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A Socioeconomic, Community-Based Approach for Developing an Integrated Mass Transit System for Baltimore City

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16. Abstract

This project addresses the possibility of expanding Baltimore's light rail network and improving its integration with the metro line and bus system. The goal of such a network should be not only to transport people from point A to point B, but also to make the city a more attractive (convenient, economical, and cleaner) place to live. This network could help to keep employers in the city by alleviating parking shortages and traffic congestion. Also, the light rail system could make it easier for low-income city residents to commute to outlying growth areas, thus increasing opportunities to access better-paying jobs. This research could be aligned with the State of Maryland's *Smart Growth* mandate by encouraging people to live in and near the existing urban center and reduce their highway commuting.

This study reexamines previous mass transit plans for Baltimore and reviews the experience of other North American cities that have implemented (or are in the process of constructing) light rail systems. The role of the light rail system (e.g., to serve as a suburb-to-downtown connector for commuters vs. a within city network) is also examined. The study investigates the importance of corridor and station design as essential elements of "placemaking" that could help to promote transit-centered community development. The study also develops design criteria that addresses sociocultural issues inherent to underserved areas of the city.

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TABLE OF CONTENTS

List of Tables

List of Figures

List of Photographs

ABSTRACT

The City of Baltimore is currently served by one "heavy" rail line (the Metro) and one "light" rail line (Central Light Rail line), in addition to commuter rail service (MARC train) connecting to Washington, D.C. However, the Metro and Central Light Rail lines do not share any common stations and do not function as a network. Compared with cities such as Boston and Washington, D.C., Baltimore's rail transit is underdeveloped and no additional light rail or Metro lines are currently planned.

This research addressed the possibility of expanding Baltimore's light rail network and improving its integration with the Metro line and bus system. The goal of such a network should be not only to transport people from point A to point B, but also to make the city a more attractive (convenient, economical, and cleaner) place to live. It could help to keep employers in the city by alleviating parking shortages and traffic congestion. It also could make it easier for low-income city residents to commute to outlying employment centers, hence increasing opportunities for better paying jobs. The research was aligned with the State of Maryland's *Smart Growth* mandate by encouraging people to live in and near the existing urban center and reduce their highway commuting.

The research re-examined previous mass transit plans for Baltimore, as well as reviewed the experience of other North American cities that have implemented (or are in the process of constructing) light rail systems. The research addressed issues such as the role of light rail (e.g., to serve as a suburb-to-downtown connector for commuters vs. a within-city network). The study also addressed the importance of corridor and station design as essential elements of "placemaking" that could help to promote transit-centered community development. In addition to the more physical aspects of transit location decisions, the study developed urban design criteria that address sociocultural issues inherent to most underserved areas of Baltimore City. An underlying outcome of this research was to enhance or improve the personal mobility of a wider range of citizens in Baltimore so that their employment choices are not limited by an underdeveloped transit system. This outcome was addressed in the context of the ISTEA, TEA-21, and Livable Communities Initiatives.

The primary objective of the research was to evaluate ways in which the existing Baltimore City Metro/light rail system can be improved to be more integrated and to promote community well being, environmental quality and economic prosperity for all socioeconomic and racial/cultural groups.

INTRODUCTION

Transportation planning issues impact everyday life for urban dwellers. The popularity of the automobile and the inefficiency of other modes of transportation have left our cities with a major dilemma: build more roads to accommodate the growing number of private cars or create public transit alternatives that relieve congestion and provide greater access to a wider range of city inhabitants.

Transportation strategies are often seen as a way to alleviate broader social issues such as employment, housing, and social services (Rosenbloom and Black, 2000). Access is a key component in these strategies. Simply put, people must be able to get to better paying jobs, higher quality and more affordable housing, and quality social services. Overall, transportation, specifically access and mobility, is a major factor influencing quality of life.

Background to Problem

The City of Baltimore is currently served by one "heavy" rail line (the Metro) and one "light" rail line (Central Light Rail line), in addition to commuter rail service (MARC train) connecting to Washington, D.C. The Metro extends from Owings Mills, northwest of Baltimore, to downtown (Charles Center), and then northeast to the Johns Hopkins Hospital complex. The light rail line runs north-south from Hunt Valley to Cromwell, with extensions to Penn Station and the Baltimore-Washington International Airport (see figure 1).

The Metro and Central Light Rail lines do not share any common stations and do not function as a network. Compared with cities such as Boston and Washington, D.C., Baltimore's rail transit is underdeveloped. This unfortunate situation does not reflect a shortage of ideas. Mass transit plans prepared for Baltimore in the mid-1960s envisioned a rail transit system (subway) consisting of a "downtown loop" with northwest and northeast lines (MTA, 1965). Ultimately, the plan was to extend this system by the addition of several radial lines. However, only the northwest line was actually built (becoming the Metro). No additional light rail or Metro lines are currently planned. The only ongoing project is double-tracking portions of the Central Light Rail line, which will allow trains to run more frequently. The combined Baltimore transit system provides limited services to a wide range of residents—many socioeconomic groups are ill-served due to inadequate or nonexistent linkages to their neighborhoods.

This study addressed the possibility of expanding Baltimore's light rail network and improving its integration with the Metro line and bus system. The goal of such a network should be not only to transport people from point A to point B, but to make the city a more attractive (convenient, economical, and cleaner) place to live. It could help to keep employers in the city by alleviating parking shortages and traffic congestion. It also could make it easier for low-income city residents to commute to outlying employment centers, hence increasing opportunities to better paying jobs. The research was aligned with the State of Maryland's Smart Growth mandate by encouraging people to live in and near the existing urban center and reduce their highway commuting.

Figure 1. Map of the Baltimore Metropolitan Region's Transit System.

The research re-examined previous mass transit plans for Baltimore, as well as reviewed the experience of other North American cities that have implemented (or are in the process of constructing) light rail systems. The study focused on light rail as a clean, quiet, fast, and efficient mode of urban transportation that is likely to attract a diverse ridership. The research addressed issues such as the role of light rail (e.g., to serve as a suburb-to-downtown connector for commuters vs. a within-city network) and the use of transit-oriented development (TOD) principles to stimulate economic development activity. The importance of corridor and station design as essential elements of "placemaking" could help to promote transit-centered community development such as that proposed by Calthorpe (1993). In addition to the more physical aspects of transit location decisions, the study developed urban design criteria that address sociocultural issues inherent to most underserved areas of Baltimore City. An underlying outcome of this research was to enhance or improve the personal mobility of a wider range of citizens in Baltimore so that their employment choices are not limited by an underdeveloped transit system. This outcome was addressed in the context of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Transportation Equity Act for the 21st Century (TEA-21), and Livable Communities Initiative (LCI).

Purpose of the Research

The purpose of the research was to evaluate ways in which the existing Baltimore City Metro/light rail system can be improved to be more integrated and to promote community well being, environmental quality, and economic prosperity for all socioeconomic and racial/cultural groups. The research was approached not from the perspective of the availability or feasibility of one location to another in terms of cost and efficiency. Rather, the selection of potential routes was based on the ability of the network to impact a greater number and more diverse socioeconomic groups. The research places the needs of the community first in hopes of providing better access to jobs and economic opportunities.

Objectives:

- To evaluate the feasibility of surface (light rail) routes in Baltimore City that would connect existing Metro and light rail lines;
- To analyze neighborhood characteristics (i.e., physical, social, economic) and factors that are associated with the location of the existing transit system;
- To plan and design one or more of the proposed light rail line corridors; and
- To design one or more "workable" connections between existing proximal Metro, MARC, and light rail stops.

BALTIMORE'S TRANSPORTATION HISTORY

Baltimore, like many cities, originated before the automobile and was essentially a city whose residents walked to work, walked to recreate, and spent the day taking a horse out to the country. Eventually, a horse drawn system of transportation began that moved people within and out of the city. The electric cable car, which stretched from Camden Yards to Druid Hill Park, took over. A system of trolley cars, which had individual electric motors and an extensive system of cable lines all powered by one power plant, soon followed. The trolley car lines ran radially out of the inner city to the expanding city limits, which made trolleys an efficient and convenient way to travel.

A major event in the 1920s and 1930s brought changes to Baltimore's transportation system—the invention of the gasoline powered bus proved to be far superior to the current trolley system. An advantage of the network of buses was that they could connect to areas of the city that could not be navigated by trolley. Buses proved to be a cheaper alternate to the trolley system because the bus was self-sufficient and did not need an infrastructure to support it.

The reason for the decline of the trolley system is unclear but some of its influences are known. Some argue that the influence of General Motors Co. over other tire companies and with government officials had something to do with the decline of the trolleys (Hall, 2001). Others would agree that the public was ready to move away from trolley systems altogether. The revisionist movement towards the bus and car was something that was seen as better, modern, and heading in the right direction.

The latter part of the 20th century saw an increase in Baltimore's population and a subsequent increase in automobile ownership and usage—a critical situation that challenged the city's streets and transportation network. By 1960, Baltimore was the sixth largest city in the United States. The population of the metropolitan area exceeded one million people. The need for express transportation was considered urgent. In the early 1960s, a study was commissioned to evaluate the transportation needs of the city and propose a new system that would alleviate the congestion and provide for increased mobility. This study concerned transit requirements through 1985 for Baltimore City and the Metropolitan Region (comprised of Anne Arundel, Baltimore, Carroll, Harford, and Howard counties). The Housing Act of 1954 (Section 701) provided assistance in development coordinated planning for transportation.

Mass transit plans prepared for Baltimore in the mid-1960s envisioned a rail transit system (subway) consisting of a "downtown loop" with northwest and northeast lines (MTA, 1965). Ultimately, the plan was to extend this system by the addition of several radial lines. However, only the northwest line was actually built (becoming the Metro). No additional light rail or Metro lines are currently planned. The only ongoing project is double-tracking portions of the Central Light Rail line, which will allow trains to run more frequently. The combined Baltimore transit system provides limited services to a wide range of residents—however, many socioeconomic groups are ill-served due to inadequate or nonexistent linkages to their neighborhoods.

The 1965 report was updated two decades later. A report prepared by the Mass Transit Administration (MTA) in 1987 evaluated the feasibility of four light rail lines (MTA, 1987). The north and south corridors eventually became the Central Light Rail line. Two other lines were also evaluated. A northeastern line would have extended from Johns Hopkins Hospital (the termination of the Metro line) to the Beltway at Perring Parkway. The portion from 33rd street south to Johns Hopkins Hospital was proposed to go underground, because no suitable surface route could be found (MDOT, 1988). A western line from Charles Center to the Social Security Administration complex (and the Park-and-Ride lot at I-70) also required construction of a tunnel from Fremont Avenue east to the Charles Center Metro station. The expense of constructing the underground segments was viewed as making the latter two

lines infeasible. It must be assumed that further construction of tunnels, whether for heavy rail (Metro) or light rail, will not be considered due to their high cost.

A 1998 regional transportation plan for Baltimore indicated that the region was facing "perhaps the most rapid period of change in its history" (Baltimore Metropolitan Council, 1998). Much of the change was attributed to advances in technology, the aging of the population, and boom in on-line shopping, among other forces. New approaches to alleviating the resulting traffic congestion and accessibility issues are warranted.

LITERATURE REVIEW

A review of literature was conducted to provide the context for this research project. Sources that dealt with transit-oriented development, public transportation, quality of life, environmental justice, and other related issues were consulted.

Traditional Transportation Planning Approaches

Traditional transportation planning has involved increasing the supply and capacity of street networks to accommodate the growing demand on travel. This demand has stemmed from the increase in reliance on the private automobile—a mode of travel that most U.S. cities were not built to facilitate. More people have cars and are making more work trips than the capacity of most road systems can handle. Consequently, the focus of transportation planners has shifted to address "congestion, pollution, accidents, consumption of renewable resources, and even uneven distribution of transportation facilities and services" (Rosenbloom and Black, 2000). Moreover, how to address travel demand generated by the car has become a major consideration.

Land use decisions in major metropolitan areas have favored the automobile over other modes of transportation as suburban growth and car ownership increased in the 20th century (Rosenbloom and Black, 2000). Public transportation systems have declined and more highways have been built through cities as a response to such growth. The building of new and extensive highway systems has disrupted and destroyed vibrant communities particularly in minority neighborhoods (Rosenbloom and Black, 2000). Rosenbloom and Black (2000) contend that traditional transportation planning has led to a dependence on the car and created greater pollution, traffic congestion, and the consumption of nonrenewable resources. It has also created greater demand for travel by supplying more capacity and faster levels of service. They also state that transportation planners have "failed to use transportation improvements to create more livable and sustainable environments."

Traditional transportation planning was based on profiles and characteristics of residential households (family size, income, vehicles owned) and the area itself (population density, distance from the central business district) (Rosenbloom and Black, 2000). According to Rosenbloom and Black (2000), there have been several criticisms of the traditional transportation planning process. These criticisms include:

- By favoring the automobile over all other modes, the process has hastened the decline of public transportation systems;
- Building highways through cities has disrupted and even destroyed vibrant communities, particularly in minority neighborhoods;
- Increasing reliance on the car has helped drain the vitality of central cities and encouraged urban sprawl;
- Dependence on the car has increased pollution, the consumption of nonrenewable resources, and traffic congestion;
- Supplying more capacity and faster levels of service have been self-defeating because they have only created new demand for travel; and
- Planners have failed to use transportation improvements to create more livable and sustainable communities.

The last criticism of failing to create more livable and sustainable communities is a concern that has not gone without notice within federal transportation agencies.

Federal Transportation Initiatives

Several federal initiatives have sought to improve the connection of disadvantaged communities to local transit systems. The U.S. Department of Transportation (USDOT) Strategic Plan 1997-2002 included goals that address *Mobility* (to ensure that the transportation system is accessible, integrated, efficient, and offers flexibility of choices) and the *Human and Natural Environment* (to protect and enhance communities and the natural environment affected by transportation).

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was a major federal effort to address the criticism of traditional transportation planning (Rosenbloom and Black, 2000). ISTEA contained "the most profound changes in federal transportation planning in three decades" and included strong language for public participation to ensure that communities of color are not disproportionately harmed by transportation decisions and investments. The legislation shifted some of the decisionmaking for federal transportation funding from the state DOT to shared responsibility between the state and the metropolitan planning organization (MPO). The plans completed by the MPO were required to have a reasonable expectation of funding (Rosenbloom and Black, 2000). Other aspects of ISTEA involved coordination to meet air quality standards and the participation of stakeholders in the regional transportation planning process.

ISTEA expired in 1997 but its value was recognized and continued through the Transportation Equity Act for the 21st Century (TEA-21). It was designed to build upon the ISTEA initiatives by continuing the planning process for highways and transit as well as placing a "focus on a strong planning process as the foundation of good transportation decisions." The newer legislation takes ISTEA further and addresses the rebuilding of infrastructure and improvement of safety, among other issues.

At the center of this problem is the low-income and minority neighborhood that is typically burdened by transportation planning due to the consequences of location decisions. A growing concern for low-income neighborhoods is the adequacy of transportation services to accommodate a wide range of choices and opportunities including access to better jobs, social services, and resources. Low-income neighborhoods have historically been the victim of poor transportation decisions (Scott, 1969). These neighborhoods have disproportionately been more likely to be the locations for freeways and other major highway/street projects.

Additionally, the Federal Transit Administration (FTA), in its Livable Communities Initiative (LCI), seeks to strengthen the linkage between transportation services and communities served. Key to this effort is the increase accessibility to jobs and other vital socioeconomic services. FTA's focus on environmental justice issues further supports the need for this research. The extent to which these initiatives have been incorporated into the decision-making process and their impacts on the transit system in Baltimore City were of particular interest in this research.

One of the provisions of an effective transportation system depends on decisions that impact mobility and safety. These have been designated as top priorities for the USDOT. USDOT issued its *Order to Address Environmental Justice in Minority Populations and Low-Income Populations in 1997* to expand upon the Executive Order 12898 on Environmental Justice. This follows a 1994 Presidential Order that was directed toward every Federal agency to make environmental justice a component of its mission by identifying and addressing the effects of all programs, policies, and activities on minority populations and low-income populations.

The need for the consideration of environmental justice is embodied in several laws, regulations, and policies including Title VI of the Civil Rights Act of 1964, the National Environmental Policy Act of 1969, Section 109(h) of Title 23, and the Uniform Relocation Assistance and Real Property Acquisition

Policies Act of 1970 (FHWA, 2000). The USDOT initiative stems from the need to understand and properly address the unique needs of different socioeconomic groups. USDOT defines environmental justice principles as:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The incorporation of these principles into the transportation decision-making process is intended to:

- Make better transportation decisions that meet the needs of all people;
- Design transportation facilities that fir more harmoniously into communities;
- Enhance the public involvement process, strengthen community-based partnerships, and provide minority and low-income populations with opportunities to learn about and improve the quality and usefulness of transportation in their lives;
- Partner with other public and private programs to leverage transportation agency resources to achieve a common vision for communities;
- Avoid discriminately high and adverse impacts on minority and low-income populations; and
- Minimize and/or mitigate unavoidable impacts by identifying concerns early in the planning phase and providing offsetting initiatives and enhancement measure to benefit affected communities and neighborhoods (FHWA, 2000).

The Federal Transit Administration (2000) released a document entitled, "Building Livable Communities through Transit." The document presents strategies for improving personal mobility and hence the quality of life in communities, among other issues. Transit-oriented development (TOD) and community-sensitive transit (CST) were considered to be ways to reverse the adverse trends of automobile reliance and sprawl. CST includes readily available customer information and services, a safe and secure environment, sufficient pedestrian and bicycle access, and architecture that reflects the values of the community (FTA, 1999). Overall, through its initiatives, FTA is demonstrating "ways to improve the link between transit and communities." A lengthy discussion of TOD follows.

The Idea of Transit-Oriented Development—Modern Solution

During the past two decades, numerous metropolitan areas in the United States have embraced the concept of transit-oriented development (TOD) in an attempt to control and manage the negative environmental and social impacts of dispersed growth patterns (Porter, 1998). It is suggested that TOD will increase pedestrian and transit trip taking while also reducing the number and length of automobile trips. It will contribute to the livability that some feel is lacking in modern suburban development (Calthorpe, 1993).

TOD calls for the creation of denser, mixed-use activity nodes connected by high quality public transportation. Proponents believe that a combination of design features will encourage travel mode shifts that result in reduced area-wide traffic congestion and improved air quality. These features include improved street connectivity, public amenities, and a concentration of residences and jobs in proximity to transit stations and commercial businesses. As an additional benefit, the enhanced pedestrian environment will increase casual encounters among neighbors that can contribute to a sense of community. These efforts typically begin with the implementation of major new "mass" transit investments—often light-rail systems that are designed to link central city cores, suburban downtown, and other major activity centers. TOD is possible without new transit, but most metropolitan areas choose to make the transit investment. Bernick and Cervero (1996) suggest that for TOD to succeed a

"transit metropolis" must exist, meaning, a sufficient number of TODs having balanced or special uses that are connected and allow for efficient rail travel with bi-directional travel flows.

Construction of a new transit system usually precedes the land use restructuring required to effectively support the investment, i.e., the concentrations of population, employment, public amenities, and commercial activities that will attract transit riders in sufficient numbers to satisfy the transit system's fare box recovery requirements. In particular, commercial activities often become a consideration after the transit system alignment is finalized and station areas are identified (Bernick, 1996).

Berman (1996) provides a useful review of previous studies in the urban planning and transportation literature of the transportation impacts of neotraditional development and TOD. Several recent empirical and modeling studies of TOD were consulted, and measures for successful TOD projects were presented. Specifically, it outlines the key factors that need to be understood and weighed before significant new transit investments are made. The aim is to enhance the regional planning process in a way that leads to cost-effective investments of scarce public dollars (Berman, 1996).

The Principles of Transit-Oriented Development

America's growing dependency on the automobile is widely cited as a root cause of many of today's problems of traffic congestion, air pollution, and faceless urban sprawl. According to Cervero (1994), "During the 1980s, the national share of drive-alone commuters jumped from 64.4 to 73.2 percent, despite heavy subsidies to public transit systems." One strategy being suggested to help reverse or stave off this trend is to promote more intensive development, especially housing, around rail stops. To reduce external trips, TOD projects should be located in higher-density, mixed-use, urban pedestrian districts with high-quality transit service. To be most effective, TODs located in the suburbs should also have "urban" characteristics. Pedestrian-scale design draws people to return repeatedly. Urban development supports transit; suburban development does not. The concept includes mixed-use, higher-density, buildings at the sidewalk; less private and more public open space; smaller blocks; narrow streets with wider sidewalks, street trees and lights; lower parking ratios; shared parking; parking behind buildings; and on-street parallel parking (Calthorpe, 1993).

Calthorpe (1993) provides definitions and descriptions of Transit-Oriented Development (TOD). Figure 2 shows Calthorpe's basic TOD layout. The fundamental structure of a TOD is nodal (Calthorpe, 1993). It focuses on a commercial center, civic uses, and a potential transit stop. The TOD is made up of a core commercial area, with civic and transit uses integrated, and a flexible program of housing, jobs, and public space surrounding it (Calthorpe, 1993). The densities and mix of these primary uses is determined by the specifics of each site and economy. Surrounding the TOD is a secondary area for low density uses, large lot single-family residences, schools, larger businesses, and major parks (Calthorpe, 1993). Transit-oriented development should not be mistaken for the Planned Unit Development, a mixed land use strategy that makes a weaker link between development and pedestrian circulation.

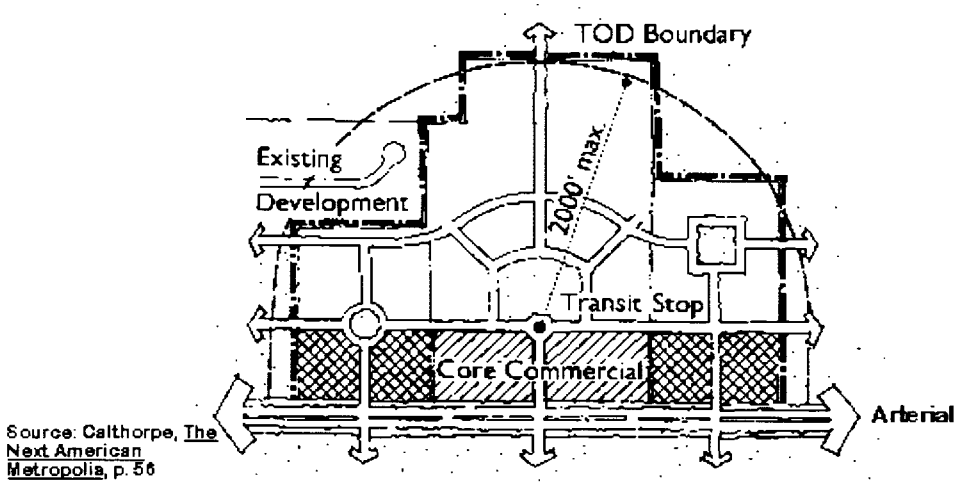

Figure 2: Calthorpe's Basic Idea of Transit-Oriented Development.

In summary, the design principles of transit-oriented developments are to:

- Organize growth on a regional level to be compact and transit supportive;
- Place commercial, housing, jobs, parks, and civic uses within walking distance of transit stops;
- Create pedestrian friendly street networks which directly connect local destinations;
- Provide a mix of housing types, densities, and costs;
- Preserve sensitive habitat, riparian zones, and high quality open space;
- Make public spaces the focus of building orientation and neighborhood activity; and
- Encourage infill and redevelopment along transit corridors within existing neighborhoods.

Maryland's Smart Growth Initiative

Maryland has developed many policies and programs to protect, preserve, and economically develop established communities and valuable natural and cultural resources. One such policy is the Smart Growth Initiative passed in 1997. Smart Growth is defined as "sensible growth that balances our needs for jobs and economic development with our desire to save our natural environment before it is forever lost" (Glendening, 1998:1). In Maryland, the Smart Growth policy provides an umbrella under which other diverse programs are unified. Programs that fall under the Smart Growth Initiative include:

- *Priority Funding Areas*: Defines where State and local governments encourage economic development and growth.
- *Live Near Your Work*: Provides employees of participating employers $3,000 toward buying homes near their workplace.
- *Neighborhood Conservation Program*: Assists with road improvement projects—streetscapes, curbs, gutter, repaving and lights—that improve mobility and facilitate local plan implementation.
- *Housing Development Programs*: Assists with the construction of elderly and family rental housing in designated areas.
- *Neighborhood Partnership Program*: Promotes through corporate tax credits private investment in neighborhood revitalization projects.
- *Main Street Maryland*: Strengthens economic potential in traditional main streets and neighborhoods within larger urban areas such as Baltimore City.
- *Neighborhood Business Development Program*: Provides loan and grant gap financing for small business start-ups or expansions in designated revitalization areas.

One Smart Growth program that is particularly supportive of this research effort is the *Smart Growth Transit Program.* This program provides funds to stimulate private investment adjacent to major transit facilities. The goal is to create high density, mixed-use pedestrian development that promotes efficient land use and increases transit ridership. There is also an incentive program that allows employers to provide up to $65 per employee per month in discounted tax-free transit benefits.

Recent Transportation Trends

In 1995, the American Public Transit Association (APTA) brought several of the Nation's most innovative transit industry leaders together to work with the Institute for Alternative Futures. Thinking as far ahead as 2050, this task force engaged in yearlong discussions and exercises and devised strategic goals and actions for making their vision of a sustainable community a reality. Several vision statements that encompassed transit-oriented development were articulated by the group. One of the more appropriate statements indicated that, "Transit-oriented developments offer much wider choices of housing types, densities, and costs than conventional suburban development. Affordable housing in close proximity to jobs proved to be the key to building up the concentrations of people living in poverty in the cheapest, most deteriorating housing in urban centers" (APTA, 1995).

In addition to the vision statements, a number of goals were also included. The strategic goals sought to: build on principles of ISTEA; strengthen regional and metropolitan planning and decision making; shift toward true cost pricing; provide creative leadership through partnerships; and cooperate more effectively with other agencies, metropolitan planning organizations, and state departments of transportation. Overall, this document explored strategies for restraining sprawl, encouraging compact and efficient growth patterns, and building transit-oriented developments to foster a sustainable community.

Cambridge Systematics, Inc. (1999) analyzed public transportation and the nation's economy. The report updated earlier findings, examined/expanded estimates of transit's economic impacts, and assessed value to an economy of each dollar invested in transit. This report "reaffirmed the significant positive economic impact of transit investment on jobs and business revenues and affirmed a variety of broader indirect benefits." The results of the analysis suggested important linkages between transit-oriented development and economic development in a community. Transit capital investment is a significant source of job creation. This analysis indicates that in the year following the investment, 314 jobs were created for each $10 million invested in transit capital funding. Transit operations spending provides a direct infusion to the local economy. More than 570 jobs are created for each $10 million invested in the short run.

Businesses would realize a gain in sales three times the public sector investment in transit capital; a $10 million investment results in a $30 million gain in sales (Cambridge Systematics, Inc., 1999). Businesses benefit as well from transit operations spending, with a $32 million increase in business sales for each $10 million in transit operations spending. The additional economic benefits from the transportation impacts of transit investment in major metropolitan areas are substantial. For every $10 million invested, over $15 million is saved in transportation costs to both highway and transit users. These costs include operating costs, fuel costs, and congestion costs.

Business output and personal income are positively impacted by transit investment, growing rapidly over time. These transportation user impacts create savings to business operations, and increase the overall efficiency of the economy, positively affecting business sales and household incomes. A sustained program of transit capital investment will generate an increase of $2 million in business output and $.8 million in personal income for each $10 million in the short run (during year one). In the long term

(during year 20), these benefits increase to $31 million and $18 million for business output and personal income, respectively.

Transit capital and operating investment generates personal income and business profits that produce positive fiscal impacts. On average, a typical state/local government could realize a 4 to 16 percent gain in revenues due to the increases in income and employment generated by investments in transit.

Additional economic benefits that would improve the assessment of transit's economic impact are difficult to quantify and require a different analytical methodology from that employed in Cambridge Systematics report. Other benefits include quality of life benefits, changes in land use, social welfare benefits and reductions in the cost of other public sector functions.

The findings by Cambridge Systematics complement studies of local economic impacts and show that transit is a sound public investment. Local studies have shown benefit/cost ratios as high as 9 to 1. These results are important for a number of reasons. The relationship between the strength and competitiveness of the Nation's economy and the extent, condition and performance of the nation's transportation system is of critical interest. There is mounting evidence that the Nation is severely under-investing in the transportation network that is so vital to U.S. economic interest, and that officials are not paying adequate attention to the development of transit and other forms of high-capacity surface transportation.

Transportation is the second largest American household expenditure after housing. Travel demand and congestion is increasing dramatically. From 1975 to 1995, the U.S. population grew 22 percent while the number of vehicles increased 49 percent. Similarly, the cost of congestion is enormous (Cambridge Systematics, 1999). Time and money lost to congestion and delay on highways is estimated at $40 billion to $100 billion per year.

Environmental and quality of life concerns related to transportation are also rising. According to Cambridge Systematics (1999), "Economic opportunities are being lost for a growing segment of Americans." Globally, however, billions of dollars are being invested in transit as part of aggressive strategies for global economic growth.

Weyrich and Lind (1999) looked at three high-quality transit systems in Chicago, San Diego, and St. Louis, among other cities. Their study, entitled, "*Does Transit Work? A Conservative Reappraisal*," shows that transit works if it is of high quality. However, in order for transit to be competitive, three criteria must be met. The criteria indicate that transit must be available, the available transit must be high quality, and the trip purpose must be one for which transit can compete.

A 1993 survey showed that almost half of the households in America do not have transit available. The vast majority of households, however, do have cars. An analysis of annual trips per household indicated that nationwide, annual transit trips remained steady between 1974 and 1993 but that annual trips per household where satisfactory transit service was available doubled over the same period. "What has held down transit ridership is not unwillingness to use satisfactory transit, but its declining availability" (Weyrich and Lind, 1999).

The Portland-based survey concluded that the way to attract riders is through the provision of high quality service. Such service should provide a safe, clean, and comfortable environment as well as be on time, have courteous personnel, and be reliable. Additionally, in order to attract riders, adequate parking must be provided. In the study areas, it was found that 75 percent of riders could drive but preferred to use the transit in Portland. Seventy-five percent of commuters using Vancouver's new rail system were new to public transit (Weyrich, 1999).

It was also found that people prefer to use transit only when they can walk to the station. People generally are not inclined to use the rail system if they must first reach the station by taking a bus. Bus service in some areas was deemed low quality. Only three percent of Chicago's rail commuters, for example, reached the system by bus.

Beyond issues of access, the Weyrich and Lind study found that transit stations must be supported by commercial and retail activities that enable riders to complete errands. Shops, day care centers, dry cleaners and other such uses should be concentrated at suburban rail stations. Combining shopping trips with the commute was thought to decrease other shopping trips hence reducing the number of automobile trips. Finally, Weyrich and Lind (1999) emphasize the importance of providing safe and secure transit stations. A sense of safety was deemed in direct correlation with the desire to use transit.

The literature review supports the notion of developing more responsive approaches to providing transportation systems/networks that provide greater choices for individuals, specifically, and communities, in general.

METHODOLOGY

This research was initially conducted through a literature review that sought information on the existing condition of the Baltimore City public transportation system and previous efforts to augment the system. A literature review was conducted to gain an understanding of the context for the research. Sources that dealt with transit-oriented development, transit system in comparable American cities, and transportation planning processes were consulted. Much of the literature was obtained through the Internet and other relevant databases. Primary and secondary data sources were found in Soper Library, Morgan State University, the University of Maryland, the Maryland Room at the Enoch Pratt Free Library, the Towson Public Library, Baltimore Metropolitan Council, the Maryland Department of Planning, the Mass Transit Authority, the Internet, and the personal libraries of the principal investigators.

The methodology employed in this research effort included: (1) reevaluating MTA's feasibility studies of surface routes for Baltimore light rail lines; (2) investigating the usage, problems and challenges with planning, design and implementation, and ancillary benefits and/or constraints of light rail in other North American cities; (3) evaluating alternate routes for connections to the existing Metro and light rail lines and Baltimore City and regional communities/neighborhoods; (4) selecting a Baltimore City corridor for a possible light rail line connecting to the existing Central Light Rail and/or Metro lines; (5) designing workable "connections" between existing proximal Metro, MARC and light rail stops; (6) conducting inventories and analyses for the selected corridor(s); and (7) planning and designing the selected light rail line corridor.

Detailed Research Tasks

1. Reevaluate the feasibility of surface routes for the northeastern and western light rail lines as proposed in the 1987 MTA report. The reevaluation would include: (a) consultations with MTA and MDOT officials, and the preparers of the 1987 MTA report; (b) discussions with Baltimore City planning officials; and (c) interviews with Streetcar Museum historians and other rail experts.

2. Investigate the usage, problems and challenges with planning, design and implementation, and ancillary benefits and/or constraints of light rail in other North American cities (Portland, OR; Denver, CO, Minneapolis, MN, Charlotte, NC, etc.), including integration of light rail with other transit modes. This task may include travel to one or more cities for in-depth assessment, personal observations, and interviews with key persons.

3. Evaluate alternate routes for connections to the existing Metro and light rail lines and Baltimore City and regional communities/neighborhoods. In addition to the information gleaned from Tasks 1 and 2, this task would include: (a) locating Baltimore City and regional community/neighborhood centers; (b) assessing the socioeconomic characteristics of the identified community/neighborhood centers; (c) locating Baltimore City and regional job hubs, and/or business districts; and (d) appraising current street patterns and usage levels regarding feasibility for light rail placement. A user-preference survey from a planning and design perspective would also be conducted.

4. Select one or more Baltimore City corridors for a possible light rail line connecting to the existing Central Light Rail and/or Metro lines.

5. Design one or more workable "connections" between existing proximal Metro, MARC and light rail stops. These connections were designed in a studio environment by graduate landscape architecture students.

6. Initiate and complete inventories and analyses for the selected corridors. Inventory/analyses along potential corridors to include: existing street configurations, population centers, levels of community cohesion, social/ cultural components, density and types of businesses, number of jobs within ½-mile radius of potential light rail stops, age and health of existing street trees, etc.

7. Select one corridor for further development.

8. Plan and design the selected light rail line corridor. This would be a three-step process: (1) an urban design plan for context would be prepared, (2) neighborhood impacts of the proposed corridor would be evaluated, (3) urban design guidelines for the corridor would be prepared, and (4) schematic designs based on the guidelines for the selected corridor would be developed. This corridor were planned and designed in a studio environment by graduate planning and landscape architecture students.

RESULTS

An early study of transportation issues in the Baltimore area culminated in a *Mass Transportation Plan of* 1965 (Parsons, et al., 1965). This plan was dubbed as the "Long-Range Program" for the area. The system consisted of surface streets and thoroughfares for cars, trucks, and buses. The only designated express transportation was on the Beltway (a highway that loops around Baltimore City) and the Jones Fall Expressway. At that time, Baltimore's metropolitan region was comprised of about 1.9 million people and an urgent need for express transportation was growing. The region was expected to grow to 2.5 million by 1980, a trend that was expected to be consistent with the population growth following World War II. In 1960, Baltimore was the sixth largest city in the United States. It comprised approximately 90 square miles and had a tax base exceeding $3.5 billion. All indications were that the region would meet the population projections.

The study looked at transit requirements through 1985 for the area that included Baltimore City, Anne Arundel, Baltimore, Carroll, Harford, and Howard counties. A rail rapid transit network was proposed. A total of 69 miles were proposed in this new transit network. The lines would run as follows:

- Line 1—Northwest Corridor, Liberty-Reisterstown Roads, 11.8 miles with nine stations;
- Line 2—Northern Corridor, Charles Street-York Road with a spur to Towson, 13.6 miles, 13 stations;
- Line 3—Loch Raven Corridor—Loch Raven Boulevard, 6.7 miles, six stations;
- Line 4—Northeast Corridor, Belair Road-Sinclair Lane, 8.5 miles, seven stations;
- Line 5—East Corridor, Dundalk-Sparrows Point area, 8.8 miles, five stations;
- Line 6—Southern Corridor, to Baltimore Washington International Airport, 11.0 miles, six stations; and
- Line 7—Western Corridor, Edmondson Avenue and Old Frederick Road, 8.6 miles, six stations.

In the late-1980s, a major study was conducted by the Mass Transit Authority (MTA). This study entitled, MTA's *1987 Light Rail Transit Feasibility Study*, addressed four corridors. These included a North corridor—State Office Complex to Hunt Valley; Northeast corridor—Hopkins Station of the extended Metro to the Beltway and Perring Parkway; South corridor—Camden Station to Dorsey Road; and West corridor—Metro at Lexington Market Station to Beltway and Security Boulevard. The North and Southern corridors eventually became the Central Light Rail Line. For the purposes of this research, only two of the lines are reviewed.

The Northeast line, which consisted of about 7.9 miles with 2.2 miles of subway and 5.7 miles at grade, was considered expensive because of the need for construction of a subway between the Johns Hopkins station and Lake Montebello. Ridership was expected to be the lowest on the Northeast corridor at about 12,200 people daily and 3,560,000 annually. The importance of this proposed corridor, however, was that it would have connected suburban residences with downtown Baltimore (via a transfer at the Hopkins station). It was expected that there would be little reverse commuting, that is, that more people would travel from the suburbs to Baltimore than from Baltimore into the suburbs. The Northeast corridor was also felt to have limited opportunities for parking facilities. Additionally, access to feeder buses and walking was considered limited. It was, however, felt that the line would serve residents who worked in the central area. As proposed, the line appeared to have minimal impact on the existing residential fabric because it was proposed to be constructed in the median along major roads. This line was significantly different from the one proposed in the 1965 study because it appeared to be less detrimental to the residential fabric.

The highest ridership was expected on the West line, with 22,300 daily and 6,510,000 annual riders. The West line would be 7.1 miles long with 4.5 miles at grade, 2.1 miles of aerial track, and 0.5 miles of subway. The major drawback of the West line was that it would run through established areas and it

would compete with automobile travel. Access to the West line stations was presumed to be by walking and transferring from other transit services. There would be limited vehicular access due to congestion in the area. The Central Line was eventually constructed and runs through the city on a North-South axis. The construction of the other proposed lines was not accomplished due in part to economic and political factors.

This 1965 transportation study was the starting part for the analysis component of the research. The research specifically addressed the feasibility of the proposed Northeast corridor.

An Analysis of Selected Transit Systems in Other North American Cities

Early in the research process, several American cities were visited to investigate the usage, problems and challenges with planning, design and implementation, and ancillary benefits and/or constraints of light rail. These problems included integration of light rail with other transit modes. This task included travel to several cities for in-depth assessment, personal observations, and interviews with key persons. Site visits were made to Portland (Oregon), Toronto, Atlanta, and Denver.

Portland, OR

Portland is heralded by many as a city that has embraced transit. Because the Portland Transit Mall was built in the 1970s, bus ridership has grown steadily. Portland transit trips per person increased by 4.4 percent between 1990 and 1995. Transit use increased faster than the population and faster than traffic growth. The types of transit available in Portland have also grown with the addition of light rail and a newly completed streetcar line. Light rail and rapid bus are considered the "backbone" of Portland's transit system. When the system is completed, light rail service will run every 10 minutes during the day, seven days a week. Rapid bus will operate every 15 minutes during the day, seven days a week. The objective of the light rail or rapid bus system is to connect regional centers and the central city.

On an average weekday in 1998, about 186,000 riders used the bus and rail systems. By 2020, that number is expected to increase to more than 500,000 riders. Increased ridership results from the expanded and integrated system, but also through transportation management associations (TMAs). TMAs are private enterprises or private/public partnerships, that offer alternatives to employees driving to work during rush hour. TMAs promote ride sharing, transit, walking, biking, work schedule changes and telecommuting to reduce rush hour traffic congestion.

In Portland, transportation planning is integral to growth management planning. The 2040 Growth Concept, started in 1992, directs most development to population centers and along major transportation corridors. It relies on a balanced transportation system that accommodates walking, bicycling, driving, using transit and keeping freight moving. The Plan recognized that a diverse and well-designed community provides closer access to a variety of jobs, recreation, shopping and other services. Additionally, these diverse and denser communities make walking, bicycling and mass transit more convenient. Portland planners have also recognized that economic vitality occurs in areas with the best transportation.

In September 2000, a site visit was made to Portland, Oregon to observe first hand its extensive bus system and rapidly expanding light rail system. The combination bus and light rail service appeared to be remarkably efficient and the buses/trains were clean.

Photograph 1. Images of Portland, OR Transit Stations.

Each light rail station was uniquely designed to "fit" with the surrounded neighborhood character or predominate landscape features. The new streetcar line was still under construction during the site visit. The line is being built from Portland State University in downtown Portland to a major hospital in northwest Portland. Future streetcar lines include one from North Macadam to Portland State University—thus making Portland's urban university a major transit hub!

Toronto, Canada

Toronto has been held up as a model urban center, largely due to its reputation for avoiding the pitfalls of massive expressway programs and its deliberate choice to develop an efficient, safe, and intensively used comprehensive system of public transportation. Land use planning has promoted higher density development and has done so explicitly along major transit routes. Understandably, the centralized Toronto transit system is generally regarded as the most successful transit operation in North America and among the best in the world. The Toronto Transit Commission (TTC) operates this highly integrated, single fare, free transfer transit system. Over 381 million passengers ride the system annually. In 1997, the system had 144 bus and streetcar routes made up of 164 light rail vehicles, 510 subway cars, and 1240 buses. A 1996 survey shows that the mode of transportation choice for the AM peak period within the City is 13 percent for walking and cycling, 32 percent for transit, and 55 percent for automobile.

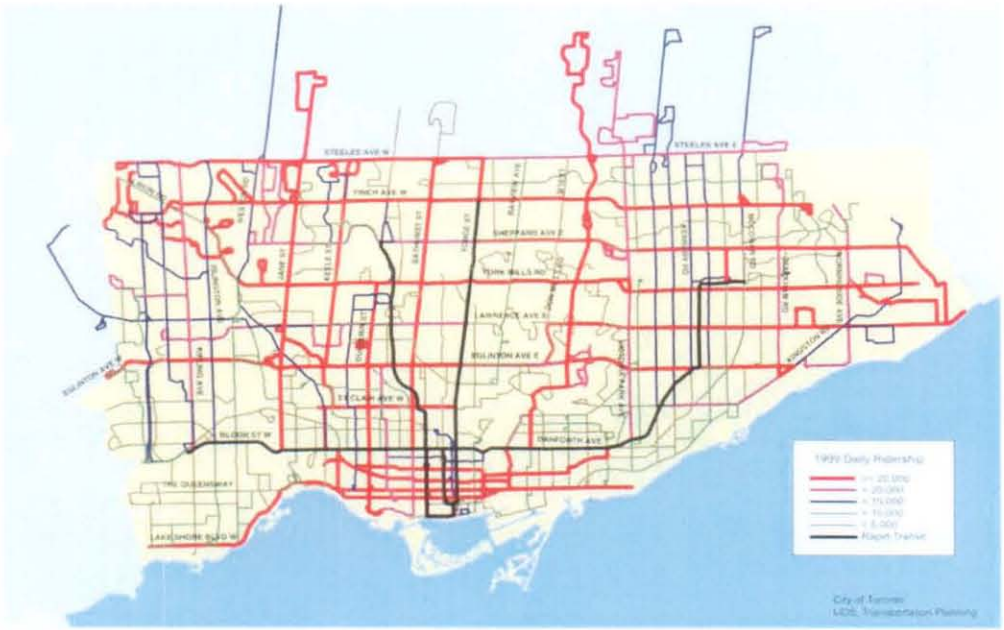

Figure 3. Toronto Transit System.

Toronto transit planning operates under the premise that the effectiveness with which public transportation service can be provided depends primarily on travel patterns. Travel patterns are strongly influenced by land use, automobile ownership, demographic characteristics, and by spatial and service characteristics of the transit network itself—all of which are highly interrelated. Toronto's transportation plan is based on the competitiveness or advantages of public transportation relative to the private automobile.

Key factors include socioeconomic and demographic characteristics; population and employment densities; work trip patterns; transit route configuration, service levels, and fares; and transit priority.

The key attributes of Toronto's 2000 Transportation Plan's vision for the future are:

1. Integrated land use and urban design that leads to fewer and shorter vehicular trips for personal travel.
2. Improved accessibility by public transit service for all constituents that is also competitive with the private automobile in terms of cost and convenience for most personal travel.
3. A comprehensive system of regulations and facilities for goods movement that enhances the economic competitiveness of the city and region.
4. Traffic engineering and street design that encourages walking and cycling.
5. Less need to own an automobile or to use an automobile for most travel within the city.
6. Strong safeguards for the protection of the natural environment.
7. Reduced air pollution and greenhouse gas emissions from transportation.
8. Equitable pricing and financing of transportation services.

In practical terms, this vision really means:

- More people and jobs in the city,
- More intensification and mixed land use,
- A friendlier environment for pedestrians and cyclists,
- Efficient goods movement,
- Improved transit accessibility for the handicapped,
- Higher transit ridership and mode split,
- Lower automobile ownership and use, and
- The development of alternative, non-property tax base sources of funding from users of the transportation system that permit greater continuity in transportation planning.

Photograph 2. Images of Toronto's Light Rail line.

