

Source	Location
2009 NHTS VA add-on survey	<a href="http://nhts.ornl.gov/2009/pub/usersguidev2.pdf">http://nhts.ornl.gov/2009/pub/usersguidev2.pdf</a>
2014 California High-Speed Rail Benefit Cost Analysis	<a href="http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Sec_7_CaHSR_Benefit_Cost_Analysis.pdf">http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Sec_7_CaHSR_Benefit_Cost_Analysis.pdf</a>
AAA, Your driving costs 2015	<a href="http://exchange.aaa.com/wp-content/uploads/2015/04/Your-Driving-Costs-2015.pdf">http://exchange.aaa.com/wp-content/uploads/2015/04/Your-Driving-Costs-2015.pdf</a>
Amtrak	<a href="https://www.narprail.org/our-issues/ridership-statistics/">https://www.narprail.org/our-issues/ridership-statistics/</a>
VRE	<a href="http://www.vre.org/service/rider/consist/">http://www.vre.org/service/rider/consist/</a>
Association of American Railroads (2013)	<a href="https://www.aar.org/data-center">https://www.aar.org/data-center</a>
Census Bureau	<a href="http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml">http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml</a>
DAT Solutions, DAT Trendlines, Southeast Regional Van Rates, (Spring 2015)	<a href="http://www.dat.com/resources/trendlines">http://www.dat.com/resources/trendlines</a>
EPA - "Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Engines Less than 30 Liters per Cylinder" (2008)	<a href="http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10024CN.TXT">http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10024CN.TXT</a>
Federal Highway Cost Allocation Study (1997)	<a href="http://www.fhwa.dot.gov/policy/hcas/addendum.cfm">http://www.fhwa.dot.gov/policy/hcas/addendum.cfm</a>
Forkenbrock (2001)	<a href="http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf">http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf</a>
FRA Office of Safety, Accident Reports (2010-2015)	<a href="http://safetydata.fra.dot.gov/officeofsafety/default.aspx">http://safetydata.fra.dot.gov/officeofsafety/default.aspx</a>
Muller and Mendelsohn, "Measuring the Damages of Air Pollution in the United States" (2007)	Not publicly available
Public Waybill Sample	<a href="http://www.stb.dot.gov/stb/industry/econ_waybill.html">http://www.stb.dot.gov/stb/industry/econ_waybill.html</a>
TIGER Benefit-Cost Analysis Resource Guide (2014)	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>
US Department of Environmental Protection: Motor Vehicle Emission Simulator (MOVES2014a)	<a href="http://www3.epa.gov/otaa/models/moves/">http://www3.epa.gov/otaa/models/moves/</a>
USDOT Bureau of Transportation Statistics 2015	<a href="http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html">http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html</a>
USDOT, FHWA, Freight Analysis Framework (2012)	<a href="http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm">http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm</a>
VDOT, Accident, Fatality and Injury Frequency (2014)	<a href="http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp">http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp</a>
VDOT, Investigation of Speed-Flow Relations and Estimation of Volume Delay Functions for Travel Demand Models in Virginia (2009).	<a href="http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt">http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt</a>
VDOT, Rail Crossing Injuries (2010-2015)	<a href="http://www.virginiadot.org/sitemap/default.asp">http://www.virginiadot.org/sitemap/default.asp</a>

Use	Term	Recommended Sources	Source Location	Current Sources	Selection Reason	
Freight	Trucks per Rail Car	USDOT, FHWA, Freight Analysis Framework (2012)	<a href="http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm">http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm</a>	A modal Comparison of Domestic Freight Transportation Effects on the General Public. The representative value is calculated using the average rail car tonnage calculated for the proposed model	- Publicly Available - Virginia Specific values - Industry Best Practice	
