Instructor: Shweta Byahut
CPLN5960/6970: Seminar on Transportation & Mobility

By:
Asma Shaikh
Amna Salman

Parking UtilizationStudy

The Case of Village Mall. Auburn ,Al

Nodal Development Study for Village Mall

Table of Content

Introduction

Our country's almost universal use of automobile for daily trips, rather than walking, biking, or riding public transit, has made large segments of the population and the entire region of the country almost completely dependent on cars to meet their daily needs. Studies done in 2001shows that an average American family drives 21,500 miles a year, nearly the circumference of the Earth, largely for the trips to work, school or shopping (Farr 2008, 205).

The total number of miles travelled per vehicle is expected to increase 2.5%per year (Farr 2008, 205). The combustion of fossil fuels to control vehicles currently accounts for 32 % of all CO2 emissions generated in the United States (Farr 2008, 204). Transportation energy is also increasing by 1.8% per year faster than any other major category of energy use (Farr 2008, 205). Therefore for these cars we need places to park too.

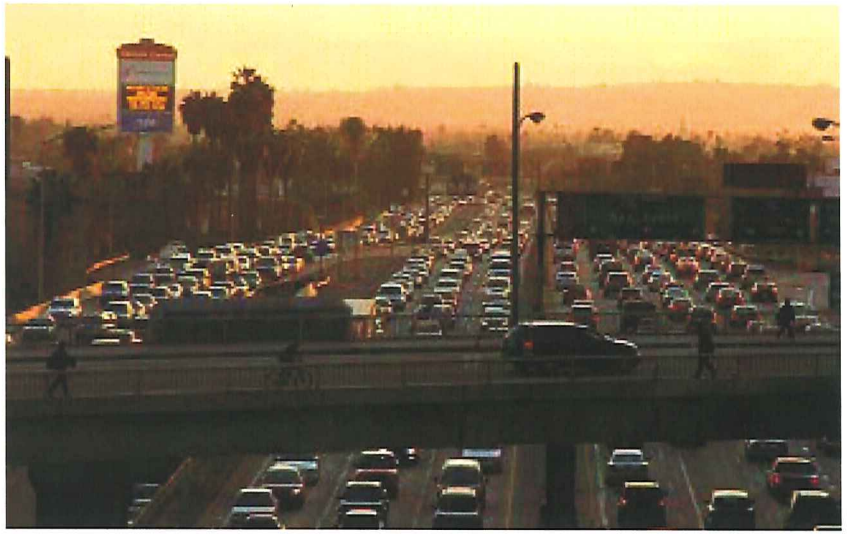
The parking policy for the past four decades has resulted in plentiful supply of parking in suburban areas. But researchers over the course of time have found that this plentiful parking is one of the main hindrances of achieving a sustainable community. Concerns about traffic congestion, energy consumption, air pollution and low density urban form has led to gradual recognition of the relevance of parking policy. Policy makers have begun to address issues in parking supply and pricing to achieve transportation and urban form objectives, and to comply with Clean Air Act requirements for transportation control measures (e.g. Municipality of Metropolitan Seattle 1990). But in suburban areas issues are a lot different. We have to think about excess supply of parking than pricing or tax policies (Wilson, 1995).

Suburban Parking Issues

Parking contributes to low density development patterns with a high automobile dependence encouraging urban sprawl and deteorating central cores. Abundant and cheap or free parking, and provision of complimentary parking as a perk by employers in central city areas promotes car ownership and use. Large dead parking lots discourage "walkable urbanism" and encourage people to travel by car .

Parking Utilization Study

Congested highways in Miami, FL
Source: http://www.transitmiami.com/highway-expansion/report-widening-highways-increases-greenhouse-gas-emissions



LA is the most terrible metropolis of traffic jams. Ranked among the top 10 most congested points in the country.
Source:http://allworldcars.com/wordpress/?p=11866

Parking Issues in Auburn, AL

Auburn is a college town and is the home of Auburn University. Auburn has been marked in recent years by rapid growth, and is currently a growing college town in Alabama.Traffic patterns and circulation in Auburn are governed predominantly by cars users. Lack of public transit and leap frogged development have acted as catalysts in the growth of car culture in Auburn.

The Renew Opelika Road project focuses on traffic of the corridor and does not address parking supply/demand problems and policies. It's goals are oriented towards corridor development and does not cover parking utilization study. The projects's objectives towards traffic studies focus on;

- Assess traffic volumes to inform the roadway design
- Assess walkability/bikeability
- Create crosswalks and sidewalks
- Reduce curb cuts
- Assess transit
- Address issues with speed and safety
- Address issues with connectivity:
- Create additional connectors
- Connect parking lots
- Access management plan
- Planning for events (football)

However, the city has no plans to conduct a parking utilization study. We therefore, conduct the study to find out the actual parking needs as compared to how much is provided. Our parking utilization study will assess in detail the parking usage, requirements and parking policies for the area.

Opelika Road Corridor
Source:Photo by Asma & Amna

Opelika Road Corridor
Source:Photo by Asma & Amna

Parking Utilization Study

Area of Study

Our area of study is the intersection of East University Drive and Opelika road. It is a busy intersection and one of the important nodes of Auburn. Development of this node will help in supporting the Renew-Opelika project. True nodal development is one of the best ways available to build compact livable cities without encouraging suburban sprawl.

