Ironbound Research Project—Phase One

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The Ironbound Research Project is a many-phased undertaking of the Infrastructure Planning Program the of New Jersey School of Architecture at NJIT. This paper documents the first phase of the project carried out during the fall semester of 2001. The Project is sponsored by the Ironbound Business Improvement District and funded through the Urban Enterprise Program and National Center for Transportation and Industrial Productivity.

The New Jersey Turnpike and Newark's Ironbound community are inextricably linked. The corridor along the Turnpike has evolved as a spontaneously, if somewhat irrationally, developed linear city and Newark, a major population area and industrial powerhouse, has been a primary node of this linear city. The Turnpike and Newark intersect in the Ironbound community – a vibrant, dense, and somewhat fragile urban fabric. Newark is in a dynamic state because of changes occurring both beyond and within its borders. Its port alone will undergo a significant increase in volume in the next decade. Many are concerned that these changes will impact negatively on Newark and the rest of New Jersey, especially the undeveloped and agricultural areas of the state. The Ironbound Research Project is a studio-based, multi-phased research undertaking that appraises these changes and develops strategies to manage them. This paper documents the project's first phase, which examines existing conditions and strategies, researches historic and contemporary precedents worldwide that deal with similar issues, and makes design proposals that seek to balance industrial productivity with local and regional quality of life.

NEW JERSEY TURNPIKE

The New Jersey Turnpike forms a critical portion of Interstate 95, serving as I-95's central, most congested section within the "megalopolis" that extends from Boston to Washington DC. The Turnpike is adjacent to Routes 1&9, passenger and freight rail and fiber-optic trunk lines. New Jersey's primary airport, seaport, and industrial core straddle the Turnpike. Because of its primary dependence on the automobile, New Jersey's burgeoning suburban population is also located close by. The Turnpike was designed for both cars and trucks.[1] The northern section, which passes through Newark, was widened to six lanes in both directions in 1966 to allow a separate cars-only highway. Today the Turnpike experiences chronic congestion daily. Given the dense development alongside it, the option to widen the road no longer exists. The only solution is to manage congestion and decrease the number of vehicles using it.

NEWARK

Originally chartered in 1666, Newark was settled because of easy access to the Hudson River. The city quickly became a production and transportation node. Local industry boomed after the War of 1812 as jewelry making and tanning entered large-scale factory production.The coming of the railroads in 1830 and the completion of the Morris Canal in 1832 greatly enhanced the ability of the city to access raw materials and to distribute local goods to distant markets. Beginning in the late 19th century, waves of immigrants, first from Europe, then from the South and the Caribbean, flocked to the many available jobs in Newark's factories. Like many small cities of its kind in the United States, Newark's industrial production and cultural presence peaked in the 1920's. The depression began a slow decline that eventually resulted in the racial upheavals of 1967. The unrest accelerated the flight of industry and large sectors of the middle class population out of the city. These changes left Newark with a depressed economy, a state which the city has only recently begun to pull itself out of.[2]

Today, two camps in Newark have differing views about the city's recent redevelopment. City boosters describe Newark's recent development as a renaissance. New buildings on the skyline, new high profile projects such as a performing arts center, a baseball stadium and sports arena and a drop in crime, are cited as evidence of the city's re-emergence. Critics complain that neighborhoods are ignored; that while many new

homes have been constructed, they are of poor quality and badly planned. They add that the lack of any central planning in the city has led to housing development in inappropriate industrial areas and the devolution of the city's once proud boulevards into strip highways. Any positive changes, they assert, such as the drop in crime, are attributable to national trends.

THE IRONBOUND

The Ironbound neighborhood, named because it is surrounded on all sides by railroad tracks, is part of Newark's East Ward, which also includes the city's downtown business district, airport and port. The Ironbound attracted industry because of access to water and rail transportation and relative isolation that sheltered it from the upheavals of the 1960's. The foundation of Newark's recent revival is largely built upon the vitality of the Ironbound, a multi-ethnic urban village,[3] where family and community ties are strong, numerous restaurants and small "mom and pop" businesses thrive, and the crime rate is one of the lowest in the city. Despite its charm, the Ironbound has always maintained a gritty image. The nearby massive transportation corridor has had its effect in noise and pollution, which are on the rise and threaten the community.

INFRASTRUCTURE:

Port and Airport

Situated between the New Jersey Turnpike and Newark Bay, the Port of Newark and Elizabeth[4] is the largest facility of the Port of New Jersey/New York, the east coast's largest and second only to Los Angeles/Long Beach nationally. The 2,100 acre facility encompasses a full range of maritime commercial activities. The port is the gateway for most imports to the New York metropolitan consumer market, the most concentrated and affluent in the world. The port also serves more distant markets in the Midwest, New England and eastern Canada via long distance trucks on the Turnpike and double-stack freight rail. The world wide shipping industry is increasingly relying on super ships,[5] huge vessels which will lead to a three-fold increase in port traffic, severely straining transportation infrastructure and nearby communities. With little room to expand, the port is reorganizing to meet the expected increase in volume. Directly across the Turnpike from the Port, Newark International Airport also has no room to expand and is currently undergoing a $3.8 billion redevelopment program.[6]

Mobility Systems

The turnpike acts as a spine to a complex mobility system for goods and people. Passengers and freight move along the same network. Change to one component often has effects elsewhere. The Turnpike, built fifty years ago to support 18,000 vehicles daily, now carries 300,000 and is stressed past capacity. [7]

In contrast to vehicular infrastructure, New Jersey's rail lines are underutilized. Only ten percent of New Jersey's residents commute by train, with many lines running service only during peak rush hour times. Fortunately, Newark has excellent rail infrastructure, including the Newark City Subway and connections to Penn Station, Broad Street Station and Newark Airport Station.[8] The freight rail system in the region emanates from the port and is operated by Norfolk Southern and CSX. The system serves almost exclusively freight rail markets greater than 500 miles away. As the port girds for an expected 300% increase in freight traffic over the next ten years, it will increasingly turn to rail and barges, instead of trucks, to absorb the increase.[9]

Land Uses

While the greatest density occurs along the corridor and specifically around the port area, land uses along the corridor are a chaotically dispersed sprawl.[10] Two egregious examples of sprawl development were identified. The first is a cluster of port-related industrial developments 40 miles away at Turnpike exit 7A, surrounded by agricultural land. The second is the stacking of empty shipping containers on vacant properties in the immediate vicinity of the port. Storage of these containers creates a visual blight that inhibits anything but the lowest use development nearby.[11]

Brownfields

In revitalizing urban centers the presence of brownfields inhibits development.[12] For many landowners, it is more expedient to let properties lie fallow than to try to sell or develop them and risk discovering contamination, often with overwhelming financial implications. These idle sites hamper a municipality's ability to attract new investments and retain existing businesses. Brownfields also contribute to sprawl because developers look to greenfield, or non industrial sites, with no hidden liabilities. Given the industrial history of northern New Jersey, there are many brownfields in the region. Newark alone contains more than 700 acres.

PLANNING INITIATIVES:

Transportation

In response to challenges, a series of interrelated local and regional initiatives has begun. Central to the Ironbound and Newark is the Newark Transportation and Development Plan

which seeks to guide Newark's expected growth. The plan builds upon the city's principle advantages: a strategic position within the metropolitan area; superb access to various transportation modes; availability of development parcels; a broad mix of existing urban activities; a population ready and willing to work and a usable, existing infrastructure system.[13] Regionally, the International Intermodal Transportation Center will lead a research initiative to coordinate intermodal transportation and economic planning, focusing on enhancing access to the Port/Airport, nearby rail and trucking warehousing terminals, the redevelopment of brownfields, the interstate and international surface distribution network and Portway.[14] Beginning at the port, Portway will be a dedicated truck-only road, designed to keep trucks – which severely degrade road surfaces and pollute disproportionately – off the already congested Turnpike and other roads in the port's immediate vicinity.[15]

Typology

Portway will link seaport and airfreight terminals to value added warehouses[16] where imports are processed. These facilities are important engines of the regional economy. A one million square foot facility can employ as many as 700 people.

Land-Use

Numerous brownfields along Portway or within fifteen miles of the port with good highway access could host value added facilities. Locating these in existing industrial areas would preserve greenfields further west, spare the environment unnecessary emissions and provide the economic benefit of bringing goods to market quicker.[17] However, uncertainty about liability inhibits their re-use. [18]

PRECEDENTS:

Linear Cities

As examples of relevant proactive planning, the teams studied linear cities, ones designed along arterial systems (like the Turnpike) and green ports, ports that follow environmentally sustainable guidelines for development. Linear cities are idealized urban models envisioned by the leading architects and planners of the nineteenth and twentieth centuries such as Arturo Soria, Frank Lloyd Wright, Richard Neutra, Ebenzer Howard, Kenzo Tange, Le Corbusier, Soviet Planners and Tony Garnier.[19] Responding to collateral problems associated with the Industrial Revolution, linear city designs attempted to alleviate urban congestion by spreading out and separating the different functions of the city into zones organized along arterial transportation networks.