In August 2000, a site visit was made to Toronto, Canada to observe first hand how this integrated subway/street car/bus/shuttle system functions. An interview with the Assistant Director of Transportation Planning provided valuable information and an escorted tour of the transit system. The Toronto system is truly all that the literature describes it to be—well planned, integrated, efficient, clean and well used by People who live in Toronto and tourists alike. However, only with recent station construction has any real attention been paid to station design, public art, and landscape design. Additionally, for current and future light rail construction projects, streetcars are separated from

automobile traffic via medians where possible, or as a minimum by 6-inch curbs. On most older lines, automobiles and streetcars share the same street lanes.

Denver, CO

Denver's light rail system has been hailed as one of the better systems in the country. It is one of 18 systems in operation throughout the United States. The system was developed from an extensive planning period that culminated with the voting by citizens in 1973 to finance the development of an integrated regional public transportation system. The Regional Transportation District's (RTD) comprehensive plan addressed, among other issues, the limited service of the existing Denver Tramway Company whose bus routes covered primarily the City and County of Denver. The plan included a 98-mile network of Personal Rapid Transit (PRT) and an extensive bus system. While early emphasis was placed on improving the bus service and encouraging ridership, other measures were taken to ensure that mobility was increased and congestion was decreased. The Central Corridor Light Rail System was opened in 1994.

Today, Denver's system serves about 2.2 million people in 41 municipalities in six counties. The service area is 2,406 square miles. There are more than 10,700 bus stops and about 59 Park-n-Ride facilities with a total of 179 regular fixed routes. Each train accommodates 126 people (64 seated and 62 standing). The trains can reach speeds of 57 miles per hour (mph) but their top cruising speed is 50 mph. There are 14 lines. The Central Line is 5.3 miles long and has 15 stations. The Southwest line has five stations along its 8.7-mile route. Thirty-one trains are utilized for light rail service.

In November 2000, a site visit was made to Denver, CO to observe the light rail system. The light rail service appeared to be remarkably efficient and the trains were very clean. The images below illustrate some of the design features observed along the line. The Central Line was the focus of this visit. Little emphasis was given to station design. Where the light rail runs in street corridors where automobiles are also in use, special attention was given to delineating each zone.

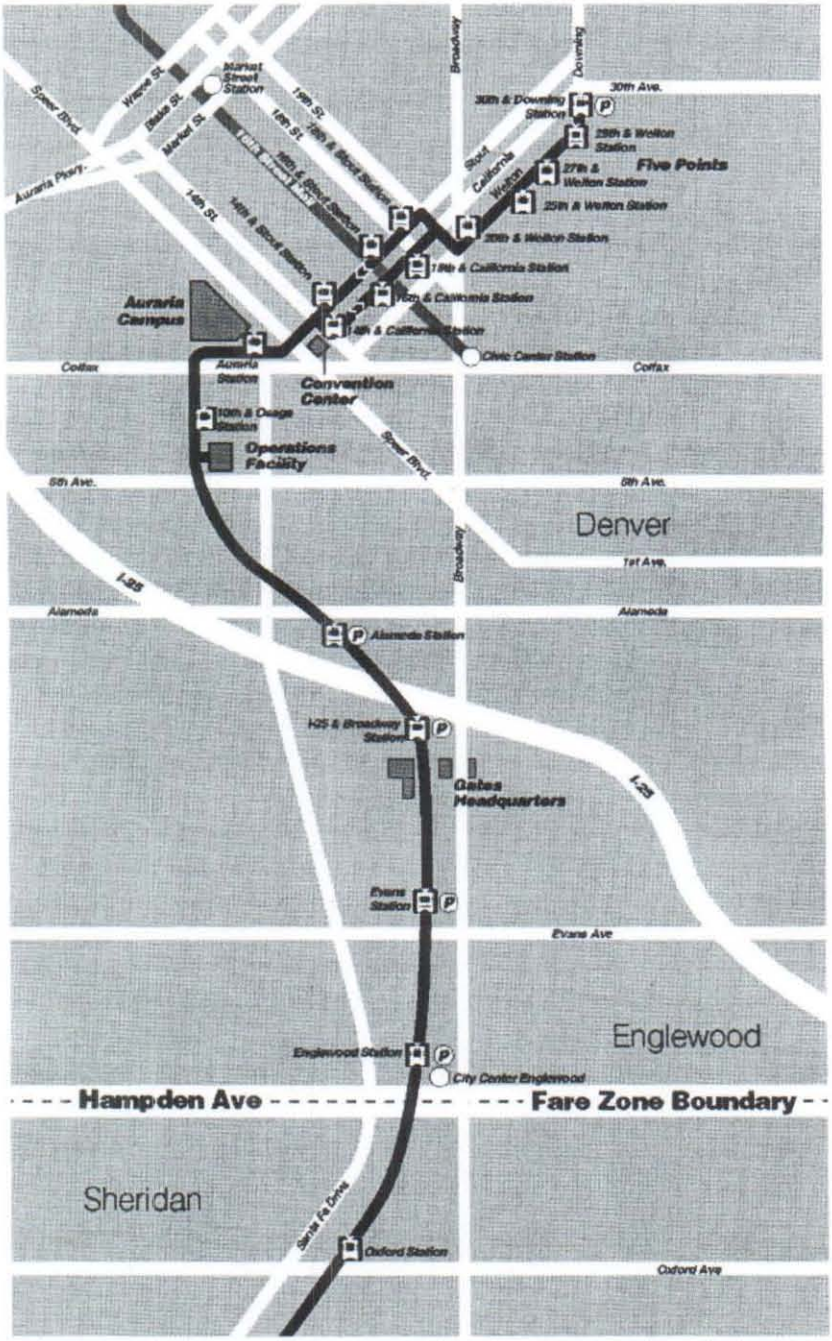

Figure 4. Denver's Central Rail Line


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408

Photograph 3. Images of Denver's Light Rail System

PROPOSED LIGHT RAIL CORRIDOR

Alternative routes were evaluated for a Baltimore City northeast light rail corridor beginning at the terminus of the existing Metro Rail Service, the Johns Hopkins Metro Station. Three "destination" routes were selected for consideration—Perring Parkway, Harford Road and Belair Road Numerous segment options from the Metro Station on Broadway to these three destination routes were inventoried for existing conditions (see Table 1). ***[Please refer to Appendix A for a complete description with photographs of the alternative route segment inventories.]*** **Following the inventory, each route segment was evaluated for its feasibility to serve as a light rail corridor based on its potential to create or enhance community cohesion; improve and/or develop commercial districts; increase job accessibility and local opportunities; provide unmet transportation needs; provide access to parks/greenspaces; meet transportation construction standards; etc. (see Table 2). The analyses resulted in three composite route alternatives—Perring Parkway, Harford Road, and Belair Road (see Figure 5). A "community-based" route (Figure 5) was also developed that adhered to the intent of this research— to define a route that comes closest to promoting** ***community well being, environmental quality and economic prosperity for all socioeconomic and racial/cultural groups.***

Therefore, the four route alternatives for the northeast Baltimore City light rail corridor are:

1. ***"Community" Alternative*****: north on Broadway from the Metro Station; northeast on Harford Road; west on 25th Street; northeast on Loch Raven Boulevard.; east on 33rd Street; north on Hillen Road; east on Argonne Dr.; northeast on Harford Road to the Joppa Road intersection and Park-n-Ride.**
2. ***Belair Road Alternative*****: north on Broadway from the Metro Station; northeast along Gay Street until it becomes Belair Road; northeast on Belair Road to I-695.**
3. ***Perring Parkway Alternative*****: north on Broadway from the Metro Station; northeast on Harford Road; north on Hillen Road until it turns into Perring Parkway; north-northeast on Perring Parkway to I-695.**
4. ***Harford Road Alternative (The "Preferred" Alternative)*****: north on Broadway from the Metro Station; northeast on Harford Road; north on Hillen Road; east on Argonne Drive; northeast on Harford Road to the Joppa Road intersection and Park-n-Ride.**

"Community" Alternative**: As stated above, the "Community" Alternative (see Table 3) follows the route that comes closest to promoting "community well being, environmental quality and economic prosperity for all socioeconomic and racial/cultural groups." This route:**

- **Has the greatest potential to service neighborhoods that have no direct access to public transportation (e.g., portions of North Broadway and 25th Street);**
- **Has the high concentrations of employment (Johns Hopkins Hospital, Baltimore Eastside District Court, North Avenue commercial district, light industry and other businesses along 25th Street, Baltimore City Water Treatment facility, Mergenthaler Vocational Center, Morgan State University, Maryland Rehabilitative Center, and the numerous commercial districts, schools, churches, etc. along Harford Road);**
- **Is proximal to dense population centers (housing is either rowhouses, or small lot single family;**

Table 1. ***Existing Conditions Matrix for All Route Segments.***

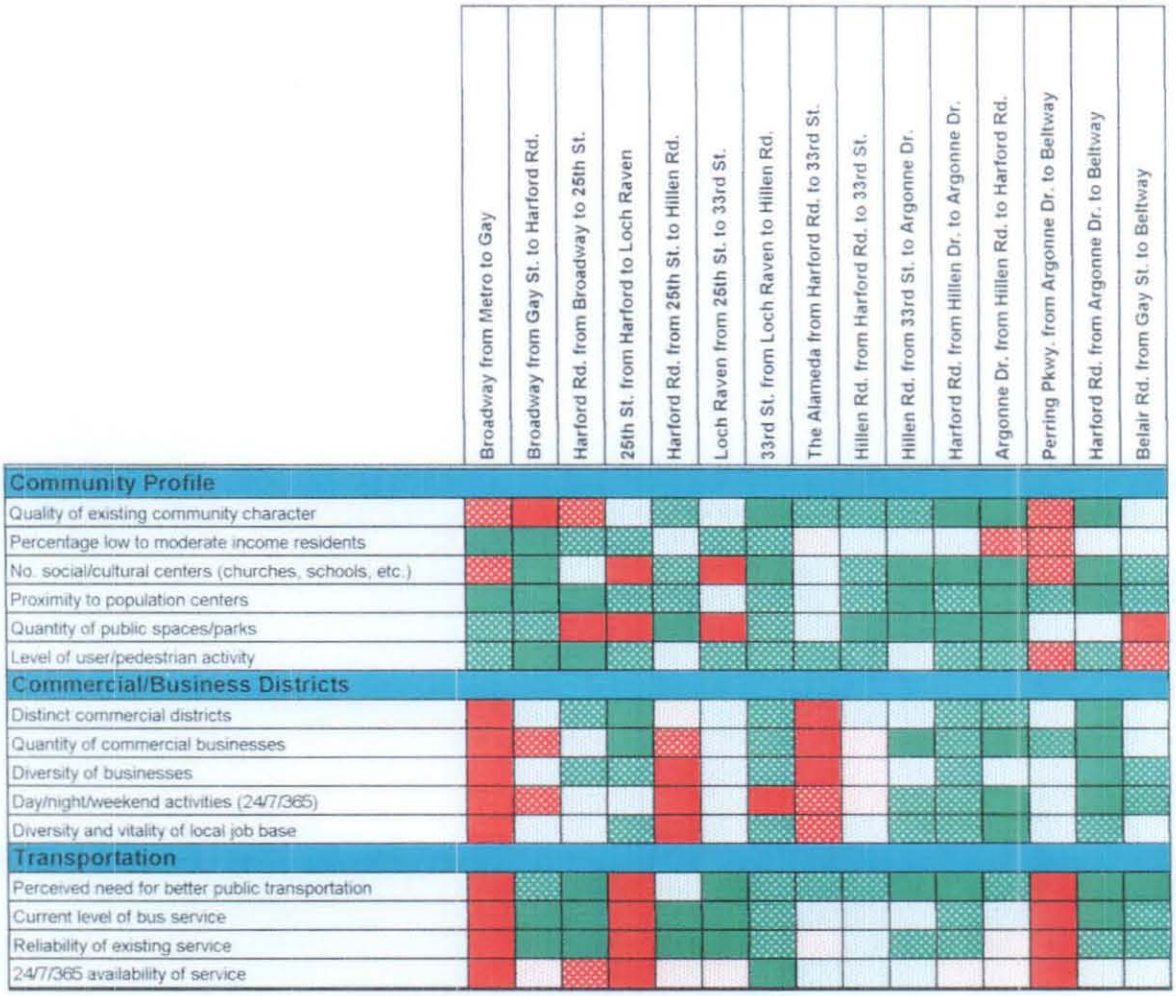
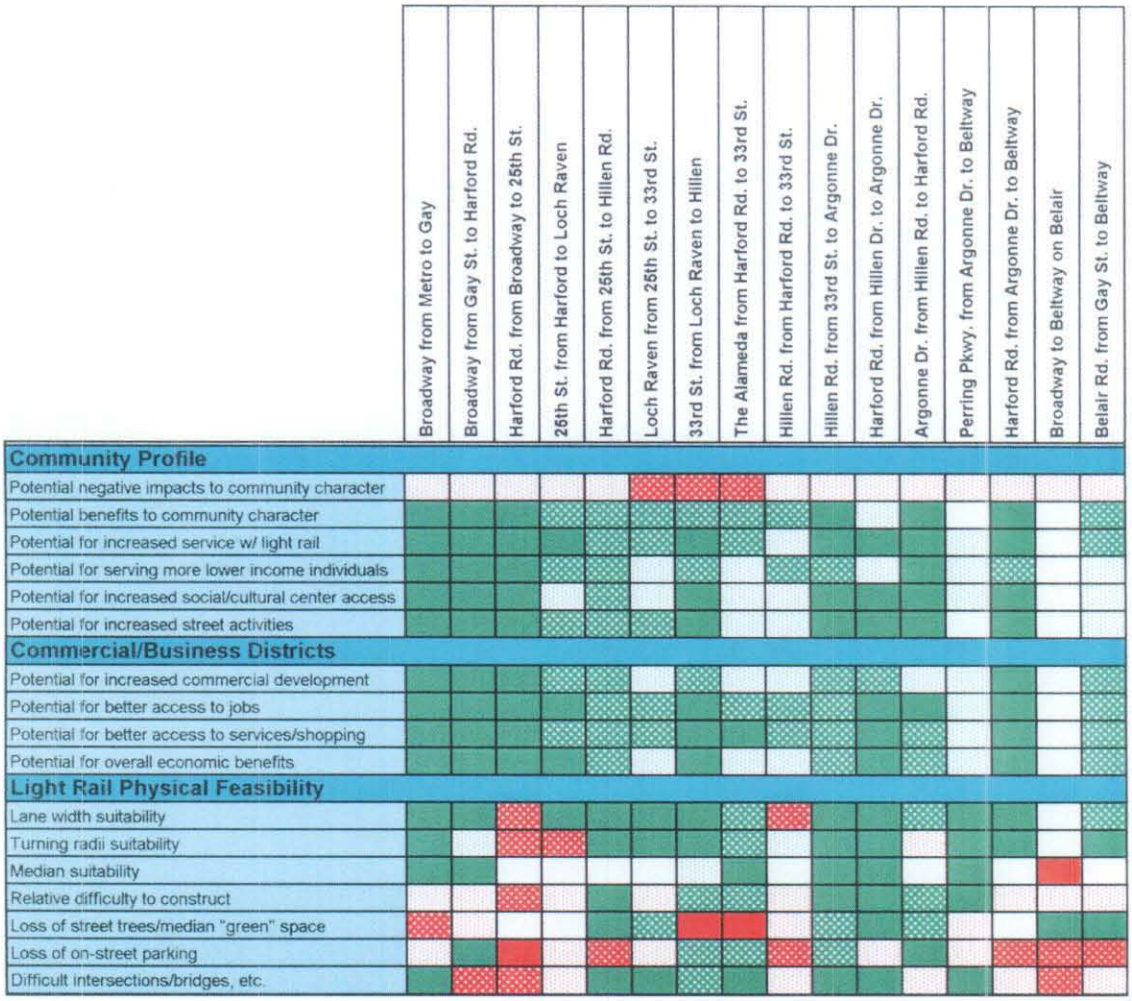


Table 2. Feasibility/Impact Matrix for All Route Segments.



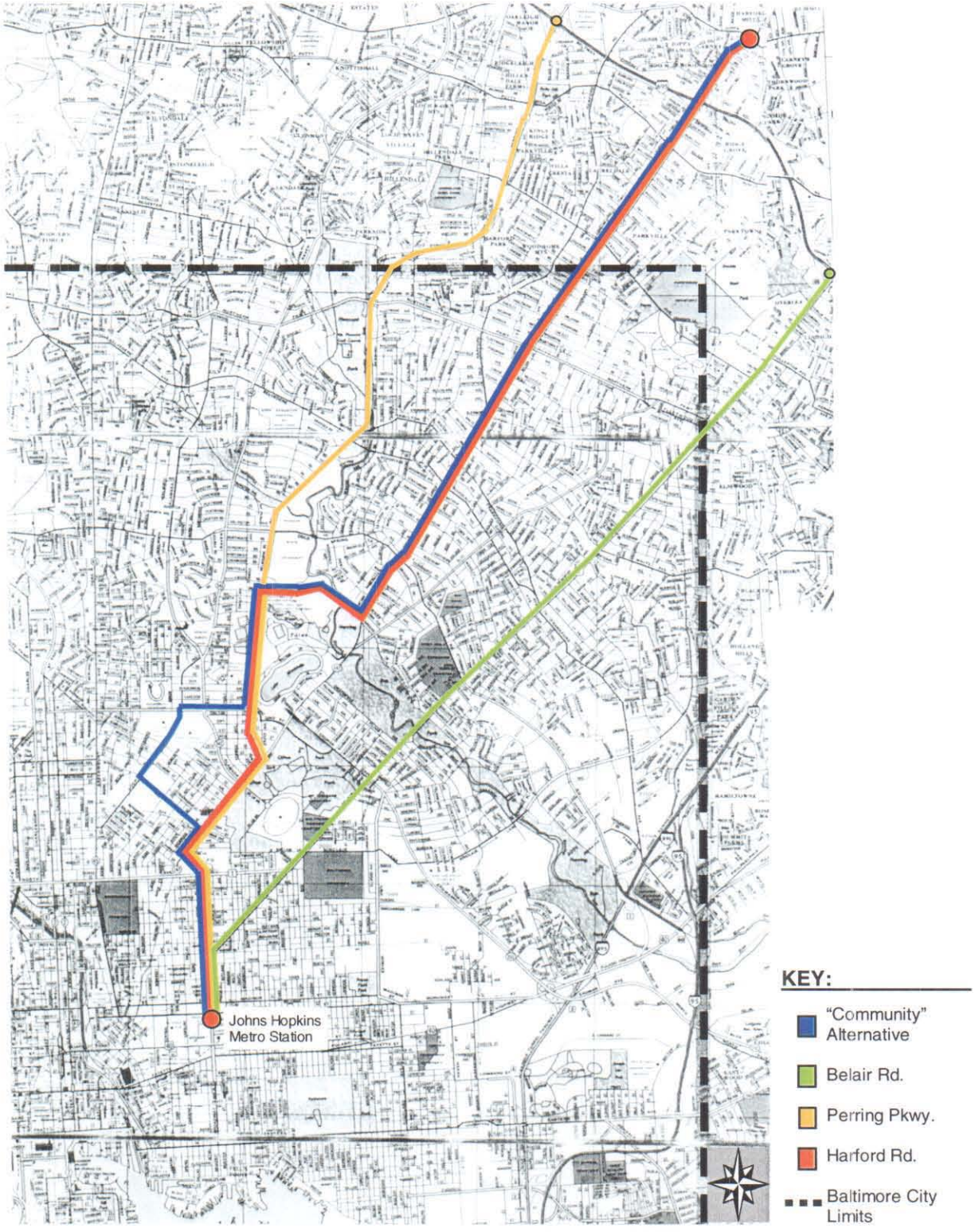
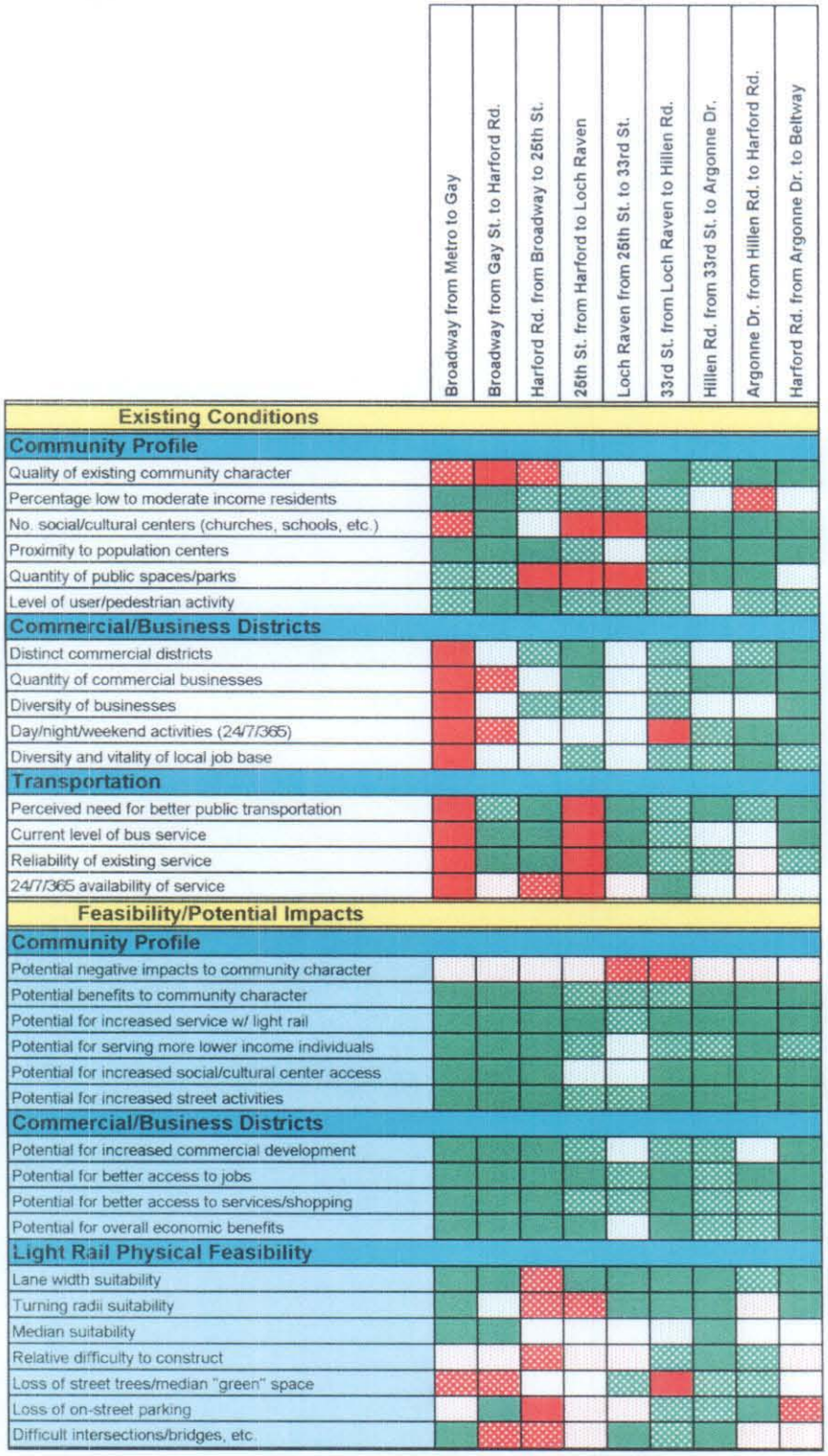


Figure 5. Map Depicting the Northeast Baltimore Light Rail Alternatives.

Table 3. "Community" Alternative Matrix for the Northeast Baltimore Light Rail Corridor.



- **Accesses the highest numbers of low to moderate income residential neighborhoods (low income particularly along Broadway and North Avenue and low to moderate income neighborhoods along the rest of the route); and**
- **Is proximal to community social or cultural centers (there are numerous churches, social centers, schools, libraries, fraternal organizations, etc. along the entire "community" alternative).**

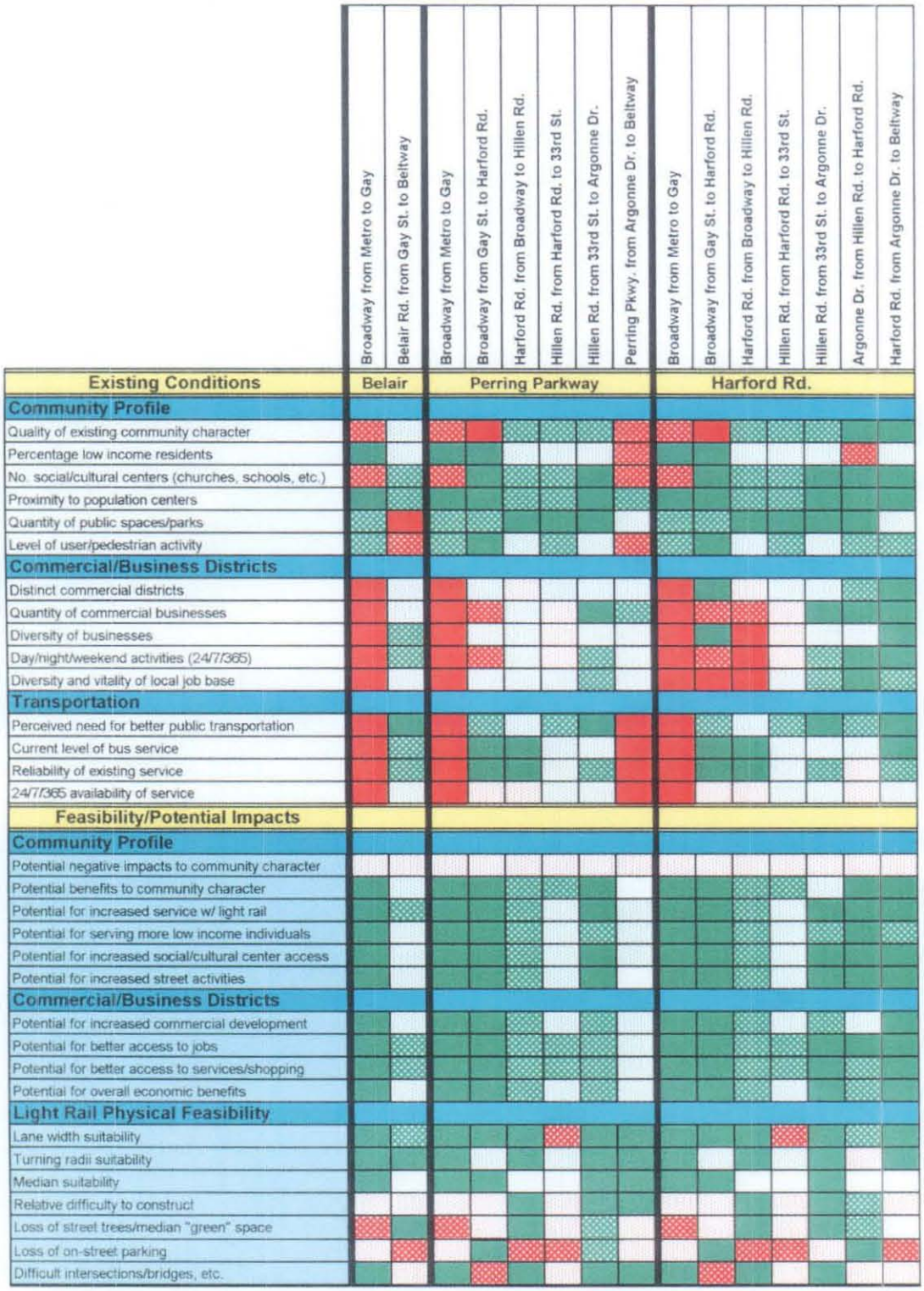
However, this alternative is not the most feasible route from a transportation engineering perspective. The route is quite circuitous and several route segments had difficult turning radii, contained difficult intersections or bridge structures. Other segments would result in a substantial loss of street trees or median green spaces. Two segments would pass through suburban residential neighborhoods that could be perceived as a negative impact on the neighborhood character, as well as associated visual and noise impacts. The Loch Raven segment currently has no bus service, while the 33rdStreet segment has three different bus lines that regularly travel along it. The median along 33rd Street, however, was originally designed by the Olmsted Brothers and the area is considered to be a "no impact" zone by local preservationists.

***Belair Road Alternative*: While the Belair Road route (Table 4) is the most direct and has the fewest engineering construction difficulties, 93 percent of the route—along Belair Road—does not fulfill the research agenda for enhancing/ creating neighborhood character, improving community livability, contributing to further concentrated commercial development, etc. Currently, there are no distinct commercial districts or neighborhood centers along this route. The functional make up is primarily strip malls and auto dealerships—both totally dependent upon auto traffic vs. mass transit or pedestrian access.**

***Perring Parkway Alternative*: The predominate leg of this route is along Hillen Road/Perring Parkway (Table 4). Hillen Road/Perring Parkway, which comprises 66 percent of the route, is the most physically feasible sections for the construction of a Northeast Baltimore light rail line. There is ample road width, gently curved streets, few traffic lights, suitable median and minimal loss of on-street parking. However, as with the Belair Road Alternative, much of the route is not contiguous with dense housing stock or commercial development. The Hillen Road segment would serve the Baltimore City Water Treatment facility, Mergenthaler Vocational Center and Morgan State University. But the Perring Parkway segment was developed as a "parkway" with wide tree planted medians and houses or shopping centers set well off the roadway. Few people would be served by a light rail along this route; it would most likely only serve as a "connector" from downtown to I-695 or White Marsh.**

With so few traffic lights and the ease of flow along this route, the research suggests that this route be used for rapid bus transit for commuters into and out of the City. This suggestion mandates that the buses would have control over the few traffic lights along this route. The rapid buses would terminate at the intersection of Hillen Road and Argonne Dr., where riders could then access the proposed Northeast Baltimore light rail line into Downtown Baltimore where it joins the existing metro system. At the Hillen/Argonne intersection, riders could also access the existing and well-utilized MTA east-west bus system.

Table 4. Matrix for the Three Alternative Routes Considered for the Northeast Light Rail Corridor.



Harford Road Alternative (The "Preferred" Alternative): **Based on the inventory and analyses, Harford Road route (Table 4) was determined to be the "preferred" alternative. It combines most of the "community" alternative segments, but is not quite as circuitous and does not adversely impact any suburban neighborhoods. It is not as "direct" as the Belair Road and Perring Parkway routes, but the advantages gained with regard to enhancing/creating community character, reaching underserved low to moderate income ridership, serving social and cultural centers, churches, schools, population centers, promoting pedestrian activities, increasing commercial development, providing better access to jobs, etc. far out way the slight jog in the travel route. Consideration was given to continuing the route up Harford Road and bypassing Hillen Road/Argonne Dr., but it was determined to be counter to the research agenda and it would also adversely impact the adjoining suburban neighborhood and users of Clifton and Herring Run parks.**

The Harford Road Alternative would terminate at the intersection of Joppa and Harford roads. It is proposed that the current auto-friendly shopping centers on three corners would be totally redeveloped following TOD principles. This route would also include a loop to the Park-n-Ride lot located just north of the Joppa-Harford intersection. It is also proposed that this site could serve as a major hub in a larger regional transportation system.

TOD principles would also be applied to neighborhood level hubs to enhance the existing character of these communities, i.e., Lauraville (intersection of Cold Spring Lane and Harford Road), Hamilton (intersection of Northern Parkway and Harford Road) and Parkville (intersection of Taylor Avenue and Harford Road). Two intermediate hubs are proposed for (1) the triangle created by the intersection of Broadway, Harford Road and North Avenue that includes the Baltimore Eastside District Court, and (2) the Northwood Shopping Center site at the intersections of Hillen Road and Argonne Drive. Morgan State University is negotiating to purchase the site for its future Hospitality/Hotel Management School and University Conference Center. Both sites would not only serve as light rail stops, but would serve as major east-west connectors for existing MTA bus lines. The Morgan shuttle service would also provide service to the rest of the campus from this point. Other east-west transfer connections to existing MTA lines are proposed for Biddle Street/Preston Street, 33rdStreet and Belvedere Avenue.

Constraints Relevant to All Proposed Routes

Short-term impacts associated with the construction of a light rail corridor would be dust and noise, traffic disruptions due to construction vehicles, detours around the site, traffic congestion, loss of traffic lanes, loss of parking, and interference with pedestrian circulation. Short-term economic impacts to businesses may include loss of customer parking, reduced attractiveness of businesses, and reduced ease of access of delivery vehicles. Care must be taken to coordinate all construction activities to shorten the time of adverse impacts to businesses and residents.

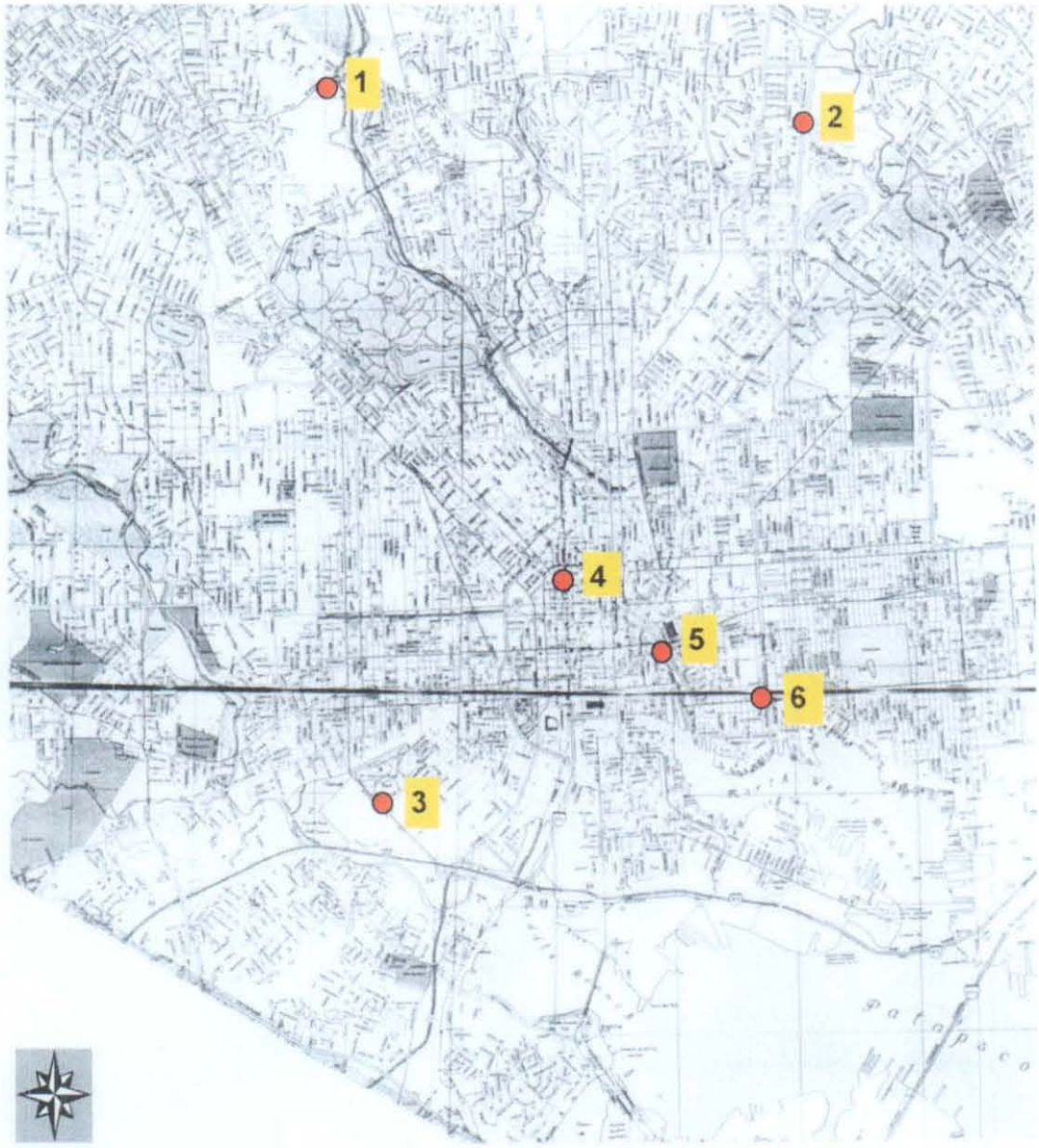
Long-term impacts could include the visual presence of the light rail. If not properly designed, the light rail line could be perceived as a "barrier" that divides the community and reduces community cohesiveness. However, using TOD principles, appropriate design guidelines and site-specific hub and corridor designs, the light rail corridor would "connect" rather than "divide" communities and "enhance" rather than "detract" from the visual quality of the served neighborhoods.

Segment specific, long-term impacts were discussed under the individual route alternative discussions.

Transit Hub Designs for Existing Metro and Light Rail Systems

During the Spring 2000 semester, Landscape Architecture Urban Design Studio students developed concepts for transportation hubs within Baltimore City. The designs are included in Appendix B. Figure 6 gives the location of the student projects. As stated in the introduction, there are currently no viable connections between the light rail and Metro lines even though in several places the two lines run parallel to one another or cross. Two of the designs proposed to link the two systems—a project in South Broadway proposed to extend the existing light rail system east from Camden Yards along Fleet Street to South Broadway. At the Broadway/Fleet Street intersection a new Metro station would surface to meet the light rail line extension. Another project proposed to surface a Metro station under Howard Street at Centre Street in order to connect it with the light rail stop at that location. The project theme was an "Avenue of the Arts," in keeping with the significant art/cultural related galleries, museums, shops, schools, etc. in close proximity. A third project proposed "A Home to Harbor" connection from the Shot Tower/Charles Center stop to the Inner Harbor. Currently, riders exit the Metro and are faced with no visual clues or physical connections to the activities at the Inner Harbor.

Other designs were developed for sites that the students felt were important locations for future hub locations if the current Metro/Light Rail system were ever to be expanded: (1) a new light rail station at Cold Spring Lane that would allow for easier access by Poly-Western High School students; (2) a westward expansion to the light rail system from Camden Yards along Washington Street The hub would location at the intersection of the revitalized "green" Montgomery Wards building and Carroll Park; and (3) a major transportation hub at the intersection of Hillen Road and Argonne Dr. Morgan State University is currently negotiating to purchase the Northwood Shopping Center property in order to build its new Hospitality/Hotel Management School and University Conference Center. The design included the new Morgan facilities and further proposed the site would be an ideal transportation hub for a "university/college" light rail network throughout the Baltimore Region.



1. "Putting Down Roots: Reclaiming a Lost Landscape" by Rachel Blistein
2. "A College Town Main Street" by Kristen Humphrey
3. "Mt. Claire Bridges" by Ginger Howell
4. "Avenue of the Arts" by Adrienne McCray
5. "Home to Harbor" by Andrew LaStella
6. "A Rendezvous with Broadway" by Om Khurjekar

Figure 6. Location Map for the Fall 2000 Landscape Architecture Urban Design Studio Transit Hubs.

CONCLUSIONS AND RECOMMENDATIONS

Baltimore has the potential to maximize its opportunities to support transit-oriented development to benefit a wider range of residents. The augmentation of the Baltimore City public transportation system through the construction of a new light rail line that better serves low to moderate income neighborhoods would be beneficial to residents who currently are underserved and consequently have limited transit options. The City lacks a functional network of logical transportation systems. The Metro doesn't link to the light rail system and overall, the system should be reevaluated to provide for better connections between its riders and their destination points.

Is Transit-Oriented Development for Baltimore City?

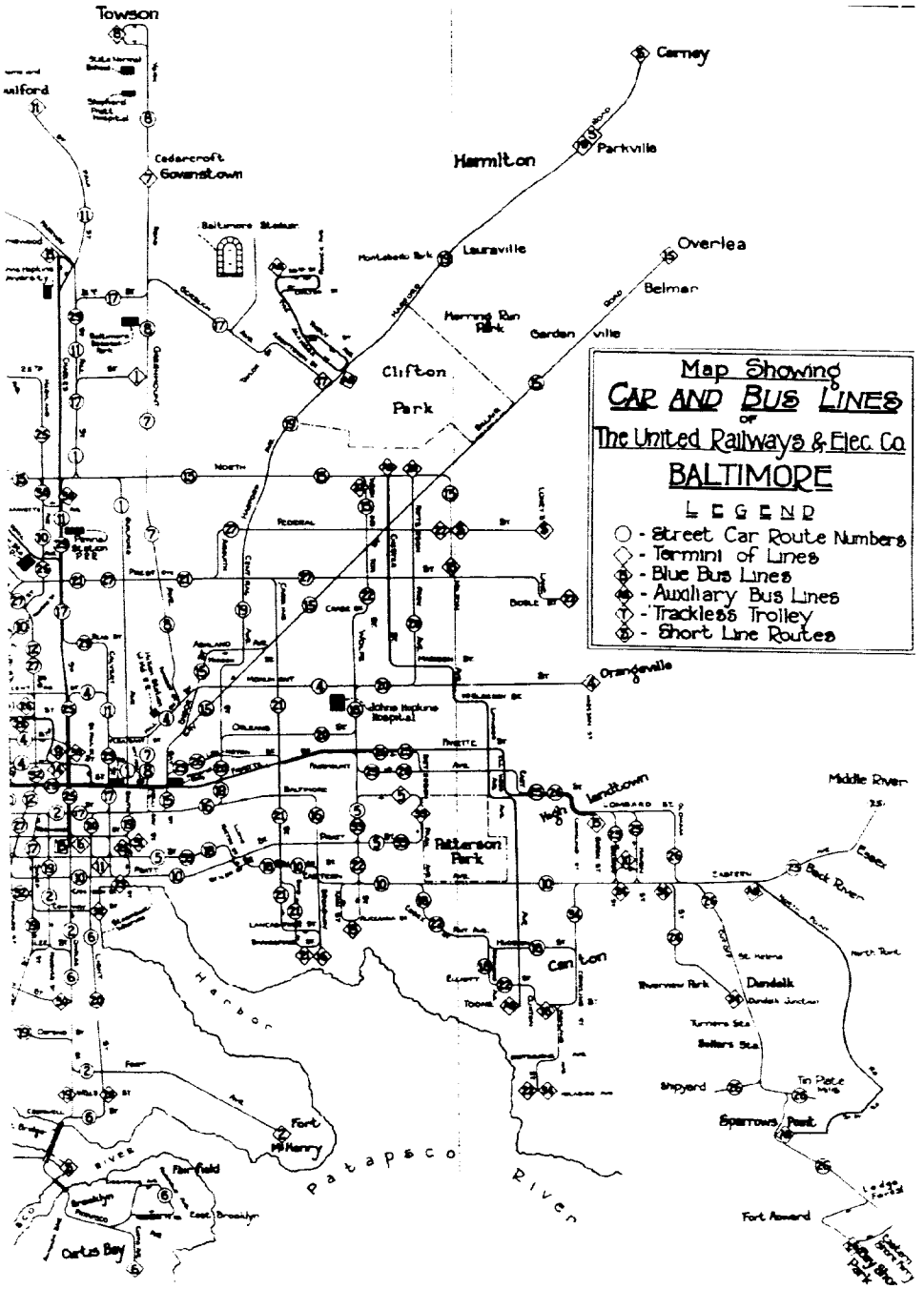
Baltimore City once was oriented to transit—when the early streetcar lines were laid out commercial and residential neighborhoods soon followed. Other lines conformed to existing established communities and commercial districts (see Figure 7). As Baltimore grew over time, the transportation infrastructure did not keep pace. Residential areas became disconnected from businesses and shopping. Baltimore could once again be considered a TOD place, but it lacks a functional transportation network to support the title.

One barrier to becoming transit oriented is the lack of connection of the light rail line to the Metro line and the configuration of the Metro line itself. Both factors leave the city very poorly accessible to a great percentage of city inhabitants. Other obstacles include the dwindling of funds to support new transportation construction, the reduced population in the city due to people moving to the suburbs, and the perception that the city is unsafe due to the volume of crime and drug activity. Clearly, the situation is multifaceted and will require bold approaches to broadening the availability of transit opportunities.

One positive attribute regarding Baltimore is its proximity to the "Megalopolis" of Boston, New York, Philadelphia, and Washington, D.C. Baltimore has a convenient locus along the Megalopolis spine of railroads, ports, and super highways. Access to and from Baltimore to other regions via transportation is very easy and convenient. The problem is not the connectivity to the surrounding regions, but rather the city's inter-connectivity (Hall, 2001). Another positive attribute to Baltimore's transportation systems is the existing radial pattern of some of the major roadways and communities found along them. In some fashion, a transit-oriented development already exists in Baltimore, but it has to be revived and put together as a whole.

In comparison to other U.S. cities, Baltimore is a relatively inexpensive place to live. The cost of housing is low enough to attract people to live in the city but commute out for work. Companies that used to be based in the City have moved to the suburbs to avoid higher taxes. The City has lost a good deal of its companies and finds it hard to attract new ones. Those who can afford to commute go out of the city while those who cannot afford to commute find it hard to secure work at all. Today's higher turnover rate for jobs creates a high turnover rate for home ownership within the city as well.

What is the next step for Baltimore? One key is to highlight the assets of Baltimore and revel in its distinct neighborhoods and commercial districts, diversity, art, architecture, food, hidden treasures, and culture. Another step is to get people out of their cars and riding transit systems.



