Abstract:-
This paper will examine how street typology impacts urban form. Street pattern is the most enduring element in urban form. Buildings and land uses altered more frequently than streets are changed or relocated. This is due to fact that streets are a capital asset not lightly set aside and the difficulties in implementing large scale change. This paper will examine four neighborhood clusters in the Northeast Development Area of Baltimore and how street pattern shapes their form.

Key-Words: - street typology, walk-ability, urban morphology, transit modes, building structure

1. Introduction

The morphological dimension of urban design encompasses layout and configuration of urban form and space. A study of morphology helps urban designers understand local development patterns and processes of change. Morphology is derived from several key elements. These include land use, building structure, lot and street pattern, and street type [1].

2. Methodology

The case study area consists of four distinct neighborhood clusters in Northeast Baltimore with unique architectural, land use and neighborhood character. The following elements which are directly related to urban form and space will be analyzed to define neighborhood character for each community:

- Street pattern

  This element includes evaluation of local, collector, and arterial street patterns, and capacity of the street network; rights of way; and access and connections.

  o Local streets are most mostly residential in use. They are also often narrower in width to collector and arterial streets.

  o Collector streets usually run perpendicular to local streets and take the traffic from local streets and lead to
arterial streets. They can be residential, commercial or institutional in use.

- Arterial streets can be minor or major. Minor arterials can be institutional or commercial that collects traffic and directs it through a community. Major arterials are usually major roadways such as freeways or interstates.

- Scale and Density

Scale is the qualitative measure of the relative height, and massing of buildings and spaces. Density is a quantitative measure of the number of units on a particular area of land, often measured as number of people, housing units, amount of square feet of development per land area.

- Walk-ability

Walk-ability includes the appropriate mix of activity and land use, the connectivity of streets and sidewalks, the appropriateness of scale, and the inclusion of place making factors such as vegetation and site furnishings[2].

- Architecture

Building height and massing, compatibility, style and period of architecture is key to a architectural assessment of the community[3]. Street typology and architecture interrelate as they impact urban morphology. The ratio of building wall to street width can make an area feel more or less enclosed. Low walls in relation to width do not sufficiently provided a sense of enclosed space. Wall heights equal to street width provides a strong sense of enclosure. Wall heights that exceed street width may provide too much enclosure. [1]

- Transit modes and services

This includes evaluating street networks, traffic volumes, parking locations and transit routes and stops.

3. Cluster Analysis

3.1 Northwood Cluster

3.1.1 Streetscape Patterns

Northwood is composed mainly of local residential streets that run into 4 major collectors, Woodbourne Avenue, Coldspring Lane, Argonne Drive and 33rd Street which run east and west; and 3 arterials, Loch Raven Boulevard, Hillen Road, and the Alameda, which run north and south.

3.1.2 Scale and Density

Located in the northeast section of Baltimore, Northwood is a composed of several communities. These include New Northwood, Original Northwood, Ednor Gardens-Lakeside, Perring Loch, Stone-Pentwood Winston, and the Hillen communities. These communities are composed of both single family and town homes giving Northwood variety in scale and density. Northwood has multiple grade changes ranging in some areas from 0 to 9 feet. Even with the varying topography and housing patterns, the neighborhood still has a unified environmental and community presence through it use of human scale, and proportions in site and building design.
3.1.3 Walk-ability

There is mix of land uses in this community although it is primarily residential. There are three community retail outlets including the Northwood Shopping Center and several institutional facilities including churches and schools. The retail plazas are designed for shoppers to arrive via car rather than walking. The store fronts are distanced from the street by parking lots that have limited accommodations for pedestrians. Morgan State University forms the eastern boundary of this community. All of the streets have sidewalks and are linked to each other and important parts of the community creating ease of mobility an access if one chooses to walk. The row homes in the neighborhood and the limited spacing between detached homes also offer a sense of connectivity and walk-ability to the neighborhood. Less than a third of the Northwood cluster is within walking distance of a retail shopping center. This is based on a distance of 1320’ (1/4 mile) measured out radically form the center of the zoned commercial district. This is the distance that the average pedestrian can walk in five minutes at a reasonable pace. Larger retail centers that offer groceries and basic goods and services are indicated as commercial nodes.

