
Chapter 7

GENERAL RETAIL DEVELOPMENT IMPACTS

The retail sector performs several functions in metropolitan regions and a community. It is where consumers acquire goods and services needed for daily living. It provides jobs, contributes to governmental revenues, and presents an image of a vibrant community. However, retail establishments may also increase noise and traffic, require infrastructure improvements at the community's expense, strain the environment through increased vehicle emissions and the runoff of pollutants into water courses, and draw business from existing retailers. *While the most immediate impacts of development are felt by the residents and businesses adjacent to retail establishments, the consequences of development are felt throughout a community, and often extend beyond municipal borders.*

METHODOLOGY

Most new retail development occurs in the form of shopping centers or free-standing structures, such as big-box retailers and corner drugstores with drive-through windows. *Table 7.1* illustrates the nine types of retail development which will be examined, as well as the general retail mix in each of the shopping centers.

Type of Retail Development	Composition	Size (sq. ft.)	Total GLA (sq. ft.)	Project Value	Full Time Equivalent Construction Jobs Generated	Full Time Equivalent Retail Jobs Generated
Large Super Regional Center	4 Department Stores (multi-story)	496,000	896,000	\$88,910,000	371	2240
	Other GLA (mall stores)	400,000				
	Common Area	150,000				
Small Super Regional Center	3 Department Stores (multi-story)	372,000	683,000	\$68,340,000	285	1707.5
	Other GLA (mall stores)	311,000				
	Common Area	121,000				
Regional Center	2 Department Stores (single story)	133,000	351,000	\$35,275,000	147	877.5
	Other GLA (mall stores)	218,000				
	Common Area	64,000				
Community Center	1 Discount Store (single story)	73,500	164,500	\$13,982,500	58	411.25
	1 Supermarket	43,000				
	Other GLA (specialty stores)	48,000				
Neighborhood Center	1 Supermarket	31,000	58,000	\$4,930,000	21	145
	Other GLA (specialty stores)	27,000				
Convenience Center	Total GLA	18,000	18,000	\$1,530,000	6	45
Power Center	6 "category-specific" anchors	388,000	388,000	\$32,980,000	138	970
Big Box Retailer		150,000	150,000	\$12,750,000	53	375
Large Drugstore		15,000	15,000	\$1,275,000	5	37.5

Table 7.1. Project Profiles and Employment Impacts of Average Midwestern Retail Developments

SOURCES: Dollars and Cents of Shopping Centers: 1998. Urban Land Institute Development Impact Assessment Handbook: 1994 (costs inflated to 1999 levels), Bureau of Labor Statistics

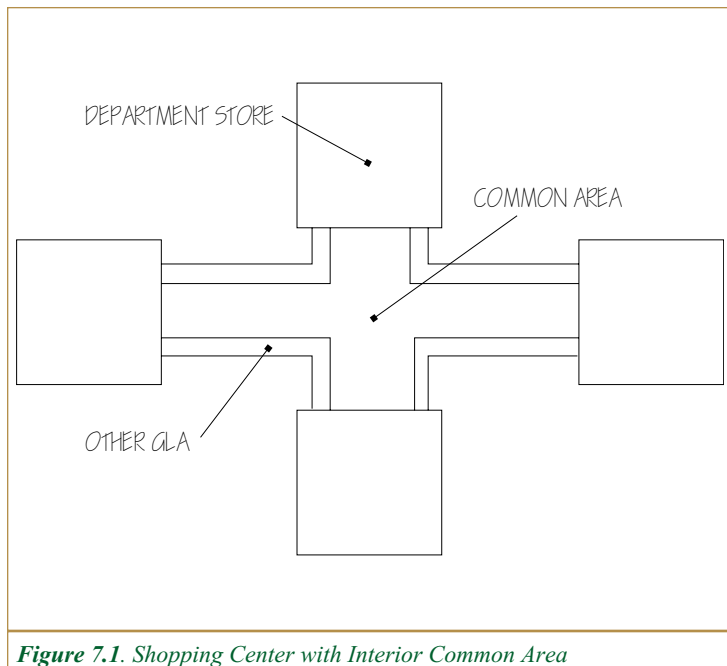


Figure 7.1. Shopping Center with Interior Common Area

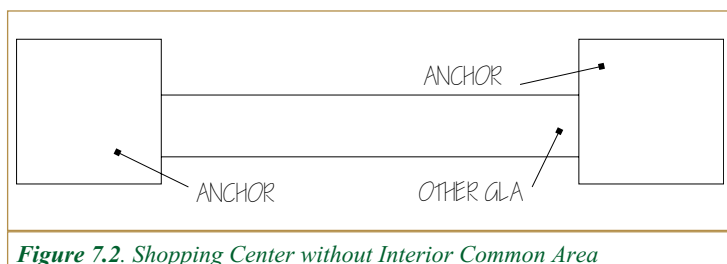


Figure 7.2. Shopping Center without Interior Common Area

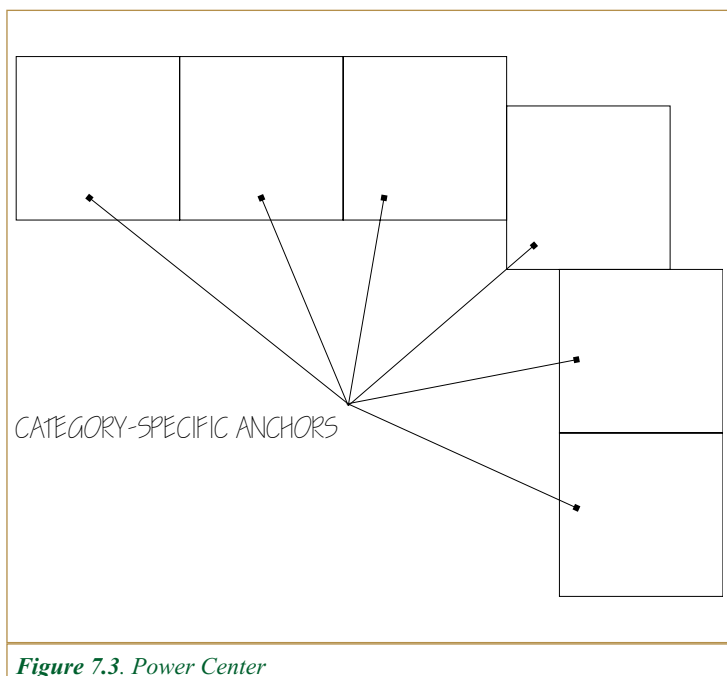


Figure 7.3. Power Center

Figures 7.1 to 7.3 show general layouts of different shopping centers. The categories use the standards developed by the Urban Land Institute to describe shopping centers.¹ Generally, the larger the shopping center, the more widespread the impact. The category of *Large Super Regional Center* represents large shopping malls that draw customers from throughout a region, such as Greater Cleveland. This type of center typically houses four or more department stores and a large number of specialty shops located around a large indoor atrium. On the other end of the spectrum, the impact of a *Convenience Center* is usually limited to the residential neighborhood in which such centers typically are located. Convenience stores, dry cleaners, and small restaurants usually are located in this type of center.

In addition to the traditional shopping centers that will be examined, the impacts of “Power Centers”, large strip-style shopping centers that consist largely of off-price, category-killer anchors and a discount department store or a warehouse club will also be addressed, as will single store big-box retailers and large drug-stores that typically include drive-through windows.

A land use analysis which will illustrate the impacts of retail development relative to office, light industrial, and residential land uses is also presented in this chapter. A sample ten acre property in Cuyahoga County will be used as a basis of comparison, with project characteristics, tax rates, and impact multipliers characteristic of average suburban developments in the study area. The impact analysis is based on suburban rather than urban land use patterns since most of the new retail growth in the region is taking

place in the second ring suburbs of Cuyahoga County as well as suburban locations in the rest of the region (see *Chapter 5: Analysis of the Cleveland Retail Market*). For comparative purposes, the four land uses to be analyzed will include: a *Community Shopping Center* consisting of a supermarket and a discount store, totaling 108,900 square feet; a typical office building of 110,400 square feet; an 81,800 square foot light industrial building; and 20 single-family homes on half-acre lots. While the impacts of each of these land uses differ from one another, the methodology will remain consistent throughout. **Appendix D** contains a series of tables which illustrate methodology and calculations.

This chapter will individually examine each type of impact and, wherever possible, compare the different types of retail development with one another and with other land uses. The impacts outlined here are general, and apply to representative shopping centers and typical land uses; the actual impacts of each development depend upon the unique character and situation of each setting. For those impacts that cannot be adequately measured due to the complexities of scale or the unique attributes of each project or land use, a more qualitative analysis will be applied.

EMPLOYMENT

New retail development can bring about two types of new employment. Construction jobs are generated first; these are seasonal jobs that depend on the scale of development and the quality of the building. Salaries for these jobs are estimated at \$18 an hour, according to the Bureau of Labor Statistics. Generally, larger and higher quality retail establishments require more labor hours than smaller and lesser quality construction. On average, 8.1 hours of on-site construction is needed per \$1000 of contract expenditures. **Table 7.1** outlines construction employment impacts for the nine types of retail development under consideration.

Permanent retail employment is generally based on Gross Leaseable Area (GLA), the amount of space used by retail tenants for sales. GLA includes both floor space (the area that is used by the public) and merchandise storage areas. Common areas (such as mall atriums) that are not available for sales activity by any particular store are not included in calculating GLA. **Table 7.1** displays the permanent employment impacts of different categories of retail development. *Large Super Regional Shopping Centers* generate 2,240 full-time jobs, while at the other end of the spectrum, a *Large Drugstore* would generate about 37 full-time jobs.

Table 7.2 shows a comparison of permanent employment impacts for different land uses. While retail development generates the second highest number jobs, after office development, the total wage income generated by retail lags behind both office and light industrial uses, since retail jobs tend to be low-skill positions with correspondingly low wage rates. For a ten acre lot, a typical shopping center will generate 272 full time jobs with an average annual salary of \$16,723, and the annual total wage income from such a shopping center would amount to about \$4.5 million. By comparison, an office building on a similarly sized site would generate three times as much aggregate wage income while light industry would generate nearly twice the wage income of retail uses. Residential land use, while not directly providing employment to communities, does generate wage income from employed members of the household. The median household income in the Cleveland-Lorain-Elyria PMSA is \$30,332, resulting in a total wage income from a ten acre site of \$606,640.

Land Use	Retail	Light Industrial	Office	Residential
Gross Floor Space per Acre	10,890	8,180	11,040	
Number of residential units per acre				2
Gross Floor Space (square feet)	108,900	81,800	110,400	0
Number of Residential Units				20
Jobs generated (full-time equivalent)	272	180	331	
Annual total wage income	\$4,552,837	\$8,083,983	\$13,574,563	\$606,640
Annual Municipal Income Tax Revenue (1.75%)	\$79,675	\$141,470	\$237,555	\$10,616
State Income Tax Rate (approximate)	1.0%	4.0%	4.0%	3.0%
Annual State Income Tax Revenue	\$45,528	\$323,359	\$542,983	\$18,199
Annual County Property Tax Revenue	\$44,106	\$33,130	\$52,604	\$12,895
Annual Municipal Property Tax Revenue	\$39,696	\$29,817	\$47,344	\$11,605
Annual School Property Tax Revenue	\$132,319	\$99,391	\$157,813	\$38,685
Annual Library Property Tax Revenue	\$4,411	\$3,313	\$5,260	\$1,289
Annual County Sales Tax Revenue	\$240,669	\$0	\$0	\$0
Annual Transit Sales Tax Revenue	\$240,669	\$0	\$0	\$0
Annual State Sales Tax Revenue	\$1,203,345	\$0	\$0	\$0
Annual Revenue from State Local Government Fund	\$10,338	\$2,677	\$4,495	\$151
Annual Revenue from State Local Govt. Revenue Assistance Fund	\$913	\$236	\$397	\$13

Table 7.2. Project Profiles and Employment and Tax Impacts of Different Land Uses on a Ten-Acre Site

SOURCES: Development Impact Assessment Handbook, 1994; Bureau of Labor Statistics; Trip Generation (5th Edition), Institute of Transportation Engineers, 1991; U.S. Census Bureau; "Paying for Public Services", Richard G. Sheridan, Federation for Community Planning; State of Ohio: Department of Taxation, Tax Analysis Division; Dollars and Cents of Shopping Centers: 1998, Urban Land Institute; Cuyahoga County Auditor's Office

TAXES

Income, property, and sales taxes are all affected by retail development. Construction and permanent retail jobs generate income tax revenue, the improvements made on the land by the construction of buildings produce property tax revenues, and the sales generated by retail activity provide sales tax revenue.

