

After 35 Years, Does It Need to Change? Evaluating the Fuel Usage Factor for Structures

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FHWA Fuel Price Adjustment

Fuel Usage Factors are a critical element for calculating the fuel price adjustment. FHWA's 1980 publication, *T 5080.3*, lists fuel usage factors for each work item and multiplies it by the gallons of fuel used per unit of construction. The units of construction are measured in cubic area or weight, **except for structural items**, which are measured in \$1,000 of contract costs. It is highly probable, however, that \$1,000 total worth of work for structures in 1974 is vastly different from today. The FHWA has created an historic structures index from 1972 to 2006 based on three items of work: reinforcing steel, structural steel, and structural concrete. During this 34 year time period, the price of structures increased by more than 257%. Because *T 5080.3* was created over 30 years ago, and given the significant increase in the FHWA structural index, it is important to identify how states may have changed the way they calculate the fuel price adjustment.

Objectives

The Research reported here uses a recent national survey by the authors to determine how states, and their DOTs calculate a fuel price adjustment, and whether the values for the fuel usage factors reflect *T 5080.3*. In addition, we examine how the price of structural construction has changed over time to establish whether the current fuel usage factor for structures, based on fuel usage per dollars of construction, is still applicable and equitable. New indices of construction items are developed for both a national and state model (Oregon).



Survey Responses of States that use Fuel Usage Factors for Structures

State	Fuel Usage Factor for Structures (\$)	Origination of Fuel Usage Factor	Source of Fuel Price	Trigger Value	Recent Changes to the Fuel Adjustment	% of Total Budget spent on FPA
DE	8	Looked at Other States	OPIS ^b	5%	None	Don't Know
GA	8	Looked at Other States	AAA ^c	10%	None	Less Than 1%
ID	19	Internal Committee	OPIS	20%	None	Less Than 1%
IL	8	Internal Committee	IL DOT	5%	None	0%, new provision
MI	11	Don't Know used at least 10 years	Platt's ^d	Any Change	Added more bid items	Less Than 1%
NV	1% ^a	Internal Committee	OPIS	25%	Changed Fuel Usage Factor	Less Than 1%
NH	13	Don't Know, revised over time	Journal of Commerce	10%	Added more bid items	Less Than 1%
OR	10 (pre-cast)/19 (cast-in-place)	T 5080.3	OPIS	25%	None	Less Than 1%
PA	8	Don't know, created long ago	OPIS	5%	Source of Fuel Price	Less Than 1%
UT	38	Don't know, created long ago	Wall Street Journal	15%	None	Less Than 1%

^a - One percent of the total cost of structural bid items spent per month is the fuel usage factor for structures; ^b - Oil Price Information Service; ^c - American Automobile Association; ^d - Platt's Oilgram Price Service

Oregon's Method for Calculating the Fuel Adjustment

If the fuel increases by more than 25% then Oregon pays contractor:

$$\text{Fuel Adjustment} = [MFP - (1.25 * BFP)] * [(\$/1,000) * FF]$$

If the fuel decreases by more than 25% then contractor pays Oregon:

$$\text{Fuel Adjustment} = [MFP - (0.75 * BFP)] * [(\$/1,000) * FF]$$

Where *BFP* is the fuel price at the beginning of the project, *MFP* is the monthly fuel price, \$ is money spent on structures by contractor the month the fuel price changed, and *FF* is the fuel usage factor which is 10 for pre-cast concrete and 19 for cast-in-place concrete.

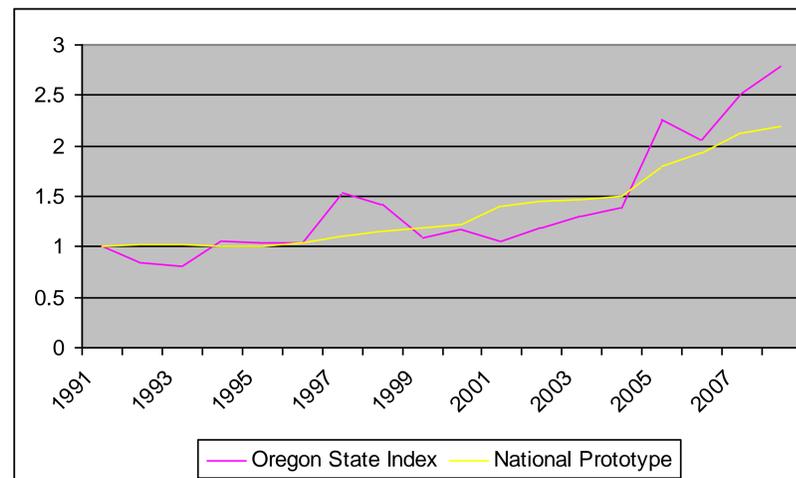
National and Oregon State Index Development

- Construction** costs overtime of the six most costly and frequently used items (Structural Excavation, Reinforcement, Coated Reinforcement, Class 5000 Concrete, Structural Steel, and Steel Rail) are examined to develop an index.

- Determines** how different \$1,000 worth of work in 2008 was compared to 1991 for both a National consideration, and that of Oregon.

- Oregon** supplied cost information back to 1972. Costs in 1972 produce an index value of 0.30.

Price Percentage Change Trend for the Oregon State Index and National Prototype



Conclusions

The National prototype index and the Oregon State index demonstrate that the price for structural construction has increased, which implies that \$1,000 worth of work is not remotely the same between years.

Results exemplify that structural costs have inflated by more than double. Assuming fuel efficiency of construction vehicles has not changed, \$1,000 of work in 1991 is less than \$500 of work in 2008. Since the fuel usage factor for structures is fuel consumed per \$1,000 of work, the real fuel price adjustment in structures is twice as much in 2008 than in 1991.

Recommendations

- 1) The fuel factors for structures should be changed from 19 gallons per \$1,000 for cast-in-place, and 10 gallons for pre-cast to 9 for cast-in-place and 5 for pre-cast items in Oregon, to reflect the impact of inflation on construction costs.
- 2) After 35 years of overlooking the impact of construction cost increases on the fuel factors relationship, the fuel factors should be reviewed and recalculated roughly every three years to keep the factors current and equitable.

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