

Delightful Density: The Answer to Suburbia's Missing Pedestrian

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(ABSTRACT)

The Pedestrian is compromised in the majority of our built landscapes. Today's dominant fixture is the automobile. Pedestrian and automobile efficiency are in direct competition with each other; to facilitate one is to inhibit the other.

Pedestrian functionality depends on the presence of walkable destinations, commonly referred to as multi-use areas. Pedestrian functionality is an important issue because sprawl, the current development norm, is reaching the physical limits of the countryside. Density is the positive alternative to issues we encounter as a result of low density such as increased runoff, pollution, congestion, obesity, physical inactivity, and road rage. The alternative to sprawl is simple and timely: neighborhoods of housing, parks and schools placed within walking distance of shops, civic services, jobs and transit a modern version of the traditional town.¹ Improving pedestrian functionality has the ability to impact multiple aspects of our lives and improve the quality of life we experience. We need communities that are occupied full time and that provide a world of opportunity for kids and communities that support women and men in their efforts to weave together an ever more complex life of home and work.²

¹ Calthorpe, Peter, p. 16

² Duany, Andres, p. 25

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the GWU gang who have spent the last five years making this journey with me

To my parents for their support

To my husband for a million little things

“Improving pedestrian conditions can benefit our nation as a whole.”

Federal Highway Administration.

“The environment exists for the purpose of movement.”

Lawrence Halprin

“These boots were made for walking”

Nancy Sinatra

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Part 1: Introduction

The Pedestrian is missing from the majority of America's new landscapes. Today's dominant fixture is the automobile. Pedestrian and automobile efficiency are in direct competition with each other; to facilitate one is to inhibit the other. Old world cities enjoyed a healthy existence prior to the automobile. The pedestrian infrastructure was established before automobile efficiency could dominate.

Successful pedestrian functionality depends on the presence of walkable destinations, New Urbanism, Smart Growth and other organizations refer to such places as multi-use destinations. Established multi-use areas evolved over time in older neighborhoods where key factors were encouraged. These factors included street networks with high connectivity; usually placed on a gridiron organization. The resulting network allows for multiple trip routes and enforces non-hierarchical street organization. Non-hierarchical streets tend to be more narrow and have shorter block distances, thus the scale is more conducive to the pedestrian than the automobile. A density of buildings, services, and amenities is created from this human scale. When development focuses on the automobile services are spread out, intersections are seldom and greater distances are covered. Density is a fundamental component of multi-use. It is with density that pedestrians can exist.

Pedestrian functionality is an important issue because sprawl, the current low density development practice, is reaching the physical limits of the countryside. Compound this distance with the necessary dependence on the automobile created as a result, we are sitting more, producing more harmful emissions into the air and water and destroying more ecological habitats. Density is the positive alternative to these issues we encounter as a result of low density development such as increased runoff, pollution, congestion, obesity, physical

inactivity, and road rage. “The alternative to sprawl is simple and timely: neighborhoods of housing, parks and schools placed within walking distance of shops, civic services, jobs and transit – a modern version of the traditional town.”¹ Improving pedestrian functionality has the ability to impact multiple aspects of our lives and improve the quality of life we experience.

My position on pedestrian functionality centers on the importance of multi-use destinations and therefore density. Although multi-use areas and the lack thereof are the results of planning decisions and zoning ordinances, my project is not an attempt to dapple in urban planning. I hope to demonstrate how density can prove “delightful”. I believe “delightful density” can also improve other important areas such as the environment, public health and the community. I will identify the obstacles to pedestrian functionality, the benefits from walkable communities and use this understanding to address my site.

Street Design

Examining newer developments found in the suburbs of our cities, land-use decisions, segregate functions and hierarchical street design dictates the automobile as the only successful connection between destinations. Safe pedestrian infrastructure is absent. This type of development is coined “Sprawl” and has been criticized on many levels as sporadic, fast-paced and irresponsible. Andres Duany, in *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream*, says, “In suburbia, there is only one available lifestyle: to own a car and to need it for everything.”² He continues, “The average household currently generates 13 car trips per day.”³ The sprawl-type development of the suburbs is most

¹ Calthorpe, Peter, p. 16

² Duany, Andres, p. 25

³ Duany, Andres, p. 22

detrimental to pedestrian functionality with regards to street design.

Street design has evolved to “serve one user, the automobile”⁴. The result is unimpeded traffic flow. To maximize automobile efficiency, lanes are wider, blocks are longer, resulting in less connectivity, turning radii are generous which increases lane widths and street details are simpler in order not to distract motorists, which all equate to higher car speeds. “To be a pedestrian, a bicyclist, or a vendor on one of these streets is to be a fish out of water.”⁵ Safety is a major concern along these types of streets; pedestrians have to walk farther to cross streets and traffic is moving at elevated speeds. “A nationwide study showed that (pedestrian/vehicular) deaths are more likely to occur in newer, sprawling, communities where transportation systems are most biased toward the car.”⁶ The hierarchical design of suburban streets further degrades pedestrian functionality by categorizing street function based on the amount of automobile traffic it handles. This completely excludes the pedestrian from the equation.

Health and the Obesity Epidemic

The average American is not getting enough exercise and obesity in America is on the rise. “Travel by private vehicle accounted for 86% of all person trips and 91% of all person miles, while walking accounted for only five percent of trips and less than one percent of miles.”⁷ Obesity puts individuals at a higher risk for such health issues as stroke, high blood pressure, hypertension, high blood cholesterol, type 2 (non-insulin dependent) diabetes and coronary heart disease among others. Increasing American's activity is a necessary strategy for addressing the epidemic of obesity. Active Community Environments (ACEs) are

⁴ Untermann, p. 123

⁵ Untermann, p. 123

⁶ Killingsworth, Richard and Jean Lamming, p. 14

⁷ Frank, Lawrence D. and Peter Engelke, p. 29

considered “places that are close to home or work, are safely and easily accessible, and that allow people to be physically active.”⁸ A successful active community integrates multi-use within walkable distances. The goal is for people to live, work and play within a walkable area. People integrate exercise into their everyday activities instead of planning time for it or ignoring the need all together. “Effective solutions to the epidemic of inactivity are likely to require both, programs to motivate individuals and environmental changes to make it easier to choose to be active.”⁹ The active living approach “is a way of life that integrates physical activity into daily routines, with a goal to accumulate at least 30 minutes of activity each day.”¹⁰ This relates to walkable communities because the daily physical activity requirement is not only recreational exercise. Walking or bicycling for transportation applies to the minimum 30 minutes. “An active living community (walkable community) is designed with a pedestrian focus and provides opportunities for people of all ages and abilities to engage in routine daily physical activity.”¹¹

The strategies for creating active community environments involve changing land use policies, improving transportation systems (including street networks), instituting safety features and attention to street design and details. Changing land use policies proposes the adoption of practices that favor mixed-use communities. Current zoning regulations were once established to separate uses as an attempt to mitigate the once unhealthy co-location of housing and industry during the industrial revolution.¹² Today they break down the pedestrian fabric and are outdated.

⁸ Killingsworth, Richard and Jean Lamming, p. 12

⁹ <http://www.activelivingresearch.org/downloads/research.pdf>

¹⁰ Emerine, Dan and Eric Feldman, p. 4

¹¹ Emerine, Dan and Eric Feldman, p. 4

¹² Frank, Lawrence D. and Peter Engelke, p. 74

Density

“Delightful density”, coined by the Robert Wood Johnson Foundation is a philosophy in line with New Urbanism, Slow Cities, Active Communities and Smart Growth. All are responses to the erratic development of the suburbs. Although each ideology has its own agenda, at a high level each argues for a level of density that provides residential areas, retail areas and service areas within a walkable distance of each other. In other words all require multi-use functionality. The American Journal of Preventative Medicine published, “Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ” through the support of the Robert Wood Johnson Foundation. The results concluded, “Present results indicate that people are more physically active and more likely to meet recommendations of 30 minutes of moderate activity when they live in neighborhoods with nearby shops and services, with many street connections between residential and commercial districts.”¹³ Simply stated the data suggests we are more active when we are centrally located to home, work and shopping.

Most people are fearful of the notion of density, conjuring images of pollution, mega-structures, and traffic congestion. There is an assumption that higher density development will generate more traffic than experienced in suburban areas with low density. However, low density design is what delegates the suburb's dependency on the automobile as the primary mode of transportation. Residents of low-density communities tend to have two or more cars per household while residents of high-density apartments and condominiums tend to have only one car per household.¹⁴ “According to a study from the National Personal

Transportation Survey, doubling density decreases the vehicle miles traveled by 38 percent.”¹⁵

¹³ Frank, Lawrence D. etc. p 125

¹⁴ National Multi Housing Council

¹⁵ Haughey, Richard, p. 16

A higher-density development is more walkable because people can not travel the distances cars do. For destinations outside a walkable neighborhood, a denser community brings together the concentration of population required to support public transportation.

Other Issues

Walking is a physical activity and we understand how it can improve our health.

Interestingly, by increasing pedestrian functionality, evidence suggests we can improve other areas as well. First, walking can help sustain the environment. “The use of private vehicles has expanded over the last quarter century, particularly for single-occupant trips.”¹⁶ By using walking as a means to accomplish our daily activities, we decrease the amount of driving we do. Therefore, decreasing the emissions that are polluting the air and water quality.

“Compact urban design reduces driving and smog and preserves the natural areas that are assets of the community: watersheds, wetlands, working farms, open space, and wildlife corridors. It further minimizes impervious surface area, which causes erosion and polluted storm water runoff.”¹⁷ The Federal Highway Administration says, “Society benefits from walking through reduced traffic congestion, environmental improvement, and consumer cost savings.”¹⁸

As stated, there is a cost savings with denser development. “A recent study analyzing the costs of sprawl estimated that more than \$100 billion in infrastructure costs could be saved over 25 years by pursuing better planned and more compact forms of development.”¹⁹ Politicians from both parties have recognized this issue as one of basic fiscal responsibility.

