

A UNIFIED THEORY OF URBAN DESIGN In Search of a Sustainable Future

The TRANSIT TRANSECTS

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Abstract : *There is more than enough land, if properly developed within a 6 minute walk from existing and proposed train stations to meet the vast majority of the residential and commercial growth in a sustainable, green urban form for the State of New Jersey in the foreseeable future.*

It is also clear that market responsive planning (cheap, easy, convenient and profitable) which overshadowed the hierarchical urbanism of vibrant cities and towns with rural hinterlands, created a land use pattern of sprawl and auto dependency that became the envy of the world is entering a transitional phase. This paper provides one alternative for the future, focused primarily on cities, assuming that our existing sprawl pattern is here for the indefinite future.

This is the second draft of a position paper. I would welcome any comments, revisions etc. Please e mail me a:

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Introduction

Focusing on the future of place generates a life energy.

Should future physical planners, policy professionals, public health professionals and other disciplines who take courses in the programs of Planning and Public Policy or Public Health, be equipped with a **positive, healthy, multi-modal, sustainable vision for the future**? Should this be generated and promoted despite current programming, special interests, negative bureaucratic functionalist, a bleak current economic conditions and past sixty year history of pro sprawl, almost total auto dependant domination and a spirit of anti urbanism that will make the implementation of that **vision** seem unrealistic, too visionary, not “what the market wants” (code for development already has plans for what they want or what they think people expect) therefore too academic, not sufficient profitable and therefore not politically feasible. If we were to teach a current reality-based future vision with all of these constraints and pent up fears, is the future a continuation of the status quo, a “hold on” strategy? Perhaps the answer is we must generate a long-range vision, funded by public private partnerships but an understanding that has to be implemented in small increments. Each increment a small step that implements a long range vision plan. Any construction and redevelopment, rebuilding, reusing that contributes towards a positive vision provides incremental hope and sense of positive fulfillment. If this positive vision for our cities and country side is not generated soon, I sense a growing impatience, particularly with the younger generation. Is there no interesting exciting vision for their future? Or will it be a continuous series of media distractions without the realization of a unified vision and a series of policies that they can attach themselves to. They are now the most optimistic and to kill that optimism portends poorly for our future. We haven’t had a clear vision for the future of our cities and countryside since 1939. Is it time to generate a new one? Is it time to find out what

they want and energize the future with this vision, or will planning be the metrics of change without a vision?

I post these question after a 41 year career where I have maintained a professional practice in Visioning, Planning and Urban Design for national and international clients and taught urban design at two of the best planning schools in the country. I have facilitated the creation of three and four dimensional plans and visions for the future in over 167 cities using a patented public participation process. Many of those visions have become reality. Today Director of Undergraduate Programs in Planning and Public Policy and Public Health at the Bloustein School of Planning and Public Policy at Rutgers the State University of New Jersey, with approximately 1,200 students who take courses in these programs, I posed question to gain an insight for the expected future of urban places.

I have recently conducted visioning sessions that include a Visual Preference Survey[™] and a range of policy questions to graduate and undergraduate students at Rutgers. I have also used many of the same image sets and policy questions in professional conferences, most recently being the Redevelopment Forum sponsored by New Jersey Futures. (see UTube Nelessen). The results from these visioning processes mirror quite distinctly the recommendations which were generated from over 167 Visual Preference Surveys[™] conducted for various municipalities over the last years. I also conducted a national poll for the National Association of Realtors that also generated a vision for the future. These polls and the most current responses provide a fascinating vision and generate recommendations for the frame work of a future vision.

My polls use a negative and positive value response. It uses the duality of the normal emotional of likes and dislikes, ying and yang, euphoria and depression, sense of heaven and hell as well an a neutral response, “ I have no reaction, don’t care, or don’t know.” The responses to images and policies, are evaluated on a +10 to 0, from 0 -10 scale. The numerical values range from highly agree to highly disagree; from most appropriate for the future not appropriate for the future. The resulting positive visions of place is

manifested in those images and policy statements which receive high positive scores and low standard deviations. The negative, neutral or positive responses provide insight as to the policy implication of planning for the future. The cluster of positive images and policies provide a vision of a future that people want. These are not only goals for the future but can be translated into future plan, development programs and phasing- giving people hope and a positive feeling about the future, as opposed to fueling frustration and depression about the current state of city life.

There are a growing number of people, professionals, government officials and academics who understand that there will be a 21st century's sustainability crisis fueled by energy, climate change, deferred maintenance, high cost of living, accumulated debt and political unrest. It must also be said that there are many, many people who have accumulated sufficient wealth to weather any crisis and like where they live, work, their cars and life style.

