

Enhancing the Opportunity for a Healthy, Prosperous Future for New Jersey

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Abstract:

New Jersey has the opportunity to become one of the most healthy, prosperous, sustainable states in the United States. It has the land, resources and basic infrastructure. It only takes political will to make this happen.

Using basic GIS analysis of the land use, New Jersey has land, water and locational resources for food production, with more than enough available land, if properly developed, within a 5 minute walk from the 251 existing and proposed train/transit stations to meet the vast majority of the residential and commercial growth in the State of New Jersey for the foreseeable future. Expanding beyond that basic 162 acres (five minute walk) around train and transit stations to a 12 minute walk provides development and rehabilitation opportunities for growth beyond all projections with out have to build one more unit or office in suburban or rural lands. Implementation at the appropriate scale and amenities within these growth target areas will improve health, reduce carbon footprint, improve the quality of life, reduce unemployment, provide extraordinary economic development opportunities and make living in those communities that implement this concept more affordable, safe and pleasant, healthy and sustainable. It is a strategic option, for cities with existing or proposed transit and communities with food production potential. Whereas little can be done to the existing, inefficient and unsustainable sprawled land use pattern, it is what it is. This pattern will continue to provide living accommodation to those that have time, resources and want to be auto dependant, but must realizing the cost that they are incurring on the rest of society as it becomes even more unsustainable and expensive in the future. The new generation of millennials who become the majority demographic by 2016 already understand the benefits of a more sustainable, urban, walking and transit dependant future. It is their future-healthy food and a great place to live, work and grow.

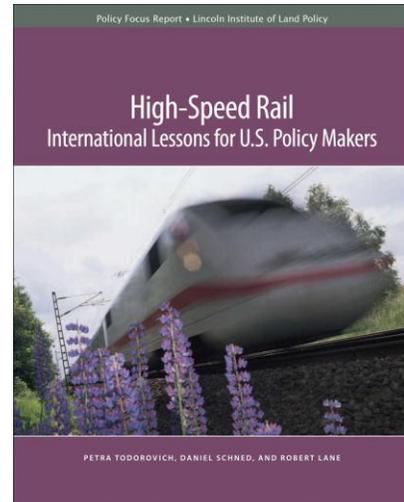
“ Plan for maximum land development benefits by coupling high-speed rail station investments with policies that encourage land development around station areas that are primarily located in urban area. In general, well-connected stations in center-city locations offer the greatest potential for urban revitalization.”(1)

(1) From the America 2050 and Lincoln Institute of Land Policy

Introduction

Transit Dependant Development (TDD) means that land use and transit depend on one another. It means that residents and businesses can exist without reliance on a car or immediate access to parking. TDD puts the focus on walking, bicycling, on promoting a healthier life style and higher quality urban design. It also has economic advantages. In a forthcoming paper entitled, *The Walkability Premium in Commercial Real Estate Investments*, Pivo and Fisher state “ the benefits of greater walkability were capitalized into higher office, retail and apartment values.”

Transit Oriented Development (TOD) is now a policy within current urban planning dogma. Unfortunately it is considered more as an option, with vague metrics, dimensions and standards. TOD encourages places to become more walkable around existing and proposed transit stations. On the other hand, Transit Dependant Development demands, walkability, bicycle use, multi transit modes and high intensity of mixed and multiple use buildings and civic spaces within reasonable walking distances. It has specific metrics for implementation.



Transit Dependant Development uses the concept of Transects,⁽²⁾ applied to locations with major transit stops and train stations. It is particularly applicable in New Jersey which has the nation's largest statewide public transportation system (source NJ Transit) It is also applicable to any other city or region that has now or is proposing high speed rail, enhanced rail, light rail or narrow gage streetcars, or BRT public transit. Transit Dependant Development has two, three and four dimensional metrics. It provides a basic framework for new buildings and public spaces, infrastructure, future transit networks and public and private investments. It generates the opportunity to generate vary livable, sustainable urban habitation. With proper urban design standards, great places of memorable character with high quality of urban life can occur. This is fundamental to the regeneration of faltering cities and towns, that became auto and parking dependant. It is this change in this dependency which provides the greatest opportunity and provides the greatest challenge.

Focusing investment into transit dependant urban areas, designing exciting interesting places to live, work and play is far more cost effective and energy efficient. We can experience this in the cities that have already implemented more transit dependency. We know that we cannot promote the pattern of development that encourages energy consumption and pollution, traffic, noise and accidents and the diminishing respect for the pedestrian.

The obscene and wasteful amount of land for parking, particularly in urban areas provide land banks for new urban development. We know that the auto/parking dependant land use pattern has generated huge profits for a few, particularly the surface parking lot owners and operators, with long term costs to consumers and society beyond measure.

(2) Transects are more simple division of land uses into 7 basic categories as opposed to the multiple "zones" typical of most local zoning ordinances. The land use Transects divide land into T-1 – Environmentally sensitive lands – rivers, wetlands, flood planes etc. T-2 – Agricultural lands to be reserved until all other land is built out; T-3 –standards suburban sprawl, T-4 - General urban areas, T-5 – Areas around the cores of cities or towns. T-6 – The cores of cities, towns and villages and SD – a special district

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True costs to society and the environment have not been calculated. Unfortunately, this land use pattern of sprawl and the deurbanization of cities and towns with its auto and parking dependency, over the last three generations has left few mobility options for the vast majority of people. But where these options still exist (cities and town with existing train stations, light rail or BRT) they must be capitalized upon. Transit dependency is not a new land use pattern. It was functional and operational in the past. It is the emerging vision for the evolving future, using the best of a more humane urban design combining new technology propelled by global, financial and environmental urgency. Combine this with a new generation that is beginning to understand that the future planning will not be the same as the past. That a new economic and social reality must emerge.

Researching for Sustainable Future

Since the first Urban Design Studio [UDS] at Rutgers, the State University of New Jersey was taught in 1973, to provide a physical planning course to provide accreditation to the Master's Degree Program in City and Regional Planning, it has been dedicated to the research, graphic and communication of three and four dimensional urban forms that positively impacts the quality of life and future sustainability of cities and towns. It has now an impressive list of professionals who have graduated after taking the three course Urban Design sequence. This article emerged after another of these studios focused on the task of developing and testing a conceptual Urban Design framework and landholding analysis on cities in New Jersey that were served by heavy and/or light rail transit. This research studio was conducted in 2009 by a team of 6 graduate students. Focused on New Jersey, with its existing and potential expandable transit network and stations, the resulting recommendations could be applied to the regeneration of cities with current and potential train/transit stations across the United States. The land use goal is higher mixed buildings with walking distances from the station combined with an emphasis on pedestrianism and the de-emphasis on parking.

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The purpose was to develop and test a Unified Theory of Urban Design for Transit Dependant Development that would generate a simple, basic two dimensional diagram- a fundamental framework of function, use and intensity, along with a series of Urban Design Standards for urban character, form, massing along with development program metrics. This combination of diagram, metrics and standards could be applied to any city with, or proposing a train or major transit stop/terminal. The diagram had to be simple, with basic metrics and provide infinite flexibility when applied to a specific town with its unique geography, street network, natural features and community visual preferences. The architecture and design vocabulary within the diagram can be determined for each city or town on an individual basis. The specific application of the urban design diagram and standards along with the specific architectural design vocabulary should be generated through a public participation process, thereby insuring optimum public input and the public support of the final form of the land use, street types, parking and public spaces, parks and plazas.

The studio began by researching earlier studies of Transit Oriented Development, the concept of the American Mega Regions with high speed rail connecting major nodes, being promoted by American 2050 of the Regional Plan Association, the Smart Code and the Transects as being promoted by the Congress for the New Urbanism. The studio was a spin-off of initial analysis and recommendations generated from a public participation process/workshops commissioned by Union County, New Jersey to probe the visual, spatial and technical standards for development around train stations in small towns with train stations. Called *Transit for Small Towns, 2005*, the report summarized the process and recommendations. This report was prepared by A Nelessen Associates with Berger Associates. See the diagram *Three Transit Sheds 2005*

What would transit dependant regenerated cities that incorporated this urban design diagram look and feel like? Much in-depth Urban Design Observational Research was completed in cities nationally and internationally that already had a reputation for walkability, livability, sustainability and transit dependency. Much of this observational research was completed prior to the studio, and captured on hundreds of hours of video

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and slide images. Most of this observational research was in Europe, some in Asia and South America. The film and images from the streets and public domain in these cities presented a most compelling and logical, humane and environmentally green vision for the future. The cities where the observational research was conducted provided the “idea models” for which United States cities must start planning if they are to become more sustainable, healthy and efficient in the future. After an internal visioning session using these films and images, a “this could make American cities great” attitude was generated. With the current problems financially and ecologically, globally and locally, it is clear that our costly, polluting sprawl model of urban growth will end when the financial and ecological problems become more manifest to more people. Compact well designed, pedestrian, bicycle transit based cities provide one potentially compelling opportunity to get it right in the future and will particularly appeal to the newer generations, particularly the Millennials (in 2011 are 8 to 29 years old) who will be the prime decision makers about the form of cities in the future because most will live in cities for pleasure and survival. Visual Preference Surveys ⁽³⁾ with this cohort clearly indicate a desire for an alternative future.