The study of linear cities yielded important findings. A fine grain understanding of adjacencies is paramount to design as densities increase. Simply separating uses into distinct zones leads to a dependence on the automobile and hence sprawl. While planners must be careful not to locate industrial facilities near residential zones, certain clean industries can be interspersed within mixed use neighborhoods, or located near transit. This allows workers to get to their jobs without having to drive. Eliminating excess parking facilities allows for more compact, more livable, sprawl-free neighborhoods. Arturo Soria's Ciudad Lineal is a good example of how transit can foster this development. Another important feature is the application of landscaped buffers. Where different uses must be separated, green buffers can protect uses such as residences and schools from undesirable adjacencies like heavy industry or dangerous transportation infrastructure. These same green buffers can still provide pedestrian networks. Le Corbusier's Linear Industrial City and Tony Garnier's Cite Industrielle both successfully use this strategy. In complex, mixed use environments, frequency of repeating elements becomes an important notation of scale and change in uses. The frequency of transit stops, for example, can define neighborhood centers based on walkability. Other uses can then locate at different frequencies following this basic rhythm, creating larger patterns. The linear projects of the Soviet Planners show this strategy best.

Green Ports

The Ironbound Research Project studied two "green" ports: Rotterdam in The Netherlands and Corpus Christi in Texas. Rotterdam has initiated programs to lessen the environmental impact of the shipping industry. An incentive program gives trade benefits to companies that meet safety and environmental standards. "Distriparks" separate incoming goods into specialized handling facilities which ensure maximum efficiency, where computerized warehouses optimize tracking and space efficiency. Certain goods are assembled on site in value-added facilities, then sent directly to the consumer market. Rotterdam re-uses excess storage containers to reclaim land.[20]

The Port of Corpus Christi mixes uses to diversify port activities and make a sustained effort to balance industrial productivity with local community needs. Harbor Island, part of the port, is being developed to combine seemingly incompatible uses such as industrial oil fabrication and container storage with residential and resort programs. New waterfront development will transform a cargo dock into a place for meetings, banquets, concerts, and the docking of cruise ships. All initiatives have been furthered by working closely with the community through committees and focus groups. Ultimately, the Port of Corpus Christi will become a diversified, exciting area with entertainment, retail, and restaurants that treats harbor facilities as a public amenity and tourist destination.[21]

ASSESSMENT — FIVE FINDINGS

Research on existing conditions and planning initiatives indicate that both the I-95 corridor and the Ironbound community are in a highly dynamic state. On a regional level, steadily increasing congestion, plus the increased volume projected for the port, could lead to complete transportation paralysis. Locally, the Ironbound is experiencing dynamic pressures internally and externally that threaten its nature To enable the Ironbound to manage this change, the study identified five key findings, all of which are inter-related, with both regional and local implications.

Fragility of the Ironbound

The Ironbound is a thriving yet fragile community, a complex organism of local retail and dense residential development. Active streets give the community qualities that sprawling suburbs lack. For the Ironbound to survive, these qualities must be protected and sustained. New residential development, whether in existing neighborhoods or in appropriate former industrial zones, should be high density. Current zoning that mandates unnecessarily high parking requirements, turning streets into parking lots, should be reformed. Non-residential development in industrial zones should be non-polluting and integrated with pedestrian and transit networks to discourage automobile use. Industrial and commercial facilities should be coordinated with truck and rail access so as not to adversely impact the larger community. Container storage should be banished and the recycling of containers for community and environmental uses should be supported.

Vehicular Congestion

Automobiles and trucks congest roads throughout the region, adversely impacting the quality of life. The benefit of vehicular mobility is illusory in the face of steadily increasing congestion. In response, the capacity of the underutilized mass transit network should be met in order to decrease automobile dependency. State Smart Growth Planning guidelines that support transit development for residences, retail and industry should be adhered to. Industrial uses that minimize excessive freight movements should be promoted and appropriately sited.

Port Expansion

Not only is the port critical to the region's economy, but keeping it close to the center of the region's markets makes good sense. While adapting the port to accommodate supership is essential to remain competitive, every effort should be made to minimize the impact of increased volume on already stressed infrastructure. This can be achieved by: encouraging the Portway project; coordinating the location of value-added facilities and other appropriate industries near the port; transferring much of the burden from trucks to intermodal rail and barge; and developing a comprehensive plan to deal with shipping container storage.

Sprawl

This study shows that a community's problems do not occur in a vacuum. The problems of an inner city community like the Ironbound are inextricably linked to those of distant suburban communities and far-reaching economic and societal patterns. Any remedies for the Ironbound's challenges should be viewed holistically, taking into account the whole region that impacts it. The New Jersey State Plan, through its adherence to smart growth principles, offers an effective strategy for this holistic approach.

Brownfields

Redevelopment of brownfields are critical to the success of any smart growth strategy to limit development of pristine or agricultural land. However, care must be taken not to repeat the mistakes of the past by proceeding out of ignorance and expediency. Brownfields must be assessed with diligence and prudence and only appropriate uses should be encouraged for their redevelopment.

PLANNING PROPOSALS:

After concluding the research and assessment phases, teams developed designs for the industrial neighborhoods on the Ironbound's periphery. The area was divided along natural boundaries into three distinct zones. Teams inventoried the characteristics of their respective zones and developed designs that sought a balance between the needs of industrial productivity and the quality of life.

ZONE A

Team A addressed the mixed-use area of residences and factories east of the newly restored Riverbank Park, bordered on the north by the Passaic River and the southeast by Routes 1&9 The group studied Raymond Boulevard, a major gateway into Newark, which gives many their first impression of the city after exiting the Turnpike. Today, stacked containers and derelict properties along this approach give a negative impression.

Raymond Boulevard is a one-way, four lane auto-oriented boulevard into the city. Its outbound one-way counterpart, a combination of Market Street continued by East Ferry Street, is of a different character: only two lanes and in some locations lined with shops. This outbound route has the potential to be more pedestrian oriented if volume is rerouted. The group proposed uses and streetscapes that reinforce and diversify this auto/pedestrian dichotomy of Raymond and Market/East Ferry. In the proposal, Raymond Boulevard will be landscaped, with truck traffic limited to the industrial loop east of Chapel Street. Former industrial sites will be rezoned for auto-oriented retail. By providing an outlet for these uses at this location, auto-oriented development can be curtailed in denser parts of the Ironbound. North-south streets crossing Raymond will become pedestrian based, connecting the isolated residential area north of Raymond to the East Ferry Street neighborhood to the south. By synchronizing stop-lights on Raymond, traffic will be modulated to leave generous time for pedestrians to cross this wide street. In this way, Raymond Boulevard successfully accommodates both auto and pedestrian based uses.[22]

Pivotal to any development of the Market/East Ferry corridor is the former Ballantine Brewery site. This property will be developed as an urban node to complement the Ironbound's western node, Penn Station.[23] The team explored developing the Ballantine Site as a new civic center, with a high school flanked by a new library and post office. The site would be gridded with new streets that would continue and complement surrounding ones. A new street would provide an outlet for outbound Market Street traffic directly to Routes 1 and 9, thereby rerouting volume from a re-invigorated East Ferry Street.

If the stacks of containers on the riverfront are removed, broad parkland could be created. This would complete the transformation of Raymond Boulevard from a forlorn industrial corridor to a visually enhanced urban connector.[24]

ZONE B

The Zone B study area covers the land west of I-95 corridor to Rome and Jabez Streets. It extends north to include the recreational center and south to the freight rail line. Wilson Avenue connects the thriving, mixed-use residential zone to the west with the light to heavy industrial uses on the east side of Routes 1&9. Wilson Avenue is well served by buses. Wilson Avenue accesses numerous vacant, city-owned properties and brownfields which could be used for manufacturing related to the port expansion.

The eastern end of Wilson Avenue (Zone B1) is in disarray, dominated by container storage, truck parking and mostly abandoned industrial sites. Given the road and rail connections, considerable amounts of city-owned land and underutilized brownfields, the area is prime for redevelopment consistent with ongoing initiatives. The team designed value added prototypes that could be adapted for different size parcels and identified locations where they could be located. Further west on Wilson (Zone B2), the area is primarily light industrial with uses such as used car sales, lunch truck repairs, gas stations, and heavy duty equipment repair and a lone restaurant. Given the presence of auto related uses and the proximity to Routes 1&9, new auto related uses could be developed featuring extensive use of signage that would be highly visible from heavily traveled adjacent roads. Truck parking would be more regulated and auto retail uses would be centralized with parking lots in the rear.

West of Routes 1&9 (Zone B3), Wilson bisects a mixed use, intersticial zone along Rome and Jabez Streets. It is influenced equally by residential and industrial pressures, forming a linear zone of mixed uses. Existing uses include multi-family residences, light industries, retail distribution warehouses, restaurants and a few "mom and pop" stores. This area is well connected to Routes 1 and 9 via Wilson Avenue. As in zone A, the team proposed development that reinforces the positive overall patterns of the Ironbound. Because of excellent highway access, the kinds of auto/truck dependent development, that if built in the Ferry Street core would adversely affect it, are proposed along Rome and Jabez. However, the design stresses dense layouts that are consistent with nearby mixed use neighborhoods.