Eastern Baltimore street car/bus system (From: 1929 Baltimore Street Railway Directory).

Figure 7. Eastern Baltimore Street Car/Bus System.

Conclusions

This research looked at the potential for a more inclusive transportation system that consists of an additional light rail line. The next steps are to further explore the conceptual designs proposed in the research and determine their feasibility as well as their true benefit to low-income groups in the city.

The overall goal of an improved transportation system is to develop an integrated, multimodal transportation system that is efficient and sustainable. To achieve this goal the following objectives must be addressed:

- Promote land use development and urban form that lead to fewer and shorter trips.
- Improve access to public transit for all citizens that is competitive with the cost and convenience of using a car for most personal travel.
- Institute planning, traffic engineering and street design practices that encourage walking and cycling.
- Incorporate strong safeguards for the protection of the natural environment.
- Institute equitable pricing and financing of transportation services.

The desired results are more people living and working in the city, intensification and mixed land use, a friendlier environment for pedestrians and cyclists, fewer cars on the road, higher transit ridership, and reduced air pollution and greenhouse gas emissions from transportation. Some of the ways to achieve these results are listed below.

- ***Introducing Alternative Transit Service.*** New types of surface transit (mini-buses, vans or shared taxis) in low-density residential neighborhoods operating in a more flexible, demand-responsive manner with a variable route, schedule and fare structure.
- ***Surface Transit Priority.*** Surface Transit Priority measures have the potential to greatly improve the attractiveness of transit as an alternative to the car. Strengthening the competitive position of transit depends somewhat on how much transit priority measures inconvenience car users. An important part of the transportation campaign should be building the case for adopting more aggressive transit priority measures in the city, particularly on light rail routes. A major reason why surface transit moves slowly, especially in congested conditions, is that transit vehicles operate on the same roads as private vehicles. Most delays happen at intersections blocked by cross-street traffic or delayed by cars turning. Over a long route, this can increase passenger travel time by 15 to 20 minutes, giving lower quality service at higher cost. Giving public transit vehicles priority at intersections by, for example, in the case of light rail routes prohibiting left turns by cars and trucks, would clearly frustrate non-transit users. Similarly, the dedication of truly exclusive transit lanes would usually require the removal of on-street parking. Therefore, we need to demonstrate that the benefits of higher transit ridership and lower transit costs justify/offset the cost and inconvenience imposed on other road users. If the response to more riders is better and more frequent service, this will attract even more riders and so the virtuous cycle continues. Transit priority is the key to sustaining this cycle under conditions of increasing road congestion.
- ***Integrating Transit.*** To ensure that the transit system becomes more competitive with the automobile, better integration is needed among transit service providers. Transfer schedules need to be coordinated. Likewise, hours and frequency of service need to match user needs.
- ***Increasing Cycling and Pedestrian Comfort.*** A bicycle transportation infrastructure needs to be developed throughout the city through a network of on-street bicycle routes and lanes as well as through the existing and proposed greenway systems. Walking is a part of almost every trip. Many of our present pedestrian environments and networks are challenged by increasing car and truck volumes, not only in terms of space devoted to sidewalks and civic spaces, but also in terms of quality of interaction and exchange. Higher levels of pollution and noise impinge on the social and economic benefits of lively pedestrian environments. Baltimore needs to retain is walkable areas and increase walkability in other areas.

- ***Improving Safety and Accessibility.*** Improving transportation facilities also means creating a safer system and greater accessibility for people with disabilities, seniors or those without the option of using a car. Public transit, walking and cycling are inherently safer than the car and require less space for the movement, servicing and storage of vehicles.
- ***Better Use of Roads.*** Without many opportunities to expand the City's arterial road system, there must be a change in the way roads are used. Emphasis should be placed on moving people instead of cars. Baltimore already has the road capacity it needs. The problem is that most of the passenger vehicles on it are three-quarters empty! In peak periods, the average car occupancy rate is around 1.2 persons, which means, roughly, that every 100 cars on the road carry 120 people and over 300 empty seats.

A Sustainable Transportation System for Baltimore City

How can an integrated, multi-modal transportation system fit into the concepts of sustainability and of livable communities? Baltimore cannot achieve sustainable, livable communities without first establishing an integrated, multi-modal transportation system. Urban sprawl has created traffic congestion, and Americans are losing billions of dollars every year in lost productivity from sitting in traffic (www.livablecommunities.gov). In contrast, community development centered around a highly efficient transportation system will place jobs, commercial areas, parks, civic uses, and most housing within walking distance of transit stops. The expanded transportation choices that an integrated multi-modal transportation system will provide will enhance mobility, economic competitiveness, and quality of life in Baltimore.

The American Public Transit Association engaged in yearlong discussions in 1995 to envision public transit in sustainable, livable communities and to devise strategic goals and actions for making the concept of sustainable community a reality (www.apta.com). The Association's vision of transit-oriented developments on a national level parallels our understanding of how an integrated, multi-modal transportation system will make Baltimore a great place to live.

Compact transit-oriented development is basic to sustainable, livable communities first because it is more cost effective. It makes good use of existing infrastructure, eases traffic congestion, saves commuting time, cuts urban air pollution, and improves energy-efficiency. An integrated, multi-modal transportation system in a sustainable community will have full cost accounting and pricing mechanisms to give accurate information on the real costs of transportation and development choices. An advanced transit system offers on time, point-to-point service that automobiles offered in the past. Complete information about schedules, routes and fares is available instantaneously, anywhere.

A less intrusive, but more coherent government role is essential for creating such a system. Transportation planning needs to be integrated with land use planning, environmental quality, and inner city revitalization where private developers and businesses will work within a new framework of "rules" to promote sustainable, livable communities.

Transit-oriented development supports sustainability because it offers much wider choices of housing types, densities and costs than the conventional suburbs. Affordable housing in close proximity to Baltimore's jobs is the key to breaking up the concentrations of people living in poverty in the cheapest, most deteriorating housing in Baltimore's center.

The Clinton-Gore Administration put forth a Livable Communities Initiative, that included a comprehensive package of incentives to expand the transportation choices available to communities (www.livablecommunities.gov). These incentives, which included the federal budget, the tax code,

credit programs and investments in technology, could help and support Baltimore in achieving its goal to provide an integrated, multi-modal transportation system.

Several implementation strategies for developing multi-modal transportation systems follow. According to the APTA's Strategic Goals for 21st Century, the following strategies will ensure a viable transportation system.

- Build on principles of ISTEA (Intermodal Surface Transportation Efficiency Act):
  - Reauthorize ISTEA and align transportation planning at every government level with its principles and policy goals;
  - Build closer connection between planning for transportation, land use, air quality, and other environmental issues;
  - Strengthen regional, intermodal approaches to transportation planning to assure balanced development and interlinking of all modes of transportation in a region for convenience and economic efficiency; and
  - Increase access and mobility options for all by providing public transit and other alternatives to single occupancy vehicle travel.
- Strengthen regional and metropolitan planning and decision-making:
  - Empower Metropolitan Planning Organizations as the primary transportation planning body for metropolitan areas and regions, ensuring they have the resources and authority to function effectively.
- Shift toward true cost pricing:
  - Speed the development of software tools to help local officials assess the full costs of alternative patterns of development; in particular, develop computer models to help local officials assess the transportation efficiency, congestion... environmental impacts...;
  - Change federal tax policy to provide the same tax treatment for employee benefits for transit... and other alternatives to driving as for employee parking; and
  - Adopt the principle of "Pay For What You Use" so that drivers pay the true costs of vehicle use...
- Provide creative leadership through partnerships:
  Within the transit industry, create partnerships dedicated to industry modernization, that encourage transit industry leaders to:
  - Expand our transit advocacy efforts to include advocacy of a "Sustainable America" in which transit and transit-oriented development play an important role;
  - Approach transit as an entrepreneurial business as well as a public service;
  - Update fundamental assumptions (e.g. most trips are NOT home-to-work);
  - Expand our views of who our potential customers are and the range of services we can provide;
  - Develop and embrace new transit technologies, and reach an agreement on industry standards for new equipment;
  - Create new criteria for tomorrow's transit industry leaders; and
- Cooperate more effectively with other agencies, MPOs, and state DOTs.

One Smart Growth program that is particularly supportive of this research effort is the *Smart Growth Transit Program*. This program provides funds to stimulate private investment adjacent to major transit facilities. The goal is to create high density, mixed-use pedestrian development that promotes efficient land use and increases transit ridership. There is also an incentive program that allows employers to provide up to $65 per employee per month in discounted tax-free transit benefits.

The provision of such a system in Baltimore City will require a change in perceptions of who should be served and who should have access to economic opportunities. Without this change in mindset, TOD principles and the supportive Federal initiatives will not be effective in providing a system that serves a wider range of socioeconomic groups.

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APPENDICES

Appendix A: Proposed Light Rail Routes

Appendix B: Baltimore City Integrated Multimodal Transportation Hubs

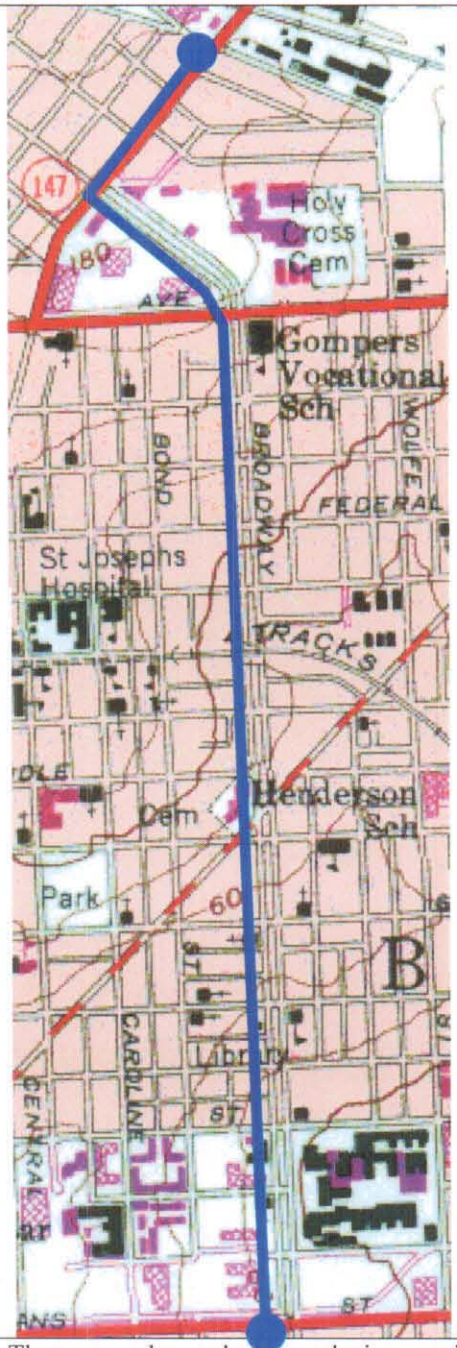
APPENDIX A: PROPOSED LIGHT RAIL CORRIDORS

During Spring 2001, comprehensive inventories and analyses were conducted for four selected corridors. The inventory/analysis along these potential corridors included: existing street configurations, population centers, levels of community cohesion, social/cultural components, density and types of businesses, number of jobs within one-half mile radius of potential light rail stops, age and health of existing street trees, among other factors.

Opportunities and Constraints Relevant to All Proposed Routes

Economic impacts on the communities would be positive around proposed transit centers and as a result of the accompanying proposed redevelopment and potential increased business activity upon completion of the system. During construction, there may be adverse impacts due to loss of parking, traffic congestion, reduced attractiveness of businesses, and reduced ease of access of delivery vehicles.

Short-term impacts associated with the construction of a light rail corridor would be dust, noise, traffic disruptions due to construction vehicles, detours around the site, loss of traffic lanes, loss of parking spaces, and interference with pedestrian circulation. Potential long-term impacts could be the visual presence of the light rail. If not properly designed and integrated into the affected communities, the light rail could be perceived as a "barrier" that divides the community and reduces community cohesiveness.

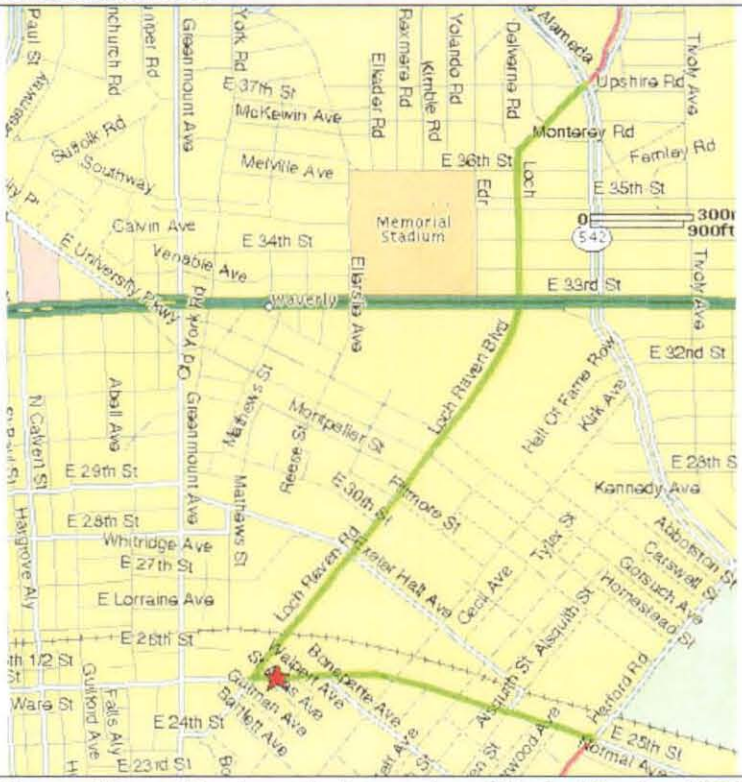
ALTERNATIVE ROUTE 1	**Broadway (at Orleans) north to Harford Road, then northeast on Harford Road to 25th Street**
Map	
Description	The proposed route begins at the intersection of Broadway and Orleans Street. The route travels north on Broadway to Harford Road. At Harford Road, it turns northeast and continues along Harford Road to 25th Street, where Rte. 1 ends. Most of the route is residential with some commercial and community links. The condition of many of the row homes are poor and about 40% of the homes are vacant. There are also a number of vacant lots where housing has been removed; the lots are overgrown with vegetation and are being used for dumping. Revitalization efforts are being made by various organizations to take back some of the vacant lots. Some of the homes are part of the city's Department of Housing and Urban Development (HUD) project, and The Washington Hill Co-op has

ALTERNATIVE ROUTE 1	**Broadway (at Orleans) north to Harford Road, then northeast on Harford Road to 25th Street**
	reclaimed most of the homes in a one-block area between Eager Street and Chase Street. The center median is the only real open space for the residents. Recently the median was redesigned and new trees were planted.
Existing Public Transportation Routes	Metro: The Metro travels east to west between Owings Mills and Johns Hopkins Hospital including stops at major destinations downtown. The Johns Hopkins station has two entrances within our study area, one on Broadway between Orleans Street and Madison Street, and the second on Broadway between Madison Street and Monument Street. Bus: The following bus lines travel on or intersect the streets within the study area. • Bus No. 15, running between Perry Hall and Security Square Mall, travels on Broadway from Eager Street to Preston Street. • Bus No. 5, running between Cedonia and Mondawmin Metro station, has a number of different routes it travels: o Johns Hopkins, which travels on Madison Street (one-way west) o Johns Hopkins, which travels on Monument Street (one-way east) o Cedonia, which travels on Biddle Street (one-way east) o Cedonia, which travels on Preston Street (one-way west) o Express, which travels on Federal Street during peak hours only. • Bus No. 13, running between Canton and Walbrook Junction, travels on North Avenue. • Bus No. 19, running between Carney and State Center, travels on Harford Road. • Bus No. 22, running between Bayview Medical Center, Mondawmin Metro Station and Curtis & Spruce, travels on Harford Road. • Bus No. 35, running between White Marsh and the University of Maryland Transit Center has two different routes it travels: o White Marsh, which travels on Monument Street (one-way east) o U. Maryland, which travels on Madison Street (one-way west) • Bus No. 120 Commuter Line, running between White Marsh, Downtown and Johns Hopkins, travels on Monument Street. • Bus No. 160 Commuter Line, running between Essex, Downtown and Hopkins, travels on Monument Street. • Bus No. 420 Commuter Lines, running between Havre de Grace, Downtown, and Hopkins, travels on Monument Street.
Problematic Intersections and Conditions	1. The Train bridge over Broadway has a 12-foot clearance height and will pose a problem for the light rail overhead lines.  Train bridge looking north on Broadway. 2. North Avenue is a major east/west connection for vehicular traffic and pedestrian traffic. Building functions and activities located on the intersection include Harford Heights Elementary School with a church behind it on the northeast corner. The *Blacks in Wax Museum* is located on the southwest corner. A Stop Shop & Save grocery store is located

ALTERNATIVE ROUTE 1	**Broadway (at Orleans) north to Harford Road, then northeast on Harford Road to 25th Street**
	on the northwest corner, and a vacant apartment building, with positive architectural features, is located on the southeast corner. The size of the center median varies from 30 feet on the side north of North Avenue to 50 feet on the side south of North Avenue.  Intersection of Broadway and North Avenue. 3. At Broadway and Harford Road the route takes a sharp right turn. Intersection activities include a gas station, with a vacant building and Laundromat behind it on the southeast corner. A corner store and residents are located on the northeast corner. A bank is located on the northwest corner. A Wendy's and the East Side District Court is located on the southwest corner.  Intersection of Broadway and Harford Road. 4. Harford Road and 25th Street is another intersection has high volumes of vehicular and pedestrian traffic. ***Route 2*** takes a left turn from Harford to 25th, and ***Route 5*** travels straight. Intersection activities include a gas station on the southwest corner. Another gas station is located on the northwest corner. A check-cashing store is located on the southeast corner, and residential housing is located on the northeast corner.  Intersection of Harford Road and 25th Street looking southwest on Harford Road.
Neighborhoods	Somerset Homes, Dunbar, Gay Street, Middle East, Oliver, Broadway East, South Clifton

ALTERNATIVE ROUTE 1	**Broadway (at Orleans) north to Harford Road, then northeast on Harford Road to 25th Street**
	Park, East Baltimore Midway, Darley Park, Coldstream-Homestead-Montebello, and Belair-Edison.
Predominant Land Use	Most of the corridor is residential, with some mixed use throughout.
Schools and Other Institutions	**Schools:** Harford Heights Elementary at Broadway and North Avenue; Christian School at Broadway and Gay Street; and Male/Female Primary, and affiliate of Kennedy Krieger Institute is located on Ashland Avenue. **Institutions:** Enoch Pratt Library at Broadway and Orleans, Johns Hopkins Hospital on Broadway between Orleans and Monument, Kennedy Krieger Institution on Broadway between Monument to Madison, *Blacks In Wax Museum* on Broadway and North Avenue, The East District Court on Harford and North Avenue, Numerous Churches—at Broadway and Miller, Broadway and Chase, Broadway and Biddle, Broadway and Hoffman, Broadway and Eager, Broadway and North Avenue, and Harford Road before 25th Street.
Commercial Areas	The majority of the study area is residential, however there are some businesses located along Broadway and Harford Road. **Broadway:** (below North Avenue) A Successful restaurant/carry out on Monument Street; Carry out and Liquor Store on Eager Street; Eye Care store on Chase Street; Liquor/convenient store on Preston Street. Bar/Lounge on Oliver Street; (Above North Avenue to Harford Road); Stop Shop & Save Grocery Store; McDonalds; Laundromat; East District Court House; Gas Station. **Harford Road:** (Between Broadway and 25th Street) This area consists of row houses where some of the first floors have been converted into businesses. Convenience Stores; Barber Shop; Beauty Salon/Supplies; Liquor Store; Check Cashing Store; Various clothing vendors; and two gas stations on the corner of 25th and Harford Road.
Vegetation	Broadway has a 50-foot vegetative central median below North Avenue, and a 30-foot central median above North Avenue from North Avenue to Harford Road. There are many newly planted trees along the medians, and there are many mature street trees that range from good to fair condition. Recently the city redesigned the median below North Avenue to create an inviting community space that is well lit. Most of the residents and passers by use the space to cut through. We witnessed a few people sitting on the benches in the center, and a few people talking to other people in the center. Next to the Amtrak Bridge someone has tied a tire to a tree in attempt to make a swing. There are no playgrounds within the study area.
Parking	Broadway between Orleans and Monument: Permanent parking is not allowed because of the Johns Hopkins Hospital. There is a garage for hospital parking on the east and west sides. Broadway between Monument and Madison: There is parking for Kennedy Krieger Hospital on both sides of the street leaving one narrow lane that serves to slow down traffic. There are surface lots north of the hospital and directly across the street. Broadway between Madison and North Avenue: There is street parking on the east and west sides. The travel lanes are oversized so when a car is parked there is a lane and a half left for passing traffic. Broadway between North Avenue and Harford Road: Street parking is restricted at certain times. There are surface parking lots adjacent to the street for the surrounding businesses and the courthouse. Harford Road between Broadway and 25th: There is street parking on both sides of the road. Traffic traveling northeast has two lanes in addition to the lane used for parking. Traffic traveling southwest has one lane in addition to the lane used for parking.
Final Analysis	Creating a major northeast transit link traveling up Broadway will not only offer

ALTERNATIVE ROUTE 1	**Broadway (at Orleans) north to Harford Road, then northeast on Harford Road to 25th Street**
	opportunities for connections with the existing transportation network, it will also benefit the community in the following ways: 1. Increased access to small business, which will promote economic growth. 2. Improved access to major destinations for residents, which can be promoted as an amenity for buying homes and living in the adjacent neighborhoods. 3. Service underrepresented groups.

ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**
Map	
Description	Proposed Route 2 begins at the intersection of Harford Road and 25th Street. The route travels west on E. 25th to Loch Raven and turns north on Loch Raven, extending to The Alameda. The route along E. 25th Street is commercial. On Loch Raven between 25th and Fillmore the route is also commercial. Between Fillmore and Gorsuch, rowhouses exist in fairly poor condition with three vacant houses on the east side of the road. A day care and a confectionary store occupy two of the rowhouses. After Gorsuch a small block of well-kept rowhouses exist on the west side of Loch Raven. Baltimore City College, Johns Hopkins at Eastern, and Abbottson Elementary School lie north of these rowhouses until 33rd. Single family houses exist on Loch Raven between 33rd and The Alameda. The neighborhood becomes very well kept in this area, and while no street trees exist, the trees from the side yards are large mature trees stretching out over the road.
Existing Public Transportation Routes	The route along 25th Street and Loch Raven Boulevard is not well serviced by existing bus routes. Several bus routes intersect this proposed light rail route: • Harford Road/25th • Kirk Ave./25th • 33rd St./Loch Raven • 36th St./Loch Raven • The Alameda/Loch Raven, where the bus route then follows Loch Raven to the north. A lack of bus service exists in the Harwood and Better Waverly neighborhoods along 25th and Loch Raven between Harford Rd. and The Alameda.
Conditions	**Section A:** 25th Street from Harford Road to Kirk Ave. This section of 25th Street has a total of five lanes, each 10 ft. wide, with the center lane serving as a turning island to access the businesses. On the north side is a 12-ft concrete sidewalk with a total right-of-way distance of 25 ft. The right-of-way on the south side varies from business to business. Electrical poles are situated right next to the curb for the extent of the section.

ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**

Section A. 25th Street looking west from Harford Road.

Section A. Sidewalk and electrical poles.

Section B: 25th Street from Kirk Avenue to Loch Raven. This section has the same five lanes and width, but the right-of-way on the north side narrows to 14 ft. On the south side the right-of-way generally widens, but still differs from business to business.

Section B. Sidewalk on north side of 25th Street.

Section C: Loch Raven from 25th Street to Gorsuch Avenue. This section has a total of four lanes with a total width of 52 feet. Two lanes run in either direction. The inside lanes are 9 ft. wide and the outside lanes are 18ft. wide. The right-of-way on either side is 5 ft. wide, and consists of concrete sidewalks. At rush hour this area of Loch Raven is heavily traveled. Businesses exist until Fillmore Street. Three rowhouses exist between Fillmore and Montpelier on the west side of Loch Raven, followed by a vacant lot with a large billboard. On the east side after Fillmore Street at 3123 Loch Raven are some single family homes of rowhouse size, two of which are vacant. On a Sunday several big rigs and trailers were parked on either side of Loch Raven between Exeter Hall and Fillmore Street. On a Wednesday one trailer still remained. A few cars were parked near Homestead Street on Sunday, but the parking regulation signs are missing from their poles.

Section C. Loch Raven looking north to the railroad bridge.

Section C. Trailer parked on Loch Raven outside Cloverland.

ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**
	 Section C has some residential areas in poor condition. Here parking signs are missing from poles. **Section D:** Loch Raven Road from Gorsuch Avenue to 33rd Street. The road conditions of Section D are the same as section C—two lanes in either direction with the outside lanes double wide. Some well-kept rowhouses exist on the west side of Loch Raven after Gorsuch in the 3200 block. Loch Raven is lined with mature trees in this section, with a double row of trees on the west side.  Section D. Loch Raven becomes very well kept around this school area between Gorsuch and 33rd. **Section E:** Loch Raven from 33rd Street to The Alameda. The number and width of lanes remains the same as Section D. This section changes considerably from the previous sections in that it is entirely a residential area, consisting of single family homes in very good condition. The right-of-way on either side is no greater than 6 ft., with a 3 ft. concrete sidewalk. While no street trees exist, the trees from yards are close to the road and their canopies spread out over the road, giving the feel of street trees.
Problematic Intersections and Conditions	Several intersections were deemed as potentially difficult for accommodating a light rail line. 25th Street and Loch Raven: The turn from 25th Street onto Loch Raven Boulevard is sharp. The building in Figure 2 could be relocated to accommodate the required 50-ft turning radius for the light rail.

ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**

Storage building on northeast corner of intersection of 25th Street and Loch Raven.

The height of the CSX train bridge on Loch Raven is 14.25 ft and would need to be modified to accommodate a light rail train passing under it. Alternatively, the street could be excavated to increase the distance from road level to bridge.

The width of the street is 18 ft. excluding the sidewalk. The light rail would need to take one of the two street lanes in either direction, or the traffic could follow the light rail under the bridge instead of traveling next to it.

CSX train bridge with 14.25 ft clearance on Loch Raven between 25th and Exeter Hall.

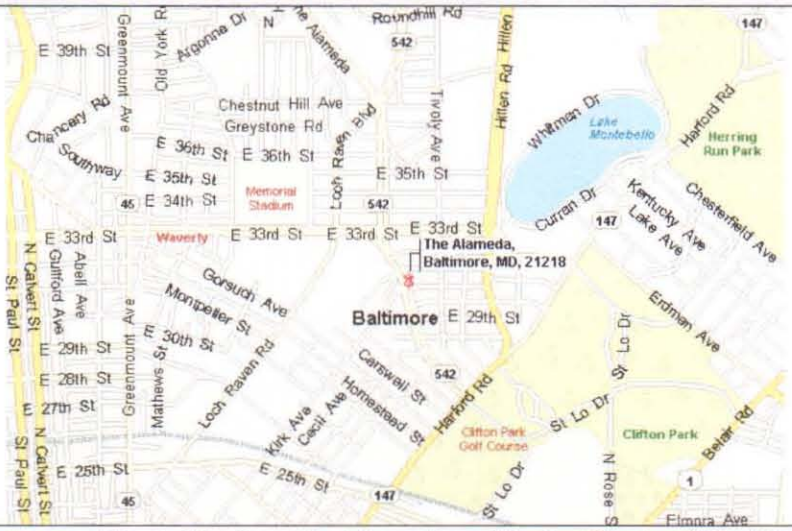
Loch Raven—Alameda intersection:
Three streets meet at this intersection, Loch Raven, Alameda and Upshire Road. Upshire Road has a low traffic volume, the others high. Traveling south on Loch Raven, the road widens into four southbound lanes just before this intersection. The two most left lanes turn onto The Alameda.

Looking north on Loch Raven to where southbound lanes split into two sections.

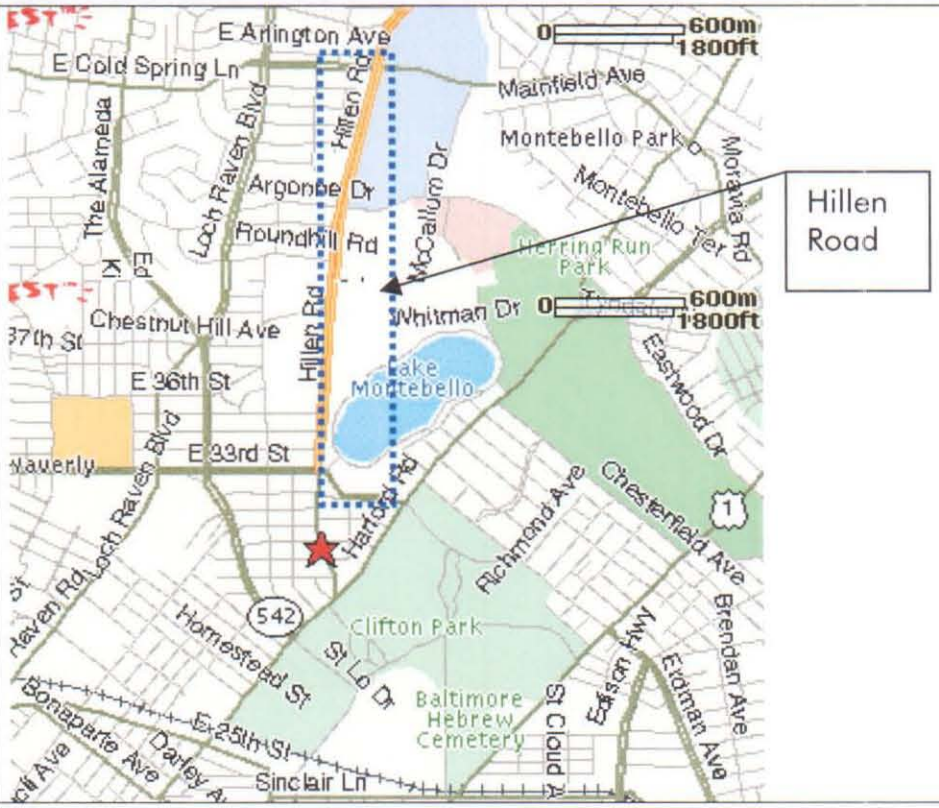
ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**
Neighborhoods	Darley Park, Harwood, Better Waverly, Ednor Gardens and Lakeside. While website profiles of these neighborhoods are positively biased due to their real estate connections, useful information can be found such as neighborhood association contact names and telephone numbers (www.livebaltimore.com/neighbor).
Predominate Land Use	According to the 1997 Maryland Office of Planning's Land Use Digital Map, all these neighborhoods are high-density residential areas (from a possible low, medium and high density category).
Schools and Other Institutions	Schools: Abbotson Elementary School No. 420 on Loch Raven and Exeter Hall, Baltimore City College on Loch Raven and 33rd, Johns Hopkins University Annex at Eastern on Loch Raven and 33rd, Mergenthaler Technical School on Hillen Road (approximately four blocks from the route). Institutions: A post office on the corner of Loch Raven and Fillmore, Baltimore Association for Retarded Citizens on Loch Raven and Fillmore, and the Department of Veterans' Affairs Rehabilitation Center on Loch Raven and The Alameda.
Commercial Areas	The route along 25th Street between Harford Road and Loch Raven is all commercial use. Businesses include: eleven automotive related, four gas stations/car wash, and four light industries. Other businesses include: a healthcare facility, bank, restaurant, two convenience stores, liquor store and a fire station. The Loch Raven portion between 25th Street and The Alameda consists of seven light industry businesses, two offices and a corner store. The following businesses are land uses Are found along 25th Street: <u>25th Street/Harford Rd. to Kirk:</u> S/E side of the street: Clifton Car Care and Repair; unnamed garage; General Auto Parts; King's Uniforms (1209); Electrical Tool and Machinery; Maryland Brake and Alignment; Josef's Auto Body (1123); Mirror Image Auto Body; vacant building for lease (1101); vacant lot (fenced); Dryer's Carry Out/Lottery/Liquors; 901 Broadway Services, Inc.; Personnel Services; large asphalt parking lot; Baltimore City Fire Dept. (Cecil/25th); and 7-11 (on Kirk). N/W side of the street: Exxon gas station; vacant gas station; Uniforms Premier Manufacturing (1212); Frick Bros. Roofing; C & T Transportation (1120); 25th St. Motors; Gambro Health Care; Housing Authority of Baltimore City Plant Operations Facility (HCD) (910); Property Management Maintenance (900); Vacant (Josef's) (900) <u>25th Street/Kirk to Loch Raven:</u> S/E side of the street: Johnson's Medical Center (721); Miller Bros. Auto Body (711); Marantha Apostilic Temple (701); Ferguson Corp. Automotive Equipment (659); L & M Automotive Inc.; W & W Body and Fender; General Auto Glass (601) N/W side of the street: Allfirst Bank; Baltimore Betting Company (766); American Oxygen Service); Mobile Gas Station; Baltimore Hydrolics (708); The Electric Motor Repair Co. (700); M&G Aramture and Generator Service (612); unnamed garage (600). <u>Loch Raven/25th to Gorsuch Street</u> S/E side of the street: Oles (2510); Carroll Independent Fuel Co.; Triple C Wholesalers (2728); Dixie Sand and Mig Co.; Martin Screen Printing (2740); Schrader Electric Co. (2824); BARC (2828); Gill-Simpson Inc. (2834); Air and Hydrolic Equipment; 3 new houses between Fillmore and Montpelier; vacant lot with billboard; Bunny Love Day Care; and residence (3116). N/W side of the street: unnamed garages; Nino's Fresh Pizza Dough (2525); Cloveraland; Mobile home unnamed; USPS parking lot; Vacant house; two vacant houses (3023).

ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**
	Homestead to Gorsuch Street S/E side of the street: JCM. N/W side of the street: Confectionary Store; residence. Gorusch to 33rd Street S/E side of the street: row homes well kept (3200-3212). N/W side of the street: school.
Vegetation	Section A: 25th Street from Harford Road to Kirk Avenue. Mature Bradford Pear trees in fair condition exist on the north side of the road two blocks west of Harford Road. A turf strip exists between the road and the sidewalk on the north side throughout this section. Section B: 25th Street from Kirk Avenue to Loch Raven Road. Bradford Pear trees are scattered throughout this section on the north and the south sides. There is no turf strip. Section C: Loch Raven Road from 25th Street to Gorsuch Avenue. No street trees exist in this section. There is a turf strip outside Cloverland as pictured in Figure 5. Section D: Loch Raven Road from Gorsuch Avenue to 33rd Street. Large mature trees in fair condition exist on both sides in a turf strip between the road and sidewalk. Section E: From 33rd going north there is a green strip for one block, then sidewalk only until the Alameda intersection. The trees from house yards are large enough and close enough to the road to create the feel of street trees as their canopies stretch across Loch Raven Road.
Parking	Section A: No parking for first half block from Harford going west on 25th. Non-metered parking then exists between drives until Kirk Ave. Section B: Two-hour metered parking on north side of 25th. Four-hour metered parking on south side of 25th. Section C: No parking until approximately one block north of the railroad underpass. Truck loading zones then exist between the hours of 8 a.m. and 6 p.m. on both sides of the street. Section D: Weekend parking only on both sides of the street. No parking along school boundaries. Section E: No parking northbound. Parking southbound between Alameda and Delverne.
Final Analysis	Several benefits can be seen to implementing the light rail corridor along Route Two, at least between Harford Road and 33rd Street. 25th Street between Harford Road and Loch Raven Road is a high-use commercial area containing at least two businesses with large numbers of employees, Fick Roofing Co. and Cloverland. Many automotive repair businesses lie along the route, which could potentially benefit from a light rail, in that their customers could drop off vehicles and continue to other destinations. Services such as the Healthcare facility could definitely benefit from a light rail running past their door. The surrounding neighborhoods have high density populations with rowhouses. These neighborhoods could potentially benefit from the light rail to access a wider range of employers and services. The physical attributes of Route Two could support the implementation of a light rail. The street width is adequate to accommodate the light rail at 30 ft. in either direction. The existing parking is not extensive enough to create a negative impact if it was eliminated. The vegetation along 25th Street and the lower portion of Loch Raven is minimal or non-

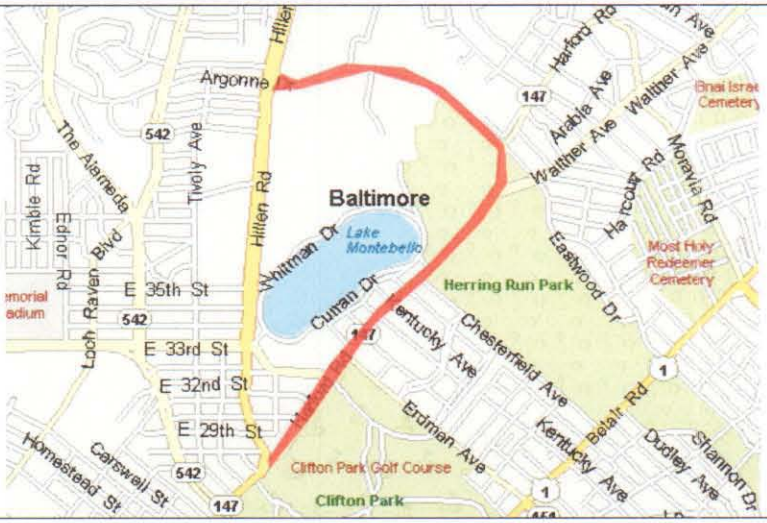
ALTERNATIVE ROUTE 2	**25th Street (at Harford Road) west to Loch Raven Boulevard, then north to The Alameda**
	existing. The visual impact would be minimal if any of this vegetation were to be removed. The last two blocks of Loch Raven before 33rd Street has established street trees in good condition, and if possible, should be left undisturbed so as not to affect the appearance outside the existing schools in this area. The lack of bus service in the Harwood and Better Waverly neighborhoods along 25th and Loch Raven between Harford Road and The Alameda would require extended bus routes to be implemented to provide easier access to the light rail. Many residents however, do live within walking distance of the corridor.

ALTERNATIVE ROUTE 3	The Alameda between Harford Road and Loch Raven Boulevard
Map	
Description	Proposed Route 3 begins at the intersection of Harford Road and The Alameda. The route travels northwest and extends to Loch Raven Boulevard. The route is mainly residential, with 6 churches and 2 small businesses. From 33rd Street to Harford Road are rowhouses. North of 33rd Street are single family homes with front yards. The homes between 33rd and Kirk Avenue have lawns, and there is a grassy strip between the sidewalk and the street. Between Kirk and 29th Street, the front yards become smaller and the grassy strip remains. Between 29th and Harford Road, the lawns become nonexistent, there is no grass between the sidewalk and the street, the sidewalks are wider (due to lack of lawn), and there are several vacant/boarded-up houses. Along the entire route is a 36-ft. wide median strip with turf and a double row of trees.
Existing Public Transportation Routes	The proposed route along The Alameda runs along the existing bus route, which would provide easy access to and from the light rail.
Problematic Intersections and Conditions	The Alameda and Loch Raven: There are three roads coming together at this intersection (Loch Raven, The Alameda, and Upshire Road), with turning lanes on Loch Raven separated by concrete medians. The Alameda and Harford: This is a busy intersection with excessive traffic. There are two lanes of traffic each way on both roads.
Neighborhoods	Ednor Gardens and Lakeside, Coldstream Homestead and Montebello.
Predominate Land Use	The Alameda route is mostly residential. According to the 1997 Maryland Office of Planning's Land Use Digital Map, all these neighborhoods are high-density residential areas (from a possible low, medium and high density category).
Schools and Other Institutions	Schools: Baltimore City College High School at 33rd and The Alameda, Mergenthaler Technical High School (on Hillen Road two blocks from the route), Lake Clifton High School at Harford and The Alameda. Institutions: Several churches at 29th and Alameda, Kirk and Alameda, 32nd and Alameda, 33rd and Alameda, 35th and Alameda
Commercial Areas	There is very little commercial use along the Alameda route. Businesses include a Dentist Office at 33rd and The Alameda and a Medical Office at 33rd and The Alameda.
Vegetation	From Harford Road to 29th Street: • Turf and mature double row of trees in median strip (36 feet wide) • Mature Bradford pears lining sidewalks • No green space or lawns lining sidewalks—concrete from stairs at residence to curb.

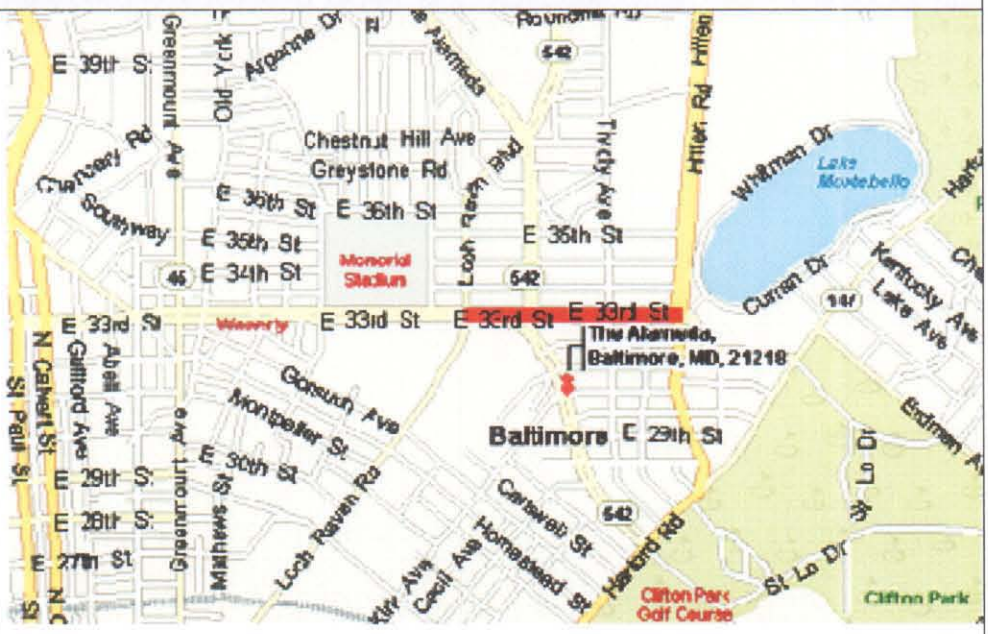
ALTERNATIVE ROUTE 3	The Alameda between Harford Road and Loch Raven Boulevard
	From 29th to Kirk Avenue: • Small grassy front yards • Green strip between curb and sidewalk • Turf and mature double row of trees in median strip (36 feet wide) • Mature Bradford pears lining sidewalks. From Kirk Avenue to 33rd: • Medium sized front yards • Green strip between curb and sidewalk • Turf and mature double row of trees in median strip (36 feet wide) • Mature Bradford pears lining sidewalks From 33rd to Loch Raven: • Large front lawns • Turf and double row of trees in median strip (36 feet wide). Trees in median strip are mature, but in poorer condition than above. • Green strip between curb and sidewalk • Mature Bradford pears lining sidewalks • At the intersection of Alameda and Monterey: there is a large planting of bulbs and an extra median strip around a small memorial.  Median on Alameda looking east.
Parking	Parallel parking is allowed on both sides of the street from Harford Road to 33rd Street, but not along the median. North of 33rd, there is no parking on The Alameda.
Final Analysis	While the median strip that runs through this entire route is not used as a public open space, it remains the only green space south of 33rd Street. In this area there are very few lawns or other green spaces. The intersection at The Alameda and 33rd Street is critical: there is a school, a church, and two medical offices. If this route were chosen for a light rail corridor, 33rd Street would be a natural place for a stop.

ALTERNATIVE ROUTE 4	**Hillen Road between Harford Road and Argonne Drive.**
Map	
Description	Apart from a small commercial area at the junction of Harford and Hillen roads, this area is residential, or occupied by institutions. The street is wide and contains a 20-ft. median strip for most of the route.
Existing Public Transportation Routes	• No. 19 runs along Harford Road (bus stop on the junction of Hillen and Harford roads) • No. 33 runs along Argonne Drive and then continues on Hillen Road up to Cold Spring Lane (bus stop on the junction of Argonne Drive and Hillen Road)
Problematic Intersections and Conditions	The junction of Hillen Road and Harford Road is a major junction where three roads come together at odd angles.
Neighborhoods	Ednor Gardens and Lakeside, Coldstream Homestead and Montebello.
Predominate Land Use	The neighborhoods along Hillen Road are mostly residential. There is a small commercial area at the junction of Hillen and Harford roads. According to the 1997 Maryland Office of Planning's Land Use Digital Map, all of the neighborhoods in the area are high-density residential areas.
Schools and Other Institutions	Schools: Morgan State University (at the junction of Argonne Drive and Hillen Road), Mergenthaler Technical High School (on Hillen Road two blocks from the route). Institutions: a church office building at the junction of Hillen and Harford roads, a church at the junction of 30th Street and Hillen Road, and the Baltimore City Water Treatment Facility.
Commercial Areas	There is very little commercial development along Hillen Road. Businesses include: "Baba Jani" food market at the junction of Hillen Road and Harford Road, H&H Liquors opposite from the food market.