Paved Surface

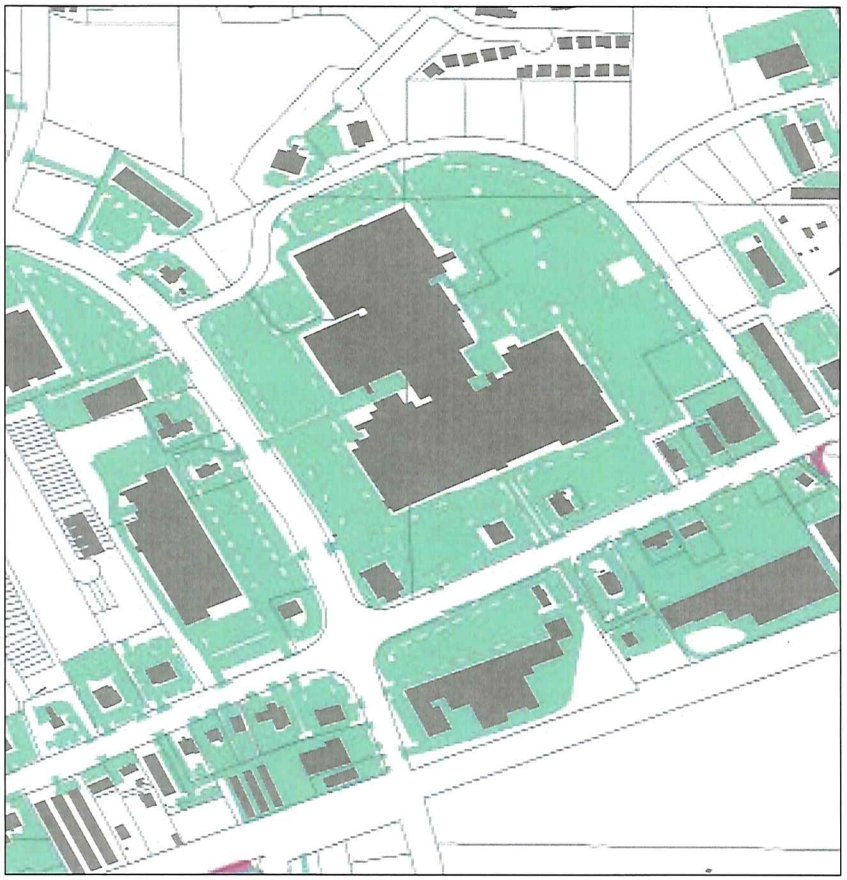
The existing paved surfaces do not allow for water filtration to replenish ground water. Paved parking lots are typically designed to collect and concentrate large areas of stormwater runoff, which can impact a receiving streams hydrography as well as water quality. Paved parking lots can generate heat, raising the surrounding areas air temperature and the temperature of the first flush of stormwater, creating significant ecological impacts *(Source: http://nemo.uconn.edu).* Around 330sqft is needed for a single car. The cost for on ground parking is approximately $3,000 and for ramp parking it is $15,000 and for underground parking it is $25,000. Cost is usually transferred to the society (e.g. free parking provided by employers is actually paid for by all employees, not just those using cars).

Circulation

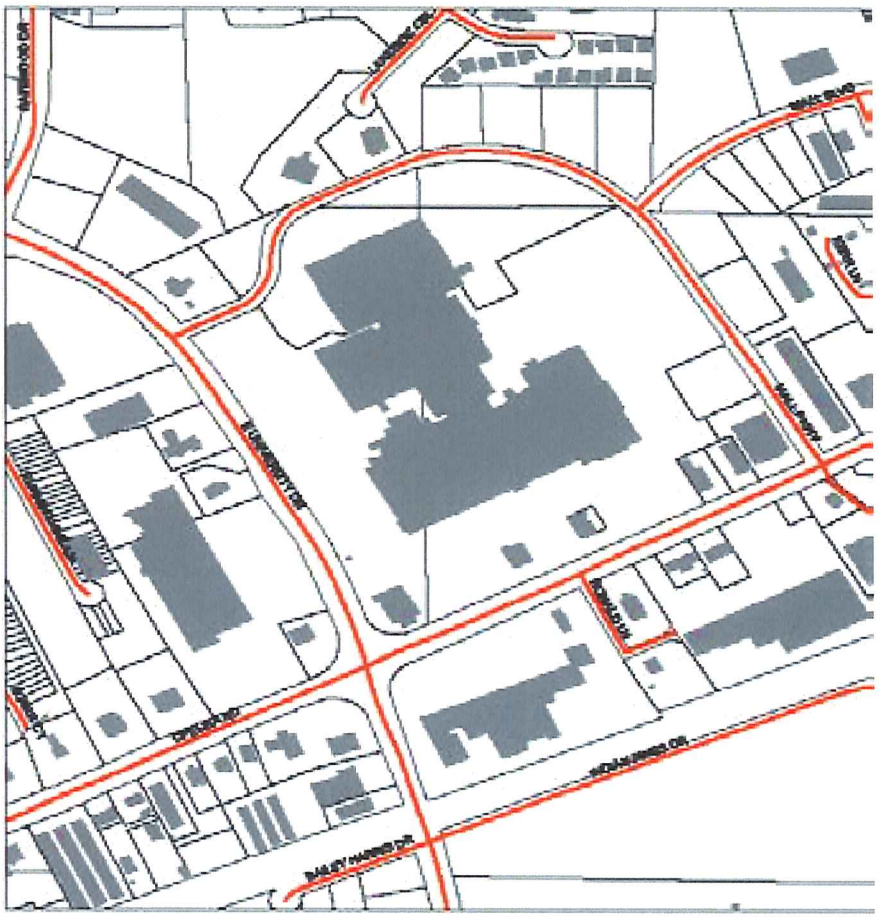
The City's traffic circulation system does not emphasize pedestrian safety and transit friendly design through construction of streetscape improvements that address pedestrian and vehicle movements. The existing travel patterns encourage motorists to travel circuitous routes to get to priority parking spaces. Many motorists drive around ignoring the existing directional arrows because they will not drive around empty parking spaces just to follow painted arrows.

Intersection of E University and Opelika Road

Parking Utilization Study



Zoning Map
Intersection of E University and Opelika Road



Circulation Map
Not to scale

Source: Courtesy of City of Auburn for making Auburn GIS data available to College of Architecture, Planning, and Landscape Architecture.

Goals and Objectives of the Parking Study:

Parking is vital but often ignored while making the transportation policies. Although the traffic patterns and parking needs are changing rapidly the standard for parking requirements in the zoning ordinance remains the same. It is also known that suburban parking is almost free to the parkers despite its substantial economic cost.

- To understand parking planning as an integral part of transportation planning
- To analyze and conduct a detailed study of the current parking situation consisting of occupancy rates, car counts and circulation areas.
- To learn about on-site and off-street parking issues in the current situation.
- To formulate parking policies that would help in regulating the amount of under-utilized and vacant spaces.

Parking Study Methodology:

- Record existing parking supply, conduct parking counts, and develop detailed base maps using GIS map files

- Estimate existing and future parking demand for the study area, based on parking counts and future projects.

- Identify potential parking options and parking management policies, to better utilize the existing parking supply.

.

