Table A.1

Recommended standard values for use in cost-effectiveness & benefit-cost analysis in SFY2022

Minnesota Department of Transportation, Office of Transportation System Management, July 2021

Variables		Values		
		Low	**Most Likely**	**High**
Real discount rate[1]		see Most Likely →	0.7%	← see Most Likely
Annual traffic growth rate modifier[2]		83%	100% (no modification)	125%
Value of travel time savings per person-hour[3]	Auto	$16.80	$22.50	$27.30
	Truck driver	$26.90	$33.60	$40.40
	Transit passenger	$15.20	$21.20	$25.40
	Transit driver	$22.60	$28.20	$33.90
Auto per-mile operating and emissions costs				
Auto variable vehicle operating costs[4]			$0.27	
Auto climate- and health-related emissions costs[5]		see Most Likely →	$0.07	← see Most Likely
Auto total operating and emissions costs (dollars per mile)			$0.34	
Truck per-mile operating and emissions costs				
Truck variable vehicle operating costs[4]			$0.66	
Truck climate- and health-related emissions costs[5]		see Most Likely →	$0.29	← see Most Likely
Truck total operating and emissions costs (dollars per mile)			$0.95	
Per-crash comprehensive costs[6]				
Fatal		$7,700,000	$13,300,000	$18,800,000
Suspected Serious Injury		$450,000	$750,000	$1,040,000
Suspected Minor Injury		$140,000	$230,000	$310,000
Possible Injury		$80,000	$120,000	$160,000
No Injury (Property Damage Only)		$13,000	$13,000	$13,000

Notes

[1]Determined as the five-year average for real (with inflation removed) interest rates on 30-year Treasurys. ***LINK***

[2]Calculated from 20-year compound annual growth rate projections for national vehicle miles traveled in low ("pessimistic") / high ("optimistic") economic growth outlooks relative to most likely, described in "FHWA Forecasts of Vehicle Miles Traveled (VMT): Spring 2020" (not updated in 2021) for all vehicle classes. For example, when the most likely traffic growth is modeled as 1.2%, the corresponding low and high sensitivity annual growth rates are 1.0% (1.2% x 82%) and 1.4% (1.2% x 118%), respectively. Due to compounding, differences under the sensitivity outlooks will be magnified in later years of the analysis period. ***LINK***

[3]All values adapted from USDOT's "Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis" published September 27, 2016, with Minnesota household income and wages. ***LINK***

[4]Updates cost levels in the University of Minnesota's *The Per-Mile Costs of Operating Automobiles and Trucks* published in June 2003. Variable costs are fuel (assessed at real tax-neutralized price in analysis period midpoint), maintenance, tires, repair, and depreciation. ***LINK***

[5]Applies EPA (carbon) and USDOT/NHTSA (all other emissions) dollars-per-ton monetization factors to average on-road vehicle emission rates for Minnesota derived from EPA's 2017 National Emissions Inventory to account for the social cost of carbon (in analysis period midpoint) and health damage from the criteria pollutants of volatile organic compounds (ozone precursor), nitrogen oxides, particulate matter ($PM_{2.5}$) and sulfur dioxide. ***LINK (EPA)*** ***LINK (NHTSA)***

[6]The most likely values reflect Minnesota's recent (three-year) crash history and procedures contained in FHWA's *Crash Costs for Highway Safety Analysis* published January 2018, with comprehensive crash cost valuation consisting of both economic/monetary impacts (e.g. medical services, insurance claims processing, legal fees) and estimates of the intangible effects from diminished quality of life following injury crashes. Low/high crash cost dispersion is taken from the range of uncertainty for the value of a statistical life found in USDOT's "Departmental Guidance: Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses" published March 2021. ***LINK (Most Likely)*** ***LINK (Low/High)***