Income Taxes

Cities, villages, and the State of Ohio all have the power to levy income taxes. While the state personal income tax is graduated (ranging from 0.743% to 7.5% of a person's income) and increases as a person's earned income increases, municipal income taxes are "flat taxes", applying the same tax rate to everyone, regardless of income. Application of the state income tax rate to the impact analysis is approximate due to the complexities of the state income tax system.²

Table 7.3 shows the revenue collected through income taxes from permanent employment for different retail establishments. A 1.75% municipal income tax rate was applied to the analysis, although this rate varies by community.

Table 7.2 compares the income tax revenues generated by different land uses. Paralleling the range of wage income generated by the different land uses, both industrial and office land uses bring more income tax revenue to the municipality. Residential land uses generate less income tax revenue due to the small number of households relative to employees located in businesses on a similarly sized plot of land. For the amount of income tax revenue available to the state, the revenue differences between the land uses widens due to the graduated tax rate system employed by the state.

Type of Retail Development	Annual Municipal Income Tax Revenue (1.75%)	Annual State Income Tax Revenue (1.0%)	Total Property Tax Revenue	Annual County Sales Tax Revenue	Annual Transit Sales Tax Revenue	Annual State Sales Tax Revenue	Annual Revenue from State Local Government Fund	Annual Revenue from State Local Government Revenue Assistance Fund
Large Super Regional Center	\$711,872	\$406,784	\$2,118,236	\$1,721,760	\$1,721,760	\$8,608,800	\$74,632	\$6,592
Small Super Regional Center	\$542,644	\$310,082	\$1,628,166	\$1,317,390	\$1,317,390	\$6,586,950	\$57,095	\$5,043
Regional Center	\$278,870	\$159,354	\$840,409	\$684,640	\$684,640	\$3,423,200	\$29,657	\$2,619
Community Center	\$130,695	\$74,683	\$333,126	\$363,545	\$363,545	\$1,817,725	\$15,666	\$1,384
Neighborhood Center	\$46,081	\$26,332	\$117,455	\$113,100	\$113,100	\$565,500	\$4,899	\$433
Convenience Center	\$14,301	\$8,172	\$36,451	\$27,360	\$27,360	\$136,800	\$1,200	\$106
Power Center	\$308,266	\$176,152	\$785,732	\$779,880	\$779,880	\$3,899,400	\$33,738	\$2,980
Big Box Retailer	\$119,175	\$68,100	\$303,762	\$301,500	\$301,500	\$1,507,500	\$13,043	\$1,152
Large Drugstore	\$11,918	\$6,810	\$30,376	\$44,700	\$44,700	\$223,500	\$1,907	\$168

Table 7.3. Tax Impacts of Average Midwestern Retail Developments

SOURCES: Development Impact Assessment Handbook, 1994; Bureau of Labor Statistics; U.S. Census Bureau; State of Ohio: Department of Taxation, Tax Analysis Division; Dollars and Cents of Shopping Centers: 1998, Urban Land Institute; Cuyahoga County Auditor's Office

Property Taxes

County auditors are responsible for administering property taxes. The collected property taxes are distributed among the county, municipalities, school districts, and special purposes such as libraries, volunteer fire departments, vocational schools, and other special districts. Typically, about 60% of property tax revenue goes to the school district in which the property is located, 20% to the county, 18% to the city/village/township, and 2% to libraries or other special use districts. Therefore, this distribution will be applied to the impact analysis, although the amounts vary by community. For purposes of the analysis, the Cuyahoga County average commercial property tax rate of 68.07 mills will be used. **Table 7.3** illustrates the property tax impacts of various retail developments.

Table 7.2 shows the property tax impacts of different types of development. As expected, office development generates more tax revenue than other land uses, with retail development following closely in the amount of property taxes collected per acre of land. The impact of residential development is significantly small in comparison due to the relatively low property value of housing and to the lower property tax rates levied on homeowners.

When assessing valuation for property tax purposes, county assessors examine the quality and age of the building, the value of surrounding buildings, the level of infrastructure, and other factors. For retail establishments, sales generated is a factor; given two comparable shopping centers that were built at the same time, with similar materials, in similar surroundings, the center that generates more sales will have a higher assessed value, and thus will pay more in property taxes. Older shopping centers that are not able to sustain acceptable levels of sales will become devalued over time and may lose value to the point that surrounding housing and building values will likewise fall. For communities that have established retail areas and are also attracting new retail development, the increase in property tax revenue brought about by new development may be offset by a corresponding decrease in the property values of existing retail developments and their surrounding areas.

Communities can also expect retail establishments to gradually pay less in property taxes over time due to lowered property values as a result of depreciation. Since buildings experience physical deterioration and must eventually be replaced, laws allow owners to deduct depreciation as an expense, thereby decreasing their tax burden. However, Congress has historically allowed owners to claim depreciation allowances greater than the actual physical decline of the property in order to stimulate investment in real estate and spur construction.³ In addition to the standard straight-line depreciation based on a building life of 39 years, real estate investors have turned to methods that shorten the economic life of buildings, thereby accelerating depreciation which results in lower tax payments.⁴ This can be done by classifying assets defined within the property as “short-life property”, which would have lifetimes of 5 to 15 years. Not only would the property be worth less for taxation purposes, classifying some of the assets as short-life may exempt them from local property taxes. While the federal government can realize some of the income tax loss through the capital gains tax, local government cannot recoup lost property tax revenues.

Sales Taxes

County	County Tax Rate	Transit Tax Rate	State Tax Rate	Total Sales Tax Rate
Cuyahoga	1.00%	1.00%	5.00%	7.00%
Geauga	0.50%	0	5.00%	5.50%
Lake	0.50%	0.25%	5.00%	5.75%
Lorain	0.75%	0	5.00%	5.75%
Medina	0.50%	0	5.00%	5.50%
Portage	1.00%	0	5.00%	6.00%
Summit	0.50%	0.25%	5.00%	5.75%

Table 7.4. State and Permissive Sales Tax Rates

SOURCE: Ohio Department of Taxation

Levied on most services and tangible personal property, sales taxes primarily benefit the state and the county, with some counties electing to also service public transportation through the sales tax. The portion of the tax that goes to the county budget may vary from nothing to 2%. Sales tax rates thus vary from county to county, with only the constant being the 5% state sales tax. **Table 7.4** shows the breakdown of sales tax rates for counties in the study area.

Sales taxes are the primary source of revenue from retail uses, but they do not benefit municipalities directly; municipalities do receive some revenue as a result of the State and Local Government Fund and Revenue Assistance (to be discussed later in the chapter). **Table 7.3** shows the breakdown of sales tax revenue generated by different retail establishments, using Cuyahoga County as an example.

Among the four examined land uses, only retail generates sales tax revenue. For an average shopping center located on 10 acres, about \$24.5 million in sales is generated, amounting to \$245,025 in county sales tax revenue, \$245,045 in transit sales tax revenue, and \$1,225,125 in state sales tax revenue (see **Table 7.2**).

Intergovernmental Transfers

Two major mechanisms are in place by which state revenues are distributed to local governments. In 1998, a total of \$632.5 million was distributed to municipalities and counties from the state local government fund and the state local government revenue assistance fund. Both of these funds use statutory formulas to distribute funds collected by the state from sales tax, use tax, personal income tax, corporate franchise tax, and the public utility excise tax, and then transfer them back to Ohio’s municipalities and counties for use and distribution to municipalities. The state local government fund accounts for 4.2%, and the state local

government revenue assistance fund accounts for 0.6 % of these collected taxes. The distribution of monies is based on the population of each county relative to the state population and the property taxes collected by each county relative to property taxes collected throughout the state. Counties that have higher populations and higher property tax revenues will receive more money from the state through intergovernmental transfers.

For purposes of the impact model, two multipliers were developed to simplify calculation of intergovernmental transfers gained as a result of retail activity at any one site. These can be found in *Appendix D*. Because of the complexity of the statutory models, and the fact that decisions are made at the county level concerning how the some of the monies are redistributed, the amount of money that each land use and retail establishment generates for municipalities are approximations.

Table 7.3 shows the amount of intergovernmental revenue that typical retail establishments may be expected to bring to their counties. *Table 7.2* shows the amount of intergovernmental revenue that different land uses may generate. Retail uses will generate considerably more in intergovernmental funds, since both state income taxes and state sales taxes are contributed to the funds. The revenue received from municipalities via intergovernmental transfers is miniscule compared to revenue directly received through income and property taxes.

Tax Revenue Impacts by Jurisdiction

Due to the variety of mechanisms by which public services are funded (see *Table 7.5*), as well as the impacts that different land uses have on tax assessment, jurisdictions benefit from tax revenues in different ways. A comparison of the tax impacts of different land uses with respect to jurisdiction illustrates this point.

Graph 7.1 shows the revenues that schools receive from the tax structure. Since the only major revenue stream that schools receive is from property taxes, office and retail land uses will generate more revenue than light industry and residences.

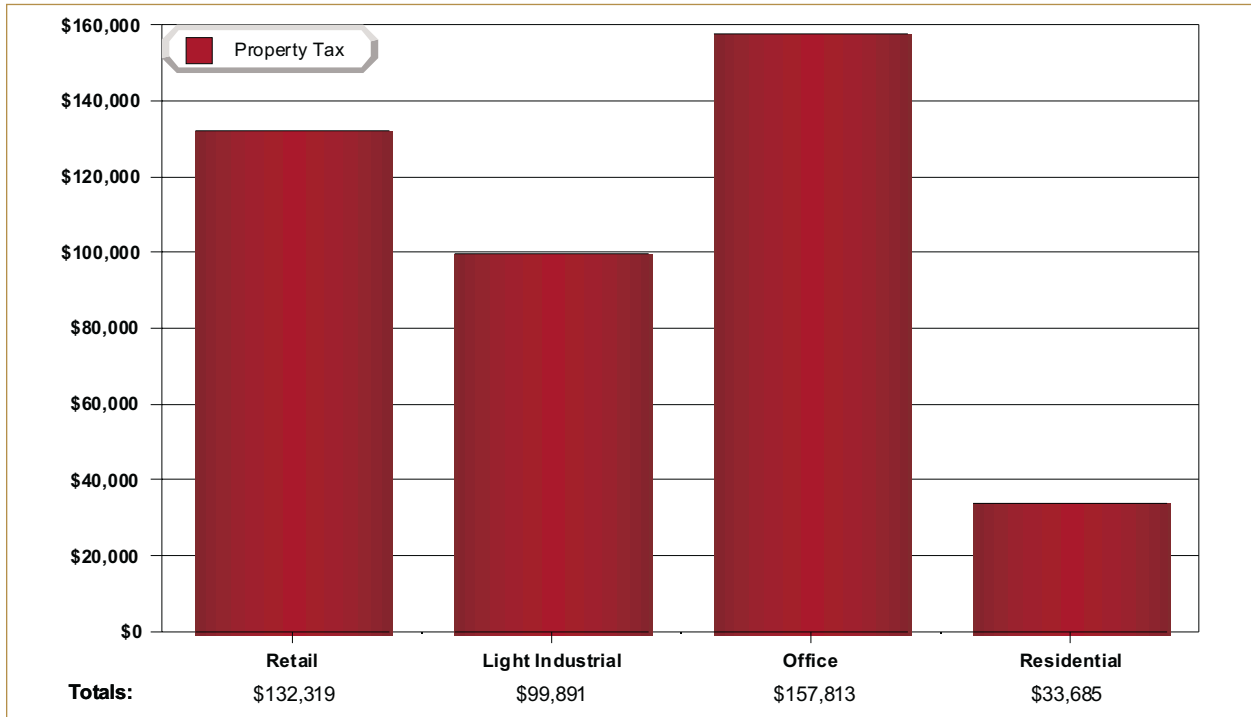
Graph 7.2 shows a more complicated picture of how municipalities benefit from different land uses with regard to taxes. Because of the heavy emphasis on municipal income taxes, office uses generate over twice as much revenue as retail uses, which require lower-skill employment. However, for municipalities with low income tax rates, or for townships that do not collect income taxes, the tax revenue gap between retail and office uses can be significantly narrower.