Figure 1 Streetscape Typology in the Northwood Cluster

3.1.4 Architecture

There are both row and detached homes located in Northwood. New Northwood is composed of new homes built in the mid 1950’s. The Hillen community is similar to New Northwood in housing type and design. Original Northwood is composed of single family town houses built in the 1930s. The initial development took on a New England residential theme of half timbering and stucco, with an irregular type of massing (see figure 6). One of the first planned communities in the United States, Original Northwood has historic designation and contains the largest unified collection of buildings from the architect John A. Ahlers. Ahlers incorporated the natural topography into his work. Most homes in the Northwood neighborhood have some form of stairs, ramps
or combination to deal with change of grade that is characteristic of the rolling topography on site.

3.1.5 Transit modes and services

The most prevalent of mode of travel in the Northwood neighborhood is by automobile. There is on-street parking on most local streets, and most homes have rear parking pads or garages which are accessible by the rear alley. There is bus transit on the major collectors and arterials, and bus stops, often with covered shelters, are provided. The #3, 33, and 36 are the major bus lines that travel through the Northwood Cluster. East-west service is provided by the #33 bus line on Cold Spring Lane. The #3 bus line on Loch Raven Boulevard and the #36 bus line running on Ellerslie Avenue to Argonne Drive and The Alameda are major north-south routes. The Baltimore Bike Master Plan indicates that Woodbourne Avenue, Winston Avenue, Argonne Drive and 33rd Street are designated bike routes.

3.2 Greater Govans Cluster

3.2.1 Scale and Density

The Greater Govans cluster is composed of the Woodbourne-McCabe, Winston-Govans, Kenilworth Park, Richnor Springs, Wilson Park, Pen Lucy and Waverly Neighborhoods. It is a very diverse cluster in regards to scale and density. There has been some population decline in this cluster [3]. The neighborhoods of Woodbourne-McCabe, Winston-Govans, Wilson Park and Penn Lucy have substantial vacancy rates which affects future density in these areas.

3.2.2 Walk-ability

The neighborhoods in the Greater Govans cluster take on the traditional pattern of an outer urban area. The residential and commercial zones are generally separated and there are not many mixed use structures. Most of the general commercial land use is located along York Road, an arterial which acts as the western boundary of the cluster. Therefore for some neighborhoods walking to retail and business services is easy and convenient, but for others more toward the east is may be easier to walk to services in the adjacent cluster. There are sidewalks and crosswalks on most of the streets which makes traveling by foot fairly easy. Most of the residential streets have a good tree canopy which makes walking pleasant. Much of York Road is zoned commercial; however there are only 2 retail centers with grocery stores.
3.2.3 Streetscape Patterns

The cluster is bounded by Woodbourne Avenue, The Alameda, Argonne Drive, Ellerslie Avenue, 33rd Street, and Greenmount Avenue and York Road. The cluster is a mixture of long and short blocks and streets. Some of the local streets in the cluster are not through streets, but most of the through streets run into 4 east-west collectors which include Coldspring Lane, 43rd Street, Argonne Drive, Woodbourne Avenue and 33rd Street and one north-south collector Midwood Avenue. The collectors lead to the Alameda Boulevard and York Road which are arterials. Within this cluster, Woodbourne Avenue, Winston Avenue, Argonne Drive and 33rd Street are designated bus routes.