“California’s Republican Governor Arnold Schwarzenegger has criticized 'fiscally

¹⁶ <http://www.fhwa.dot.gov/policy/2002cpr/pdf/ch13.pdf>, p. 12

¹⁷ Haughey, Richard, p.22

¹⁸ <http://www.fhwa.dot.gov/policy/2002cpr/pdf/ch13.pdf>, p.13

¹⁹ Haughey, Richard, p. 9

unsustainable sprawl,'²⁰ while Michigan's Democratic Governor Jennifer Granholm has noted that sprawl 'is hampering the ability of this state and its local governments to finance public facilities and service improvements.'²¹²²

Finally, community interaction is criticized as stunted. "Given that most time in public is spent driving around in isolation chambers, it is no surprise that social critics are witnessing a decline in the civic arts of conversation, politics and just simply getting along."²³ Suburban communities are developed where functions are detached and subsequently communities become private worlds. Limited interaction occurs with neighbors only passing each other in their own vehicles. "The automobile has become a powerful deterrent to socially responsive streets. Cars isolate people. They detach users from their environment and often inspire heedless behavior on the part of the drivers."²⁴ Subsequently, a domino effect of hostility and rage festers and results in an overall social deterioration.

"Environmental Blinders (the isolation experienced driving in cars) reinforce a feeling that people – even neighbors – who pass by on foot or bicycle are merely obstructions to efficient travel. As a pedestrian, I sometimes become angry at cars that will not stop for me; as a driver, the object of fury reverses, and I become irritated at pedestrians who want me to stop for them. Either situation generates hostility, primarily because when there are no travel options other than driving, drivers become detached and selfish."²⁵

²⁰ CNN.com

²¹ Muro, Mark and Rob Puentes

²² Haughey, Richard, p. 9

²³ Duany, Andres, p. 62 - 63

²⁴ Untermann, p. 123

²⁵ Untermann, p. 124

Part 2: Case Studies

Nicollet Mall: Minneapolis, Minnesota

Nicollet Mall is considered the urban core of downtown Minneapolis. In the late 1950's, a revitalization effort began in an attempt to keep major companies in the downtown area. Local businessmen were concerned with the flight of business to the suburban shopping centers and demanded strong action. Planning studies determined first, to concentrate on Nicollet Mall and second, to combine public transit and pedestrian functionality along this corridor. Private automobiles would only access the area on east-west cross streets. Lawrence Halprin's firm refined a serpentine street concept by allowing the curve to create sidewalk areas three to four times the typical sidewalk size previously found in the city.

According to reports from 1969 in “New Street Scene: Minneapolis pedestrians come into their own...”, “the mall has lived up to all expectations.”²⁶ Since then some criticism has developed. Typically two major issues are repeatedly identified. First, the bus traffic along the transit-way is viewed as positive because it brings pedestrian traffic and retail customers to the area. However, critics complain that the bus traffic is noisy and pollutes the air with diesel exhaust that prevents complete usage of the street side such as outdoor cafe seating and event space. On the one hand the buses are viewed as vital to the continued success. On the other hand they are viewed as stunting the growth potential and should be eliminated. Second, sky-walks have been added that connect the mezzanine levels of supporting buildings. Critics believe the sky-walks have proved too popular and rob the street level of pedestrian activity.

Halprin designed the street for the pedestrian. There is an overall unity of design

²⁶ Architectural Forum, p. 75

elements along the mall's length. He achieved a balance between variety and repetition. Most importantly, he provided a park atmosphere along a urban street. Halprin incorporated details such as benches, tree groupings and planters, fountains and art are all provided so the pedestrian can linger in the area and create a human scale that fosters a sense of place.

Clarendon: Arlington, Virginia

Clarendon is described as one of “Arlington's urban villages; walkable, mixed-use neighborhoods well served by public transportation. People who live in these neighborhoods are able to walk to shopping or to restaurants and hop on Metrorail, Metrobus or ART when



Image 1: Clarendon Metro

they need to go anywhere else in the Washington Metro area.”²⁷ In time, department stores including J.C. Penny and Sears opened along the Wilson Boulevard corridor. Like most areas, Clarendon experienced urban flight and was left with open lots and struggling retail merchants.

After the Washington DC Metro was introduced and Clarendon was selected as a station site in the early 1980's, Clarendon has become a destination for an eclectic mix of shops, trendy bars, and small restaurants. Sustaining this renewal is the development of the former Sears parking lot and automotive department into luxury apartments and upscale chain stores. Some of the original businesses do remain along with the addition of new small businesses and a high-end grocery store.

Clarendon has a major automobile transit-way along Wilson and Clarendon

²⁷ <http://www.commuterpage.com/art/villages/clarendon2.htm>

Boulevards, Wilson Boulevard operates traffic in the west direction and Clarendon Boulevard operates traffic in the east direction. One block off either boulevard puts a pedestrian in a highly connective street network of residential single family houses. In recent years, the area south of Clarendon Boulevard has experienced a high level of infill development of apartments and condominiums, increasing the area's density.

Clarendon is an excellent example of a multi-use that has increased residential housing around an established retail area. The “urban village” is successful because it is a multi-use area, but also because the surrounding neighborhood is connected to the retail area. Clarendon is highly successful because it is well connected to its



Image 2: Clarendon Neighborhood: one block from Wilson Boulevard

residents but is also convenient for visitors. Visitors can arrive by public transportation or by private automobile. Arriving by automobile is easy due to the proximity of Route 66, a major interstate, and an abundance of parking. Arlington County keeps a government building parking garage open every night to provide free parking

Image 3: Looking East on Wilson Boulevard



to out of area visitors. The chain stores also have a pay parking garage next to the shops and street parking is also available. Once a person arrives in Clarendon, the shops, restaurants and residences are easily accessed on foot.

Street details are not abundant. Seating is mostly provided by the restaurants that

allow customers to dine outside. Street trees are recent installations and do not provide a large impact along the sidewalk yet. The sidewalk area is approximately 15 feet wide along the two major boulevards. A small “public” park is located at the chain store complex, but is public space owned by a private company. A few benches are available here. Despite the broken rules for good pedestrian street design the area is thriving. Most likely there is a limited need for such devices because of the convenient parking, the compactness of the area and visitors limited dispersal within the areas beyond the retail core.

Duke Street: Alexandria, Virginia

Alexandria Virginia was established as a port town in the 1750's. Tobacco was the major export of the colony. Roads developed as a way for farmers to get their crop to the

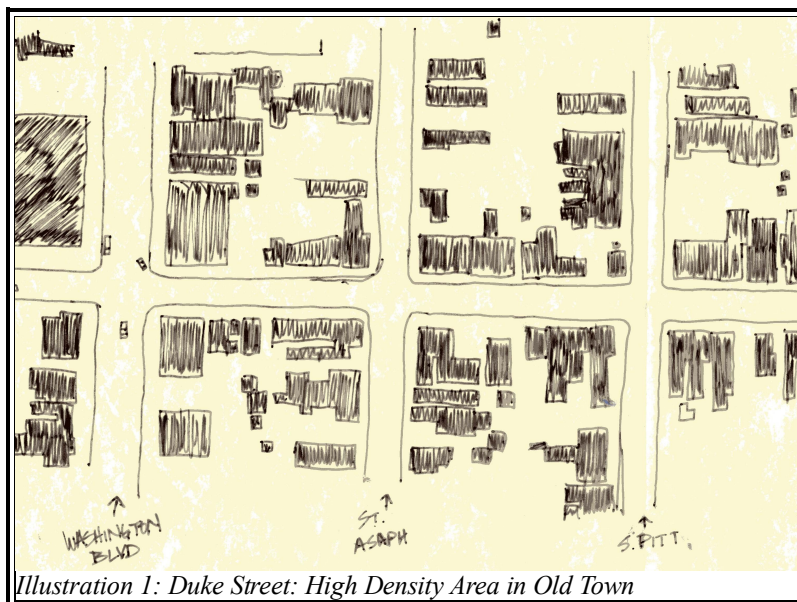


Illustration 1: Duke Street: High Density Area in Old Town

warehouses for quality reviews.

Along the river and among the

warehouses, the street organization

was a strong grid pattern. “The

prevalence of the grid in the

eighteenth century was due in large

part to a conviction that rational

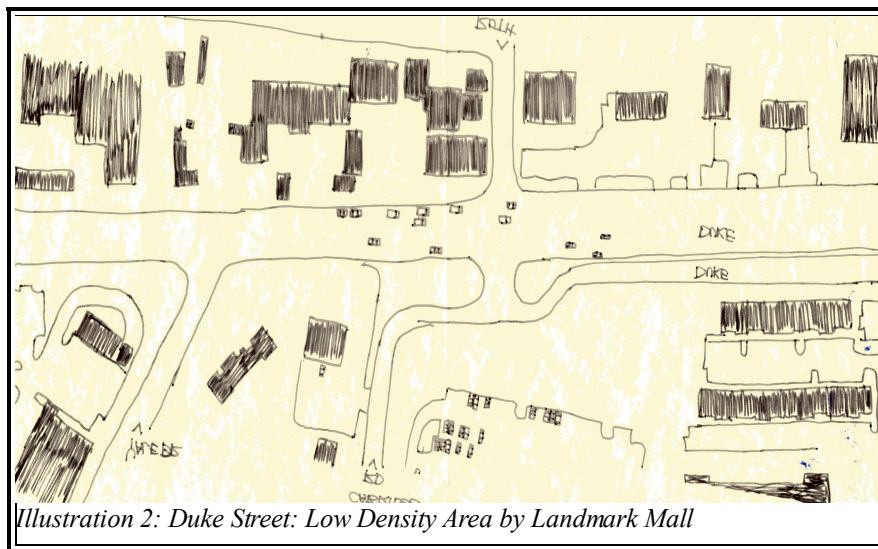
order could be imposed upon nature.