ALTERNATIVE ROUTE 4	**Hillen Road between Harford Road and Argonne Drive.**
	 Commercial area at the junction of Hillen and Harford Roads.
Vegetation	From Harford Road to 30th Street: • Clifton Park at the junction of Hillen Road and Harford (located to the west of Harford Road) • Lawn strips and few trees that are in a poor condition • No green space lining sidewalks. From 30th Street to 33rd Street • Green front yards rich in planting • Community garden at the junction of 33rd Street and Hillen Road From 33rd to Argonne Drive • Turf and double row of trees in median strip (20 ft. wide). The median has few trees and some of them are in poor condition. • Bulb plantings can be seen at some locations on the median.  Community Park at the junction of 33rd Street and Hillen Road.  Hillen Road at the junction of Argonne Drive looking North.
Parking	Parallel parking on both sides of the road on Hillen Road (between Harford and 30th Street); a parking lot at the junction of Hillen and Harford road; and parallel parking after 4 p.m. on Hillen Road between 33rd Street to Argonne Drive.
Final Analysis	Hillen Road has ample width to accommodate a light rail line. The disturbance to communities would be minimal since 75% of the route is institutional land. While numbers of residents gaining direct access to the rail line would not be as high as other routes, the numbers benefiting from access to the two schools on this route would be high.

ALTERNATIVE ROUTE 5	**From the intersection at Harford and Hillen go north to the intersection of Harford and Argonne. Left onto Argonne to the intersection of Argonne and Hillen**
Map	
Existing Public Transportation Routes	The entire route is serviced by one continuous bus line.
Problematic Intersections and Conditions	Harford Road goes over a bridge that would make it difficult to accommodate four lanes of traffic and a light rail line.  Bridge on Harford looking north. The intersection of Harford and Argonne should not be a problem for a light rail to make a 50-ft. radius turn.  Looking west at the intersection of Harford and Argonne. The most difficult section of this route is the bridge on Harford; it is not possible to accommodate four lanes of traffic and a light rail on the bridge.

ALTERNATIVE ROUTE 5	**From the intersection at Harford and Hillen go north to the intersection of Harford and Argonne. Left onto Argonne to the intersection of Argonne and Hillen**
	 Looking West at the bridge on Argonne.
Neighborhoods	Belair-Edison, Belair-Parkside, Mayfield Montebello, Arcadia, Lauraville, Beverly Hills.
Predominate Land Use	Residential and Open Space
Schools and Other Institutions	Schools: Saint Francis of Assisi Elementary School, Morgan State University, and Montebello Elementary. Institutions: The Clifton Park Golf course is along this route near the intersection of Harford and Hillen Roads; The Maryland Rehabilitation Center is along the route on Harford Road. A shopping center is situated at the intersection of Hillen and Argonne Parks: This route is comprised of about 50% open space. Clifton Golf Course lies along the route. There is a community garden called the Mother's Garden. Lake Montebello and Herring Run Park are visible at the intersection of Argonne and Hillen.
Commercial Areas	There is no major commercial district along this route. Just past the intersection of Harford and Argonne there are many different businesses.
Vegetation	There is very little tree coverage along the route, however, in some places trees have been replanted. The parks along the route provide much of the greenery for the area.
Parking	Parking is not allowed on most of the streets.

Alternate Route 6	33rd Street from Loch Raven Blvd. to Hillen Road
Map	
Description	This route would serve as a connector between Loch Raven Blvd. and Hillen Road. The route would then continue up Hillen Road. The large Coldstream-Homestead-Montebello community is predominantly residential in character. The neighborhood is generally composed of small and medium-sized rowhouses constructed during the first quarter of the 20th century. A number of duplexes and early frame dwellings may still be found in the west-central portion of the community. A large portion of the community is also devoted to educational use. The architectural variety of these neighborhoods makes the area unusual in Baltimore, where most neighborhoods were developed as solid row house neighborhoods or as suburbs with frame cottages of more or less uniform style. Because it was developed so early, this area today contains both types of housing next to each other. The best known structure in the area is the "Collegiate Gothic"-City College.
Existing Public Transportation Routes	33rd Street is currently served by existing bus routes 3, 22, and 86. Bus route No. 3 continues north on Loch Raven and south on Guilford Avenue. Bus route No. 22 continues west onto University Parkway. This route also continues east onto Harford Road. Bus Route No. 86 continues north on Loch Raven.
Problematic Intersections and Conditions	Loch Raven intersects with 33rd Street at a 4-way intersection served by a traffic light.  Intersection of Loch Raven and 33rd Street looking south from Loch Raven.

Alternate Route 6	33rd Street from Loch Raven Blvd. to Hillen Road
	As Loch Raven draws closer to 33rd traveling north, it curves to the left before entering the intersection. This could cause a tight turn for the rail line entering 33rd Street. As 33rd Street continues, it intersects The Alemada. At this intersection, the traffic signal poles are within the median strip and would need to be relocated in order to continue the rail line. The intersection of Loch Raven and Hillen Road proposes no problems, and provides for a wide turning radius. The road is 24.33 ft. wide on each side of the median strip. The median strip continuing along 33rd Street is approximately 39.5 ft. wide.  Median along 33rd Street.
Neighborhoods	Coldstream, Homestead, and Montebello neighborhoods. Some of the natural open space settings surrounding these neighborhoods include: Clifton Park, Lake Montebello, Abboston Park, Briscoe Park.
Predominate Land Use	The predominant land use is residential with some single family homes along the northern side of 33rd. St. There are primarily row homes along the southern end of the street.  Homes along 33rd St.
Schools and Other Institutions	Schools: Coldstream Park Elementary; Montebello Elementary; Abbottston Elementary; Baltimore City College High School; Lake Clifton/Eastern High School; Morgan State University; Johns Hopkins University; and Baltimore City College.  Johns Hopkins at Eastern is on the southwest corner of Loch Raven and 33rd Street.

Alternate Route 6	33rd Street from Loch Raven Blvd. to Hillen Road
	 Baltimore City College. Institutions: A Family Planning Clinic exists on the NW corner of 33rd St. and The Alameda. "Our Savior" Lutheran Church is on the NE corner of 33rd. St. and The Alameda.
Commercial Areas	A dental office (B.F. Shelton D.D.S.) is on the southeast corner of 33rd. Street and The Alameda.
Vegetation	Mature plantings of Zelkova trees exists along the grassed median strip on 33rd Street. Street trees grow within the grass strip bordering the street and the sidewalk.
Parking	Parallel parking is allowed along both sides of 33rd Street (this parking is primarily used for the residents of the bordering homes).
Final Analysis	The connection between Loch Raven and Hillen Road via 33rd Street would be beneficial for a proposed light rail line. There are few physical obstacles to address with the proposed implementation of a rail line along this route. A wide median strip provides the needed space for the rail line. The established trees in the median, however, greatly add to the aesthetic value of the area and their removal would visually impact the area in a negative way. A number of residents would be served by a rail line in such close proximity. Morgan State University is 1.2 miles up Hillen Road from the intersection of 33rd Street. This access, along with the proximity of other schools and institutions, would benefit a number of people utilizing a proposed rail line along this route.

APPENDIX B: BALTIMORE CITY INTEGRATED MULTIMODAL TRANSPORTATION HUBS

BALTIMORE CITY INTEGRATED MULTIMODAL TRANSPORTATION HUBS



Prepared by:

GRADUATE PROGRAM IN
LANDSCAPE ARCHITECTURE

LAAR 550 • Urban Design Studio • Fall 2000

Institute of Architecture & Planning

MORGAN STATE UNIVERSITY

Prepared for:

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"Sustainable development is placing equal and integrated emphasis on economic prosperity, environmental quality and community well-being for all socioeconomic and racial/cultural groups."

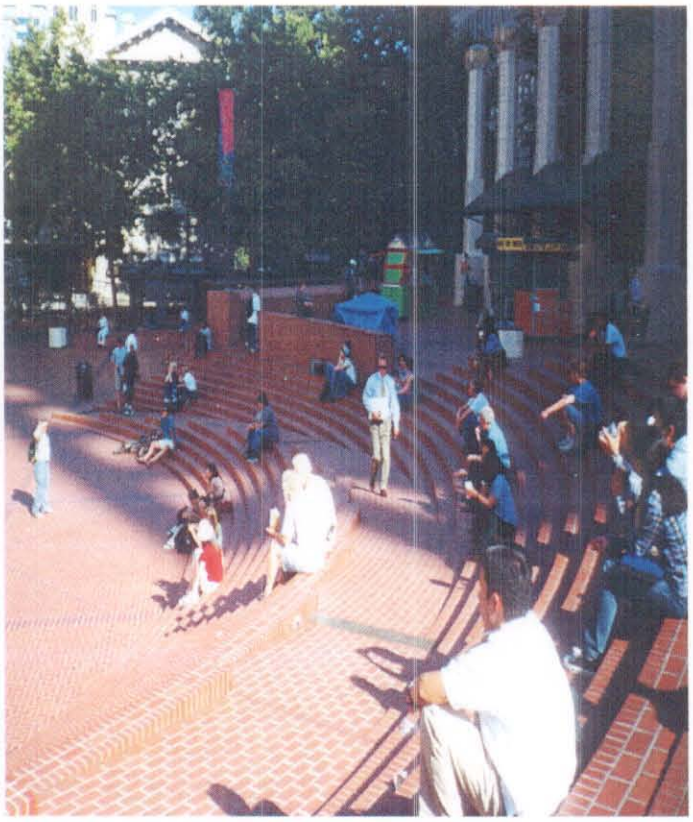
– Claudia Goetz Phillips

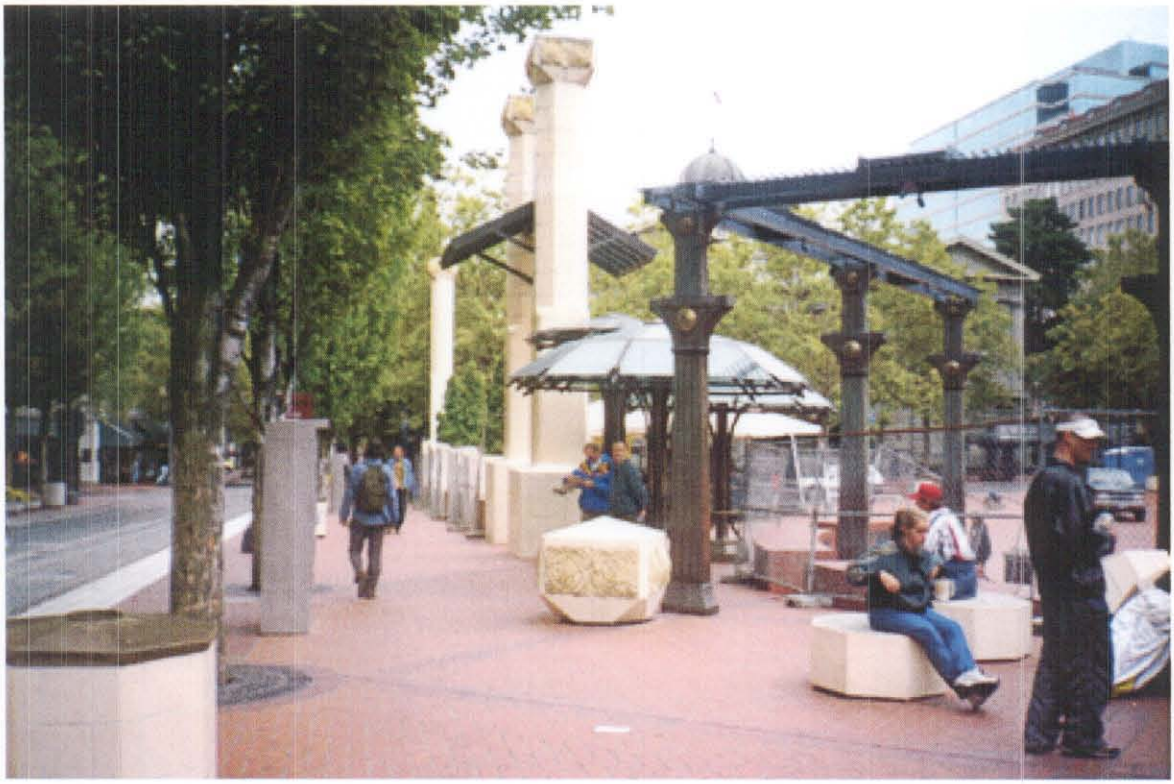
The **U.S. Department of Transportation** Strategic Plan 1997-2002 includes goals that address *Mobility* (to ensure that the transportation system is accessible, integrated, efficient, and offers flexibility of choices) and the *Human and Natural Environments* (to protect and enhance communities and the natural environment).

The **Transportation Equity Act** for the 21st century (TEA-21) includes strong language for public participation to ensure that communities of color are not disproportionately harmed by transportation decisions and investments.

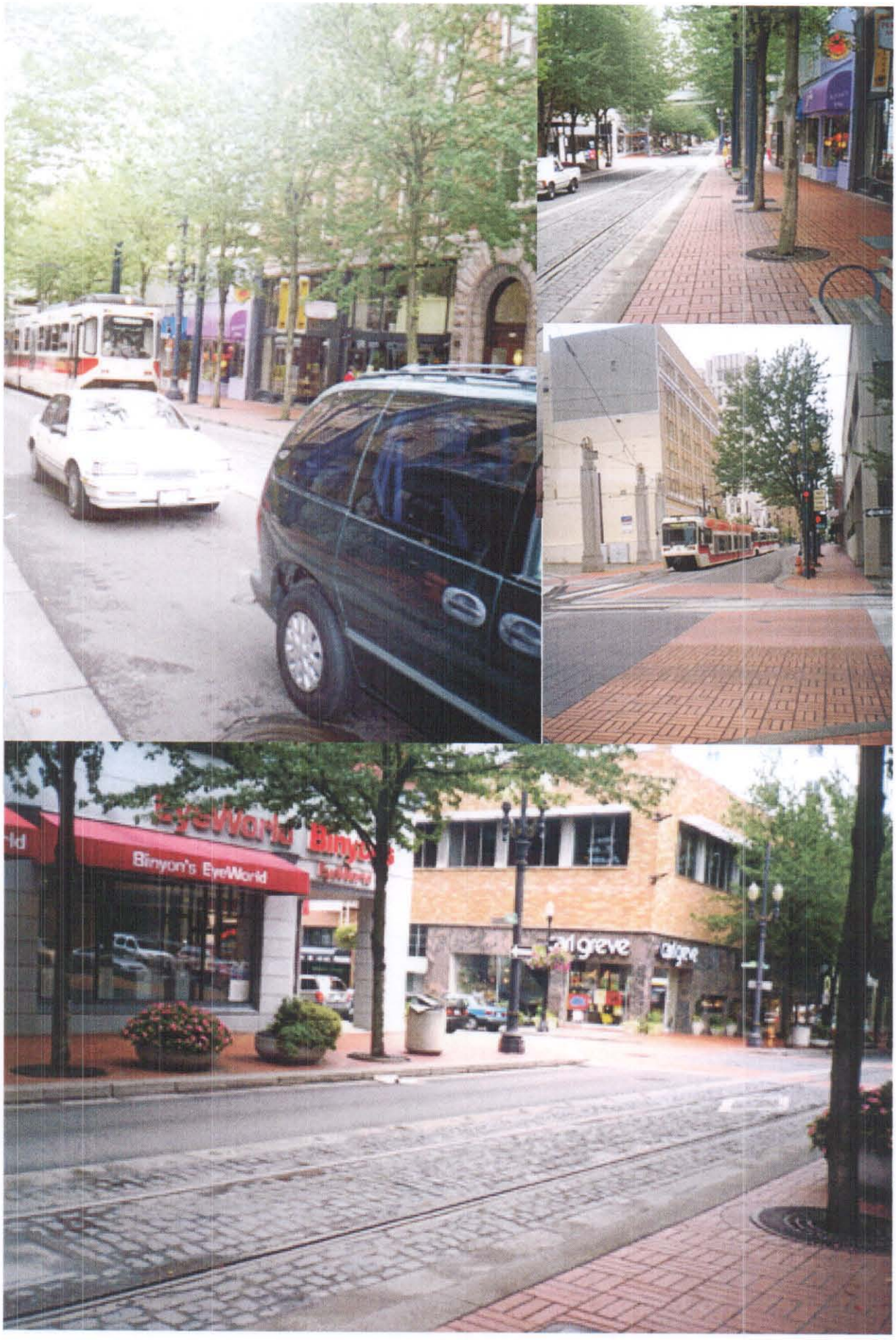
The **Federal Transit Administration**, in its *Livable Communities Initiative*, seeks to strengthen the linkage between transportation services and communities served. The initiative proposes increased access to jobs and other vital socioeconomic services.


PRECEDENT STUDIES . . .

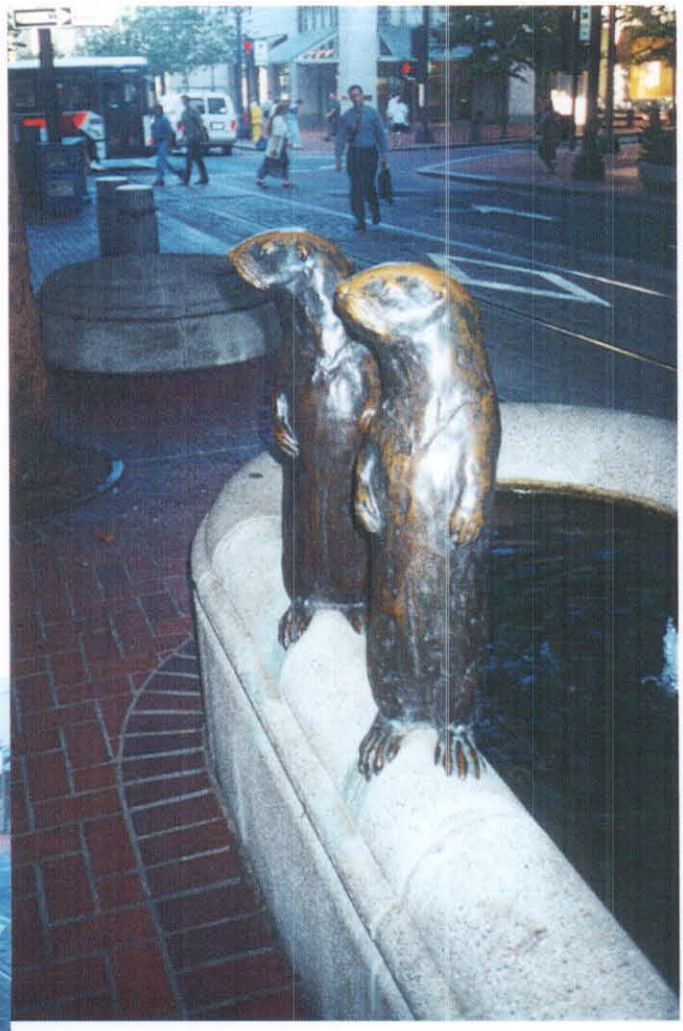


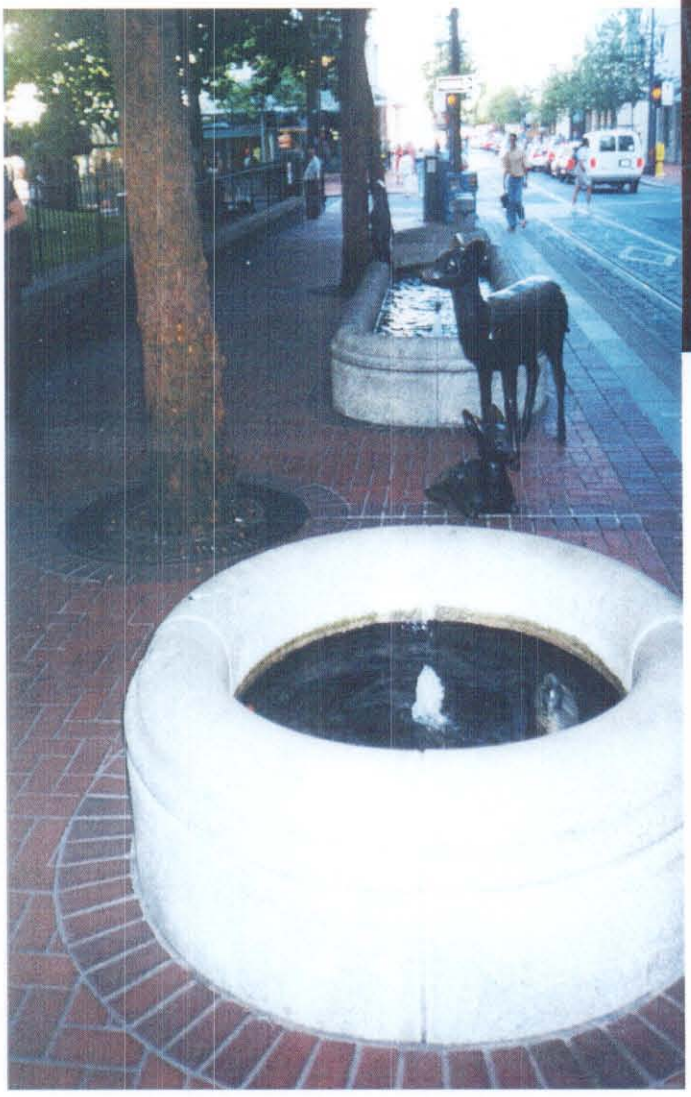


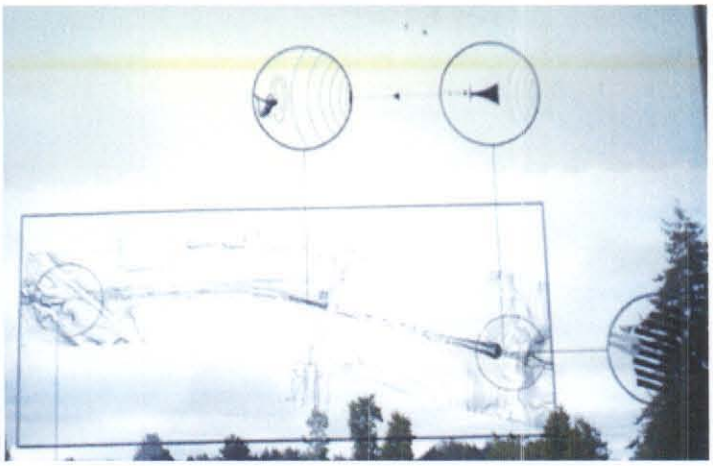
Portland Transit System


Binyon's EyeWorld

Dallas Light Rail System







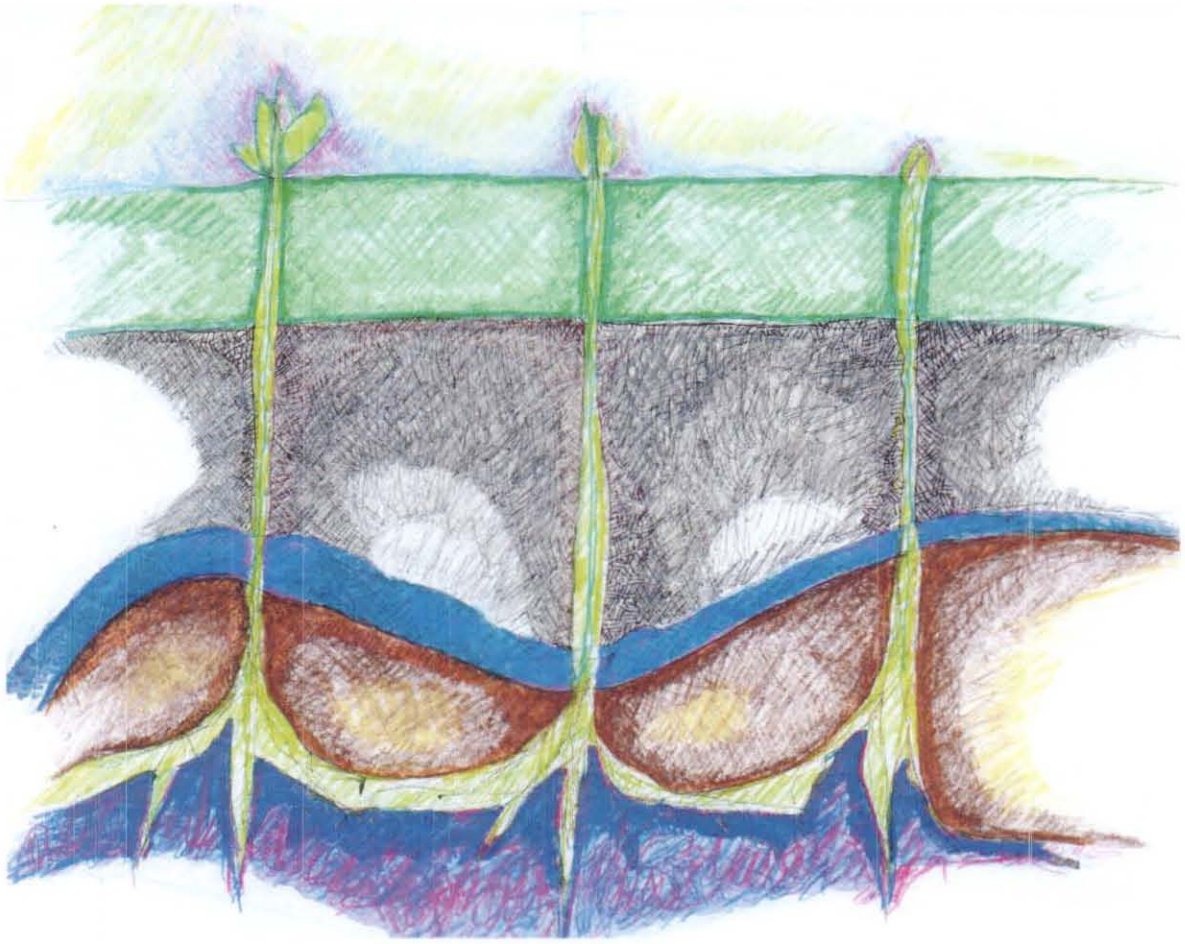
Portland Transit "Art"


Our Free Checking
has something unique.
Nothing to hide.
Free
Checking

Los Angeles Light Rail Stations

Los Angeles Light Rail "Art"

PUTTING DOWN ROOTS: Reclaiming a Lost Landscape



Rachel E. Blistein • LAAR 550 Urban Design Studio • Fall 2000

Coldspring Light Rail Station

The Light Rail Station located on Cold Spring Lane just west of Falls Road sits directly on the banks of the Jones Falls River and is surrounded by a wealth of resources, including a large publicly-used woods, Cylburn Arboretum, Polytech & Western High Schools, and several high and middle-income residential communities. Although it currently lacks parking facilities, the Mass Transit Administration has selected an adjacent site for a terraced lot that will accommodate 300+ vehicles. The Jones Falls Valley Master Plan calls for the area to serve as a major hub for the Jones Falls Greenway that would connect Woodberry Woods and Cylburn Arboretum.

Despite this potential wealth of resources, the Cold Spring Station does not function as an effective transit node. Major issues contributing to this failure are as follows:

- Poor visibility—the Light Rail Station is situated approximately 30 feet below street grade and is accessible only by a relatively steep ramp or a long run of stairs. A bus stop at the head of the station's access point on Cold Spring Lane is unattractive and uncomfortably close to automobile traffic.
- Busy traffic and multiple highway interchanges along Cold Spring Lane. The station is heavily used by Polytech & Western students who must cross four lanes of speeding traffic to access their school.
- The vastly underused Polytech parking lots present an unattractive face on a potential gateway area. The intersection of Falls Rd. & Cold Spring is experienced as a vast, unbounded landscape.
- The nearby communities of Cross Keys, Medfield and Cold Spring New Town are disconnected and isolated from one another.
- The Jones Falls is natural and vegetated just to the rear of the Light Rail station, but is hidden from view and appears unclaimed and unsafe.
- The area is characterized by an overwhelming sense of placelessness and lost space—potential nodes (e.g., a premier educational facility, a vast park-like wilderness and light rail station) are merely disconnected objects in space.

School Campus

School Parking Lot

Graffiti at Bus Stop

Baltimore Polytechnic Institute

Surrounding Communities

Cold Spring New Town

Cross Keys

Medfield

Roadways

Cold Spring - View West

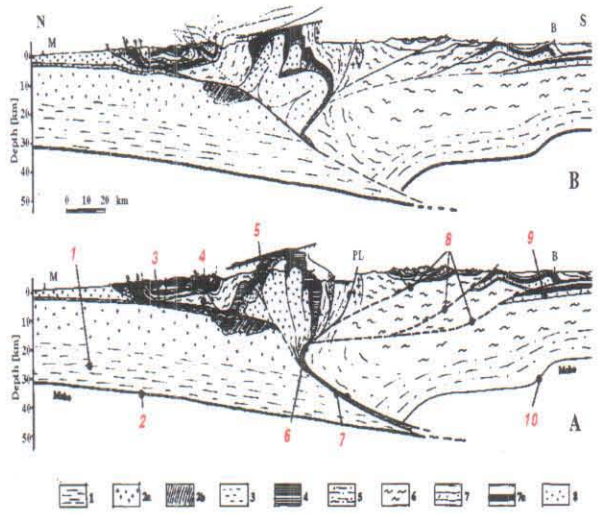
I-83 Exit Ramp

Public Transportation

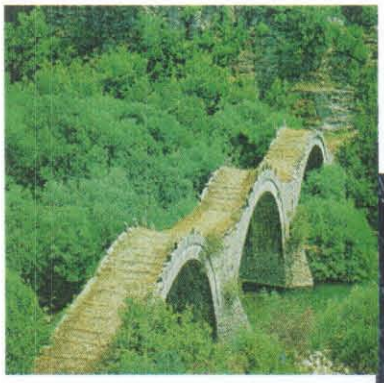
Entrance to Light Rail

View of Light Rail Tracks

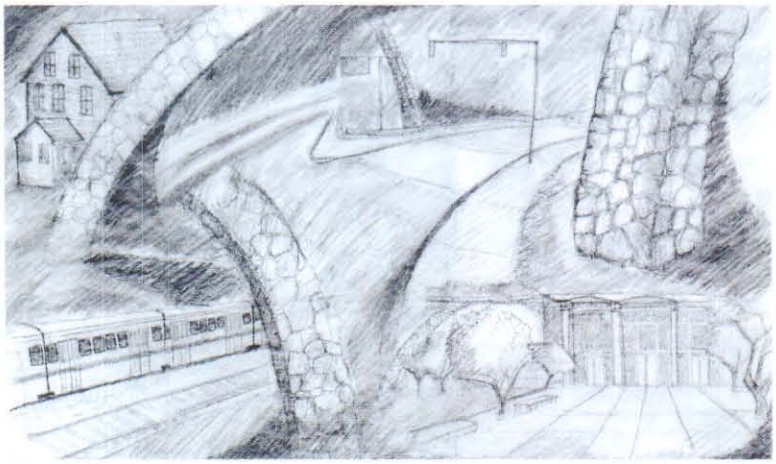
yields inspiration and interpretation ...



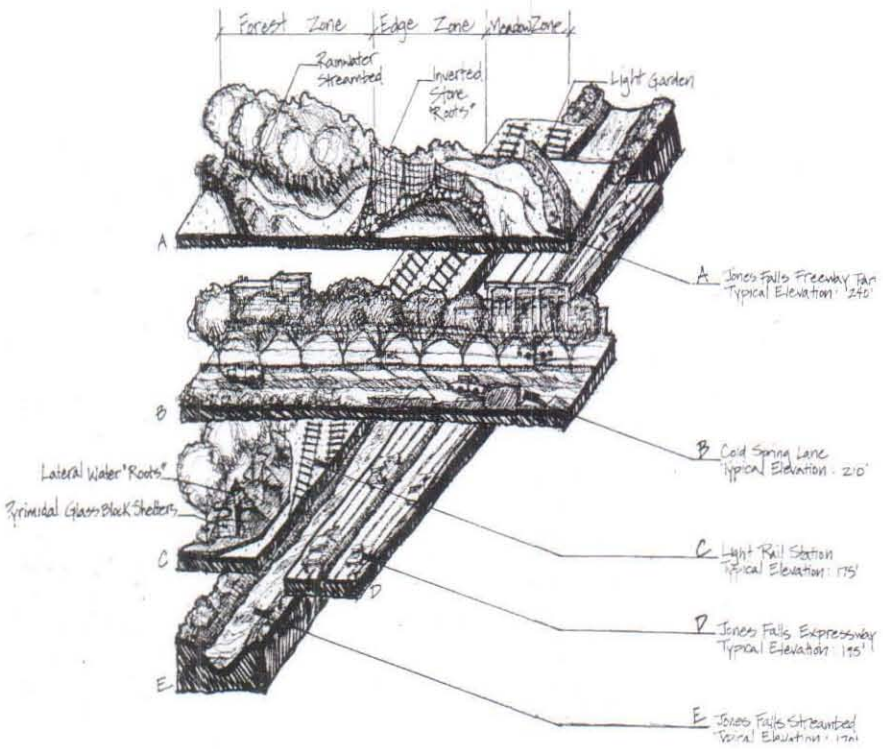
Reference to Natural...



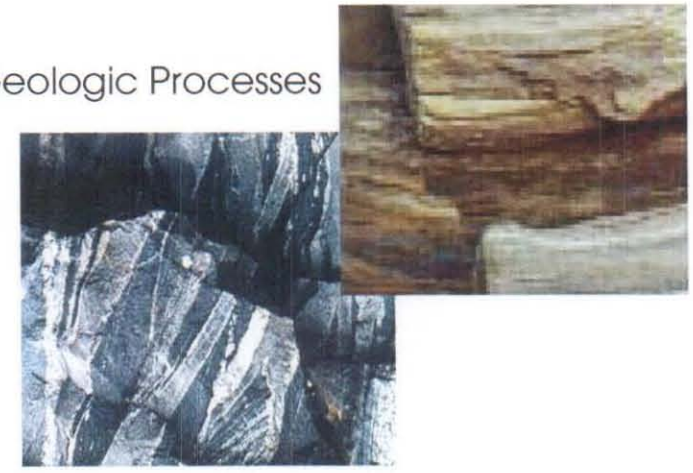
... & Built Forms



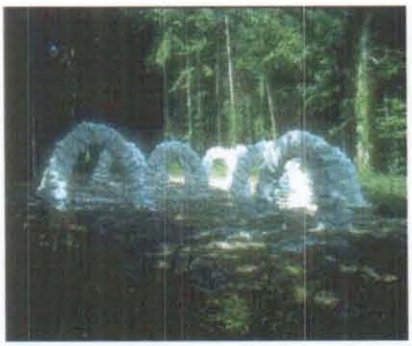
Looking beneath the surface



Layering & Geologic Processes



Repetition of Form Through Space



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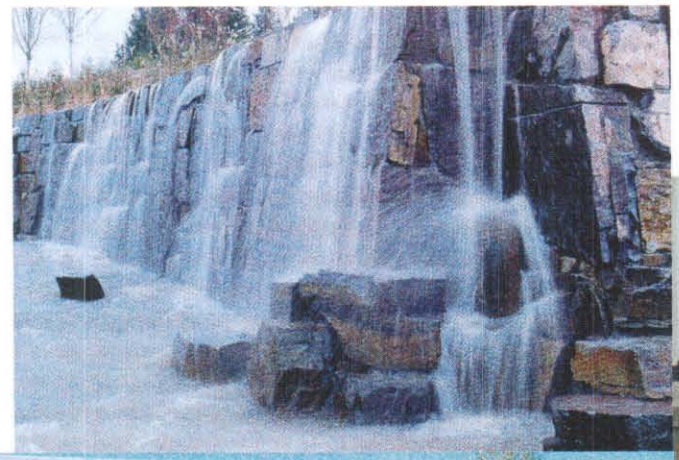
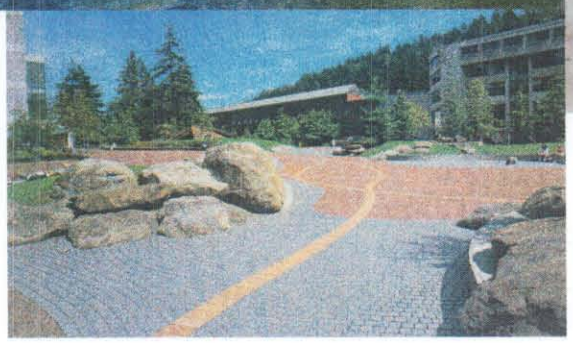
Water Features





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Green Architecture

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Elevated Parks

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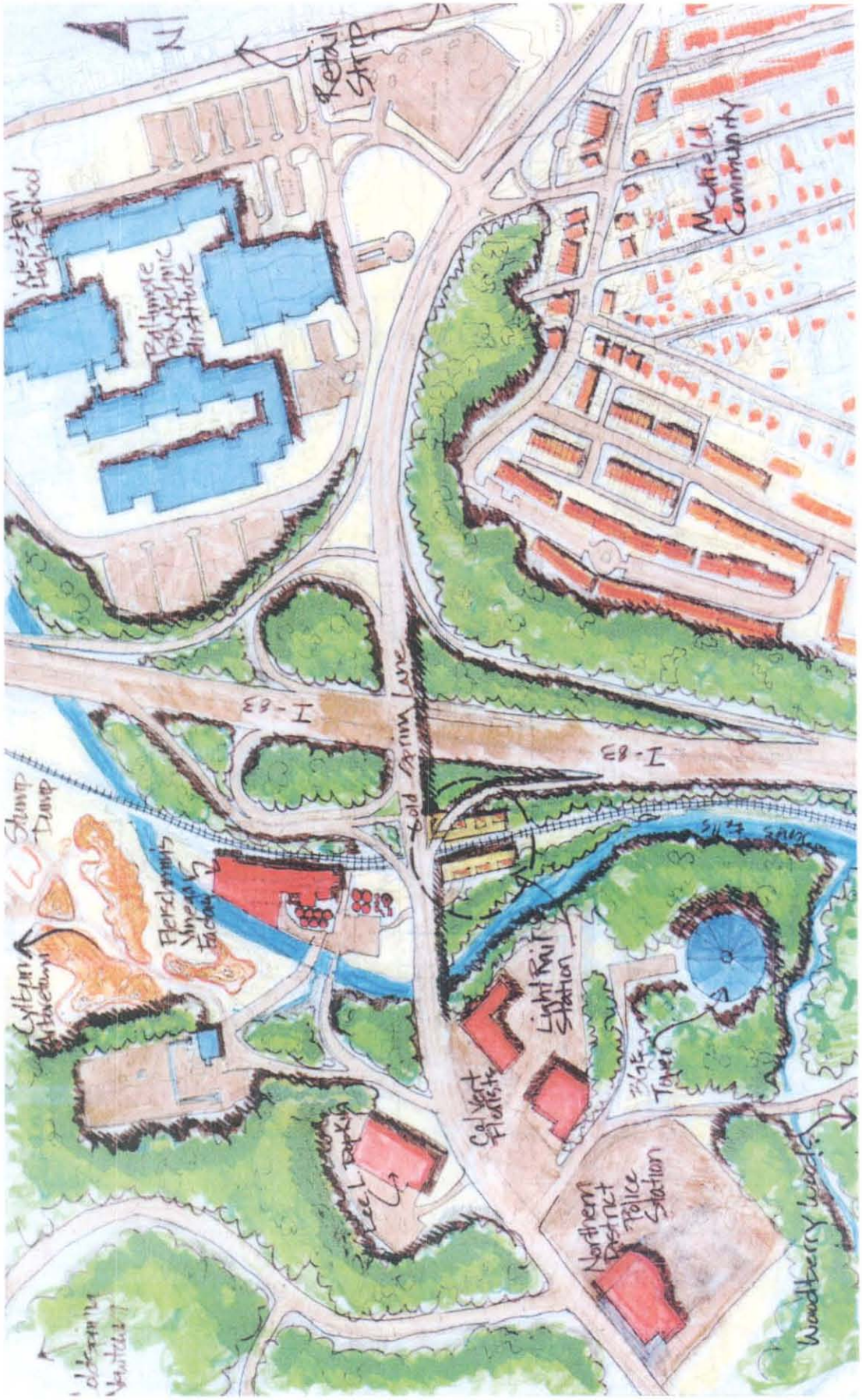
A buried landscape and a community divided by a sea of asphalt...



General Notes

- Area to become a major Greenway Hub connecting Woodberry Woods & Cylburn Arboretum.
- Underused Polytech parking lots present an unattractive "gateway" from I-83. Intersection of Falls Rd. & Coldspring is a vast, unbounded landscape.
- Nearby communities of Cross Keys, Medfield and Cold Spring New Town are disconnected and isolated from one another.
- Cold Spring Light Rail Station heavily used by Polytech & Western students, but is accessible to schools via a dangerous, unpleasant walk along Cold Spring.
- The Jones Falls is unchannelized and vegetated just to the rear of the Light Rail Station, but is hidden and unsafe looking.
- Overwhelming sense of placelessness and lost space - potential nodes exist (e.g., a premier educational facility, a park-like wilderness and light rail station).

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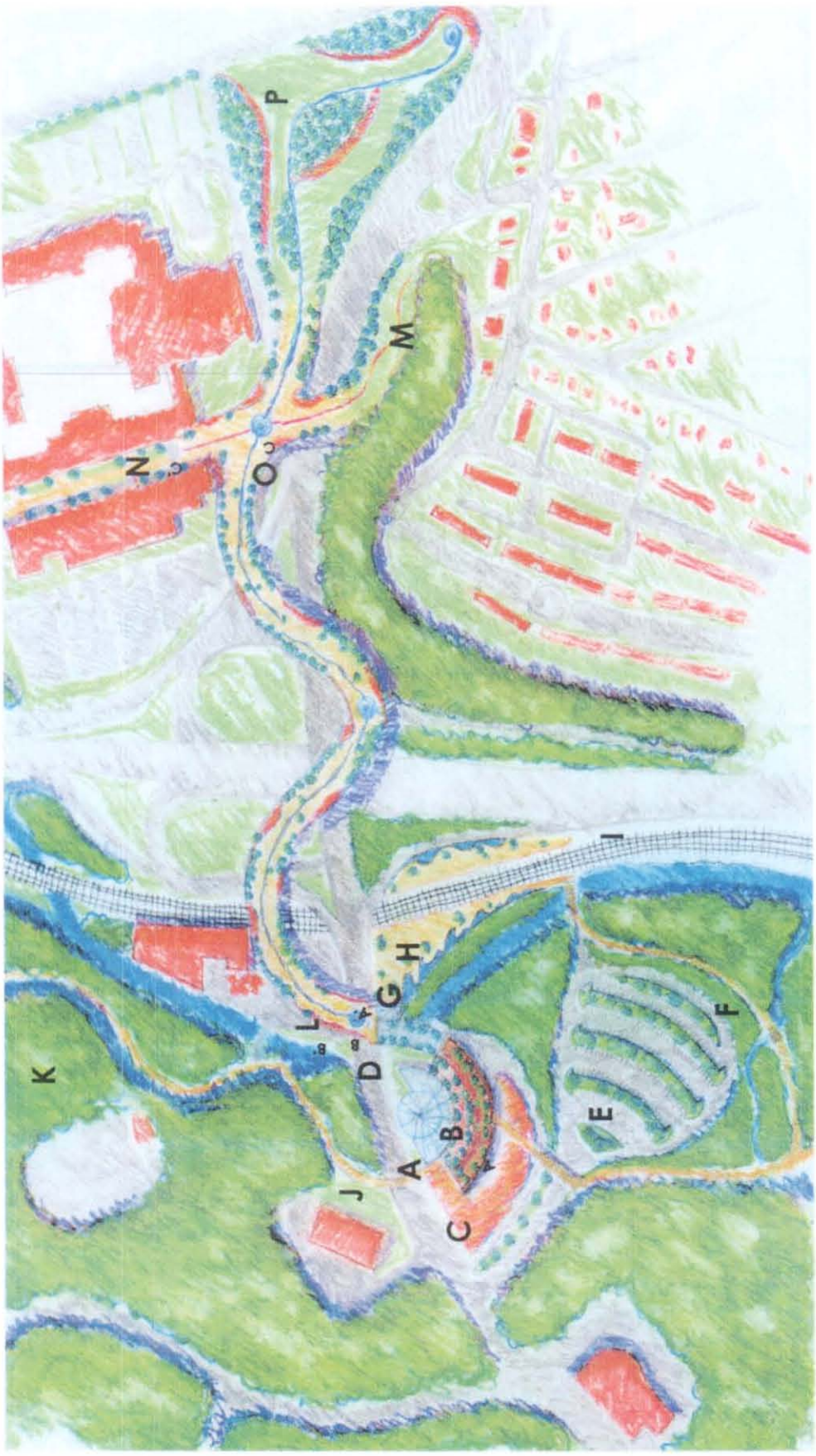
A river of stone floats above the freeway and sends down roots to the earth...