This would be achieved through the development of a "flex" building type. The flex building would accommodate uses consistent with the neighborhood on the ground level, or new uses such as walk-in factory retail, warehousing or office space. The team identified sites on which to place eleven new flex buildings. Three of these sites are vacant and the remainder currently house light industrial uses such as retail distribution, which can be converted to a higher level of use. Directly behind the flex buildings a wall of storage containers will be constructed. This wall will be located in the vacant space just outside existing property lines and made up of 40 foot long containers stacked up to three high. Parking for the flex buildings will be located in the base of the wall. The wall will serve as a sound and visual barrier between the neighborhood and the rail and I-95 corridors. Extending from the southern end of Jabez Street to the Ironbound Community Center, a landscaped linear park will be built atop the barrier. Advertising located on the side facing Routes 1 and 9 will generate income for the Ironbound. Many precedents of adaptive container re-use as public, urban components exist worldwide. Their re-use acknowledges sustainable ecological values that promote recycling. As seen from Routes 1 and 9, the containers will give an entirely new image of the Ironbound and convey the message that the community is progressive, resourceful and thriving.

ZONE C

Zone C is defined by the elevated Amtrak railroad line and McCarter Highway to the northwest, Chestnut Street to the northeast, and Conrail and Amtrak railroad lines to the south and southeast. South Street bisects Zone C and runs east-west through Newark. The street is a connector between downtown, Route 21, the Ironbound and Routes 1 and 9. South Street carries heavy automobile and truck traffic and acts as an edge between the Ironbound and an established industrial area to the south. Although its character is more residential to the west, it becomes increasingly industrial further east. Large tracts of new housing have been built along it on former industrial properties. The quality of construction and planning is poor and these developments lack the amenities that typically make a neighborhood.

The team focused on introducing services to reinforce recently developed neighborhoods and to grow new ones. The process began with an inventory of existing amenities and their patterns. Their placement along South Street currently corresponds with density patterns; there are many public telephones between Hermon and Pacific Streets, but only a few near the Routes 1 and 9 access ramp. Bus stops are placed at regular intervals along South Street but they are not highly visible, nor are they covered, nor do they provide seating. Detailed information about bus routes is typically not provided. Outdoor space, including sidewalks, planting and building facades, is neglected and overhead utilities are chaotic. Using the concept of Barsch and Ginzburg's Soviet linear city as a precedent, the team organized public amenities along the South Street activity spine. Use of each service will determine its frequency. Various nodes were identified as activity centers and these nodes determined the nature of the design interventions. The main intervention tool will be the 'folly'.

A folly is an object that suggests activity and defines outdoor space. A light pole will be the core of the folly; its height and color will be visible from afar and at night it will signal activity. The folly is intended to catalyze future neighborhood improvements. Electricity from the light structure will supply the folly attached to it. Based on location and need, follies can be bus shelters, telephones, food trucks and carts, information bulletin boards, and green space identifiers. Follies will promote interaction between residents and commuters in the Ironbound. These follies will bring a sense of order, rhythm and identification to the South Street neighborhood. On Dawson Street, a food cart will plug into the light pole and become a folly. This food cart can be modeled on one of the itinerant food trucks that are common in Newark. As the neighborhood's population grows and the cart's clientele becomes established, the business can relocate to an existing, adjacent building, becoming permanent. In this way, the folly incubates seeds to grow a neighborhood. Near where it intersects Routes 1 and 9, the team proposed making South Street a gateway. The landscape will be improved at this threshold incrementally. Initially, follies will be placed to define location and encourage activity. This will be followed by relocating electrical cables underground, restoring sidewalks and adding trees. The follies will become prominent nodes, improving the legibility and image of South Street. In this way, they will emphasize entrance and exit, arrival and departure.

NOTES

[1] Inspired by the General Motors funded, futurist vision of Norman Bel Geddes' Futurama presented at the 1939 World's Fair, and by the practical precedents of the parkways of suburban New York City and the Pennsylvania Turnpike, the New Jersey Turnpike catalyzed the State's development. The Turnpike was built in one massive effort. In 25 months the Turnpike Authority paved 118 miles of roadway, built two bridges spanning over 6000 feet, moved 52 million cubic yards of earth, built 17 toll booth Interchanges, 11 rest area facilities, and one administration center. Through generously spaced lanes and shoulders and very gentle curves, it was designed to safely accommodate different vehicles. The total cost was $250 million. Unlike the roads built through the federally financed Interstate Highway Program of 1956 which bisected central cities, the Turnpike passed mostly through farmland and skirted central cities. See Steve Anderson, (*www.nycroads.com/roads/nj-turnpike/*) (c) 1996-2003See also Ellen M. Snyder-Grenier *Turnpike Treasures.* (Newark, N.J. : New Jersey Historical Society, 2001)

[2] Newark's Industrial Exhibition of 1872 recognized the city as a major national production center and finally gave it an identity independent from New York City. See John T. Cunningham, *Newark.* (Newark, N.J.: New Jersey Historical Society, 1966)

[3] Today, it is estimated that more than 40 different ethnic groups live in this one section of Newark. Newark's first industrial immigrants from eastern and southern Europe – mostly Italians, Poles, Jews, Slavs, and Lithuanians – established small tidy homes amidst the factories. They were followed recently by Portuguese and Spanish speaking immigrants, both of European and African decent. From Go Newark Network LLC. (*www.guide2newark.com/history* 2002)

[4] To clarify, the Port of New York and New Jersey is made up of six facilities within the New York metropolitan area. When combined with these, the port is the second largest in North America. Each year more than 16 million tons of ocean borne general cargo move through the port. See The Port of New York and New Jersey (*www.portnynj.com/* 2001)

[5] The world wide shipping industry is increasingly relying on super ships, vessels capable of carrying up to 7,000 cargo containers each. These vessels are significantly larger than ships currently in use that have capacities of 4,000 containers. In order to accommodate supership and to prevent the flight of Newark/Elizabeth's private carriers to the deepwater ports of Halifax or Norfolk, the Port Authority of New York and New Jersey will maintain the shipping channels to the port at a depth of 50 feet. See The Port Authority of New York and New Jersey, (*www.panynj.gov/commerce* 2001-2002).

[6] Newark International Airport complements the port's container freight facility, serving a different sector of the freight industry: just-in-time-delivery. The airport also has no room to feasibly expand. In addition to serving as a major passenger facility, it is the fourteenth largest air cargo facility in the world and the eighth largest in the U.S. Combined with La Guardia and Kennedy, the three New York cargo facilities carry the largest volume in the world. See The Port Authority of New York and New Jersey, (*www.panynj.gov/aviation* 2001-2002)

[7] Statistics reveal that 80% of the region's residents commute by car. Only six percent of commuters take buses, many of which ply the Turnpike. The remainder use rail transit or other means, such as walking or bicycling. See Steve Anderson, (*www.nycroads.com/roads/nj-turnpike/*) (c) 1996-2003

[8] New Jersey Transit is chronically plagued by an inability to secure enough funding to operate its existing service, let alone expand. This is due to a multitude of reasons that include: high labor costs, mismanagement, fickle

state funding and a predilection for planning costly new capital projects that are politically driven and do not respond to rider demand. For a critical analysis of New Jersey Transit's troubles see Martin E. Robins and Neal A Denno. *A Recent History of NJ Transit's Operations and Capital Budgeting.* (New Brunswick, NJ Alan M. Voorhees Transportation Center, Edward J. Bloustein School of Planning and Public Policy, 2001)

[9] Industrial centers within 300 miles and with water access, such as Albany, Camden and Providence, are being studied as barge destinations. The current modal split between rail and truck freight leaving the port is approximately 14%/86%. The modal split goal for the next ten years is truck–39%, barge–38% and rail–26%. William Ellis: The Port Authority of New Jersey and New York: Seminar Presentation (31 Oct. 2001).

[10] Sprawl is a loosely planned, market driven settlement pattern. While in the short term, sprawl may seem to provide everyone with a suburban home, low property taxes and a ten minute car commute to work, sprawl eventually undermines the general quality of life. To remedy this, the New Jersey State Plan offers guidelines for responsibly planned, or smart growth. The goals of the plan are to: *"conserve its (the State's) natural resources, revitalize its Urban Centers, protect the quality of its environment, and provide needed housing and adequate public services at a reasonable cost while promoting beneficial economic growth, development and renewal. . .".* See New Jersey State Planning Commission. *The New Jersey State Development and Redevelopment Plan.* Trenton 2001)

[11] Simply banning containers in the port area will only displace the problem, forcing containers to be shipped elsewhere, in all probability by truck, exacerbating problems of congestion and air quality. Increasing transfer of goods at the port to barge or rail will disperse the storage needs and send containers to manufacturing centers that can fill them for the return trip. Using them to ship New York City's trash to remote landfills is still under negotiation, and may be so for some time. Adaptive re-use offers many possibilities and is being encouraged. Richard Carthis: Mearsk Sealand: Seminar Presentation. (31 Oct., 2001)

[12] Brownfields are abandoned, idle, or under-used industrial and commercial properties where expansion or redevelopment is complicated by real or perceived environmental contamination. If a contaminated brownfield is irresponsibly developed, it can harm human health and the environment, leaving the property owner liable for any injury or damages resulting from contamination. For further information see North Jersey Transportation Planning Authority; New Jersey Institute of Technology, *Brownfields Economic Redevelopment.* Newark: NJTPA, NJIT. (2001)

[13] The Parsons Brinckerhoff, *Newark Transportation and Development Plan,* (Nov.1998) includes development goals that seek to reinforce Newark's position as a center for industry, commerce, service, culture, education, institutions and transportation. Organized in seven development nodes, the plan specifically seeks the generation of: between 1,000 and 1,100 jobs; nearly 900 dwelling units; 970,000 s.f. of warehouse, light industrial and office-flex space; 85,000 s.f. of retail commercial space; $850,000 in annual municipal payroll tax; $3.3 million in annual property tax; and $20 million in annual retail expenditures. Many of the elements of this plan, such as warehouse developments and transportation improvements related to the marine terminals and airport, impact the Ironbound.

