Appendix B Transit Oriented Design Site Assessment

Overview

In late 2001 RTA, in conjunction with the Committee for Transit-Oriented Design (cTOD) commissioned the following study to document and communicate the existing conditions and land use characteristics within key transportation nodes and their surrounding environs. The study seeks to identify existing conditions and to make recommendations for potential redevelopment utilizing the fundamental principles embodied in Transit-Oriented Design (TOD) as expressed in the organization’s mission statement. Moreover, this study supplements the information in Chapter 5 on land use and joint development. The information herein seeks to foster joint-development interest and to educate citizens on the role of public transportation plays in the revitalization of our urban and built-up communities.

The accompanying station-area case studies emanated from discussions within cTOD and reflect the committee’s desire to identify those areas most amenable to revitalization through transit-oriented design. The case study format allowed for in-depth site analysis and resulted in succinct reports on conditions, resources, and constraints in each of the study areas. The case studies include TOD sites comprising stations on the existing rapid transit network, an important transfer node on two highly productive bus routes, and a site currently under study for station relocation.

The report begins with an analysis of the land use patterns surrounding the intersection of Mayfield Road and East 117th Street on Cleveland’s east-side. The area includes an abundance of housing and serves as a primary employment district, second only to the central business district in terms of employment density. The next area analyzed is the Madison Avenue and West 117th Street district. The area is on Cleveland’s west-side boundary abutting the community of Lakewood. The study area encompasses the West 117th Street Rapid Station, a variety of industrial employment sites, and residential neighborhoods in both Cleveland and Lakewood. The next station area analyzed is the West 65th Street Rapid Station. The study area focused on the intersection of Madison Avenue and West 65th Street and the area encompassed by a one-half mile buffer. The Detroit Shoreway Community Development Organization has commenced with redevelopment of the site with plans emulating the principles embodied in TOD. Moving east on the transit authority’s red line, one arrives at the West 25th Street rapid station and the site of the next area case study. As was the case at West 65th Street, the Market Square Historic District is undergoing extensive revitalization. Substantial reinvestment in the existing retailing and substantial loft conversions punctuates the revitalization initiatives. The final area analyzed is the intersection and accompanying land use mosaic at the intersection of Union Avenue and East 93rd Street. While the rapid transit does not service the area, this important node is situated at the convergence of two of GCRTA top producing bus routes (the “ten” and “fifteen”).\footnote{1}
Mayfield Road and East 117th Street

Overview of the TOD Site

The Mayfield Road and East 117th Street Transit-Oriented Development site is located within the University Statistical Planning Area on the city of Cleveland’s East Side. The eastern segment of the Greater Cleveland Regional Transit Authority’s (GCRTA) Red Line heavy rail bisects the buffer area. In addition, two prominent bus routes provide access to the TOD site. The “six” route skirts the buffer area along Euclid Avenue and averages more boardings than any other route in the GCRTA service network. The “nine” routes running along Mayfield Road provides express access to the Cleveland CBD and along the Mayfield Road business corridor in Cleveland Heights and points further east. The site is approximately five miles from the CBD along Euclid Avenue. Along the heavy rail corridor, however, the distance is approximately 6.25 miles. The heavy rail provides more rapid travel time to the CBD than the bus routes in typical peak-hour congestion along the Euclid Avenue corridor.

Existing Land Use

The land use mosaic encompassed within the 10-minute walk of the potential transit oriented development site at the intersection of East 117th Street and Mayfield Road comprises a diversity of housing options, employment destinations, and quasi-public institutions. Broadly, the University Hospital Complex and the Little Italy Historic District dominate the site physical development. The Greater Cleveland Regional Transit Authority and Consolidated Railway Corporation’s right-of-way bisects the buffer area. Furthermore, the right-of-way isolates the two primary land assemblages, both institutional and residential-commercial along a north-south axis.