As a result of the heavy reliance on sales tax revenue, counties get a significantly higher benefit from retail uses than from any other use, as shown in *Graph 7.3*. Over five times as much revenue is generated by retail use than by office use. Again, with a lower county sales tax rate, the benefit gained from retail use will decrease, although only with a complete divestiture by the county of sales tax revenues will office uses become fiscally more valuable.

Tax	Sales	Property	Income
City/Village		x	x
Township		x	
Schools		x	
Transit Authority	x		
County	x	x	
State	x		x

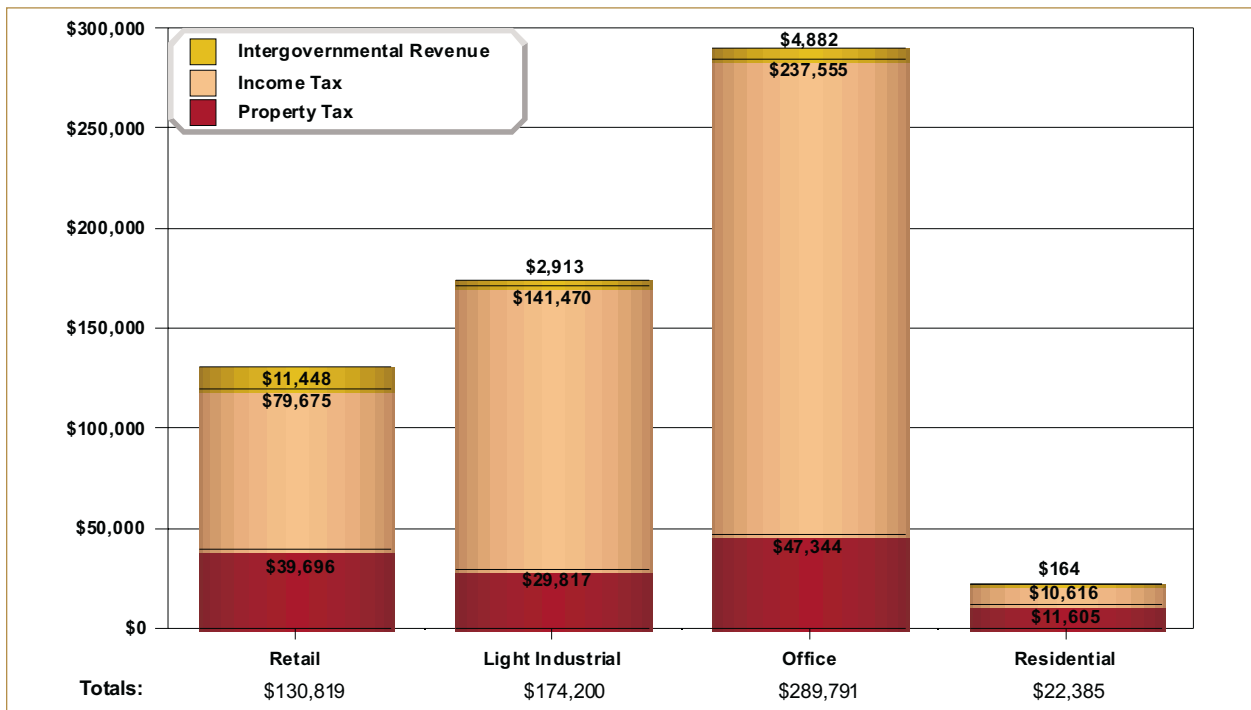
Table 7.5. Taxes by Jurisdiction

SOURCE: *Paying for Public Services*. Richard G. Sheridan, *Federation for Community Planning*



Graph 7.1. Revenues to Schools from Different Land Uses

SOURCE: *Paying for Public Services*, Richard G. Sheridan, Federation for Community Planning; State of Ohio Department of Taxation, Tax Analysis Division; Cuyahoga County Auditor's Office; U.S. Census Bureau



Graph 7.2. Revenue to Municipalities from Different Land Uses

SOURCE: *Paying for Public Services*, Richard G. Sheridan, Federation for Community Planning; State of Ohio Department of Taxation, Tax Analysis Division; Cuyahoga County Auditor's Office; U.S. Census Bureau

Like counties, the state derives much of its revenue from sales taxes, though not to as great an extent. *Graph 7.4* illustrates the higher value of retail uses to the state, largely due to sales tax revenues. However, because of the use of the graduated income tax, office uses generate much more income than retail uses.

Overall, municipalities and schools do not benefit as much from retail uses as they do from office uses. Furthermore, as will be shown later in the chapter, the public service impacts of retail uses are greater than that of any other land use except residential. This suggests that from a fiscal perspective, municipalities may be better served by land uses other than retail. For counties and the state, while retail uses are lucrative, there is a limited amount of income that can be spent on retail sales, and as such, a limit on how much sales tax revenue may be generated. The emphasis on sales tax revenues by counties and the state limits the fiscal benefit that additional and widespread retail development may produce.



Figure 7.4. The area around Randall Park Mall in North Randall encompasses many shopping centers and big box stores.

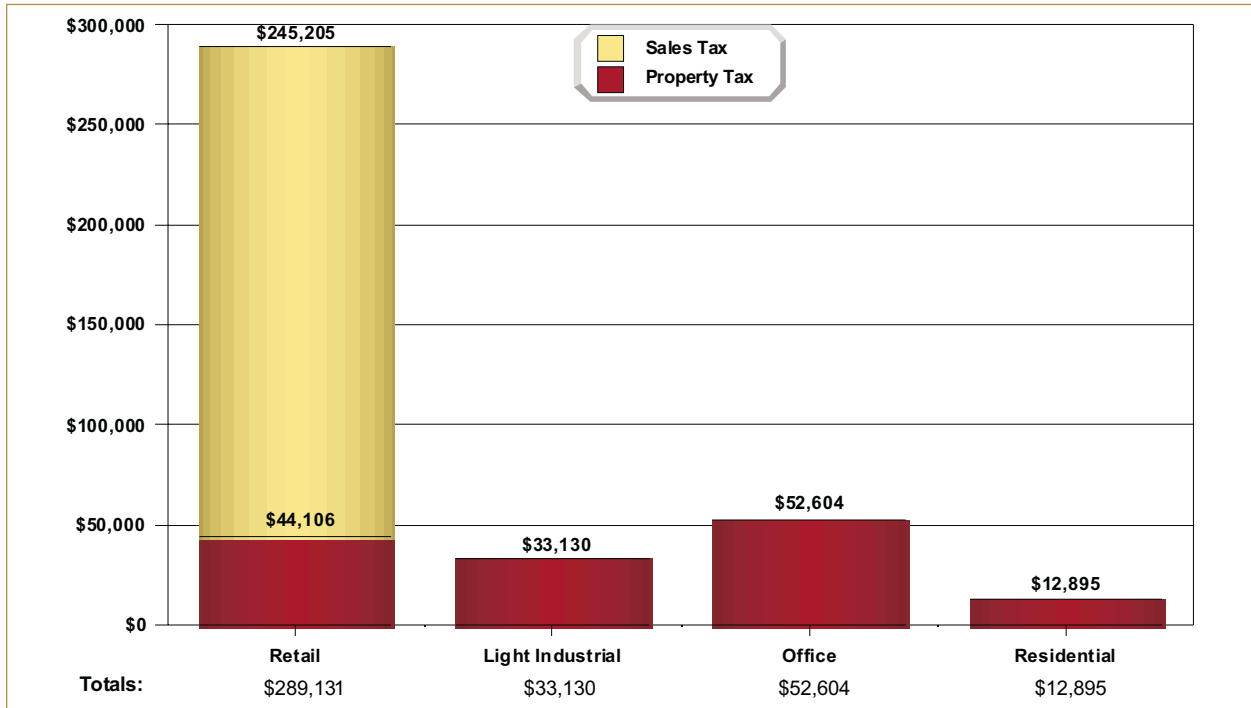
TRAFFIC

Among the impacts generated by retail use, traffic may count as the most visible. For residents who live near retail establishments, the noise, fumes, and congestion generated by shoppers are all negative effects. Areas around major suburban retail nodes are impacted the most since mass transit accessibility decreases outside of heavily urbanized areas of the region (*Chapter 3, Map 3.11*). Furthermore, shopping establishments tend to locate near existing clusters because there already exists a proven area that is well known by consumers. Communities in which a new shopping center is built will find themselves targeted by other developers who want to “piggyback” on the success of a new retail node by building more stores and shopping centers. As a result, traffic tends to increase dramatically, particularly in outer-ring suburbs that are experiencing residential and retail growth that outpaces the capacity of the road network.



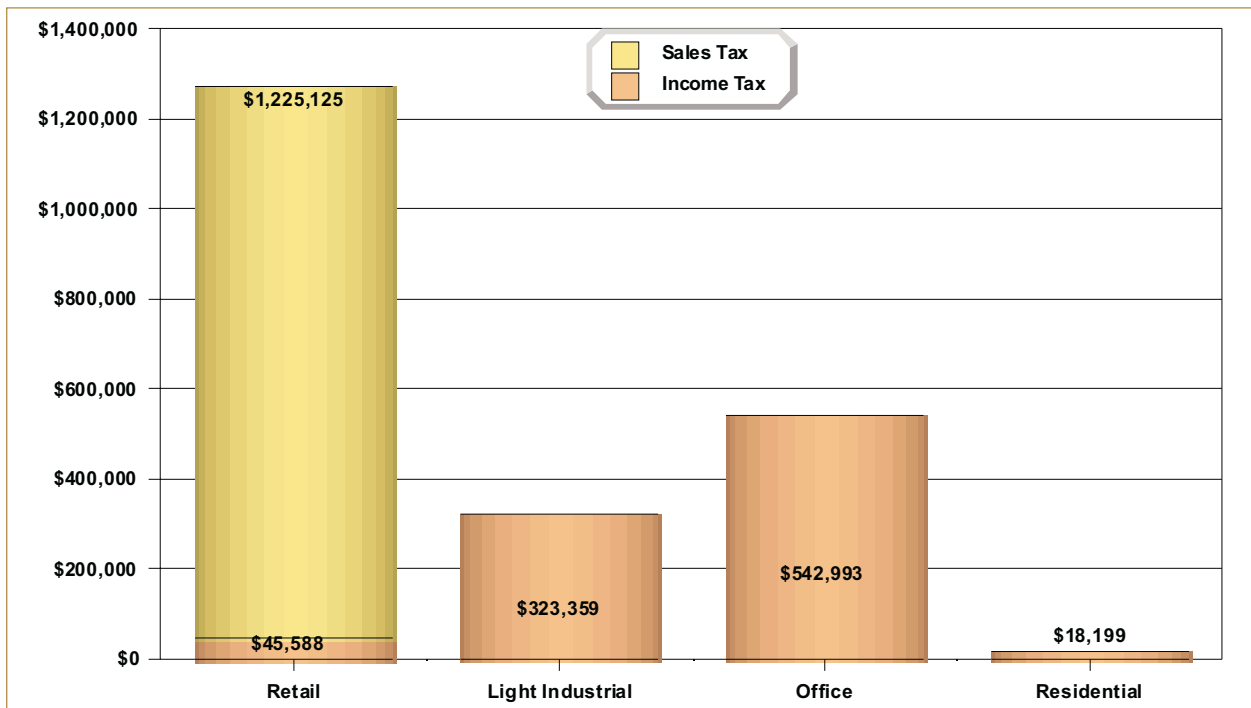
Figure 7.5. Some intersections, such as this one on Mayfield Rd. north of Golden Gate Shopping Center, have heavy traffic volumes due to the number of stores in the vicinity and the proximity to interstate ramps.