		Public Waybill Sample	<a href="http://www.stb.dot.gov/stb/industry/econ_waybill.html">http://www.stb.dot.gov/stb/industry/econ_waybill.html</a>			
	Congestion cost	USDOT, FHWA, Freight Analysis Framework (2012)	<a href="http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm">http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm</a>	Federal Highway Cost Allocation Study (1997), Annualized Social Cost of Motor-Vehicle Use in the US (VTPI, 2001), TTI, TIGER IV (All National Averages)	- Corridor Level Values - Publicly Available - Virginia specific values for passenger and freight value of time - Clear separation of Urban and Rural based on highway characteristics - Industry Best Practice	
		VDOT, Investigation of Speed-Flow Relations and Estimation of Volume Delay Functions for	<a href="http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt">http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt</a>			
		An Analysis of the Operational Costs of Trucking: A 2014 Update (ATRI)	<a href="http://content/uploads/2014/09/ATRI-Operational-Costs-of-Trucking-2014-FINAL.pdf">content/uploads/2014/09/ATRI-Operational-Costs-of-Trucking-2014-FINAL.pdf</a>			
		2013 American Community Survey (BLS)	<a href="http://www.bls.gov/news.release/pdf/ecec.pdf">http://www.bls.gov/news.release/pdf/ecec.pdf</a>			
	Truck Noise pollution cost	TIGER IV (National Average)	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>	TIGER IV (National Average)	- Industry Best Practice	
	Truck Air Pollution	US Department of Environmental Protection: Motor Vehicle Emission Simulator	<a href="http://www3.epa.gov/otaq/models/moves/">http://www3.epa.gov/otaq/models/moves/</a>	- Not easily accessible	TIGER IV, Federal Highway Cost Allocation Study (1997), Forkenbrock (2001) (National Averages)	- Use of a more up-to-date source - Moves 2014 is specific to metropolitan and rural areas - <b>Not easily accessible</b>
		Muller and Mendelsohn, "Measuring the Damages of Air Pollution in the United States"				
	Train Air Pollution	EPA - "Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Engines"	<a href="http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10024CN.TXI">http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10024CN.TXI</a>	Forkenbrock (2001)	- Use of a more up-to-date source - EPA source values consistent with truck air pollution	
	Noise pollution cost per train ton mile	Forkenbrock (2001)	<a href="http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf">http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf</a>	Forkenbrock (2001)	- Available Industry Practice - Publicly Available	
	Shipping rate per train ton mile	Association of American Railroads (2013)	<a href="https://www.aar.org/data-center">https://www.aar.org/data-center</a>	2005 - No source listed	- Best Industry Practice - Publicly Available	
	Shipping rate per truck ton mile	DAT Solutions, DAT Trendlines, Southeast Regional Van Rates, (Spring 2015)	<a href="http://www.dat.com/resources/trendlines">http://www.dat.com/resources/trendlines</a>	2005 - No source listed.	- Use of a more up-to-date source - Regional values - Publicly Available	
	Pavement maintenance cost per truck mile	USDOT, Addendum to the FHCA Study, 2000	<a href="http://www.fhwa.dot.gov/policy/hcas/addendum.cfm">http://www.fhwa.dot.gov/policy/hcas/addendum.cfm</a>	USDOT, Addendum to the FHCA Study, 2000	- Industry Practice	
	Accident cost per truck VMT	Virginia DMV, Accident, Fatality and Injury Frequency (2014)	<a href="http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp">http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp</a>	Values reflect national averages. Federal Highway Cost Allocation Study (1997), Forkenbrock (2001), TIGER IV. Base Value was listed by \$/truck ton-mi, but sources reflect \$/mi.	- Use of a more up-to-date source - Publicly Available - Virginia Specific values - Industry Best Practice	
		TIGER IV (Values for Crashes and Injuries)	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>			