[14] The National Center forTransportation and International Productivity is funded through the U.S. Department of Transportation Federal Highway Administration under the High Priority Projects Program of the Transportation Equity Act for the 21st Century.

[15] The dedicated new roadways and bridges are designed for 40 ton capacity and include increased turning radii and other truck-specific geometry. The Portway project is planned to consolidate freight related warehousing along its length and near the port, thus decreasing trips and curtailing pollution. James Greller: New Jersey Transit, Seminar Presentation, (26 Sept. 2001).

[16] Most goods coming through the port terminals require additional processing such as final assembly or subassembly, or simply labeling or repackaging. This is done primarily to take advantage of lower tariff rates because goods are classified as raw instead of finished if they are processed before going to market. Value added facilities have evolved in the last twenty years as consumer imports have grown. A value added facility includes a building whose foot print can range from 60,000 up to one million square feet. The building is split into separate storage and processing sections. The storage portion is normally a single story building of 40 ft. clear interior space with a shelving system that is increasingly becoming roboticized. One side of the storage volume is dedicated to loading doors. The processing portion can be multi-floor, within which activities ranging from simple packaging to custom finishing can occur. The building is surrounded by an asphalt apron to accommodate tractor trailers and employee parking. Facilities in the Ironbound will be well served by bus transit. John Hummer: North Jersey Transportation Planning Authority. Seminar Presentation. (3 Oct. 2001).

[17] North Jersey Transportation Planning Authority: New Jersey Institute of Technology, *Brownfields Economic Redevelopment.* Newark: NJTPA, NJIT. (2001) The Brownfields Redevelopment Initiative, a component of New Jersey's Fiscal Year 2001 Budget, is a extension of the New Jersey Urban Site Acquisition Program (USA). This program will fund $15 million in grants to urban municipalities that wish to acquire and remediate contaminated properties, returning them to productive use. By taking advantage of this program, facilities can be built along Portway with most of their related remediation costs refunded through tax abatements and other measures. In addition, private parties that voluntarily agree to clean up a contaminated site are offered some protection from future State enforcement action at the site, either in the form of a 'no further action' letter or 'certificate of completion' from the State. This provides a degree of protection against future liability.

[18] A unique method for reclaiming brownfields uses fill dredged from the harbor. This fill is contaminated from years of pollution. If mixed with concrete it becomes insoluble and can effectively and safely cap contaminated soil in a brownfield. This method has undergone extensive environmental testing by government agencies. The successful recent development of the Jersey Gardens Mall atop a brownfield employs this method of reclamation. Through these government initiatives, brownfield sites near the port become competitive on the real estate market with other properties throughout the state.

[19] The linear city was a highly discussed planning topic in the early 19th century, especially in its opposition to the garden city. For an excellent overview of the linear city. See George R Collins: *Linear Planning Throughout the World.* Journal of the Society of Architectural Historians, (vol. 18, no. 3, Oct. 1959) page 74-93. Other sources include Kenzo Tange, *Architecture and Urban Design.* New York, London: Praeger. (1970). George R Collins: *The Ciudad Lineal of Madrid.* Journal of the Society of Architectural Historians (vol. 18, no. 2, May 1959) page 38-53. Diana Velez; *Late Nineteenth-Century Spanish Progressivism: Arturo Soria's Linear City.* Journal of Urban History, (vol. 9, no. 2, Feb.1983) page 131-164. N.A. Milyutin; *Sotsgorod. The Problem of Building Socialist Cities.* MIT, Cambridge, Mass. (1974).. A. Kopp; *Town and Revolution, Soviet Architecture and City Planning 1917-1935.* (1970). Tony Garnier; *Une Cite Industrielle.* New York: G. Braziller. (1969)

[20] Port of Rotterdam; *www.portofrotterdam.com* (2002).

[21] The Port of Corpus Christi; *www.portofcorpuschristi.com* (2001).

[22] This analysis will be part of the a traffic/pedestrian computer simulation in phase three of the Ironbound Research Project study.

[23] This site is currently being recommended as a possible Redevelopment Zone in the Ironbound Community Corporation's Master plan and is under consideration by the Newark School Board as a possible location for a new East Side High.

[24] Phase Two of the Ironbound Research project is complete and Phase Three is underway. The second phase developed an urban design framework for Ferry Street. Issues studied included land uses – residential, commercial, institutional and industrial – parking and all modes of circulation: pedestrian, vehicular, bicycle, truck, bus and rail. Based on traffic simulation models of existing conditions on Ferry Street and comparisons with an alternative range of traffic schemes, several streetscape design options were offered. Alternative planning and design proposals were made for the area around Penn Station, an important regional rail hub on the Ironbound's western edge, along the Passaic River waterfront, and for of a second node of development to complement Penn Station in the eastern part of the district. The Ironbound Business Improvement District is proceeding with the proposals developed for a redesigned "gateway" park and market under the Amtrak rail viaduct and for rebuilding the streetscape of Ferry Street. Phase Three will model truck and automobile mobility throughout the district and immediate region and use the model to develop pedestrian and vehicular networks throughout the district

[25] Like a contemporary loft building, a flex building can accommodate any combination of uses ranging from residential to office to industrial. Each building would be three to four stories in height with approximately 7,000 s.f. per floor. A typical flex building has an open concrete structure with pre-cast components for minimal construction assembly. A parking ratio of 1 car to every 600 s.f. would be accommodated below and in the rear of the building.

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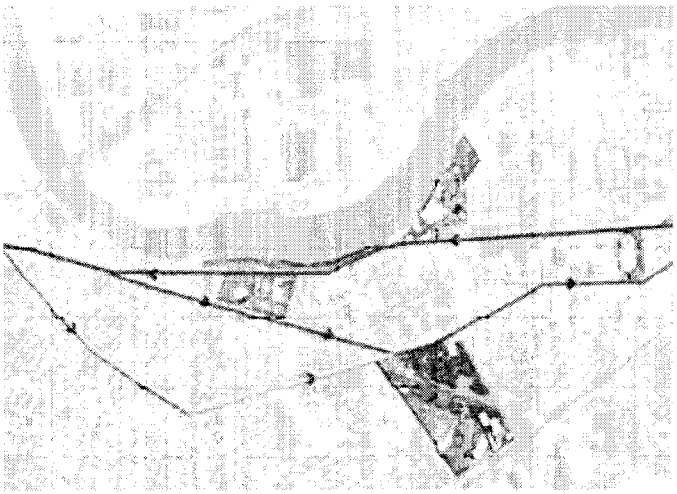


Fig. 1. Zone A – Studio-based design proposals.

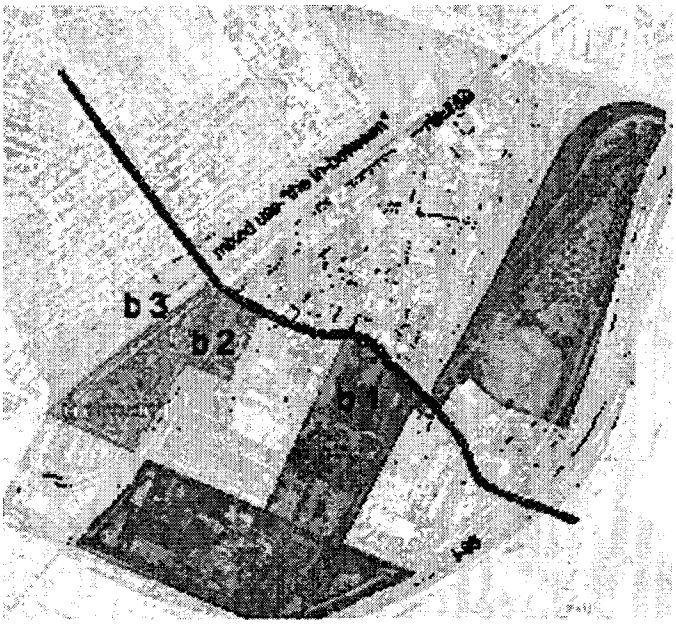


Fig. 2. Zone B – Studio-based design proposals.

Fig. 3. Zone C – Studio-based design proposals.

Fig. 4. I-95 with other transportation routes.

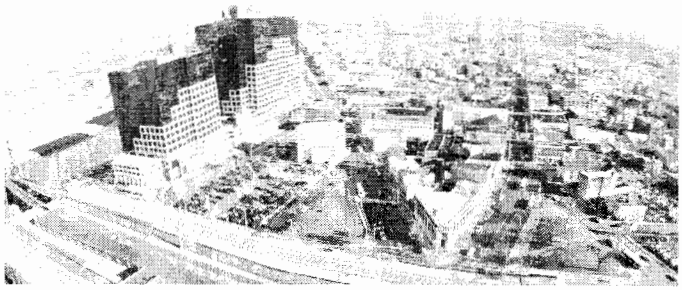


Fig. 5. Ironbound.