Estimates of traffic generated by types of land use are compiled by the Institute of Traffic Engineers (ITE) and are based on survey data and research done by transportation engineers and planners.⁵ ITE uses this data to formulate equations that can be used to calculate traffic estimates based on building type, gross floor area, and/or other factors (such as number of gasoline pumps). Generally, the larger the building, the more traffic it will generate. After calculating the number of trip ends (which are one-way trips to a destination), a pass-by trip factor is used to calculate the actual number of trips generated by the presence of a particular land use. Stopping by a drugstore on the way home from work does not result in a trip generated by the



Graph 7.3. Revenue to Counties from Different Land Uses

SOURCE: *Paying for Public Services*, Richard G. Sheridan, Federation for Community Planning; State of Ohio Department of Taxation, Tax Analysis Division; Cuyahoga County Auditor's Office; U.S. Census Bureau



Graph 7.4. Revenue to the State from Different Land Uses

SOURCE: *Paying for Public Services*, Richard G. Sheridan, Federation for Community Planning; State of Ohio Department of Taxation, Tax Analysis Division; Cuyahoga County Auditor's Office; U.S. Census Bureau

store, but a trip made specifically to go to the drugstore will result in two trip ends. Larger retail establishments, such as regional shopping centers (malls) and big box retailers tend to be primary destinations, resulting in fewer pass-by trips than convenience centers and drugstores, which are typically visited on the way to or from home.

For shopping centers and other retail establishments, the number of vehicle miles traveled as a result of traffic to the retail establishment can be calculated by multiplying estimated trip ends by the average travel distance made by a shopper. Average travel distances for retail establishments are based on primary market areas, which are the areas from which a store may be expected to draw repeat sales. The size of a market area typically corresponds to the size of the retail establishment. As an example, convenience centers and corner drugstores will generally draw customers from the immediate vicinity, while large malls will pull shoppers from throughout the region. **Table 7.6** shows the calculations of daily trips and daily miles generated by different types of retail establishments.

Type of Shopping Center	Pass-By Trip Factors	Average Travel Distance (miles)	Total Trips on a Weekday	Cumulative Miles Traveled on a Weekday
Large Super Regional Center	30%	10	19,543	195,433
Small Super Regional Center	30%	8.5	16,414	139,516
Regional Center	30%	5.7	10,698	60,979
Community Center	30%	3.5	6,572	23,001
Neighborhood Center	30%	1.1	3,361	3,698
Convenience Center	40%	0.8	1,358	1,086
Power Center	30%	7	11,410	79,870
Big Box Retailer	30%	4	6,918	27,672
Large Drugstore	70%	0.8	397	317

Table 7.6. Total Daily Trips and Vehicle Miles Generated by Retail Establishments

SOURCES: Trip Generation (6th edition), Institute of Transportation Engineers, 1997; Development Impact Assessment Handbook, 1994

Graph 7.5 illustrates the number of daily trips generated by different land uses. Retail uses generate nearly four times as much traffic as office uses, and nearly eight times as much as light industrial uses. Furthermore, because shopping centers are typically automobile-oriented and retail establishments are often-times clustered around each other, additional traffic is generated by patrons driving from store to store, rather than using transit or walking. This analysis does not include the cost of building new roads and widening existing roads since this varies depending on the existing road network and the level of service that a community may deem necessary to maintain traffic flow. However, maintenance costs will rise due to increased automobile and heavy truck traffic generated by retail establishments.

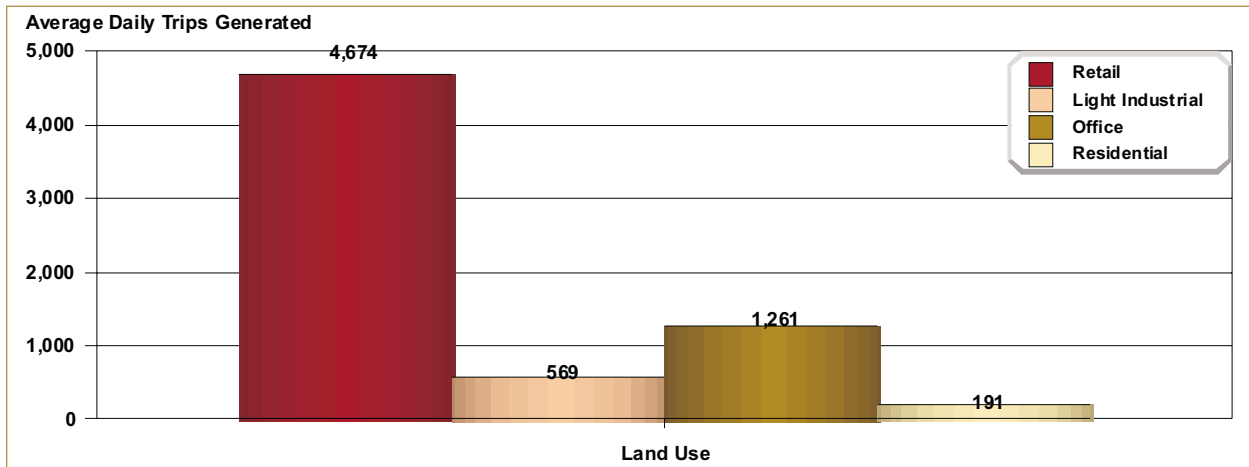
Generated vehicle miles for land uses other than retail could not be calculated. While there is a positive correlation between size of a retail establishment and its geographic area, for residences and workplaces, a simple correlation does not exist. However, the Federal Highway Commission's *National Personal Transportation Survey, Summary of Trends* illustrates the extent to which the number of trips for shopping has increased, relative to vehicular trips for other reasons (**Graph 7.6**).

In addition, while the average trip length for all purposes has increased 1.8% from 1969 to 1995 (from 8.90 to 9.06 miles), the average trip length for shopping has increased 29% (from 4.63 to 5.64 miles).⁶ This reflects a movement within the retail industry towards larger stores that serve larger geographic areas, as

well as a preference among consumers for more product choice and comparison shopping. However, this is often at the expense of locally-owned, neighborhood-based stores.

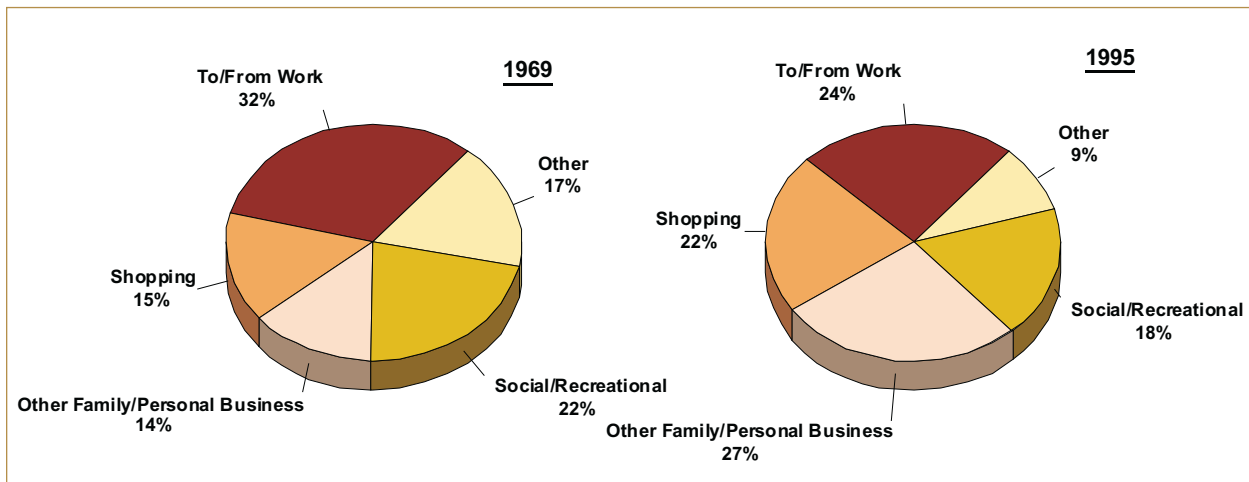
PARKING

For retailers to remain competitive, they must not only have adequate parking to meet the needs of their customers, but they must also maintain the perception of convenience and availability to attract more business. Early efforts to establish a relationship between retail area and parking area centered around a 3-to-1 ratio of parking area to building area (or 3 square feet of parking to 1 square foot of building). This resulted in parking lots that were much larger than necessary, thus creating large, barren expanses of land



Graph 7.5. Traffic Impacts of Different Land Uses

SOURCE: Trip Generation (6th Edition), Institute of Transportation Engineers, 1997



Graph 7.6. Vehicle Trips by Purpose

SOURCE: Federal Highway Administration, "1995 National Personal Transportation Survey, Summary of Travel Trends"

that brought little financial benefit to retailers and municipalities.⁷ Over the years, the Urban Land Institute and the International Council of Shopping Centers have commissioned studies that examined the relationship between shopping center retail area and parking and made recommendations concerning parking needs. The latest study, *Parking Requirements for Shopping Centers: Second Edition*, recommends 4-to-4.5 parking spaces per 1,000 sq. ft. GLA, with larger shopping centers requiring more parking spaces per area of retail space than smaller centers. The 20th-busiest hour, determined to be between 1 p.m. and 3 p.m. on the second-to-last Saturday before Christmas Day, was designated as the standard for determining parking requirements. This would allow for adequate parking for most of the year, while trimming some of the excess capacity. Nonetheless, with this standard, at least one-half of a shopping center's spaces would be vacant 40 percent of the time.⁸



Figure 7.6. This parking lot for a shopping center illustrates the excess of parking typical of retail establishments.

Using the ULI/ICSC study and a standard of 520 square feet of parking area per vehicle (taking into consideration the amount of paved area that is used for driveways, lanes, and loading area), calculations of parking spaces and parking lot area for typical retail establishments were made (**Table 7.7**).

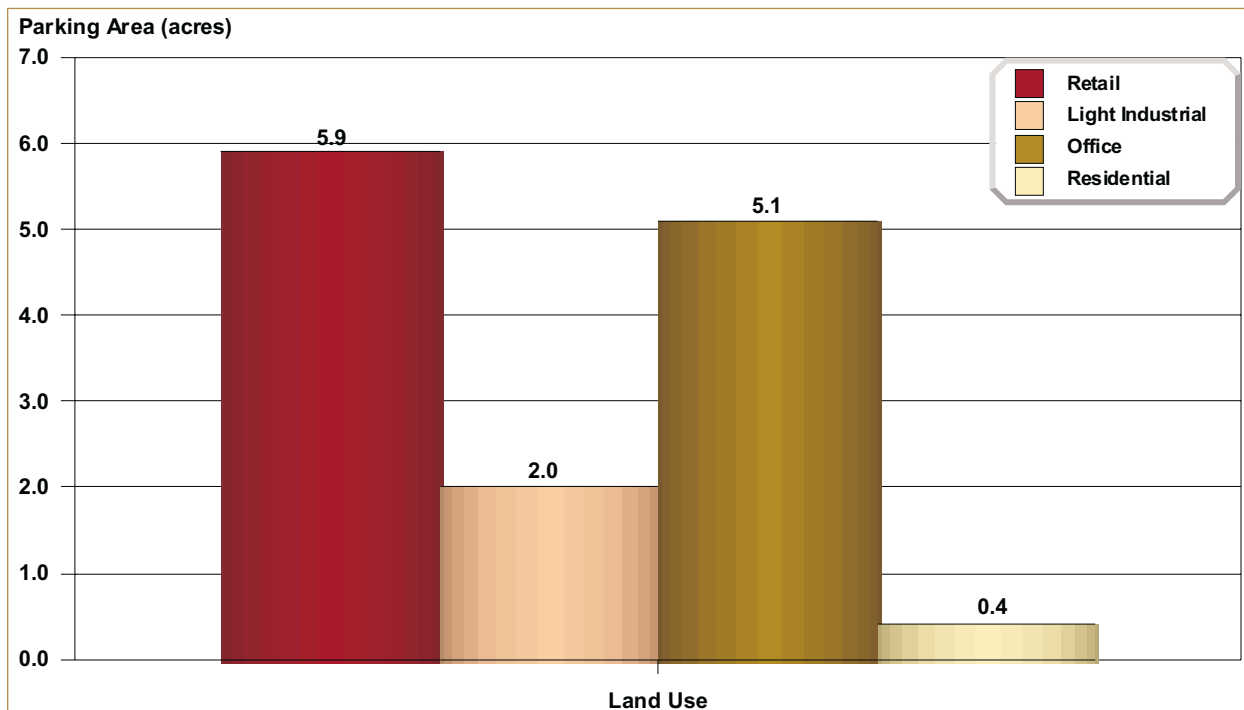
In earlier editions of *Trip Generation*, ITE included in its survey results the number of parking spaces per 1,000 sq. ft. of gross floor area (GFA), along with other factors such as employment and trips generated per unit of GFA. Using ITE's standards, as well as measurements of aerial maps of industrial and office buildings in the Greater Cleveland area, calculations of parking area needed by different land uses can be determined (**Graph 7.7**). Retail and office uses require relatively equal amounts of parking area per acre of land, while industrial uses, because of the small number of employees per GFA, and residential uses, due to the low density of use, need less paved area for parking.

