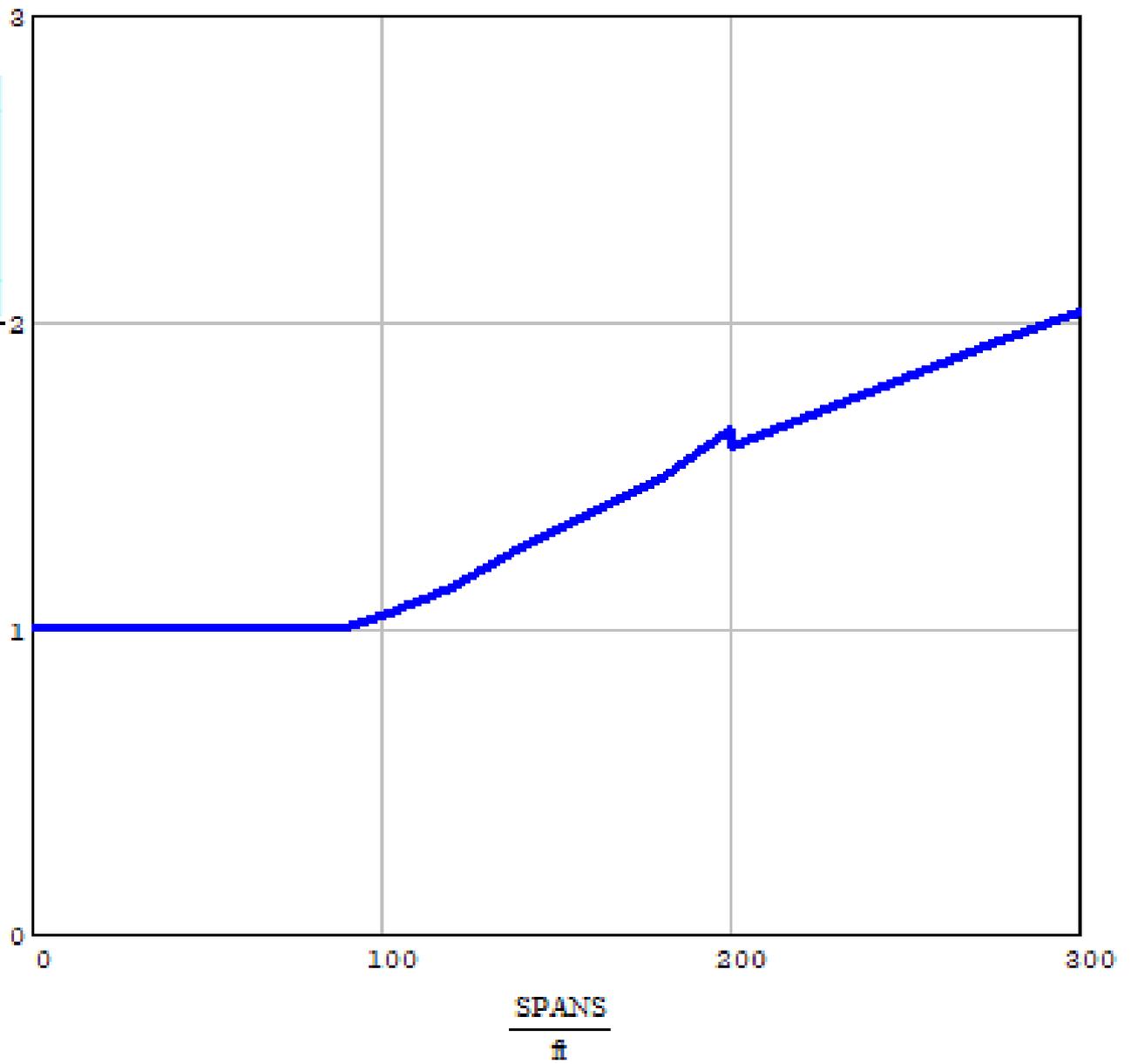


**(PLATOON 3S2)/(SINGLE 3S2)**

LL 1.33, PLATOON  $\left( \begin{array}{cc} 0 & 15.5 \\ 4 & 15.5 \\ 22 & 15.5 \\ 4 & 15.5 \\ 11 & 10 \end{array} \right)$ , 30ft, 300ft

LL 1.33,  $\left( \begin{array}{cc} 0 & 15.5 \\ 4 & 15.5 \\ 22 & 15.5 \\ 4 & 15.5 \\ 11 & 10 \end{array} \right)$

LL 1.33,  $\left( \begin{array}{ccc} 0 & 9 & -1 \\ 15 & 9 & 200 \\ 4 & 9 & 1.2 \\ 15 & 12 & 0 \\ 16 & 10.5 & 0 \\ 4 & 10.5 & 0 \end{array} \right)$



**(PLATOON 3S2)/(3S2 or LANE)**

### TRUCK PLATOONS

Kevin Dopart of USDOT Vehicle Safety & Automation. Expert.