Key

A: Living Building/ Atrium with pass through for buses & shuttles.
B: Retail Node with underground parking garage.
C: Successional Meadow/ Native Plants Nursery.
D: Express Shuttle & Bus Stop for Polytech/ Western.
E: Terraced MTA Parking Lot.
F: Hiking Trail Connection with Woodberry Woods.
G: Stairway & Elevator Connection between park, retail & light rail station.
H: Light Rail Station.
I: Double-tracked Light Rail.
J: Trail Connection with Cyburn Arboretum.
K: Green Trail Head reclaimed from "Stump Dump."
L: Elevated Freeway Park with stream, fountains, and varying meadow, transitional & forest zones.
M: Community Gateway & Access Point.
N: Connection with existing interior school courtyard.
O: Express Shuttle/Bus Stop.
P: Gateway Park.

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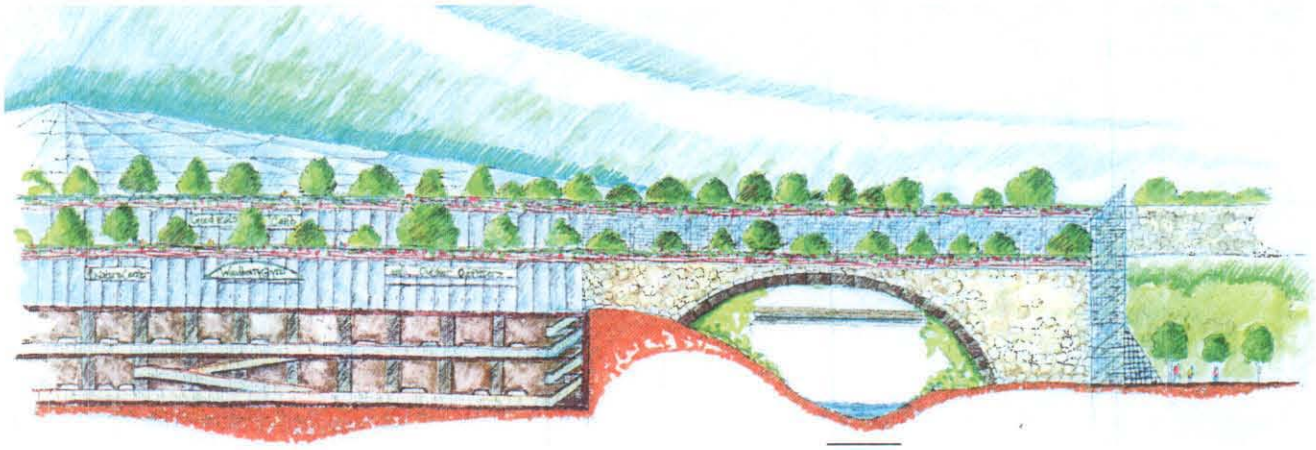
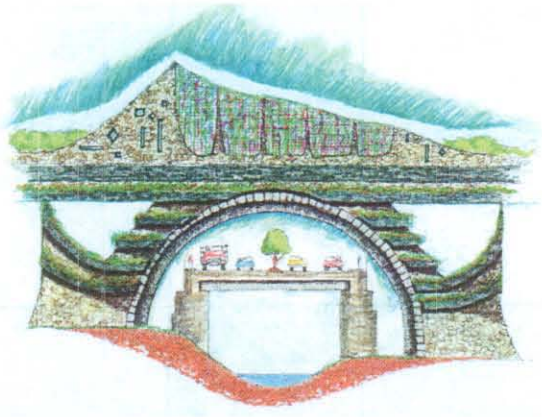
In order to address these problems, I examined not just the Light Rail station, but the area as a whole. References to the area's natural history and foundations led to the development of a plan based on the concepts of ecological processes and geologic layering. A design was created that would facilitate economic revitalization while reconnecting the community both with the Jones Falls and with existing destination points. Key aspects of the plan included the following items:

- An elevated freeway park running from Falls Road to a terminus just south of the Light Rail station. The park would contain a man-made stream, fountains, and a rhythmic progression of meadow, transitional & forest zones.
- A "Living Building"/Atrium combined with a retail node and underground parking garage.
- Relocating the Light Rail bus stop from its current location to the proposed retail node.
- Express Shuttle & Bus Stop for Polytech/ Western.
- Successional Meadow/ Native Plants Nursery.
- A Hiking Trail Connection with Woodberry Woods and the Jones Falls Greenway.
- Relocation of the Light Rail bus stop from its current location to the proposed retail node.
- Trail Connection with Cylburn Arboretum.
- Green Trail Head reclaimed from the "Stump Dump."
- A Community Gateway and parks on Falls Road and at the Medfield Community on Cold Spring.
- A Freeway Park that connect with Polytech's existing green spaces.

... Grounding & reconnecting a lost landscape

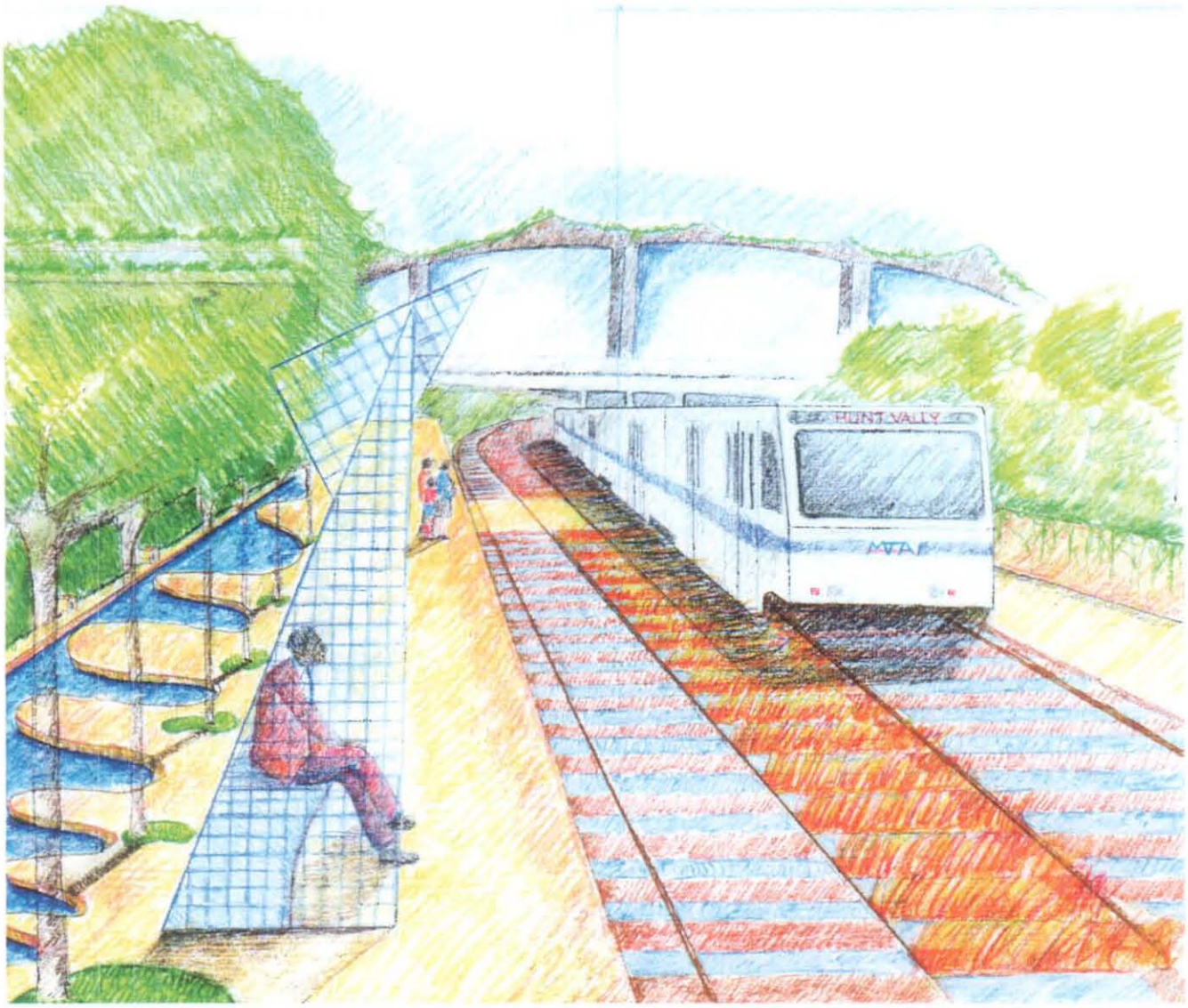


Section A-A'



Section B-B'

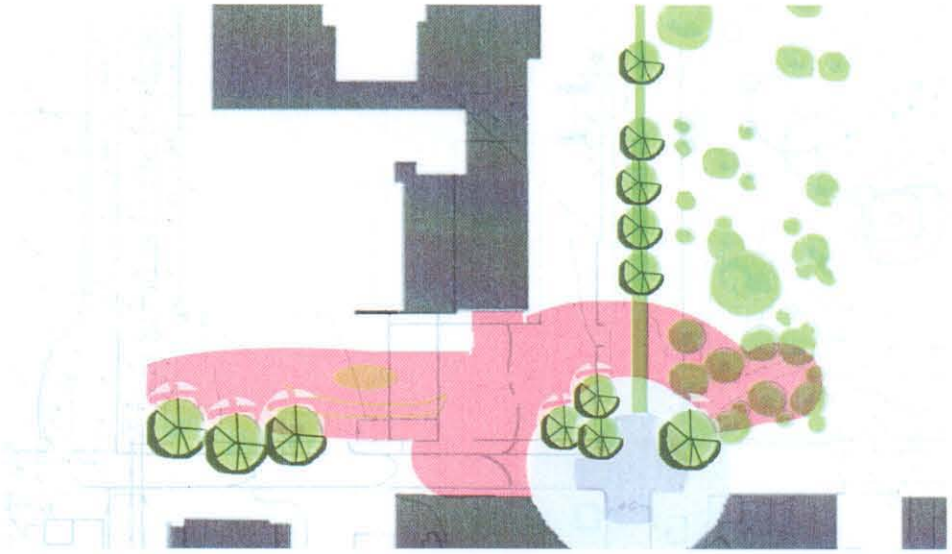
Section C-C'



Cold Spring Light Rail Station

Mt. Claire Bridges

Transportation spanning the industrial ages of Baltimore and linking its communities



Schematic concept of proposed two-level transit plaza in Southwest Baltimore

Project Goals

- City-oriented design
- Link neighborhood communities
- Promote community health and welfare
- Design flexible transportation hubs
- Integrate physical and cultural context
- Provide a "Gateway" to the City

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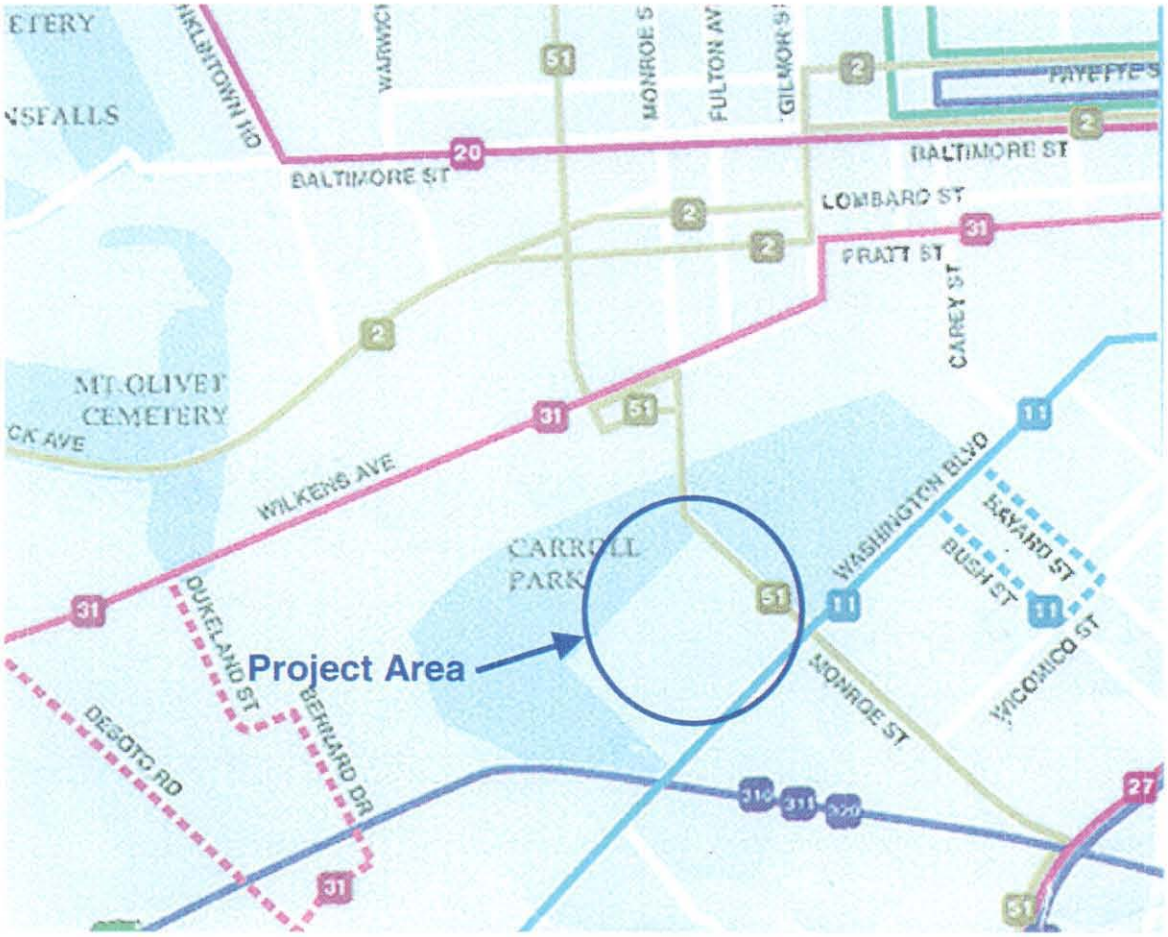


Map adapted from Maryland Transit Authority route map

Located in Southwest Baltimore at the intersection of Monroe and Washington Blvd., Carroll Park and Mt. Clair have long provided open space, fresh air and recreation to the area's residents. Mt. Clair, where an 18th century historic house stands protected by an easement, overlooks downtown Baltimore and once was only a mile from the harbor.

To the southeast lie Interstate 95, I-295 and a large industrial district. To the west is Morrell Park, connected to Washington Village by MTA bus #11, Riverview, Downtown. The MTA bus maintenance facility stands directly across from the park on Washington, with buses exiting the yard onto Monroe.

Trucks coming off the exits on the highway travel north on Monroe or west through the busy intersection at the park's present entrance. Railroad tracks extend north along the original Locust Point line to the main B&O tracks that run along the northwest side of the park. The B&O Museum, on the site of the former Mt. Clair station is just north. This area is a repository of significant local national transportation history.

Existing Conditions

Monroe Bridge over railroad tracks

Local street under highway

Buses through Monroe and Washington

The old park entrance on Monroe; a community garden is opposite but inaccessible.

Southwest Baltimore is currently served by bus routes

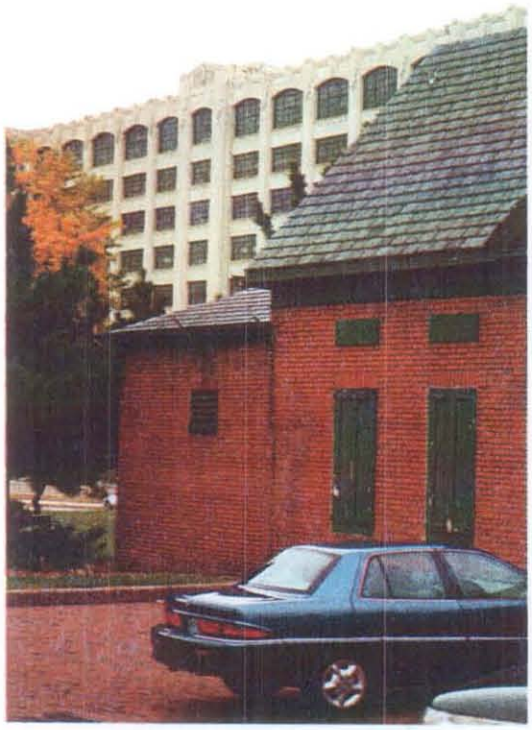
Because of the evolution of a roads network carrying autos and trucks during the 20th century, most of this area is isolated from nearby residential communities at Washington Village and Morrell Park. Both neighborhoods were accessible by streetcar in the early 20th century. Bus routes replaced the streetcar lines by 1950.

Architectural and design precedents at this site are plentiful

The Ward Building at the corner was vacated over 15 years ago as distribution centers shifted to the suburbs—it stands as monument to changing times.

The Ward Building is being renovated for offices. It will be an example to the city of 'green architecture'—rain will be redirected to an internal water recycling system; the large windows will be retained but insulated with new glass technology. As a new office center, employing over 1000 workers, new transportation facilities are required.

Most of the first new employees at the Ward Building (initially the MDE employees) will be driving or taking the bus to work from residences all over the Baltimore metro area. At present, parking facilities have been planned for an area of Washington near the rear of the Ward Building. The one-story flat-roofed warehouse building on Monroe is currently inaccessible from Monroe due to high traffic speeds on a dangerous curve.

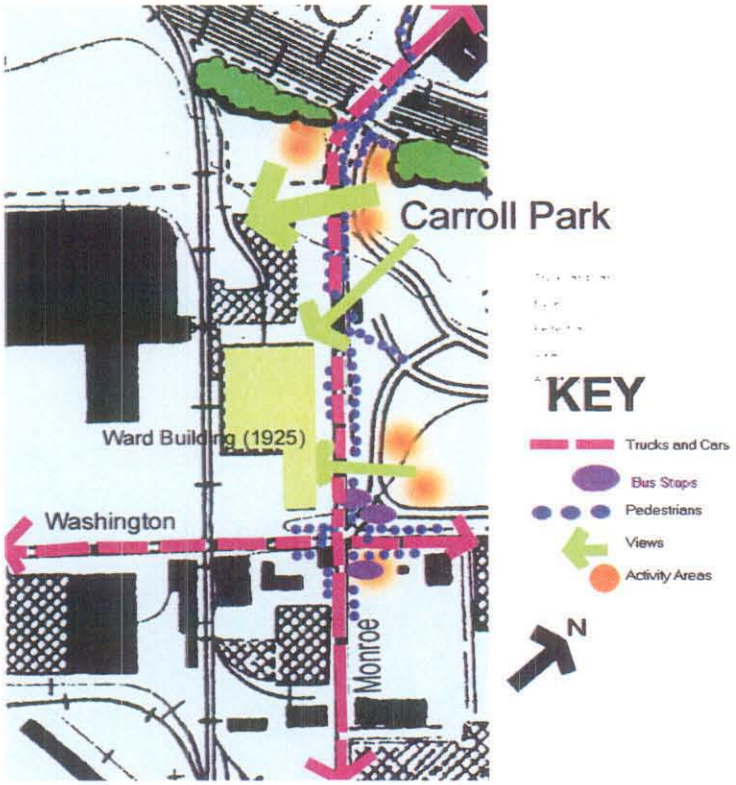


Mt. Claire stables, Ward Building

Mt. Claire Mansion

The Ward Building

Analysis

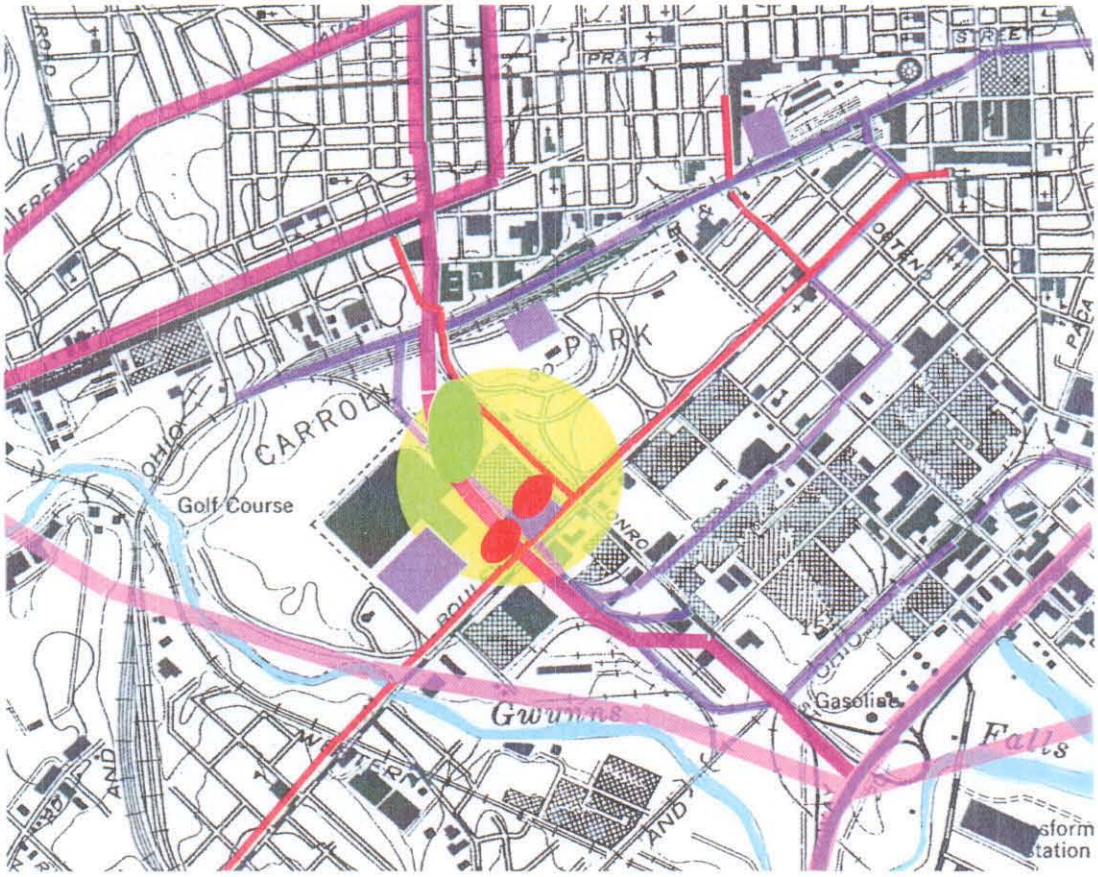


During the discovery phase of this project, an in-depth site inventory and analysis were conducted, with the focus primarily on traffic and linkage. Trucks travel at high speeds north on Route 1 up Monroe. While the road and curve at the top of the hill have been widened in recent years to nearly 70 ft., the four lanes encourage high speeds. While posted speed limits are 35 mph, traffic was often clocked at 55 mph during this project. A narrow sidewalk runs along the side of traffic on the bridge over the railroad. Young children were seen frequently along this walk, within inches of speeding traffic. While not within the scope of this project, a separate pedestrians-only bridge is needed here if Monroe continues to carry this volume.

To the southwest where the Gwynns Falls flows southward, the river floodplain identity has bee lost in the maze of interchanges at I95, I295, Monroe and Washington streets. A former trail along the river on the golf course has been virtually washed out. Access to the river through the golf course is barred or not identified. The Gwynns Falls Greenway is expected to follow Washington along the south side of the park and turn south at Bayard or farther east.

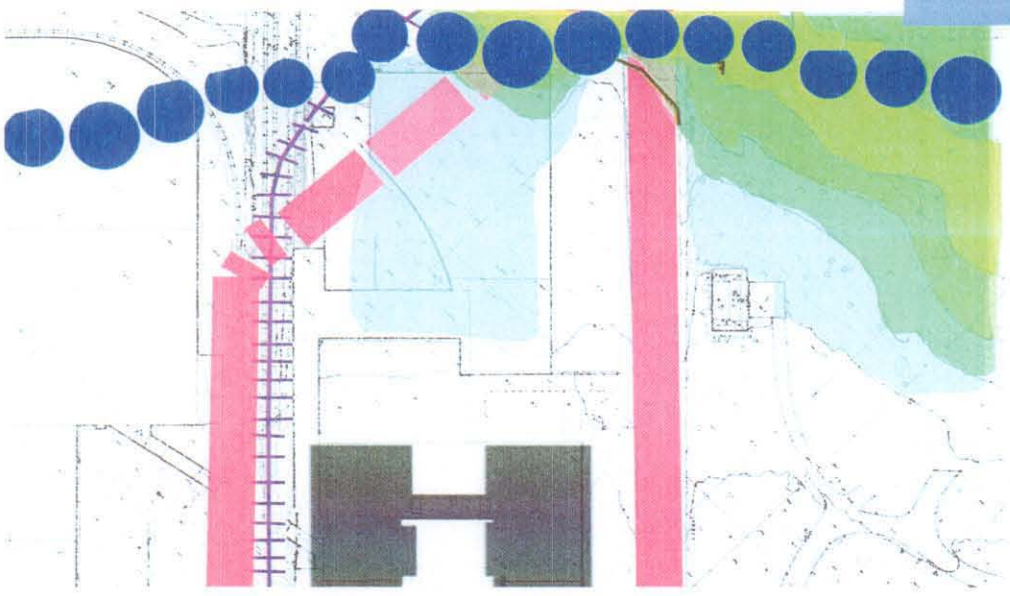
Traffic through the intersection at Monroe and Washington is impeded during rush hours, a total of 7 hours per day; no left turns are permitted. Crosswalks are not well marked and pedestrians frequently jaywalk, especially to catch bus connections. There is one bus shelter, approximately 45 sq ft. The park entrance at this corner is dangerous and will be blocked to vehicles with adoption of the Carroll Park Master Plan. Currently, MTA staff illegally use the park's drives for an employee lot. The two sub shops and gas station at the corner are closed and will probably be redeveloped. Most of the area of the south side of the intersection is asphalt parking.

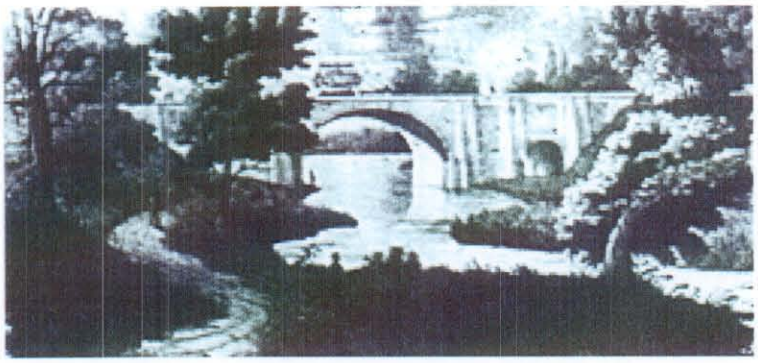
While there is s distinct sense of arrival at the intersection because of the 8-story Ward Building on the left and the open park and Mt. Clair on the right, there is no reason to stop and no way to either turn or go into the park without danger. This is an ideal spot for a gateway to the city. As a gateway, it can also be a central transportation hub.



The yellow circle above indicates the project study area; the two red ovals indicate potential kiss n' ride or park n' ride locations, and the green oval indicates a proposed underground parking garage for the Ward Building. The 'roof' of this would serve as a pedestrian and bike trail bridge over Monroe, thus linking the two separated halves of Carroll Park.

Conceptual Routes

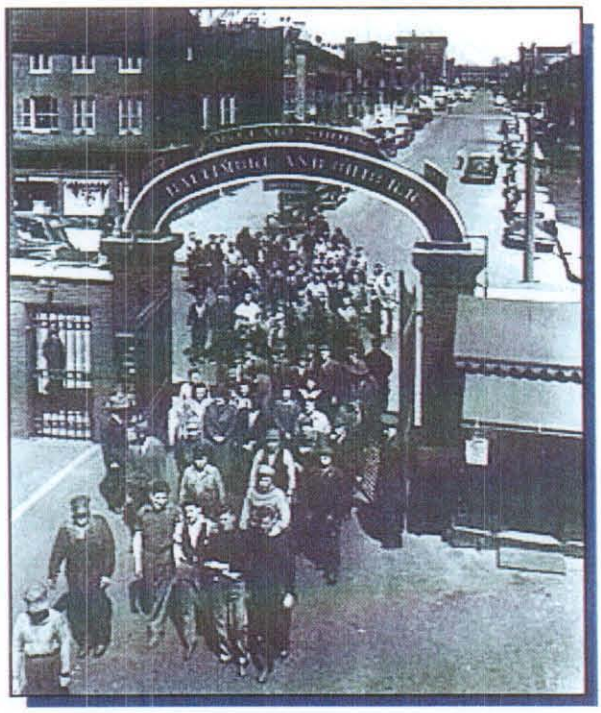




Project Concept

Bridges provide links which connect people and often free them. In the early 19th century less than ½ mile away, the first bridge across a river to carry the new mode of railroad travel was built. Today, the existing roads isolate the neighboring communities. This project proposed to bridge the communities again, bringing new freedom. These bridges are spans from one age to another, as Baltimore grew from a provincial seat to a metro center, this area grew from plantation to brickyard to commercial center and Baltimore's third largest park. Where the Ward Building sits was an encampment of soldiers during the Civil War. The clay soils along this river valley edge provided early industry, bringing immigrants to settle in Pigtown. Later they worked in the B&O yards. Bridges brought them from place to place.

This project proposed a bus transfer center, tied to a new light rail loop with commuter parking. To accomplish this, through traffic north on Route 1 would be re-routed to Putnam Avenue to the west, the original route for the area, then through a tunnel/parking garage north of the Ward Building. In keeping with the green architecture, this parking garage will be the under-girding for a new greenway connecting the two sides of Carroll Park.



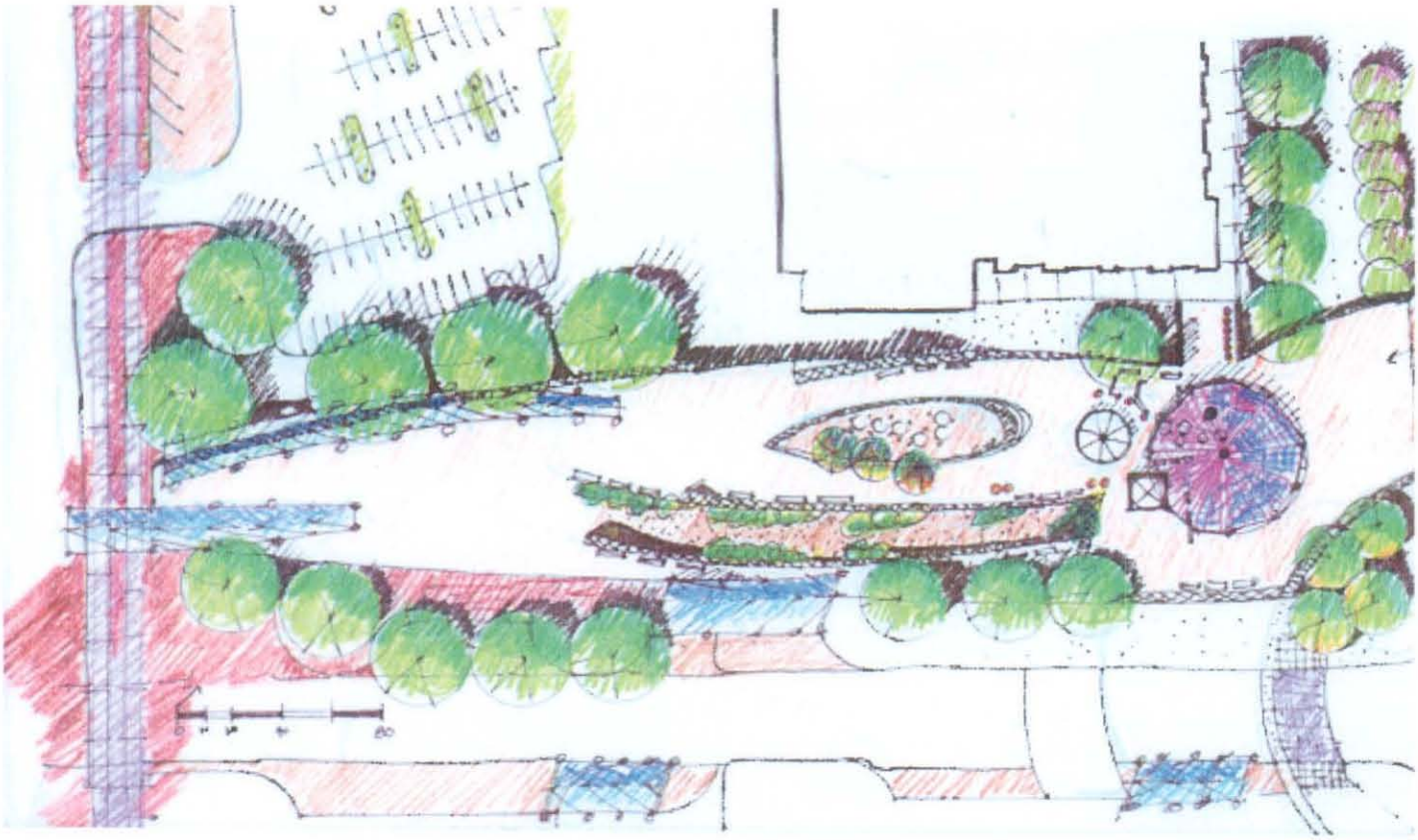
Ward Plaza

Upper Level

Ramp at Los Angeles Bus Plaza

The west side of the proposed plaza contains a ramp, seating areas and a large information and snack kiosk

The east side shows a bridge over Monroe from Carroll Park and a raised plaza for festival-goers to view activities in the park.



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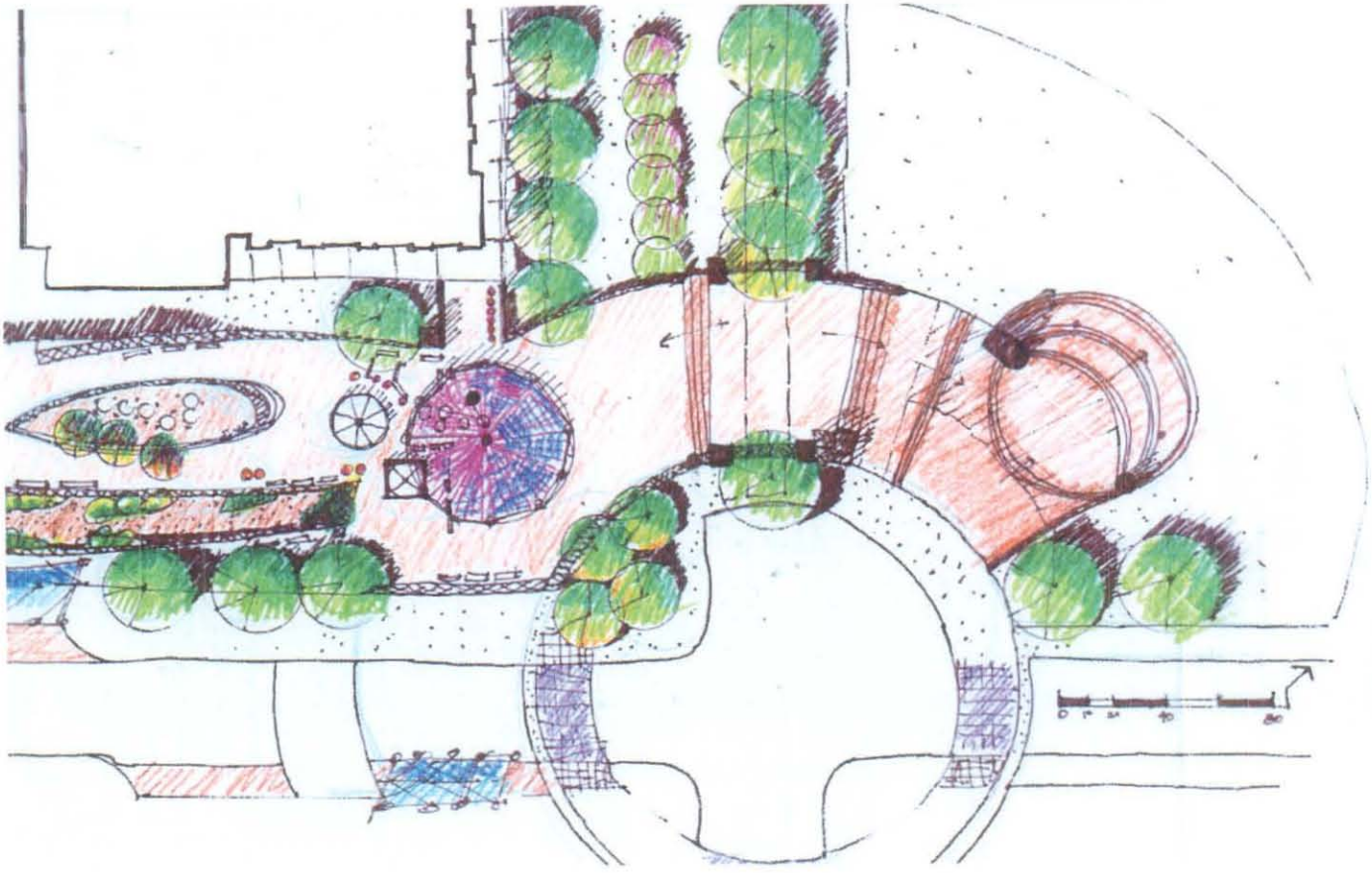
Ward Plaza



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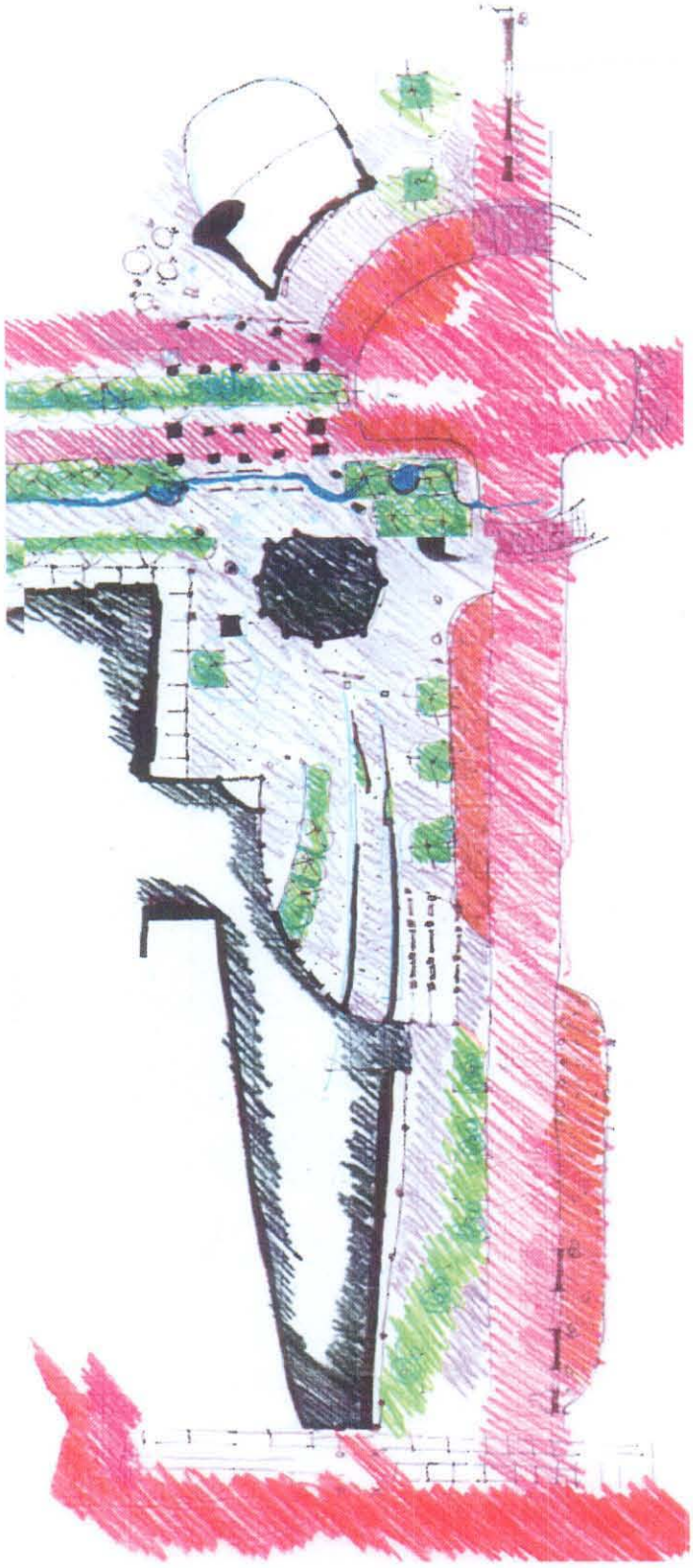
Ward Plaza

Lower Level

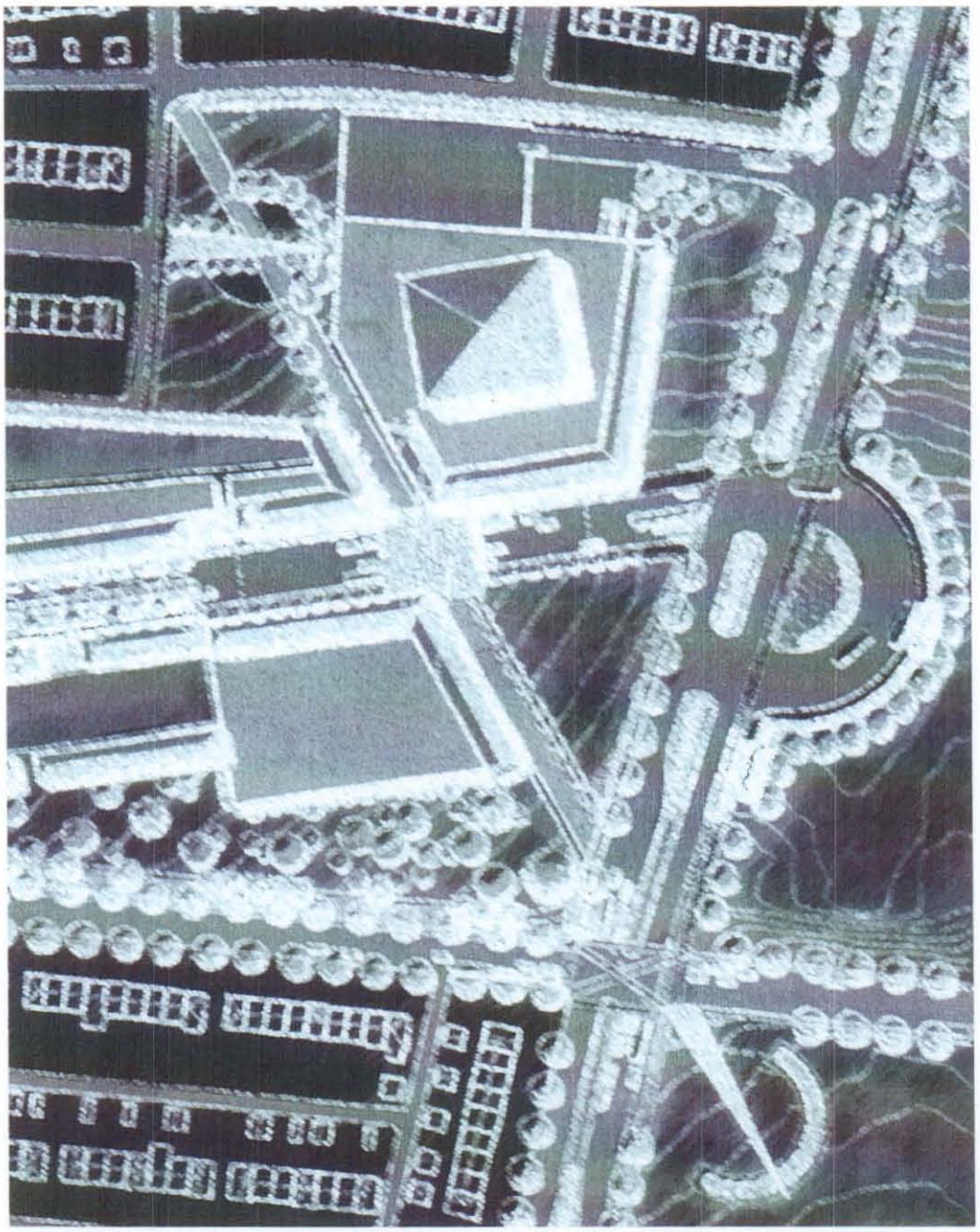


Lower Level (shown here rotated from previous view of upper level) has open access to building. A rivulet reminiscent of the Gywnns Falls runs along Monroe in a wide pedestrian plaza.

Storage for park furnishings is provided under the east plaza. An ordered row of trees provides a boulevard on Monroe.

