

## Corvallis Area Devoted to Cars

In 2015, Corvallis allocated 25% of its land to car dependence and the area devoted to each car is equal to the size of the average house.

**Introduction:** Why is the space allocated to cars important? First, cars dominate land use, second, infrastructure cars require is expensive to build and maintain, and finally land devoted to cars take land away for other uses like houses, parks, natural areas, and increasing productive enterprise. Further, cars are a major cause of greenhouse gases and air pollution.

A car takes as much space as a house. The median sized house in Corvallis is about 2000 ft<sup>2</sup> ([https://www.trulia.com/real\\_estate/Corvallis-Oregon/](https://www.trulia.com/real_estate/Corvallis-Oregon/)). Cars take so much space because they require roads, parking, and storage in driveways, garages, and on streets. Each car uses 3-8 parking spaces for accessing activities around town (Shoup, *The High Cost of Free Parking*). Some spaces are provided by businesses and public institutions. Much of the space on streets is free parking.

Maintenance of the car-dependent infrastructure is expensive. Gas taxes and a street maintenance fee support car-dependent infrastructure, but these income streams do not cover the cost of building and maintaining the infrastructure devoted to cars.

Corvallis is difficult to reach without a car. It draws people to its major educational and medical facilities. OSU, Samaritan Health Services, the Hewlett-Packard Campus, and Linn-Benton Community College offer significant amounts of parking. Shopping centers and businesses offer free parking to attract customers. Yet many residences, businesses, apartment complexes, and schools depend on free on-street parking.

Not everyone, however, can find parking where and when they want it. Many students living in Corvallis bring a car to get here. More people drive to Corvallis to work than leave it for work. All this driving contributes significantly to greenhouse gas emissions that are important to reduce. Data show that Oregon is not making progress toward its climate goals largely due to added traffic (Oregon Global Warming Commission 2017:9)

**Approach:** To estimate the space used by cars, the starting point was a City of Corvallis GIS map of

impervious surfaces. Eight types of car-dependent infrastructure were identified (Table 1). These are driveways, parking, and roads. Sidewalks might be added as would garages. A more comprehensive definition of car-dependence could also include rights of ways and buffers. The analysis of these data sought two final estimates—the area (footprint) as a percent of Corvallis devoted to car-dependent infrastructure and the area (car footprint) in square feet per car of car-dependent infrastructure.

Table 1. Impervious Surface Types

Car-dependent Type	Not car-dependent
"ALLEY" SQ FT	"BUILDING" SQ FT
"DRIVEWAY GRAVEL" SQ FT	"BUILDING INTERIOR" SQ FT
"DRIVEWAY PAVED" SQ FT	"CONCRETE" SQ FT
"PARKING LOT GRAVEL" SQ FT	"DECK" SQ FT
"PARKING LOT PAVED" SQ FT	"GREENHOUSE" SQ FT
"ROAD GRAVEL" SQ FT	"MISCELLANEOUS STRUCTURE" SQ FT
"ROAD HIGHWAY" SQ FT	"OBSCURED LINE" SQ FT
"ROAD PAVED" SQ FT	"POOL" SQ FT
	"RUINS" SQ FT
	"UNDER CONSTRUCTION" SQ FT
	"SIDEWALK" SQ FT

**Percent of City:** Calculation began with totaling the cumulative size of impervious surface slices in each of the eight car-dependent infrastructure categories. The total square footage in Corvallis was summed for each type to get the 80,772,369 ft<sup>2</sup> car-dependence (20.4%) in driveways, parking, and roads (Table 2). Other impervious surface types were included for comparison. For example, 12.8% of the area of Corvallis is in buildings. To get a more accurate figure the data need to have rights-of-way for roads added and the impervious surface in rights of way subtracted, since they have already been summed. Further, the right-of-way devoted to the Willamette River within City limits has to be subtracted out. Making these subtractions and adding rights-of-way gives 98,461,326 ft<sup>2</sup> of car-dependent land use (24.7%). Adding an estimate for garages takes the total to 104,158,026 ft<sup>2</sup> or 26.1%.

The 25% figure is a good estimate. It corresponds with other calculations and frequently reported estimates. Not adding buffer areas also associated with car-dependent infrastructure like green strips in parking lots biases toward under estimation of the car-dependent area percentage.

Table 2. Summary of area and percentage for impervious area types.

Area of Focus	File = City 2	2012 & 2015
Type	Area ft <sup>2</sup>	%
Alleys*	289470.5	0.1
buildings, OSU includes, n=480	50906007.8	12.8
building interiors	19841.8	0.0
buff	3869846.5	1.0
decks	2673565.4	0.7
driveways, gravel*	955276.0	0.2
driveways, paved*	12424346.8	3.1
+garages	5696700.0	1.4
parking lot, gravel*	3443909.1	0.9
parking lot, paved*	24968639.4	6.3
path	5639254.5	1.4
road, gravel*	276257.3	0.1
roads, highway*	3558910.5	0.9
road, paved*	34855559.5	8.7
sidewalk	9454925.0	2.4
+unpaved vehicle rights of way (up-ROW)	17688957.3	4.4
Total Area Corvallis at 14.3 mi <sup>2</sup>	398661120.0	
* = Car-dependent		20.4
Car-dependent w/ROW + garages		26.1

**Square Footage per Car:** This estimate is 2500 ft<sup>2</sup> per car, which is bigger than the median-sized house. These calculations require a number of assumptions. How many cars are there in Corvallis is the biggest? Unlike the area of Corvallis, the number of cars in the City is much more variable. The number of cars varies by time of day, week, season of the year, and year. Many students drive cars to Corvallis and store them while they live or take classes here. About twice as many travel by car to Corvallis each day as leave Corvallis. Light trucks are assumed to be insured like cars. Commercial vehicles are not included.

Many calculations were made and ranged between 2,000-3,500 ft<sup>2</sup> of land within Corvallis being required for each car. The number of ft<sup>2</sup> per car is very sensitive to the figure used for the total number of cars registered to, stored in, and migrating to and from Corvallis. The starting estimate is 38,203 insured and 4,101 uninsured cars for 2015 (<https://carinsurancelocal.org/states/oregon/corvallis/>). These data likely include the Corvallis Urban Growth Boundary, possibly even outside the UGB. The UGB population is 60,006 (ECONorthwest 2016). Dividing the number of cars by the population gives 0.70 cars per person. Multiplying this ratio times the Corvallis' population of 54,953 (2014) gives 38,708 cars residing within the city limits. Dividing one quarter of the area of Corvallis by the estimate for the number of cars gives 2544 ft<sup>2</sup> needed in driveways, garages, parking, rights-of-ways for cars, streets, and roads. This estimate may be high because it does not include cars brought to Corvallis from other addresses. This number changes daily as people choose to move into or out of Corvallis, as new building takes place, and as transportation options change. Generally, as the population of Corvallis increases additional car-dependent square footage will have to be added. If the total area remains fixed, loss of open space, buffers, and overcrowding of roads occurs.

Car-dependence is costly in terms of the space available for other activities. With less car dependence, more dwellings could be added to the community. Car-dependence increases air pollution and limits the city's ability to meet its carbon goals. The future of the car and transportation generally is changing and uncertain. Some scenarios indicate less demand for car infrastructure others could increase the demand. Discussing different visions for the future is important in developing policies for adapting to it.

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