[https://www.its.dot.gov/press/2014/kevin\\_dopart.htm](https://www.its.dot.gov/press/2014/kevin_dopart.htm), kevin.dopart@dot.gov

Steve Boyd of Peloton. Lobbyist.

<https://lobbying.wi.gov/Mobile/PrincipalInformation/2017REG/Information/7748>

Truck Platooning, Past, Present, and Future. Rolf Lockwood. 04-08-2016.

<https://www.truckinginfo.com/156677/truck-platooning-past-present-and-future>

Review of Aerodynamic Drag Reduction Devices for Heavy Trucks and Buses. Jeff Patten Et Al. National Research Council Canada, Centre for Surface Transportation Technology Project 54-A3578. 05-11-2012.

[http://www.tc.gc.ca/en/programs-policies/programs/documents/AERODYNAMICS\\_REPORT-MAY\\_2012.pdf](http://www.tc.gc.ca/en/programs-policies/programs/documents/AERODYNAMICS_REPORT-MAY_2012.pdf)

### EMERGENCY VEHICLES

A House Transportation and Infrastructure Committee Hearing discussed EVs during the markup for H.R. 3736 on 10-22-2015. Subsequently H.R. 22 passed EV legislation. <https://youtu.be/99KuKrsrTMA> 3:36:30-3:42:00

Dumb Laws: Fire Truck Weight Limits. Editorial, Illinois Truck Enforcement Association. 09-03-2016.

<http://illinoistruckcops.org/?p=7517>

# PLATOONING REFERENCES

**EV**

**CLASSIFICATION**

**AND POSTING**

FULL COMMITTEE  
**MARKUP**

•livestream•

---

October 22, 2015 @ 10:00am

[transport.house.gov](http://transport.house.gov)

**EV**

**TRANSPORTATION COMMITTEE  
10-22-2015 3:36:30 TO 3:42:00**

**DO FIRE TRUCKS  
REALLY OVERLOAD  
BRIDGES?**





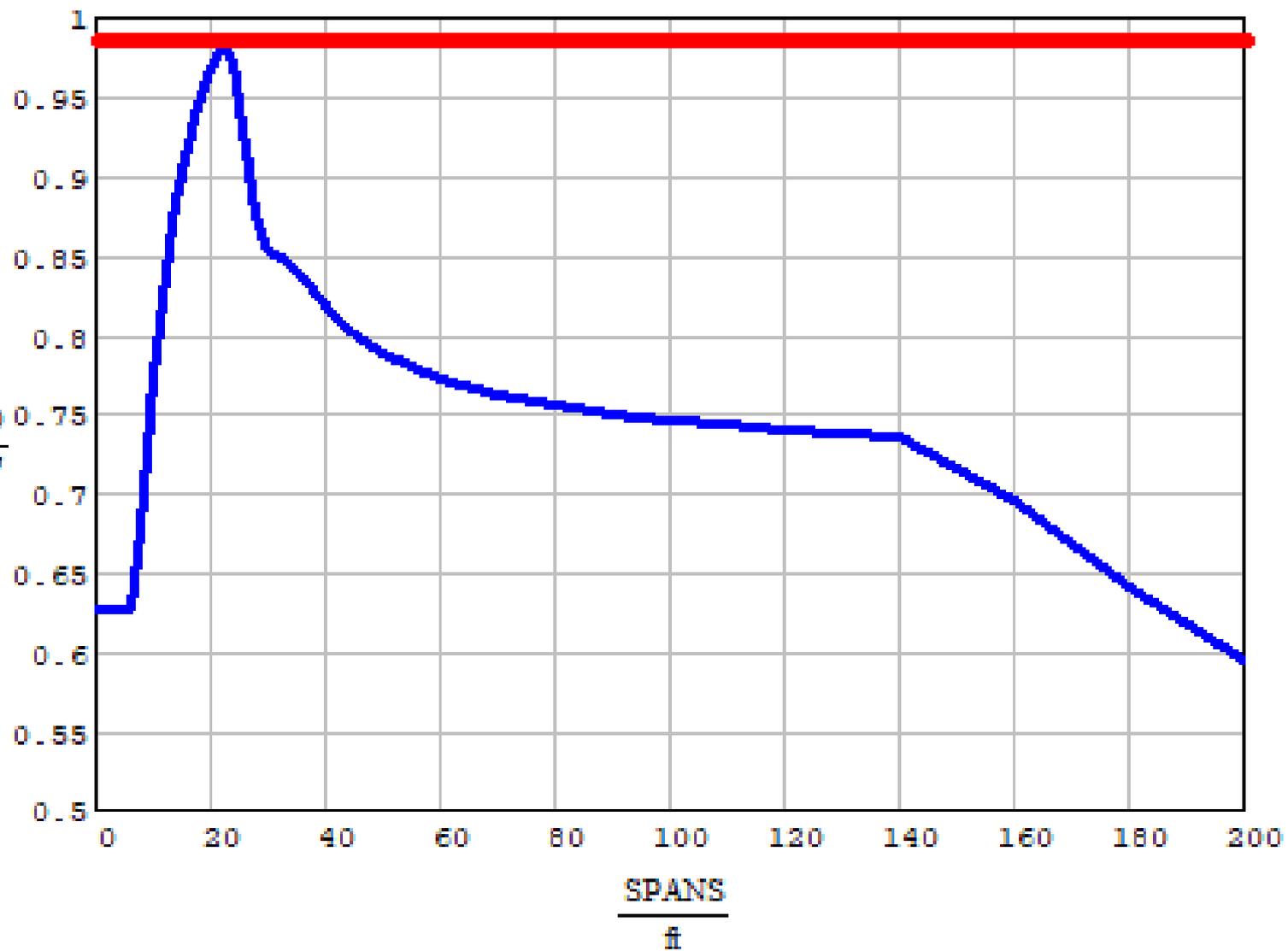
Photo taken from the Cal Fire magazine.com on 10/2/16 by Office of the Assistant Attorney General and Inspector General for Fire Engine #1111 - Jettys Rein, Ebad, over Sacramento River, CA 1/7-10-2016



