



Focus on Linking Land Use, Air Quality, and Transportation Planning

Major Urban Communities

Background information

Motor vehicles are the largest source of air pollution in Washington. Every day, the average household spends over two hours on the road, makes 7.5 trips, and travels 58 miles. As a result, the average car emits more than 600 pounds of air pollution each year.

How are land use and transportation planning related to air quality?

Physical characteristics and patterns of land development affect air quality by influencing the availability of a variety of travel modes, and ultimately which modes of travel people select. Land use strategies that promote air quality include:

- creating smaller blocks;
- building more sidewalks and paths;
- developing vacant urban areas; and
- increasing residential density.

Development patterns that locate jobs, housing, and recreation in close proximity increase the use of alternative forms of travel, such as walking, biking, and mass transit. Alternative forms of travel reduce the number of vehicles on the road, reduce the amount of pollution emitted by motor vehicles, and improve air quality. Principles that improve air quality also provide additional cost savings by taking advantage of existing infrastructures for public utilities and services.

Five Characteristics of Urban Form that Influence Air Quality

- **Density:** Increasing neighborhood, development, or regional density reduces the distances that people drive, increases the viability of alternative modes of travel such as walking and biking, makes mass transit a convenient choice, and provides cost savings to the commuter.
- **Land Use Mix:** Incorporating different land uses (e.g. recreation, housing, employment, shopping) within a development, neighborhood, or shopping area reduces the number of vehicle trips, lessens the distance of trips, and reduces required commute distances.
- **Transit Accessibility:** Locating high-density commercial and residential development around transit stations increases transit use and decreases auto use.
- **Pedestrian-environment/Urban Design Factors:** Features that can make the environment more pedestrian-friendly, encourage people to drive less, and promote walking and bicycling include: sidewalks, crosswalks, bike paths, bike lanes, bike parking, shade trees, benches, and landscaping.

- **Regional Patterns of Development:** Centralizing or clustering activities within a metropolitan area, in relation to highway and transit development, shortens the distance between trip origins and destinations.

Land Use Links: Transportation and Air Quality

In the Average Urban Area in Washington:

- Each gallon of gas used by a motor vehicle causes over one pound of air pollution.
- The average automobile trip is eight miles long and takes sixteen minutes, with an average speed of 25.5 mph.
- As the household density increases in residential areas, the number of vehicle trips and vehicles miles traveled decreases, regardless of the distance between the home and workplace.
- An increase of ten employees per acre in employment areas reduces vehicle miles traveled by about one percent.
- Each added mile driven to work increases carbon monoxide and volatile organic (VOC) compounds by one percent and nitrogen oxides (NO_x) by three percent. Sunlight reacts with VOC and NO_x to create ground-level ozone, a harmful pollutant.
- Reducing block size by 20 percent reduces “cold start” trips by 3.2 percent. Starting the car after the engine has not been running for the previous hour is known as a cold start. Half of all vehicle trips are “cold start” trips – the most polluting type.

For more information

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