The Little Italy Historic District, east of the railroad right-of-way, comprises approximately 900 of the 2775 housing units within the buffer zone. While much of the housing within the historic district is either single or two-family, multi-family apartment and dormitory-style housing predominate within the remainder of the buffer zone. For parcels identified and zoned for single or two-family homes, the average parcel size is approximately 6,100 square feet suggesting the existence of high-density multi-family housing. Indeed, the multi-family housing is rather dense with clusters scattered throughout the buffer zone. The multi-family units cluster in concentrations along Murray Hill Road and on the western boundary of Cleveland Heights where it abuts the City of Cleveland. Additional high density housing for the Case Western Reserve University occupies the northwestern quadrant of the buffer area. After aggregation, the calculated density is supportive of public transit investments based on the area’s twenty-five dwelling units per acre (net).

Commercial activity has coalesced in two distinct nodes of activity. At Mayfield Road and Euclid Avenue, retail storefronts line three sides of the intersection. The retailing facilities serve the convenience needs of University Hospital employees and students of the two academic institutions. Within the Little Italy Historic District, a multitude of retail and commercial establishments
has assembled and provides authentic cuisine and cultural artifacts. A niche market has emerged that recognizes the historical distinctiveness of the ethnic neighborhood.

Public and institutional holding predominate in the western hemisphere of the buffer zone. The primary institutional landowners include University Hospitals, Case Western Reserve University, the Cleveland Institute of Art, and the consortium, non-profit University Circle Incorporated. The institutional cluster is a primary regional employment center. Literally tens of thousands of work-based trips culminate in and around the university complex every day. Indeed, employers located within the statistical geography encompassing postal code 44106, employed approximately 38,000 employees, representing more than $1.7 billion dollars of potential market demand in 1999.iii Approximately sixty-five percent of these employees are within the buffer zone surrounding the intersection at Mayfield Road and East 117th Street.

The remainder of the site contains a combination of underutilized lots, surface parking, two large cemeteries, and a nominal amount of open-space. Approximately twenty-seven acres of the 502 acre buffer area are currently vacant or underutilized. The two large cemeteries encompass an additional 100 of the 502 gross acres contained within the one-half mile buffer area. Additionally, several light industrial firms operate in a confined precinct immediately east of the railroad right-of-way.

Street Network Coverage

The street network coverage permeates the buffer zone. The dense network of streets within one-quarter mile of the station area, accompanied by the axes created by Mayfield Road and Euclid Avenue result in tremendous buffer area pervasion. The resulting coverage area encompasses approximately sixty-two percent of the overall one-half mile buffer area. Additional infrastructure, within the quarter mile buffer, would facilitate additional permeation of the overall buffer zone. Increased access not only facilitates access, but also reduces peak-hour congestion by providing additional routes for navigating the gauntlet created by Mayfield Road.

The total lane mileage, as calculated by a single centerline measurement, is approximately 6.92 miles. The dense street network facilitates internal circulation and provides abundant access for the pedestrian to the employment destinations and retail-commercial establishments within the station area. Extensive surface parking lots interrupt the overall continuity of the urban environment surrounding the proposed transit-oriented development site. The availability of land, however, does present a suitable site for intensification of the existing residential and commercial facilities. Moreover, area non-profits already control much of the developable parcels.
East 117th St and Mayfield Rd TOD Site
Land Use and the 10 Minute Walk
Street Network Analysis of Internal Circulation Relative to the 1/2 Mile Buffer
Overview of the TOD Site

The Madison Avenue and West 117th Street TOD site is on the western boundary of Cleveland where it abuts the city of Lakewood. The buffer area intersects with three of the Cleveland City Planning Commission’s statistical planning areas; including Cudell, Jefferson, and Edgewater. The intersection is immediately north of the West 117th Street rapid transit station on the GCRTA Red Line with direct access to the Central Business District and Hopkins International Airport. In addition, the GCRTA has built 200 park and ride spaces at the rapid transit station to leverage the station’s propinquity to the I-90 interchange south of the location. In addition, three local, one express, and a community circulator line serve the station area along West 117th Street.

