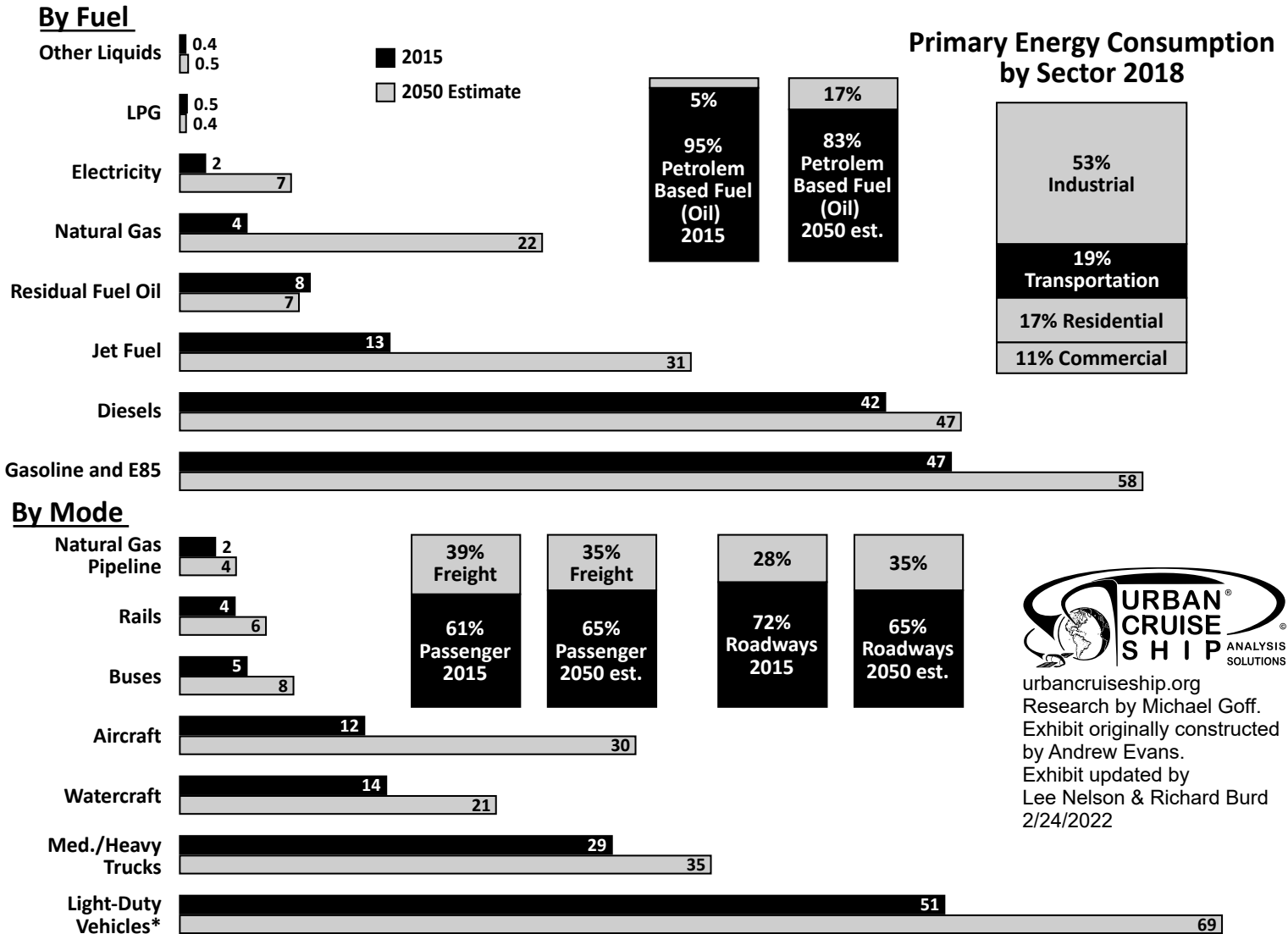


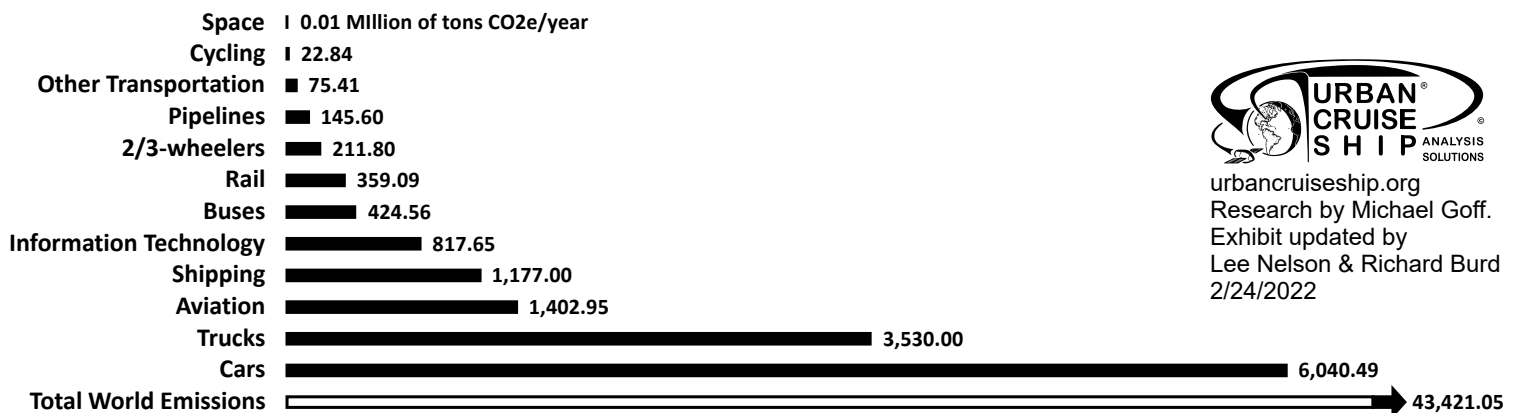
Worldwide Transportation Sector Energy Consumption



urbancruiseship.org
 Research by Michael Goff.
 Exhibit originally constructed by Andrew Evans.
 Exhibit updated by Lee Nelson & Richard Burd
 2/24/2022

Source: Energy Information Administration (EIA), Annual, Energy, Outlook 2017 (https://www.eia.gov/outlooks/ieo/excel/appl_tables.xlsx)
 Global Greenhouse Gas Emissions Data (<https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>)