(3) Survey results from recent Visual Preference Surveys can be seen on <http://goo.gl/ekB28>)

The focus cities for the observational research included Zurich, Switzerland [considered the city with the highest quality of life]; Oslo Norway; Vancouver, Canada; Portland, Oregon; Curitiba, Brazil; Freiberg, Germany; Copenhagen, Denmark; Gent and Brussels, Belgium along with pedestrian and bicycle priority streets in Manhattan and foremost Amsterdam, Holland, the poster child of this type of rational, green development at the national, city and town scales. Holland is one of the most advanced countries on the planet. It has achieved a strategic balance between the pedestrian, transit, bike, the car and parking; between urbanism and farm/food production lands. The observational research of the Dutch and Belgian cities, filmed during winter and summer proved invaluable and informative. Cities had more pedestrian activity in the winter contrary to the belief that pedestrianism is a fair weather exercise! Another city was Oslo, Norway, a wonderful case study unto itself.

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There was much to be learned and experienced from these videos. These cities represent the current evolution of urbanism and humanism, green technology and planning, education and culture, transit and bicycle orientation while balancing urban life, pedestrian prioritization and the private automobile. A summary of observational research that focuses on Oslo is currently on You Tube titled: *Planning and Designing Healthy Sustainable Future* by Tony Nelessen.

In the United States there are excellent examples of cities that have been historically planned and implemented to achieve a high level of sustainability or appeal. Unfortunately many of these cities have lost their train stations and had their transit replaced by arterials and parking lots. Some cities may still have transit but with urban design so negative that it lacks appeal. Portland, Oregon is probably close to a holistic transit dependant city, with high quality urban design that capitalized on its walkable grid, waterfront and well scaled architecture, integrated green and a bicycle network. The early Visual Preference Surveys conducted there set the tone for expanding transit dependency.

There are extraordinary small scaled projects examples in the United States at the downtown or neighborhood level that promote walking and transit/land use dependency like areas of downtown Denver and now Manhattan, Brooklyn and Philadelphia, or sections of Hoboken. In the US we plan and implement incrementally and much of that is “value and traffic engineered” or has very poor quality urban design, streetscape and related public spaces. It is all auto/parking dependent. If developer investment is not seen as generating a guaranteed savings or immediate profit, because it is their money, why do it?

Much of today’s urbanism seems to be designed for the corporate market and not for the long term good of people or community or sustainability or long term enhancement. It is rare to discover a continuous urban experience at a large scale that contains all the characteristics of *sustainability, energy efficiency, affordability, convenience and urban delight*.

Walking, bicycling, transit orientation balanced with trucks and cars are the mobility fundamentals to the most sustainable and attractive cities. Intensity of land use,

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from the highest to the lowest as it transitions through the three transit transects is the second key to future sustainability. All cities and towns have available land and are not now or will ever be “built out” thereby providing the opportunity to retrofit for transit, bicycles and mixed use at appropriate contextual scale.

The entire concept inherent in a transit dependant city – a new urban design theory, generated many questions. Can we reinvigorate walking and transit, bicycles, pedestrian priority and mixed use intensity in our urban centers that are car and parking dependant? How does this diagram overlay and is retrofitted onto an existing city with transit and an array of potential developable lands and buildings? How intense and at what scale does new infill and redevelopment have to be to make places attractive, pedestrian oriented and affordable? At what time and scale of development will cities allow cars to be removed from streets to be converted to pedestrian priority? How do we overcome the desire for parking proximity? How do we retrofit cities to implement this diagram and urban design standards in the United States given our car oriented, parking dependent, non-walking culture and a past history of pedestrian priority (downtown pedestrian mall) failures? Can businesses exist in a downtown without immediate adjacent parking? What happens if a major county or state road transverses the study area? Can the state and federal government become involved in planning and designing critical sustainable elements of sustainable green infrastructure, like sewer, water, communications technology, upgrades to stations, streetcar lines and remote parking.

Parking and access to parking became a key concern. Many existing cities and towns with an active train or major transit stops are heavily dependant on surface parking or parking decks. Most are located next to or immediately adjacent to the station occupying some of the most valuable land in the most unattractive building with awful pedestrian realms and perceptions. Other stations have little or no development of any reasonable scale or intensity around them. Some are park and ride facilities because they serve a suburban auto based population. Opportunities abound in any of these cities to apply the framework diagram and begin the process of planning the transit dependant development of the future. The scale, location and intensity of existing parking lots and

structures will be the greatest impediment to implementation. Fundamentally it must be remembered that enhanced pedestrianism is the hallmark of a sustainable city.

Cities that have embraced transit by default also have to embrace pedestrianism because the user needs to walk to the station. The more people walk, the greater their sensitivity to place and those features that make walking a pleasant and safe experience. Walking five to fifteen minutes is possible, but beyond that, a holistic sustainable system must incorporate convenient secondary transit modes. By extending mobility beyond the ten minute walk, by use of bus rapid transit, on-demand transit and narrow gage street cars, the center of the city with a train station will develop an entire new vitality. We only need to research other cities that have great secondary connections from airports to generate positive examples of secondary transport that works.

URBAN FRAMEWORK DIAGRAM [UFD]

After reviewing the observational and best practices research, building and street form concepts and much discussion, the Urban Design Studio spent several weeks developing and refining an urban design framework diagram that could be superimposed over existing train or transit stations/stops and cities with a range of development opportunities. This Urban Framework Diagram joins other classic diagrams that have used the development radiating out in circles from an urban center. The resulting diagram uses a new combination on the traditional circular diagram similar to the Garden City diagram of Ebenezer Howard or the Future City diagram of Victor Gruen. Each contained a focus areas, transportation and mobility network and green spaces. The urban framework diagram prepared by the Rutgers Studio uses three concentric circles that contain mobility and development “sheds.”

See *Figure 1 Conceptual Diagram* which illustrates the primary and second walking sheds as well as the tertiary shed divided into multiple potential traditional neighborhoods with their five minute walk from the center of each neighborhood.

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The three transit transects of the framework diagram can be understood as the primary, secondary and tertiary service areas. The first two walking distance metrics are universally accepted in the transit business. The first is the traditional five to six minute walk from its centroid [See Figure 2 - TT6]; the second is a six to twelve minute walk out from the centroid [See Figure 3 – TT5]; A minute of walking time was calculated at 250 feet. Where TT6 and TT5 are walkable, the TT4 with its multiple neighborhoods that support the center requires supplemental transit modes to connect each of their neighborhood centers to each other and from each neighborhood center to the main city center and the more regional transit stop. T4 has a radius of two to two and one half miles, a 42 to 45 minute walk or 15 minute bike ride.[See Figure 4 –TT4] The maximum that people will walk may be up to 20 minutes. Clearly, not only is the bicycle critical but will also depend of a range of transit options beyond the bicycle. Bus rapid transit and narrow gage streetcars are the least expensive but would only connect more intensely developed neighborhoods and more remote parking storage areas to the main transit/train station. All the other neighborhoods would require a supplemental form of transit like on-demand transit. This technology seems like the only logical choice supplemented with taxi.

The Conceptual Diagram can be overlaid with its center on any station over any city or town with any combination of streets and natural areas. The essence of this urban framework diagram is that it is infinitely adaptable to any location, natural conditions, street and highway structure provided that the circles are translated into isobars and the dimensional characteristics of the three transit transects are retained. *Figure 5* illustrates the Conceptual Diagram infilled with color with the arrange representing the possible neighborhoods with their centers. *Figure 6* called the “Reality Model” illustrates how the conceptual diagram can be modified for natural conditions and major roadways which act as edges to neighborhoods.