Fig. 6. Urban fabric: Ferry street in the Ironbound.

Fig. 7. Portuguese festival – Source: www.gonewark.com.

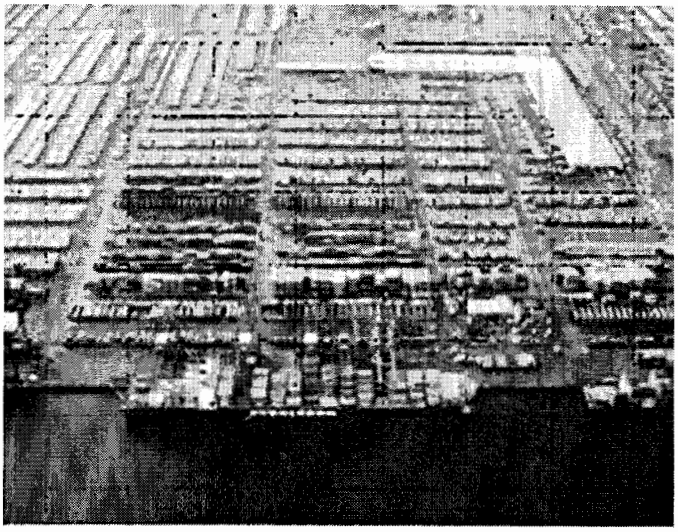


Fig. 8. Port Newark – Source: www.aapa-ports.org.

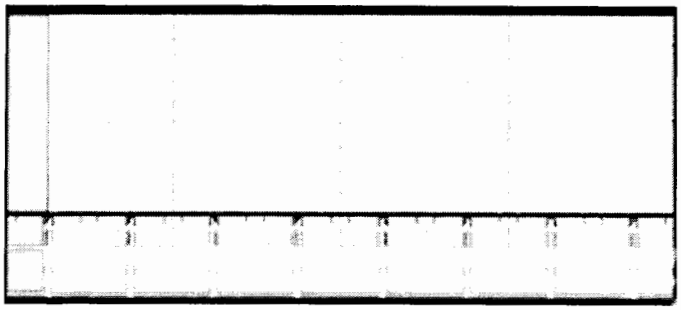


Fig. 9. Plan – Modular System.

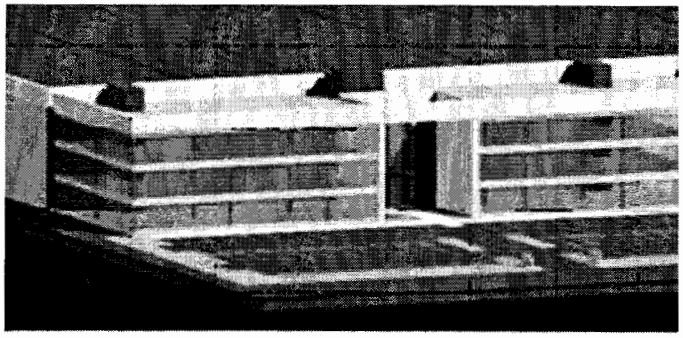


Fig. 10. Perspective.

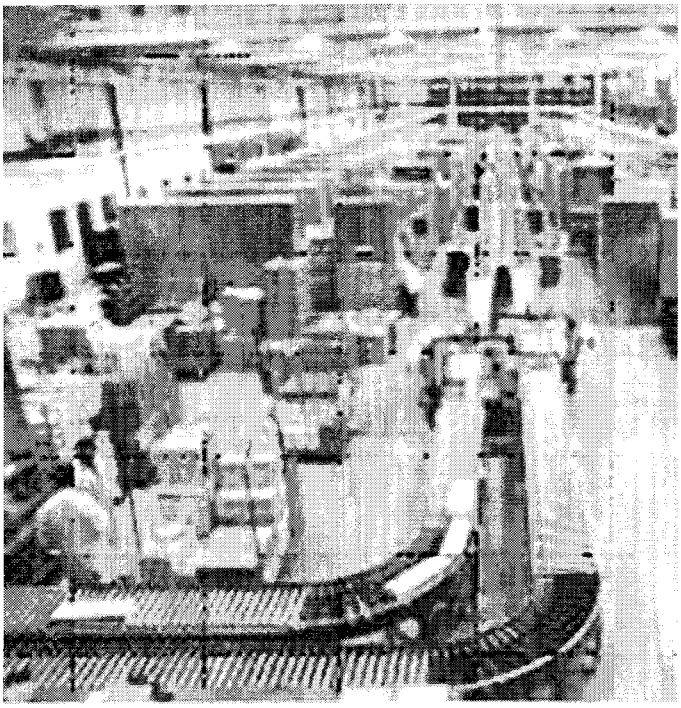


Fig. 11. Typical Interior-Source: www.ebv.com/prodserv/vas/warehouse.

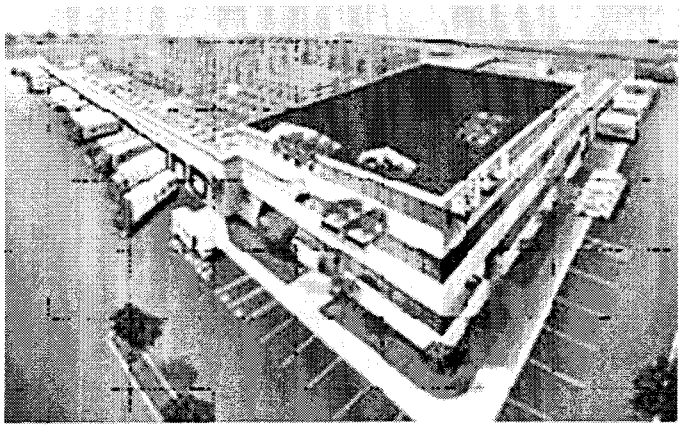


Fig. 12. Cutaway-Source: www.ebv.com/prodserv/vas/warehouse.

Fig. 13. Land use along I-95.

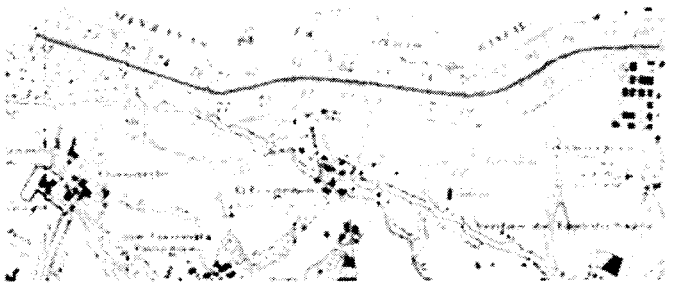


Fig. 14. Ciudad Linea-lSource: The Ciudad Lineal of Madrid: *George R. Collins: Journal of the Society of Architectural Historians, vol. 18.*

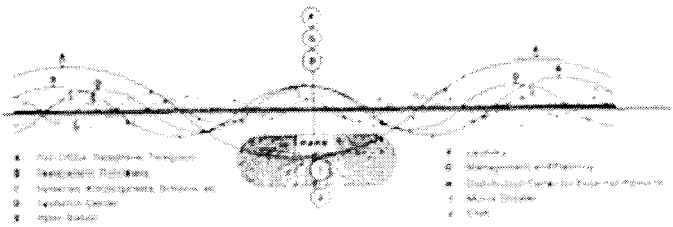


Fig. 15. Soviet Linear City-Source: Town and Revolution, Soviet Architecture and City Planning 1917-1935; *A. Kopp Braziller, 1970.*

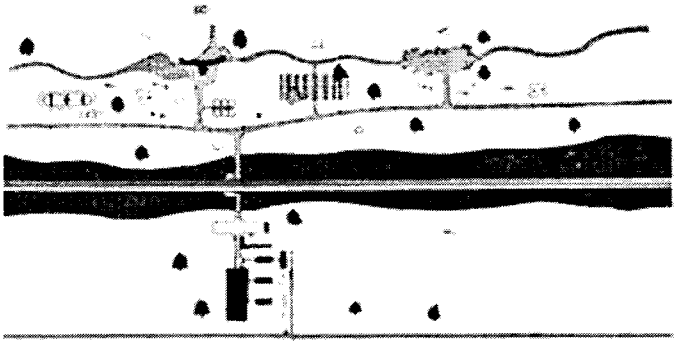


Fig. 16. Linear Industrial City; Le Corbusier-Source: Town and Revolution, Soviet Architecture and City Planning 1917-1935: *A. Kopp Braziller, 1970.*

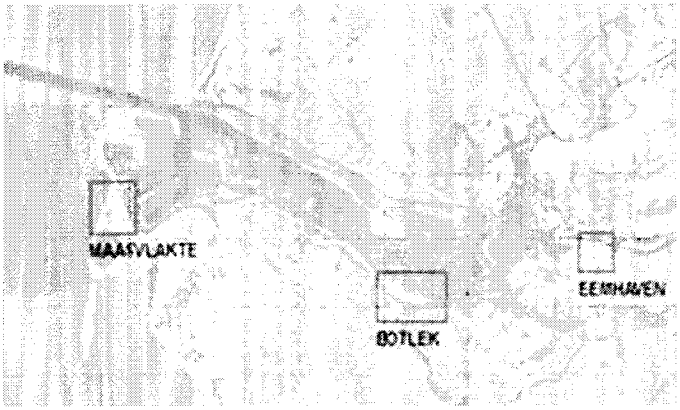


Fig. 17. Rotterdam, The Netherlands-Source: www.portmanagement.com

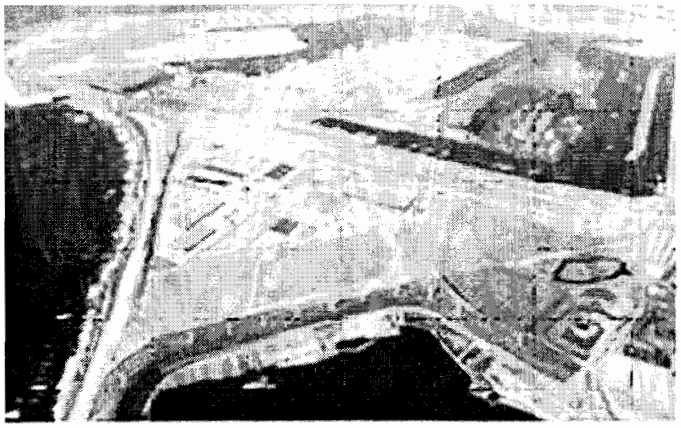


Fig. 18. Rotterdam, The Netherlands-Source: www.portmanagement.com.