This belief is evident also in the ordered system of architecture of the same period. The grid was unimaginative, perhaps, but it served well the commercial life of these seaport towns and was expandable. The same grid plan of two-acre blocks was subsequently extended several times.”²⁸

²⁸ <http://oha.ci.alexandria.va.us/archaeology/decades/ar-decades-1740.html>

Duke Street starts in the historic port section of Alexandria Virginia known as Old Town Alexandria today. Here it is a narrow street with many block intersections. The first users of the street were pedestrians so the scale, character and functionality is better served by pedestrians than cars. Some block sections along Duke Street are still the original cobblestone. The row houses are close to the street curb and together with the old street trees provide a sense of enclosure in scale with the pedestrian. The row houses are continuous yet provide enough detail to keep a pedestrian interested along their journey. The street detail is too small and too frequent to be viewed today by automobile users.

Duke Street continues out of the Old Town section to a modern “town-center”, familiar



to us as the shopping mall, in this case the Landmark Mall. Yet the pedestrian functionality breaks down and by the time a pedestrian could reach Landmark Mall the trip is vastly different from where they started in

historic Old Town. Around Patrick and Henry Streets that intersect Duke the sense of enclosure enlarges and becomes more in scale with an automobile than a pedestrian. Buildings are still set close to the street, but the street is two lanes wide in each direction and street trees are more random in their placement. Traffic is moving at an elevated pace. Buildings are also taller and wider, making some of the blocks longer and less connected to other areas. However, the street is still a walkable area until the pedestrian arrives at the King

Street Metrorail station. On the other side of the Metrorail station is the Masonic temple and its vast grounds. Duke street runs parallel to the southern boundary of the Masonic Temple. From this point onward the streetscape is designed for the automobile.

Duke Street from the Masonic Temple to the Landmark Mall is dominated by the automobile. Blocks are long as to not interrupt the traffic flow. Buildings are set several hundred feet back from the street. Retail areas are set even farther back in order to provide adequate parking spaces. The street width is six lanes wide to provide traffic and turning lanes. Traffic speeds are excessive. Even though a sidewalk area is continuously provided, seldom is a pedestrian seen. As a pedestrian approaches Landmark Mall, several traffic overpasses direct automobiles towards and away from the mall. This means the pedestrian is often walking along a three foot wide sidewalk with speeding traffic to the left and a concrete retaining wall several stories high immediately to the right. This environment is so uncomfortable to a pedestrian that only automobiles are the safe mode of transit.

Delightful Density: The Answer to Suburbia's Missing Pedestrian

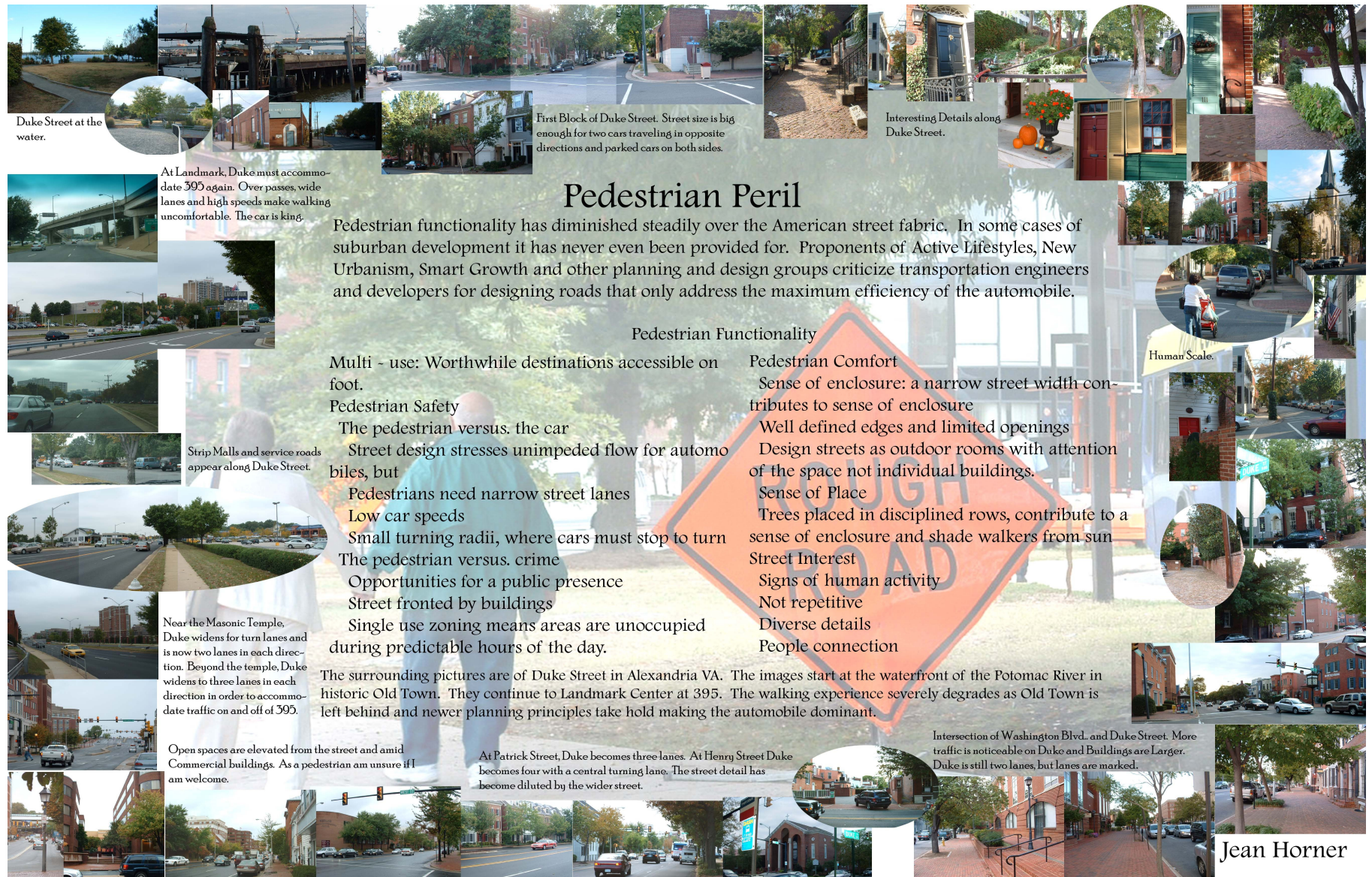


Diagram 1: The Pedestrian Experience along Duke Street

The transformation of a delightful pedestrian friendly street into a barren pedestrian nightmare is the evolution of Duke Street from historic district to modern development. Duke Street does everything correct in the Old Town area. It is highly connected to the overall area. Multi-use areas are within walking distance. Automobile traffic in this section exists, but is controlled and measured. Speeds can not gain momentum due to the high number of intersections and stop signs.

Seven Corners: Falls Church, Virginia

Seven Corners in Falls Church Virginia is so named because of the convergence of multiple arterial roads at one intersection so seven wedges or corners are created. The shopping center located here was built in 1953 and was considered a “new prototype of American retailing emporiums”.²⁹ The resulting development is similar to the Landmark Mall area along Duke Street. There are several over-passes. The street widths of both Route 7 and Route 50 are wide. Route 50 is four lanes in one direction, eight lanes including both directions. Buildings are set back from the street and fronted with large parking lots. Traffic speeds can reach 50 mph because few intersections are present. This also means pedestrians have few opportunities to cross the street. This area is known for its pedestrian/vehicular deaths as a result of pedestrians jaywalking.

An article, “A Walk on the Wild Side”, published in The Washington Post Magazine in January 11, 2004 presented the perfect case study of walking within this area. The author, Mary Battiata, walked from Washington DC to Gilbert's Corner (the intersection of route 50 and route 15). She spotlighted the intersection of Arlington Boulevard (route 50) and Patrick Henry Street within the article as being one of the “most dangerous roadways for

²⁹ <http://www.fcrcv.org/baileys/history.htm>

pedestrians in the Washington area”. The article sums up the problem as, “ road design, or the lack thereof. These intersections are textbook examples of all the ways that roads designed for speed and maximum traffic flow are hazards for anybody who has to walk on them.” Large apartment buldings complexes are located adjacent to the Seven Corners “big box” stores that are surrounded by parking lots. Residents use the stores and the metro bus hub that regional bus routes stop at. Factor this large pedestrian population together with poor road design and fast moving, high-volume traffic, it is easy to understand why the intersection has a high incidence of pedestrian casualties and near misses.

The following excerpt is taken from the Washington Post article previously mentioned. It is included to illustrate the problem intersection in the author's own words.

“But the Route 50-Patrick Henry intersection is poorly designed for pedestrians. There is a crosswalk and a walk signal, but the walk-signal button on the westbound side of 50 is bolted to a pole that appears unconnected to the light itself. Pedestrians share the first part of the crosswalk with fast-moving, right-turn-only traffic shooting onto 50 from Patrick Henry. The signal gives people 22 seconds to cross eight lanes of traffic, including two right-turn merges whose traffic is not controlled by the light.

For pedestrians who don't want to cross here, the next legal option is half a mile away at Seven Corners itself, a route that requires hiking up a ramp to the top deck of the interchange, traversing a series of traffic islands and signals, hiking back down the ramp on the opposite side of the boulevard and retracing one's steps half a mile back to the shopping center and apartments.

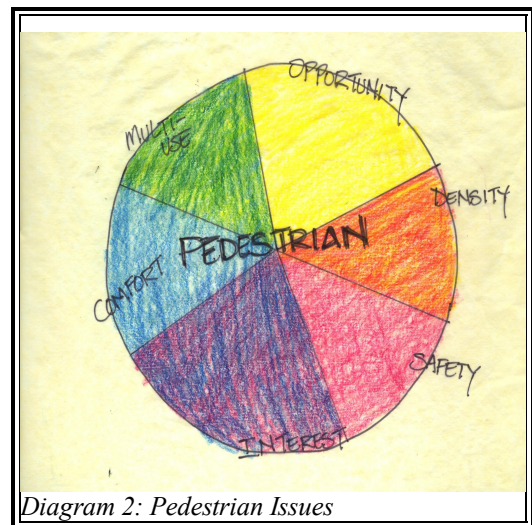
Confronted with these choices, many people here opt for door No. 3.

