Valuation of Travel Time

The *Value of Travel Time* (VTT) refers to the cost of time spent on transport, including waiting as well as actual travel. It includes costs to consumers of personal (unpaid) time spent on travel, and costs to businesses of paid employee time spent in travel.

Jiang and Morikawa (2004) use the theoretical framework to derive the variation in VTT with respect with travel time, wage, and work time.

Oregon Department of Transportation (ODOT) estimate the hourly value of travel-time for two types of travel with three types of vehicles (ODOT, 2012). On-the-clock business trips represent travel for work and do not include commute trips. The value of On-the-clock business trips is a reflection of the total cost of the employee’s time to the employer and so is a function of total compensation. Personal trips include recreation, shopping, commuting, and other personal travel. Value of personal time reflects the opportunity cost of time spent traveling vs. time that could be spent doing something else and is typically expressed as a fraction of household income. The fraction of the hourly median household income used to value personal time is currently 50% for local trips and 70% for intercity trips, applied equally to drivers and passengers.

Tab.1 Details of Estimated Value of One Hour of Travel-Time by Vehicle Class, Oregon 2011

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Vehicle Category | | |
| Automobile & Psngr. Truck | Delivery & Med. Trucks | Heavy Trucks |
| 2011 Oregon Median Hourly Wage | $16.90 | $14.54 | $18.41 |
| 2011 Value of Fringe Benefits | $7.35 | $7.29 | $9.23 |
| Total Hourly On-the-clock Compensation | $24.25 | $21.83 | $37.64 |
| 2011 Oregon Hourly Median Household Income | $24.77 | N/A | N/A |
| Hourly Value Personal Local Travel | $12.39 | N/A | N/A |
| Hourly Value Personal Intercity Travel | $17.34 | N/A | N/A |

The methodology used by ODOT is based on work done by the USDOT in the Revised Departmental Guidance on Valuation of Travel Time (USDOT, 2008). And ECONorthwest and PBQD (2002) also used USDOT recommended travel time. Table 2 illustrates USDOT recommended travel time values. Personal travel is calculated relative to wages, and business travel relative to total compensation, averaging 120% of wages.

Tab. 2 Recommended Value of Travel Time

|  |  |  |
| --- | --- | --- |
| Time component | Reference | Value |
| In-Vehicle Personal (local) | Of wages | 50% |
| In-Vehicle Personal (Intercity) | Of wages | 70% |
| In-Vehicle Business | Of total compensation | 100% |
| Excess (waiting, walking, or transfer time) Personal | Of wages | 100% |
| Excess (waiting, walking, or transfer time) Business | Of total compensation | 100% |

Fosgerau et al. (2010) used stated preference survey data to measure the value of travel time for several transport modes. The stated choice survey includes both an experiment measuring the VTT in the current mode of the respondents, but also a similar experiment for an alternative mode. Consequently, the authors observe the same individual’s VTT in different modes, and can thereby disentangle mode effects from user type effects.

Tab. 3 Relative mean Value of Travel Time, after controlling for covariates (bus-none normalized to one)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Current mode | Alternative mode | Experiment Mode | | |
| Car | Bus | Train |
| Car | None | 1.21 |  |  |
| Car | Bus | 1.36 | 1.25 |  |
| Car | Train | 1.37 |  |  |
| Bus | None |  | 1.00 |  |
| Bus | Car | 1.06 | 0.90 |  |
| Bus | Train |  | 0.79 | 0.71 |
| Train | None |  |  | 1.36 |
| Train | Car | 0.94 |  | 1.45 |
| Train | Bus |  | 0.97 | 0.73 |

Litman (2007) estimated travel time unit costs with respect to qualitative factors such as comfort, convenience, productivity and security for different types of travelers. Table 3 indicates how travel time values vary depending on the quality of conditions, using level-of-service ratings to reflect comfort and convenience factors.

Tab. 4 Travel Time Values Relative to Prevailing Wages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | LOS A-C | LOS D | LOS E | LOS F |
| Commercial vehicle driver | 120% | 137% | 154% | 170% |
| Commercial vehicle passenger | 120% | 132% | 144% | 155% |
| City bus driver | 156% | 156% | 156% | 156% |
| Personal vehicle driver | 50% | 67% | 84% | 100% |
| Adult car passenger | 35% | 47% | 58% | 70% |
| Adult transit passenger-seated | 35% | 47% | 58% | 70% |
| Adult transit passenger-standing | 50% | 67% | 83% | 100% |
| Child (<16 years) - seated | 25% | 33% | 42% | 50% |
| Child (<16 years) – standing | 35% | 46% | 60% | 66% |
| Pedestrians and cyclists | 50% | 67% | 84% | 100 |

References:

ECONorthwest and PBQD (2002). *Estimating the Benefits and Costs of Public Transit Projects*, TCRP Report 78. Retrieved from http://www.tcrponline.org/PDFDocuments/tcrp\_rpt\_78.pdf

Fosgerau, M., Hjorth, K., & Lyk-Jensen, S. V. (2010). Between-mode-differences in the value of travel time: Self-selection or strategic behaviour?.*Transportation research part D: transport and environment*, *15*(7), 370-381.

Jiang, M., & Morikawa, T. (2004). Theoretical analysis on the variation of value of travel time savings. *Transportation Research Part A: Policy and Practice*,*38*(8), 551-571.

Litman, T. (2007). Build for comfort, not just speed: valuing service quality impacts in transportation planning.

Oregon Department of Transportation (2012). The Value of Travel-Time: Estimates of the Hourly Value of Time for Vehicles in Oregon 2011. Retrieved from http://www.oregon.gov/ODOT/TD/TP/Reports/Value\_of\_TravelTime2011.pdf

U.S. Department of Transportation (2011). Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis. U.S. Department of Transportation. Retrieved from <http://www.dot.gov/sites/dot.gov/files/docs/vot_guidance_092811c_0.pdf>