EarthFare Parking Lot
Source:Photo by Asma & Amna

EarthFare Parking Lot
Source:Photo by Asma & Amna

Major Findings

Analysis of Zones:

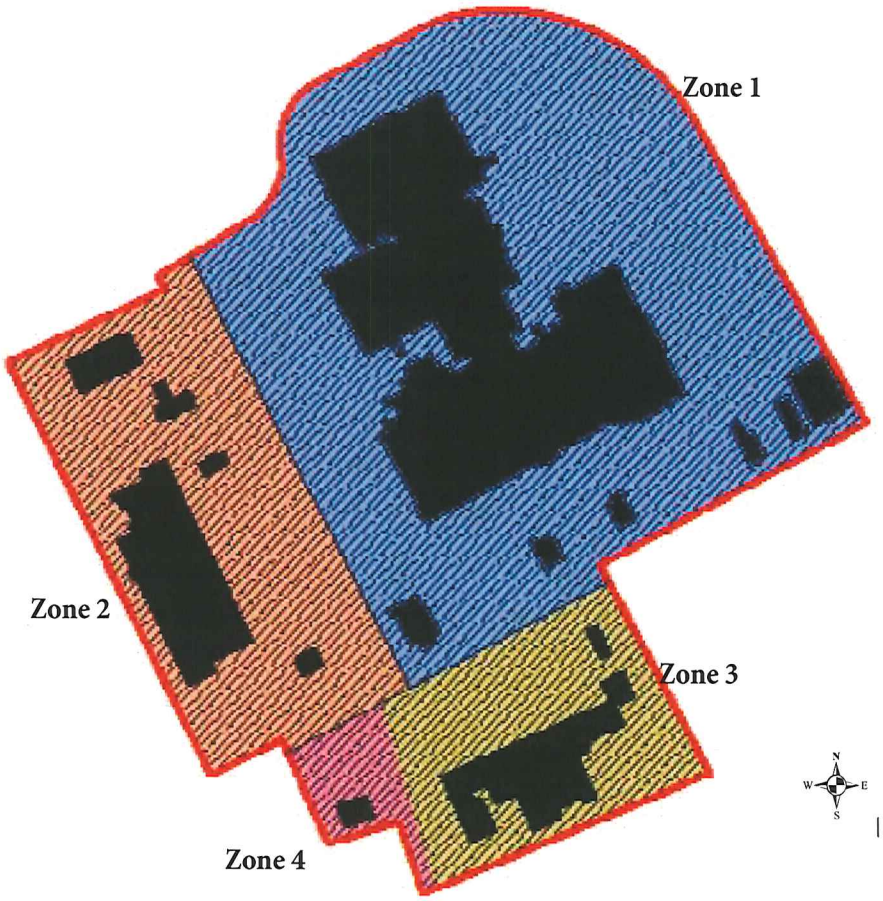
The intersection is divided into four different zones.
Zone 1: The Village Mall
Zone 2: Kmart Area
Zone 3: Earth fare Plaza
Zone 4: CVS

We have recorded the parking needs of the four zones at peak and non-peak times on a week day and weekend.

Parking Analysis:

For the nodal study we started with the average parking requirements, supply, and peak utilization for each of the four zones. The peak hour utilization is based on hourly recording of the number of cars parked in mid-week and weekends.

After the study we found that 70% of the total available spots were vacant even at the peak hours. In all four zones the, the parking utilization is far below the parking supply. However, these results contradict the impression that we get from the streets, because the most visible are most likely to be filled first. Therefore the observation suggest that parking utilization counts are stabilize any mistaken impressions about parking needs held by policy makers.



Map showing analysis zones
Not to scale

Existing Parking Demand and Usage

The existing suburban style parking plan at the node shows less than 30% occupancy at all times. The majority of the parking in the study area is provided in the surface parking lots at the store frontage. There are no on-street parking or parking garages.

On weekdays during the day, most of the parking spaces are occupied by the offices, bank and mall employees. There is considerable parking available in the evenings, both on weekdays and weekends.
On weekends during the day, on sale events days and regular weekends parking spaces are mostly occupied, but not to the same extent as on weekdays. The surface parking has less than 20% occupancy rate. On game day the occupancy rate is 30%
The current parking usage is much lesser than the supply and does comply with the zoning ordinance.

Zoning Ordinance:

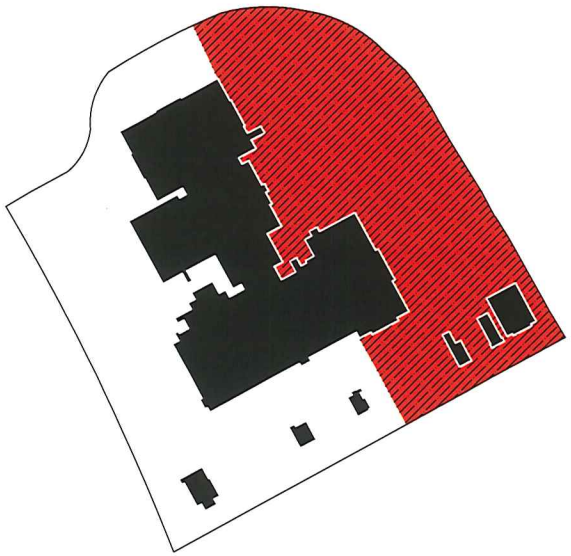
- Commercial and Entertainment uses: one (1) space for 250 sqft of gross floor area; for uses exceeding 100,000sqft, one (1) space for 300 sqft of gross floor area.
- Commercial/ recreational uses: one (1) space per 4 patrons to maximum design capacity of the facility.
- Commercial Support Uses: One (1) space for 750 sqft gross floor area.
- Banks: One (1) for every 300 sqft gross floor area, plus four (4) spaces off street waiting spaces per driven in lane.
- Grocery/ Supermarket (Standalone): One (1) space for every 250 sqft gross floor area.
- Restaurant standard: One (1) space for every four (4) patron seats or one (1) space for every 150 sqft gross floor

The map shows the excessive open spaces that are not occupied for any use.
Not to scale

Zone 1

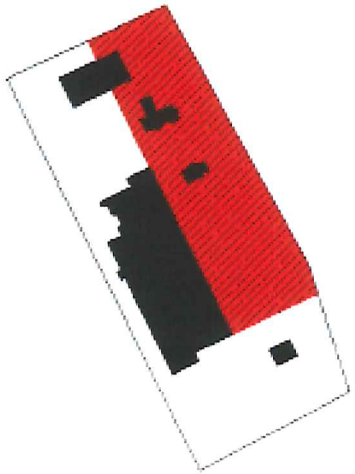
The Village Mall parcel observes maximum traffic on game days and sale events.

The shaded area shows the vacant land that is under utilized. It covers up to 60% approximately of the total parking area.