Existing Land Use

The land use pattern within the one-half mile buffer of the intersection of Madison Avenue and West 117th Street consists primarily of residential and industrial sites. The Regional Transit Authority and Consolidated Railway Corporation’s right-of-way functions as a barrier between the two land use types. The residential blocks north of Madison Avenue are within the municipal boundaries of the city of Lakewood and comprise a residential character typical of the communities’ suburban quality. Average lot size for the single and two-family homes is approximately 5,700 square feet resulting in moderate densities, particularly in the northwest quadrant of the buffer zone. Additionally, the Cuyahoga County Planning Commission’s documentation identified some 200 lots as multi-family housing. The multi-family housing does not interrupt the residential character of the place because zoning provisions have dispersed the structures throughout the neighborhood. The resulting high residential density of some twenty-two dwelling units per acre (net) is surprising given the extent of industrial and strip-retail development within the buffer area.

The industrial facilities south of Madison Avenue and north along West 117th Street include a variety of manufacturing and light industrial activities. The rapid station could potentially serve as a transportation alternative for the workers employed in the industries within walking of the stop. Transit boarding data, however, suggests that the station primarily serves as a park and ride facility. With over 200 dedicated park and ride spaces coupled with the station’s close proximity to I-90, the station draws extensive ridership from commuters arriving via I-90 and from the Lakewood. The close proximity of the expressway interchange for I-90 negates much of the potential locational incentive provided by the station’s proximity to the employment centers.

The buffer area comprises a variety of retail and commercial facilities. Little of the existing retail establishments directly support or orient towards the rapid transit station or the intersection at West 117th Street and Madison Avenue. Instead, substantial parking surrounds what little retailing that does exist at the intersection. In addition, a full-service automotive dealer encompasses a substantial portion of the intersection. Retail activities and marginal office space
predominate north along West 117th and upon the intersection with Detroit Avenue, approximately one-half mile north of Madison Avenue, form a clustered activity node.

The remainder of the buffer area includes an amalgamation of underutilized industrial sites, public utilities right-of-way, and railroad facilities. The potential brownfield status of the underutilized industrial sites adversely affects the redevelopment potential of much of the parcels south of Madison Avenue. In addition, the existence of continued industrial production, with affirmation from zoning codes, reduces any potential short-term transit-oriented revitalization south of the station area.

**Street Network Coverage**

The street network provides ample penetration throughout the one-half mile buffer zone. Indeed, the linear axes created by the intersection of West 117th Street and Madison Avenue provides substantial penetration in all direction. The lack of an extensive network of side streets paralleling Madison Avenue diminish the street network’s completion diffusion throughout the buffer area. Nevertheless, based on existing infrastructure, the street-network coverage area comprises approximately sixty-two percent of the buffer area’s surface area.

The total lane mileage, as calculated by a single centerline measurement, is approximately 7.3 miles. The street network provides ready access to the residential neighborhoods north of Madison Avenue. To the south, however, the street network serves primarily to link the industrial-manufacturing firms to the I-90 interchange. Moreover, the pedestrian environment south along West 117th Street is not amenable to walking or bicycling. Instead, automobiles and freight dominate the right-of-ways. The City of Cleveland, in conjunction with Lakewood and GCRTA, has undertaken street improvements in an attempt to rectify the identified shortcomings.
West 117th and Madison Ave Rapid Station
Land Use and the 10 Minute Walk
West 65th Street and Madison Avenue

Street Network Analysis of Internal Circulation Relative to the 1/2 Mile Buffer
Overview of TOD Site

The West 65th Street and Madison Avenue TOD site is in the midst of a profound revitalization process undertaken by the Detroit Shoreway Community Development Organization (DSCDO). The site is strategically positioned within the DSCDO sponsored Eco-Village demonstration project. The revitalization strategy seeks to unite the tenants of the new-urbanism with the ecological principles of sustainable development. The project’s goals include the revitalization of the adjacent rapid transit station, whose entrance is just feet from the intersection, and the creation of an urban village centered on an innovative housing development and revitalization strategy.

