County Engineers have undertaken an effort to meet federal standards for bridge load ratings. In discussions with the Federal Highway Administration, FHWA, on Ohio's proposal to increase truck weight limits to 90,000 pounds regardless of the number of axles, FHWA has responded with the following statements:

The Code of Federal Regulations (23CFR 650.313 Inspection procedures) requires that all bridges need to be rated (analyzed) to their safe load carrying capacity in accordance with the AASHTO Manual for Bridge Evaluation. Additionally the bridges need to be posted or restricted in accordance with the AASHTO Manual or in accordance with State law, when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating or equivalent rating factor.

By adding an additional state legal load truck configuration to those already in place all bridges would need to be re-rated (using the new truck configuration) to their safe load carrying capacity and posted if necessary.

"The Bridge Formula establishes the maximum weight any set of axles on a motor vehicle may carry on the state highway system."

Here is the current status of county bridge load ratings in Ohio:

County Engineers have spent the last five years load rating all county bridges over 20 feet long. All counties have completed 80% of their bridge load ratings and are required to be 100% complete by October 1, 2013. Any additional overweight vehicles will cause all load ratings to be nullified, and counties will have to redo every one of them at a further cost of:

Structure over 20 feet span

a. +/- 15,000 bridges on county roads
    i. Average Cost to Reload Rate: $3,000 per structure
    ii. 15,000 x $3,000 = **$45 million**

(Note: Costs are based on actual past load rating data)

Furthermore, depending upon how overweight vehicles are defined, if 10 to 20 foot bridges must also be load rated due to the increase in overweight vehicles, the cost would increase by an additional:

Structures between 10 and 20 feet span

a. +/- 11,000 bridges on county roads
    i. Average Cost to Reload Rate: $3,000 per structure
    ii. 11,000 x $3,000 = **$33 million**

Total Cost to Reload Rate all county bridges: $78 million

In Civil Engineering, there is an exponential relationship, not a linear relationship, when you talk about additional weight to roads and bridges. Exponential growth occurs when the growth rate of the value of a mathematical function is proportional to the function's current value. The formula for exponential growth of a variable x at the growth rate r, as time t goes on in discrete intervals, is:

$$x_t = x_0(1 + r)^t$$