 *Includes cars, SUVs, motorcycles, vans, pickup-trucks, and most other vehicles dedicated to personal transit.

Transportation Sector Emissions - World



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 Research by Michael Goff.
 Exhibit updated by Lee Nelson & Richard Burd
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Vehicle and Cargo In Various Vehicles Compared

Wasteful transport

Efficient transport

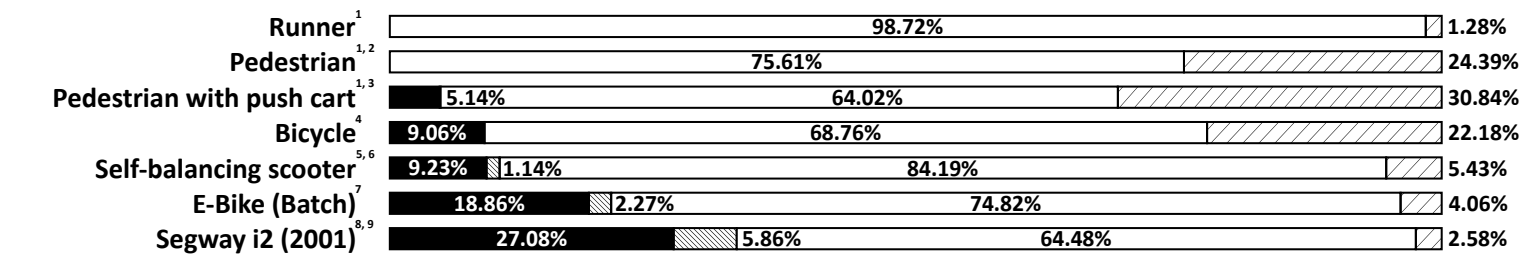


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Exhibit concept & editing by
John van der Harst. Research
by Michael Goff. Research &
graphics by Richard Burd
2/24/2022