# **EV CLASSIFICATION**

$$\begin{array}{l}
 \text{LL 1,} \\
 \left[ \begin{array}{c} \left( \begin{array}{cc} 0 & 24 \\ 15 & 32.5 \end{array} \right) \\ \left( \begin{array}{cc} 0 & 24 \\ 15 & 21 \\ 4 & 31 \end{array} \right) \end{array} \right] \\
 \hline
 \text{LL 1,} \\
 \left[ \begin{array}{c} \left( \begin{array}{cc} 0 & 8 \\ 14 & 32 \\ 14 & 32 \end{array} \right) \\ (0 \ 18 \ 0.64) \end{array} \right]
 \end{array}$$

1.20  
2.17



**HS20 INVENTORY RATING  
FACTOR NEEDED FOR EV**

Structure Id 720708

Parallel Structure (101)

Misc. Bridge

LR1 - Main

LR2 - Posting

Inventory Type (065) 3 LRFR Load & Res

Operating Type (063) 3 LRFR Load & Res

Original Design Load (031) HL 93

Date 5/17/2007

Initials TWF

Load Rating Rev. Recom.

Load Rating Plans Status

Built

### Inspection - 1/29/2018 (UJDT)

Condition Load Rating Inventory Roadway On Schedule

Year Built (27):	2005
Service Type On (42a):	1 Highway
Service Type Under (42b):	5 Waterway
Main Spans (45):	1
Main Span Material (43a):	5 Prestressed Concrete
Main Span Design (43b):	02 Stringer/Girder
Max Span Length (ft) (48):	120.0
Structure Length (ft) (49):	560.0