The Urban Framework Diagram incorporates four of the seven transects as developed by the Congress for the New Urbanism along with the principles of Smart Growth and many of the standards contained within the Smart Code in lieu of the chaos, inefficiencies and non-sustainability of existing zoning regulations. The transects, as they

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are used by the Congress for the New Urbanism, are massing and use designations, devoid of defined area until applied to existing land uses or used as a model for urban redevelopment. The Transects ranged from a Transect Six, T6 to a Transect One, T1, and a Special District. T6 is characterized by the highest density, intensity of activities and mixed-use, decreasing to lower density and intensity in the T5, lower in the T4, transitioning into suburban lots and land uses in the T3, land to be reserved in the T2. The T 1 [areas to be preserved and restored] The designation includes land that is to be preserved for its unique ecological characteristics. A transect based on existing intensity of land uses can be reinforced by various mobility options and vice versa. When applied as a more dimensional “control” for the dependency of land use with specific mobility options an extraordinary range of opportunities emerges.

The Urban Design Research Studio expanded on this concept of Transects by superimposing the three most urban transects, T6, T5, T4, as radii onto an actual city site with a major transit or multi-modal station as the center point of the radius. Three concentric “rings” of development were recommended

In the Transit Dependant Diagram, T6 is characterized by the highest density, intensity of activities and mixed-use, decreasing to lower density and intensity in the T5, lower in the T4, transitioning into suburban lots and land uses in the T3. The T 1 designation was also used. The designation includes land that is to be preserved for its unique ecological characteristics including flood plains, wetlands, potential high water along with existing parks and green acres lands within urban areas. Much of the T1 area will have to be restored to a new ecological balance incorporating environmental best practices for runoff and wet ponds. T1, “Lands to be Preserved,” could intersect every transect within the radius diagram. It could provide continuous green connections from the periphery to the center connecting parking and open spaces with streets and plazas.

A special district transect is an optional use. Special Districts could be hospital complexes, industrial sites, warehouse and distribution, universities, etc., those places that need specific land use and access.

Exhibit One: The Transect

The urban design framework diagram incorporated a more specific set of definitions which took into consideration not only the location of the major train station/transit stop, but also walking distances, potential bicycle paths, higher intensity of mixed and multiple use development and parking locations. The new planning term that evolved was **the Transit Transect or TT** using the same numerical enumerations as provided by the Congress for the New Urbanism. The beauty of this diagram is that it provides a rational cost effective model for development with clear rules for all as opposed to the current politically based, and corruption generating rationalization of land use, parking and traffic engineering on an incremental project by project basis.

Each transit transect has a strong emphasis on sustainability through walkability, appropriate mixed-use high density, incorporation of green, infill and rehabilitation. As you can imagine, this diagram superimposed with its center on the station, has the potential to generate a wide range of design scenarios and form patterns based on where the station is located in relationship to the city core, the natural features, existing important buildings, street configuration etc. Depending on location, the edges of the transect could overlap municipal boundaries.

Critical to the diagram is the ability to incorporate multi modes beyond pedestrians. Bicycles and bike lanes have only recently become a hot topic and transportation planning application in the United States. It is well established in Europe and Asia. More cities are incorporating bicycles as a major form of personal mobility. Bicycles for transport are the most sustainable next to walking. They are nearly pollution free and are healthy exercise. Bicycle travel was calculated at 10 mph. It also assumes that designated bike lanes/access continues through all three Transit Transects starting at the major station, continuing on into the T3 suburban area. Provision of safe, stress free bicycles lanes in the three major transit transects is critical to make the entire set of transects work to its optimum advantage and highest level of sustainability. To make bicycles work within the three transit transects, on-street parking must be sacrificed on

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many streets unless they are wide enough for parking or have such little traffic or could be redesigned as a slow speed one way.

The initial urban design research included the TT6, TT5 and TT4, but focused on the TT6 because it has potentially the more intense development in the smallest area. The center city/town core TT6 is supported by (TT5) of less development intensity that surrounds and reinforces the core. The TT 5 is pedestrian/ bike and car balanced while the TT4 is more oriented towards the car and bike with the pedestrian. Of course the T-3 is suburban and almost entirely car oriented. As the distance from the train station increases, sustainability also decreases because there is typically greater energy usage, pollution and lower intensity of mixed uses.

The TT6, the city center, has to be the highest mixed use density (FAR). The most pedestrian oriented and least car/parking oriented. Major public facilities and plazas should be located in TT6. Ideally, many pedestrian priority streets are located in TT6 area. Parking of all types, on-street, surface, podium, decks and underground, should be seriously discouraged in this transit transect. Keep the car, traffic, pollution, noise and accidents out! Personal vehicles for handicapped, taxis, limos or vans for delivery is restricted, except with a special parking permit for specific and limited locations or for specific and time limited delivery areas.

To accommodate the transition to transit dependent development, a phased plan for implementation and deployment of parking must be developed in time with the implementation of other transit, mobility and parking options for those that still must commute to and from the city center. What has worked best in other cities is a timed phase out of parking by providing transit options, zip cars combined with off-site parking at low costs.

TT5 is still high mixed-use density, but with a greater emphasis on housing. It has a high priority on pedestrianism, bicycles and local green spaces. Parking should also be restricted in this Transit Transect. If parking is to be allowed, it should be in mixed use

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parking structures on the edge of the transect or into the lower TT4 transect near a major roadway, arterial or highway. Parking can be up to a 5 to 8 minute walk away when there is a great, safe walking experience.

The TT4 area is by far the largest extending out approximately 2/1/2 miles. This area should be divided into multiple traditional neighborhoods that have the same five minute walking radius to their respective centers. There could be 75 to over 100 distinctive neighborhoods with the recommended distance dimension within the TT4 area. The most adjustment to the diagram will happen in the TT4 with its multiple traditional neighborhoods whose location is based on existing streets, natural features, historic boundaries and social ties. These smaller circles of neighborhood development can easily be adjusted for major highways, arterials and natural features.

Linking the center of these neighborhoods to the center city core with transit, bicycles and cars is critical for the entire structure to work and function holistically. We know that bicycle has great potential for access to the core from any neighborhood within the TT4 provided that there are bike lanes. Light or narrow gage transit, bus or bus rapid transit can only serve the prerequisite five minute walk to the transit stop therefore these transit modes must be centered on the most intensely developed neighborhoods and mixed use parking areas. How are the remainder of the neighborhoods connected to the city center? This will require a new type of on-demand transit that only connects the centers of each of the neighborhoods to the centers of each of the other neighborhoods and to the city center. Each traditional neighborhood should be redesigned to have a transit/on-demand stop a maximum of 5 minute walk from its edge to its center. Other choices include taxi, smart cars or the use of personal vehicles. There should be an emphasis on small, electric cars, smart cars and corner cars. If there is a holistic mobility network, of walking, bicycles, on-demand transit, combined for some neighborhoods with light or narrow gage transit, the need for a car should be significantly reduced or eliminated. Vehicles miles traveled will be significantly reduced and quality of life and the environment will improve.

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Within the three transit transects, there must be a jobs-to-housing balance, using a minimum of 1 job to 1 housing unit . For every new and existing housing unit within the three transit transects, there need to be 180 to 300 square feet of job generating space as a general rule. Many of these jobs can be distributed throughout the three transit transects, but should be focused in the TT6 and TT5. The TT4 is the ideal location for more home occupations and businesses with few employees. In addition there must be a housing-to-retail balance of 10 square feet for each existing and new residence within the three transit transects. Here again the larger scale retail/commercial uses should be located in TT6 and TT5 with smaller retail uses focused in the center of the multiple neighborhoods of the TT4. Further there should be an open space (parks and recreation) balance based on land use and the potential development program. The provisions of parks, well landscaped streets and plazas must be a top priority to attract and retain people living and working in cities. Parks must be located so they become part of the everyday experience in each of the transit transects. Local neighborhood parks should be located within a three minute walk of all residents.

Within most cities the current urban land uses are completely out of balance thereby requiring extensive commuting and parking. As the economic times become tougher, with the price of energy increasing, a decreasing amount is being spent on other sectors of the consumer economy. Sooner or later a new enlightenment should occur that could lead to changes in land use and mobility. Today a lot of emphasis is being placed on the emerging electric car and the ability to recharge them. Having a small electric car for long distance t rips out of the transit commuting range seems probable. The concern is were will they be parked in TT6 and TT5.

With in the three primary transects, this balance must be achieved the sooner in the development process the better, typically by providing more attractive and affordable housing and great safe streetscapes and green spaces. Being able to get to and from work, school, shopping and recreation without the use of a car will reduce pollution, accidents, unsightly parking, significantly reduce the vehicles miles traveled, reduce cost to user and allow the valuable land that heretofore has been used for parking, to be

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repurposed and designed for other uses. The more intense the development, the more activity, the less expensive to maintain and energize and the more taxes can be generated. The greater the diversity of users and activities the more interesting and engaging is the living experience. Remember those that are more concerned about their privacy, their large lot and yard and can afford the cost and impacts will still have a huge array of choices as more and more suburban housing becomes available.