Excessive parking area presents problems other than visual blight. It is estimated that each unused parking space wastes \$600 to \$900 a year in land development costs in addition to lost tax revenue. Furthermore, by creating more impervious surface through the paving of parking area, additional storm sewer capacity is needed to divert rainwater runoff; impacts related to runoff will be discussed later in the chapter. Finally, the visual blight that is created by excess parking capacity, rather than attracting customers, gives the impression that retail establishments are performing poorly, thus providing a disincentive to shop.

Type of Shopping Center	Number of Spaces	Area of Lot (Square Feet)
Large Super Regional Center	4,032	2,096,640
Small Super Regional Center	3,618	1,881,360
Regional Center	1,660	863,200
Community Center	658	342,160
Neighborhood Center	232	120,640
Convenience Center	72	37,440
Power Center	1,552	807,040
Big Box Retailer	600	312,000
Large Drugstore	60	31,200

Table 7.7. Parking Impacts of Retail Establishments

SOURCES: *Parking Requirements for Shopping Centers: Second Edition*, Urban Land Institute, 1999; "Parking", Robert A. Weant and Herbert S. Levinson, 1989



Graph 7.7. Parking Impacts of Different Land Uses

SOURCES: Trip Generation (5th edition), Institute of Transportation Engineers, 1991. "Parking", Robert A. Weant and Herbert W. Levinson, 1989

AIR EMISSIONS

Unlike factories and power plants, retail establishments are not perceived as being generators of pollution; there are no smokestacks or discharge drains. However, due to the reliance of stores on the automobile to bring customers, the effects of automobile emissions on the atmosphere and parking lot runoff on watersheds are substantial. This section will catalogue the effects of retail on atmospheric pollution, specifically "criteria" air pollutants produced by the fuel combustion processes of mobile sources (automobiles).

Carbon Dioxide

Carbon Dioxide is a gas that is naturally produced by animals by way of respiration and is used by plants in photosynthesis. It is not directly harmful to human health, and is not a criteria pollutant. However, it is classified as a "greenhouse gas" that traps heat in the atmosphere and contributes to global warming. **Table 7.8** shows the amount of carbon dioxide released as a result of emissions generated by the annual vehicular miles traveled to shopping centers.

Volatile Organic Compounds and Nitrogen Oxides

Usually referred to as hydrocarbons, volatile organic compounds (VOC) react with nitrogen oxides to form ground-level ozone, which is the major component of smog. Excess ground-level ozone raises a number of respiratory problems. Minor symptoms include choking, coughing, and stinging eyes. Damage to lung

Type of Shopping Center	Cumulative Annual Vehicle Miles Generated	Annual Carbon Dioxide Emissions (tons)	Annual Volatile Organic Compound Emissions (tons)	Annual Nitrogen Oxide Emissions (tons)	Annual Carbon Monoxide Emissions (tons)
Large Super Regional Center	70,638,750	33,906.6	250.7	129.2	1,931.0
Small Super Regional Center	51,358,499	24,652.1	182.3	94.0	1,403.9
Regional Center	22,042,231	10,580.3	78.2	40.3	602.6
Community Center	8,404,578	4,034.2	29.8	15.4	229.7
Neighborhood Center	1,426,511	684.7	5.1	2.6	39.0
Convenience Center	472,410	226.8	1.7	0.9	12.9
Power Center	28,846,272	13,846.2	102.4	52.8	788.5
Big Box Retailer	10,024,065	4,811.6	35.6	18.3	274.0
Large Drugstore	115,525	55.5	0.4	0.2	3.2

Table 7.8. Annual Vehicle Emissions Generated by Retail Establishments

SOURCES: U.S. Environmental Protection Agency National Vehicle and Fuel Emission Laboratory, 1998; Statistical Abstract of the United States, 1998, U.S. Department of Commerce

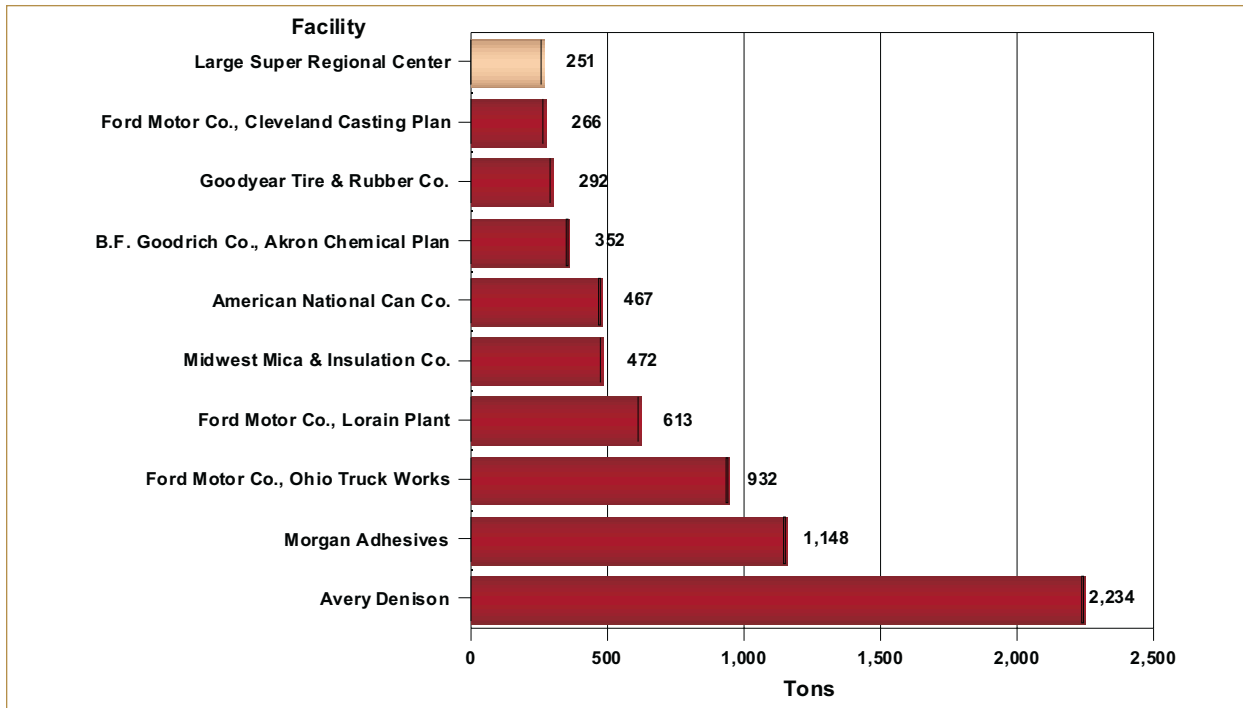
tissue, aggravation of respiratory disease, and susceptibility to respiratory infections are all long-term effects of ozone. Vegetation is also affected by ozone, with trees and plants being more susceptible to disease and environmental stresses. Also occurring is a reduction of agricultural and commercial forest yields.⁹ Ground-level ozone concentrations generally peak in the summer. While vehicle miles have increased over the years, emissions from mobile sources have dropped largely due to cleaner-burning vehicles and oxygenated fuels.

VOC and nitrogen oxide emissions due to vehicular miles generated by retail establishments are shown in **Table 7.8**. Larger shopping centers generate more airborne pollutants through traffic than smaller centers, not only because they attract more business, but also because their customers tend to drive longer distances. Calculations of airborne pollution from traffic to and from large shopping centers and comparisons with the largest point-source polluters in the region illustrate the VOC and nitrogen oxide impacts of retail uses (**Graphs 7.8 and 7.9**). A single large super-regional shopping center would rank as the tenth largest producer of VOC emissions and the twentieth largest generator of nitrogen oxides in the seven county region. Within the region, eight shopping centers meet the GLA criteria to qualify as large super-regional centers.

Carbon Monoxide

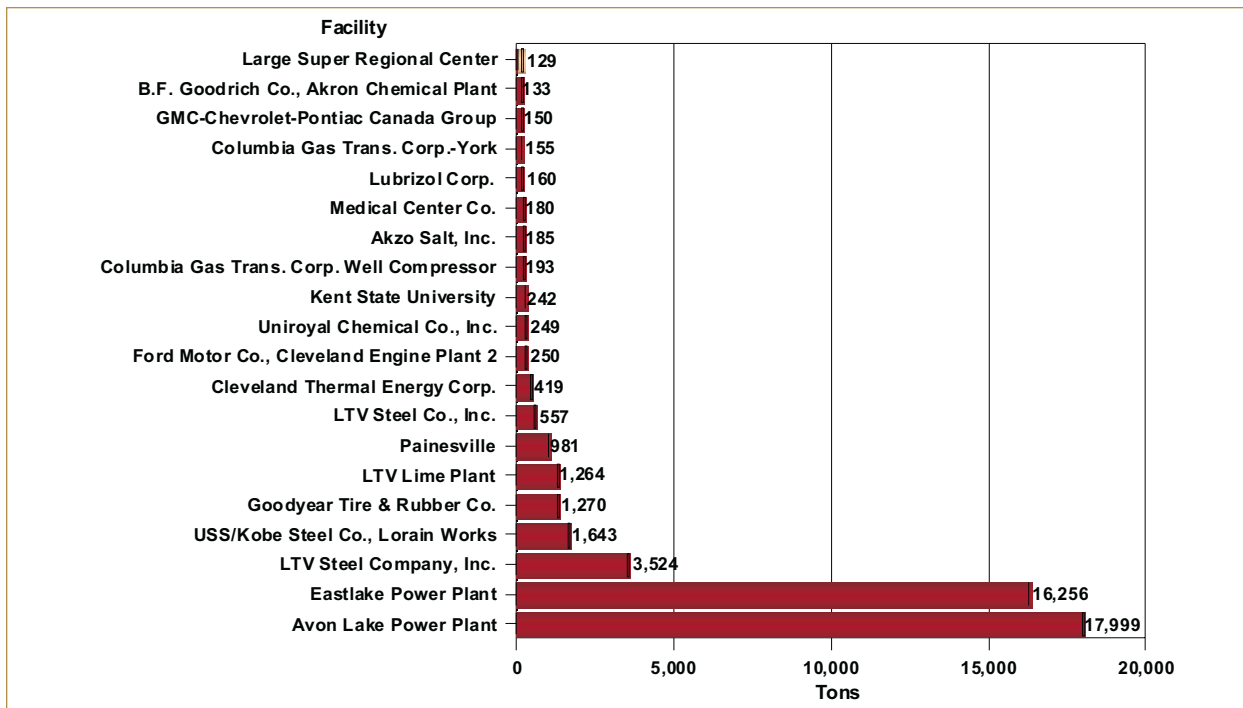
The health problems caused or exacerbated by carbon monoxide (CO) are numerous. A colorless and odorless gas, CO binds to the blood more readily than oxygen, impeding the delivery of needed oxygen to the organs and tissues of the body. Prolonged exposure to CO may result in “dizziness, headaches, fatigue, visual impairment, reduced work capacity, reduced manual dexterity, and poor learning ability.”¹⁰ Vehicular emissions of CO are greater when it is cold.