HS20/FL120 Max Span Rating

79.8 tons

Dynamic Impact in Percent

33 %

Governing Span Length

119.0 ft

Minimum Span Length

40.0 ft

Distribution Method

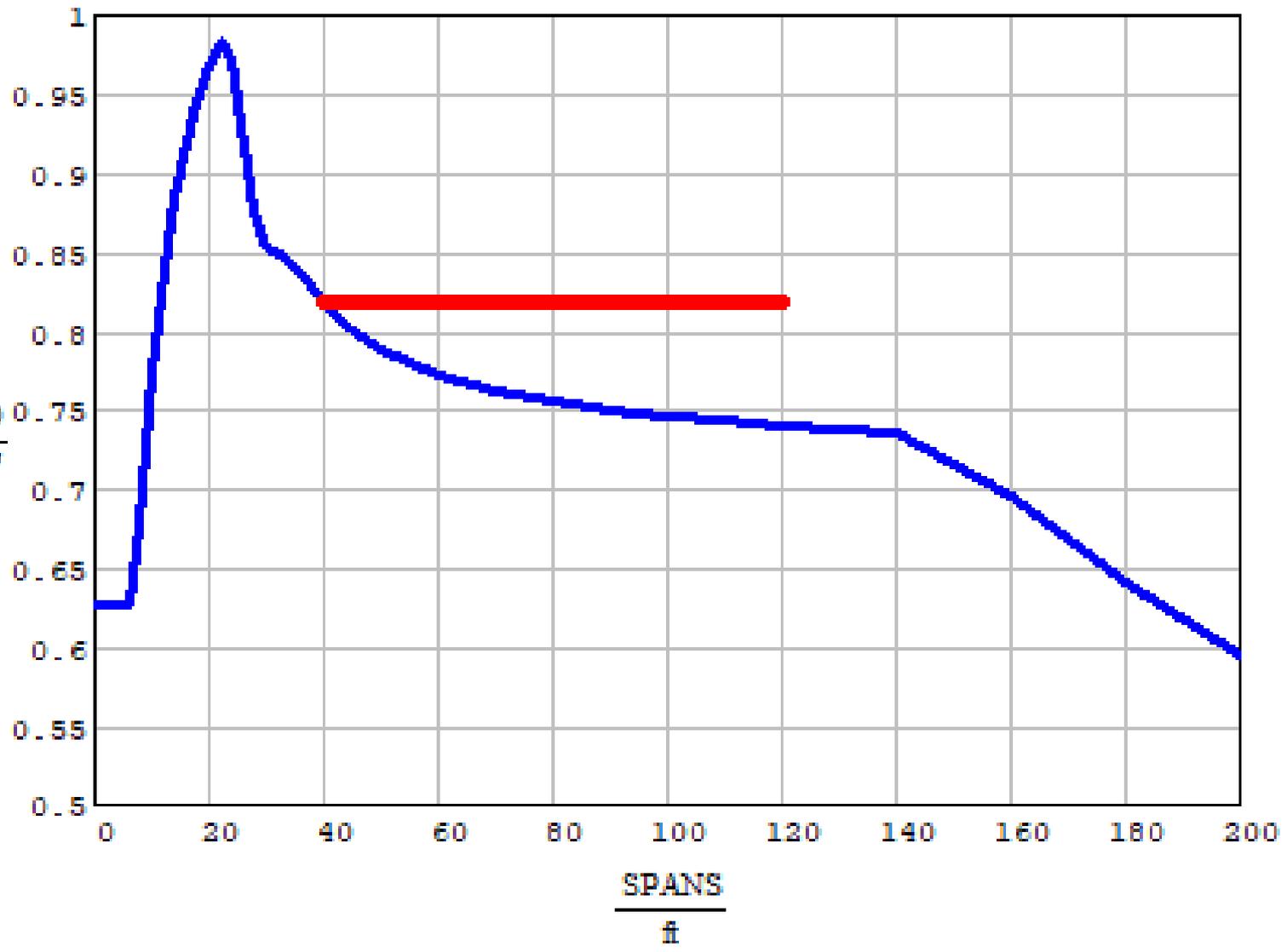
AASHTO formula

Load Rating Notes

# MINIMUM & MAXIMUM SPAN LENGTH

$$LL 1, \begin{bmatrix} \begin{pmatrix} 0 & 24 \\ 15 & 33.5 \end{pmatrix} \\ \begin{pmatrix} 0 & 24 \\ 15 & 31 \\ 4 & 31 \end{pmatrix} \\ \begin{pmatrix} 0 & 8 \\ 14 & 32 \\ 14 & 32 \end{pmatrix} \\ (0 \ 18 \ 0.64) \end{bmatrix}$$