More than a Hub:
A "College Town Main Street"

A Proposed Re-design of the Northwood Shopping Center



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The Big Picture:
The "Education Connection"

Overall Concept Goals

- Link area universities via trolley / light rail to promote:
  - ❖ Resource sharing of libraries, materials, academic expertise, and curricula
  - ❖ Information exchange; exchange of ideas and experiences
  - ❖ Cultural exchange; exposure to different people of different cultures, races, social and economic backgrounds
- Link other important institutions such as hospitals, libraries, museums as well as recreational amenities such as parks and open spaces

The "Education Connection"

Proposed Trolley/ Light Rail Lines

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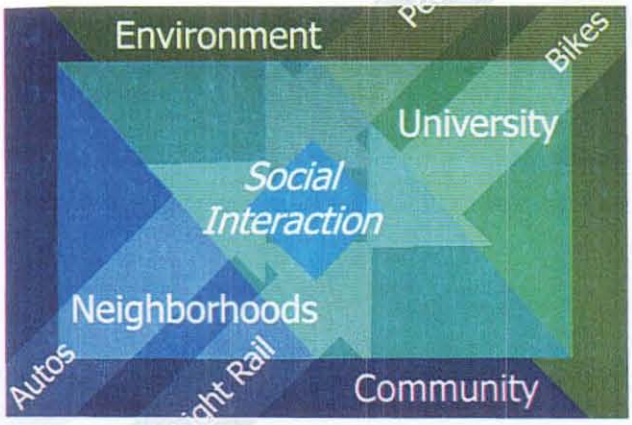
A "College Town Main Street"

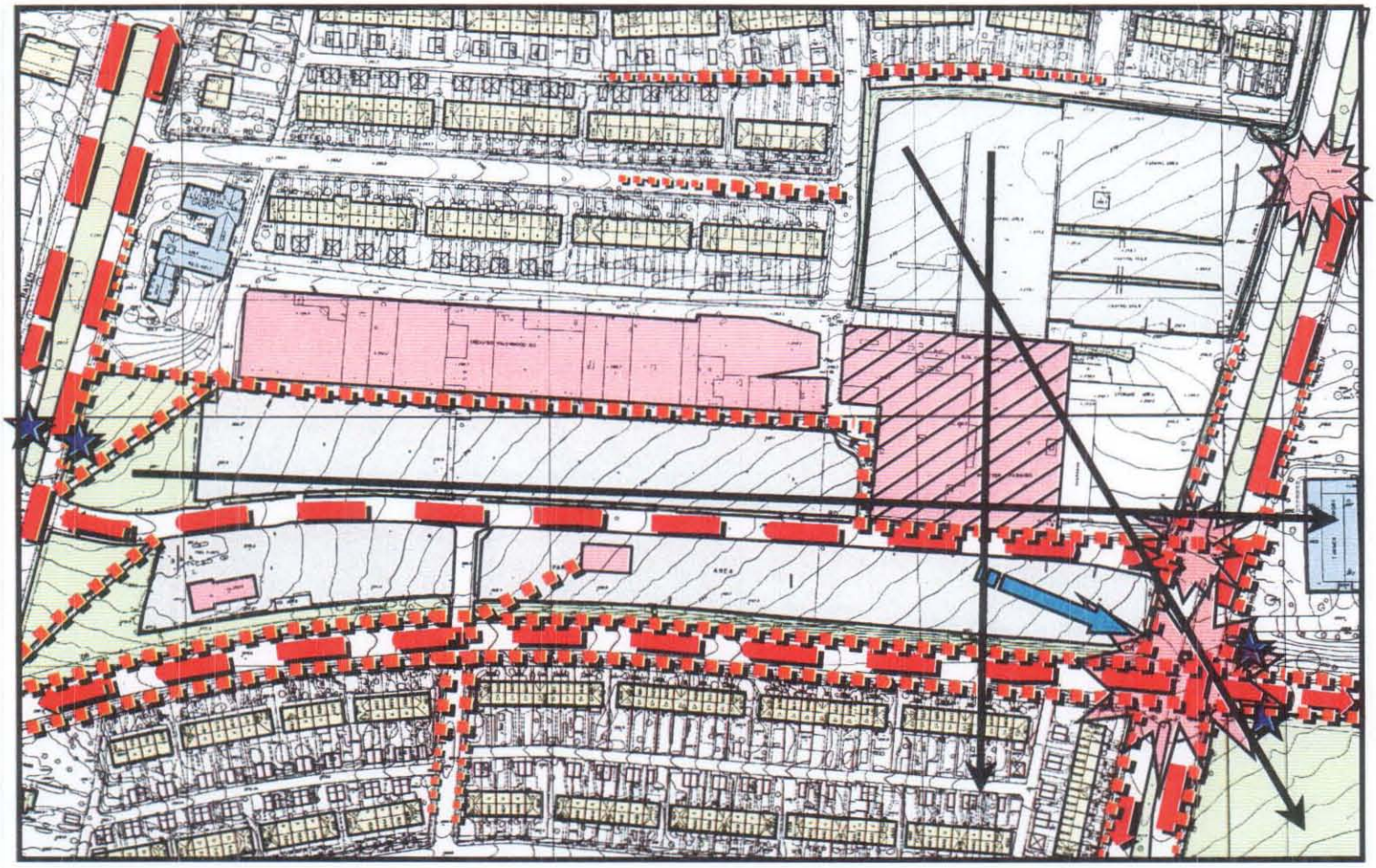
Site Concept / Goals

- Bring together residential and academic communities which were historically separate and segregated
- Create a dynamic retail shopping district that reflects / relates to the scale of the neighborhood
- Incorporate a university hospitality center and academic building into the site w/o overpowering it
- Create social spaces where people can interact – the "epicenter" is a pedestrian plaza, the main focal point of the main street
- Enhance the environment of the neighborhood by increasing the amount of green space
- *Provide convenient access to reliable, safe public transit – make transfers from one mode to another easy*



A "College Town Main Street"

Site Inventory and Analysis



Public" Open space

Retail

Vacant Retail

Institutions/"Anchors"

Residential

Parking

Auto Traffic

Pedestrian Traffic

Bus Stops

Bad/Unsafe Intersections

Poor Drainage

Views From Site

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A "College Town Main Street"

Existing Site Conditions

N

NE

E

SE

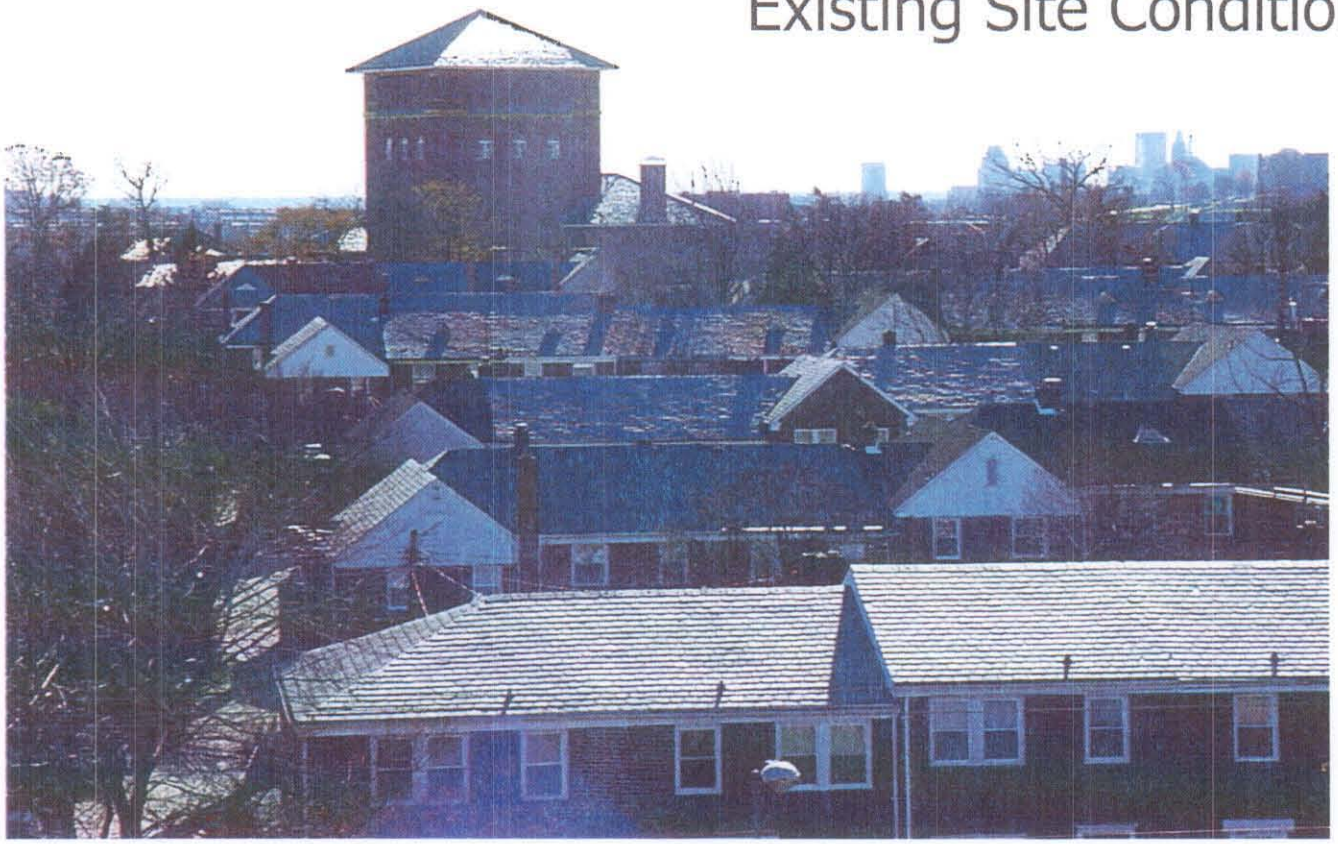
Looking east across Hillen Road toward dormitories and park

Looking west-southwest along existing driveway

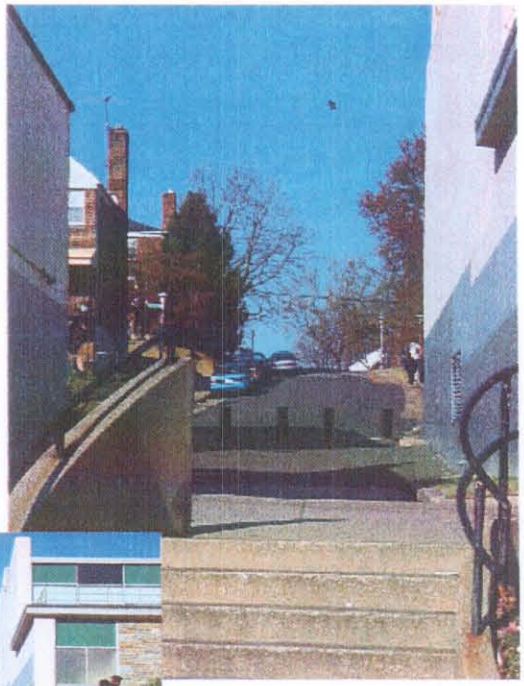
Looking west-southwest along existing driveway

A "College Town Main Street"

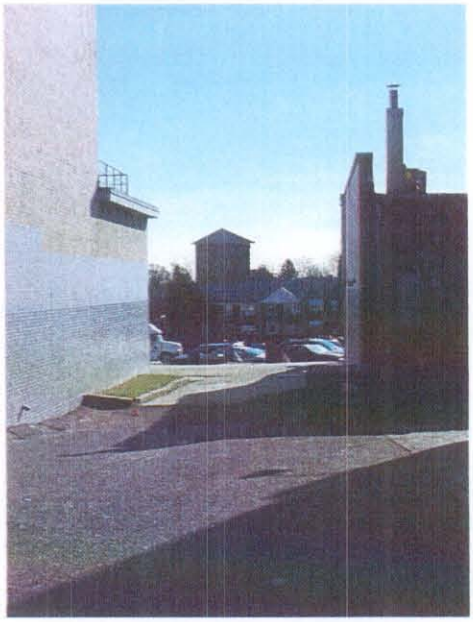
Existing Site Conditions



Looking south across Argonne Drive toward rowhomes and water plant



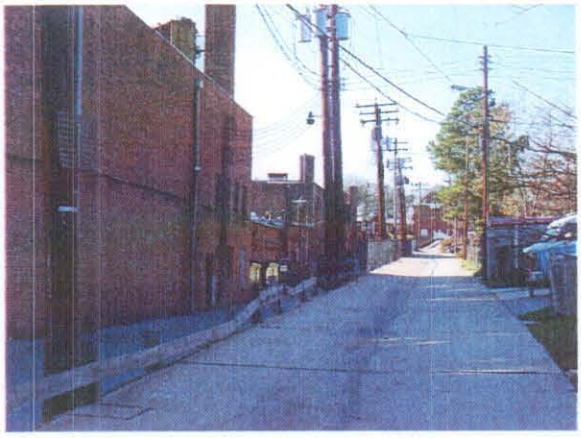
Looking toward neighborhood behind shopping center

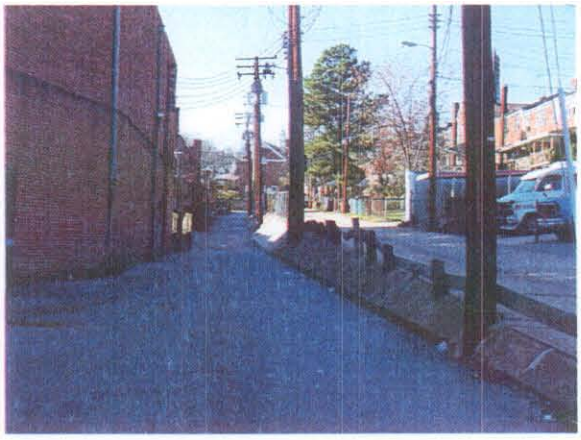


Looking south from alley toward water plant

A "College Town Main Street"

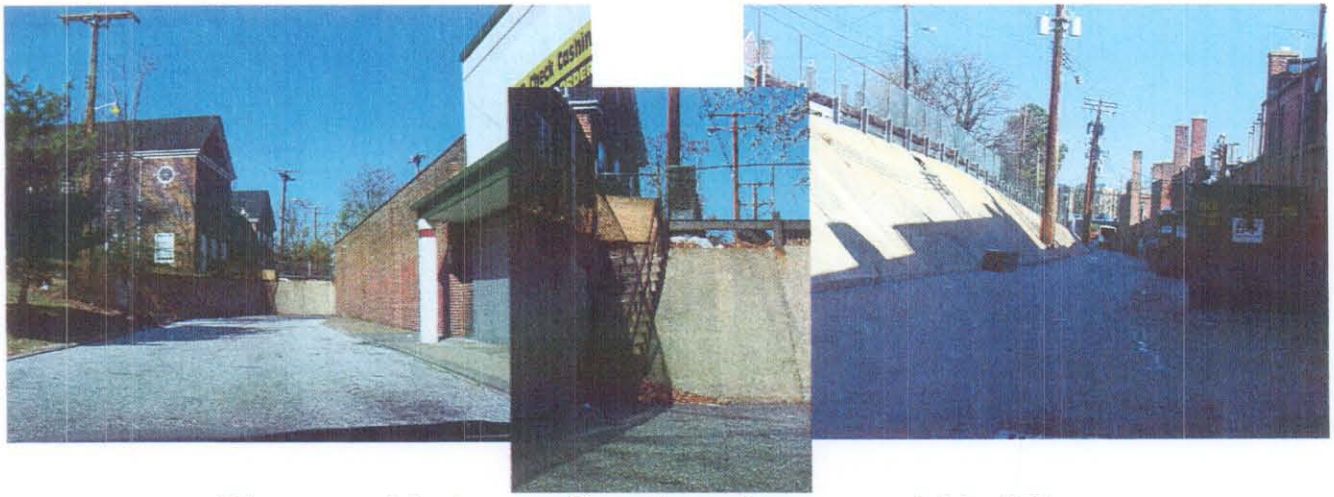
Existing Site Conditions





"Backside" of Shopping Center:
Looking east along commercial and residential alleyways

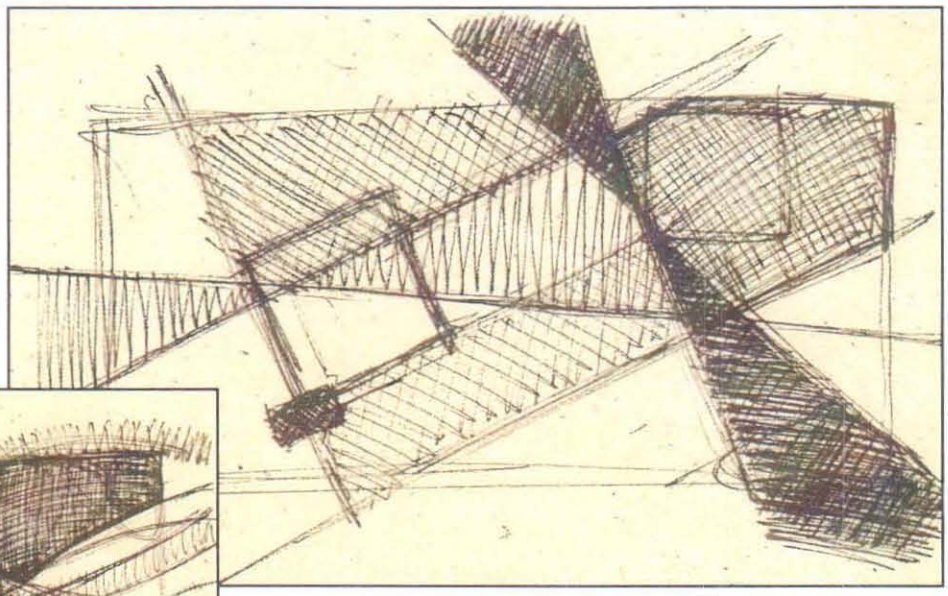
Major "disconnect" between neighborhood and shopping center:
Looking east along commercial and residential alleyways

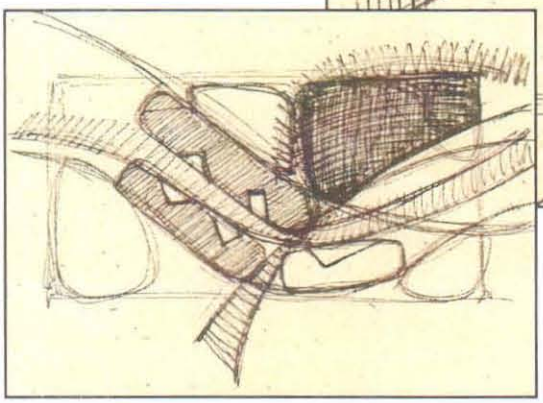


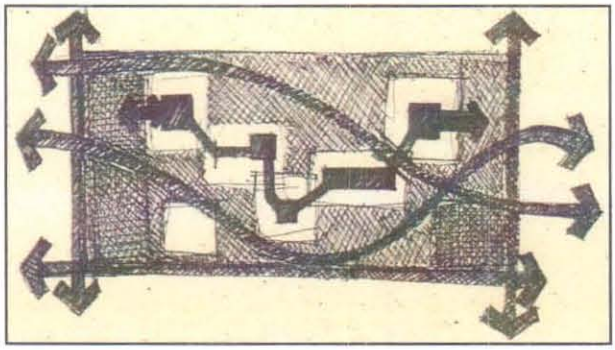
Disconnect between Church and commercial buildings:
poor pedestrian access from west end of neighborhood

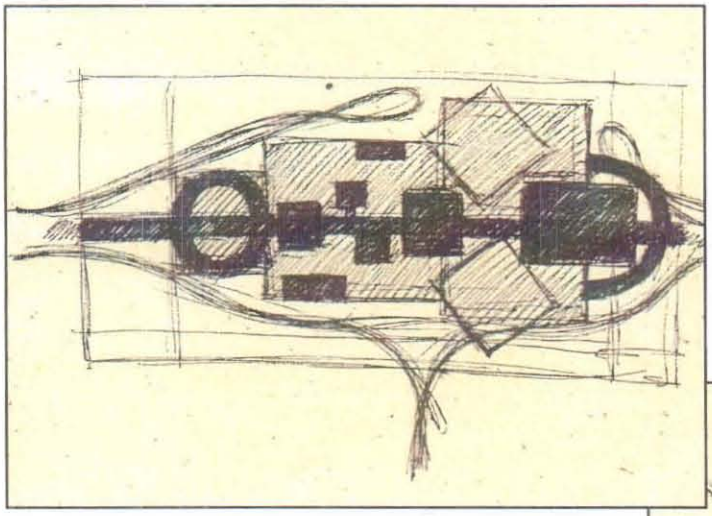
A "College Town Main Street"

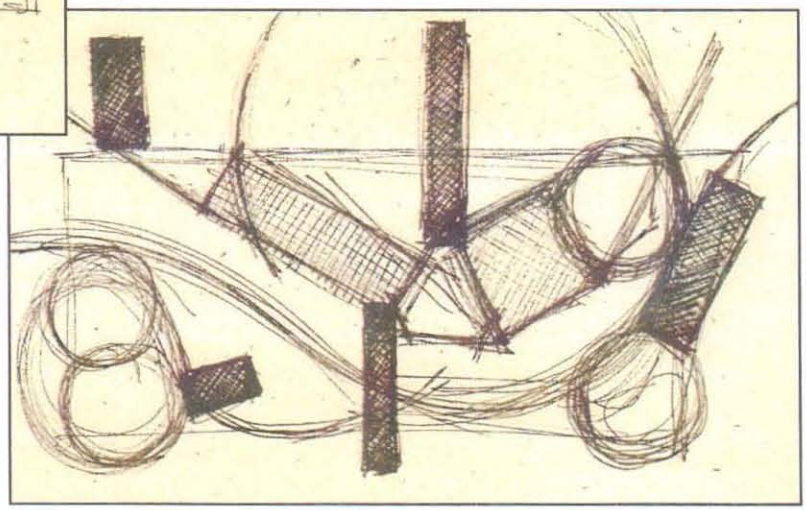
Concept Sketches











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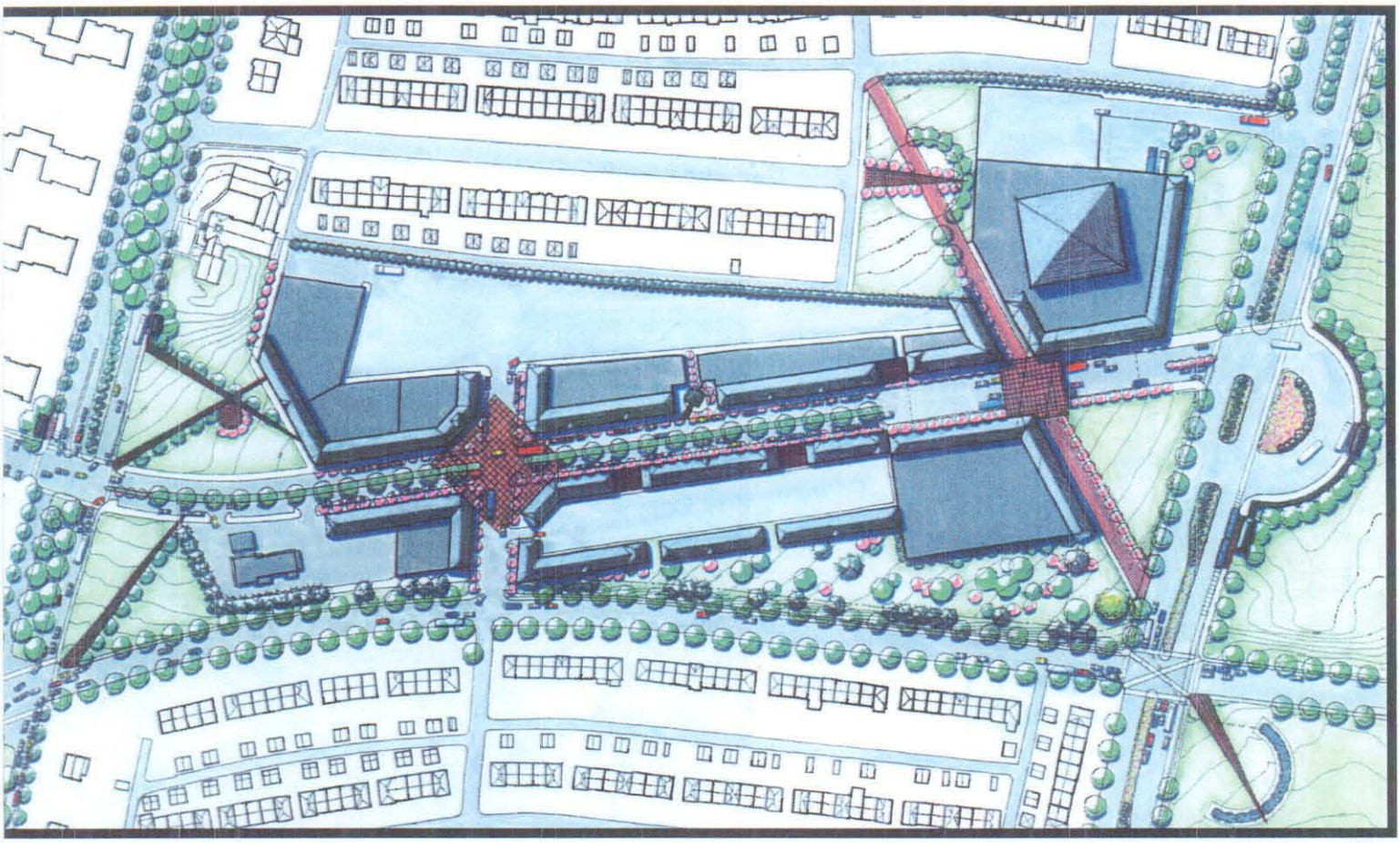
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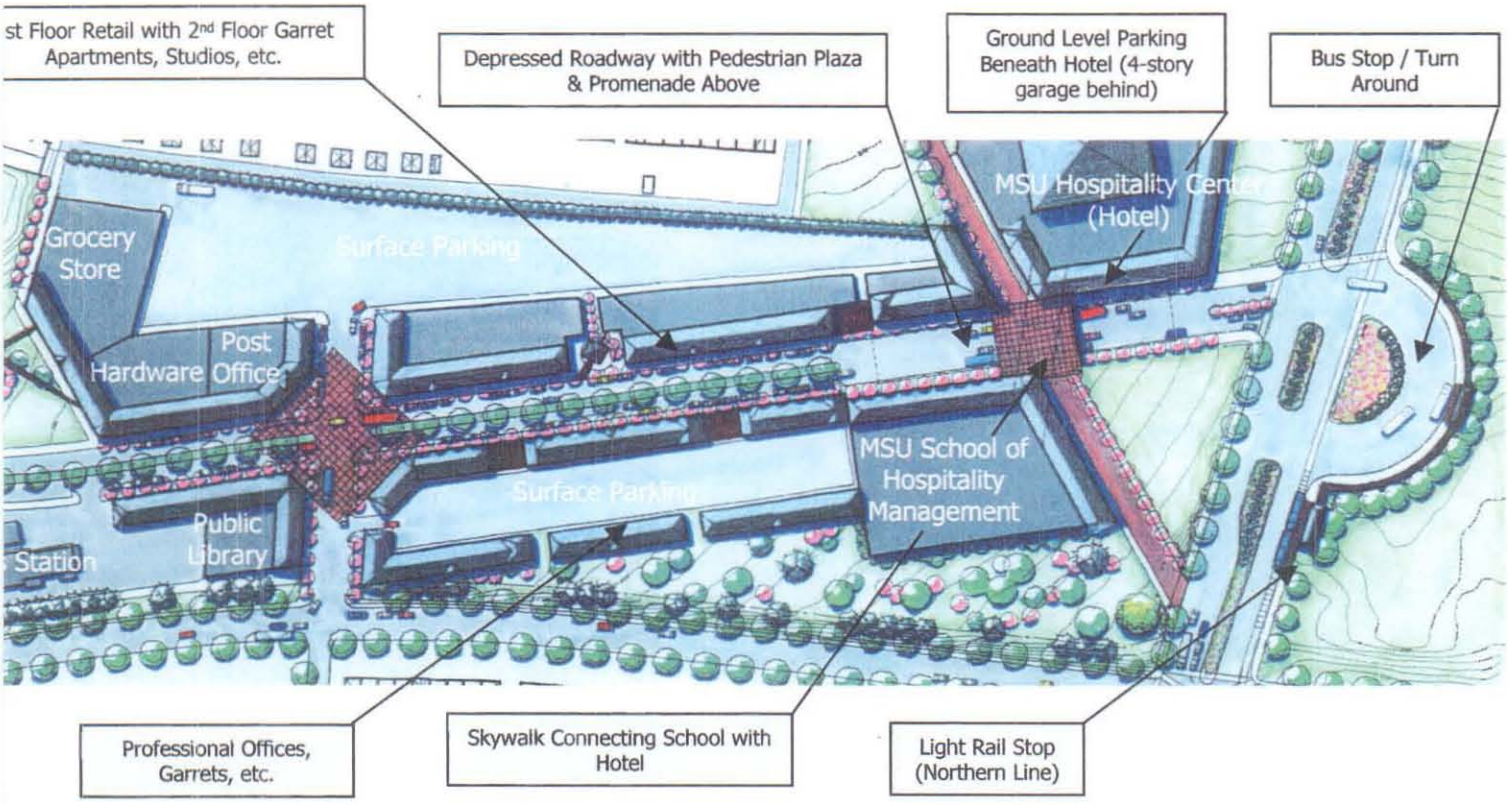
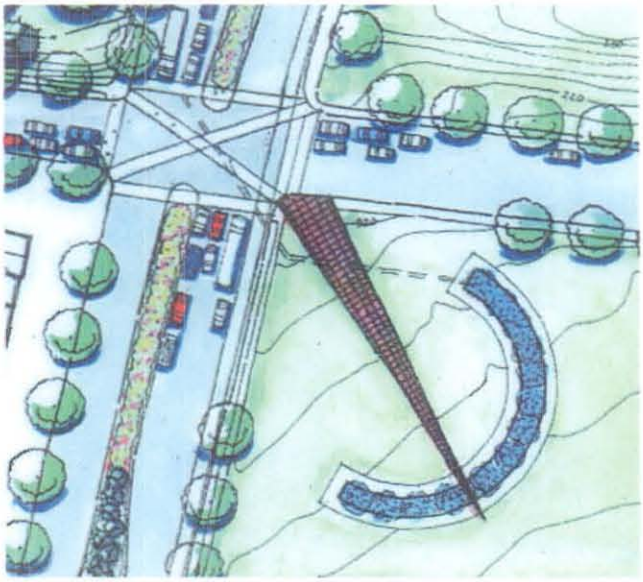
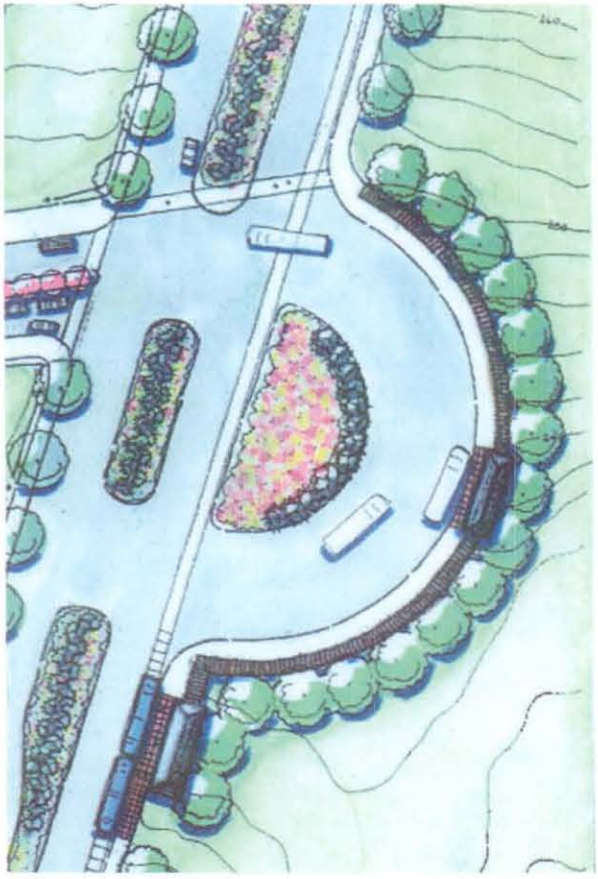
A "College Town Main Street"

Illustrative Plan - Details







Visual Focal Points:

Above: an interactive water fountain at grade that regularly "mists" is fed by surface runoff from shopping center and "shoots up" during a downpour. **Right:** The light rail stop and bus stop are linked by an arced row of shade trees and a wooden arbor and which may sport colorful flowering vines in summertime.

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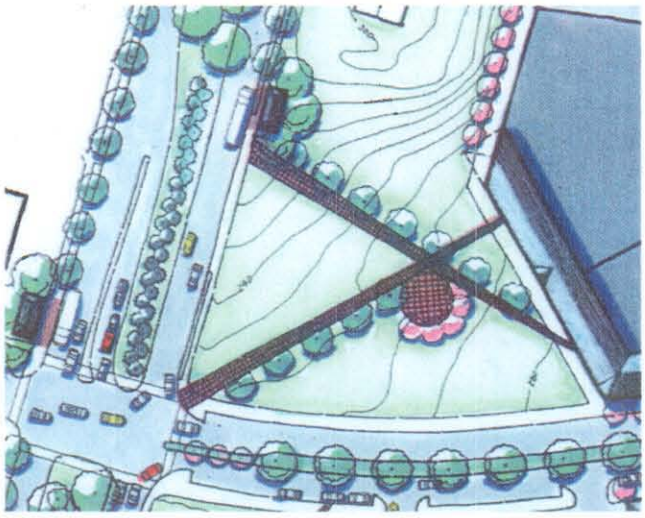
A "College Town Main Street"

Illustrative Plan - Details

Pedestrian Spaces:

A variety of pedestrian spaces, ranging from "very public" to "more private", provide visual and psychological relief from the density of the surrounding neighborhoods.

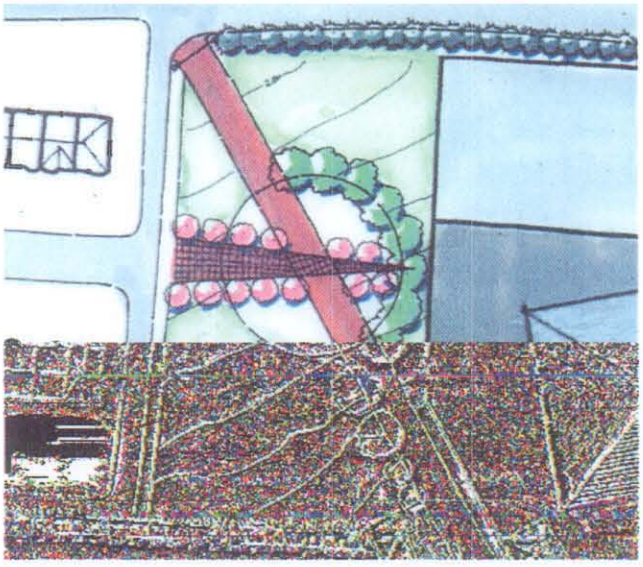


Top:

A small circular plaza space provide a place for shoppers, transit riders and residents to seek a brief respite from busy Loch Raven Boulevard.

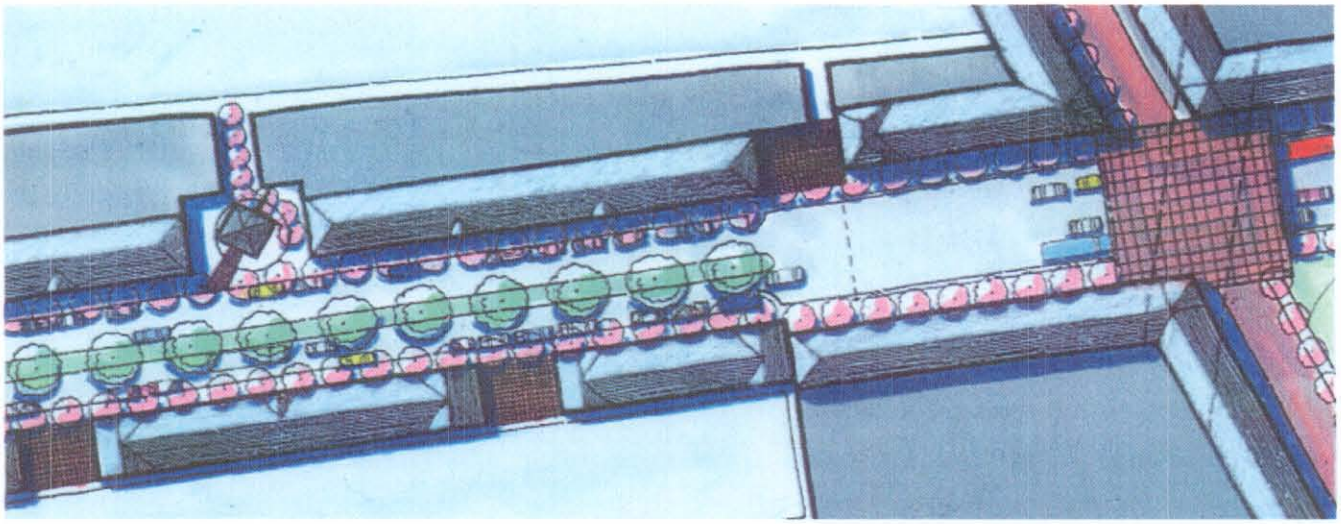
Center:

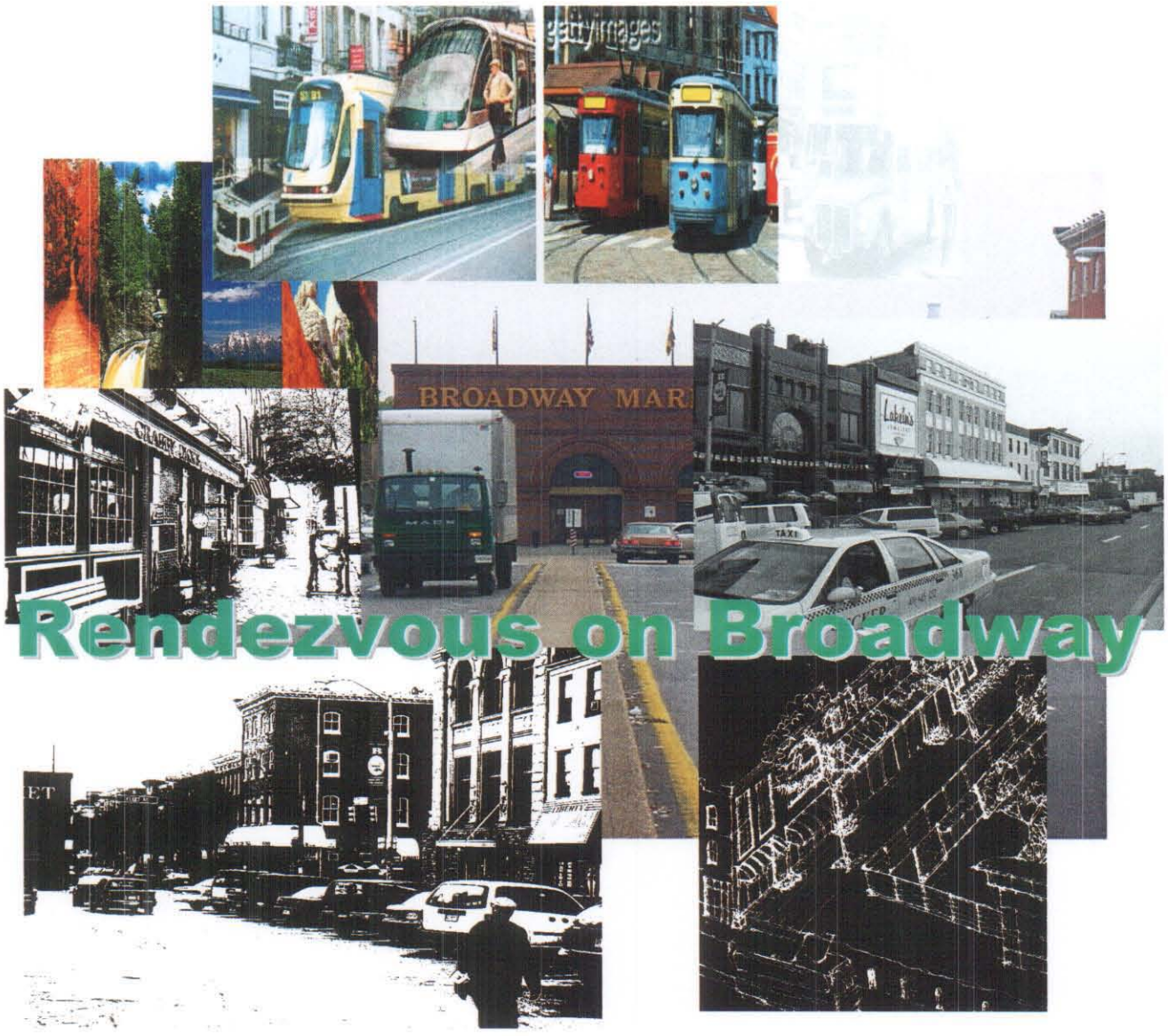
A large circular plaza bisected by at irregular angle by a pedestrian only pathways connects the neighborhoods to the shopping center / transit hub as well as the park space to the south.



Bottom:

A hierarchy of rectilinear plaza spaces provide convenient breaks in the pattern of buildings, serving as meeting places, outdoor dining spaces, as well as places to park bicycles and strollers.





Rendezvous on Broadway

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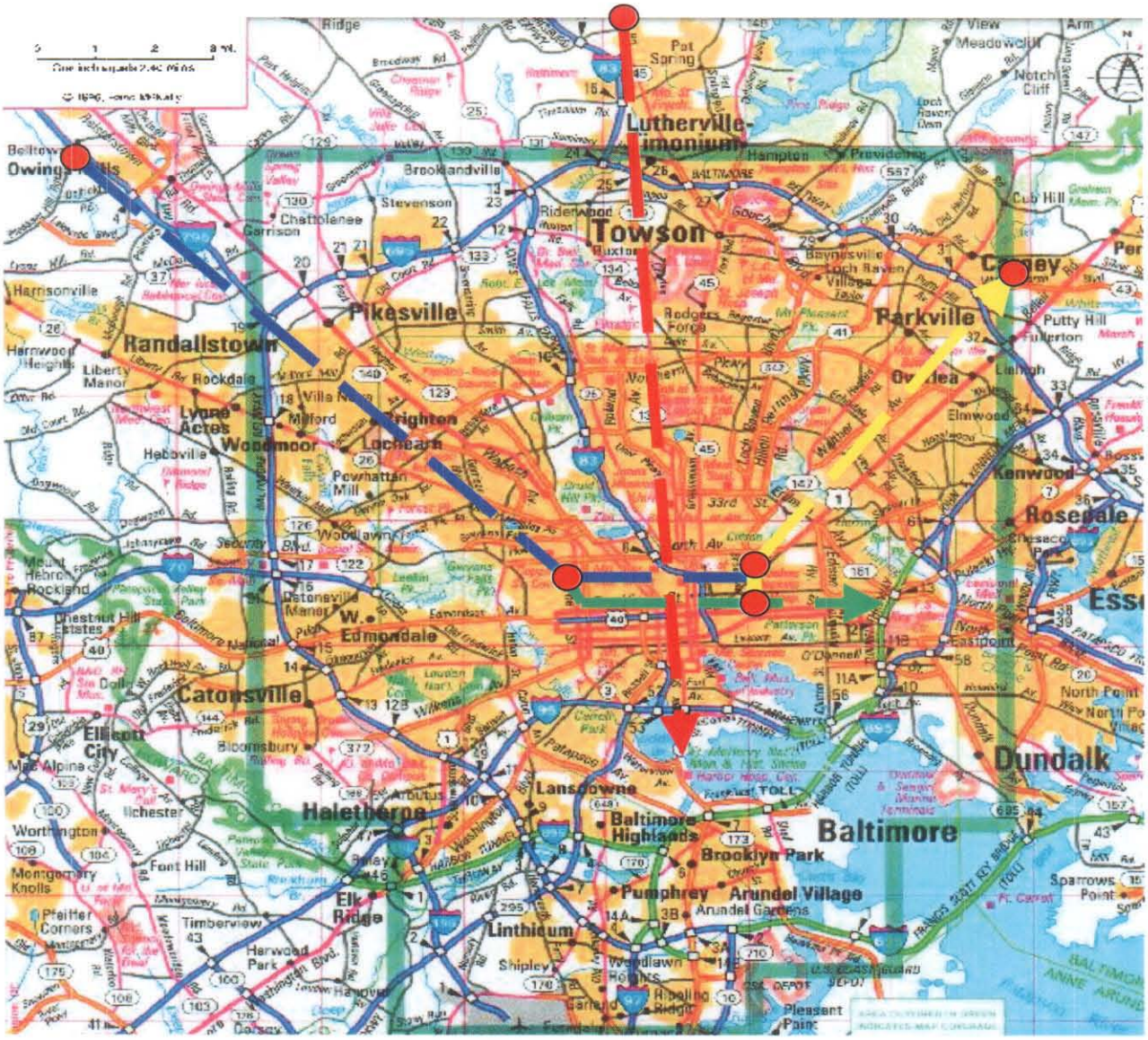
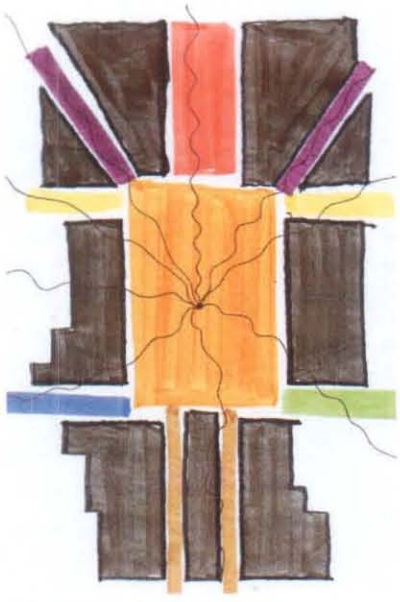
Proposed Network



Recommendations:

- Extend the existing metro from John Hopkins Hospital down to Fells Point and to the north to White Marsh.
- Add a light rail spur from Camden Yards to Fells Point and then to Patterson Park.
- Add additional hubs at important location throughout the city.