Table 7.8 shows CO vehicular emissions generated by various retail establishments. **Graph 7.10** compares shopping centers with the largest point-source CO generators in the region. Because of the large amounts of CO generated by mobile sources, four shopping center categories rank among the ten largest CO polluters. All of the 26 largest retail centers (ranked by total retail area) according to *Crain’s Cleveland Busi-*



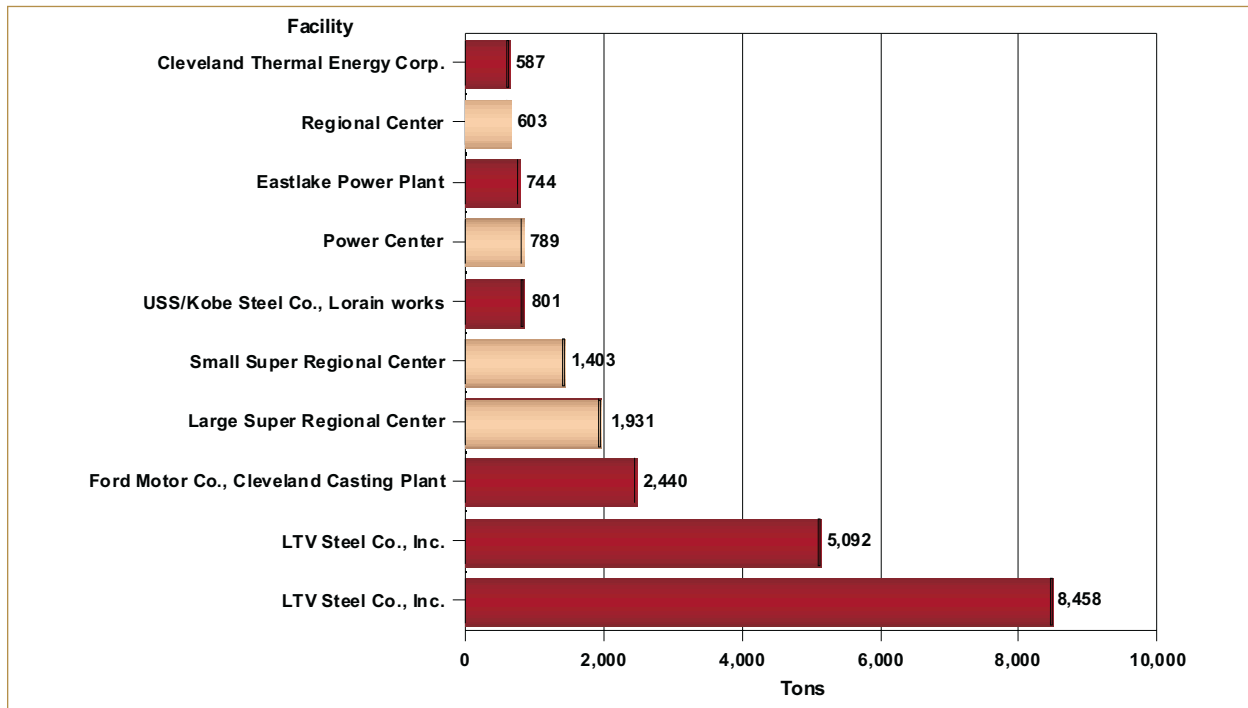
Graph 7.8. Volatile Organic Compound Impact Comparison

SOURCE: Environmental Defense: <http://www.scorecard.org>



Graph 7.9. Nitrogen Oxide Impact Comparison

SOURCE: Environmental Defense: <http://www.scorecard.org>



Graph 7.10. Carbon Monoxide Impact Comparison

SOURCE: Environmental Defense: <http://www.scorecard.org>

ness meet the criteria to generate more CO than the fifth largest point-source polluter in the region.¹¹ The smallest retail category to rank higher than the sixth largest point-source polluter consists of little more than two retail anchors and about 200,000 square feet of additional retail space.

STORMWATER RUNOFF

The dependence of retail uses on automobiles not only affects air quality, but water quality as well. Urban watersheds are directly affected by the level of imperviousness at a development site or throughout the watershed. Factors that contribute to watershed imperviousness include rooftops of buildings, roads, parking areas, sidewalks, or any other surface that prevents water from infiltrating permeable surfaces and gradually flowing into streams, rivers, and lakes. **Table 7.9** summarizes the negative effects that increased impervious cover creates in urban waterways. The following sub-sections will detail these effects.

Flooding

Lacking grassy surfaces or any other impediment to the flow of water, paved surfaces force stormwater to drain directly and quickly into urban streams. Channels wear away more quickly and the possibility of flash flooding in low areas increases. The widening of



Figure 7.7. The clearing of land for retail construction leaves areas bare and prone to erosion. The washing away of soil into streams negatively affects aquatic ecosystems.

Urban Stream Classification*	Sensitive: 0-10% Impervious	Degrading: 11-25% Impervious	Non-Supporting 26-100% Impervious
Channel Stability	Stable	Unstable	Highly unstable
Water Quality	Good to excellent	Fair to good	Fair to poor
Stream	Good to excellent	Fair to good	Poor
Resource Objectives	Protect biodiversity and channel stability	Maintain or restore key elements of stream quality	Minimize downstream pollutant loads
Water Quality	Sediment and temperature	Nutrient and metal loads	Bacteria

Table 7.9. *A Model for Classifying Headwater Urban Streams Based on Ultimate Impervious Cover*

*NOTE: Range of impervious cover used to classify urban streams may shift among ecoregions
SOURCE: Northeast Ohio Regional Sewer District

streams that takes place when water flows into them unimpeded oftentimes makes them too shallow to support fish and other wildlife. Furthermore, the increased reliance on storm sewers over natural streams to divert stormwater increases the possibility of mixing water between storm and sanitary sewers when storm sewers are pushed beyond capacity. Mixing of water from storm and sanitary sewers causes untreated sewage to flow directly into urban waterways and Lake Erie, leading to the swimming bans that are prevalent after heavy rainfall. For areas downstream, upstream water can overwhelm storm sewers, resulting in flooded streets and basements.

Type of Shopping Center	Runoff Volume in a 10-Year Storm, Peak Hour of intensity (Acre-Feet Per Hour)	Average Annual Runoff Volume (Acre-Feet)
Large Super Regional Center	6.18	147.12
Small Super Regional Center	5.54	132.02
Regional Center	2.54	60.57
Community Center	1.01	24.01
Neighborhood Center	0.36	8.47
Convenience Center	0.11	2.63
Power Center	2.38	56.63
Big Box Retailer	0.92	21.89
Large Drugstore	0.09	2.19

Table 7.10. *Annual Stormwater Volumes Generated by Retail Establishments*

SOURCE: "The Importance of Imperviousness", *Watershed Protection Techniques*, 1994

Table 7.10 shows annual runoff volume and runoff from a ten-year storm for selected retail establishments. The Northeast Ohio Regional Sewer District uses the ten-year storm standard (1.54 inches of rain at the peak hour of intensity) for storm sewers in commercial areas to prepare its sewer infrastructure for most precipitation events that will occur in Greater Cleveland.

Graph 7.11 compares runoff volumes between different land uses. Retail, light industrial, and office uses have comparable runoff volumes due to paved areas for parking and large building rooftops that all contribute to ground impermeability.

Stream Warming

Impervious areas such as rooftops and parking lots tend to absorb heat, especially in the summer. Areas that have high levels of imperviousness typically are 10 to 12 degrees warmer than the fields and forests that they replace.¹² Urban waterways and the bodies of water that they feed (such as Lake Erie) are affected adversely on several different levels. Resistance to disease is reduced in fish, algae growth is increased, thus reducing water clarity and making areas less amenable to swimming and recreation, and water quality is affected in the form of bad odor and taste.¹³

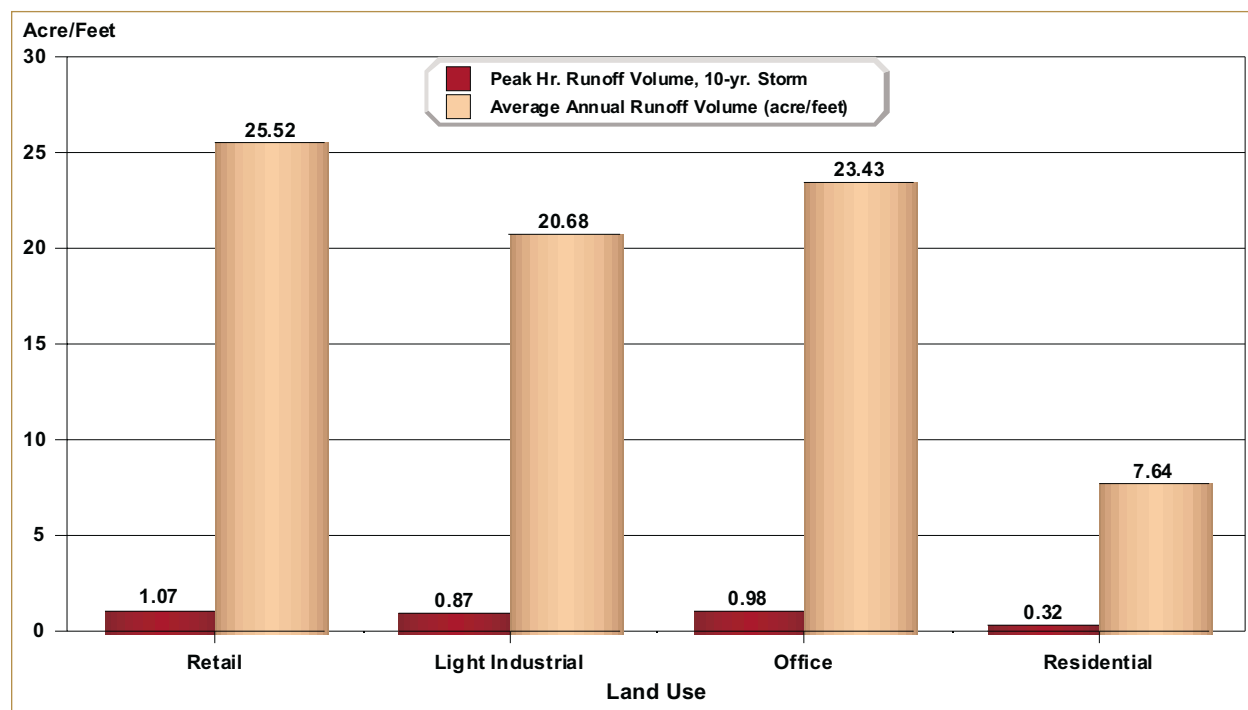
Pollutants

As stormwater or melting snow flows over roads, bridges, sidewalks, and parking lots, it picks up surface contaminants such as oil, rubber and metal deposits from automobiles, trash, fertilizers, road salt, and animal waste (**Figure 7.8**). The natural filtering mechanisms that take place when water flows over permeable surfaces are negated by pavement, thus causing pollutants to directly enter urban waterways. **Table 7.11** describes some of the nonpoint source pollutants that are washed into waterways and their impacts. Most of these contaminants have multiple effects. Immediate impacts include the destruction of wildlife habitats and entire species of organisms as well as lowering of water quality. Economic consequences also ensue, with lowered property values and negative tourism effects arising from unsightly and foul-smelling waterfronts.

Graph 7.12 illustrates the pollutant loads generated by different land uses, and **Table 7.12** shows how various retail establishments impact watersheds. Retail and office uses, because of their large parking surfaces, tend to flush more nitrogen and phosphorus through runoff. Industrial uses, because of their reliance on chemical processes, tend to shed a disproportionate amount of heavy metals such as zinc, although nutrient loads (nitrogen and phosphorus) are also high.



Figure 7.8. Oil slicks are common in parking lots. The residue of automobiles are often washed directly into waterways.