Zone 2

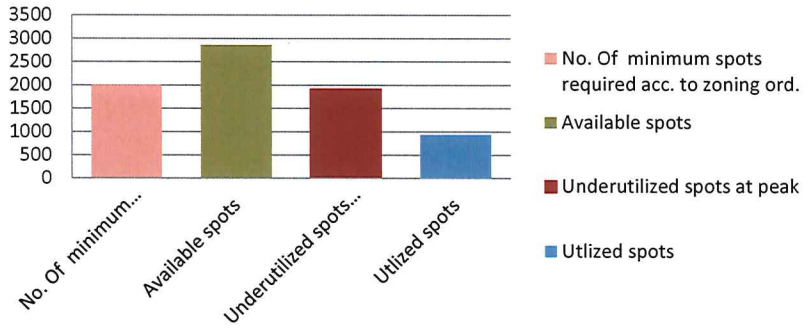
The K-Mart is not operational at the moment so the parking usage is difficult to measure. At present there is very less occupancy.
The shaded area shows the vacant land that is under utilized. It covers up to 50% of the total parking area. This analysis is done according to the area, which includes the circulation area too. The previous analysis was according to number of parking spots.

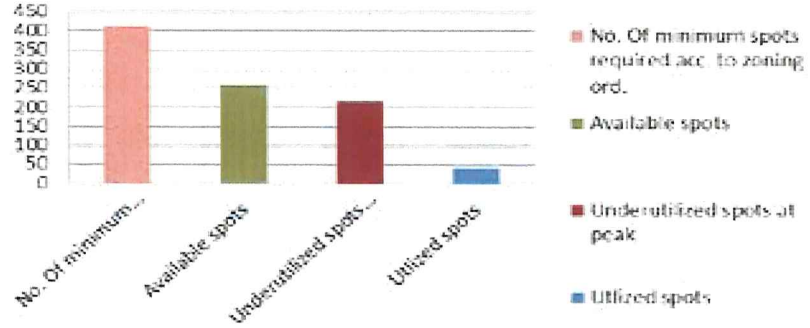


Parking Utilization Study

Current Parking Analysis

The graph shows the min. parking requirements alloted in the zoning code and the excess underutilized parking spots.

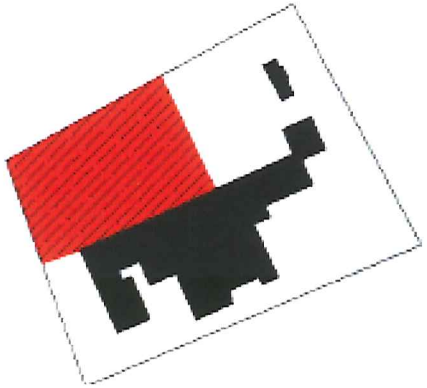




Zone 3

The EarthFare Plaza has frequenct traffic at most times due to the restaurants and grocery store on the parcel.

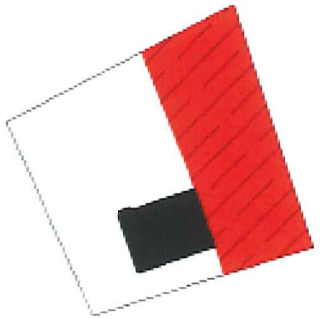
The shaded area shows the vacant land that is under utilized. It covers up to 40% approximately of the total parking area.



Zone 4

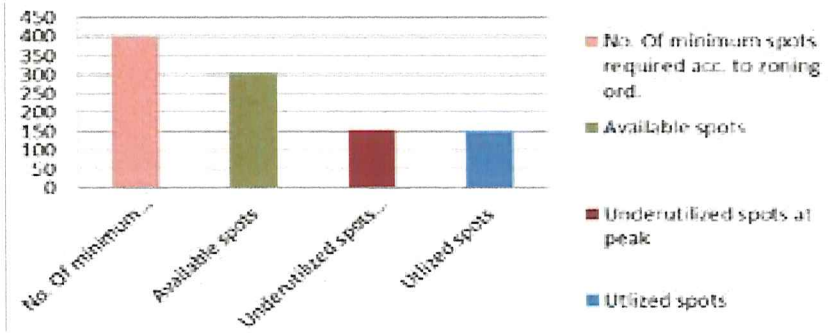
The CVS pharmacy observes very less traffic at most times.

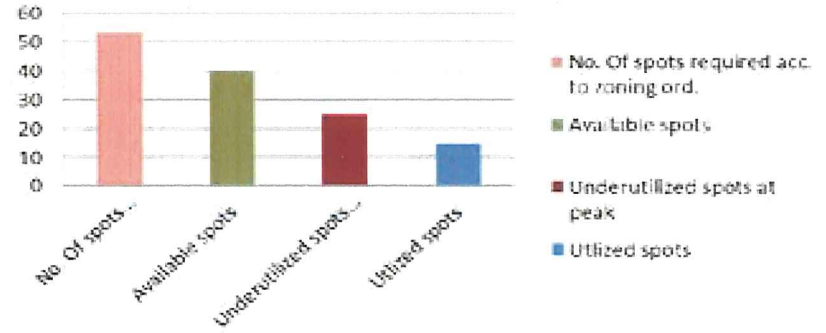
The shaded area shows the vacant land that is under utilized. It covers up to 37% approximately of the total parking area.



Current Parking Analysis

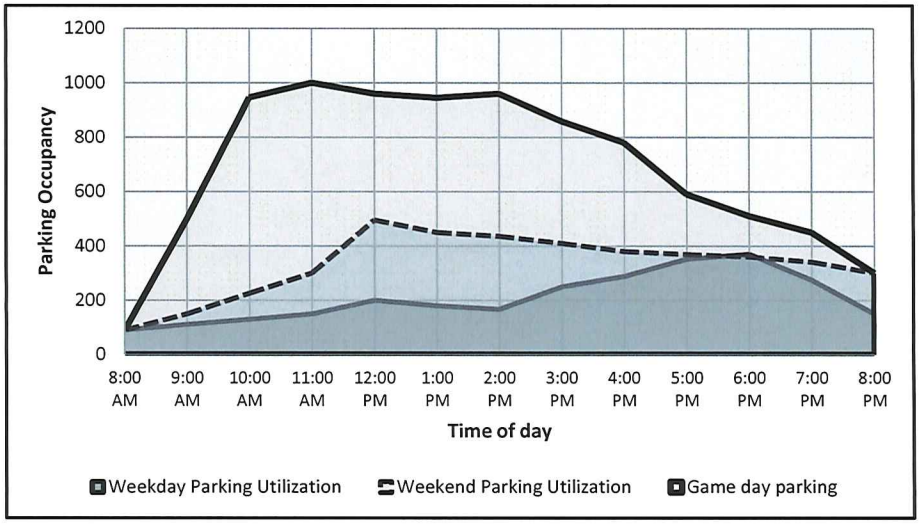
The graph shows the min. parking requirements alloted in the zoning code and the excess underutilized parking spots.