They walk up the road to a point about halfway between Patrick Henry and Seven Corners and sprint across when the traffic lulls. Any pedestrian struck by a car here – and there have been several in the past year – would appear in police and news reports as the guilty party, but the people who “ford” the road there are actually making a highly rational choice. At the intersections, the traffic is eight lanes or more and there are right and left turn lanes to contend with as well. In the middle, the traffic narrows to four lanes (plus service roads) and is easier to eyeball. People sprint across the road there day and night, so many that footpaths have been worn into the grass, and the county has erected two small signs that say “Use Crosswalk,” with little arrows pointing back toward Patrick Henry and Seven Corners. During one 10-minute stretch I watch more than a dozen people run across the road.”

The previous excerpt is an excellent window into the lack of pedestrian functionality along this corridor. It details the typical problems along many of the roadways we use today and is universal in its application to other car dominant areas. We have designed out the pedestrian.

Part 3: Purpose

I find it encouraging that my focus on pedestrian functionality has converged with other issues and offers a solution to not just our collective health, but the environment and public culture as well. Perhaps an overstatement, but if implemented on a nationwide scale, walking to our convenient destinations and using



mass transit to access the rest, could it be the instrumental turning point we need to save the planet. I realize this is a big dream, but one I feel worthy of my thesis.

Pedestrian functionality is dependent on several key factors. A highly connective street fabric is important, such as streets laid out on the grid, it gives multiple choices for a pedestrian's route. The alternative of hierarchical roads designate how much automobile traffic they carry and at what speed and are designed to limit through traffic. The cul-du-sac road formation replaced local streets when hierarchical road design became the norm. Pedestrians trying to walk from one location to another, for instance from their house on a cul-du-sac to a nearby convenience store are subject to long curvilinear roads that do not connect home and the destination along a straight line. Instead they wind along out of the way before leading to a useful destination. This increased distance makes walking more of an inconvenience. Equally important for good street design are obvious elements such as the presence of sidewalks. Too often roads are implemented without sidewalks.

Also necessary to encourage pedestrians is a sense of safety. This can be facilitated by the presence of other people in order to suppress crime. "Higher-density developments can actually help reduce crime by increasing pedestrian activity and fostering a 24-hour community that puts more 'eyes on the street' at all times."³⁰ Moreover, it also addresses conditions that mitigate the presence of moving traffic and slow it down if possible. A type of spacial, i.e. planting strip, or physical buffer, i.e. on-street parking or street trees, between moving traffic and the sidewalk will serve to distance and protect the pedestrian. A sense of enclosure at the street level increases the level of comfort. The more comfortable one is the safer one feels. Street trees create a canopy over the sidewalk and streetscape. This "roof"

³⁰ Haughey, Richard, p. 21

dapples the sunlight and makes the street a more intimate scale. Buildings that are built to the street front also reinforce a sense of enclosure and help create a more intimate streetscape. "Street trees are generally acknowledged to be the single most powerful device in defining and humanizing the street space; certainly, they offer the greatest visible impact."³¹



This photo was taken in Old Town Alexandria along Duke Street. The streets in this section of Alexandria were created prior to the automobile. They are on a grid system. Notice the narrow street width, the mature tree canopy and that the buildings front the oversized sidewalk. On-street parking creates a buffer between the pedestrian and the street. Now compare this street design with Image 5 below.

Image 4: "Old Town" Street – Duke Street

This photo is of Duke Street outside the historic Old Town Alexandria area. Modern road design principles were applied to make this efficient for the automobile. The width is much wider, five lanes including a turn lane. Buildings are set back from the road to accommodate parking and are typically one story. Street trees are not a priority. The scale of the road compared to the surrounding area makes this a very uncomfortable space.



Image 5: Typical "Sprawl" Road Design – Duke Street

Finally good street design has details, such as things to look at and places to pause.

³¹ Greenberg, p. 202

Consider the following quote, “Pedestrians need a high level of visual stimulation to maintain their interest and encourage trip continuation.”³² Upon comparison of image 4 and 5, image 4, the pedestrian friendly street, has a lot of details. Flower boxes on the first floor windows, the brick paving, interesting architecture of the buildings and more, too much to inventory here. Image 5 seems less interesting, more vanilla. This is because the pedestrian is the audience in image 4 and the automobile is the audience in image 5. With its high speeds, the automobile does not require small details to look at. In fact such details are distracting to motorists and could cause accidents.

Density plays a key role because it increases the multi-use destinations within a walkable distance. Without multi-use and density little can be accomplished. Increasing density can be approached in two ways. First, add more residential density to retail areas. Second, increase services near residential communities. “Multifamily areas are ideal for enhancing pedestrian opportunities; they concentrate density which, in turn, encourages nearby convenience stores, restaurants, transit, and office developments. Were sidewalks to connect these services to nearby apartments, residents would be able to considerably lessen their dependence on the automobile.”³³ My goal is the later approach: to introduce retail services into an established and diversified neighborhood that is solely dependent on the private automobile.

Site Design

A design project situated in the historic residential neighborhood in Arlington, VA along the Fairfax County border will be used to demonstrate the application of pedestrian functionality. It will address increasing density in an existing neighborhood while connecting

³² Untermann, p. 129

³³ Untermann, p. 128

communities currently segregated by poor street design and a lack of useful destinations.

Program elements:

- establish a connection within the historic neighborhood of and its outlying areas, the nature trail, schools and a new centralized retail section
- incorporate pedestrian friendly street design
- provide pedestrian opportunities in multiple forms
- use of traffic calming techniques to address high traffic areas and traffic speeds
- use the street as public space

Goals:

- introduce multi-use into a primarily residential area dominated by automobile travel
- give residents an alternative to driving for their daily activities and chores
- integrate a variety of users into the site
- to accommodate for multiple uses, activities and possibilities
- to find a balance between site elements

Significance

Pedestrian functionality is largely an issue of density. The automobile's popularity encourages low density everywhere. The issue becomes one of addressing the space between functions. Most attempts to incorporate walkability into new developments often does not include multi-use within a walkable distance and the car is still overused. Typically, the general public resists attempts to infill residential areas because they fear a higher density will increase automobile usage to the area and increase congestion. However, sprawl is a reality and responsible for a multitude of sins. Change is needed in order to save the things we value,

our health, open space, wildlife, the environment and time together. If we continue along this path of spreading out, we will spend more time in the car and traffic. There will be fewer opportunities for taking children fishing, playing a pick up game of basketball or riding a bike because there will be fewer healthy fish, public open space will be vacant because children can only get there by car and riding a bike adjacent our traffic could be fatal. Both our children and ourselves will be suffering from health conditions related to obesity and physical activity will be more uncomfortable and more seldom. Addressing pedestrian functionality is a timely issue.

Part 4: The Design

This thesis addresses an established auto-centric neighborhood and proposes a walkable alternative. Through multiple strategies, I will connect users, circulate activities, and enhance destinations. In the end people will have multiple destinations within walking distance and the opportunities to walk there.

Site Inventory and Analysis

My site is the Glen Carlyn neighborhood in Arlington Virginia. It is within the triangle created by Ballston, Seven-corners and Bailey's Crossroads. Two main areas were identified for inventory and analysis, existing areas of use and existing traffic patterns.

Areas of Use

Currently there are several existing areas of use, *see map 1*. The neighborhood is known as Glen Carlyn. It possess historic status because Virginia's oldest building is still present here, the Ball-Sellers house. The community was established in 1887. The neighborhood is single-family houses (*shown in orange*) of varying styles . It is bordered on

the east by a continuous park system (*shown in green*) running from Route 66 (from the northwest) to the Village at Shirlington(to the southeast). Four mile run flows within this park area and a shared use trail (*stream and trail shown in blue*) runs along side it continuing the distance from route 66 to Shirlington. A nature center (*labeled*) is located within the park system and within walking distance of Glen Carlyn. There is a significant topographic change in the park as you move down towards the run. The Glen Carlyn neighborhood is located on a high point within the surrounding area. The community blends into the wooded trail system as a result of the mature trees within the neighborhood.

Two schools (*shown in yellow, recreation fields shown in blue*), a middle (Kenmore Middle School) and an elementary (Carlin Springs Elementary), share recreational fields in the center of my site. Adult soccer leagues use the school fields for games. The schools also have tot-lots, a basketball court and several tennis courts. The Kenmore Middle School underwent a complete renovation during the summer of 2005. The parking lot was reposition along Carlin Springs and enlarged. Subsequently, there is a large view onto the western edge fields and their large lights.

Within the historic core neighborhood there is a community hall, one of two historic buildings listed on the National Registry and a public library(*labeled*). Along Carlin Springs at the Arlington Boulevard overpass is a 7-11 and an adjacent unfinished wood furniture shop(*labeled*). These are the only two retail options within walking distance of the neighborhood.

Three high rise apartment/condo buildings (*shown in magenta*) are in adjacent Fairfax county at the far west end of the site. Currently there is no physical connection between these residents and the Glen Carlyn residents. There is fencing around the fields to prevent access

from this side. Because the fields are on public school property, they are considered park land owned by the county. The fence separates Fairfax County and Arlington County (*shown as dashed red line*).

A senior high-rise facility (*shown in plum*) is south along Carlin Springs. Elderly citizens are seen walking along Carlin Springs, often venturing to the 7-11 at the Arlington Boulevard overpass. The senior high rise residences are across Carlin Springs from the Northern Virginia Hospital Center. The hospital site (*shown in red*) is closing and presents an opportunity for development.