3.2.4 Architecture

This cluster is composed an eclectic and historic mix of architecture. There are 19th century and turn of the century duplexes, large scale single family frame houses, and row homes built at various times. There is a variety of construction material observed including brick and stone and stucco detached and semi detached homes. The detached frame houses and duplexes in the area date from the 1870's to the 1910s. The Victorian cottages in the Penn Lucy Neighborhood were built in this period. Some of the row homes in the cluster were built in 1910s and 1920s by the West Construction Company. Other row homes were built in the 1930s and 1940s. As early as 1917, Harry Wilson, an African American, started building houses and developed Wilson Park, one of the first African American suburban neighborhoods. Pen Lucy and Wilson Park are two neighborhoods in the cluster that were built with smaller gabled-end housing. Many of these housed were decorated with shiplap siding, finials, scroll-sawn brackets, cedar-shake shingles, barge-board, and porch fronts. These neighborhood were initially considered part of Waverly, but formed their own identities by the 1920s. The neighborhoods in the Greater Govans cluster are both culturally and architecturally significant. There is also historical religious architecture in the cluster including Boundary Avenue Methodist Episcopal Church (circa 1902), and the Roman Catholic Church of the Blessed Sacrament (1921).

3.2.5 Transit modes and services

Although, as in the Northwood, many residents travel via automobile, there is ample bus service in the Greater Govans cluster. Buses # 8 and #12 provide service along York Road between Woodbourne Avenue and 33rd street and beyond. Bus # 36 travels along the Alameda, the eastern edge of the cluster, also between 33rd Street and Woodbourne Avenue. East-west service is provided by # 3 bus line which travels along 33rd Street, the Southern boundary of the cluster, and the # 33 bus line which traverses Coldspring Lane. There is light rail service to the west of cluster which can be connected to by buses #33, #8 and #3.

3.2.6 Open space

There is an abundance of vegetative areas in this the Greater Govans cluster. Green areas scatter from Woodbourne Avenue southward to 33rd Street. There also several neighborhood parks which include structured amenities. These include Alhambra Park located in the Woodbourne-McCabe Neighborhood; Kimberleigh Road Park located in the Kenilworth Park neighborhood which has a playground; Willow Avenue Park which includes a playground, wading pool, and two picnic pavilions in the Wilson Park neighborhood; Mullan Park in the Penn Lucy neighborhood which includes passive seating, a fenced playground, and basketball court; and Chestnut Hill Park which has seating and is in Waverly. Two public schools in this cluster offer additional athletic file space.
3.3 Loch Raven Cluster

3.3.1 Scale and Density

The neighborhoods in the Loch Raven Cluster include Idlewood, Glen Oaks, Ramblewood, Loch Raven and Woodbourne Heights. The majority of Loch Raven cluster is comprised of row homes. There is a small amount of low density single family development at the northwest boundary of the cluster and along Loch Raven Blvd between Belvedere and Northern Parkway. There is also a small quantity of high-rise development along Loch Raven at the Northern boundary of the cluster.

3.3.2 Walk-ability

There is a diverse mix of uses within the Loch Raven cluster. This includes residential, retail, institutional (the Good Samaritan Hospital), and recreational uses. This mix of uses increases access and walk-ability. The streets within the cluster have sidewalks and most have street trees.

3.3.3 Streetscape Patterns

The Loch Raven Cluster has two major collectors. Loch Raven Blvd. travels north-south through the cluster and Northern Parkway takes the traffic east-west. Belvedere is a minor collector also taking traffic east-west. The cluster mainly has a pattern of local through streets that lead to collectors. There are only a few areas, mostly those with garden apartments, where the streets taking on a more curving suburban pattern.

3.3.4 Architecture

Loch Raven is a predominantly residential neighborhood with houses that range from middle class to lower income. Most of the houses in the cluster are brick row homes built in the 1950’s.

3.3.5 Transit modes and services

The Loch Raven cluster has substantial mass transit with 3 bus lines. The #36 bus travels along the Alameda from Northwood Drive near Woodbourne Avenue to Northern Parkway through the cluster. The #3 bus travels along Loch Raven Blvd from the northernmost boundary of the cluster southward eventually crossing Woodbourne Avenue the southern end of the cluster. The #44 bus line runs along Belvedere Avenue crossing both the Alameda and Loch Raven Boulevard.