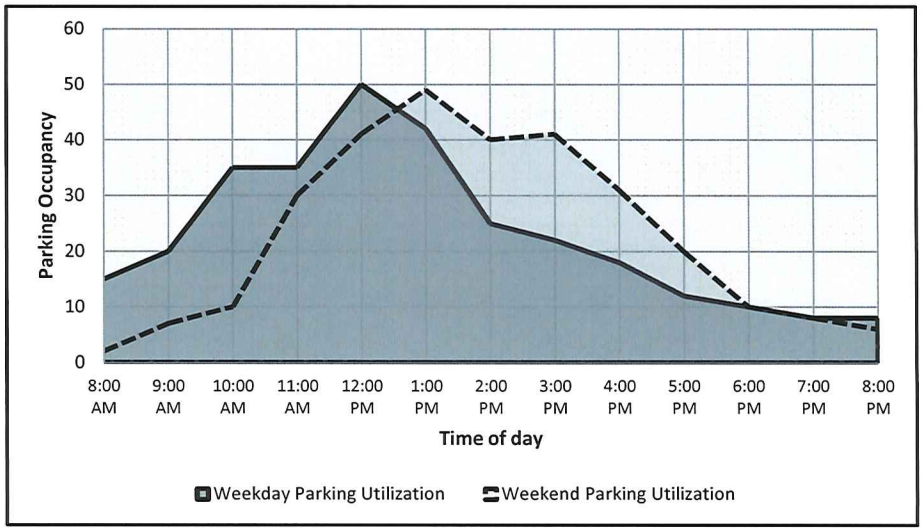
Zone 1:

This graph shows the numbers of cars parked at different times of the day in Village Mall parking lot. Although on some huge sale days we get the impression that the parking lots are full, but according to our study there is still a massive amount of underutilized parking spots. The maximum amount of parking was on the game day. To avoid congestion in the downtown and near stadium, people park their cars in the mall and Tiger Transit takes them to the stadium. Otherwise the parking on other big sale days only covers up to 19% of total parking spots.



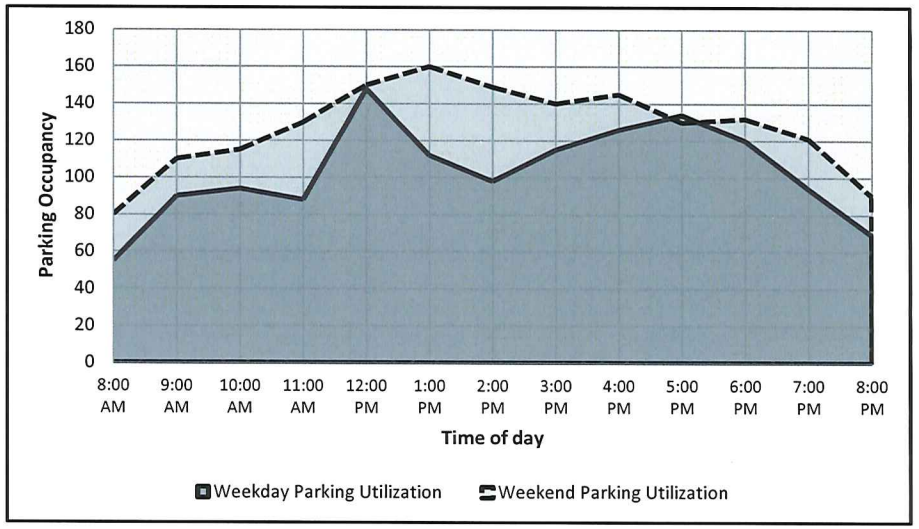
Zone 2

K-Mart is currently vacant. The actual parking utilization should be recorded once it has some business. However according to the study we did, the maximum amount of parking in that zones is about 20% of the total parking spots available.



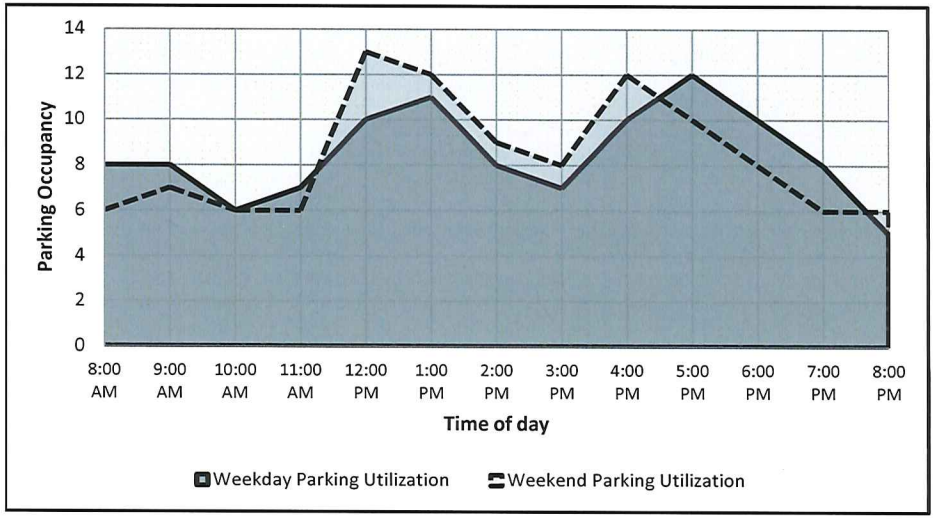
Zone 3

The presence of Earth fare and Panera bread in zone 3 makes the available parking spots occupied. A large number of people come for breakfast and lunch at Panera Bread and in the evenings the parking lot is majorly utilized by people coming for grocery. However after the study we found that 50% of the parking spots are utilized and 50% are underutilized.