Existing Land Use

Single and two-family housing predominate in the land use mosaic surrounding the intersection of West 65th Street and Madison Avenue. Zoning codification has designated the vast majority of parcels within the buffer area as either single of two-family dwelling units. The homeowners have recognized this and the neighborhood generally retains this development pattern. In keeping with the neighborhood’s characteristic dwelling type, the Eco-Village plans call for the development of a combination of attached, single-family townhouses and detached, single-family homes. Additional land uses include the Lorain Avenue retail district and the expansive open-space and public facilities at the Zone Recreational Center directly south of the intersection on Lorain Avenue.

The pattern of residential development within the local street network around the TOD site consists of a combination of single-family detached, attached row houses, and scattered multi-family dwellings. The housing density within the neighborhood is relatively high at approximately eighteen dwelling units per acre (net). As in other urban neighborhoods, much of the occupied dwellings are renter occupied. The rental occupancy rate is roughly sixty-two percent with a vacancy rate approaching fifteen percent. Average parcel size for single and two-family homes provides further evidence of the neighborhood’s urban character and transit-supportive residential densities. Based on land use data acquired from the City Planning Commission, average parcel is approximately 4,000 square feet.

Aside from the public transit right-of-way, the remainder of the station area comprises a mixture of streetcar retail on Lorain and Detroit Avenue, dispersed neighborhood retail, light industrial, and institutional holdings. The buildings lining both Detroit and Lorain Avenues contain the majority of retailing activities in the neighborhood. While individual spaces are nominal in size, the density of buildings and sheer quantity of spaces suggest an amenity to leverage in the revitalization process. In all, the one-half mile buffer comprises approximately 500,000 square feet of retail space (gross). Revitalization initiatives along Lorain Avenue have recognized the need for improving the pedestrian environment and have catalyzed redevelopment of this important historic district. Indeed, the corridor now contains an important regional cluster of antique dealers and
retailers. Moreover, the individual shopkeepers have banded together and market the area collaboratively through the Lorain Antiques Association.

While the area’s history is inextricably tied to the initial industrialization of Cleveland, local economic restructuring has shifted industrial development outside the inner-city neighborhood. The remaining land zoned for and currently in use for light industry and manufacturing occupies the entire block of parcels immediately west of the TOD site along the northern side of Madison Avenue. The cluster of firms provides industrial employment for several hundred individuals. Additionally, a substantial corridor of industrial development exists south of the interstate right-of-way along the southern periphery of the station area. The corridor is not readily accessible because of the expansive right-of-way dedicated to the interstate. West 65th is the only north-south route that links to station area with parcels south of the right-of-way, but the distance is significant and the existing infrastructure does not promote pedestrian accessibility.

**Street Network Coverage**

The axis created by West 65th Street and Madison Avenue facilitates the through network permeation of the buffer area. Additionally, the dense network of local streets north of Lorain Avenue increase the overall internal connectivity of the station area. The increased connectivity improves local accessibility from residential neighborhoods to the rapid transit station east of the intersection. The resulting coverage area encompasses over fifty-seven percent of the total buffer area.