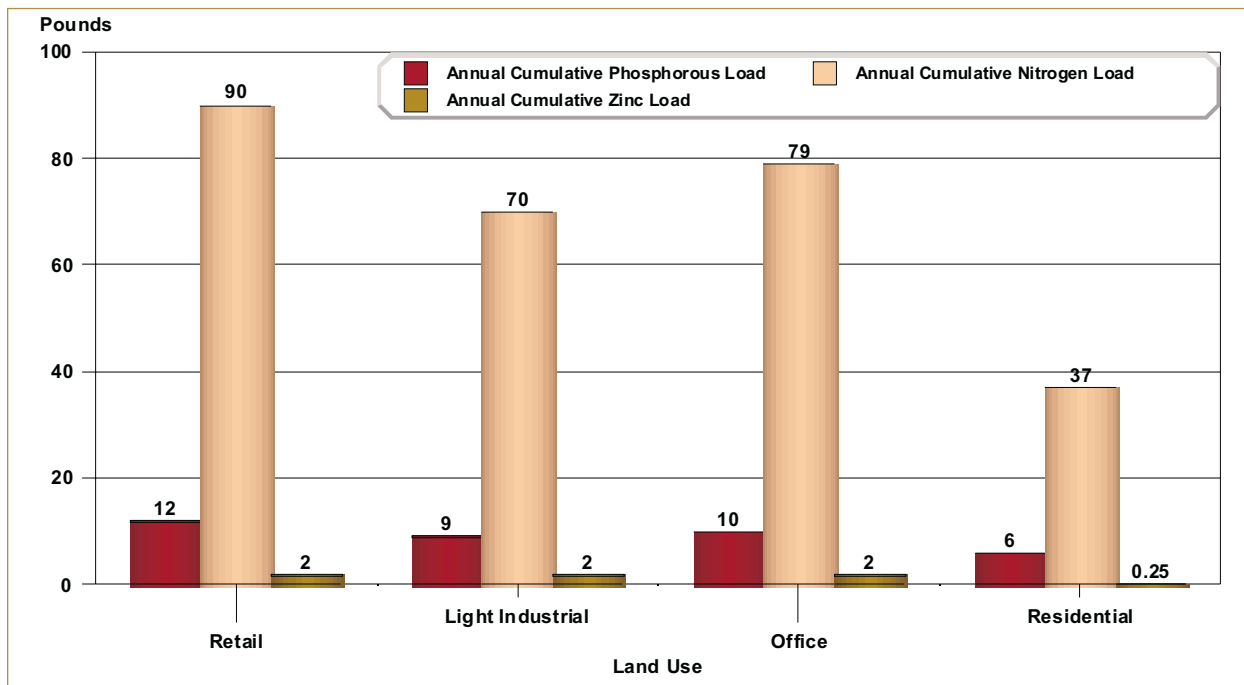
Graph 7.11. Runoff Volumes of Different Land Uses

SOURCES: "The Importance of Imperviousness", *Watershed Protection Techniques*, 1994; Northeast Ohio Regional Sewer District; US EPA/Purdue University: <http://ecn.purdue.edu/runoff>

Pollutant	Sources	Impacts
Sediment	Construction, natural erosion, road degregation, litter	Decreased transmission of light to aquatic plants, smothering of fish and other animals, damage to water treatment pumps, lowered water clarity and quality, reduction of flood storage
Nutrients (phosphorous and nitrogen)	Fertilization of lawns and landscaping, illegal waste disposal	Algae blooms and increased plant growth, water discoloration, poor water odor and taste, degregation of fishing and boating activities, reduced tourism and property values
Metals (zinc, lead, chromium, copper, cadmium)	Car and truck exhaust, worn tires and engine parts, brake linings, paint and rust	Lowered reproductive rates and life spans of aquatic organisms, water odors, lowered waterfront property values, restriction of sport fishing, increased water treatment costs, carcinogenic effects in human beings
Hydrocarbons (oil and grease)	Car and truck engines, dumping of used oil directly into storm drains, spilled oil at service stations	Lowered water quality (odors and taste), lowered reproductive rates and life spans of aquatic organisms, reduced tourism and property values
Road salts	De-icing of roads and parking lots during winter season	Habitat and food source degregation for some species, lowered drinking water quality, skin and eye irritation, higher morality rates for fish
Pesticides and herbicides	Fertilization of lawns and landscaping, illegal waste disposal	Lowered reproductive rates and life spans of aquatic organisms, poor water odor and taste, reduced waterfront property values, carcinogenic effects in human beings
Pathogens	Animal waste, mixing of storm and sanitary sewers during severe storms, septic tanks, illegal waste disposal	Lowered reproductive rates and life spans of aquatic organisms, increased public health risks, closing of shellfishing areas, increased water treatment costs, closing of swimming areas, introduction of harmful organisms to aquatic life and food chain

Table 7.11. Sources and Impacts of Pollution on Water Resources

SOURCES: "Controlling Nonpoint Runoff Pollution from Roads, Highways and Bridges", US EPA, 1995; "The Importance of Imperviousness", Watershed Protection Techniques, 1994; Nonpoint Source Pollution: A Handbook for Local Governments, American Planning Association, 1997



Graph 7.12. Runoff Pollutants of Different Land Uses

SOURCES: "The Importance of Imperviousness", Watershed Protection Techniques, 1994; Northeast Ohio Regional Sewer District; US EPA/Purdue University: <http://ecn.purdue.edu/runoff>

Type of Shopping Center	Annual Cumulative Phosphorus Load (lbs.)	Annual Cumulative Nitrogen Load (lbs.)	Annual Cumulative Zinc Load (lbs.)
Large Super Regional Center	96.26	741.24	14.44
Small Super Regional Center	86.38	665.13	12.96
Regional Center	39.63	305.17	5.94
Community Center	15.71	120.97	2.36
Neighborhood Center	5.54	42.65	0.83
Convenience Center	1.72	13.24	0.26
Power Center	37.05	285.32	5.56
Big Box Retailer	14.33	110.30	2.15
Large Drugstore	1.43	11.03	0.21

Table 7.12. Annual Stormwater Pollutant Loads Generated by Retail Establishments

SOURCE: "The Importance of Imperviousness", Watershed Protection Techniques, 1994

For communities that continue to add new development, or want to make existing development more ecologically friendly, there are a number of strategies to limit the harmful effects of runoff in commercial areas. Most of the following methods are not only environmentally responsible, but they are also economically sound and can increase the aesthetic value of a community.¹⁴

- Shared driveways
- Angled parking with one way traffic flow
- Smaller parking stalls
- Reduced parking ratios for some uses
- Shared parking facilities in commercial areas
- Two and three story buildings
- Stream buffers
- Grass swales rather than curb/gutters (**Figure 7.9**)
- Open space landscaping requirements)
- Rear yard grading to buffer
- Permeable spillover parking lots

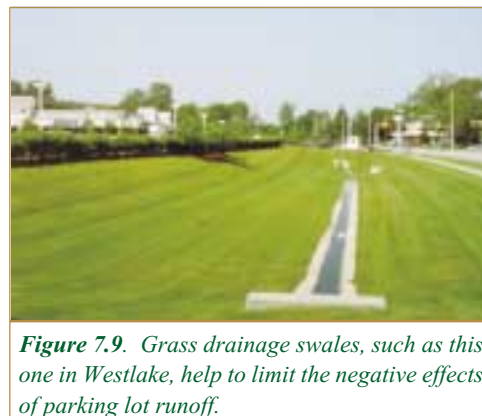


Figure 7.9. Grass drainage swales, such as this one in Westlake, help to limit the negative effects of parking lot runoff.

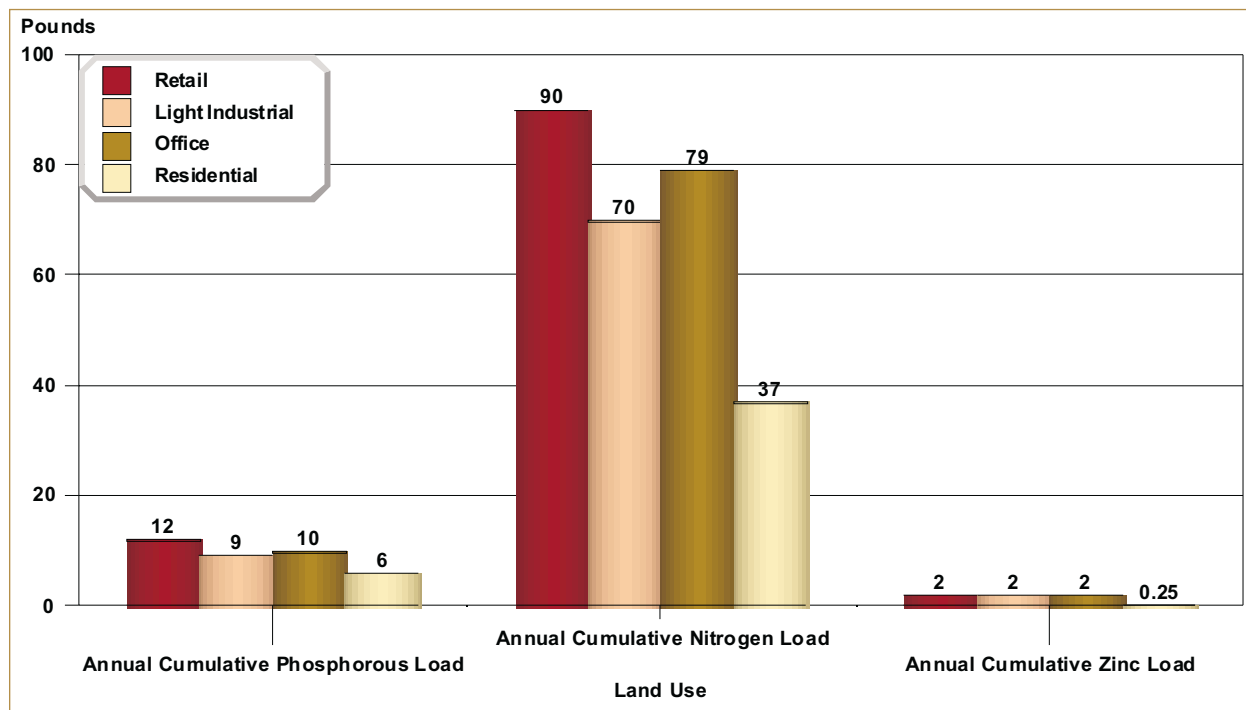
WATER, SOLID WASTE, AND SEWAGE

The introduction of new development typically places demands on a community's water, sewer, and solid waste disposal systems. While larger developments typically contract private companies for garbage pickup, water and sewer service is provided by the community. When new development occurs alongside water or sewer mains, infrastructure costs are minimized. For development in rural areas or exurbia, it becomes necessary to connect the new development to the infrastructure network, thus resulting in higher community costs that may require the levying of impact fees. The service needs of different retail establishments and land uses, using building area or population (employee or residential, depending on land use), are displayed in **Table 7.13 and Graph 7.13**. When comparing impacts by land use, light industry is shown to have a more intensive impact due to the use and consumption of materials for assembly, packaging and production.

Type of Shopping Center	Annual Water Consumption (gallons)	Annual Solid Waste Production (tons)	Annual Sewage Production (gallons)
Large Super Regional Center	34,666,240	327,040	29,812,966
Small Super Regional Center	31,106,760	293,460	26,751,814
Regional Center	16,056,350	151,475	13,808,461
Community Center	6,364,505	60,043	5,473,474
Neighborhood Center	2,244,020	21,170	1,929,857
Convenience Center	696,420	6,570	598,921
Power Center	15,011,720	141,620	12,910,079
Big Box Retailer	5,803,500	54,750	4,991,010
Large Drugstore	580,350	5,475	499,101

Table 7.13. Water, Solid Waste and Sewage Impacts of Retail Establishments

SOURCE: Development Impact Assessment Handbook, 1994



Graph 7.13. Water, Solid Waste and Sewage Impacts of Different Land Uses

SOURCE: Development Impact Assessment Handbook, 1994

MUNICIPAL SERVICES

Just as a municipality is responsible for the safety of its citizens, it also must ensure the same well-being for visitors to the community. Large super regional shopping centers generated approximately 14,000 vehicles a day, which can generate daily populations exceeding 20,000 persons. To estimate the number of police, fire, and medical personnel necessary to protect such a population (not to mention the facilities and vehicles needed to support these public servants), planning standards have been developed based on residential or employee population. **Table 7.14** shows the community service needs for different types of retail centers.

Graph 7.14 shows the community service personnel required for different land uses. The standard for determining the number of personnel necessary to maintain services is the same for every land use. The model indicates that even though retail centers attract a larger combined population of employees and shoppers than industrial or office uses, the number and costs of personnel is relatively the same regardless of land use. However, due to continual violations such as shoplifting, bounced checks, parking lot altercations and similar offenses, additional police and EMS support is often required for commercial centers.



Figure 7.10. Safety forces, such as this Mayfield Heights police officer, typically patrol shopping centers.