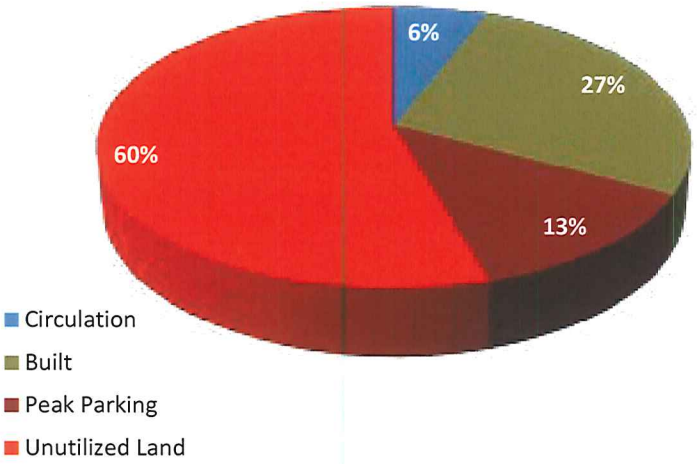


Zone 4

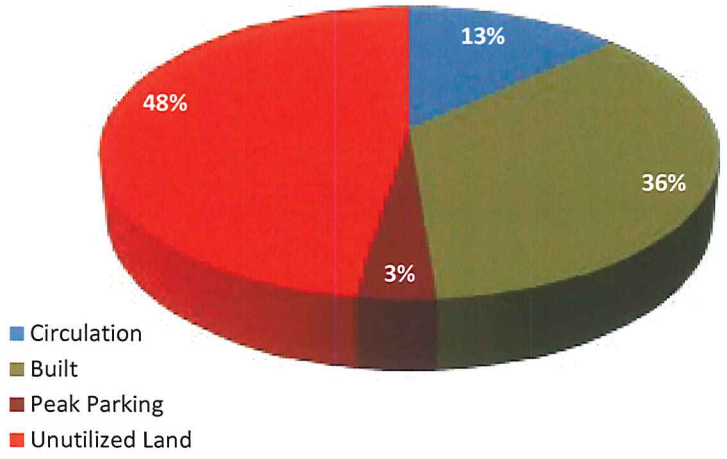
Zone 4 consists of CVS pharmacy. Total available parking is around 40. But only 15 spots are used at the peak hours.



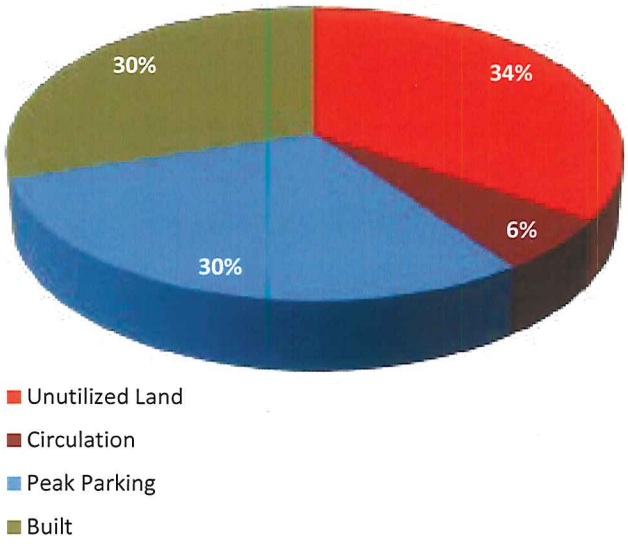
Zone 1



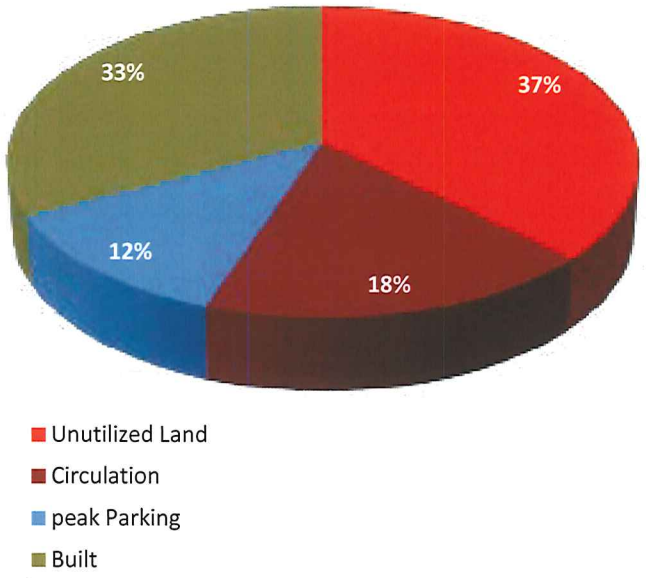
Zone 2



Zone 3



Zone 4



Parking Policy

Suburban parking requirements have unrecognized effects on travel behavior, development density, development cost, and urban design (Wilson, 1995). It shows from our case study that zoning code has negatively impacted the city as a whole. Yet the automobile commuters are shielded from the economic cost of the development. This policy has affected the urban design of our suburban development and as a result we have a low-density character and low land cost.

The services and retail businesses attract a driving clientele, but continuing to provide sufficient free parking to satisfy demand comes at the expense of the character and livability of the community. The use of time restrictions for downtown parking is common, but is not efficient in areas with abundant parking.

Parking spaces are as essential to driving as train stations are to rail transit systems. Every car trip begins and ends with a parking spot, and in the US, 99% of them are free (Shoup 2005). Drivers have been taught to expect a convenient, free parking spot upon arrival at just about every destination. In a society that is heavily reliant on cars, there is no doubt that we must have parking spaces – for businesses, for connections to transit, and as a basic component of the road system.

At suburban locations with limited and in most cases no transit, it is still possible to reduce the number of single-occupant drivers by incentivizing carpooling and promoting bicycling and walking, although the impacts will be less.

Parking policy can be based on incetives/policies by the local government or city planning department. It can also be use-based policy for the huge parking lots.

Source: http://www.interculturalurbanism.com/

Parking Utilization Study

Parking Policy - Incentive/Policy Based

Make changes to the zoning code, introduce free market pricing.

Allow the market to decide the demand and supply, this could be a controlled measure by the City and will avoid any over supply of parking. Because of the over supply of residential parking downtown as mandated by zoning, parking is artificially cheaper than it should be. This, of course, encourages greater auto use in the densiest part of the city, the part in which public transportation of various modes operate at a very high frequency practically around the clock. It also encourages the catering of urban design towards the car and away from alternate transportation modes, despite the fact that the alternate transportation modes may make up a larger share of trips in this area.