$$\frac{1.30}{2.17}$$



**HS20 INVENTORY RATING  
FACTOR NEEDED FOR EV**

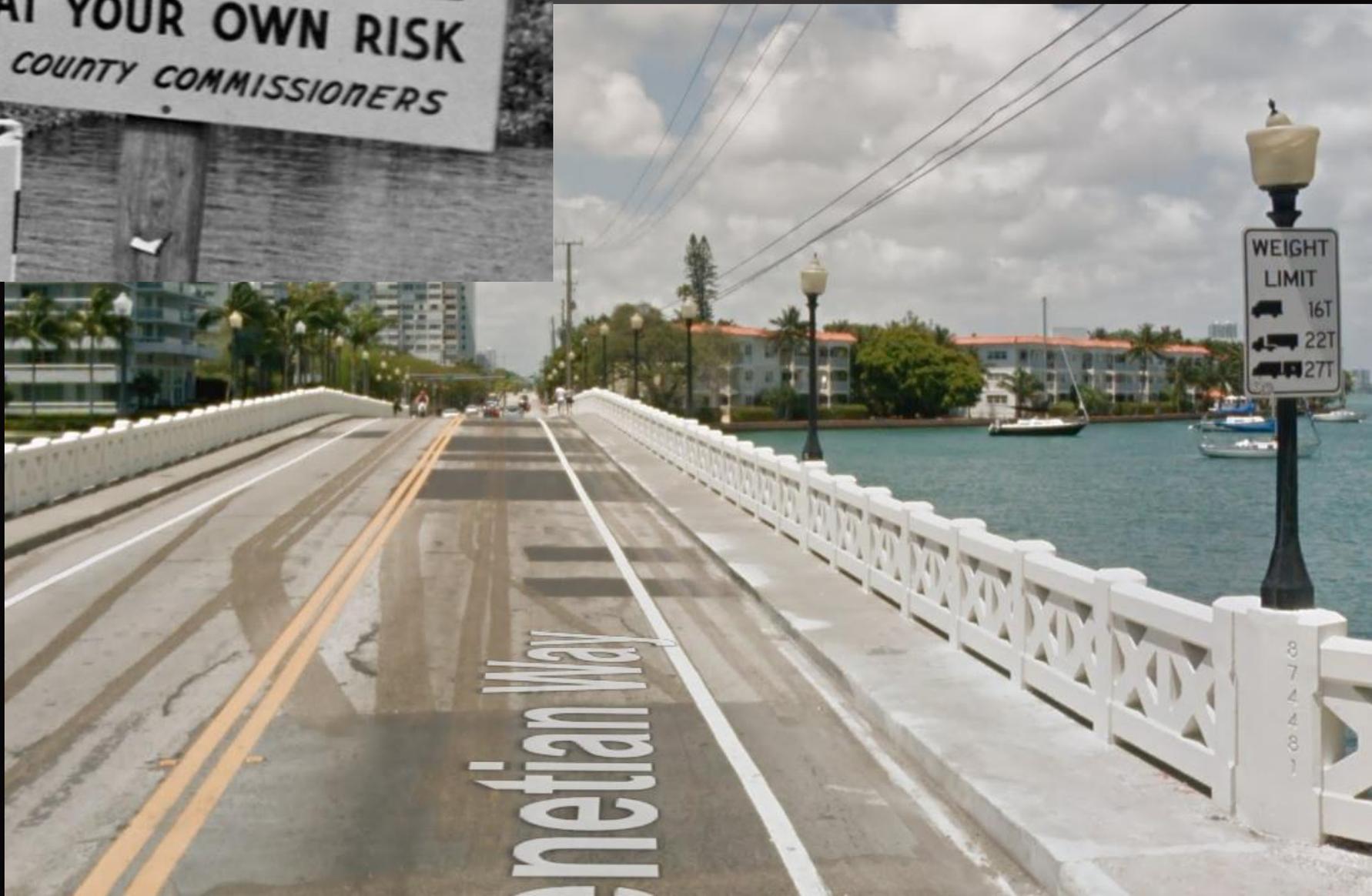
**POSTING SIGNS**  
**VS**  
**RESTRICTION MAPS**