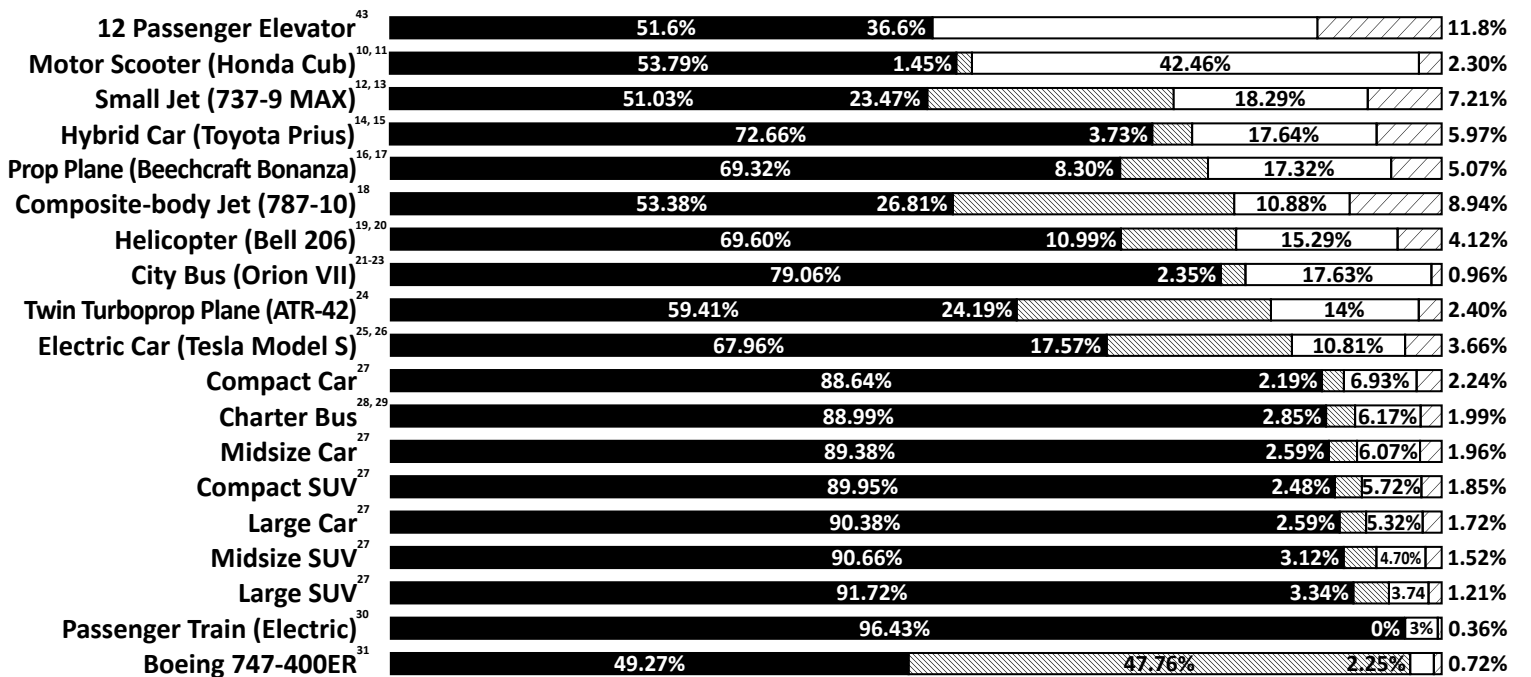
■ Vehicle Weight ■ Fuel Weight

□ Passenger Weight □ Cargo Weight

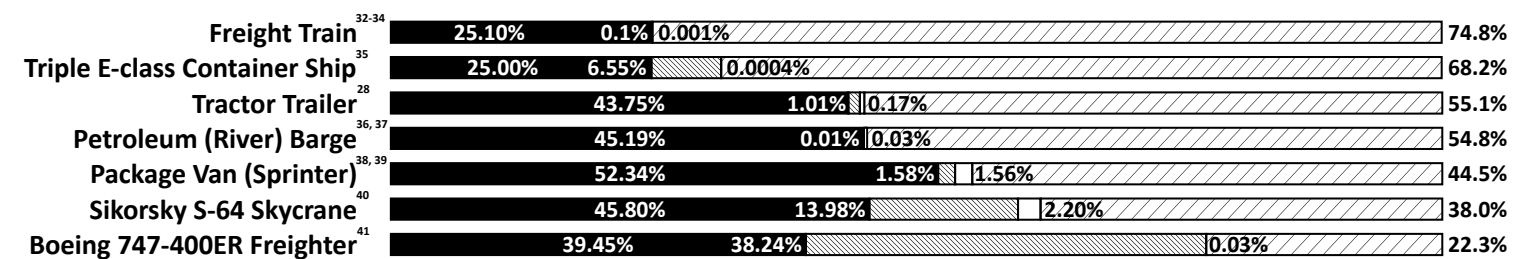
Pedestrian Vehicles



Passenger Vehicles



Freight Vehicles



1.) We assume a person weighs 62 kilograms per Rettner, R. "The Weight of the World: Researchers Weigh Human Population". Live Science. 2013.
 2.) Wagner, N. "Carry That Load". The Doctor Will See You Now. October 2014.
 3.) Wellmax Grocery Utility Shopping Cart Product Specifications
 4.) White, M. "How Much Does a Bike Weigh?". Bicycle Universe. Accessed May 28, 2021.
 5.) Acc. to Xpirit SBW666 Product Specification total weight is 19 lbs
 6.) Battery is a XIXIML 36V 4.4Ah 4400mah & weighs 2.1 lbs per consumer review
 7.) Wired Magazine: "The 13 Best Electric Bikes for Every Kind of Ride" 2021.
 8.) i2 Segway Product Specifications
 9.) Segway i2 battery is 22.7 lbs per this reseller's specifications
 10.) Honda Cub is the most manufactured motor scooter acc. to: Joe D'Allegro "Honda Builds 100 Millionth Super Cub Scooter". The Drive 2017
 11.) The Honda cub carries one gallon of gas weighing 6.3 lbs acc. to these specifications at bikez.com
 12.) Empty Weight is 99,360 lbs acc. to Boeing: 737 MAX Airplane Characteristics for Airport Planning 2019
 13.) Boeing 737 MAX Airplane Characteristics for Airport Planning 2019; p.51 of 196 (PDF)
 14.) The top selling hybrid car in the U.S. acc. to Wikipedia
 15.) Curb weight is 3,040.2 lbs acc. to Wikipedia
 16.) Anders Clark (June 25, 2015). "The Beechcraft A36 Bonanza". Disciples of Flight; this model has the "...longest production run of any aircraft in history."
 17.) Assuming 4 passengers with fuel & cargo at max allowable takeoff weight per Airmart's Beechcraft G36 Bonanza Specifications
 18.) Assuming 330 passengers with fuel & cargo at max takeoff weight per Modern Airlines Dreamliner Boeing 787 Specs Table
 19.) Acc. to FlightGlobal, the Bell 206 is the most widely used helicopter in service w/ 15% of the market