Image 7: Kenmore Middle School: seen across Carlin Springs Road



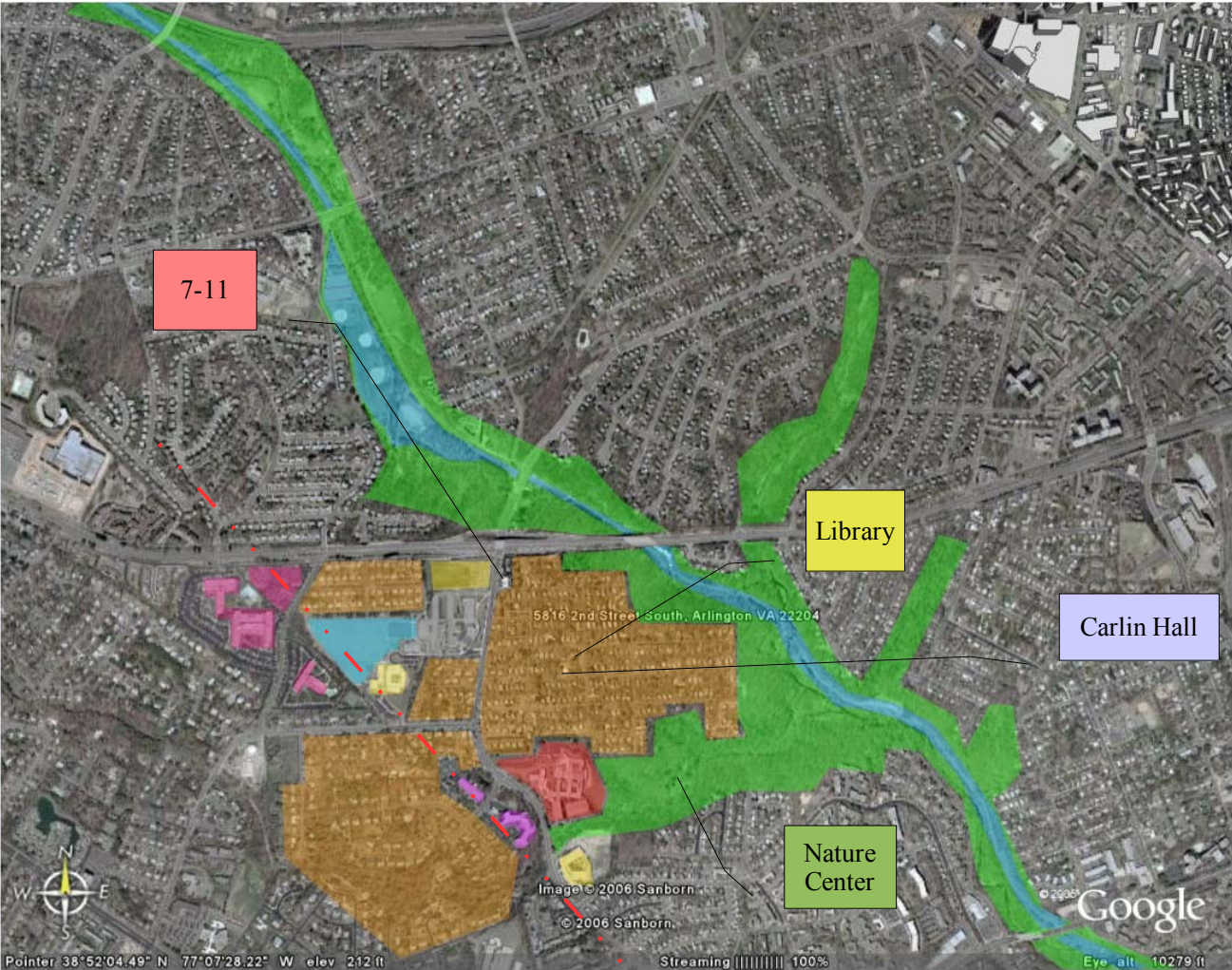
Image 6: Historic Carlin Hall



Image 8: Glen Carlyn Library



Image 9: Fairfax County High-Rise Residences in the distance of the Recreation Fields



Glen Carlyn: Areas of Use

- County Park/Nature Area
- Recreational Area: Sports Fields or Shared Use Trail
- Public Schools: Elementary and Middle Grades
- Single Family Residences
- High Density Residences
- Senior High Density Residences
- Existing Hospital: to be Vacant

Map 1: Area of Use

Traffic Patterns

The existing traffic circulation frames and also dissects the site in half, *see map 2*. The northern border of my site is Arlington Blvd (*shown in red, running east/west*). It presents a strong barrier; it handles 61,000 cars a day.³⁴ It is classified as an arterial road. Arlington Boulevard is an overpass at Carlin Springs so traffic is continuous along it. Public transportation buses run along both Arlington Boulevard and Carlin Springs.

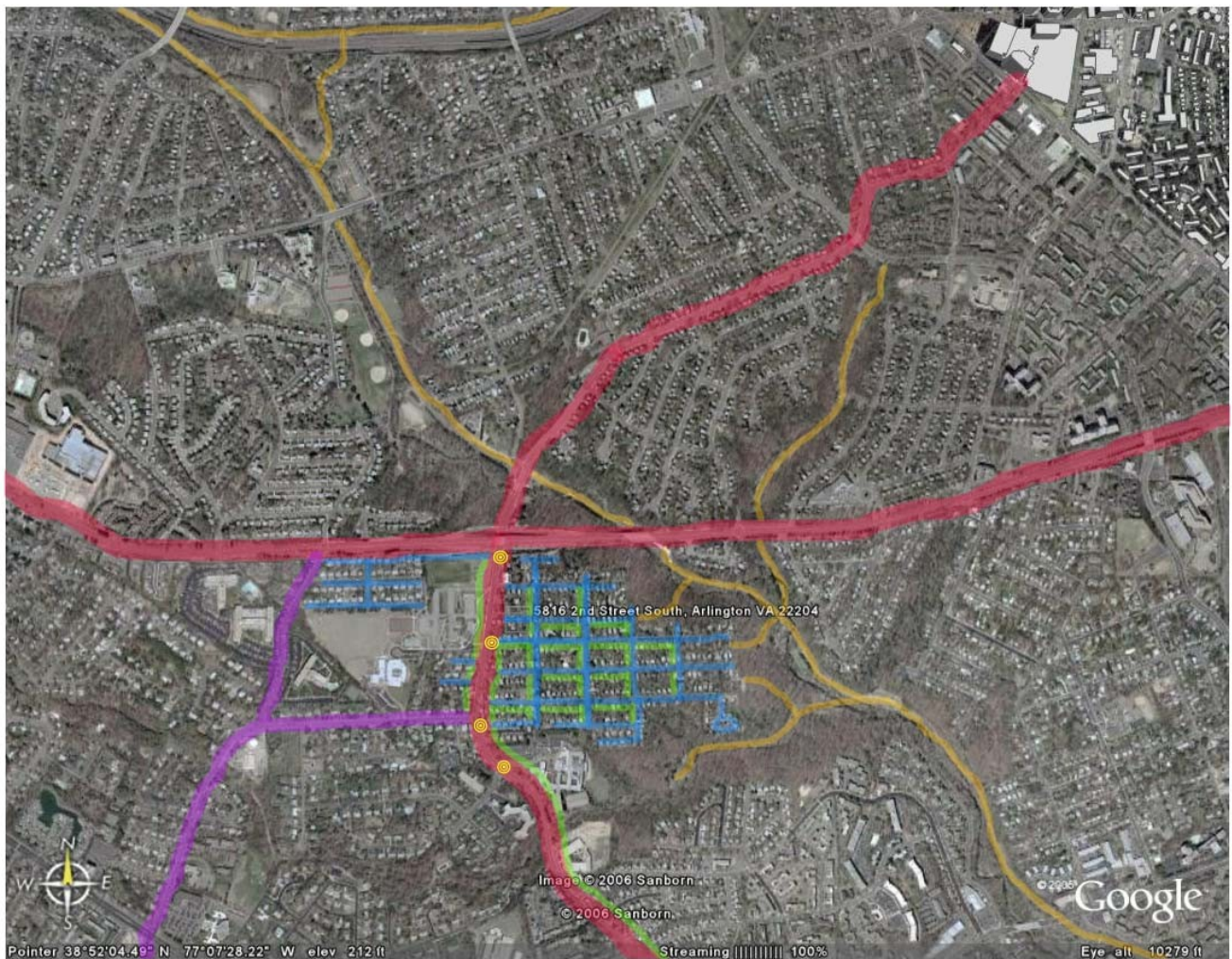
The next major road is Carlin Springs Road (also *shown in red, running north/south*). It runs through the site and separates the schools from the the historic core of Glen Carlyn. Carlin Springs handles 28,000 cars a day from Arlington Boulevard to 5th Street.³⁵ This is the entire site. Only three traffic signals (*shown in yellow*) are present on Carlin Springs along the neighborhood. The sidewalk along Carlin Springs is 3' wide and directly adjacent to the road. There is no utility buffer or planting strip separating pedestrians and automobiles. The intersection of Carlin Springs, 5th Road (*shown in plum*) and 5th Street is awkward because the cross streets (5th Rd and 5th St) do not align. This creates a blind curve on Carlin Springs.

Local streets (*shown in blue*) within Glen Carlyn do not experience through traffic. There is automobile access into the Four Mile Run parks, but no through automobile connection exists within the park. Streets are narrow in the original historical core, with an average width of 36'. Some streets are as narrow as 26'. Currently parking is allowed on both sides of most streets. Where this happens only one lane of automobile traffic can pass at a time. Many of these narrow streets do not have sidewalks on them. In fact the sidewalks (*shown in green*) are not continuous throughout the community. According to the Glen Carlyn sidewalk study performed in 2005 by Arlington County (present in 2006), "about 35%

³⁴ VDOT – Average Daily Traffic Volumes

³⁵ VDOT - Jurisdiction Report

(of streets) currently have a sidewalk on at least one side of the block. The majority of these sidewalks are found west of Carlin Springs Road on newer residential streets.”³⁶ School children walk within the neighborhood and must cross Carlin Springs to get to school and back home. Finally, the shared use trail (*shown in orange*) within the park system is used for bicycle commuting into DC and gets heavy use on summer weeknights and weekends.