This will allow for shared parking at closer to the true cost of providing that parking. It will also allow the free market to decide what the best use of property is under right and can reduce the cost of development and occupation of residential and other space. Most importantly, removing the parking minimums and over-supply of parking will be supportive of the existing public transportation infrastructure in place downtown, as it is the dominant mode of travel within the area and its externalities are significantly better than the car.

Set maximum parking standards based on maximum capacity at any given times of the year.

Zoning ordinance states the minimum parking requirements which turns in oversupply of parking spots (EPA 1999, Shoup 2002). It increases the demand for cars (Shoup 2005). 99 % of parking in America is free. But they cost a lot to the local and state government.
Local Parking requirements are significant regional policy issue. The effect of huge parking lots on urban form, transportation and human health cannot be ignored yet we do not see these problems under debates at a federal or state level. However, we do see changes in Transportation planning. Also the federal air quality regulations now consider many cities to consider transportation control measure such as managing the parking supply. The local jurisdiction can omit the minimum parking requirements, the zoning code, and let the market decide how much parking they need to provide. The fear of the circumstances of spill over can be solved by the availability of on street parking regulations or shared parking system. The city can then propose different projects on the vacant areas for the future.

Parking Policy - Incentive/Policy Based

Improve bicycling infrastructure and the pedestrian environment

Provide secure bike racks, improve crosswalk visibility, create bike lanes, etc. Work with employers to incentivize carpooling, bicycling, walking Employers can offer workers benefits such as: the cash equivalent of a parking space, access to a shared company vehicle, cash per mile ridden for bicyclists, etc.

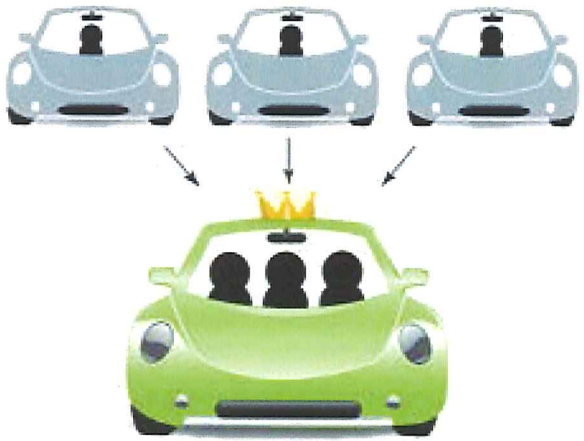
Carpooling

Congestion seems to be one of the biggest problems on campus. With an increasing number of cars, there are limited options to reduce congestion. Carpooling is one way of reducing the problem. The Office of Transportation has developed a program to allow parking permit holders to trade in two permits and receive a single carpooling pass. This initiative should be promoted by the Office of Transportation to reduce congestion on campus and increase sustainability. There could be a tremendous impact from this initiative on campus. Apart from reducing the carbon footprint, it will help transportation to efficiently manage parking spaces, effectively manage traffic and traffic-related congestion on campus and create awareness amongst students about sustainability-related issues.

Car Sharing

Carsharing or car sharing is a model of car rental where people rent cars for short periods of time, often by the hour. They are attractive to customers who make only occasional use of a vehicle, as well as others who would like occasional access to a vehicle of a different type than they use day-to-day.

Bicycling Racks at Fairfax County, Virginia
Source: *http://fabb-bikes.blogspot.com/2007_11_01_archive.html*



Source: http://www.carpoolking.com/nz/en-gb/faq.jsp

Parking Policy - Incentive/Policy Based

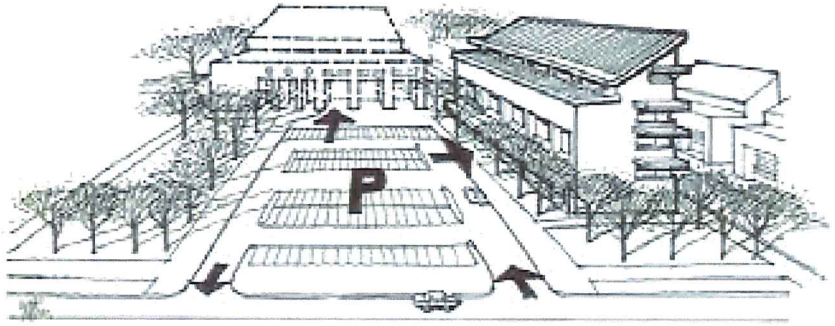
Applicable to Village Mall

Shared parking

Shared parking is a tool through which adjacent property owners share their parking lots and reduce the number of parking spaces that each would provide on their individual properties. Shared parking is not a new concept. It has been used extensively in traditional neighborhood commercial nodes and downtown settings for decades. In these locations, there are higher-density office or apartment buildings, with shops and restaurants lining the sidewalks. People often park in one spot and then walk from one destination to another. The effect is that those various uses share the same parking spaces. Shared parking is being used more and more in conjunction with new development. If adjacent land uses have different peak hours of parking demand, then they can share the some of the same parking spaces.

There are two main approaches to shared parking:
(1) contractual agreements between adjacent uses; and
(2) parking management districts.

Whereas the first approach involves only two adjacent users, the second approach encompasses an entire district with multiple property owners. Under a contractual agreement, the circumstances under which parking spaces would be shared would be explicitly defined in the contract. In a parking district, all uses within the district would have access to all the parking spaces at any given time.



Source: http://www.ladstudios.com/ladsites/sustainability/strategies/Strategies_SharedParking.shtml

720-758 Hawthorne Ave NE, Salem (Center Street Plaza)
Source: http://smicre.com/720-758-hawthorne-ave-ne-salem-center-street-plaza/

Parking Policy- Use-Based
Applicable to Village Mall

Public Space

The huge parking lots are undesirable urban areas that are in need of a re-design—making no positive contribution to the surroundings or users. They are ill-defined, without measurable boundaries, and fail to connect elements in a coherent way. On the other hand, they offer tremendous opportunities to the designer for urban redevelopment and creative infill and for redis-covering the many hidden resources in our cities.

Open, surface parking lots can be indeed considered urban lost space, but they are also an essential part of the built environment. They form part of a city's public realm by virtue of their physical openness and contrast to the city's architectural fabric. The lot's distinctive spatial and use characteris-tics offer unique opportunities for their utilization beyond the temporary storage of cars.