**BRIDGE UNSAFE**  
CROSS AT YOUR OWN RISK  
*ORDER OF COUNTY COMMISSIONERS*

**POSTING, 1950s**

**BRIDGE UNSAFE**  
CROSS AT YOUR OWN RISK  
*ORDER OF COUNTY COMMISSIONERS*

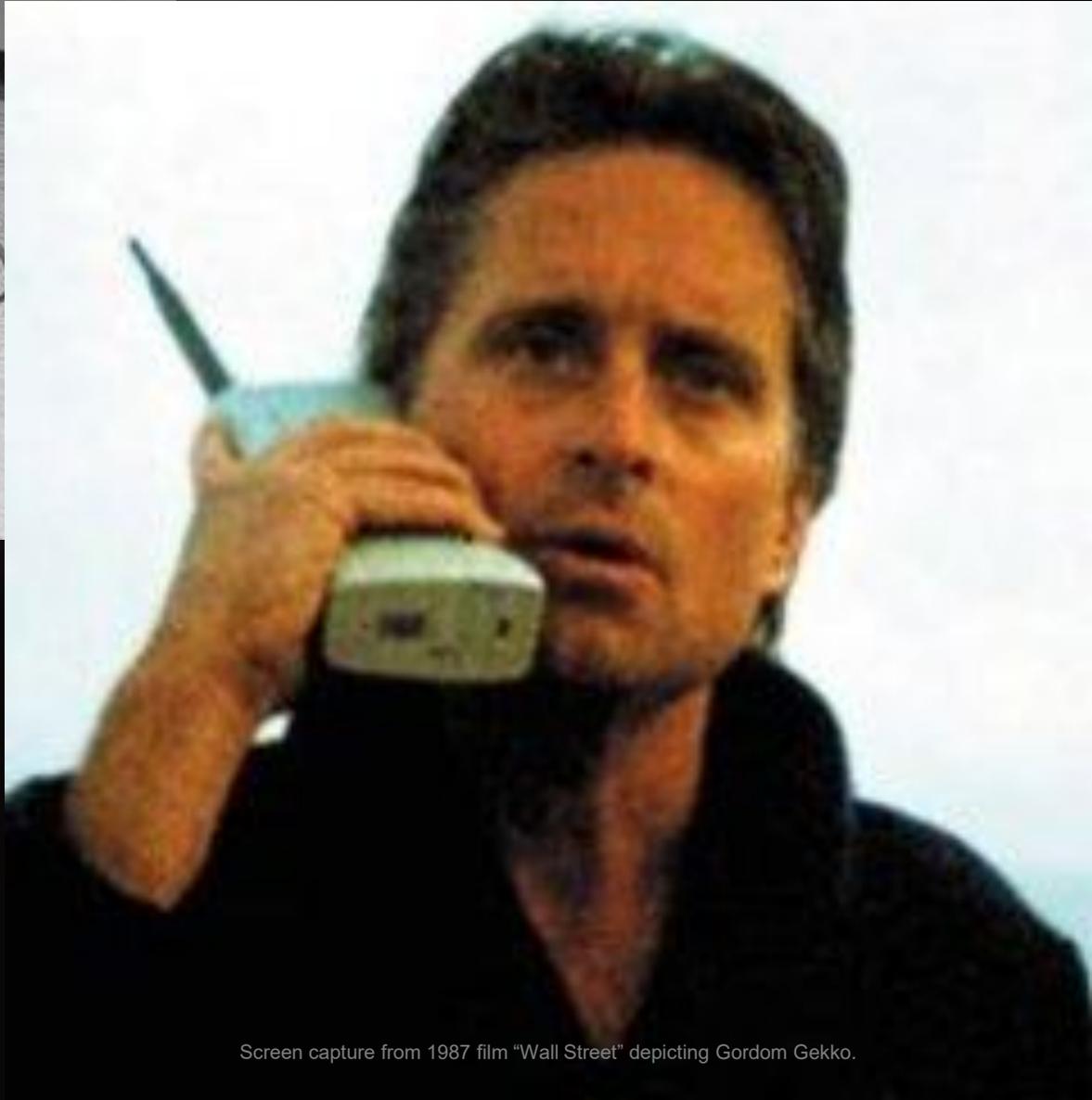


WEIGHT  
LIMIT  
16T  
22T  
27T

8  
7  
4  
4  
8  
1



<https://www.floridamemory.com/items/show/127762> (flipped horizontally)



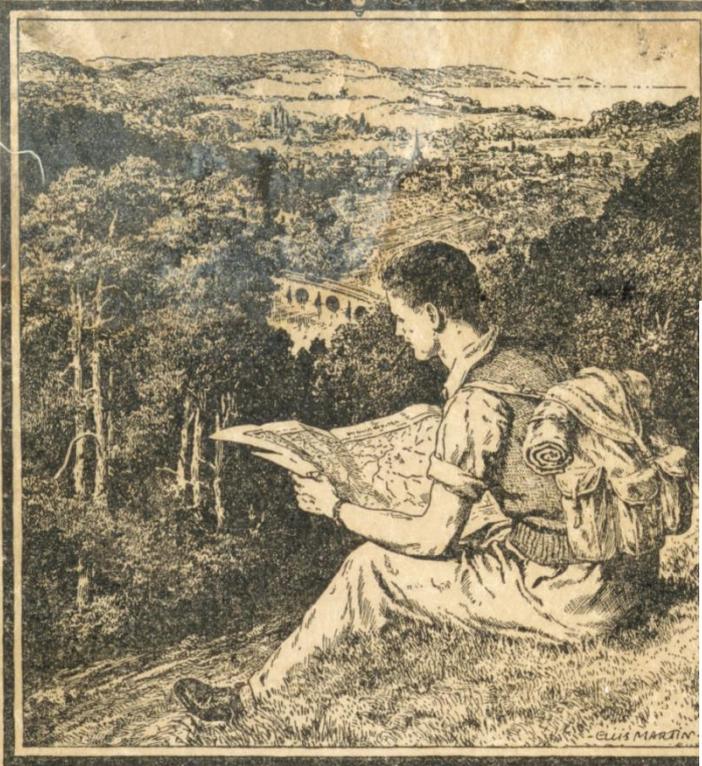
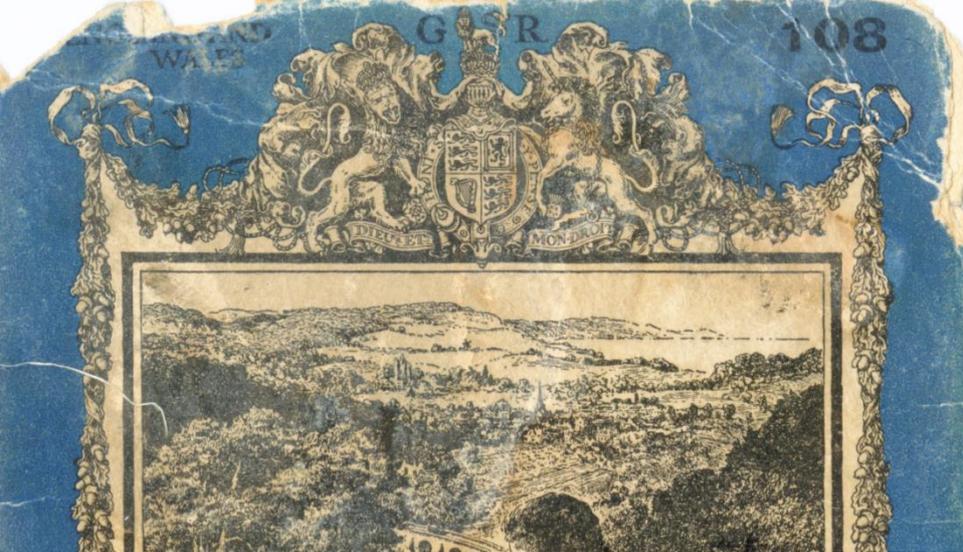
Screen capture from 1987 film "Wall Street" depicting Gordon Gekko.