Accident cost per freight train ton mile	Forkenbrock (2001)	<a href="http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf">http://nexus.umn.edu/Courses/ce8214/papers/Forkenbrock2001.pdf</a>	Forkenbrock (2001)	- Best Industry Practice - Publicly Available		
Accident cost per rail crossing removed	VDOT, Rail Crossing Injuries (2010-2015)	<a href="http://www.virginiadot.org/sitemap/default.asp">http://www.virginiadot.org/sitemap/default.asp</a>	FRA Office of Safety (National Averages)	- Use of a more up-to-date source - Publicly Available - Virginia Specific values - Industry Best Practice		
	TIGER IV	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>				
	FRA Office of Safety, Accident Reports (2010-2015)	<a href="http://safetydata.fra.dot.gov/officeofsafety/default.aspx">http://safetydata.fra.dot.gov/officeofsafety/default.aspx</a>				

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Passenger	Vehicle occupancy rate	2009 NHTS VA add-on survey	<a href="http://nhts.ornl.gov/2009/pub/usersguidev2.pdf">http://nhts.ornl.gov/2009/pub/usersguidev2.pdf</a>	Communication with Ron Mustain, VDOT (2007)	- Publicly Sourced Data - Use of a more up-to-date source - Virginia Specific values
	Congestion cost	USDOT, FHWA, Freight Analysis Framework (2012)	<a href="http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm">http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm</a>	Federal Highway Cost Allocation Study (1997), Annualized Social Cost of Motor-Vehicle Use in the US (VTPI, 2001), TTI, TIGER IV	- Corridor Level Values - Publicly Available - Virginia specific values for passenger and freight value of time - Clear separation of Urban and Rural based on highway characteristics - Industry Best Practice
		VDOT, Investigation of Speed-Flow Relations and Estimation of Volume Delay Functions for	<a href="http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt">http://trbappcon.org/2009conf/TRB2009presentations/s12/TRB_App_Conf_12_100_Lee_Munn_0519_2009.ppt</a>		
		An Analysis of the Operational Costs of Trucking: A 2014 Update	<a href="content/uploads/2014/09/ATRI-Operational-Costs-of-Trucking-2014-FINAL.pdf">content/uploads/2014/09/ATRI-Operational-Costs-of-Trucking-2014-FINAL.pdf</a>		
		2013 American Community Survey	<a href="http://www.bls.gov/news.release/pdf/ecec.pdf">http://www.bls.gov/news.release/pdf/ecec.pdf</a>		
	Accident cost per vehicle mile	Virginia DMV, Accident, Fatality and Injury Frequency (2014)	<a href="http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp">http://www.dmv.state.va.us/safety/#crash_data/crash_facts/index.asp</a>	"Comparing Alternative Policies to Reduce Traffic Accidents", VTPI (2000), TIGER IV (National Averages)	- Use of a more up-to-date source - Publicly Available - Virginia Specific values - Industry Best Practice
		TIGER IV (Values for Crashes and Injuries)	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>		
	Accident cost per train passenger mile	USDOT Bureau of Transportation Statistics 2015	<a href="http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html">http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/index.html</a>	No Value Available	- Use of a sourced value - Publicly Available - Virginia Specific values - Industry Best Practice
		TIGER IV (Values for Crashes and Injuries)	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>		
	Accident cost per rail crossing	VDOT, Rail Crossing Injuries (2010-2015)	<a href="http://www.virginiadot.org/sitemap/default.asp">http://www.virginiadot.org/sitemap/default.asp</a>	FRA Office of Safety	- Use of a more up-to-date source - Publicly Available - Virginia Specific values - Industry Best Practice
		TIGER IV	<a href="https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf">https://www.transportation.gov/sites/dot.gov/files/docs/TIGER%20BCA%20Resource%20Guide%202014.pdf</a>		
		FRA Office of Safety, Accident Reports (2010-2015)	<a href="http://safetydata.fra.dot.gov/officeofsafety/default.aspx">http://safetydata.fra.dot.gov/officeofsafety/default.aspx</a>		
