

## Estimates of Employment Generation As A Result of Highway Construction Expenditures

### Background

In 1996, the Oregon Department of Transportation (ODOT) funded a study titled, *Economic Impacts of New Highway and Street Expenditures in Oregon*, by E.D. Hovee & Company. That study utilized the 1993 IMPLAN input-output model to develop estimates of job-creation per million dollars of highway construction expenditure. For 1996, the study estimated the creation of 7.27 direct, 5.05 indirect, and 9.02 induced jobs; for a total of 21.33 jobs created per million dollars of highway construction expenditure<sup>1</sup>.

### Issues

Recent discussions regarding the Oregon Transportation Investment Act of 2001 (OTIA), and potential counter-cyclical actions state government might take to stimulate the economy, have kindled an interest in this sort of job creation data. Issues raised include whether the data above can be updated, and whether certain types of construction create more jobs than other types of construction.

Obviously, the data above are out-of-date. In addition, the data only considered highway construction as one broad class. They are not categorized by type of construction (or construction-related) activity.

### Recent Data

Simply adjusting the 1996 estimates for inflation results in the estimated creation of 6.30 direct, 4.38

indirect, and 7.82 induced jobs; for a total of 18.48 jobs created per million dollars of highway construction expenditure during 2002. While probably more accurate than the unadjusted 1996 estimates, the new estimates are still based on a 1993 model of the Oregon economy. This means the estimates are somewhat questionable, but appear to be consistent with FHWA national data<sup>2</sup>. This adjustment does not address questions related to job impact by type of construction activity.

A recent *Transportation Research Record* article addressed the issue of job creation by type of construction (or construction-related) activity<sup>3</sup>. This study updated the 1992 national input-output model compiled by the U.S. Department of Commerce with 1997 construction industry data. The study only considered direct and indirect employment; induced employment was not analyzed<sup>4</sup>. The study's findings are presented in the following table:

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### Person-Years of Employment Generated per \$1 Million Highway Investment

New Route	19.49
Relocation	19.09
Major Widening	19.77
Minor Widening	18.29
Restoration/Rehabilitation	18.30
Resurfacing	18.62
New Bridge	20.02
Bridge Replacement	19.68
Bridge Rehabilitation	19.65
Minor Bridge Rehabilitation	19.28
Safety/Traffic/TSM	19.61
Environment Related	20.55
Reconstruct w/Added Capacity	18.79
Reconstruct w/no Added Capacity	19.15

The authors of the article believe the differences are significant. In a practical sense, the figures seem remarkably close together. It is hard to imagine that transportation investment priorities would be re-ordered as a result of these relatively small differences in (estimated) employment impact.

It is important to remember that the employment effects of additional highway expenditures will be much larger on the national level than on the state level. Since states have small economies relative to the national economy, states have more “leakage” resulting from the need to import specialized goods and services. This is reflected in the Transportation Research Record article where the national direct and indirect employment generation figures resulting from \$1 million of highway investment are approximately the same as the Oregon direct, indirect, and induced estimate. If induced effects had been included with the national data, the national employment impact figures would have been approximately double the amounts above<sup>5</sup>.

Finally, at the state level, the variation of values should be expected to be somewhat larger than in the table above. This is because purchases of products and services at the state level have a greater variation in leakage rates than they do at the national level. Indi-

vidual states simply do not produce the same breadth of goods and services at competitive prices as can be found at the national level. The amount of additional variation at the state level depends upon what is imported and how much it costs relative to other, alternative expenditure choices including what is built, and what processes and materials are used to build it.

### Conclusions

Two sets of conclusions can be drawn from the discussion above. The first is that the 2002 estimate of 18.48 jobs created in Oregon per million dollars of highway construction expenditure is reasonable. However, more recent models would somewhat improve this estimate.

The second is that there are differences in the job creation impacts of different types of highway construction activity. However, these differences are relatively small, and are probably not large enough to affect project or program priority.

<sup>1</sup> The definition of “jobs” is somewhat awkward. “Jobs” actually refers to job-years. These jobs may be either part- or full-time. The ratio of part- to full-time employment is determined by actual averages by industry sector during 1993.

<sup>2</sup> “Direct on site” employment, which is narrower than “direct” employment, was estimated by FHWA to be 6.18 during 1999. The inflation-adjusted Oregon direct employment estimate for 2002 is 6.30

<sup>3</sup> Anderson, William P., Lakshmanan T.R., and Kuhl, Brenda, *Transportation Research Record 1777*, “Estimating Employment Generation by Federal-Aid Highway Construction Projects,” 2001.

<sup>4</sup> A cursory review of the 1993 IMPLAN model results indicates that the differences in the effects would be proportionately the same had induced effects been considered.

<sup>5</sup> FHWA’s Highway1 national employment model is also based on 1993 data. Estimates using this model indicate 44.7 full-time jobs are created from each \$1 million of highway construction-related expenditure.