"R E N D E Z V O U S"



Concept Diagram

Concept Statement:

"Rendezvous" can be defined as a meeting. Here, my idea is to create a place that would be a meeting place for people supported by the presence of a very active commercial district--places to eat, places to shop, places to sit and enjoy, places to relax and beginning point for a journey. This district is connected with the rest of the city via the help of mass transit network.

South Broadway is very rich in cultural diversity. It is a major commercial district and is very close to Fells Point. However, there is big disconnection between this neighborhood and downtown Baltimore. Hence my idea is to extend the existing MTA network up to this area and beyond and create a hub at the junction of Broadway and Fleet St. I envision this place to be a multi-leveled plaza with street cafes and relaxing area at ground level, shopping and open to sky underground plaza at Level1, which would also incorporate the metro station.

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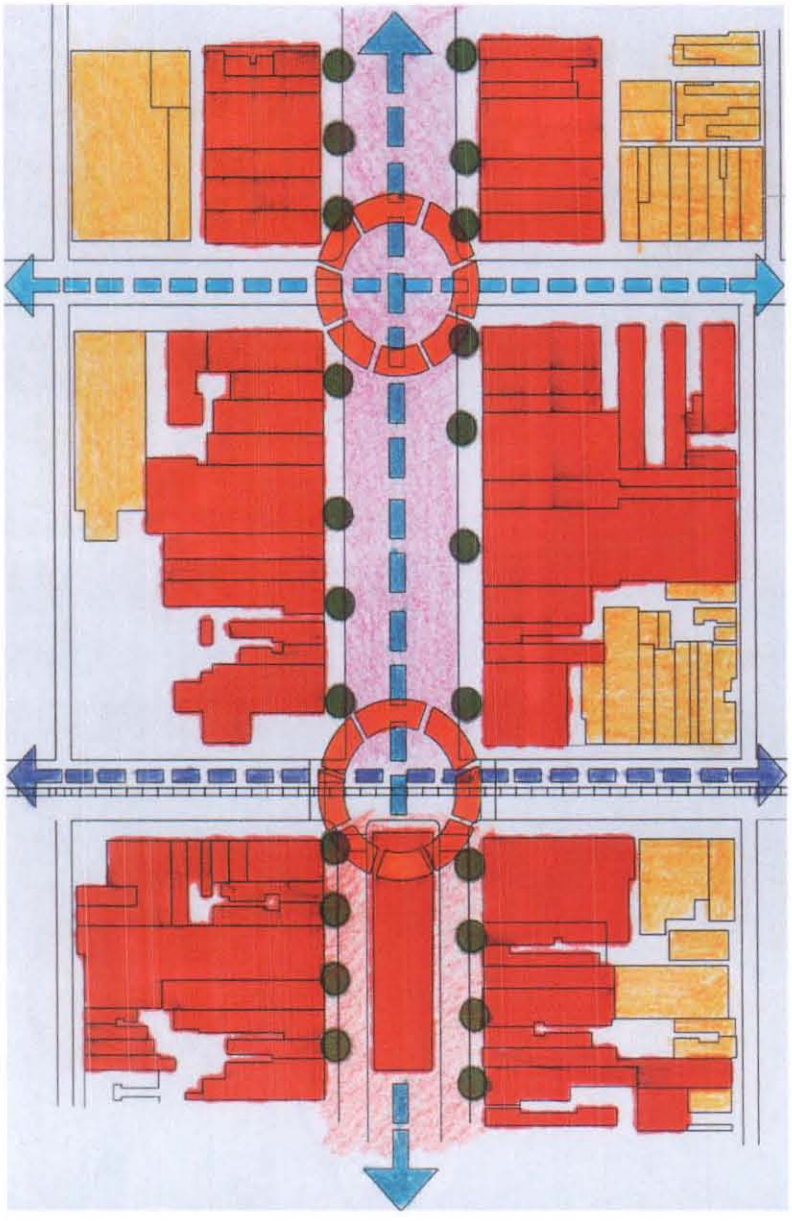

Constraints:

- No linkage to the rest of the city and especially to John Hopkins Hospital
- Presence of unwanted loiterers, therefore the area doesn't feel safe
- The area is commercially active, but it is still not a popular place for the non-locals
- No physical connection with the main metro and light rail systems
- The area rich in cultural diversity, but still has no identity
- Proximity to Fells Point waterfront but connection is not evident from Fells Point to South Broadway

Opportunities:

- Provide a transportation hub that will connect the region with the rest of the city through and integrated mass transit system
- Use the cultural diversity as a means to create an identity for the region
- Use landscape as a means of beautification and improving the environmental quality of the area

GOAL

- Create a place that is rich in resources, culture, transportation links and a place for people

KEY

- Commercial
- Residential
- Major north-south street
- Major east-west street
- Ex. Trees

Existing Conditions

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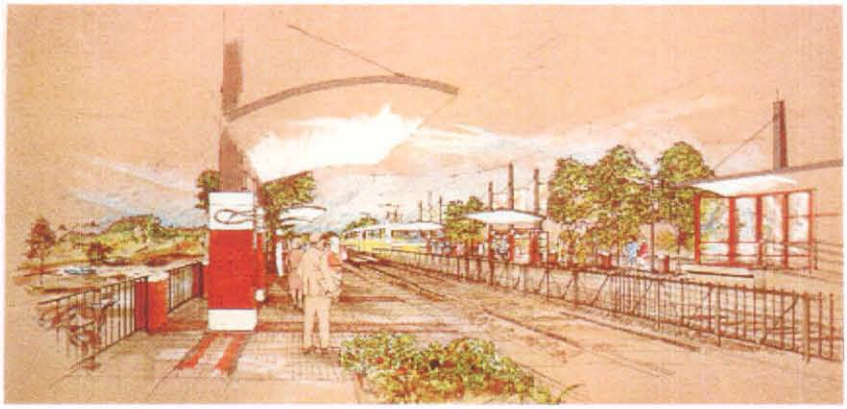
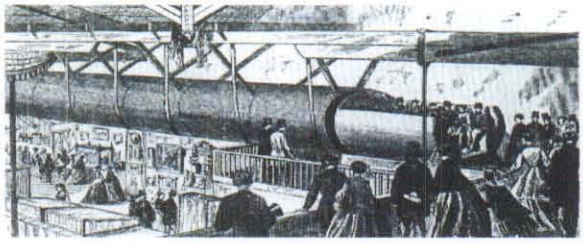
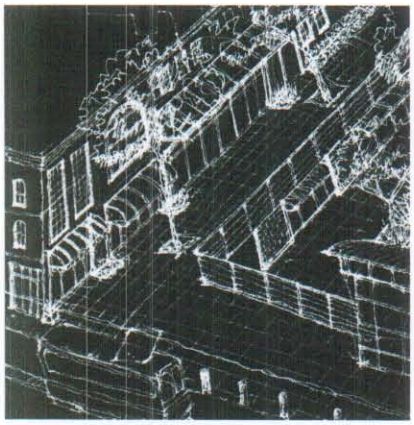
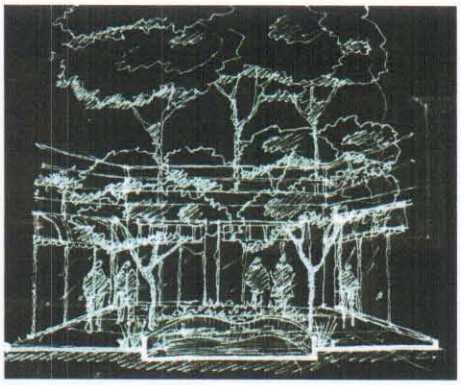




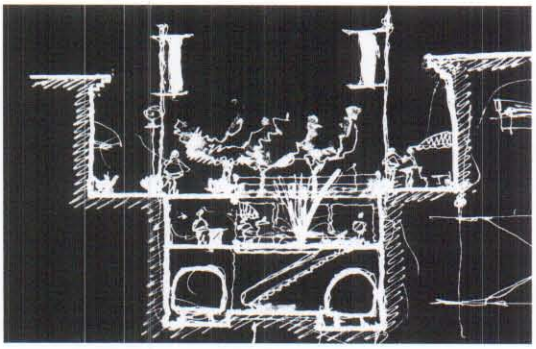
Precedents





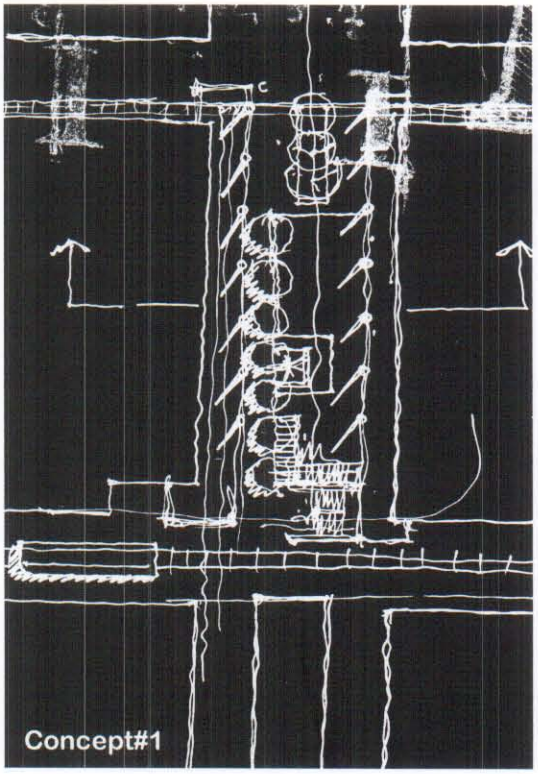
Concept # 1

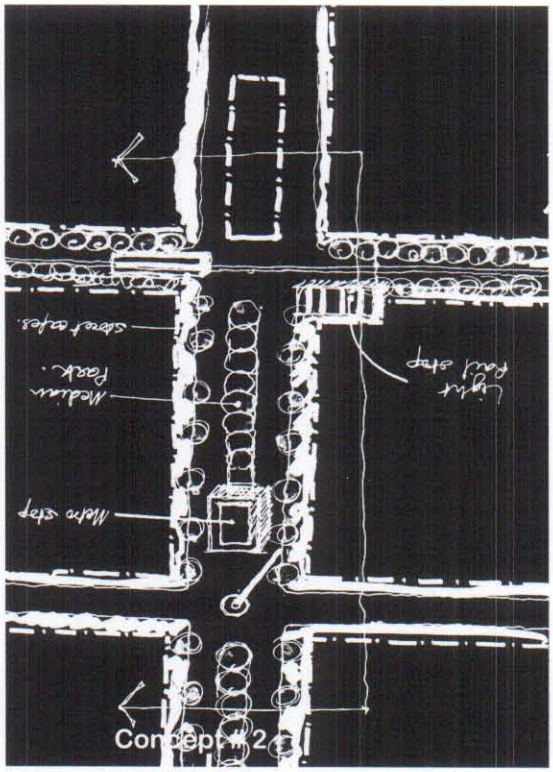
- Create a Multi-leveled plaza space, that gives the users different shopping opportunities and also is an entertainment hub
- The main feature would be the plaza at lower level, which would also act as the entrance to metro.
- The plaza would be connected with the rest of the city with three modes of transportation viz., Bus, Metro and Light rail



Concept # 2

- Extend the median along Broadway from Baltimore St. down to Fleet
- Create a median park in the block from Fleet to Eastern Avenue
- Propose street café's, shopping etc.
- Propose metro and light rail stops to connect the area with the rest of the city



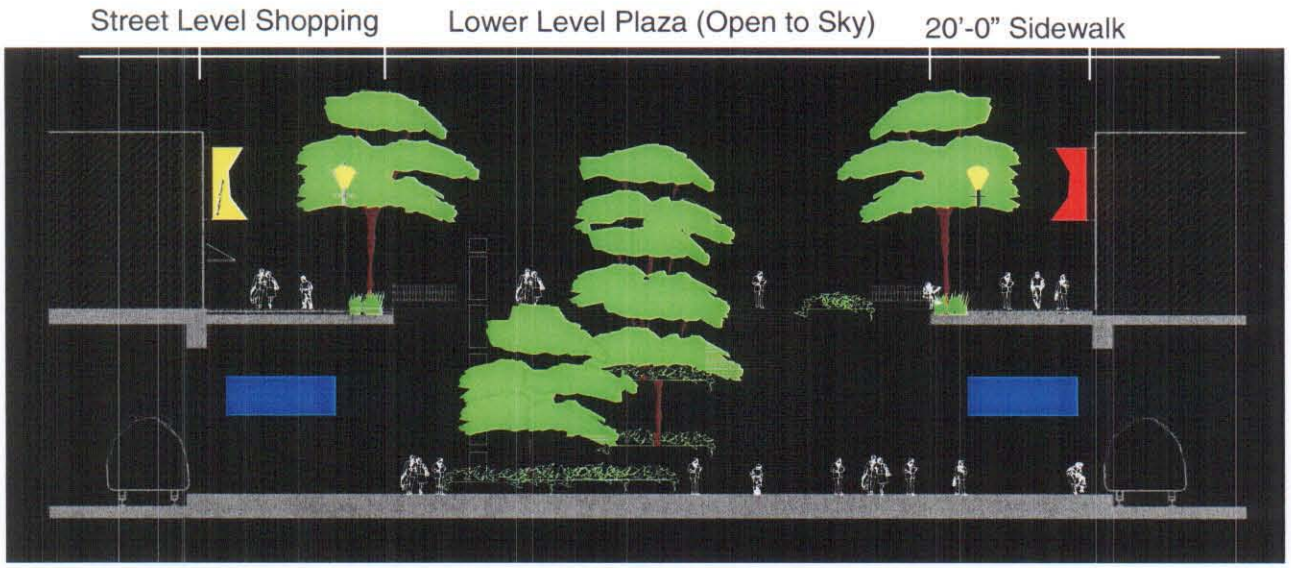


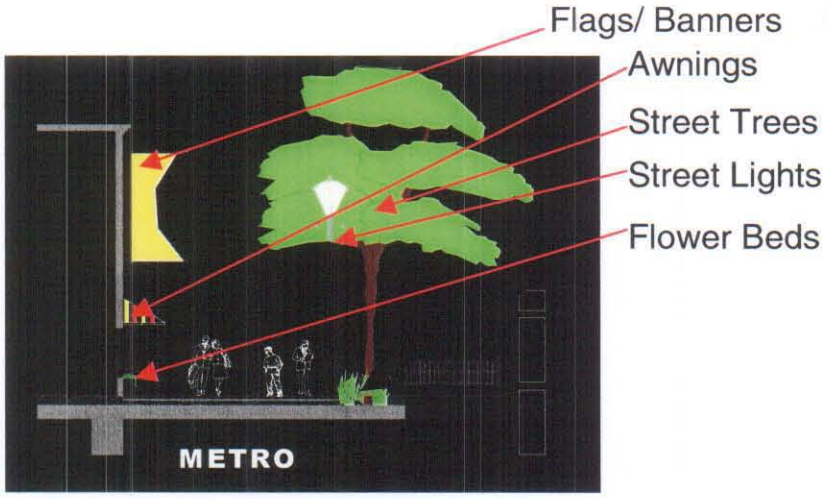
Conceptual Designs

Master Plan

Features:

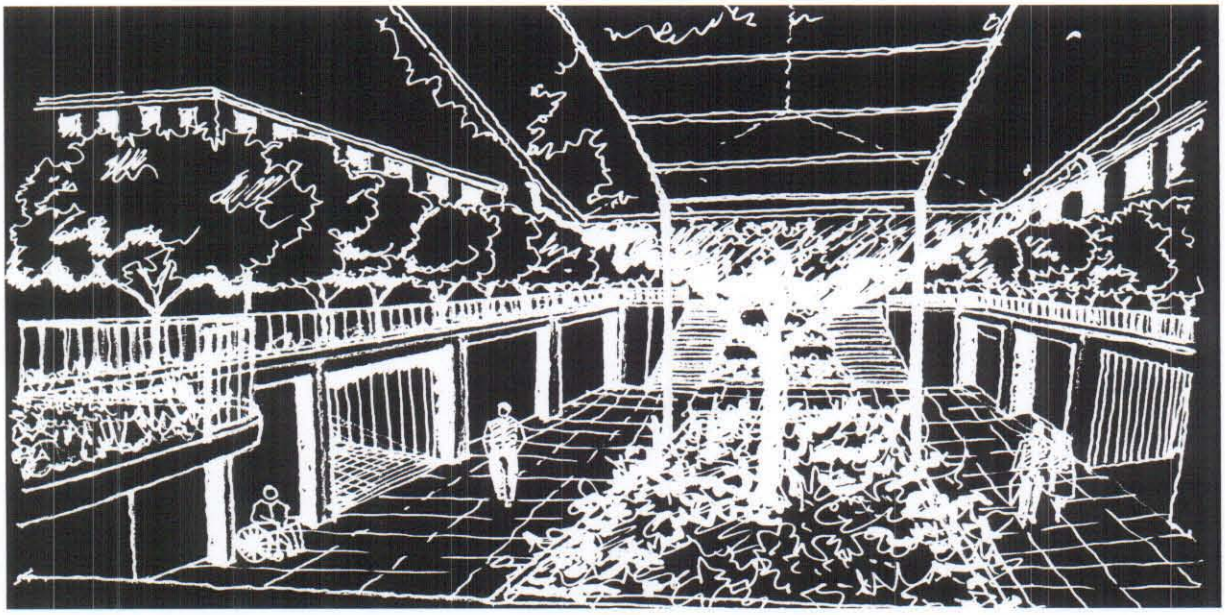
- Extend the median along Broadway from Baltimore St. down to Eastern Avenue
- Create A multi-leveled plaza in the block from Fleet St. to Eastern St. that would mainly be a transportation hub
- Entrances to the plaza would be from both ends, Eastern Ave. and Fleet Street respectively
- Street café's, restaurants and entertainment shops would be located at the street level
- The lower level plaza would consist of mainly an open to sky court rich in landscape and would have the entrances to the metro
- The plaza would be linked with the inner harbor with the help of a new light rail line and with John Hopkins Hospital with the help of a new metro line


Street Level Shopping
Lower Level Plaza (Open to Sky)
20'-0" Sidewalk

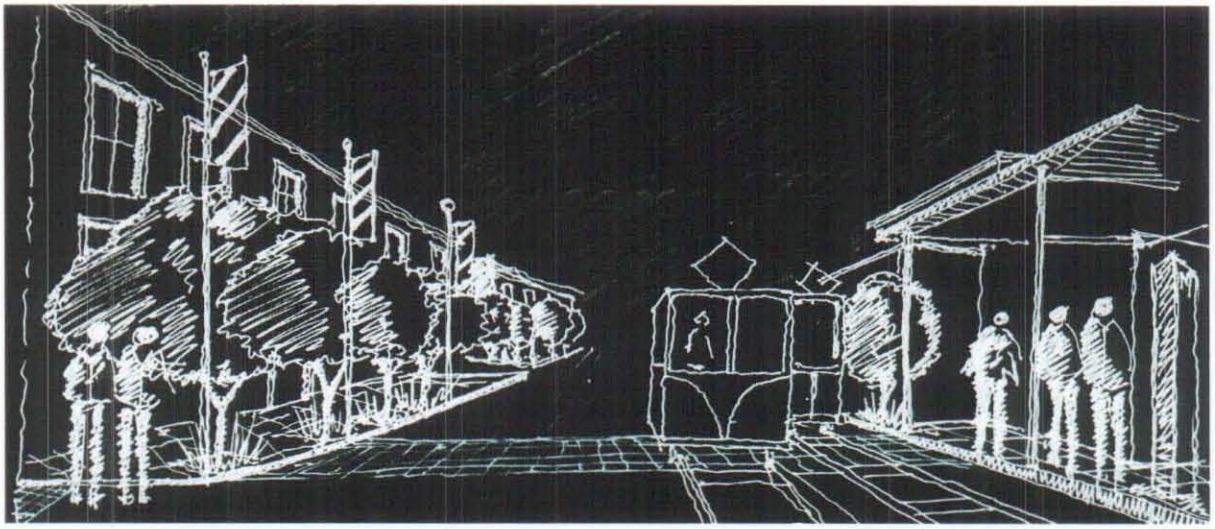

Flags/ Banners
Awnings
Street Trees
Street Lights
Flower Beds
METRO


Street Level Shopping
METRO
Lower Level Plaza

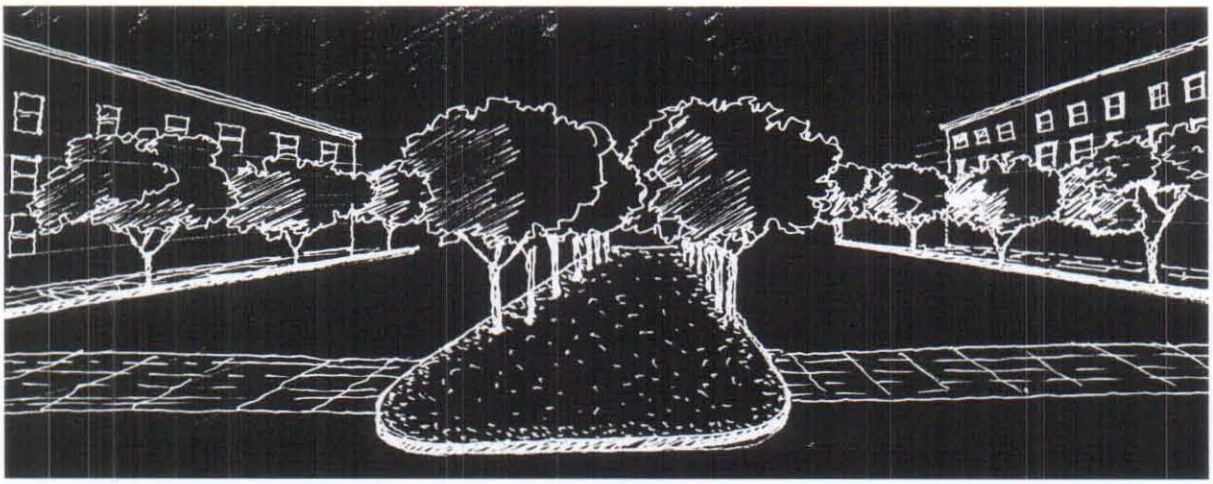
View at Street Level



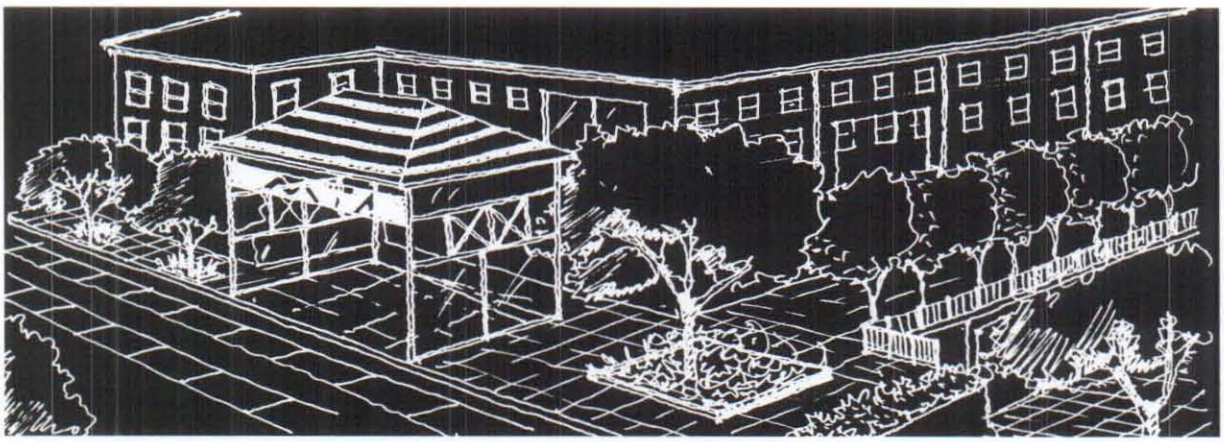
View of Lower Level Plaza



View Showing the Light Rail Stop

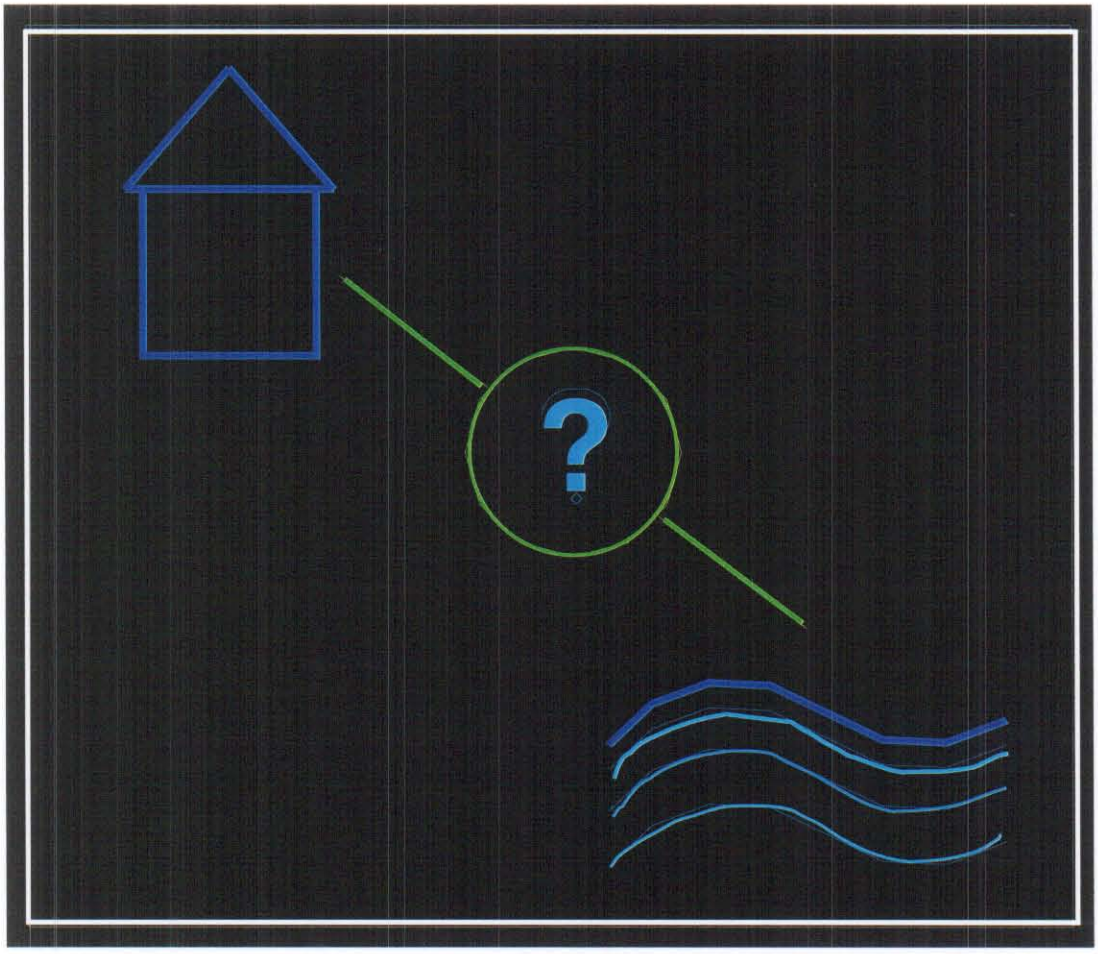


View Showing the Green Median



View Showing the Southern End of the Plaza

Home to Harbor



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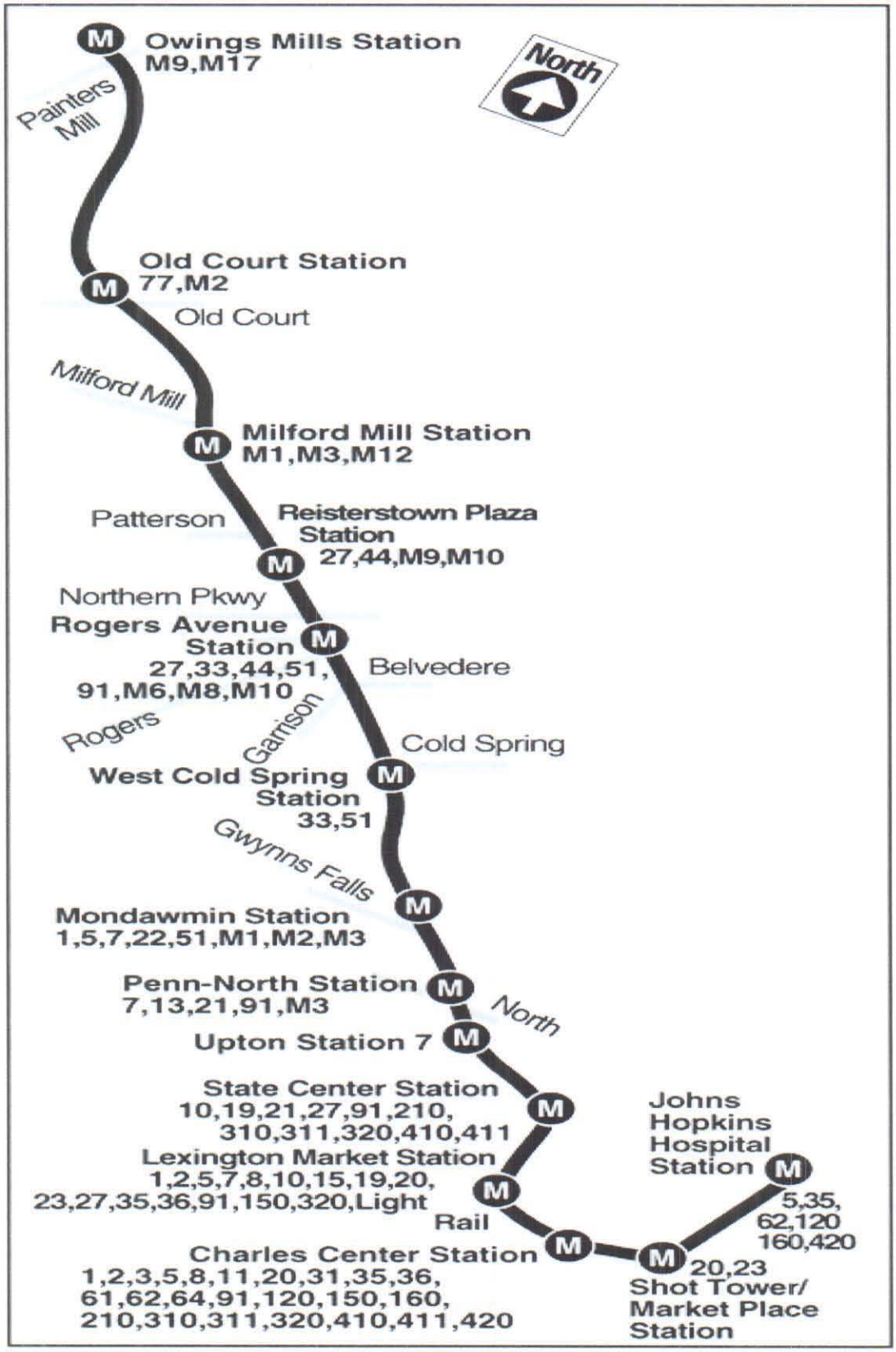
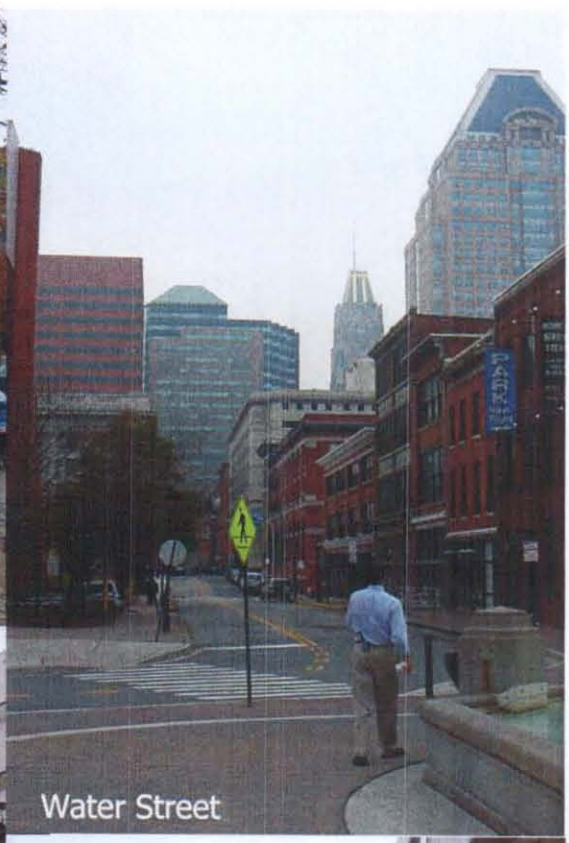
METRO STOPS


Owings Mills Station
M9,M17
North
Painters Mill
Old Court Station
77,M2
Old Court
Milford Mill
Milford Mill Station
M1,M3,M12
Patterson
Reisterstown Plaza Station
27,44,M9,M10
Northern Pkwy
Rogers Avenue Station
27,33,44,51,
91,M6,M8,M10
Belvedere
Rogers
Garrison
Cold Spring
West Cold Spring Station
33,51
Gwynns Falls
Mondawmin Station
1,5,7,22,51,M1,M2,M3
Penn-North Station
7,13,21,91,M3
North
Upton Station 7
State Center Station
10,19,21,27,91,210,
310,311,320,410,411
Lexington Market Station
1,2,5,7,8,10,15,19,20,
23,27,35,36,91,150,320,Light
Rail
Charles Center Station
1,2,3,5,8,11,20,31,35,36,
61,62,64,91,120,150,160,
210,310,311,320,410,411,420
Johns Hopkins Hospital Station
5,35,
62,120
160,420
20,23
Shot Tower/
Market Place
Station

EXISTING SITE CONDITIONS



Lombard Street

View toward plaza from Metro

Plaza Area

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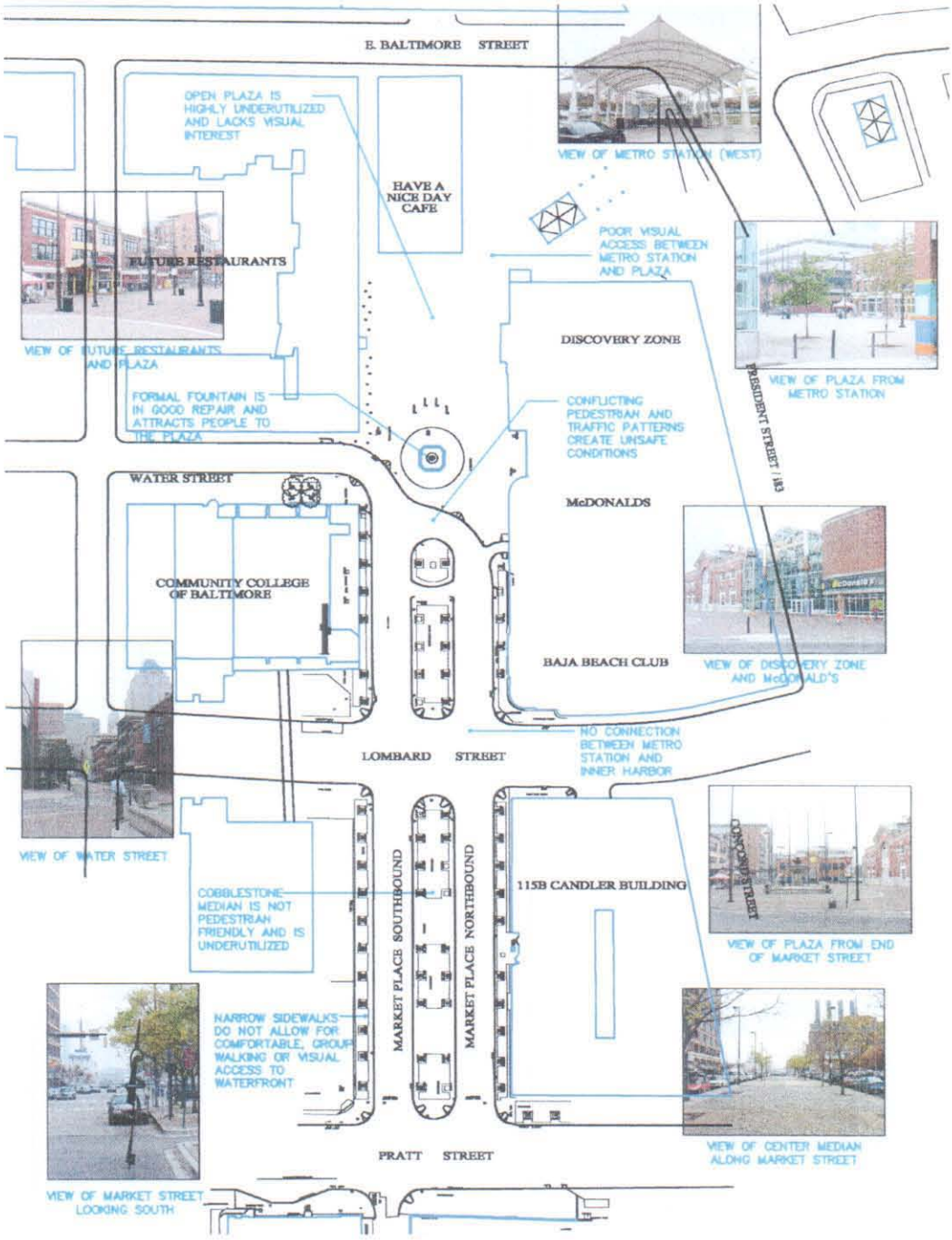
View toward plaza
from Metro

Views toward metro

Shot Tower West

Shot Tower East

INVENTORY & ANALYSES



The Shot Tower metro stops, located at the corner of President (I-83) and Baltimore streets, are only a short distance to the Inner Harbor. Pedestrians (tourists and locals alike) find it difficult to navigate their way to the metro stop due to poor advertising, lack of visual access and poor connection to the metro's surroundings. The open plaza, located adjacent to the metro stop is highly underused as a space; however, the surrounding commercial buildings that boast entertainment themes are helping to bring the area back to life.

PROGRAMMING ELEMENTS

The key to the success of the design is making the connection between the Inner Harbor and the Shot Tower metro station

The design starts with the plaza: A visual link from the west Shot Tower station to the plaza is made possible by a sculpture fountain. Continuity between the metro station and the sculpture fountain is successful because stone sculptures (located in the metro stop) are utilized in the landscape. The stone sculptures also serve as a directional element, pointing the way to the Inner Harbor. The combination of water and light runs along the ground plane to the existing fountain by means of a glass block runnel. Outdoor cafes and landscaping are introduced to the plaza. The entire first floor of "Have a Nice Day Café" is opened up for visual access to the metro stop and to create farmers market space.

New restaurants and shops

To attract more people to the area and therefore the plaza. The plaza itself, now bustling with activity on the edges and center, serves as the gateway to the harbor.

Turn-around area at the top of Market Street

Currently u-turn traffic and traffic heading toward Water Street conflict. Access to Water Street is eliminated allowing for a market place feel. The end of Market Street is changed into a loop which a large turning radius. The space is safer and less confusing.

New and wider sidewalks on either side of Market Street

To extend from the plaza space to Pratt Street. An additional +/-10 ft of sidewalk width added to the design to accommodate large numbers of pedestrians and to allow for visual access to the harbor.

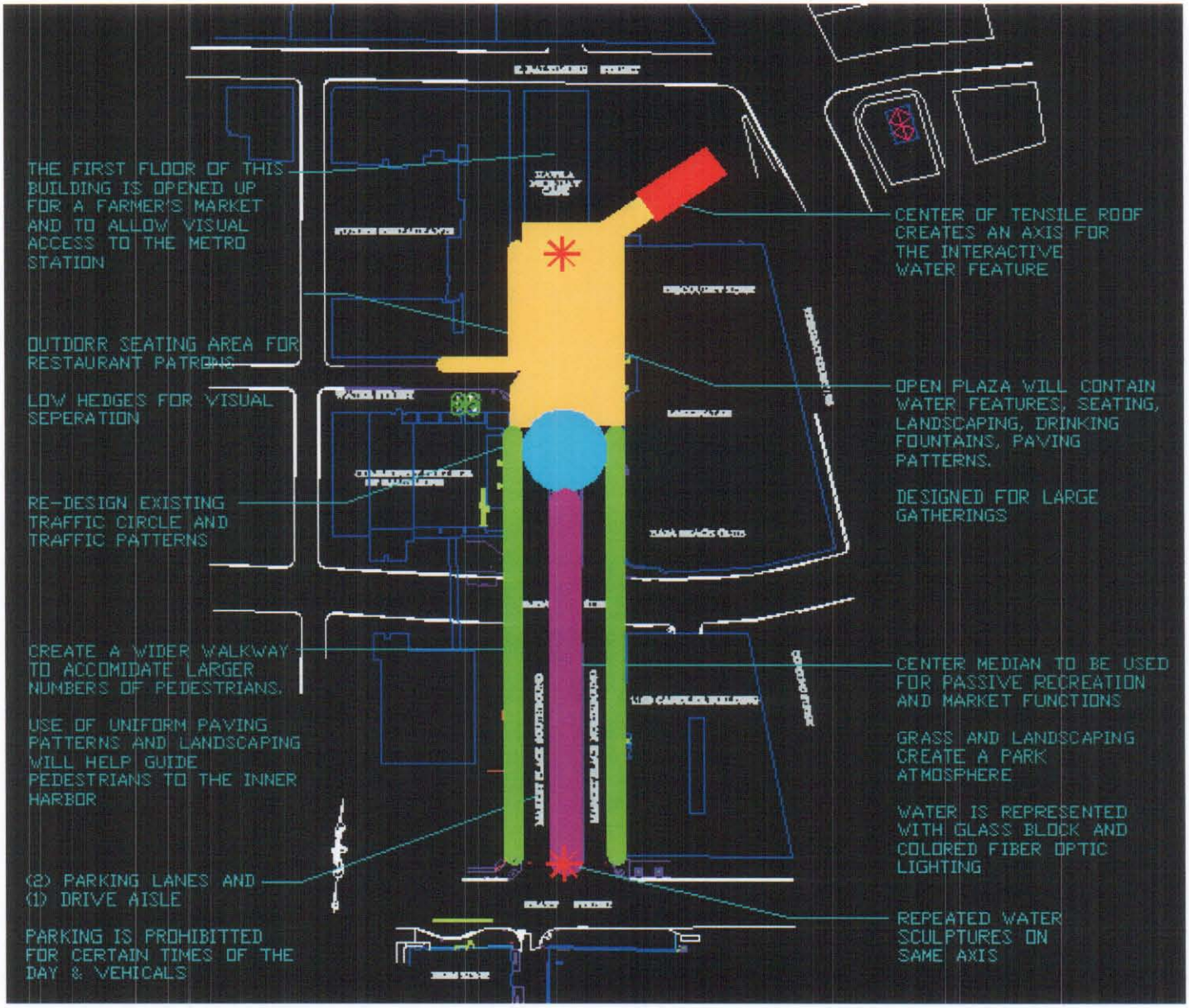
Strong center median from the plaza to Pratt Street

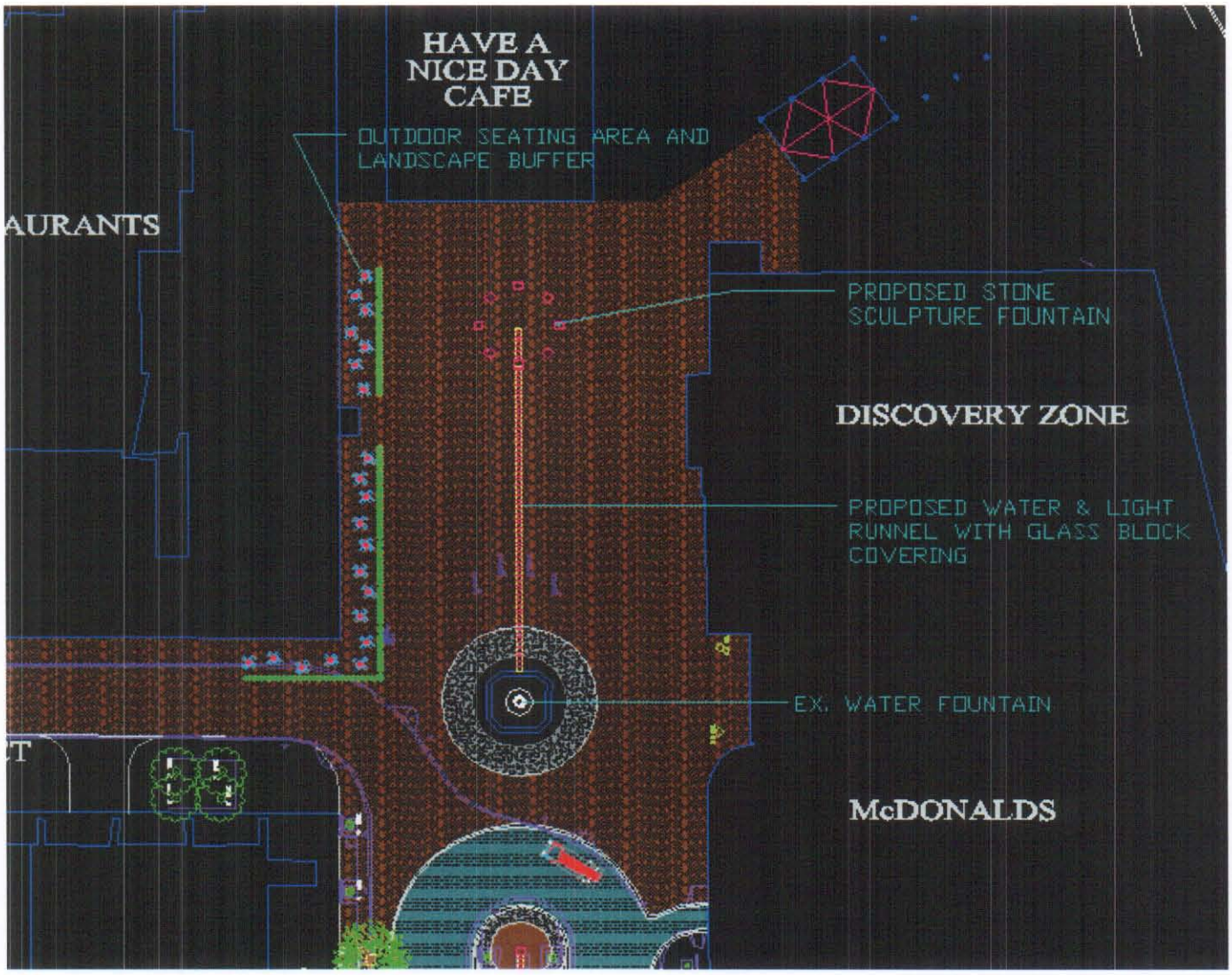
The major connection between the Inner Harbor and the metro station is served by the center median. Cobblestone pavers (re-used in the streets) are replaced with grass and landscaping. Allees of trees line the edges of the median to create visual connection with the water.