The three concentric circles must be converted into isobars when specific pedestrian, bicycle or transit routes are plotted over a specific network of streets, highways, railroad overpasses and natural features. This is best done by a walk-out from the station at different times of the day and year to understand the actual location experience. Nothing beats direct observation. A good urban designer in conjunction with a good new urbanism transportation engineer is needed to determine that which can be changed to make the walking bicycling experience more pleasant and effective. GIS can also be used with the correct metrics- but must be field checked.

How much potential development area is available when these transit transects are applied? First we calculated the gross total amount of land in each of the Transit Transects. The general gross area was determined for each using a circle as a surrogate for the actual movement- isobar.

TT6: 6 minutes = 1,500 foot walk or 162 acres

TT5: 12 minutes = 3,000 foot walk or 648 acres - 162 acres [T1] = 486 acres

TT4: 2 ½ mile = 13,200 foot walk or 12,560 acres – 648 [T2] = 11,912 acres

To determine the “holding capacity” of each of the transects, we used a combination of aerial photography, primarily using Google Earth, along with “in-field” investigation of the vacant land, parking lots and single story building in bad shape. Field analysis was completed at the three potential city locations, Asbury Park, Rahway and Elizabeth. For the remainder of the 251 stations, we generated “utilization factors” based on the visual and GIS data to provide an estimate of the potential land holding capacity.

The studio focused on two cities to prepare a detailed land use analysis and susceptibility to change maps for TT6. A series of sketch urban design plans, using the Urban Design Framework diagram were developed overlaying the existing street network, building, natural areas, empty lots, and land and buildings considered highly susceptible to change using GIS and Sketch-Up over Google maps and AutoCAD.

URBAN DESIGN STANDARDS and PROCESS

Before a more specific massing and development program could be developed, there was much discussion regarding the “urban design standards” that should be applied to provide focus, integrity and integrate the new infill with the existing context, while meeting the goals of *sustainability, energy efficiency, pollution and accident reduction, affordability, convenience and urban delight*. The principles of Smart Growth and the Smart Code were reviewed as were classic urban design texts.

After much discussion, ten urban design standards that in part incorporated a process were developed and incorporated into the preparation of the urban design plans:

1. In a transit dependant development, the train station is the critical center point. Redesigning, rehabilitating and rebuilding major train stations in city centers to modern engineering and design standards making them more attractive, comfortable and user friendly is critical. This assumes that improvements to tracks, rolling stock, computer scheduling, switching and energy are co-requisites. Designing stations and major stops to be multi modal, provide parking for bicycles and ease of drop off and pick up by transit modes, jitneys and taxis is basic. This is one of the infrastructure improvements that is critical. Also using available transit owned land around and above stations for the highest intensity is only logical for high intensity mixed use. This is a critical infrastructure improvement. Using a process of District Improvement Bonuses (DIB) at intensities above a certain standard could significantly offset costs.

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2. A land and building use analysis must be completed using field work, in field community workshops, synthesized in GIS. Determine the amount of existing retail, offices, service and residential in all three transit transects. Inventory, all vacant, partially vacant, underutilized, tax delinquent, undervalued property (low improvement to land ratio) and inappropriately used land (e.g. surface parking, storage) and buildings within each of the three transit transects starting from major trains station or transit station continuing out through the TT4.

Inventory and map the status and capacity of existing sewer, water and other infrastructure including streets, electric transmission, gas, cable, fiber optics etc. Prepare a demographic, housing, and economic profile for all areas within the three transit transects.

If possible declare the as much of the area occupied by the three transects “an area in need of redevelopment” or “an area in need of rehabilitation.” The easiest to implement is the declaration of the area as being in need of rehabilitation. This designation does not have the power of condemnation but provides the opportunity of rezone or recode the entire area using a form based-smart code, the framework diagram and the ten urban design standards and processes. Do not default to a large number of small more focused “area” designations. Either way, it is highly recommended that the three transit transect areas be declare, by a non binding resolution of the municipal planning board and the city council, a “critical area for future sustainability.”

3. Apply the Urban Framework Diagram and modify it for local conditions, walking distances, major natural features, highways, existing neighborhoods, potential neighborhood centers etc.
4. Once the land and building analysis is complete and the diagram applied, prepare a sketch three dimensional urban design plan to redevelop and infill all of the

determined “available” land based on #2 above using AutoCad, Google Earth and Sketch up. Design for the highest floor area ratio, the tallest buildings the highest residential densities for a diversity of population with the most intensive city center mixed use in the TT6 graduating out to lower intensity through the TT5 area and into the TT4 area. For TT6 use a minimum FAR of 3. For the TT5 a minimum of 1.5 and for the TT4 a minimum of .5. Dependent upon intensities and development program, these FAR’s can be significantly increased provided that the building heights respect the human scale in the proportion of the streets and spaces. Active pedestrian edges should be kept to a four to six story height and then stepped back when building multi stories above the base.

Clearly scale has an important emotional and physical impact on people testified to by the responses from hundreds of Visual Preference Surveys and more locally that Hoboken with its 3 to 12 story scale, punctuated by the occasionally 20 to 30 story building is considered the most comfortable scale street to be on and is one of the fastest growing cities in New Jersey.

5. Refocus most new retail, commercial, social and cultural facilities again in the downtown TT6, providing space, logical dimensions, distances and destination anchors. The basic design rules for retail are well documented. Provide space to promote cultural activities and events in the downtown rebuilding the vitality of the center city. Promote a center city Business Improvement District. Determine the size of the retail and commercial facilities based on population both existing and proposed.

Master Plans and zoning will have to be amended in most locations to accommodate Transit Dependant Development. No additional retail or commercial facilities should be allowed except in the TT6, with less in TT5 and only located in the neighborhood centers in TT4. Those that are “grand fathered” in any of the transects can stay unless the building is vacated for over 6 months.

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Short term incentive opportunities should be provided for transfer of development rights for retail and commercial from existing strip commercial and office parks to the downtown transects. Allow no new retail or commercial expansion in the T3 and T2 Transects. Use regional or state wide planning mechanisms or inter governmental agreements when transects overlap municipal boundaries.

Provide a high jobs to housing balance (as close as 1 job to 1 housing unit as possible). For each new or existing unit, with in the three transit transects, as a rule of thumb, provide 180 to 300 square feet per job.

For each existing and new person provide a minimum of 10 square feet of retail space

6. For urban areas to be successful, we must integrate nature/green into each of the transects both summer and winter. Design parks, plazas, greenways, river walks, waterfronts, green buildings, green roofs, as part of the everyday experience. Create a green continuous experience by extending green through street plantings and furniture. Design a “green experience as part of the everyday walking experience, close to residential and accessible from offices and work places.
7. Maximize walkability and pedestrianism within the TT6 and TT5 transects using pedestrian priority streets and plazas, wide sidewalks and quality streetscapes. Pedestrian streets must be lined on both sides with retail or commercial and maintain proper height to width proportions of the streets to make them comfortable and imageable. Pedestrian streets should be hierarchical, with primary and secondary pedestrian streets. Pedestrian streets are dedicated to the walking pedestrian. Bikes on these streets must be pushed.
Reduce the interference of taxis and on-demand jitneys accessing and exiting the two primary transects to the low pedestrian priority street.

8. Incorporate multi modal transit including bicycles, narrow gage and light rail, bus rapid transit, buses, taxi and on-demand jitney services that connect the neighborhoods in the TT4 area and remote parking to the downtown civic center TT6 and TT5 and the train station. Only light/narrow gage rail, taxis, buses, service vehicles and bicycles should be allowed inside the TT6 and possibly TT5 areas. Design transit modes to increase accessibility, promote walking, reduce parking, accidents and pollution. Bus rapid transit, narrow gage street cars, bike lanes, on-demand transit, and zip cars must be integrated with the pedestrian movement to eliminate conflict.

Light rail, BRT, or narrow gage street cars should be incorporated into the overall plan connecting the highest density outer (TT4) neighborhoods, remote parking structures and other local destinations. Those neighborhoods within the TT5 and TT4 Transects that cannot be served by light or narrow gage or conventional bus service need to be served by an on-demand jitney service. If a car is required, the smart car, zip car or corner car rental should be applied provided that it is parked out of the pedestrian realm.