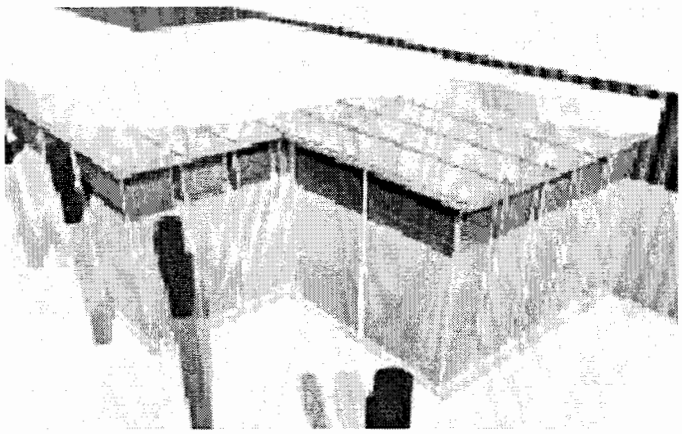


Fig. 19. Containerland-Source: www.portmanagement.com.

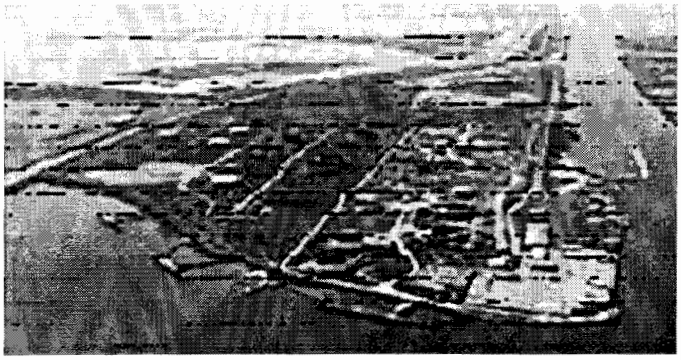
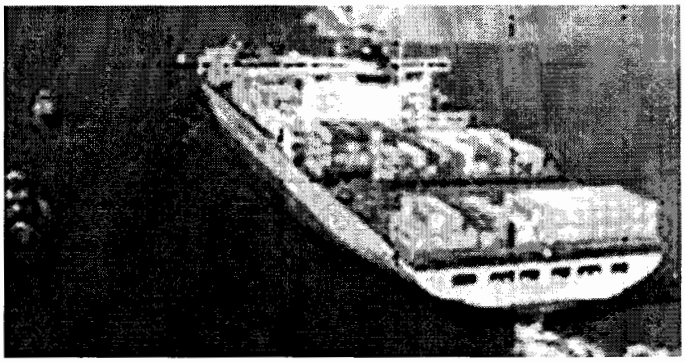


Fig. 20. Harbor Island, Texas-Source: www.portofcorpuschristi.com.

Fig. 21.

Fig. 22.



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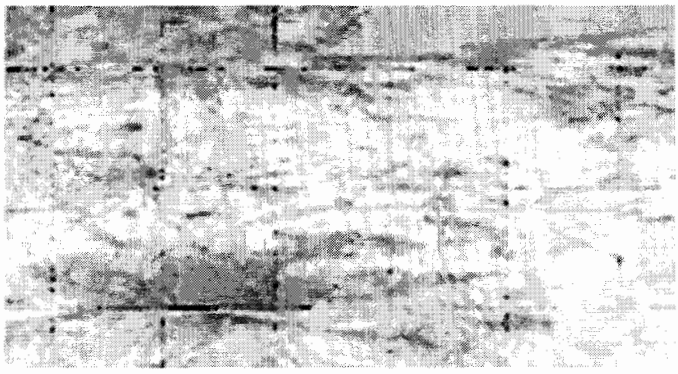

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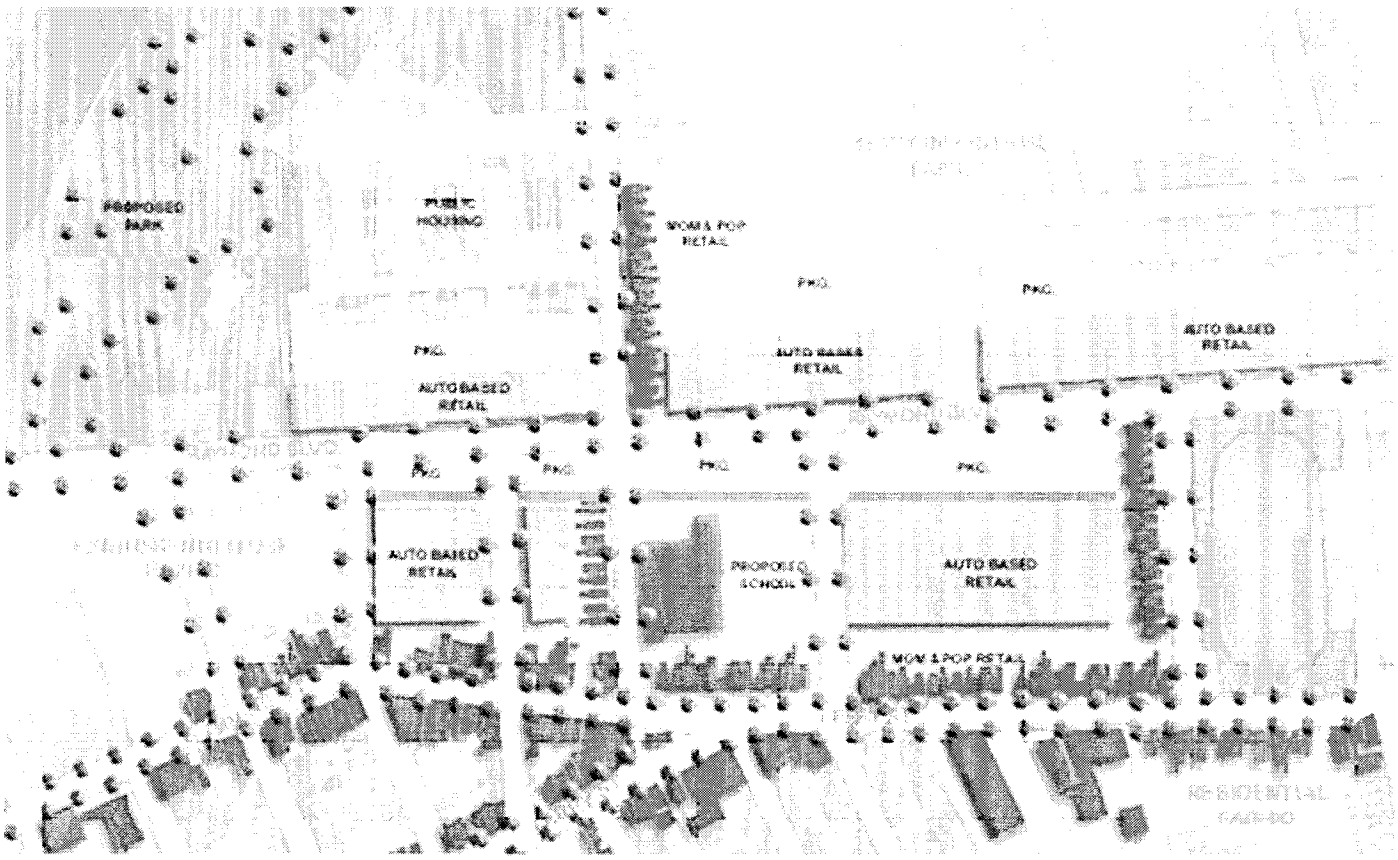

Fig. 26. Proposed redevelopment of Raymond Boulevard and Ferry Street.