The total lane mileage, as calculated by a single centerline measurement, is approximately 10.56 miles. The nature of the street network results in the vast majority of lane mileage fostering internal circulation in the station area north of Lorain Avenue. Traveling south on West 65th Street, however, the density of infrastructure declines significantly because of the extensive right-of-way allocated for the interstate. Indeed, no east-west radials or local streets intersect with West 65th south of Lorain. This lack of connectivity severely compromises the accessibility of areas south of Lorain Avenue. Thus, without substantial reconfiguration of the existing infrastructure, public transit facilities within the buffer area will primarily depend on neighborhoods north of Lorain Avenue for ridership. Moreover, incentives should promote development within this constrained area until conditions emerge to promote the revitalization of areas south.
West 65th and Madison Ave Rapid Station
Land Use and the 10 Minute Walk
Street Network Analysis of Internal Circulation Relative to the 1/2 Mile Buffer

West 25th Street and Lorain Avenue
Overview of the TOD Site

The West 25th Street and Lorain Avenue TOD is centered in the Ohio City Statistical Planning Area just one mile west of the CBD on the GCRTA heavy rail line. The Ohio City Near West Development Corporation (OCNWDC) has played an instrumental role in the revitalization of the Ohio City neighborhood. While evidence of the organization’s work exists throughout the neighborhood, their focused redevelopment strategy at the intersection of West 25th Street and Lorain Avenue has bolstered ridership at the transportation facilities and bus routes by improving the pedestrian environment en route to the transit station and by catalyzing market-oriented revitalization. Indeed, the area immediately adjacent to the intersection has absorbed significant redevelopment in the past several years. In addition, current redevelopment initiatives will add significant residential space in the Fries and Schuele Co. Building at West 25th Street and Market Street. The study reports employment data derived from postal code 44113.

Existing Land Use

The land use mosaic bounding the intersection of West 25th Street and Lorain Avenue is the most heterogeneous of any of the transit-oriented development sites. A multitude of office, retail-commercial, residential, and industrial land uses engage one another at this strategic node in the near-west side neighborhood of Ohio City. The historic neighborhood maintains much of its original physical form. The recent history of the neighborhood has witnessed a renewed interest in area’s historical housing stock, rich urban amenities, and authentic market retailing at the West Side Market.

The buffer area comprises two large clusters of residential development to the north and south of Lorain Avenue. Most of the housing units within these two clusters are either single or two-family detached homes. The average parcel size of only 3,200 square feet provides insight into the timeframe of the residential development of Ohio City. Indeed, many of the homes are historically significant and retain the vernacular trappings of their late 19th-early 20th Century vintage. Throughout the past several years, renewed investor and homeowner interest has manifested itself in substantial private and public sector reinvestment. These investments have galvanized the neighborhood and stabilized the housing stock. In addition, a smaller cluster of detached housing occupies parcels east of the intersection among the cross-blocks south of Lorain Avenue.

The land development process has also produced significant multi-family apartment buildings and has subdivided detached housing throughout the area to the north and west of Lorain Avenue and West 25th Street. In addition, an assisted-living facility occupies a prominent site along West 25th Street and abutting the bluffs overlooking the Cuyahoga River. The facility and the apartment building immediately north provide a high residential density conducive to public transit ridership. The resulting residential density within the one-half mile buffer is over twenty-six dwelling units per acre (net). While the neighborhood has undergone substantial reinvestment, the rental occupancy rate
remains high at over sixty-seven percent. Moreover, the buffer area’s vacancy rate is unusually high at roughly twenty-two percent.\textsuperscript{vii}

The Market Square Historic District, which encompasses the TOD site, functions as an important specialty-retail destination for much of metropolitan Cleveland. The West Side Market anchors the cluster and provides approximately 30,000 square feet (gross) of retail space to a variety of local vendors and produce distributors. On the adjacent corner, a neighborhood commercial plaza contains an additional 26,500 square feet (gross) of retail space. Additional retailing occupies space in buildings on both sides of street west of the intersection. In sum, the immediate parcels contiguous to the intersection at Lorain and West 25\textsuperscript{th} comprise approximately 70,000 square feet (gross) of retail-commercial space. Moreover, the extensive revitalization and streetscape investments undertaken by the OCNWDC has improved and reconnected the pedestrian environment with the West 25\textsuperscript{th} Street Rapid Station. Thus, this retail destination helps to bolster in-bound transit boardings.