The urban design of the streets, public spaces and buildings in all three transit transects must be so desirable and positive in its scale and character, use and facilities, that people who live there could find most of what they wanted or needed within a walk, a short internal transit or bicycle ride. Assuming you arrive at the major central train station from another Transit Dependant Development, a short walk puts you in the center of the activity and intensity. If you need to get to a more remote location within the TTD a short wait should provide transit access. Or, you could rent a bike. Ideally each TT and neighborhood would have characteristics and facilities, spaces and places that make it unique and walkable.

9. Because buildings are the primary users of energy, incorporate and integrate green building architecture into plans for infill and rehabilitation is critical. Design for

appropriate orientation, incorporating sustainable building practices, materials, day lighting, recycling, green roofs etc.

New redevelopment must reduce our carbon footprint. The more global issues of climate change being generated from the increase in atmospheric carbon from 280ppm to 386 parts per million this year and increasing each year is setting off alarm bells. It is estimated that we have a planning window of 22 years at the current rate before the concentration will reach the critical 450 part per million. This requires that we must do more than current tokenism to reduce carbon emissions. The United States only has a small percentage of the planetary population but generates the second largest amount of pollution.

Reduction in our carbon footprint can best be implemented through changes in land use, less dependence on the automobiles and the energy that is required to maintain our transport systems, the incorporation of renewable energy, the infilling of the urban fabric with energy efficient buildings, and the design of great urban environments where people want to live, work, play walk and bicycle.

10. Parking will be important as long as there are vehicles and people have to use vehicles to get to their destination and at the destination they need to leave their cars for a short or long period of time. Creating high density mixed uses places where people can live, work and play in walking proximity and have access to mass transit and bike lanes is primary. Where vehicles park is the key. Our recommendation is that no parking be provided for new infill within the TT6 and TT5. All required parking should be removed beyond the TT5 and require people to walk thereby enhancing the pedestrian realm. Land is too valuable within these areas to be used for parking. The studio rejected the idea that in order to sell a housing unit within a well designed TT6 or TT5 parking for each unit is required within the buildings. When this exists there is no personal interaction with the pedestrian realm. If density is high enough, the streetscape compelling, with alternative forms of transit, remote parking is the trade off for a more pedestrian

character of place. It is vehicular circulation within the primary transit transects that is the most inhumane and with its noise, speed and inconvenience and danger to the pedestrian. To enhance the pedestrian realm most on-street parking should be removed and replaced with wider sidewalks and bike lanes except for delivery and pick up locations and those pre-permitted parking locations. Any Urban Design Plan must plan for a hierarchy of mixed use parking facilities outside TT6 and TT5 to include local, neighborhood, district and regional parking.

Locate all new parking for the TT6 and TT5 on the periphery of the TT5 adjacent to and accessible by major streets/arterials. Locate new more remote parking areas within an optimum walking distance of 10 minutes or if located at a further distances, connect by transit and/or bikes. Use all existing surface lots within the TT6 and TT5 for development. If possible remove or reuse older parking structures for offices or retail, manufacturing or service/storage uses, urban farming, hydroponics and roof top renewable energy. Do not locate car or truck parking for the train station within TT6 or TT5. Close-in parking increases the anxiety level when combined with traffic, accidents and the need to rush. Slowing down and a short walk are good for your emotional and physical health.

Local parking in TT6 and TT5 is reserved for a limited number of cars, handicap drop off areas, package delivery, designated taxi stops and limo parking. These must be included in the plan. All of the above require a local permit for parking. Certain streets, particularly pedestrian oriented street can have no parking and no vehicular service except for emergency and after hours delivery, cleanup and garbage/recycling pick up.

Neighborhood parking within TT4 is primarily for residential uses but also some commercial, service and retail must be contained within a mixed use structure or be located within an optimum 5 minute walking distance from designated locations. This can be embedded or under building parking. Ideally

this parking is encased by liner buildings a minimum of three sides with retail or commercial on the ground level.

District parking is primarily for office and day time parking outside the TT5 with vehicular access from a major street or arterial. Connection to parking structures on the edge of the TT5 can be a pleasant and interesting 10 to 12 minute walk or by transit/bus or possibly by bike.

Regional Parking is located in very large efficient parking structures located on the edge of a freeway, major highways, arterial or boulevard well out from TT6, TT5 or TT4 although it could be on the outside edge of TT4. There should be limited retail and services on the ground level. Accesses to and from regional parking is by transit or bike. Regional parking should have the cheapest parking rates. Parking in Transit Dependant Development is considered infrastructure and as such should be eligible for federal funding. Financing for these structures should be a joint venture between the municipality parking authority and the development community who will not have to provide on site parking and deal with the disruption that auto traffic generates.

Almost all traffic engineers focus on function, capacity and safety of the driver of the automobile. But, given that we kill between 95 and 115 people per day in the United States in fatal crashes, should we not look to reduction in the need to use the auto as opposed to better seat belts and crash tests? The number of fatal crashes is slowly decreasing but add up to 35,000 to 42,000 per year. Some days it can reach over 350 people killed. A huge number of people are injured.

These 10 Urban Design standards were considered the minimum that must be applied to achieve the level of sustainability that is required in the future and come reasonably close to the vision that was generated through the Observations Research. The next step in the process was to determine the potential

development program that incorporated these standards. Optimism grew as the 10 standards were discussed and agreed on.

The odds are slowly stacking up for walkability, transit and healthy humanism by the presence of obesity, pollution, climate change, and unsustainable land use patterns. There is a growing acceptance and media coverage of sustainability, climate change and cost of energy, and the financial crisis. Unfortunately it is still a minority view and most people are locked into the present pattern of auto convenience and dispersion. Currently there is no major crisis that has precipitated the need for change, although history clearly indicates that we are following a trajectory of change. (*Generations* by Strauss and Howe)

DEVELOPMENT POTENTIAL

How much future growth, development, infill, redevelopment and rehabilitation could be accommodated in these areas using the Urban Design Framework diagram while incorporating the ten design standards? To calculate a gross land holding capacity, we first started by superimposing the urban design framework, using GIS, centered over the 215 existing train stations/transit stops in New Jersey. See *Exhibit 1: 251 Train Stations*

In a later study the same transects were superimposed over the 32, 685 bus stops. Incidentally, there is so much development potential around the train and transit stations alone that using bus stops would only be used where no other transit modality exists or to act as a feeder system to the larger nodes. See *Exhibit 2, Train and Bus*

In developing the gross calculations of future capacity, we had to take into consideration that a hierarchy of stations exists with a wide a range of available, vacant and underutilized land and political aptitude towards sustainability. Some municipalities with existing stations will never accept

any type of development at this time, others will accept limited development. Some with land resources might not see the need. Other cities are in such political chaos, or politically dysfunctionality that no decision can ever be made without significant changes in the governmental structure. Others may be locked into their existing zoning which is inappropriate for future sustainability particularly if that zoning is “Desperation Zoning.” This type of zoning will allow any use including low density, low FAR and high parking ratio suburban type development like drug stores, fast food, big boxes and gas stations and suburban parking around train stations. Finally there is currently (2011) little market for any type of development. Therefore physical planning is in hiatus. Planning for infrastructure improvement like transit dependant development should be considered a federal requirement. The purpose here is to test the concept and generate form and a potential holding capacity for future planning and design.

In the development of our gross calculations for the entire 251 existing stations in New Jersey, we created factors for these conditions. In the analysis of the more specific urban design plans that were generated, we far exceeded our preliminary estimates. The gross numbers we calculated are very low relative to what is possible with high quality urban design.

Our field work and GIS/Google Earth investigations suggested that in the TT6, approximately 6% to 20% of the land not including streets, was either vacant, i.e. cleared of buildings, abandoned one story buildings, surface parking lots or buildings for lease or sale. If occupied a building was marginally used on the ground floor. Some cities had significantly more than 20% of the land available, some less. This was simplified to a mean of 12% of total land area for our initial gross calculations. For the TT5 and TT4 area we estimated that approximately a very conservative 10% of the land area, not including streets and parks could be developed or developed at a higher intensity. TT5 and TT4 would be infilled at a much lower FAR to respond to

the existing context.

Applying that factor (12%) to the 162 acres of the TT6, we estimated that we could design 19.4 acres of new development. We then applied a FAR of 3.0 – [using the 4 over 1 mixed use design module] which is a very cost effective building type- determined a preliminary minimum development program of approximately 2,535,000 square feet within the TT-6, the most walkable mixed use transect. This 2,53,000 ft.² can be used for housing, retail, commercial and civic uses. It does not include spaces for the needed and necessary open spaces plazas and parks nor does it include area for parking. If buildings increase in height, beyond the FAR of 3, extra land would be available for the needed and necessary parks and open spaces.