There are others, with powerful voice who cannot foresee a crisis at all, that is, no climate change impacts, peak oil, shortage of food and water or the limits to growth based on natural resources as being a political concern. Shortages of anything unfortunately are also good business as we know from supply and demand models. Fear is also very good for business. Only when we can develop a consensus “buzz,” a consensus vision of the potentials of the future will policies be generated.

When asking people. “when do you think climate change from CO2 will begin to precipitate a planning crisis?, we get a 6[3] value between now and 10 years from now. When asked,” do you think that there will be a planning crisis when oil peaks around 2020?, we get a 6[4] yes response. When we ask, “How informed do you think you are about applying smart growth and sustainable principles and practices in the future?”, the responses 2[4] with the 10 being very well-informed. This seems to indicate that people who are concerned about an impending crises, are not well-informed as what to do about it or what can be done about it. Perhaps the most serious of the responses and the one that generates the greatest concern is the response to the following question. “How do you

rate the current political and bureaucratic ability of municipalities, states and the federal government to implement a consensus vision that promote smart growth and sustainability”? The responses a -4[4] with a -10 being the most pessimistic. All of the above seem to indicate that there should be a even greater concern about generating a unified vision for what we could become perhaps similar to the effort that was put forth at the end of the last great depression in 1939 with the collective vision generated from the New York world's fair.

Only a few undergraduate students at Rutgers study physical planning and urban design, within the Bloustein School. About 60% of our graduate students take at least one physical design related course. On the other hand, all students I have polled have some type of a vision of what they would like the future to be and want to be part of the solutions.

Should a new vision for the future be generated at a time of fiscal uncertainty? I suspect more than ever. Historically, in the last great depression we had a American vision for the future, we also had movies of glamour by Busby Berkley which provided escape and entertainment – perhaps American Idol is today’s equivalent. We need a sense of civic engagement and optimism about the future. Do we need another American vision as was so carefully programmed in the 1939 which can generate a future vision of equal magnitude if we appropriately use current technology and social media.

A Draft Discussion of a Unified Physical Planning Urban Design Vision

Based on what I have learned from numerous Visual Preference Surveystm and Vision Translation Workshops across this country, along with current polls provides a emerging clarity of a future vision for policy makers and planners.

With a seriousness to achieving a more healthy, sustainable and resilient future for our cities and towns, villages and regions, we must explore a more unified theory of physical planning and urban design that would superimposed itself on existing land uses and

transportation networks. Although much work has been done on various comprehensive plans, transportation studies and redevelopment plans, combined with various tax credits for transit oriented development areas and potential new incentives for more vertical development on smaller lots [the Vertical GDP Bill current in the NJ legislature], there still does not appear to be any unifying plan that provides a sustainable vision for the sustainable evolution for the State of New Jersey in the future. It is more policy and not a physical plan. Planning is still very much ad hoc, market driven, based on the political and physical character of the existing communities along with the unrelenting reliance on auto dependency and adjacent parking. This is combined with a wait-and-see attitude towards the impending sustainability crisis.

I suspect that this “wait and see attitude” also applies to much of the nation. New planning diagrams/visions, that specifically focus on high intensity urbanism and inter connected regions of the country with high-speed rail, is gaining footage through the work of America 2050 although currently dumped by several governors. The high speed rail diagrams for selected growth regions of the country is one positive unified vision, but it too has been setback. The TIGER grants are renewing interest in transit but they have been limited by the current congress. While we wait through this “wait and see” period, it provides the perfect opportunity to train a new cadre of planning and design professionals who will be able to take on the impending planning crisis when it occurs. From my analysis of the responses for a future vision , walking, bicycling, more compact mixed use, transit, great streetscapes, parks and plazas are what many expect will be the urban future. It is an exciting prospect.

All transit and high-speed rail stops and light rail stops provoke the opportunity for the application of more pedestrian orientation within the 10 to 12 minute walk of the stations. Probably the world's greatest example of this is the development around train stations in Holland which was put into effect in many years ago and from which one can now see extraordinary examples. The nexus between transit and development can also be demonstrated along the Hudson Bergen light rail line.

Focusing on New Jersey, we know that much of the land across the state has been set aside for limited development including the Highlands and the Pine Barons, Greenacres and farm preservation areas. These are extraordinary policies that have been implemented and which in the future provide opportunity for water and food production as well as place additional pressure on infill growth in urban areas. We also know that New Jersey will be impacted by projected future increases in water level and storm surges which will cause land area shrinkage and will impact some lengths of our existing train/transit lines- which should be of great concern .