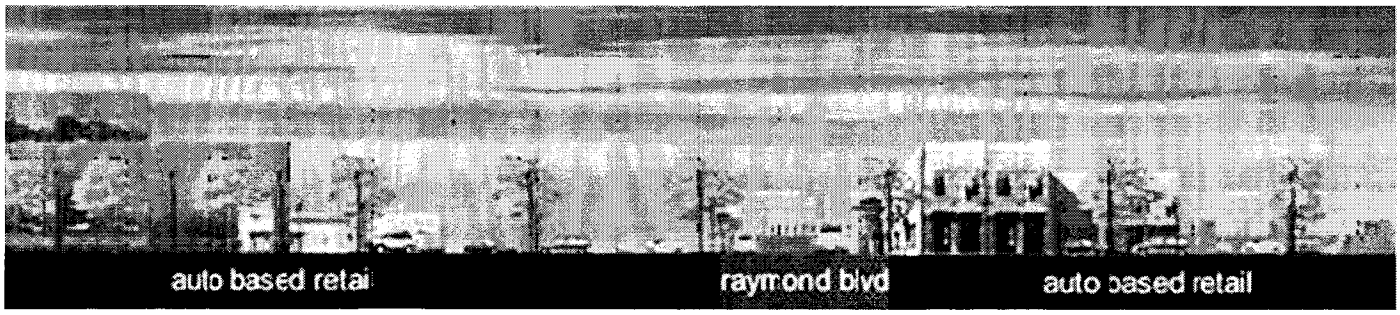

Fig. 27. Proposed auto based retail along Raymond Boulevard.

Fig. 28. Proposed "mom and pop" stores along Ferry Street.

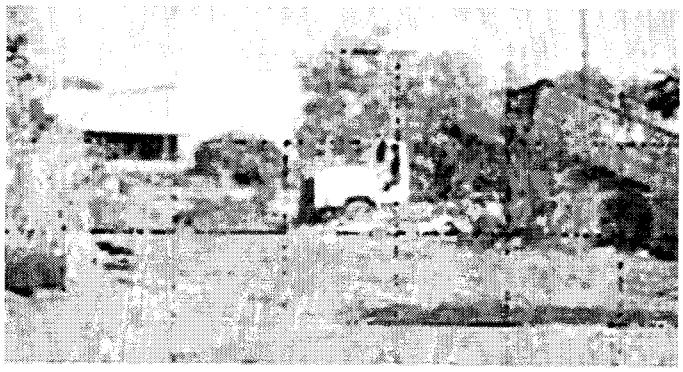

Fig. 25.

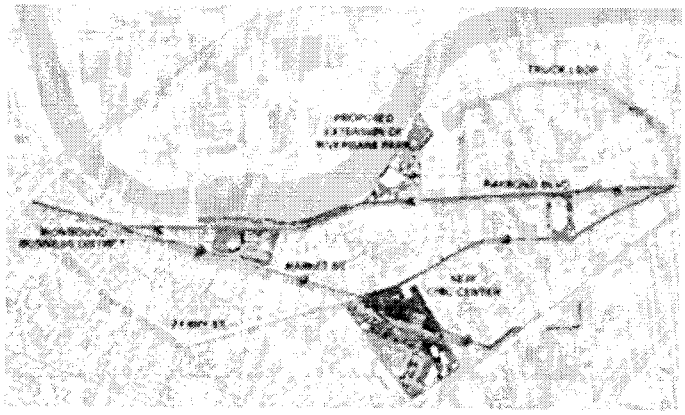

Fig. 29. Zone A circulation and proposals, showing the new civic center, including: high school, library and post office.

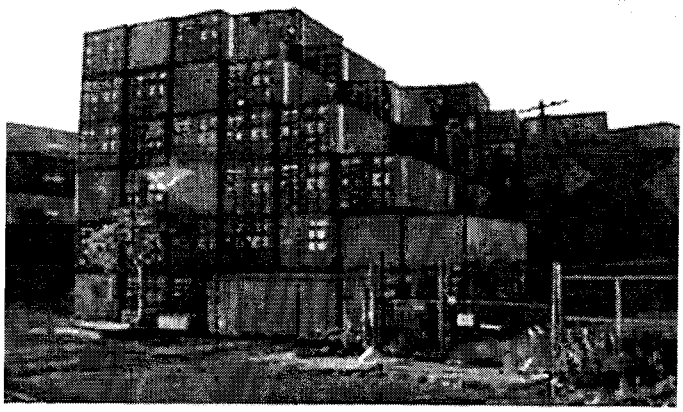

Fig. 30. Containers on open lot.

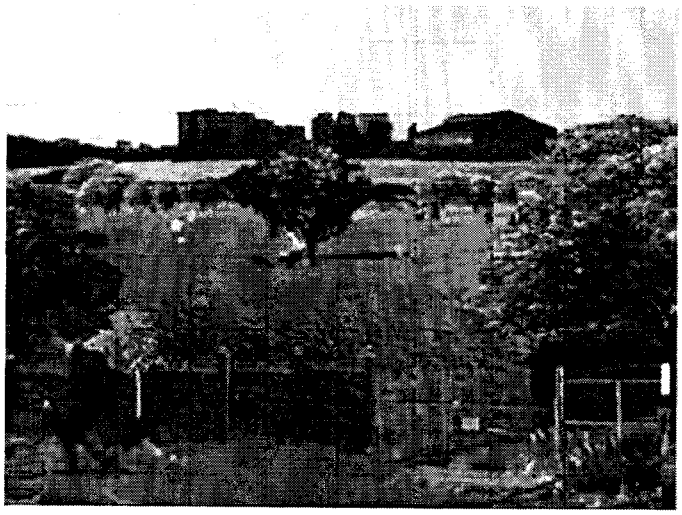

Fig. 31. Proposed park and view when containers are removed.

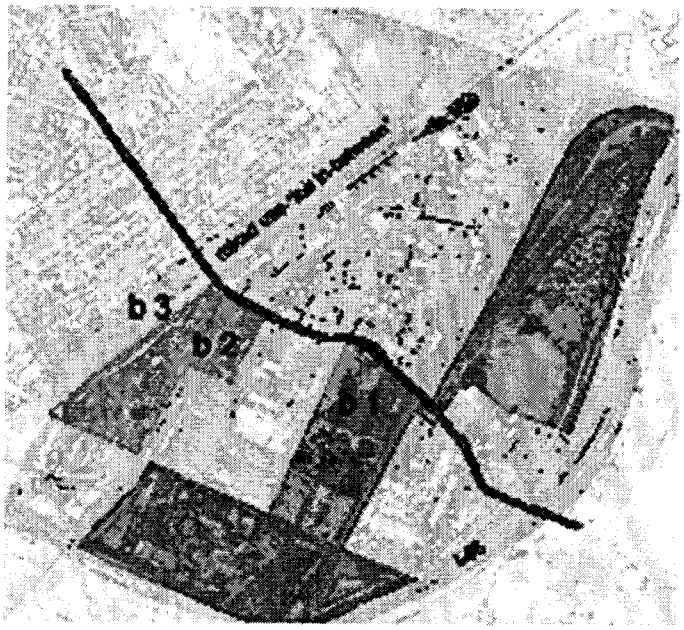

Fig. 32. Zone B specific study areas.

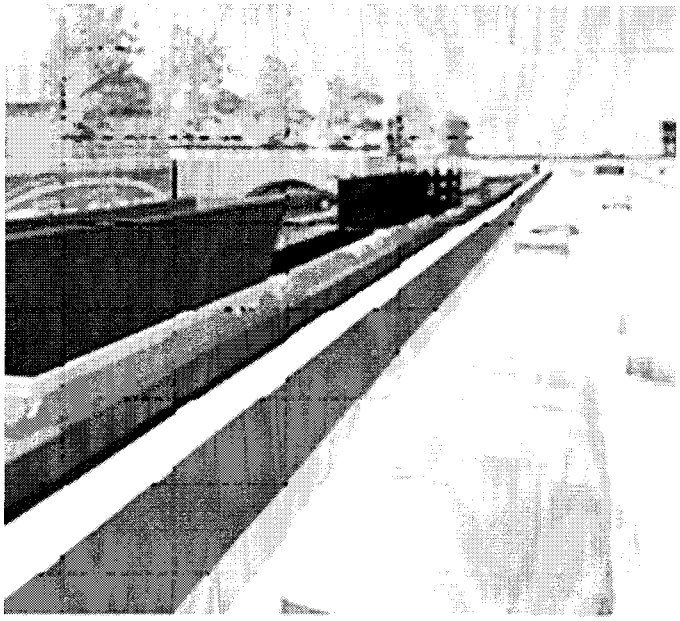

Fig. 33. Routes 1 and 9 view.

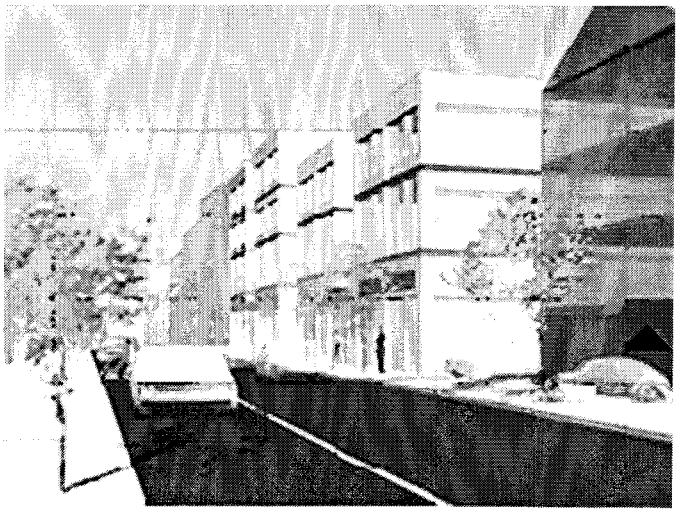

Fig. 34. Rome Street view.