The bulk of the office space within the Lorain-West 25\textsuperscript{th} Street buffer area occupies prominent space immediately adjacent to the intersection. The largest space resides at the southwestern corner of the intersection. The former savings and loans building fronts on both Lorain Avenue and West 25\textsuperscript{th} Street with a footprint of approximately 26,600 square feet (gross) in Class B office space. Redevelopment of several building along Market Street has revitalized additional office space that co-mingles with the retail-commercial space within the area.

**Street Network Coverage**

The West 25\textsuperscript{th} street buffer area allows for an interesting comparative analysis of the disparities inherent in typical public infrastructure alignment. To the east of the intersection, the street network is rather anemic, with Lorain Avenue providing nominal linear penetration. West of the intersection, the street network adheres to the traditional gridiron pattern. The resulting density of the street network provides the ideal combination of access and integration to facilitate choice in mobility decisions. Moreover, the gridiron street pattern fosters higher residential density by allowing for substantial parcel subdivision.

The total lane mileage, as calculated by a single centerline measurement, is approximately 11.45 miles. The street network west of the TOD site accounts for the vast majority of this density. Clearly, the traditional gridiron represents the eminent street alignment for dense development and efficient internal circulation. Improvements in the street network, coupled with increased parcel subdivision east of Lorain Avenue would facilitate increased residential development in the underutilized areas.
West 25th and Lorain Ave Rapid Station
Land Use and the 10 Minute Walk
Street Network Analysis of Internal Circulation Relative to the 1/2 Mile Buffer

Coverage Area Buffer
66.7 Percent Permeation

- Quarter Mile
- Half Mile

r
Overview of TOD Site

The Union Avenue and East 93rd Street TOD is located southeast of the CBD at the juncture of the Lee-Miles and Kinsman Statistical Planning Areas. Two of the top ten performing bus routes in the GCRTA service network, (the “ten” and the “fifteen,”) intersect at this strategic transit node. Bus service emanating from the intersection provides access to express service on Broadway Avenue and north via the Shaker Rapid Transit via the Woodhill rapid station to the CBD. Public transportation plays a particularly significant role in the southeast neighborhoods in light of the corridor’s lacking of direct highway access to the central business district.

Existing Land Use

The two primary land uses within the buffer area are residential and light industrial. The land development process and zoning codification have segregated the two land uses to a great extent. The dense street-network surrounding the intersection of Union Avenue and East 93rd Street has promoted accessibility and access through the area for residents and workers at the industrial facilities. The buffer area also encompasses a retail cluster at the intersection of Union and East 93rd and additional commercial activities along both Union Avenue and East 93rd Street. The land use pattern along both Union Avenue and East 93rd Street is evidence of each street’s transportation function as primary arterials for the southeastern community areas. In addition to retail-commercial activities, the buffer area comprises an unusually dense concentration of religious and institutional facilities.

Residential development predominates in approximately two-thirds of the buffer area surrounding the intersection of Union Avenue and East 93rd Street. The development pattern primarily consists of single and two-family detached housing oriented towards the side streets east and north of the intersection. The buffer area comprises approximately 2,100 housing units. Over sixty-six percent of the existing housing units are single-family detached. With the majority of the remainder being two-family dwellings. The resulting density is supportive of public transit with an estimated 11.46 dwelling units per acre (net). The average parcel size is approximately 4,900 square feet suggesting the neighborhood exudes an urbane character. Indeed, the majority of the occupied housing units are renter-occupied at roughly fifty-three percent according to 2000 census data.

The land use pattern along Union Avenue and East 93rd Street, (both of which are arterial streets) has developed an amalgamation of retail-commercial, office, and institutional land uses. Where the two arterials intersect, an auto-oriented retail cluster has emerged. Retail establishes anchor all four corners; however, each is setback from the street and possesses an abundance of surface parking. Thus, on the accompanying land use maps, much of the underutilized space immediately adjacent to the TOD site is currently surface parking or patchwork open-space. Attempts at revitalization along the corridors
should include clustered multi-family housing to integrate a greater variety of dwelling types and to combat the potential of tenure transfer to accommodate the demand for rental housing near the TOD site.