"Market Place" theme

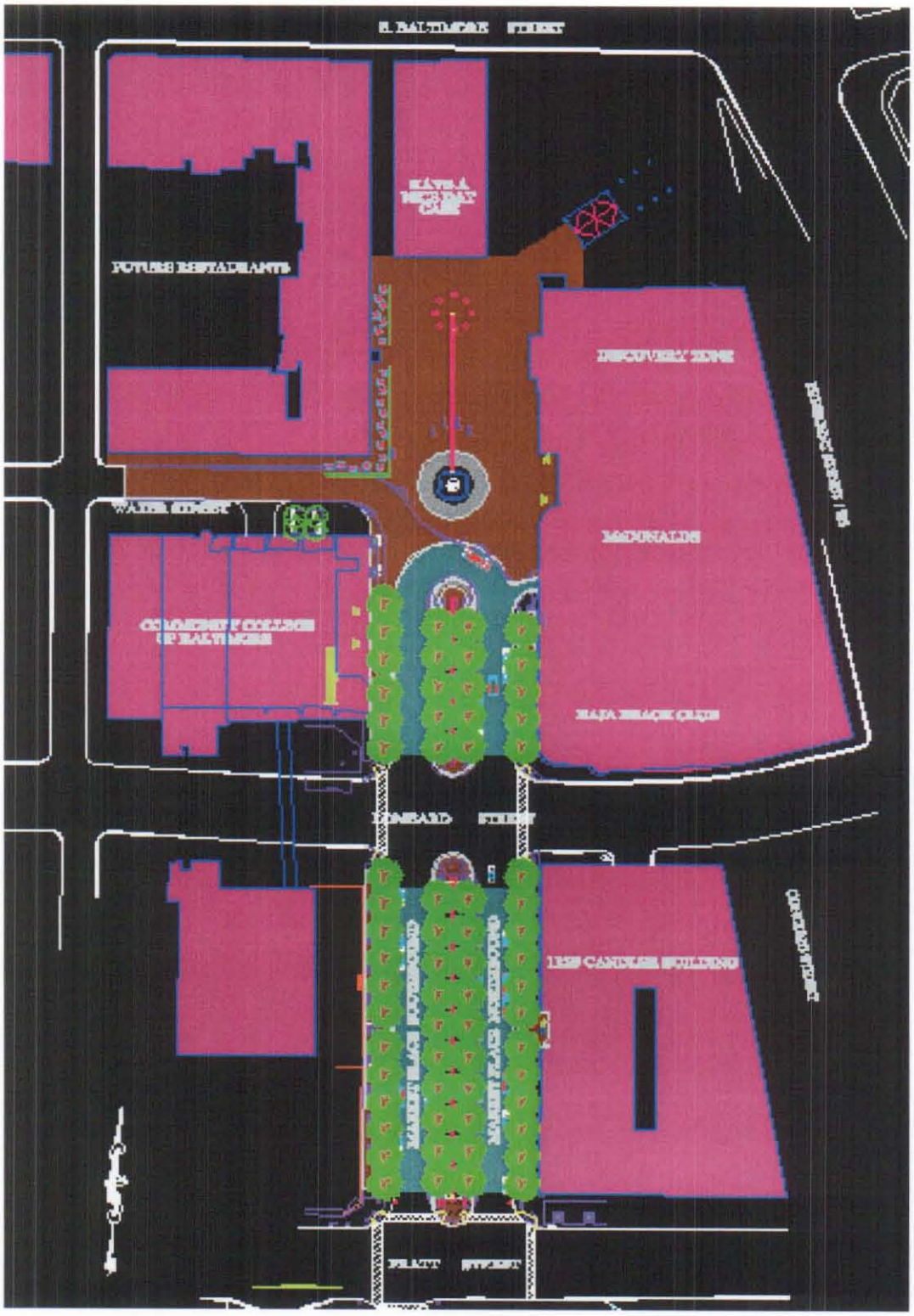
Carried through by the addition of calendar events such as the weekly farmers market or monthly book selling fairs. When special events are not occurring, connection between the Inner Harbor and the Metro stop is made possible by the water/light runnels.

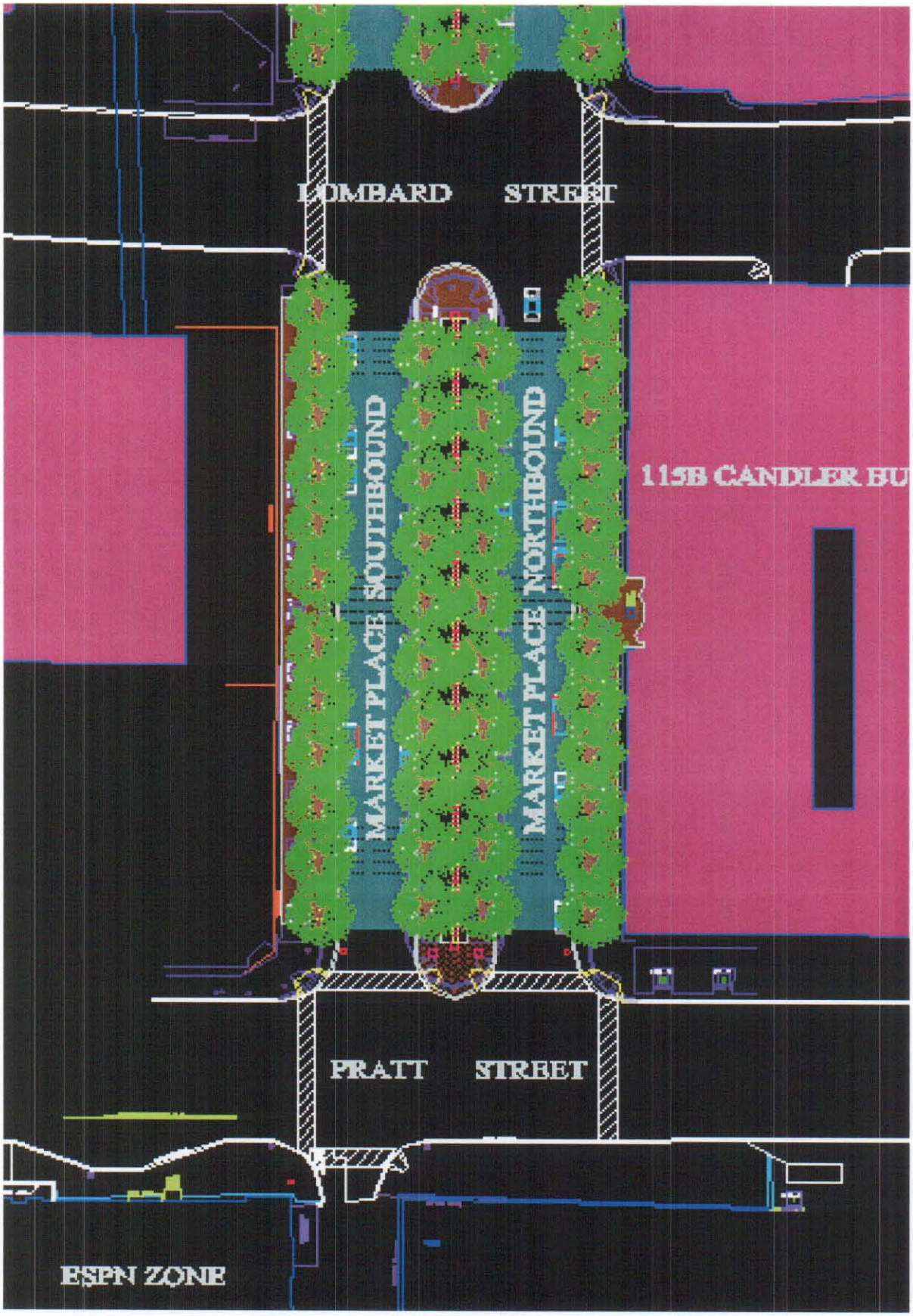
PROGRAMMING

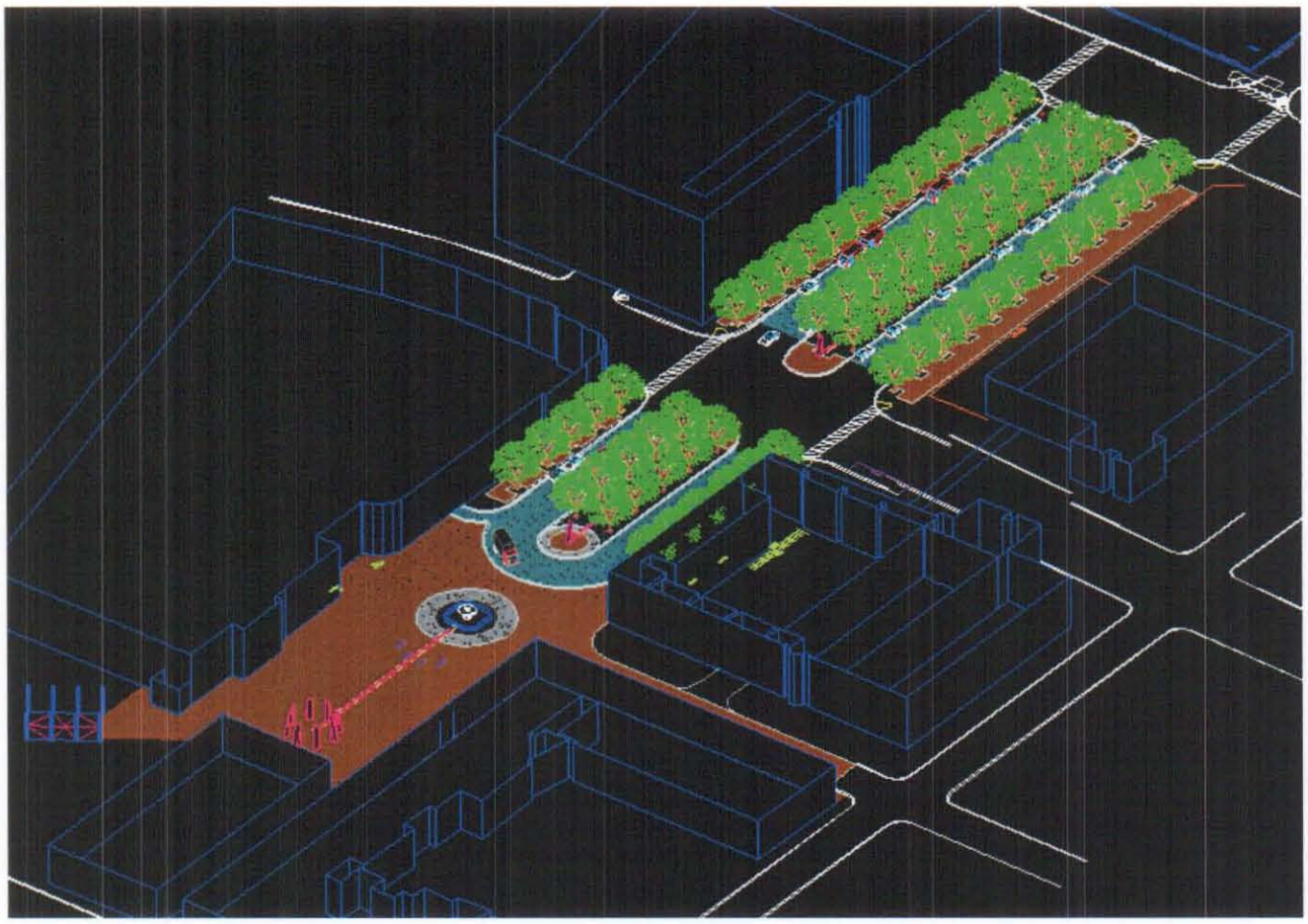


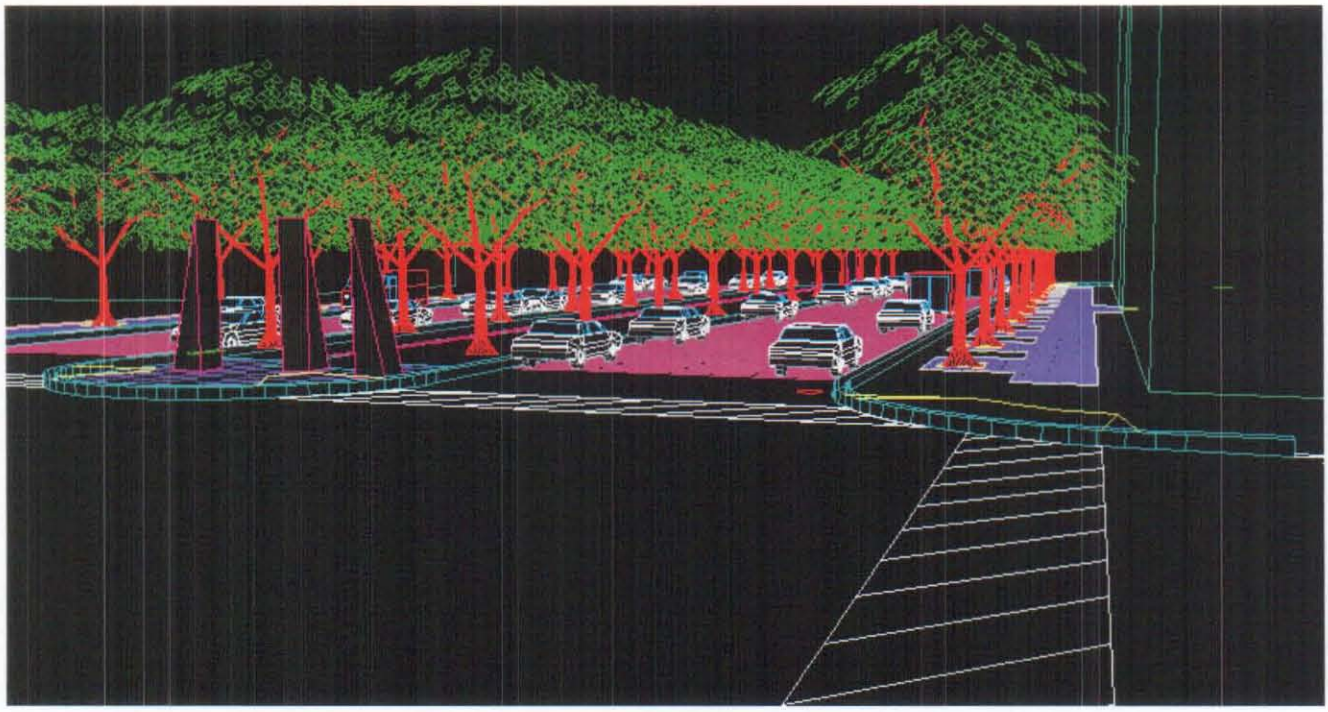

HAVE A
NICE DAY
CAFE
OUTDOOR SEATING AREA AND
LANDSCAPE BUFFER
AURANTS
PROPOSED STONE
SCULPTURE FOUNTAIN
DISCOVERY ZONE
PROPOSED WATER & LIGHT
RUNNEL WITH GLASS BLOCK
COVERING
EX. WATER FOUNTAIN
McDONALDS

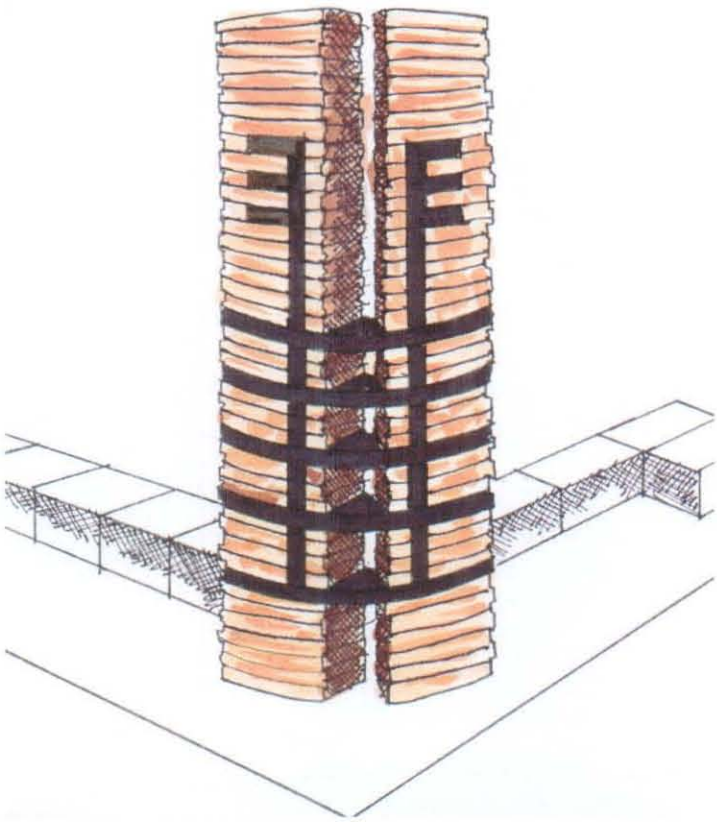
THE MASTER PLAN




LOMBARD STREET
MARKET PLACE SOUTHBOUND
MARKET PLACE NORTHBOUND
PRATT STREET
ESPN ZONE







Stone Sculpture from
Metro Station

Water Feature

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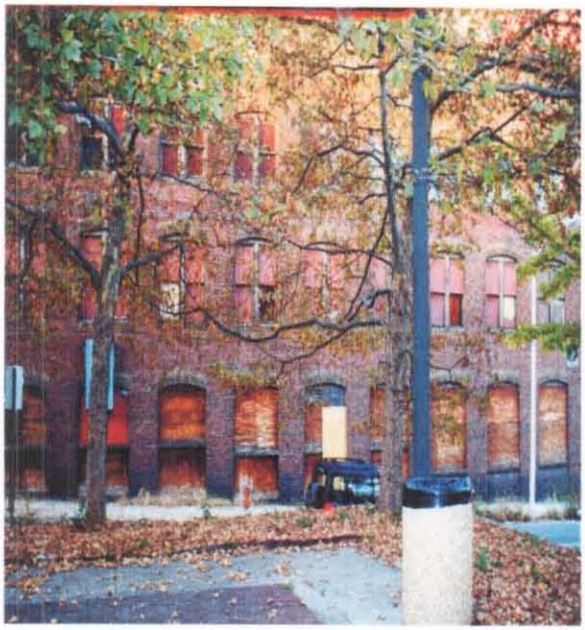
Inventory

- Located in historic Mount Vernon
- There are existing light rail and bus stops
- John Howard Park has poor visibility
- Residents and surrounding businesses have withdrawn from street activity

John Howard Park



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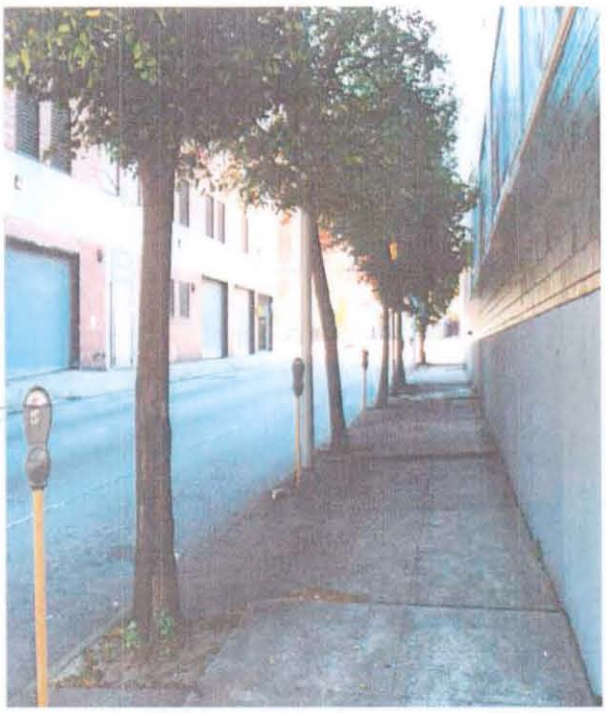
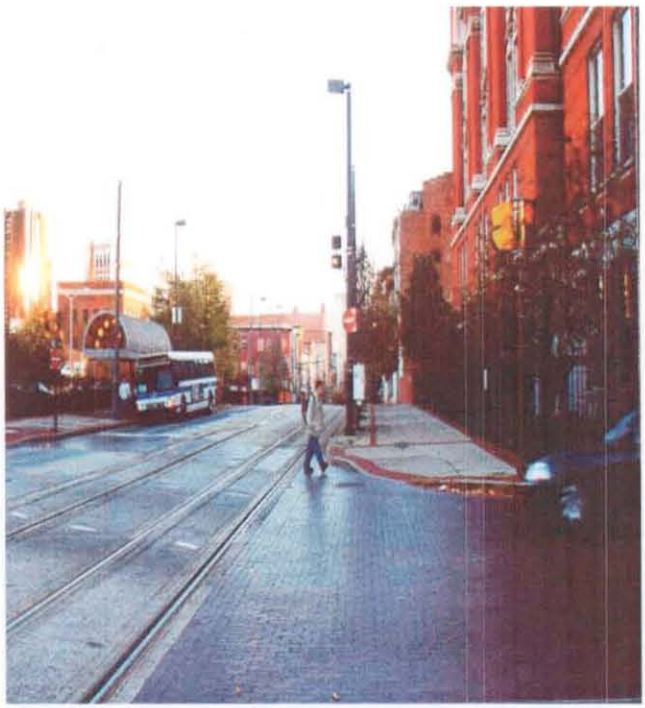
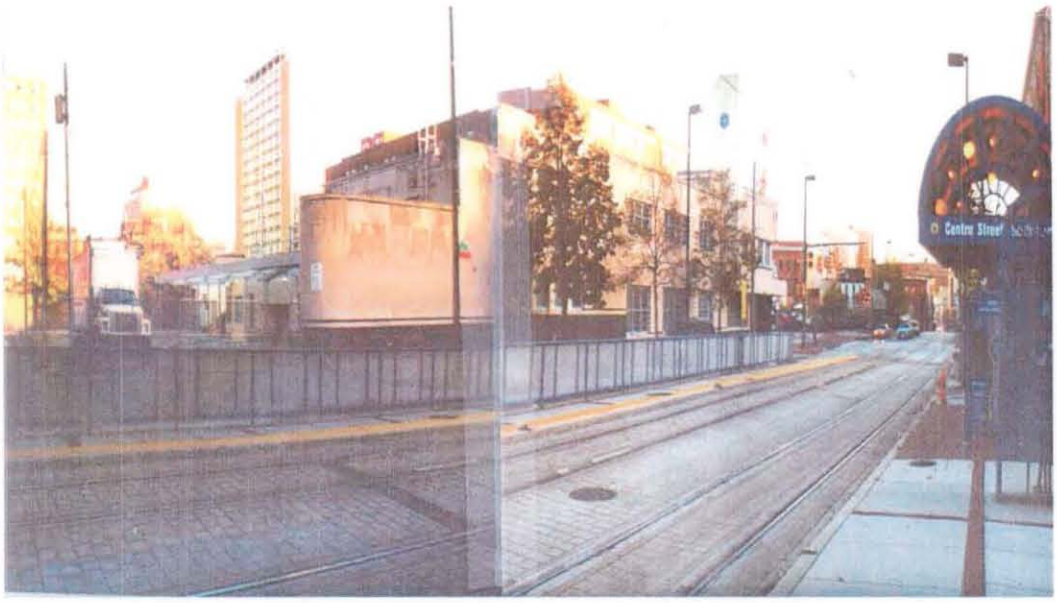
Existing Street Conditions







Residential Character

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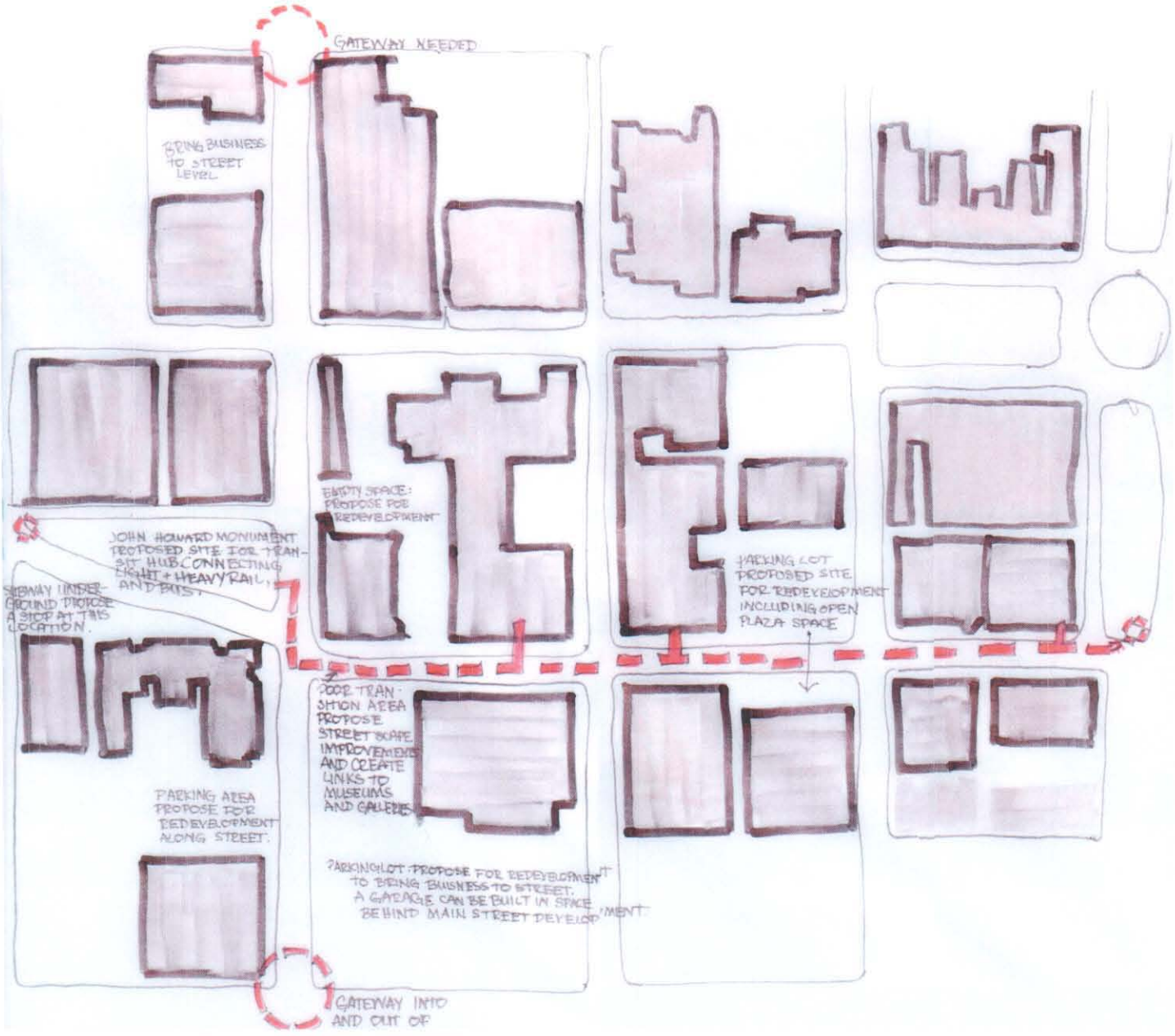
Analysis


GATEWAY NEEDED
BRING BUSINESS TO STREET LEVEL
JOHN HOWARD MONUMENT PROPOSED SITE FOR TRANSIT HUB CONNECTING LIGHT + HEAVY RAIL, AND BUS'S
SUBWAY UNDERGROUND PROPOSE A STOP AT THIS LOCATION.
EMPTY SPACE: PROPOSE FOR REDEVELOPMENT
PARKING LOT PROPOSED SITE FOR REDEVELOPMENT INCLUDING OPEN PLAZA SPACE
POOR TRANSITION AREA PROPOSE STREET SCAPE IMPROVEMENTS AND CREATE LINKS TO MUSEUMS AND GALLERIES
PARKING AREA PROPOSE FOR REDEVELOPMENT ALONG STREET.
PARKING LOT PROPOSE FOR REDEVELOPMENT TO BRING BUSINESS TO STREET. A GARAGE CAN BE BUILT IN SPACE BEHIND MAIN STREET DEVELOPMENT
GATEWAY INTO AND OUT OF

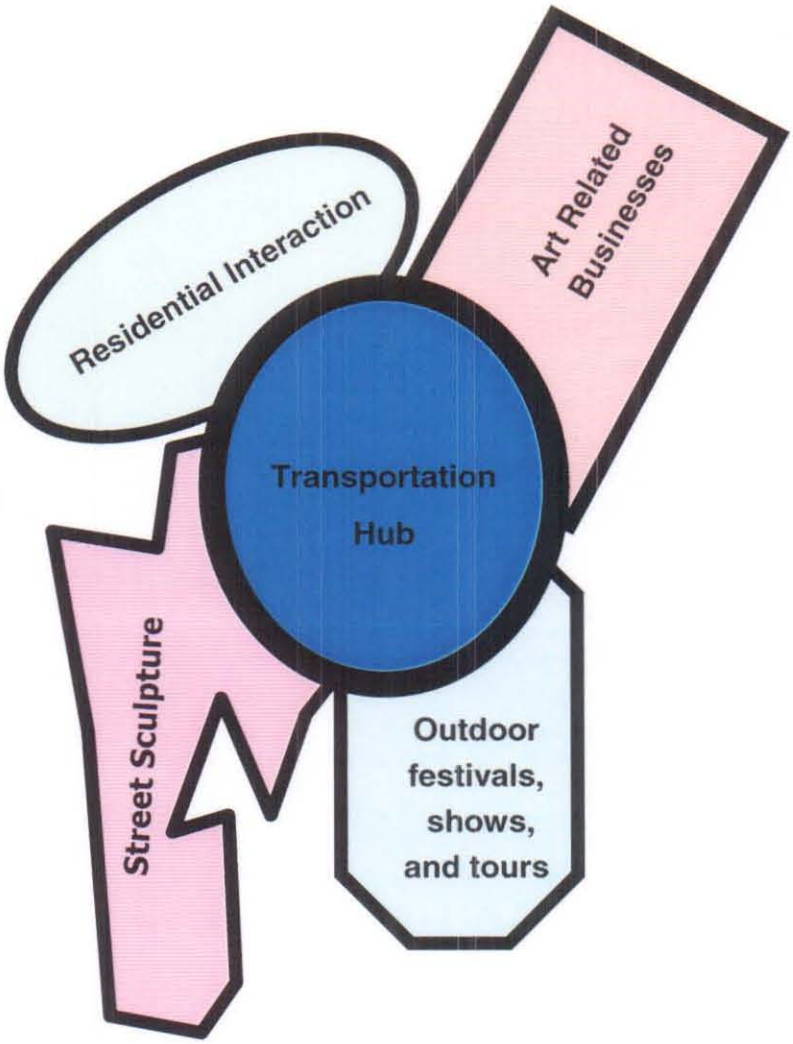
Concept

"The Avenue of the Arts"

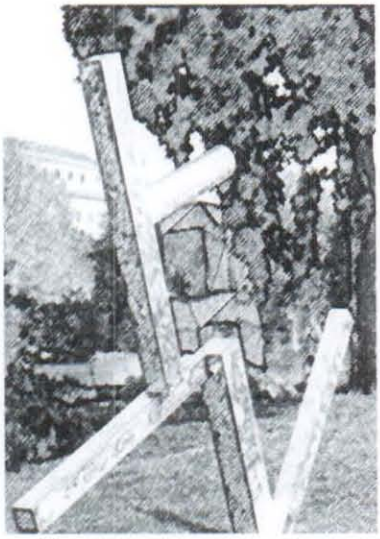
Baltimore's Avenue of the Arts is a historic arts district that provides culture and education in the form of two- and three-dimensional visual arts, and the performance arts. The focus extends from interior spaces to creating experiences in a variety of exterior spaces. The entire avenue is treated as a destination that contains major focal points throughout. The link to this destination is "The Avenue of Arts" transportation hub. The new hub will bring people to the district by way of light rail, heavy rail, bus, shuttle service and cab. The transit hub will become a platform for various activities, and a guide to what one can experience throughout "The Avenue of the Arts."

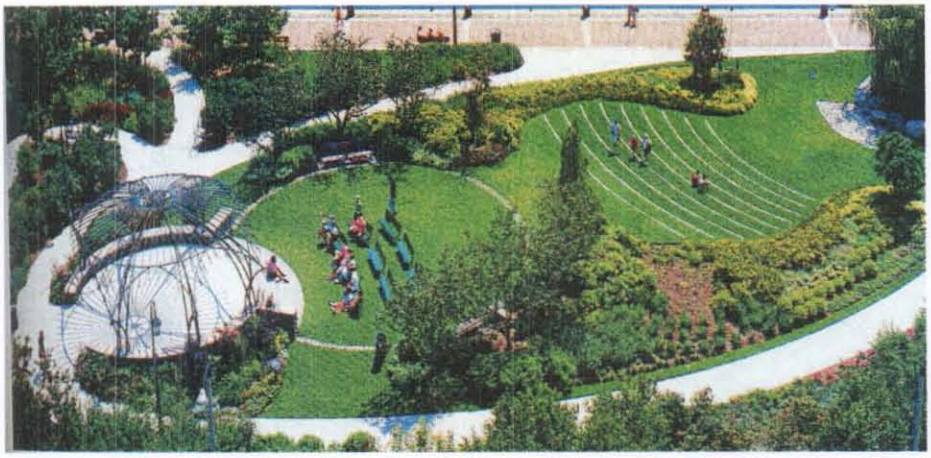
Programming

- Visitors and residents will have the opportunity to visit the museums, galleries, playhouses, and schools, and will be able to shop for art in the range of "affordable" to original pieces of artwork.
- Artists will have places to purchase supplies, obtain historical information for their work, or use the site to create a work of art.
- Visitors and residents will experience sculpture gardens, courtyards, parks, window displays, and murals tied together by a carefully designed streetscape.
- Visitors and residents can also see and hear live performance art from traditional stage performances to impromptu street acts.
- There will be restaurants with indoor and outdoor seating that will focus on the views to "The Avenue."
- Finally, the transportation link will provide a gateway to all of these activities.



Concept Precedence





Transportation Network

Master Plan

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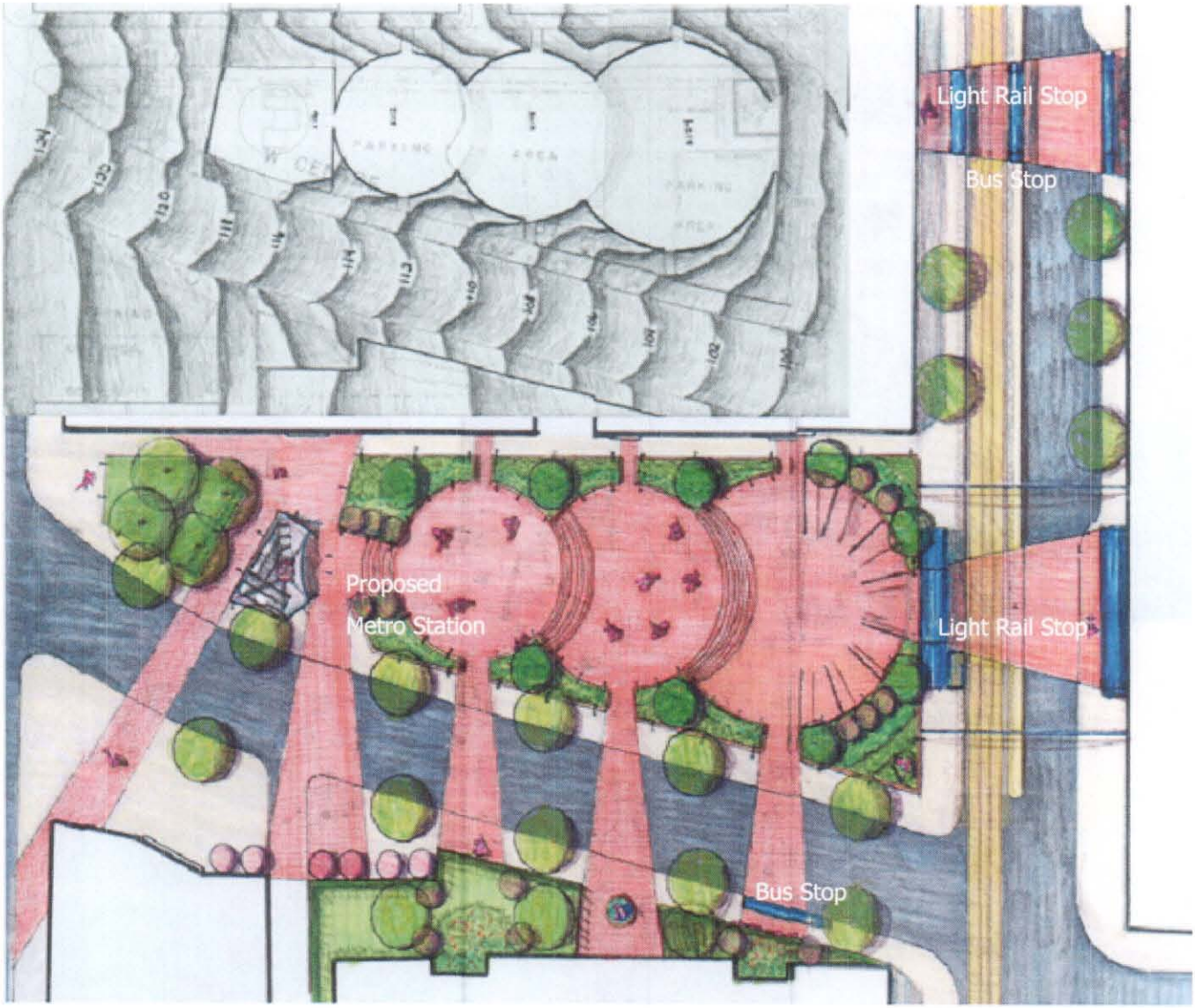
Redesign of John Howard Park



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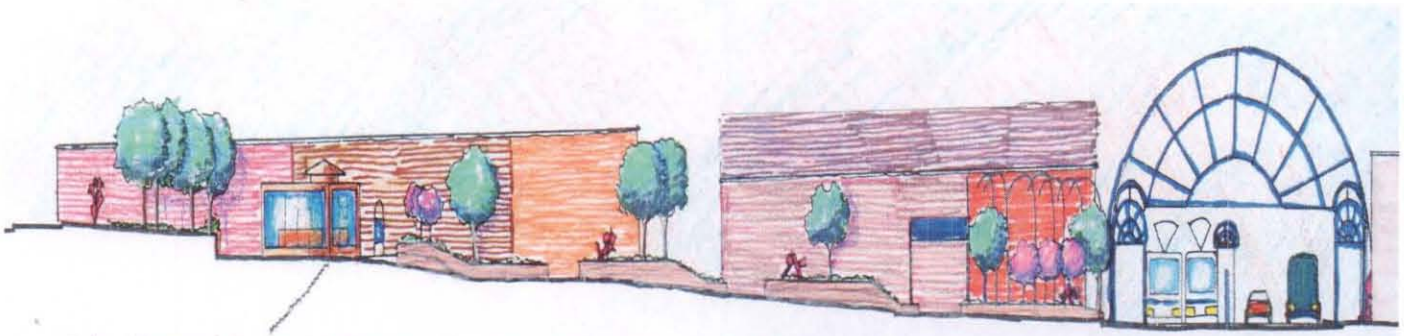
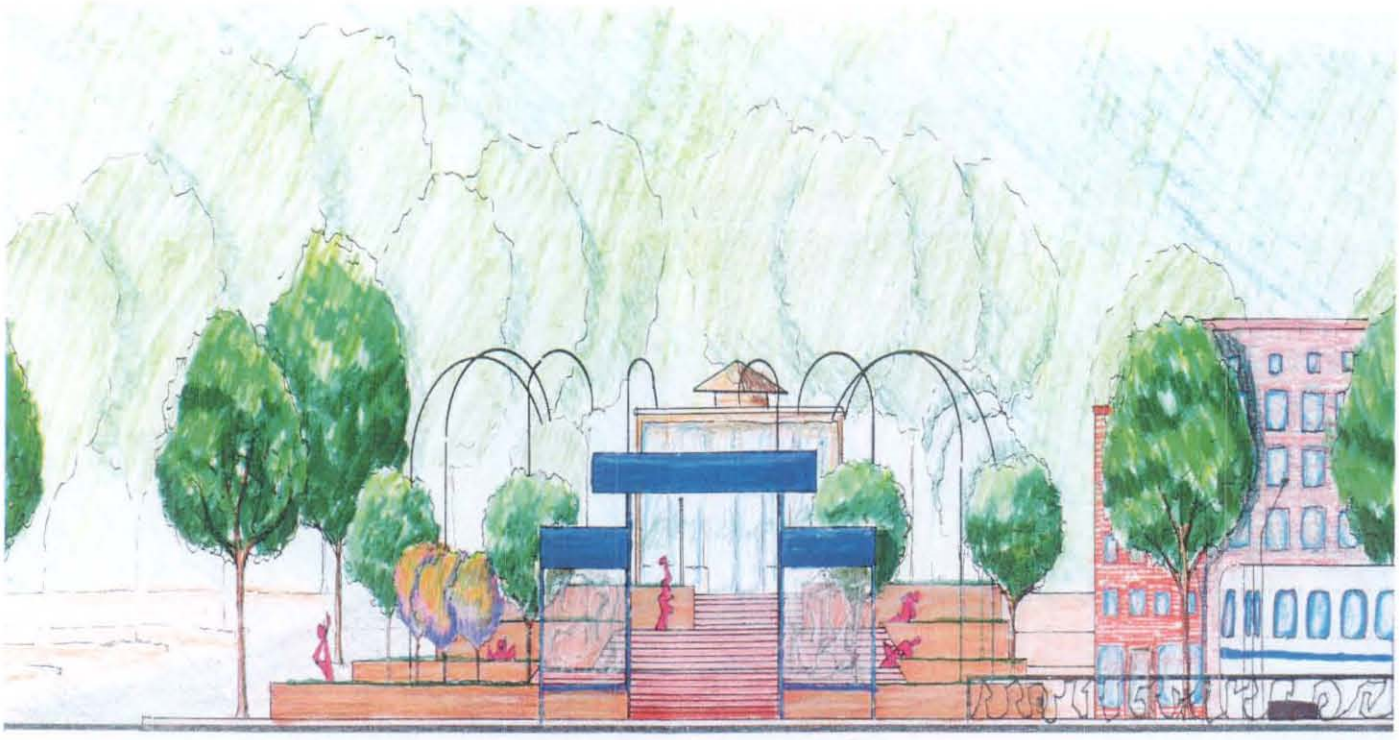
Elevations/Sketches



John Howard Park with Proposed Metro and Existing Light Rail Stops.



Performance Stage in John Howard Park.

Elevations/Sketches

New Streetscape Artwork.

Metro Station Entry.

Performance Space in John Howard Park.