<https://www.loc.gov/resource/cph.3c30588/>



<https://buy.garmin.com/en-US/US/p/162982>



# ORDNANCE SURVEY "ONE-INCH" MAP

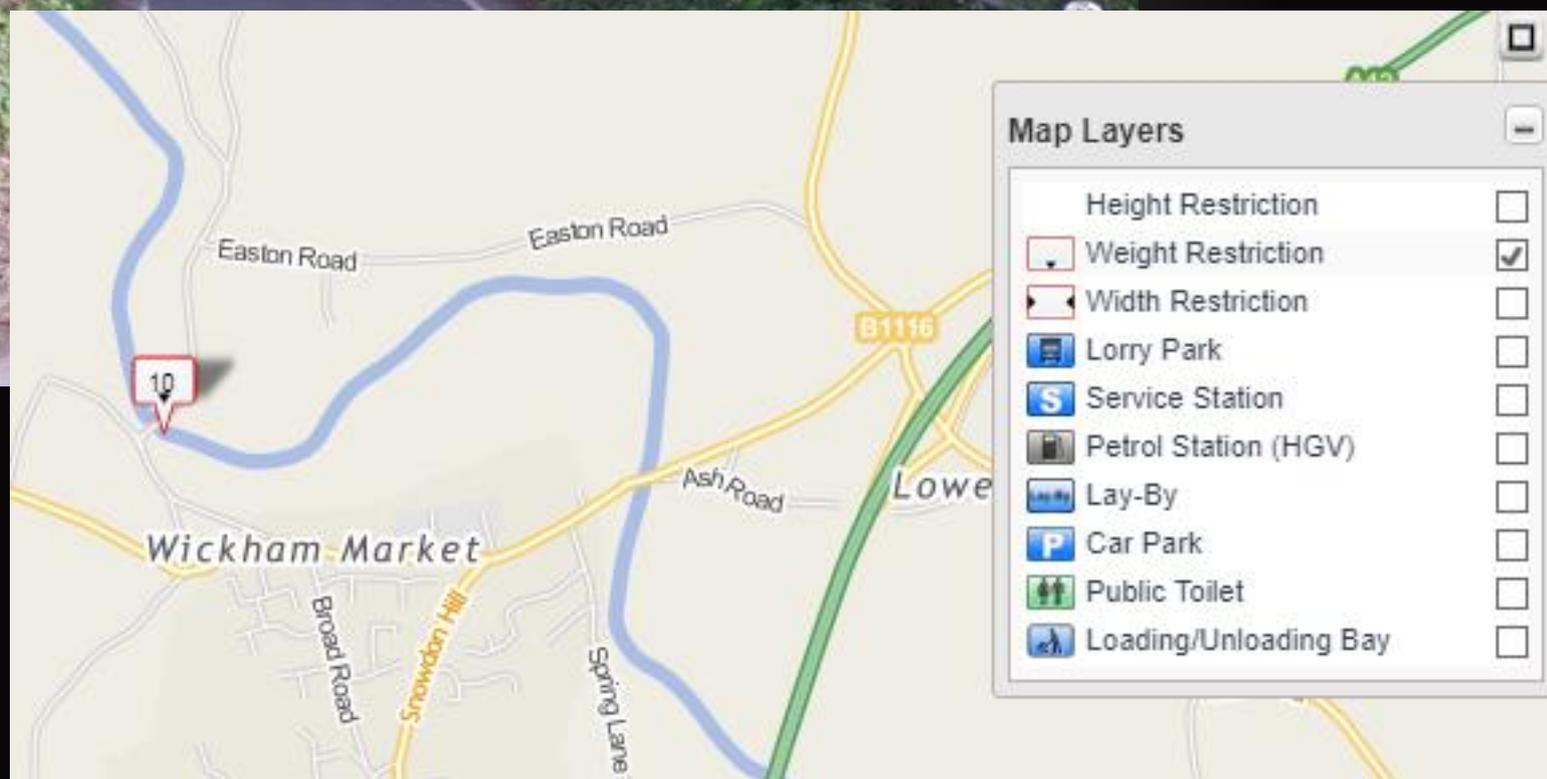
[https://upload.wikimedia.org/wikipedia/commons/7/7a/Ellis\\_martin\\_5th\\_series.png](https://upload.wikimedia.org/wikipedia/commons/7/7a/Ellis_martin_5th_series.png)