 20.) Assuming a load of 4 passengers, an empty weight of 2,331 lbs, & max takeoff weight of 3,350 lbs per Wikipedia
 21.) Assuming a curb weight of 29,780 & fuel capacity of 125 US Gallons (Diesel) per Wikipedia & C.P.T.D.B. Specs respectively
 22.) Assuming fuel tank capacity of 125 U.S. gallons (deisel) per Canadian Public Transportation Discussion Board Specifications
 23.) Assuming 36 passengers (4,921 lbs) on a standard 40' bus per New York City MTA Service Guidelines p.14 of 21 in the PDF
 24.) Specifications per ATR Family Booklet as well as ATR's 42-600 homepage carries 2 pilots, a steward(ess) and 30-48 passengers
 25.) Curb weight: Sabatini, Jeff (November 2014). "2014 Tesla Model S 60 Full Test - Review". Car and Driver. Retrieved May 7, 2015.
 26.) Battery Weight: "How Much Does a Tesla Weigh?" Weight of Stuff
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 28.) Weight: Pennsylvania Department of Transportation. "Approximate Vehicle Weights". Accessed May 28, 2021.
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 33.) GE Dash 8 Series (locomotive) Wikipedia
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 36.) Weight estimates based on data provided by: Crowley. "LPT-16552 Deck Cargo/Petroleum Barge". Accessed December 1, 2021.
 37.) Physical weight calculated using Archimedes' principle on this 3D model in the Trimble Sketchup 3D warehouse
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 39.) Specifications provided by the manufacturer: Sprinter Cargo Van by Mercedes-Benz. Accessed November 30, 2021.
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 41.) Boeing. "Introducing the 747ER and 747ER Freighter". January 2003. Accessed November 23, 2021.
 42.) U.S. Air Force Fact Sheet "Global Hawk". Accessed December 1, 2021.
 43.) Vehicle weight is the cabin weight minus the counterweight; we assume 6 passengers (as an average load) each carrying 20kg cabin-weight, passenger-weight, and counterweight are average approximations of Doug Guderian; accessed on January 17, 2022.