	Vehicle operating cost	AAA, Your driving costs 2015	<a href="http://exchange.aaa.com/wp-content/uploads/2015/04/Your-Driving-Costs-2015.pdf">http://exchange.aaa.com/wp-content/uploads/2015/04/Your-Driving-Costs-2015.pdf</a>	The value listed is from the National Transportation Statistics, the comparable AAA Driving Costs (2012) was \$0.1964/mi	- Use of a more up-to-date source - Publicly Available - Industry Best Practice
	Fare per passenger mile (Amtrak/VRE)	Amtrak	<a href="https://www.narprail.org/our-issues/ridership-statistics/">https://www.narprail.org/our-issues/ridership-statistics/</a>	Amtrak, VRE, National Transit Database	- Use of a more up-to-date source - Publicly Available - Industry Best Practice
VRE		<a href="http://www.vre.org/service/riders/consist/">http://www.vre.org/service/riders/consist/</a>			
Weighted average value of time	Census Bureau	<a href="http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml">http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml</a>	TIGER III (National Average)	- Use of a more up-to-date source - Virginia Specific (Regional and Corridor) Values - Publicly Available - Industry Best Practice	
Air pollutant emission	US Department of Environmental Protection: Motor Vehicle Emission Simulator	<a href="http://www3.epa.gov/otaq/models/moves/">http://www3.epa.gov/otaq/models/moves/</a>	VTPI TCA Report	- Use of a more up-to-date source - Moves 2014 is specific to metropolitan and rural areas - Not easily accessible	
	Muller and Mendelsohn, "Measuring the Damages of Air Pollution in the United States"	- Not easily accessible			
Noise pollution cost per VMT	Federal Highway Cost Allocation Study (2000) (National Averages)	<a href="http://www.fhwa.dot.gov/policy/hcas/addendum.cfm">http://www.fhwa.dot.gov/policy/hcas/addendum.cfm</a>	Federal Highway Cost Allocation Study (2000) (National Averages)	- Industry Best Practice - Publicly Available	
Air pollution cost per train mile	EPA - "Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Engines Less than 20 Ltr per Cycle" (2008)	<a href="http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockkey=P10024CN.TX.I">http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockkey=P10024CN.TX.I</a>	Amtrak, Colorado B/C Study (2005)	- Use of a more up-to-date source - EPA source values consistent with truck air pollution - Publicly Available - Industry Best Practice	
Noise pollution cost per train mile	2014 California High-Speed Rail Benefit Cost Analysis (2014 Statewide Value)	<a href="http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Sec_7_CaHSR_Benefit_Cost_Analysis.pdf">http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Sec_7_CaHSR_Benefit_Cost_Analysis.pdf</a>	N/A	- Most recent US based report on train noise pollution	
Pavement maintenance cost per vehicle mile	Federal Highway Cost Allocation Study (2000)	<a href="http://www.fhwa.dot.gov/policy/hcas/addendum.cfm">http://www.fhwa.dot.gov/policy/hcas/addendum.cfm</a>	Federal Highway Cost Allocation Study (2000)	- Industry Best Practice - Publicly Available	

Source	Description	Link
American Transportation Research Institute	Trucking Research and Data	<a href="http://atri-online.org/">http://atri-online.org/</a>
American Association of Railroads	National Rail Road Data	<a href="https://www.aar.org/">https://www.aar.org/</a>
Public Waybill Sample	A stratified sample of carload waybills for all U.S. rail traffic submitted by those rail carriers terminating 4,500 or more revenue carloads annually.	<a href="http://www.stb.dot.gov/stb/industry/econ_waybill.html">http://www.stb.dot.gov/stb/industry/econ_waybill.html</a>
RailFax	Summary of North American Rail Freight Traffic	<a href="http://railfax.transmatch.com/">http://railfax.transmatch.com/</a>
Intermodal Assocation of North America	Rail Movement Data	<a href="http://www.intermodal.org/">http://www.intermodal.org/</a>
FRA Office of Safety	Rail Crasah Information	<a href="https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/on_the_fly_download.aspx">https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/on_the_fly_download.aspx</a>
With the exception of pavement maintenance cost we have used the most uptodate information that can be customized to VA.		