3.4 Chinquapin Park-Belvedere

3.4.1 Scale and Density

The Lake Walker, Chinquapin Park-Belvedere, Mid Govans, and Cameron Village neighborhoods are located in the Chinquapin Park-Belvedere cluster. The majority of
apartments at the northern boundary of the cluster. There is also a very small amount of high-rise development located along York Road at the northern-west side of the cluster. Unlike the Greater Govans cluster this cluster has low abandonment and vacancy rates and maintained a consistency in population and density[4].

3.4.2 Walk-ability

The neighborhoods in the cluster have convenient distance between commercial and residential. The commercial areas of York Road and Belvedere Square are in easy walking distance from most neighborhoods in the cluster. The mix of uses in the commercial zones including retail, restaurant, office, institutional, and auto related businesses adds to the level of activity on the street and the walk-ability of the neighborhood. Most streets have sidewalks and tree cover making walking pleasant.

3.4.3 Streetscape Patterns

The cluster is located adjacent to a major north-south corridor and arterial of York Road. This provides for significant vehicular traffic. Three major east-west collectors run into York Road. These include Lake Avenue, Belvedere Avenue, and Woodbourne Avenue. Northern Parkway is the major east-west arterial. The Chinquapin Park- Belvedere cluster is designed with a more curving, irregular pattern, and conforms less to a gridded system of blocks and streets than some of the neighborhoods in the other clusters.

3.4.4 Architecture

During the 1890’s with the advent of the electric streetcar, housing began to cater to suburbanites. Houses in the area were designed in an eclectic fashion and located in a short distance to York Road the main transit and commercial corridor of the time. Four squares, Queen-Anne Cottages, and homes, found in this cluster, were built between 1920s and 1940s. Colonial revival farmhouses were built within a short on generous lots. Smaller gabled-end houses and duplexes were built for the working class.

3.4.5 Transit modes and services

There are several bus lines that travel through the cluster. These buses have a heavy rider-ship. These include the #8, #12, #44, and #36. The #8 bus line runs north-south along York Road. East-west service is provided by the # 44 on Belvedere Avenue. The #36 provides local
service along the Alameda. The access to the light rail can be gained via the #8 bus line.

4. Findings

Streets are an important element in any community. Urban morphology can have a significant effect on how people perceive and interact with their community. When streets well designed and accessible, people are more likely to walk which can help reduced automobile traffic, improve public health, stimulate local economic activity, and attract new residents and visitors to the community [1]. Streetscape design can not only reduce traffic but it can create more diverse transportation systems and accessible communities by improving non-motorized travel conditions, creating more attractive urban environments, integrating special design features such as right of way improvements, traffic calming and road space reallocation, and linking the neighborhood to surrounding development [5]. Street typology can have the following effects on urban form:

1. Improving and preserving the neighborhood image

2. Creating environments that promotes safe pedestrian activity.

3. Creating safe, secure pedestrian connections from residences to sidewalk to car, between buildings, and between the residential areas and surrounding commercial, recreational and institutional amenities.

4. Creating a sense of place by encouraging pedestrian activity, and creating exterior spaces where people can interact.

5. Enhancing the pedestrian experience by improving visual quality.

6. Enhancing the neighborhood character especially around residential and historic properties.

5. Conclusion

The neighborhoods examined, although developed before the concept of new urbanism became in vogue, demonstrate many of its principals. The main focus of this concept is that the built environment can create a sense of community and that a sense of community will follow or conform to the physical form of a neighborhood. As demonstrated by the case study, physical form of a neighborhood is mostly shaped by street typology. Street typology affects architecture, scale and density, walkability, transit modes, and streetscape pattern of the urban environment. It is important for engineers and planners to have an understanding of this concept and they plan and design urban infrastructure.
References:


[10] The Coldstream Homestead Montebello Community Area Master Plan, April 20,