New Jersey is growing at a 3.5% per the last nine years and much of that has been in our suburban and rural areas. There is still significant amounts of land to be developed. The question is does suburban growth make any sense at all to achieve the level of future sustainability? Currently there is much underutilized land that can be redeveloped particularly in our existing cities and towns, particularly if we focus on those cities and towns that have heavy or light rail transit stops and stations. This does not include all the grey field areas along our suburban arterials with their deteriorated and sometimes vacant or underutilized strip commercial. Without transit service this potential developable suburban land can not be as sustainably developed as those areas with train and transit stations/stops. So the next question arises, how much development could actually happen around a strange stations and transit stops about building in the remaining rural lands or redeveloping any of the deteriorated strip commercial areas.

The two major issues, land use, transportation modality with its corollary parking and traffic, will occupy much of the future discussions about physical planning and urban design, as it has in the past. For over the past 80 years, planners, traffic engineers, government officials, developers and bankers have promoted low-density commercial, residential and civic development served primarily by the automobile. Auto dependent site plans with parking have dominated planning discourse and planning approvals. To accommodate sprawl, governments have subsidized an extensive network of highways turnpikes arterials and parkways, county roads and approved local streets and cul-de-sac, with vast acreages for parking. They have inadvertently generated incalculable costs in

time delays, pollution, frustrations and number of accidents and deaths. They have also extended water and sewer lines, telephone and electric, gas and cable. Most people I suspect, will say, “it was worth the price” that we are “in love with our cars and our suburban form of life”. Many think that “cities are dangerous places with all bad schools,” therefore they are to be avoided as permanent places to live and work. We have to be thankful that not every one thinks this way.

Building on a more positive attitude and vision towards cities, where there are jobs, great housing, mobility options, green areas, good schools provides one of the best hopes for the future. As award winning, recently graduated planning and public policy student stated : “I think that cities are the solution to many of our problems not the problem.”

As suburbia expanded, most cities deteriorated losing their primary focus, economic intensity and civic purpose. Inner-city neighborhoods began to deteriorate, losing local vitality and coherence. Crime and public health issues increased. Deterioration, poor schools, bad food, became a condition of life for many. Empty buildings, vacant lots, underutilized and deteriorating older buildings, surface parking lots are still ubiquitous particularly with distance from the city center. In a recent presentation regarding the proposed Baltimore rezoning, we were told that there are today over 40,000 empty housing units.

While suburbia grew, most cities deteriorated. The primary question for existing and future physical planners and policy professionals is- can these two development forms be sustained and promulgated into the future? Should this form of growth and development, deterioration and disinvestment, which was promoted through master plans, zoning ordinances, and past projects continue? Or, to hedge our bets, should urban planners and policy professionals begin the research, physical planning, urban design and promote a more balanced alternative? Should planners be thinking about the future providing at least some of our citizens with an opportunity to live work and play in a more healthy, sustainable and a resilient future, while those who can afford it, and have no guilt about the pollution or time consumption and expenses to maintain, continue to live in their auto

dependent suburban lifestyles with their fertilized grasses, reliance on strip commercial, remote job locations, office parks and large parking lots?

Despite this growth and auto dependence, some of the original railroad routes and rights-of-way still exist. Some have been abandoned and built on and other converted from rails to trails. Along some routes, both old and new commuter transit traffic is brisk. As the cost of gasoline increased, there was a spike in the increase in transit. I expect this will happen again if the projections for peak oil occur. Imagine the panic when it reaches \$5, \$6 or \$7 dollars a gallon in years to come. But will we be prepared? I suspect not based on a question asked in a recent survey. Most people have no perceived option expect to use their car.

I would like to think we could be prepared. It is highly doubtful except for a few cities and then only portions of cities which have begun the implementation of this waking, mixed-use, transit based unified urban design theory.

In the more sophisticated cities, that started on a more sustainable redevelopment process years ago, with the implementation of transit and new high-intensity development built on great streets within walking distance of train and transit stations. In New Jersey, New Brunswick, portions of Jersey City and Hoboken would certainly be examples. The relatively new Hudson Bergen Light Rail Line is a true success. The River Line, which shares its tracks with freight service has generated a renewed interest and potential in the cities it serves.

To apply this new unified theory of urban design, planners, urban designers and transportation engineers would start with older cities that are still served by heavy rail train lines. Those city stations served by multi-modes like Amtrack, New Jersey Transit, Path and Accela should have the highest priority. Next are cities in priority to the number of existing modes and station or stops. Those stations with multi modes with parking lot or office park peripheries should also be of even high priority. New stations

that could serve new transit oriented development should also be considered for early priority for study, design and funding .