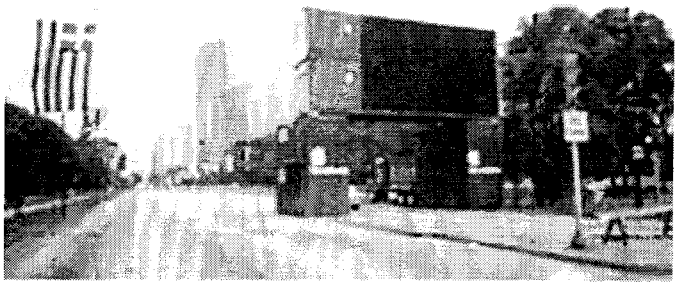

Fig. 35. Philadelphia, 34'-0" high arch as screen.

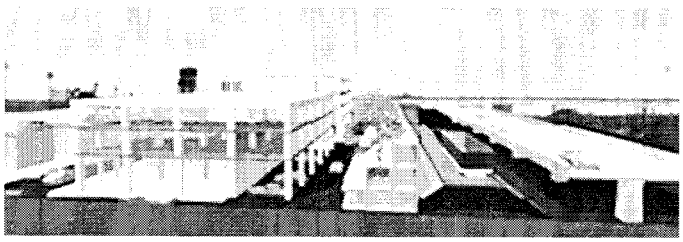

Fig. 36. Concept section.

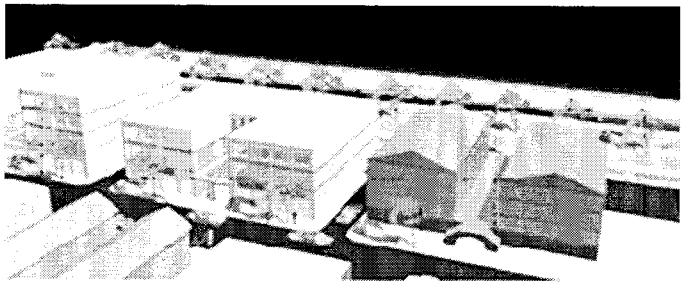

Fig. 37. Axonometric view of proposed area.

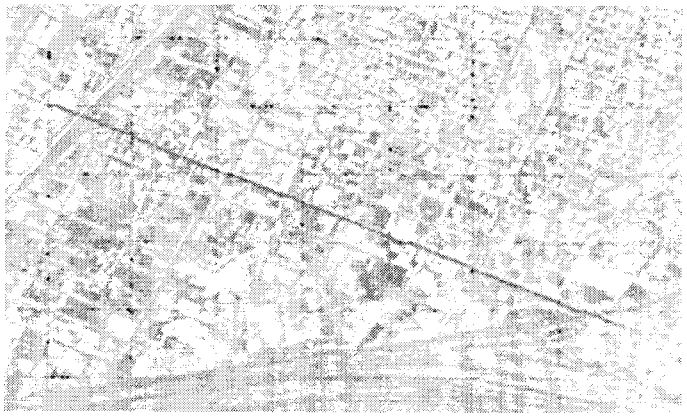

Fig. 38. Brownfields.

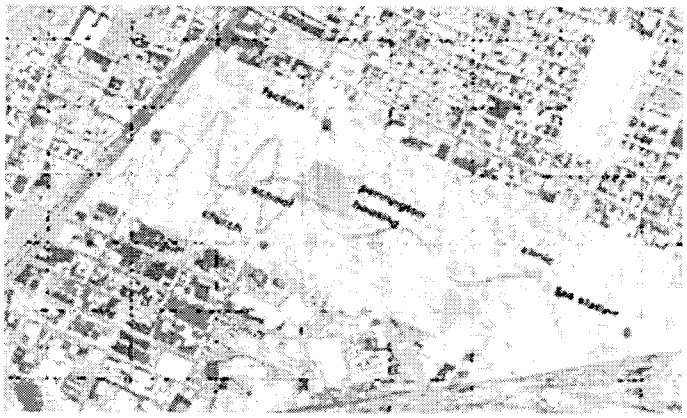

Fig. 39. Important activity nodes.

Fig. 40. Existing.

Fig. 41. Intervention.

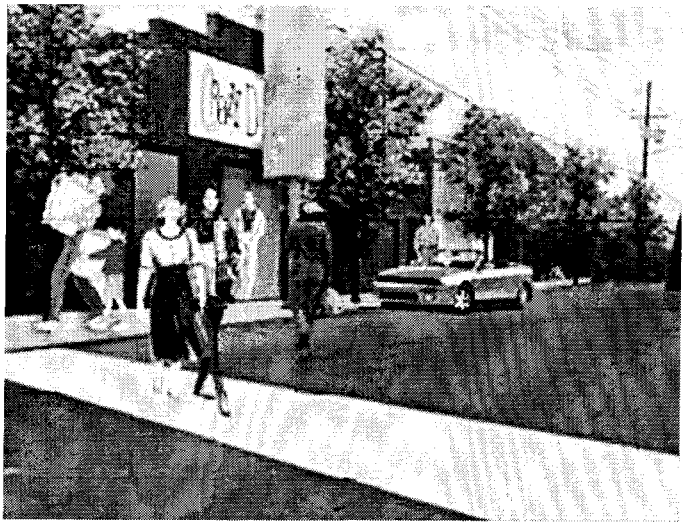

Fig. 42. After 5 years.

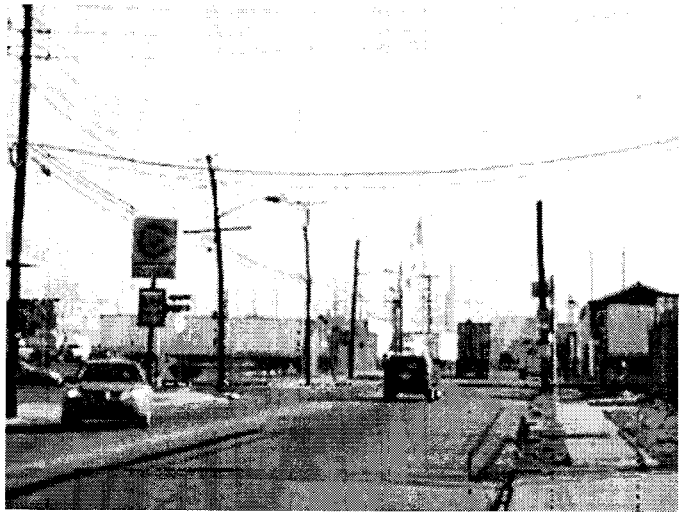

Fig. 43. Existing.

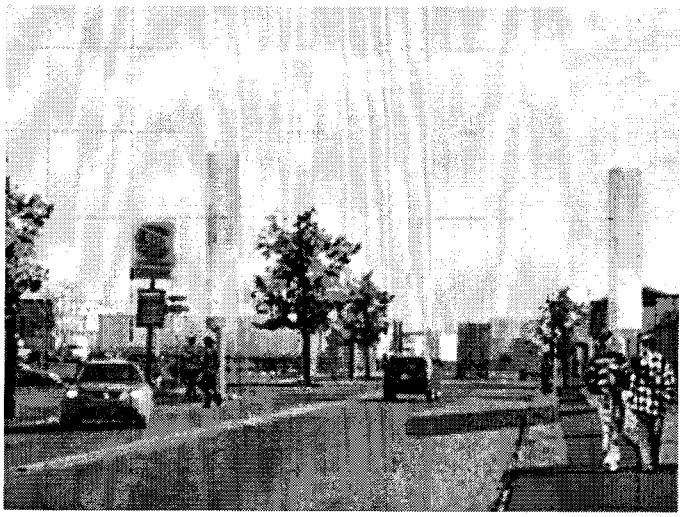

Fig. 44. Intervention.

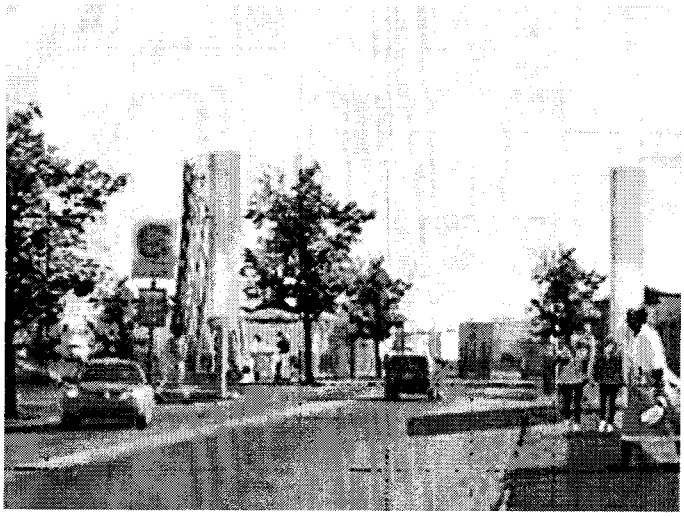

Fig. 45. After 5 years.