Glen Carlyn Existing Traffic Patterns

- Recreational Traffic (Shared Use)
- Pedestrian Traffic (Not all Traffic Occurs on Sidewalks)
- Existing Traffic Signals
- High Volume Automobile Traffic (Mostly Through Traffic)
- Moderate Volume Automobile Traffic (Mostly Through Traffic)
- Low Volume Automobile Traffic (Local Traffic)

Map 2: Existing Traffic Patterns

Delightful Density: The Answer to Suburbia's Missing Pedestrian



Image 11: Carlin Springs Road: looking south towards 5th Road



Image 10: Carling Springs Road: looking north towards the Arlington Blvd overpass



Image 12: 4th Street with in Historic Glen Carlyn



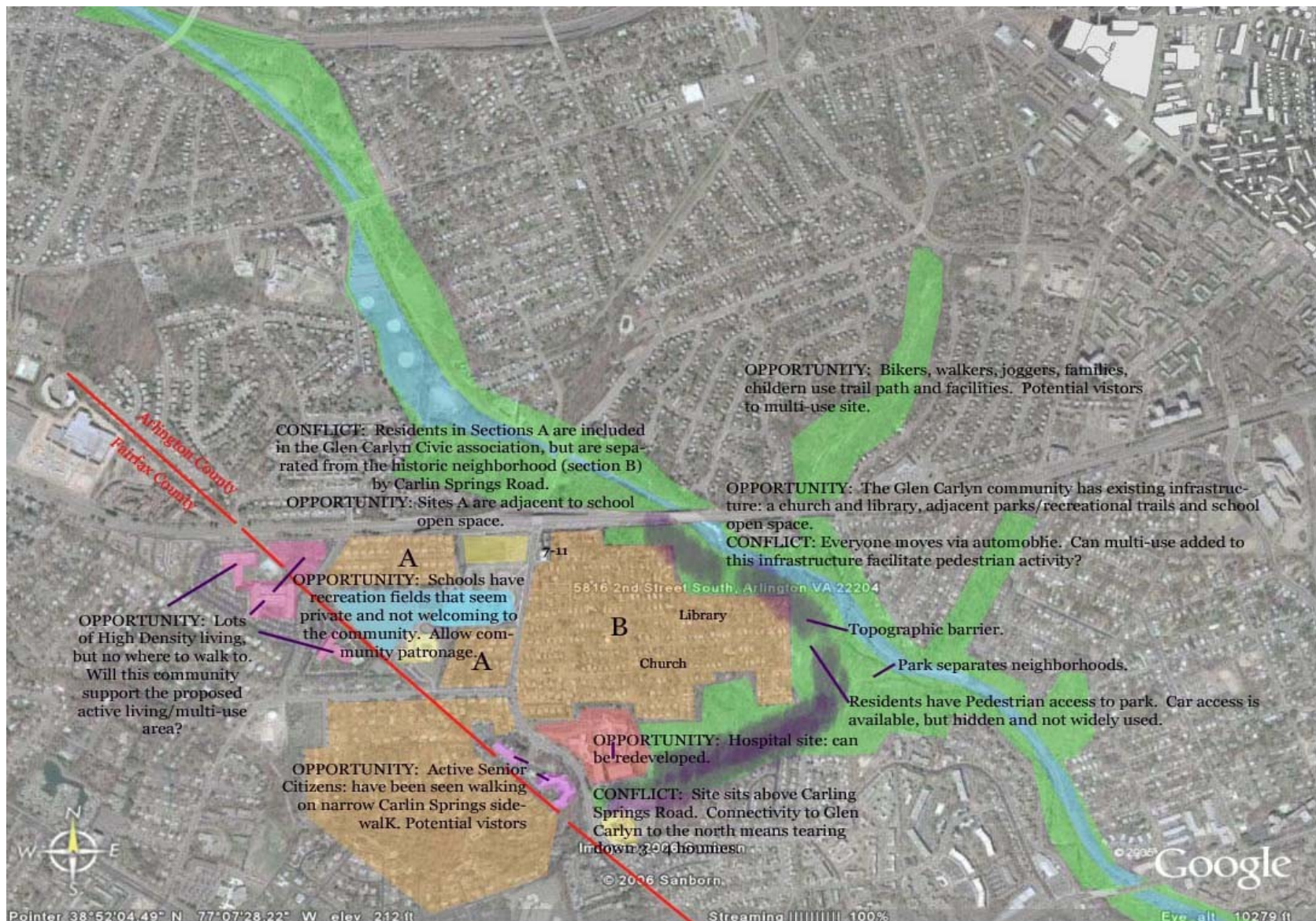
Image 13: Carlin Springs Road (looking north) Traffic and Pedestrian Conditions



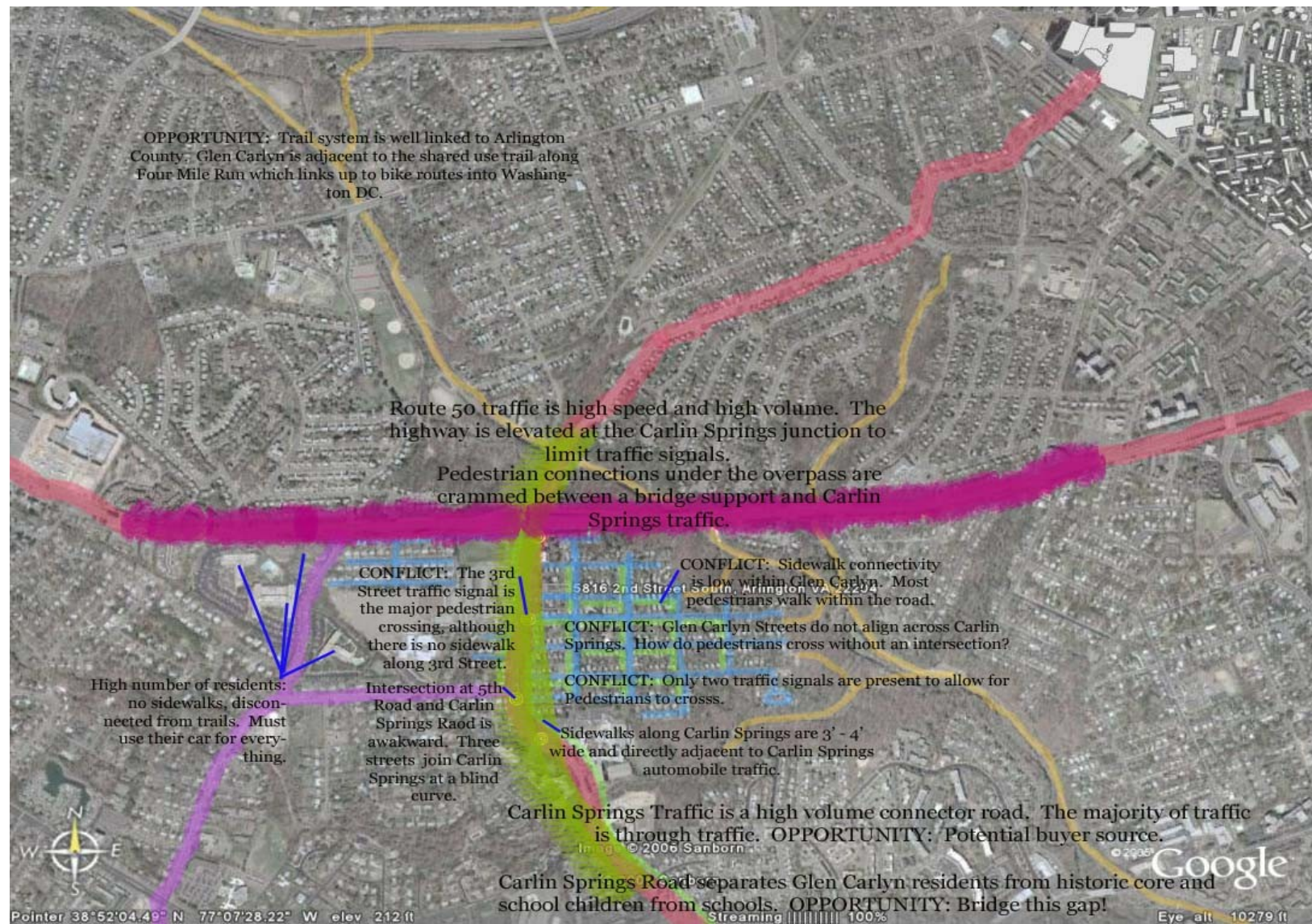
Image 15: Arlington Blvd and Overpass from Kenmore Middle School



Image 14: Carlin Springs Elementary School from 5th Road



Map 3: Existing Area of Use Analysis: provides opportunities and restraints or conflicts that exist with regards to the various areas of use.





Map 5: Synthesis

Constraints

Orange – The Glen Carlyn neighborhood is cradled along the east by Park system and a steep topographic barrier.

Red - To the north the neighborhood is defined by the hard edge of Route 50.

Yellow - Carlin Springs Road dissects Glen Carlyn in half. Pedestrian connectivity is disjointed and must be addressed.

Purple Circle – Highlights the corner of Carlin Springs Road, 5th Road to the west and 5th Street to the northeast. This is coupled by a blind curve in Carlin Springs Road.