Visual Preference Survey from a broad sample of participants suggests that the “ideal” height ranges between 6 and 7 stories with a base course of height complementing the existing scale of stories with the opportunity to go higher, up to 20 stories with appropriate setbacks. The desired proportions of the street to building wall is 1:1 to 1:2. 1:3 is ok if it is extensively landscaped with street trees.

How much development opportunity would be available if we used all three of the transit transects at a predetermined FAR using the mean land availability factor? The research design studio assumed that the floor area ratio would be an average of 3.0 in the TT-6 area, to a lower FAR of 1.5 in the TT5, and an even lower FAR of .5 in the TT-4 area. Using a combination of lower floor area ratios and the increased land availability because of area of the transit transects, TT4 had the most available land using the above low FAR.

The following are the general calculations for holding for each TT. These floor area ratios are very low and are purposeful to develop numbers that are doable and very

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conservative.

TT 6 – 162 Acres with a 12% availability factor using a FAR of 3.0 = 2,540,000 sq ft*

TT 5 – 468 Acres with a 10% availability factor using a FAR of 1.5 = 3,058,000 sq. ft.*

TT4 - 11,912 Acres with a 10% availability factor using a FAR of .5 = 25,944,000 sq. ft.

*All of these numbers will vary with land use analysis at each location, but are reasonable for the purpose of developing this urban design theory.

In total, using the three transects as applied to only one station and one major city could generate up to the unbelievable amount of 31,500,000 square feet of building area.

If all this potential over the three transit transits were applied to the 251 stations, and to be conservative, reducing the land availability factor even further i.e, 6% of TT6, 8% of TT5, and 7% of TT4) over 5.8 billion ft.² of developable space could be built!

MORE CONSERVATIVE NUMBERS

There are multiple disparities between stations in terms of available land and underutilized buildings. The 12% land availability and FAR's within the TT6's, could not be applied unilaterally to all stations. Using only the TT6 at the FAR of 3 a total of 638,000,000 square feet of building could hypothetically be built around the 251 existing stations. Even if half of that amount of land was used, or only one half of the stations were to be built in this form (some towns will object to any development) 319,000,000 sq.ft, an enormous amount of square footage could still be built around stations. To arrive at a specific number for each station area a detailed land and buildings use analysis would have to be done around all existing and proposed stations incorporating all supporting data that is current available.

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If the projected square footage of 318,000,000 within one half of all the TT-6's was simply divided into 1000 ft.² increments, i.e, one urban apartment at 1000 ft.², balanced with retail, job generating square footage, service facilities, civic and culture uses, which would add an estimated additional 1,200 square foot, a person in the future consumes 2,200 sq ft of floor space for home, retail, jobs, civic uses, etc. The plan could accommodate more than 145,000 new housing units and 173,770 million square feet of employment space.-jobs - retail - civic uses. This is a very conservative figure given the low FAR's. Remember this is just within the TT6 areas on only one half of the stations.

In 2009, the estimated population of New Jersey from the US Census was 8,707,739. In 2000 the population was 8,414,378 generating an increase of 293,361 in 9 years. At an estimated 2.68 persons per household, a total of 109,000 housing units would be needed at some time assuming that these people stay in New Jersey. This generates a crude household need of about 12,000 units per year. Assuming the very low minimum potential reflected in the FAR and number of stations areas, suggests that 145,000 housing units and their parallel non residential requirements could be developed within one half of the TT-6's alone! The seasonal adjusted average rate for housing starts in New Jersey according to the Joint Economic Committee of the US Congress was 9,680, well under the low 12,000 possible units per year. It is unclear in this constrained "wait and see" economy how much growth will actually happen. A rough estimate is that this time line could be extended out to 20 years or more. (Assuming that no other housing was built or occupied elsewhere, that existing vacant houses were to remain vacant or the 5.8 percent of all mortgages are in foreclosure are not reoccupied which is an unlikely scenario)

Can you imagine what this would be like with these great walkable and bicycle urban city centers, with continuous green space extending into the cities, great walkable streets with multi modal transit working at optimum capacity, mixed use buildings, large light filled apartments, parks, plazas, cafes, with people everywhere? All the Visual Preference Surveys that have been completed over the past 20 years

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clearly illustrate what this could be like and that the people who participated in the survey would like to have and experience.

There is plenty of new development capacity, when considering all the transects, to build an enormous number of great housing units and civic space with walking distances of train stations. These areas could consume the market for the next 50 to 60 years.

Currently, there is little market pressure for development or redevelopment as this article is being written, except for those municipalities that have a reasonable proximity to the Manhattan market, and have incorporated some but not necessarily all of the ten urban design standards.

We know it is possible, but will the market, local state and federal politics controlled by the car and parking oriented baby boomers allow it to happen? Certainly some cities are moving in this direction, New Brunswick being one, Jersey City another. For others, it is going to be a hard sell as we continue the “wait and see attitude” and enjoy the auto dependant, sprawl, anti city pattern we have come to know. The more interesting question is, could there be a market in the future for a new normal, an urban, green integrated, transit and walking oriented life style as a choice for some of the future market if we designed it properly? Perhaps not for most of the baby boomers who created the sprawl and are the most car dependant, but perhaps for the new generations who more clearly understand that their survival and future life style depend on a new urban pattern that is carbon free and could seriously reduce carbon emissions and green house gases. This will provide an even greater pressure for long term sustainable plans that would link multiple transit transects in New Jersey.

Testing the Concept

To test the concept, and prepare a gross development program, the urban design research group studio focused only on TT6, in two cities, Elizabeth and Asbury Park, New Jersey, one larger and one smaller city served by rail transit. The project was hypothetical and not sanctioned by the city of application or any transit agency. For each of these cities, field trips revealed existing conditions and notated land and buildings what appeared to be vacant or under utilized. A Land Utilization and Susceptibility to Change map was completed after field visits and before the urban design concept was applied. The methodology for the plan was to first designate the areas within TT6, locating the boundary not in the center of the street but at least one building deep or in the block center thereby capturing the building on both sides of the street. Starting first with the areas designated as the most susceptible for development, a preliminary urban design plan, massing, phasing and resulting development program was developed integrating the existing buildings and natural features and respecting the urban design guidelines. The urban design program required the designers to meet the base minimum number for the TT6 transect. If desired, and if it created a higher quality urban design, the base program could be exceeded which it was in all the specific urban design plans. The plans were created in a combination of two dimensional AutoCAD and three dimensional Sketchup. Using these programs the massing could be analyzed from any perspective thereby assuring the scale and proportions of the spaces and places designed, which also made quantity analysis easy.

When the final concept plan for the TT6 zone in Elizabeth was completed, over 37 million square feet of building area and over 2 million square feet of parks and open space emerged. This was 15 times the earlier gross estimate.

The Elizabeth development program broken down as follows:

27.75 million sq. ft. residential

7.5 million sq. ft. of retail and office

2.25 million sq. ft. of civic space

2.15 million sq. ft of Parks and Open Space

Just using the residential square footage, at the 2,200 sq. ft. (combining residential and non residential uses) a total of 12,600 units could be built in the Elizabeth TT-6 area alone or one year of focused growth for all of New Jersey. The following diagram represents the conceptual urban design massing models that illustrate the application. See *Exhibit 3: Elizabeth Development and Massing Diagram*

Once the gross potential development square footage was calculated, the next task was to prepare a preliminary urban design plan consisting of street form, block structure, open space/plazas. general building massing and development program for Elizabeth and Asbury Park to test the concept. When the preliminary urban design plans were completed, each application of the theory exceeded the minimum expected development program while adding much additional green spaces, plazas and public areas.

The urban design theory assumed little or no new parking be built with in the TT6 (UD Standard #10) and where possible moved the existing surface parking and most of the on-street parking where bike lanes or pedestrian priority streets were required to a mixed-use parking structure in one of the lower transects preferable in TT5 (a five minute walk or to the TT6 and 10 minute walk) where land was less valuable and there was greater access to a major arterial, highway and transit stop.

The issue of parking - where to locate the parking, size of lots or decks, ratios (number per square foot or unit) was the subject of much discussion and debate. Most current urban zoning codes requiring significant amounts of parking to be either in the buildings, under the buildings, in a podium or immediately adjacent in a parking structure. For most train stations, it is typically located immediately adjacent. The current planning philosophy is to increase the amount of parking

so suburbanites, those that do not live in the city, will have better access to the train station. It is simply too expensive and time consuming for many who use the train and work in Manhattan or other high density locations to stand in traffic or pay for parking and maintenance. So if we want people to use the train station, the logic goes, we must provide parking.