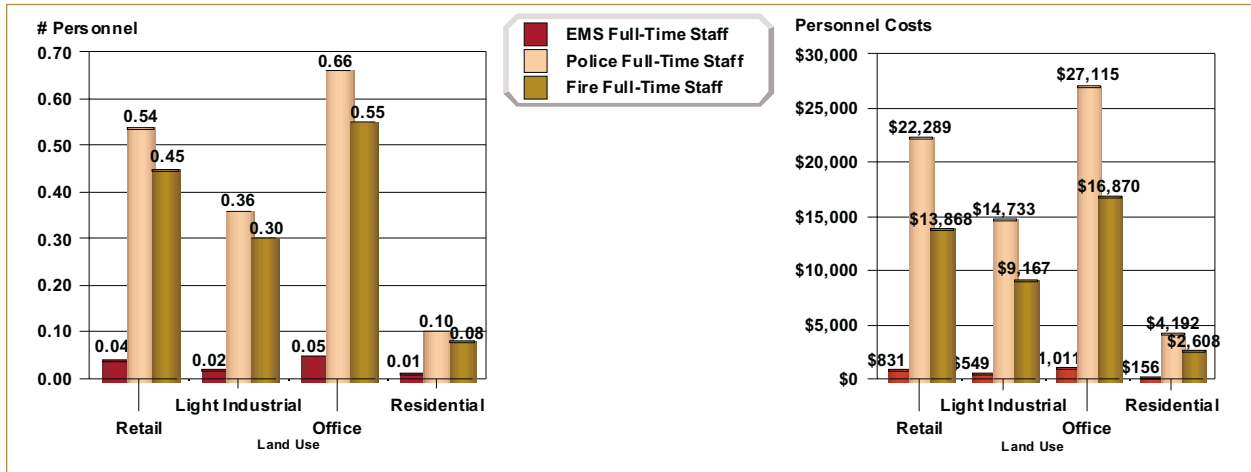
Type of Shopping Center	Emergency Medical Services			Police		
	Calls	Full-Time Personnel	Vehicles	Full-Time Personnel	Vehicles	Facilities (sq. ft.)
Large Super Regional Center	82	0.31	0.07	4.48	1.34	448
Small Super Regional Center	62	0.23	0.06	3.42	1.02	342
Regional Center	32	0.12	0.03	1.76	0.53	176
Community Center	15	0.06	0.01	0.82	0.25	82
Neighborhood Center	5	0.02	0.00	0.29	0.09	29
Convenience Center	2	0.01	0.00	0.09	0.03	9
Power Center	35	0.13	0.03	1.94	0.58	194
Big Box Retailer	14	0.05	0.01	0.75	0.23	75
Large Drugstore	1	0.01	0.00	0.08	0.02	8
Type of Shopping Center	Fire			Total Service Costs		
	Full-Time Personnel	Vehicles	Facilities (sq. ft.)	First Year	Subsequent Years	
Large Super Regional Center	3.70	0.45	560	\$598,536	\$304,320	
Small Super Regional Center	2.82	0.34	427	\$456,250	\$231,976	
Regional Center	1.45	0.18	219	\$234,471	\$119,215	
Community Center	0.68	0.08	103	\$109,887	\$55,871	
Neighborhood Center	0.24	0.03	36	\$38,744	\$19,699	
Convenience Center	0.07	0.01	11	\$12,024	\$6,114	
Power Center	1.60	0.19	243	\$259,187	\$131,781	
Big Box Retailer	0.62	0.08	94	\$100,201	\$50,946	
Large Drugstore	0.06	0.01	9	\$10,020	\$5,095	

Table 7.14. Community Services Impacts, by Retail Establishment

SOURCES: Development Impact Assessment Handbook, 1994; State of Ohio Cooperative Purchasing Program; City of Cleveland; Ohio Bureau of Employment Services; R.S. Means Square Foot Costs

OVERALL FISCAL IMPACT

Different land uses, because of the taxes that they generate and the public expenses that they incur, have different overall fiscal impacts on municipalities and school districts. A hierarchy of land uses has been developed that generally shows the fiscal impacts of different land uses, and whether or not they have positive or negative effects on revenue streams (*Table 7.15*).



Graph 7.14. Community Service Personnel Impacts of Different Land Uses

SOURCES: Development Impact Assessment Handbook, 1994; Ohio Bureau of Employment Services; R.S. Means Square Food Costs

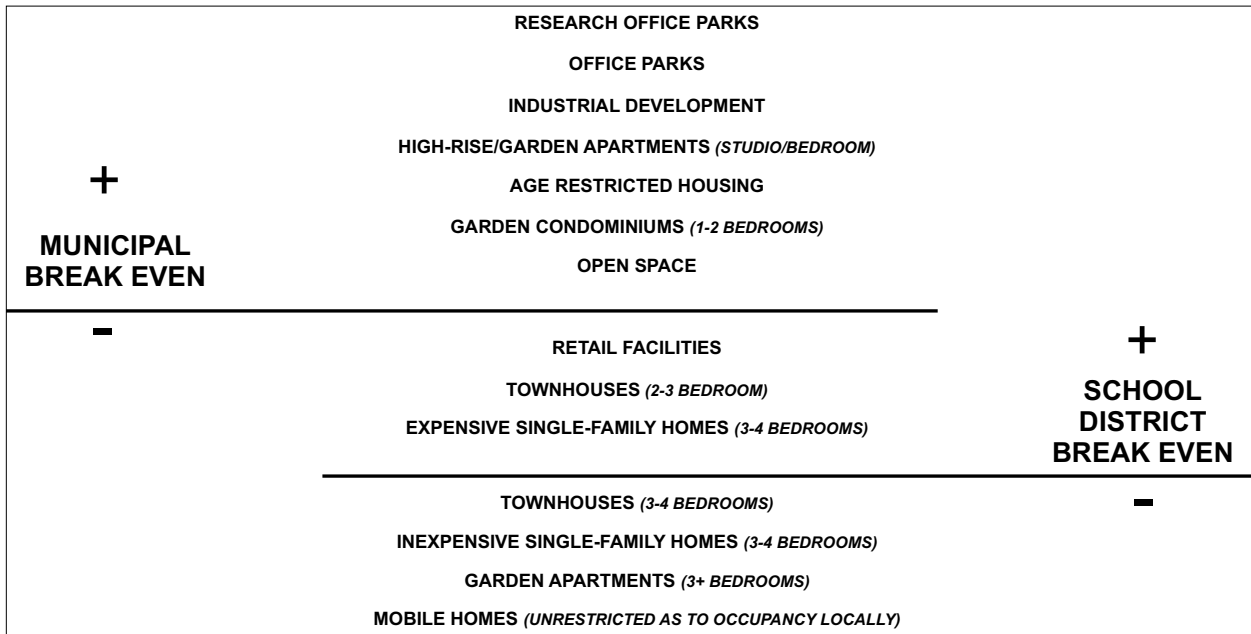


Table 7.15. The Hierarchy of Land Uses and Fiscal Impacts

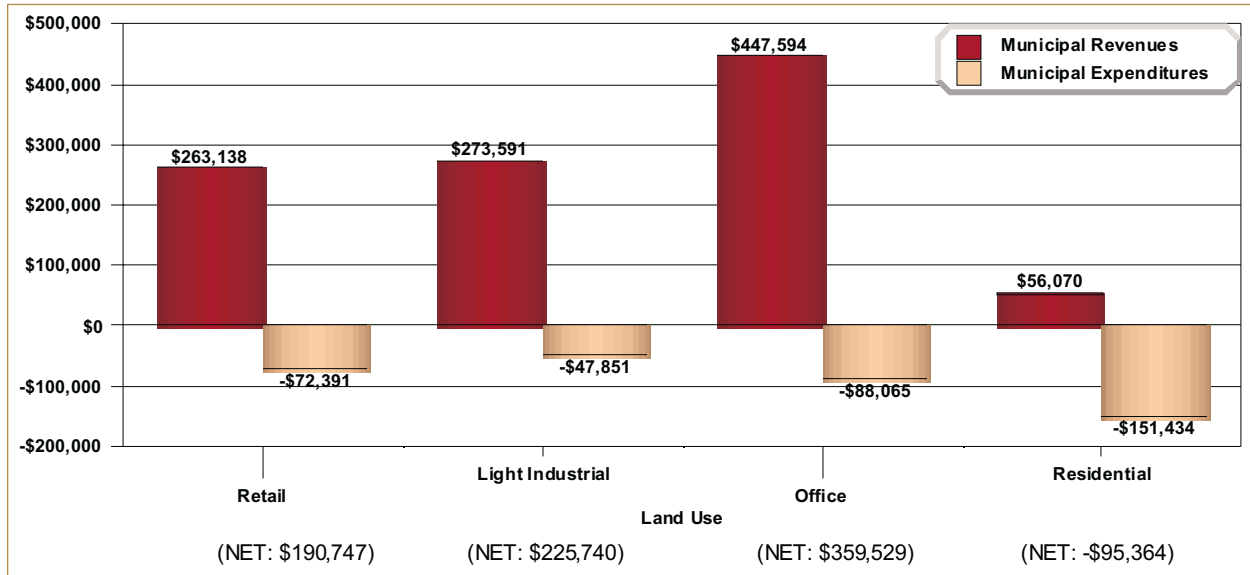
NOTE: The above list contains too many disclaimers to include here. Suffice it to say that fiscal impacts always must be viewed relative to the context of other properties' impacts in the jurisdiction of development.

SOURCE: "Land, Infrastructure, Housing Costs and Fiscal Impacts Associated with Growth: The Literature on the Impacts of Sprawl versus Managed Growth", Robert W. Burchell & David Listokin, 1995

Office uses have traditionally ranked higher in the hierarchy than other land uses because of the significant revenues that they bring to municipalities in the form of income taxes and to schools through property taxes. Because of municipal services that are generally oriented toward residents as well as the use of public schools, residential uses have been fiscal drains on communities (although they are vital for the life of a community). Industrial and retail uses lie between the two, with industrial uses usually promising a modest return for municipalities and retail uses bringing about a modest loss. Depending on the value of the property, level of employment, and indirect benefits to the community through intergovernmental revenues, retail developments may be able to bring a net revenue gain to the community.

The analysis used in this chapter produces a similar hierarchy of retail uses (*Graph 7.15*). Because municipal expenses such as road construction, improvements and maintenance, utility links, recreation facilities, and maintenance of equipment used to sustain public safety could not be calculated generally due to their heavy reliance on site-specific factors, these expenses were not included in this analysis. As a result, the net gains shown by all land uses except residential should be tempered, with a possible net loss for retail land use.

Communities planning to use retail development as the focus of an economic development strategy would be better served by trying to sustain and/or attract industrial and office-based business. Balancing residential development with a mix of other uses is prudent from both an economic and sustainability viewpoint. Furthermore, the amount of infrastructure improvements needed to open new land for development often negates the new revenues brought to a municipality. Dedicating land to parks and open space may be more prudent from a fiscal point of view and desirable from a quality-of-life standpoint than zoning such land as commercial for future development. ***Efforts may be better directed towards improving conditions for existing retail establishments, thus contributing to the well-being of the businesses and the community.*** ■



Graph 7.15. Annual Revenue/Expenditure Impacts of Different Land Uses

Land Use	Retail	Light Industrial	Office	Residential
School Revenue	\$132,319.00	\$99,391.00	\$157,813.00	\$33,685.00
Municipal Revenue	\$130,819.00	\$174,200.00	\$289,781.00	\$22,385.00
Municipal Revenues	\$263,138.00	\$273,591.00	\$447,594.00	\$56,070.00
Municipal Expenditures (Annual)	\$72,391.00	\$47,851.00	\$88,065.00	\$151,434.00
Net Municipal Revenue/Expense	\$190,747.00	\$225,740.00	\$359,529.00	-\$95,364.00

SOURCES: Development Impact Assessment Handbook, 1994; Paying for Public Services, Richard G. Sheridan, Federation for Community Planning; State of Ohio: Department of Taxation, Tax Analysis Division; Cuyahoga County Auditor's Office; U.S. Census Bureau; State of Ohio: Cooperative Purchasing Program; City of Cleveland; Ohio Bureau of Employment Services; R.S. Means Square Foot Costs

- 1 Dollars and Cents of Shopping Centers: 1998. Urban Land Institute.
- 2 Sheridan, Richard G. Paying for Public Services: A Citizen's Guide to Ohio Taxes. Federation for Community Planning. 1993.
- 3 Brueggeman, William and Jeffery Fisher. Real Estate Finance and Investments. 1997.
- 4 Bowden, Wade. "Cost Segregation Can Reduce Your Taxes & Increase Your Returns".
<http://www.theshoppingcentergroup.com/tr-05.html>
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- 14 "The Importance of Imperviousness". Watershed Protection Techniques. 1994