A screenshot of the Ordnance Survey website's 'Discover Routes' page. The page shows a map of the Lake District National Park with various walking routes highlighted in different colors. On the left side, there is a sidebar with filters for 'Distance' and 'Duration', and a list of routes. The routes listed are:

- AA Walk: A Haunting Experience on Southern Fells (8.26mi, 2h 8min, Leisurely)
- AA Walk: Across Heughter Hill Roman Road (7.43mi, 2h 13min, Leisurely)
- AA Walk: Ancient Gales of Aired Crags (8.17mi, 2h 2min, Leisurely)
- AA Walk: Avoiding the Old Man

The main map area shows the 'CUMBRIA MOUNTAINS' and 'LAKE DISTRICT NATIONAL PARK' with various routes and landmarks. A smartphone in the foreground shows a detailed view of a route called 'Cairn's Walk' with a distance of 4.54mi and a duration of 1h 58min. The smartphone screen also shows a description of the route: 'This route takes you up the famous Cairn's, near Bowness on the Lake District. It is a relatively easy walk with great views from the top.'

<https://www.ordnancesurvey.co.uk/shop/>



# POSTING MAPS

<http://www.freightjourneyplanner.co.uk/>

PTV MapGuide Internet | New use case ... | Sarcelles - Sarcelles

Open • Save • Save as • Route 2 • Optimise • Compare • Send to driver • Freights • PTV Navigator • Transcom

Sarcelles - Sarcelles

Planning Itinerary Costs Report Emissions Freight exchange

Settings

Vehicle: RF truck 7.5t • Cost profile: Costprofile\_pub • Salary profile: not assigned • Driver: 1

Country: Sylvres • Address: Sylvres • Search term: e.g. "Truck Wash"

Stop-off point list

Order ID	Town	Street, house nu...	Descr...	Type of address	Stay duration	Time slot	TS date
1	Sarcelles	Boulevard du Do...	Sarcelles	Coordinate	0h 30min	[05:00 - 17:00]	
2	Tremblay-en-Franc...			Coordinate		[05:00 - 17:00]	
3	Isles-les-Vilainy	Chemin du Bac	Meaux	Coordinate	0h 30min	[05:00 - 17:00]	
4	Villiers-sur-Marne	Rue du Général ...	Villiers...	Coordinate	0h 30min	[05:00 - 17:00]	
5	Évry	Patio des Teras...	Évry	Coordinate	0h 30min	[12:00 - 17:00]	
6	Sèvres	Rue de Ville-d'Av...	92319 ...	Coordinate	0h 30min	[12:00 - 17:00]	
7	Sarcelles	Boulevard du Do...	Sarcelles	Coordinate	0h 30min	[05:00 - 17:00]	

Marked stop-off points: 0/7

Pricing

Route calculation result

Visibility	Info	Route length	Toll route	Depart...	Arrival	Journey time	Driving time	Route costs Σ	Toll costs Σ	Fixed costs...
<input checked="" type="checkbox"/>		195.91 km	-	13:27	15:02	25:35 h	4:34 h	190.69 EUR		



The truck planning software automatically designs a route suitable only for your vehicles based on their attributes and excludes road sections unsuitable for trucks and HGVs such as roads with height and weight restrictions.

# POSTING MAPS

<https://www.ptvgroup.com/>



Simply enter the height, width, length, weight and axle load for your vehicle and avoid roads not suitable for your truck/cargo.

**POSTING MAPS**  
<http://www.sygic.com>

# **END**

## **QUESTIONS FOR RADBUG**

**Has any state posted an EV restriction sign on the Interstate?**

**Should EVs be required to use and abide truck-specific electronic routing maps, when they:**

- (1) are known by vehicular registration**
- (2) need advance warning for travel**
- (3) carry GPS routing devices anyways**

**Given the number of special new vehicles (EVs, platoons, wreckers), and the maturity of GPS routing and tracking devices, should US bridge operations post special bridge weight restrictions with a national map?**