Public Designing Public: Gansvoort Plaza
Source: http://www.tropolism.com/public_effect/index.php

Parking lot used as a weekly farmer's market.
Source: http://claudiaparaschiv.com/projects/from-anonymity-to-public-space-los-

Parking Utilization Study

Parking Policy- Use-Based

Applicable to Village Mall

Weekend Markets

Parking lots are more than places for car storage. They are also the setting for many planned and spontaneous activities, from farmers markets to weekend flea markets. This can help in encouraging urban farming and social public activities in parking lots. Such a range of activities suggests that parking lots, although not by intention, do form part of the public realm. Parking lots, with their intended and unintended usages, are a found place. They are the un-planned urban rooms that fill physical and mental gaps in our designed environment. Places where counter-interactions and social occurrences are happening on a daily basis.

Underutilized parking Lots turn into busy colorful markets, where farmers, professional vendors, or just any person sells, barters, or buys goods. The Larchmont Farmers' Market in Los Angeles is located in a small city parking lot. Like many parking lot markets it relies on precise spatial and social organization. Temporary canopies define specific use areas, and walks and passages are clearly agreed upon. All setup infrastructure is provided by the vendors, while the organizer provides signs and elements to delineate the space of the market.

Informal games such as street hockey or basketball are commonly played on parking lots' leveled asphalt. Basketball, in particular, has found a sharing ground within many lots.

Weekend Markets
Source: http://www.pps.org/great_public_spaces/one?public_place_id=174

Weekend Markets
Source: http://helmofthepublicrealm.com/2012/01/11/car_public_space_urban_design/

Parking Utilization Study

Parking Policy- Use-Based
Applicable to Village Mall

Park Space & Recreation

The under-utilized space can be used for children's play or recreation space extending the mall activities to the outside. Considering the lack of park and recreation space in Auburn this would be an apt location and an innovative re-use.

The space can be also used for dual purpose. An area allotted for temporary seating for eateries could also be used for parking during sale events when parking reaches full capacity.

Camping Sites

Many Walmart stores welcome campers and recreation vehicles to overnight for free in their parking lots. Managers reason that the distant outer reaches of their vast lots are unlikely to ever be occupied, and that the campers constitute a customer base since they are likely to stock up on necessary merchandise while in the lot. (Lynnette Walczak)

Garden space at Intersection, effective stormwater management technique.
Photos courtesy of California Park and recreation society

Recreation Society To Host Annual PARK(ing) Day Event
Photos courtesy of The CSULB Recreation Society

Temporary Eateries

Applicable to Village Mall

Food trucks can be found everywhere. Parked along the side of roads or at the edge of parking lots, they sell every imaginable food type. Food trucks and parking enjoy a symbiotic relationship. While food trucks cannot exist without a parking space, their existence en-livens the space and supports an economic base. A number of cities and local vendors have pushed this relationship between space and activity to become an event.

In Somerville, Massachusetts, the Arts Council, a steward of an arts-based economic development strategy, came up with the idea of "Brunch in the Square." Somerville Arts Council Executive Director Greg Jenkins saw the potential of creating a more permanent yet still temporary (weekly variety) event to make use of the parking lot at the city's Union Square to encourage activity in the area. He suggested local food truck vendors come into the square from 10:00 a.m. to 3:00 p.m. on Sundays and set up small movable chairs and tables for people to come and have brunch, using part of the parking lot as the outside dining room.

In California, the Southern California Mobile Food Vendors Association (SCMFVA) is trying to establish a new trend for food trucks—permanent spaces for mobile eateries to share. They have joined forces with parking lot owners around Los Angeles to provide spaces for food trucks in various locations around the city. Future plans for many of these lots include adding tables, chairs, Wi-Fi, special dog areas, and bicycle parking.

Parking space utilized for outdoor restaurant seating. Seattle, WA
Source: http://capitolhillseattle.com/2012/10/11/trading-parking-for-public-space-parklets-coming-to-capitol-hill-if-you-want-them

Residents enjoy a food truck gathering at The Black Sheep's parking lot. Restaurants have stated they're concerned about the food trucks. *Photo courtesy of Tom Henderson Source: http://thecoastnews.com/2012/08/restaurants-want-to-tap-brakes-on-food-trucks-in-encinitas/*

Tailgating
Applicable to Village Mall

Whatever its origin, tailgating in the lot has become an official part of the American football program experience. Rules for tailgate parking and parking lot behavior are an integral part of sport teams and stadium managements. Most of the National Football League stadiums post the hours when parking lots are open (usually four hours before and one hour after game time), set up rules for tailgating, and provide specific areas within the lots for the use of tailgaters.

Eating, drinking, mingling, and socializing in a parking lot have also created an opportunity for community building and economic development. College athletic programs, coaches, parents and players often use parking lot tailgating to enhance team spirit and to fundraise. Mainstream media set up portable stages in parking lots to create a tailgate atmosphere and to broadcast pre-game shows. The idea of pre-game and preshow activities has also reached festivals and concerts within the arts community.

Tailgating in the lot has become an official part of American football where eating, drinking, and socializing have became a common pregame experience. Some stadium web sites have tailgate diagrams that show the correct setup for cars, tables, BBC's, and canopies that tailgaters must adhere to.

Auburn's tiger transit caters to the Village mall parking lot, this creates potential for tailgating activities.

Big mall parking lots that are used for tailgating purpose.
Source: http://zackhample.mlblogs.com/page/2/

Tailgating at parking lots on game days.
Source: http://zackhample.mlblogs.com/page/2/

References:

Journals:

- Wilson W, Richard. Suburban Parking Requirements: A Tacit Policy for Automobile Use and Sprawl, 1995. Journal of the American Planning Association, volume 61;1 pages 29-42,
- Shoup C, Donald. The trouble with minimum parking requirements. Transportation Research Part A: Policy and Practice, 1999 - Elsevier. vol33 no. 8
- Littman, Todd. Parking Management Strategies, Evaluation and Planning. Victoria Transport Policy Institute. Planners Press (www.planning.org), 2006.

Books:

- Farr, Douglas. Sustainable Urbanism; Urban Designing with Nature. John Wiley & Sons, New Jersey, 2008.
- Shoup C, Donald. The High Cost of Free Parking. Tri-State Transportation Campaign, New York, NY, 2005
- Joseph B, Eran. Rethinking A Lot: The Design and Culture of Parking. 2012

Websites:

- http://www.auburnalabama.org/
- http://nemo.uconn.edu/tools/stormwater/parking_lots.htm