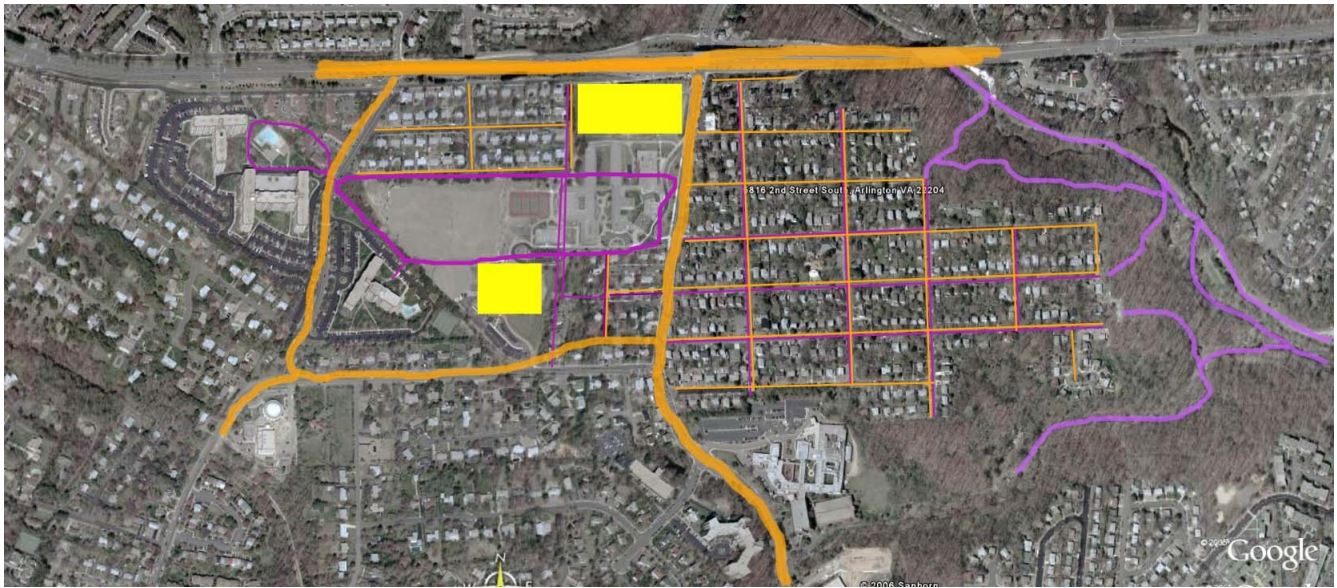
Opportunities

Green - The school site is centrally located between the Glen Carlyn neighborhood and the adjacent Fairfax County residences.

Periwinkle – These sites are adjacent to the school grounds. This proximity to the school's open space and recreational amenities could reinforce the success of a multi-use area.

Lavender - Hospital site is leaving. Its status as a soon to be brown field and proximity to Carlin Springs suggests it as a potential multi-use site.

Bright Blue – Potential residences that could support a multi-use area.



Map 6: Concept for Walking and Driving within Glen Carlyn

Concept

I plotted out the potential for walking and driving and the interaction between the two, see map 6. A “nature” walk along the school recreation fields would ground a large unattractive field area and allow residents from the high rises in Fairfax to access the multi-use area on foot. Sidewalks in the Glen Carlyn neighborhood would allow users from the trail to weave their way to the multi-use area and residents would be able to access a sidewalk easily.

Currently there is limited connectivity across Carlin Springs from the historic section to the east and the existing school and future multi-use destination. There are three intersections used for crossing Carlin Springs within this neighborhood, the Arlington Boulevard signal, the 3rd Street signal and the 5th street signal. School children cross Carlin Springs at the 3rd Street signal. This low connectivity is helpful when moving school children to the other side. Only one intersection requires a crossing guard. There is no need to

rearrange this functionality. However, the low connectivity discourages adults from walking. I propose timed traffic signals at all the intersections along Carlin Springs. This would add three traffic signals to a small section of road, at 1st Street, 2nd Street and 4th Street. This is a reasonable measure and does not try to funnel pedestrians out of their way or anticipate where they are going. It is to be expected that the motorists will not support additional traffic signals. However, using the Route 1 corridor in Old Town Alexandria as an example, this section of road handles 42,000 cars a day and balances heavy pedestrian usage.³⁷ Traffic signals are at every intersection and are timed. It is by timing the traffic signals that both modes are successful and separated from each other. Currently during rush hour, the signal at Arlington Boulevard backs northbound traffic to the 3rd Street signal. Pedestrians can not weave through the stopped cars because oncoming traffic exiting Arlington Boulevard moving southbound is not restricted with a signal. Increasing the number of traffic signals creates intersections and therefore crosswalks where currently there are none.

³⁷ VDOT – Average Daily Traffic Volumes

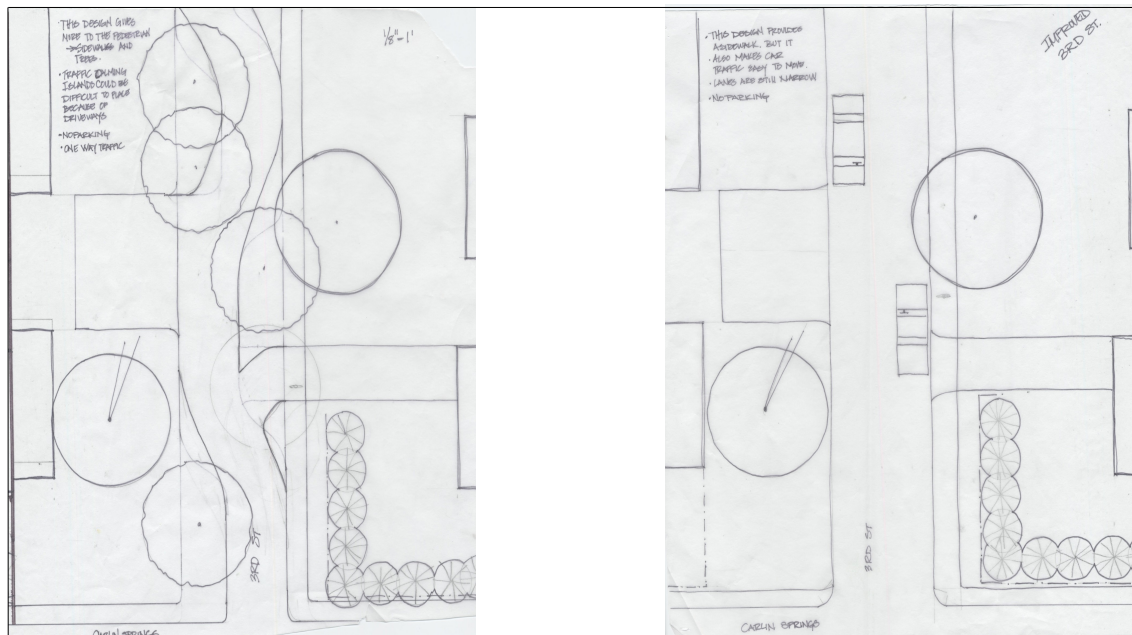


Illustration 3: Sidewalk Options for Local Streets

The above plans are options for sidewalk construction within Glen Carlyn, see *illustration 3*. As a result of the tree material within the neighborhood being very mature and an identifiable characteristic of the community, sidewalk construction should not be added at the expense of any of these trees. Two possible techniques were explored to accommodate sidewalk placement, but preserve tree material. The left image employs design techniques used in Europe called "Woonerf". The single lane of traffic slows cars down as it curves. The area gained from narrowing the street can be used for planting beds and street trees. A drawback to this technique is the residential driveways can interfere with the street curve and the planting beds. The plan to the right removes on-street parking. The existing street space is narrowed and used for sidewalk space. No plant material needs to be compromised utilizing this technique and no additional space for plant material is created.



Illustration 4: Multi-Use Destination

Plan: Phase I

Illustration 4 shows a preliminary sketch for the multi-use area. Ground floor retail shops would front Carlin Springs in an attempt to entice the commuter. Additional ground floor shopping would be located along the newly aligned 4th Street. Five story condominiums would occupy the additional floors. The newly created street that parallels Carlin Springs would be townhomes. The sidewalks along Carlin Springs and the new multi-use destination would be 25' wide. The sidewalks within the new area would be 20' wide. These generous spaces allow for several design elements. First, the extra space can be utilized by shop owners

for cafe seating and seasonal displays. Street trees are a required element for several reasons, i.e. their canopy creates a roof to the space and a sense of enclosure. They filter the harsh summer sun and provide cool shade. The roomy sidewalk allows for creative placement of the street trees; all in a row is not mandatory with the more ample room. New technology exists to allow the sidewalk paving to be placed atop growing medium, the more sidewalk space the more room trees can grow and achieve the mature sizes of the established neighborhood across Carlin Springs.

In addition, the extra space gives more maneuverability to the pedestrians, all with different agendas, walking paces etc.

The five extra feet given to the sidewalks along Carlin Springs is an added space buffer for the high volume and high speed traffic. It also reflects the scale of the larger Carlin Springs Road. The concept was to provide more room for pedestrians than automobiles. The street width of 4th Street within the shopping corridor is 28' wide, 8' for on-street parking and 12' for a lane of traffic, compared to 40' of sidewalk.



Illustration 5: Preliminary Axon of Multi-Use Area



Illustration 6: Perspective of New Multi-Use Area along Carlin Springs Road

Once I had established the multi-use area I focused on the connections between the Glen Carlyn residents, the walkers on the recreation field walk and the schools. The walk circumnavigating the recreation fields was intended to be a “nature” walk. The goal was to plant trees along the path that would lead walkers around the field, ground the fields into the surrounding community and provide gateways for pedestrian access for the community within the outskirting areas. To tie the “nature” walk into the language of Glen Carlyn and the natural parks that delineate the eastern border of the community, I recommend the native tree *Cercis canadensis*, Eastern Redbud be planted in mass. The idea would be to give Glen Carlyn the identity of the Redbud, similar to the National Cherry Blossoms representing Washington DC, the Redbud would represent Glen Carlyn. Their springtime flowering would be viewed from the central location of the schools and multi-use area and from Carlin Springs.



Illustration 7: "Nature Walk" Along Recreation Fields

The next step was to resolve the intersection of the "nature" walk and the linkage between the two schools. I struggled with this intersection.