Locating parking in the city center is anti-urban and anti-pedestrian and anti livability. It might be considered a necessary evil but it is the curse of good urbanism. The more pedestrian a city the more likable and livable. Pedestrian presence is the primary energy in a city. Moving cars into the city center and then storing them, immediately adjacent to the train station or within the TT6, or parking them on city center streets or worse in on grade parking lots creates noise, pollution, accidents and denigrates the humanism and positive visual and spatial quality of place. It impacts negatively the desire and the actuality of a more pedestrian oriented center city, pedestrian oriented streets and the provision of dedicated bicycle lanes. How we deal with parking will be one of the most difficult transitions to this unified urban design pattern because drivers expect parking to be close, cheap or free. The trade off has to be initially much higher prices to park close, reducing in cost in proportion to distance. People are very adaptable if given proper incentives. Given a choice of a well designed and accessible, mixed use parking structure with a great walking experience, or, if further out, an immediately accessible short transit ride into a pedestrian center people will walk. They will complain at first but then adapt and realize the distinct advantages to their health and positive sense of place. Removing parking, after thinking that the salvation of the city was more parking in close proximity, has been around now for so many years and is incorporated into so many centers, that not providing it may seem like a development killer. Many city centers will have great difficulty to become more pedestrian and sustainable because there are already peppered with parking structures and lots. Convenience has become normative and expected much like the remote control for a TV.

For politicians and early generation planners not to consider the lack of parking a development killer, will require that it be replaced with pedestrian places of extraordinary merit and market value. Those few places in the country that have tried it, like the Santa Monica Mall, Burlington, Vermont, Bolder, Colorado are very successful as has been most large suburban malls for so many years, that required people get out of their car and walk. Suburbanites who drive into the city will try to park as close to their destination as they can. The suburbanites mentality has tempered the planning of most cities therefore these cities that succumbed to this type of planning have lost their unique city identity. The key to the urban design of the sustainable city is to provide the opportunity to live and work without the car and for those that must drive in provide convenient and adequacy parking combined with a great short walk or transit ride. A walkable city core is the key to sustainable urban design.

Jan Guel's multi year policy to remove small amounts of parking each year now for twenty years, has made Copenhagen one of the great pedestrian, bicycle cities of the world.

Our observational research of other cities like Zurich, Switzerland, Curitiba, Brazil, Friberg, Germany; Oslo, Norway; Gent or Brugges, Belgium and many other cities in South America and Asia have revealed many pedestrian priority streets combined with the provision of little or no parking in the most used pedestrian places, typically in the center of the city. Parking is provided in non-center city locations, including neighborhood parking within a two to three minute walk, local parking within a five to 10 minute walk, or remote parking using a secondary transportation mode like a streetcar up to ten to 15 minutes away. The more remote, the cheaper and the better access to high capacity roadways and transit. By not having to provide parking, over the long term significantly reduces building costs and the environmental impacts and human costs within the TT6 and TT5. As the density increase and with the provision of secondary means of transport beyond the private automobile, people use their car

less. In some cities like Hoboken, new parking structures for some residential project are well under capacity as people opt not to purchase or rent a parking space thereby reducing their personal costs. Remote parking with a great walk can be done and has been done.

Is There a Market?

If applied, can these cities and towns attract a market? Applying the framework and standards in just two towns reveals that the holding capacity development numbers are excessive for the market need and certainly excessive for the rather low FAR development program. This means that fewer cities with major transit, done well, could capitalize the future market in New Jersey. The plan provides a market opportunity for those who wish to live a more affordable, quality life style. To really make it attractive, all the ten urban design standards would have to be applied. That city which incorporates all the standards will be the most successful.

I suspect that households without children will be the most attracted although we are seeing many baby strollers in some of our more successful urban areas like Hoboken or other cities with large immigrant populations. If there are children in the city than quality schools are critical. But for most childless households, quality schools will not be an issue. Safety, accessibility, affordability, walkability and delight will be critical. How fast we grow and how many suburbanite transfers to livable cities will in part be dependant on the quality of the urban experience.

It is clear that the vast majority of the wealth in this country is held by a very small percentage of the population. This group which controls media, real estate and finances, can and will live anywhere they want. Exciting cities, and large rural estates, penthouses and Hampton beach houses. Travel by private jet, helicopter and limo. The world is currently their oyster. Why would they change what they have and how to the keep and expand the money they have make from

the status quo? Many in the lower 95% of the population would love to live the life of the rich and famous. It is an illusion and a fantasy for most. Perhaps it is a motivation. But, what about the vast majority of the population who will have to live on lesser means? What do they deserve? Can we plan and design great good places for them? Certainly!

My guess is that it will be an uphill climb at first to create this ideal place until a holistic first phase with all the criteria can be actually experienced or produced in virtual reality generated from a future visioning process generated from many people's minds. Like most successful places, success follows success, implementation follows programming. Just as soon as the market and banks can look through the rear view mirror of time and see local demonstrated success is when real progress will come. Some city, some enlightened developer will inevitably take the chance realizing the up side. Local governments must encourage and support transit dependant development giving developers the opportunity and the motivation, but it must be holistically designed, not compromises particularly on parking. Once it is successful it will be copied similar to the evolution that happened when the one sided strip mall morphed into life quality centers that were walkable and in some emulated the traditional main street. Some even removed the parking on the pedestrian streets completely. Every Visual preference Survey and Vision Translation workshop that I have conducted reinforces this concept. The market is there, the place is not.

Implementation

Every transit/train station has a real opportunity to grow and become a positive contributor to future sustainability. The larger the station in terms of use, the more multi modes the more intensive the FAR's within the Transit Transects. Many plans for proper development around train stations have been rejected. West Winsor and Hamilton are but a few examples. Sustainability has not yet a commonly held goal. Maintaining traffic flow and convenient adequate parking

for their low density, auto dependant constituency is currently the only criteria that seems to apply particularly in ex-urban townships.

The studies and plans that have been completed for places like Hoboken, Journal Square, Monmouth Junction have revealed much land development potential. As an example, the Hoboken station has multi- modes and heavy usage with important key underutilized parcels available within walking distance, as has the Newark Station. The Asbury Park is a smaller town, also has significant vacant land. Elizabeth has large amounts of vacant and underutilized land and deteriorating, partially used buildings to which this Transit Transect could easily apply. The list could go on and on. So why has this not happened before in most cities in the United States? We could start with the car, asphalt, baby boomer program mentality. This is serious enough of a hurdle. Some think that future generations will look back on the excess of the 50's to 2010's as the most destructive, unplanned period in American history.

In discussion with the contemporary practicing planners, many feel that the European, South American, Scandinavian or Asian examples used in the observational research will have difficulty applying in the United States because the American culture, politics and expectations are different – essentially we have become programmed on sprawl, problematic cities, cheap energy, auto dependence, easy available inexpensive or free parking, convenience, and the pressures of a consumer mentality. While the baby boomers are in power, the future is maintaining the status quo which they created. This might even be extended to the Generation Xers. The politics of approval are based on this mentality. Americans want easy access and convenience according to them. Currently, cars, highways, arterials and parking are more important than transit and walking and certainly bicycles. Removing parking for bicycle lanes in cities is nearly impossible, according to most planners and traffic engineers. Higher density as seen from a suburban mentality of land use is too low to be effective

and to generate the type of urban vitality that is necessary to have a successful urban place.

Currently few cities are planning for the future. Planning academics seem to be focused on creating metrics of the present. Physical planning is a low priority for most cities that do not understand the imperative of sustainability. Physical planning requires money, public and private commitment and most important vision. Most cities are not planning for the future, because they are so hung up on maintaining the present which constrains them like an airline passenger with too much baggage. Can we learn to get along with less and have more? Will developers and cities understand the long term benefits over short term gains? If cities continue to do little will it be too late?

The baby boomers currently have their vision of what land use is and should become. Saving open space and maintaining free car flow seems to be top priority for them. We have not learned the lessons from history nor have we as a culture fully realized the huge looming problems that will confront us in the next 10 to 50 years. It is still perceived to be cheaper and easier to continue to expand into the rural areas, retrofit a few old shopping centers or add new streetscape to the center of the city than to tackle the holy grail of *sustainability, energy efficiency, pollution and accident reduction, affordability, convenience and urban delight*. It is clearly easier to accommodate the cars flowing through the center of our cities and forgo pedestrian priority in city centers than it is to modify our plans and codes, and even more to implement the alternative even though it may be healthier for people, sustainable for the planet and create more value in the center cities. The baby boomers who control, cannot see over the dashboard of their cars.

If Transit Dependant Development is considered as too visionary, radical, simplistic or unattainable at this time, it means that we must redouble the effort to

promote and educate, believing that transit based development is a rational and logical plan for the future at least for those cities with active mass transit.

