Public Transit: Clean and Efficient Transportation

The environmental benefits of public transportation include:

- Reducing air pollution from automobiles
- Reducing oil consumption and carbon emissions
- Encouraging more efficient land use

Reducing automobile pollution

Improved and expanded public transportation in Indiana will help reduce motor vehicle related air pollution as more people choose to use transit instead of driving.

Emissions from motor vehicles are a major contributor to Central Indiana ground-level ozone pollution. Nearly 60% of ozone pollution in central Indiana comes from motor vehicles.[1] Ozone pollution results when nitrogen oxides and volatile organic compounds (VOCs) are exposed to sunlight in the atmosphere. Vehicles are also the principal source of carbon monoxide emissions.[2] A single passenger car emits on average produces over 18 pounds a year of nitrogen oxides; a light truck or SUV over 25 pounds a year. [3]

The EPA has designated Indianapolis to be in attainment for the national ozone standard, but the city continues to experience days when ozone and particulate levels are unhealthy and particularly hazardous to children, senior citizens and people with respiratory illness. In 2016, Indianapolis has experienced eight air quality action days, when levels of air pollutants exceeded health-based air quality standards.[4]

Reducing oil consumption and carbon emissions

Transit buses operating with an average number of passengers use one-third less energy – per passenger mile – than a personal automobile or light truck.[5]

IndyGo has 22 electric buses at present, and will use all-electric buses on its new rapid transit lines.[6] Electric buses are four times more energy efficient than diesel-powered buses.[7] Electric bus motors have fewer moving parts and have lower lifetime maintenance costs.[8] IndyGo's electric buses are charged by a 1 megawatt solar panel system at the IndyGo garage, with additional power if needed supplied by Indianapolis Power and Light.[9]

---

[1] Indiana Department of Environmental Management (IDEM), Criteria Pollutants --Air Quality Trend Analysis Report (1980-2010)- Central Indiana
[2] IDEM
[3] U.S. EPA Emissions Facts, Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks, October 2008
[4] Indiana Department of Environmental Management, SmogWatch alerts for 2016
[5] U.S. Department of Transportation, Bureau of Transportation Statistics, Energy Intensity of Passenger Modes, 2013 data
[6] IndyGo, www.indygo.net
[7] National Renewable Energy Laboratory, U.S. Department of Energy, "Project Startup: Evaluating the Performance of Electric Buses, April 2016
[8] University of Tennessee, Chattanooga Center for Energy, Transportation and the Environment, "Frequently Asked Questions about Electric and Hybrid-electric Buses", 2015
[9] IndyGo, www.indygo.net

By 2017 over one-half of IPL's electricity generation will come from natural gas or renewable sources.[10] As a result, very little of the electricity powering IndyGo electric buses will be generated by burning coal.

Transportation consumes nearly three-quarters of all oil used in the U.S.[11] Land impacts from oil extraction (wells, roads, storage tanks and pipelines), and oil spills are among the environmental impacts of relying on oil for transportation fuel.

U.S. public transportation saves 37 million metric tons of carbon dioxide annually — equivalent to the emissions resulting from the electricity generated for the use of 4.9 million households.[12]

Encouraging more efficient land use

Public transportation infrastructure results in fewer impacts to undeveloped land, wildlife habitats and water resources, compared to expanding highways and airports. Transit encourages more compact, mixed use development, producing walkable neighborhoods which require less land and roadway space for automobiles, parking spaces and parking lots. The following image compares the road space used by 40 people in cars, buses, and bicycles.

[10] Indianapolis Power & Light, https://www.iplpower.com/Our_Company/Environment/Power_Generation/
[11] U.S. Energy Information Administration, http://www.eia.gov/energyexplained/index.cfm?page=oil_use
[12] American Public Transportation Association fact sheet, "Public Transportation Saves Energy and Helps Our Environment", 2009

Can transit use displace automobile use?

The energy and environmental benefits of public transit result from more people using transit for local travel rather than driving. Although Indianapolis will never reach the level of transit use occurring in very large, densely-developed cities like New York, Washington, DC, or Chicago, with wise investment the city could reach the levels of transit use in peer cities where a significant share of travel trips occur with transit, removing thousands of vehicles from the roads in these communities.

Metro area	Transit share	Personal vehicle share	City	Transit share	Personal vehicle share
Pittsburgh metro	5.6%	77.5%	Pittsburgh	17%	55.6%
Minn/St. Paul/Bloomington	4.8%	77.3 %	Minneapolis	14%	60.1 %
Denver -Aurora	4.5%	76.3 %	Denver	7.4%	70.1%
Salt Lake City metro	3.8 %	75%	Salt Lake City	7%	66.8%
St. Louis MO-IL	2.9%	82.7%	St. Louis	10.2%	71.3%
Indianapolis - Carmel	1.2 %	84.2%	Indianapolis	2.4%	81.7%
Source: American Community Survey 2014 data, www.census.gov					

SUPPLEMENTAL INFORMATION

Energy Intensity of Passenger Modes

British thermal units (BTUs) per passenger mile are a widely used measure of energy intensity. Following are comparisons of relative energy intensity of passenger modes from three separate reports.

Mode	BTUs/passenger mile U.S. average	BTUs/passenger mile U.S. average	BTUs/passenger mile U.S. average
Personal vehicles: autos and light trucks	4,583+	*	4,983
Bus transit	3,304	3,673	4,245
Rail transit (Light rail)	*	2,567	1,146
Passenger rail (Amtrak)	1,608	2,362	2,091

Column 1: U.S. DOT-Bureau of Transportation Statistics (2013 data)
Column 2: The Route to Carbon and Energy Savings: Transit Efficiency in 2030 and 2050, Center for Neighborhood Technology report to the Transportation Research Board of the National Academies, November 2010 (2008 data)
Column 3: American Bus Association, May 2007
[+] Pro-rated average based on automobiles (48.4%) and light truck (41.2%) percentage of U.S. vehicle miles traveled (except for ABA study – average calculations described in report)
* not calculated