**Street Network Coverage**

The street network surrounding the intersection of Union Avenue and East 93rd Streets is a semi-grid pattern. Most of the local street intersect East 93rd and run perpendicular to Union Avenue. With minor exceptions, most local streets accommodate neighborhood traffic through direct linkages to East 93rd Street. Thus, average block lengths are longer, than expected in the prototypical gridiron pattern. Indeed, the resulting reduction in connectivity affects the extent of street network coverage and reduces alternative routing throughout the neighborhood. Indeed, the lack of connectivity, particularly in the northeastern quadrant, diminishes the overall coverage area and reduces choice in accessibility. Nevertheless, the estimated coverage area is satisfactory at approximately sixty-three percent.

The total lane mileage, as calculated by a single centerline measurement, is approximately 9.24 miles. Again, the lower than expected lane mileage emanates directly from the nominal cross-street connectivity in the neighborhood. The street network does provide through coverage linearly from the intersection. The station area is one of the few, which possesses radials that extent to the periphery of the one-half mile buffer area. Thus, the TOD site is accessible, however, because the area is not directly accessible to the central business district, the area functions more as a transfer point than a direct regional gateway.
Street Network Analysis of Internal Circulation Relative to the 1/2 Mile Buffer
References:

i Bus Route Performance 2000 (May 2001) Research Section Marketing and Communication Department, Greater Cleveland Regional Transit Authority.

ii Bus Route Performance 2000 (May 2001) GCRTA.


iv Data Calculated from the City of Cleveland Planning Commission GIS parcel file.

v Ridership and “Park and Ride” data acquired from the Systems Planning Division of GCRTA.

vi Figure is an estimation based on 1990 Transportation Analysis Zone Data and 1999 Zip Code Business Patterns obtained from the US Census Bureau and NOACA.


viii Bus Route Performance 2000 (May 2001) GCRTA.


xi Data Calculated from the City of Cleveland Planning Commission GIS parcel file.
Notes:

1. The analysis of land use within station areas is accurate to the extent that the GIS database created by the Cleveland City Planning Commission accurately identified the existing land uses. Where applicable, I have made corrections to erroneously classified parcels through on-site investigation and aerial photographic analysis. The correction process was not exhaustive. Rather, the intent of the land use maps is documentation of existing conditions.

2. The conceptual framework and methodology employed in estimating the street network coverage requires explication. The technique acknowledges inaccuracy of the simple buffer methodology and attempts to model the area accessible based on the pedestrian’s primary means of access (i.e., the existing public right-of-way, causeways, sidewalks, et cetera). When accompanied by appropriate data sources, a Geographic Information Systems (GIS) software package facilitates this analysis. The primary data needs are an updated street file, current aerial photographs, and qualitative site assessments to determine the overall extent of pedestrian access routes. Moving forward, the analyst must overlay the improved network file onto the system of transit stops (transit stops need not be exhaustive, one only needs those stops intended for analysis) and confirm accurate alignment. Finally, using the Network Analysis Extension for Arc View/GIS software, the analyst performs an open-ended service area analysis. The analytic function measures outward from the desired node, (a node in GIS terminology refers to the intersection of two line segments) and calculates distances to each node linked via one line segment. The function repeats the process at each additionally node until the aggregated distance exceeds that distance specified by the analyst. The function, while intended to automate the Clapp Model service area, adequately quantifies the approximate one-half mile walk. In addition, the function overlays a polygon linking each hanging-node to form the service coverage area. A simple calculation comparing the overall area of the one-half mile buffer (c. 501.7 acres) to that area encompassed in the overlain polygon provides the percent coverage area calculation.