I believe that it will be the new generation, conditioned on continued crisis, high unemployment and lack of wealth that will spirit the change. It will not be the baby boomers and perhaps not even the GenXers, but perhaps the Millennial Generation (1982 -2003) who will be in power in 15 to 30 years from now. It is their vision of the future that might be the most important given that they are more inclusive, optimistic and tech savvy. I just hope that this will be understood soon enough before it is too late to catch up because in 15 to 25 years from now we will reach the critical 450 ppm of carbon in the atmosphere, the peak of oil and the major disruption to the oceans and two billion more people on the planet the perfect expansion of the current financial crisis scenario. Unless there is a global pandemic or a global war that would limit population, we need to start planning now.

This paper outlines a concept/framework for the perfect sustainable, transit based city center and surrounding transit transects located on very small percentage of land area for a large number of people. This framework cannot be done without the acceptance and the need for a physical manifestation of what this vision could and should look like in many locations. It argues for the creation of a vision plan. To accomplish this would require a public participation process that would generate a consensus vision. It argues for a unified theory that has great flexibility and therefore has the opportunity for multiple applications. It is only with the use of a unified diagram, and the three and four dimensional variations that could be created from this diagram, that real, phased, options for the future could be created. Within the area of diagrammatic superimposition many people could participate in the creation of a vision using the community participation techniques of visual preference surveys and vision translation workshops.

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A public relations and advertising campaign would have to be generated that would have a real buy-in. A transit based vision of the future must be able to be seen and experienced even if virtually at first. We must generate the feeling of place that people will think, “I really love this place and would love to live and work here.” This transit dependant plan of place would have to be presented first in a video form or I Max movie or a 3D movie or multiple You Tube movies. If enough people participated in the creation of some type of a transit dependant plan, perhaps in a few years as the constraints and economics of sprawl development become more apparent, this vision will move from virtual to real, small at first then growing as the new normal become more apparent.

The institutional barriers of redevelopment in New Jersey particularly after the Gallatin and Mulberry Street decisions have left many urban redevelopment places in even more advanced state of deterioration. The extraordinarily untapped potential of land with walking distances to train stations which has the greatest probability for sustainability because it's location and proximity to employment, will have to be utilized at some point in the future to achieve even a modicum of sustainability for small percentage of the population. If it cannot be developed under the redevelopment statutes, either the redeveloped criteria and process will have to be modified or zoning has to be put in place and very explicit urban design site plans are going to have to be designed and engineered within this complex geometry of ownership and underutilized land. With an overall framework diagram institutionalized through zoning, and infilled with public participation, has the potential to create an initial vision of what is acceptable and not acceptable.

For transit dependant development to happen in reality, higher intensity and density cities with great public spaces and transit, there will have to be public investments in unban infrastructure like sewer water, energy production, train station improvements, reactivating old rights of way with new train or street car service, narrow gage transit on existing streets, on demand transit, bicycle lanes

and pedestrian networks, along with parks, plazas and public parking all of which are in the public domain. There will always be the overarching question who pays for the public spaces, the needed infrastructure improvement, the provisions of the community benefit agreement. Public infrastructure is of particular concern. In almost all urban areas there is the fundamental problem of aging infrastructure. Much of the urban infrastructure has undergone delayed maintenance for many years and now to repair or modify, or, in most site plans, to add new and expand the capability of infrastructure continues to be more and more expensive. Federal Infrastructure Improvement funds are desperately needed. The capital improvements that are required and in essence should be budgeted capital improvements plans for each municipality and should probably be financed through federal money and mechanisms like a TIF. Incentivizing developers with tax credits short term abatements and building bonuses will certainly be required.

It is going to be the density and intensity, that will be of greatest concern to the development community who not only has to finance it, but also has to make a profit building and occupying it. There has to be a semi transparent cost analysis which clearly lays out the costs, the land purchase, the relocation, the demolition, the infrastructure improvement, the design development and engineering, the construction, marketing, the continued maintenance and the operating costs and the expected profit. But there will also have to be Community Benefit Agreements [CBA] that the developers and investors will have to absorb include job training, affordable housing, construction of parks and plazas, the commitment to local hiring, provision of space for neighborhood education and child care which will have to be incorporated into the development plan and costs.

Because development costs are so opaque in the minds of most community objectors, (aka corruption and overruns) the revenues generated from projects, phased over time are even more difficult for most people to understand. What density and intensity of use is required to offset the costs the profit and

continued maintenance and operating fees? If this was more transparent it is my belief that there would be greater room for negotiation to get projects built. The more intense the development, typically meaning more floors than the community would like to see, must be offset by payment into District Improvement Bonuses or Community Benefit Agreements when a base contextual number of floors is exceeded.

Rather than one or more large developments, ideally many small developers should be allowed to participate. Unified theory of urban design applied to zoning would allow many small and large developers to participate because the plan is clear, not negotiated.

There is no question in my mind that we can pay for this, we just need to divert the money from the war provoking, war production loop into sustainable city building. If we stay at war, and public money continues to be spent on wars, provoked because we are at war alienating the younger generations who then “threaten our security” we are on an endless loop of destruction and fear. Money is needed for infrastructure and it is needed soon. The most logical source is the trillions spent each year on wars diverting it into secure, livable, high density, mixed-use cities.

Summary

The goal of Urban Design is to promote a vision for the future. If we as a state and country are to evolve to a higher level of sustainability, we must have a real vision of for the future of cities particularly those with trains and connected transit. This vision must incorporate a unified theory of urban design, providing an alternative within the context of past programming not a compromise. We must strive for transit dependent communities not transit oriented communities.

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The paper sets forth a simple structural framework diagram and 10 urban design standards which can easily be superimposed on any existing city with a train station or light rail transit, underutilized lands, surface parking, continued deterioration.

Facilitation would be enhanced if there was enlightened leadership and a positive public consensus vision for the future. Ignorance, fear and government dysfunctionality or a suburban planning mentality or a “that’s the way we’ve done it in the past” mentality will be the condemning factors for the unsustainable city in the future. Partial application will engender only partial sustainability.

Just because we have become a nation of sprawl and dysfunctional cities does not necessarily mean that continuing this pattern is appropriate for the future or even that policies of the past should continue in to the future despite short term approvals and quick fix solutions which are easier. There are too many looming problems from the disappearing middle class, energy costs, depleted and expensive resources, climate change, traffic jams, changes in values, demographic changes, obesity, poor education attainment and crime. Still many view this as paradise and therefore why change?

The United States has a small percentage of the world's population. With the country, New Jersey is considered the more dense and has an extraordinary existing network of operating rail lines and many more that could be reactivated. As a country and state, we cannot continue to consume and pollute at the current extraordinarily high rate. There must be serious reductions not just token reductions because in tight economic conditions with high gas prices people drive less there is a commensurate small reduction in pollution. If we do not begin to plan for change, it will be too late to catch up as the problems intensify.

Imagine if walkable cities, towns and neighborhoods in high density metropolitan regions strung like pearls along a transit lines connected to larger

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regional and national cities. This is the ideal urban design model. Most recently, May of 2011, the Federal government announced that the North East Corridor will receive the bulk of the high speed train improvement fund for track, signaling and rolling stock improvements. A good percentage of this track is in New Jersey. This is good news for New Jersey and the region and those stations that will be stops on the new improved line. There is also a proposal to sell the line to a private group that could implement change more rapidly. Either way, it is good news for any of the station as they will be able to provide connections to the new high speed stations. Station improvement must be accompanied with a rational planning and development diagram.

It is the hope that this and a more sustainable future may generate new thinking including pressure and incentives to more intensely develop the transit transects that we currently have, and reorganize train schedules to serve these nodes in a more flexible timely manner generating more movement between these as employment nodes and places of unique cultural identity in New Jersey. The new unified theory using the Transit Transects could create the image of a more sustainable New Jersey particularly if this is combined with the growth or renewal energy resources and more local (in New Jersey) food production.

I hope this essay provides you with some things to think about as a future with limited resources and environmental constraints become more real. It is time to start planning for a possible future where many could have extraordinary, healthy places to live, work, play and move.

Additional Resources

For a visual presentation of this essay view YouTube Video *Planning for New Jersey's Future The Transit Transects –Part 1 and Part 2 2009⁽⁴⁾* This presentation represents a vision of policies and plan that would make New Jersey on of the most healthy, green and sustainable states in the country by capitalizing

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on our existing resources and our previous planning for preserving lands and focusing on urban centers.

(4) Log on to YouTube, type in "Tony Nelessen" make selection.