The area linkages, *see diagram 3*, displays a conceptual diagram of the intersecting areas. I decided that this space had to address 3 types of users, first graders, eighth graders and adults. This addressed the two separate populations at the schools and grouped all the various other visitors as Adults. Adults being residents, commuters, retail users, trail users and recreation users. The space also had to address 3 types of day: weekday, weeknight, and weekend. Thinking of the space this way freed me from forcing a direct link between the two schools. Few occasions exist where the student body from one school will need to access the other school. More often both schools will need an area for recess and spontaneous play in an area more comfortable than the existing wide open soccer fields. The retail users, "nature walkers", residents etc. will benefit from an open space where they can sit under a tree or in the sun, a place to people watch, and more comfortable than the existing wide open soccer

fields. This area had to be versatile enough to handle different volumes of people and different activities. A weekday recess and an Saturday morning will be different from each other.



Diagram 3: Area Linkages

Delightful Density: The Answer to Suburbia's Missing Pedestrian



Illustration 8: Final Plan

Plan: Phase II

My final plan, *see illustration 6*, resolves the issues discovered in the linkages diagram. I accomplished this through a large scale circle. The circle allows for a walkable connection but also creates an open space that can be used by all. It is flexible and versatile because of its size. The interior circle has a diameter of. The surround path is 20' wide. I consider it the “multi-landscape” adjacent the new multi-use area. School children can use it for recess or outdoor classes. Adults can walk along it as they make the bigger loop through the soccer fields or to gain access to the retail areas. Additionally they can sit with a cup of coffee and watch the activities from under a tree. I envision the open space to be bermed so there is a sense of enclosure along the path and there is not always a clear view into the circle center, *see illustrations 7 – 8*.

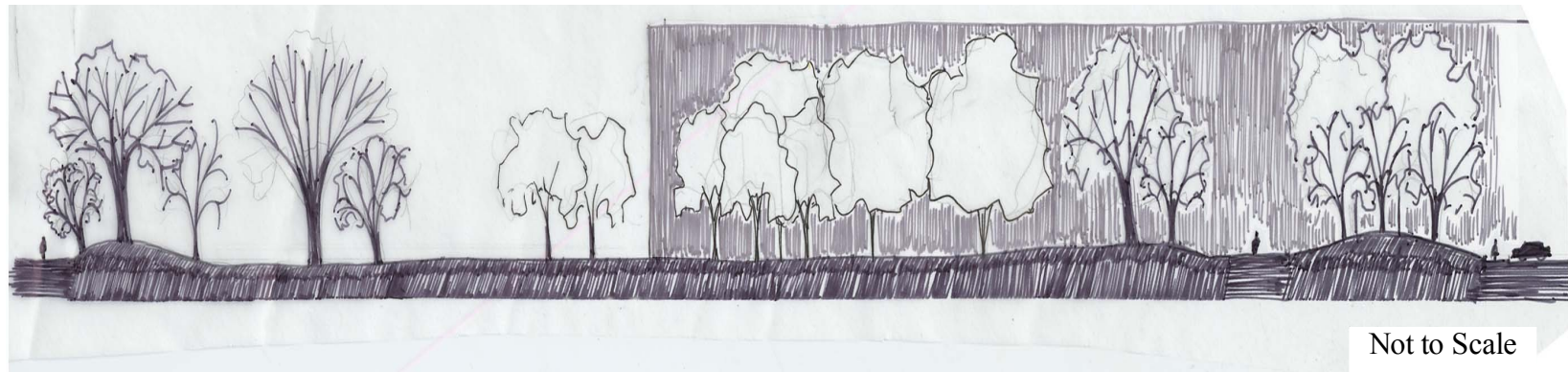


Illustration 9: Circle Section

The above section, *see illustration 17*, is a slice through the circle center looking north towards Arlington Blvd and Kenmore Middle school. As you can see the path to the left shows the bermed edge and the trees that create a sense of enclosure. The path to the right shows the relationship between the parking lot, the path and the open space. The parking lot is slightly lower, a planted berm separates the parking from the path. Another berm separates the path from the circle center. It is intended as you move around the circle that the berms would vary and in some places recede.

The bottom section, *see illustration 18*, illustrates the typical path. A sense of enclosure is created by the trees and the berms. The gentle slope into the open space allows for a relaxed hillside and lounging and viewing of central circle activities. As you move around the circle the berms recede and the space on the left of the path would be more typical of viewing into the circle from the path.

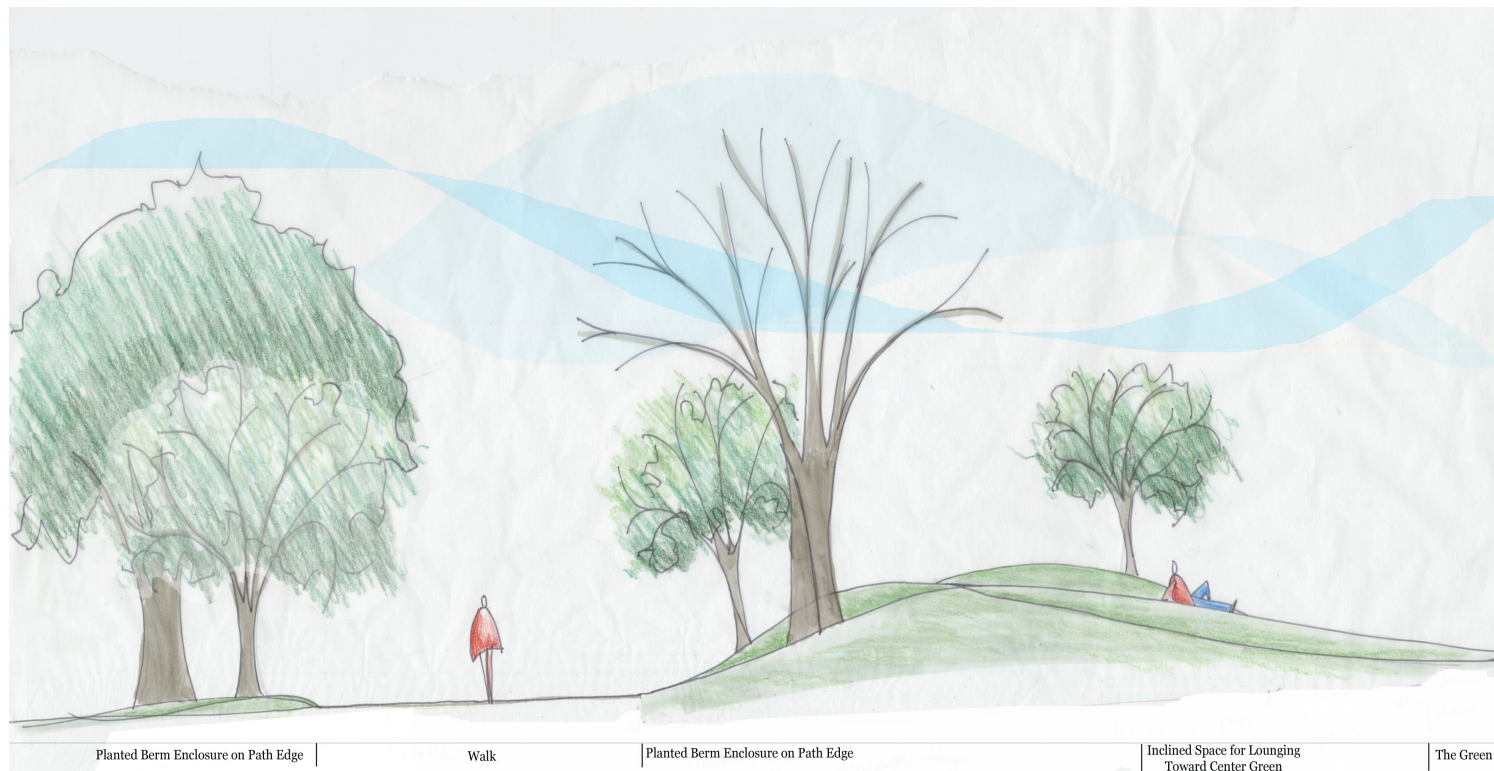


Illustration 10: Typical Circle Path Section

Part 5: Conclusions

Realistically automobiles will remain a transportation option. The goal should be to reduce our dependence on them. Hope exists because even in car only areas such as Seven Corners, the pedestrian still struggles to exist. Areas such as Old Town Alexandria, where automobiles have been retrofitted into the fabric have both pedestrians and automobiles with an equal representation. Interview a driver in Old Town, however, and you will probably find a majority do not enjoy the driving experience. Pedestrians and automobiles have a closer to a balance in Clarendon, Virginia. I believe the key to this area's success is the availability of parking within proximity of retail buildings. Parking is one feature that can turn an automobile into a pedestrian. Since most of us do not live in walkable communities, providing the opportunity for visitors to come and participate is a necessary strategy for successful multi-use.

Glen Carlyn is an excellent study for my theory on density and the pedestrian. First, it already has existing infrastructure such as, two schools with playing fields. Also there are the adjacent shared use trail and nature park along Four Mile Run. Within Glen Carlyn's historic core is a library, 7-11, community hall and residents with an active civic association. Finally, Carlin Springs Road, which dissects Glen Carlyn, is a high traffic commuter connector road. Clarendon and other successful multi-use areas in the area also have a high trafficked corridor running through it, Connecticut Ave, Wisconsin Ave etc.. Automobiles bring pedestrians to destinations and are an important part of the economic success of retail. Carlin Springs works as a commuter road and my goal is not to change that, but to utilize the already present user. In order to achieve a balance between the commuter and the pedestrian in this area, I propose

additional traffic signals, a total of three new signals.

By addressing pedestrian functionality through the incorporation of additional density into the established neighborhood of Glen Carlyn, I have aimed to facilitate a transition from the automobile to alternatives. As a result of the shared use trail on the eastern border, the high-rise buildings on the western and the mass-transit that runs on both Arlington Boulevard and Carlin Springs Road, the opportunities exist for my site as a pedestrian destination. In response to sprawl and the low-density created from it, retrofits such as this thesis introduce a possible answer just by considering the pedestrian first instead of the automobile.

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