After preliminary designation, the first step is to map and plot using isobars the potential transit impact development area within a 5 to 15 minutes walking distance and a two and one half mile bicycle distance from the station stop. This follows with a detailed site of existing conditions- buildings and land uses and environmental and infrastructure analysis to determine land development potential.

To the end of testing this theory, an Urban Design Research Studio at Rutgers, the State University, Bloustein School of Planning and Public Policy, Master's Degree Program in City and Regional Planning, in Spring of 2009, focused the semester on this conceptual framework and landholding analysis.

The overall zoning framework for the studio started with application of TRANSECTS as developed by the Congress for the New Urbanism and supported by all the principles of Smart Growth. The seven transects ranged from a T6 to a T1 and a special district transect. The T6 transect, is characterized by the highest density and mixed-use, decreasing to lower density in intensity in the T5, lower at the T4, transitioning into suburban at a T3 and then using T2 as land which is to be reserved and T 1 is land that is to be preserved for its unique ecological characteristics. A special district transect was also used. Special districts could be hospitals, industrial sites, warehouse and distribution, ports, those places that need specific land use and access to rail and highway. Transects, as they are used by the Congress for the New Urbanism are single designation transects, devoid of defined area designation. A transect can be based on existing intensity of land uses and reinforced by various walking isobars. The studio expanded on this concept.

The discussions and subsequent recommendations generated by the studio, set forth a more rigid set of definitions for the transects which took into consideration the location of the major train station, the walking distances, potential bicycle paths, higher intensity of

development and parking locations. The new planning term that evolved was **the Transit Transect or TT** using the numerical enumerations as provided by the Congress for the New Urbanism.

What would cities that incorporated elements of this unified urban design theory look and feel like? Much in-depth observational research was completed in cities nationally and internationally that already has a reputation for livability, sustainability and transit orientation. Much of this observational research was completed two years prior to the studio, and captured in video and slide images. Those cities among others that were most focused upon included Zurich, Switzerland, Oslo Norway, Vancouver, Canada, Portland, Oregon, Curitiba, Brazil, Freiberg, Germany, and pedestrian and bicycle priority streets in Manhattan and finally Amsterdam, Holland the poster child of this type of rational development.

The transit transects, when properly applied, provides a framework to focus much future public policy, planning and private investments into livable, sustainable urban areas. When proper urban design standards were applied to these transects, there is an opportunity to create great places of memorable character with the high quality of urban life. Further more, focusing investment into these urban areas is far more cost effective, energy efficient, creating exciting interesting places to live, work and play.

If a unified urban design theory could be applied to all towns and cities that have train stations, and if most of the future growth and relocation from suburbs could be focused in these areas, very little existing farmland would have to be developed in the future – it could be reserved for new and existing food production, land stewardship farm clustering. No new investments in sewer or water line extensions, roads, street or highway widening into these area would be encouraged or allowed. Many municipal master plans in these more rural areas that rely on growth, would have to be revised. Those municipalities that have relied on continued growth in housing and strip commercial, would have to be re-evaluated for their potential economic viability by applying sustainable and cultural practices, food production and processing. Certainly the tone of this is been set in several

of the State of New Jersey Development and Redevelopment Plans which call for certain areas of the state to have limited growth. This should obviously be we looked at again in future populations could someone other be directed or incentivized into a more sustainable, transit oriented and walkable urban centers.

In an ideal world, each of these transects of development would have a high jobs to housing balance (as close to 1 as possible) with an urban design so desirable 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, or a short transit ride which ideally would connect to other nodes with equal capability and delight.

There was a proposal to create ARC tunnel connecting to Manhattan which would enhance the access to a major employment, culture and financial center ideally benefiting both New Jersey and the New York. As you know this was cancelled by the governor in 2011 due to potential overruns in construction which New Jersey cannot afford at this time- or actually never should be required to pay if the engineers cannot accurately budget construction. Now that it has been cancelled, there may be additional 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 could create the pressure for a more sustainable New Jersey.

The urban design studio tested this unified theory of transit transects based on initial analysis and recommendations completed with a public participation process for [1]Union County by A Nelessen Associates with Berger Associated for development around train stations in small towns. There is a full report that can be used as a reference. [1] Transit for Small Towns , 2005

From this analysis and recommendations, the urban design concept of the transit transects was advanced. Three transit transects were applied and consisted of three

walking distance or “sheds,” that are centered on the train station, transit stop or multi modal station. The first is the traditional five to six minute walk; the second is a six to twelve minute walk and the third is the two to two and one half mile or 15 minute bike ride. A minute of walking time was calculated at 250 feet. Bicycle travel was calculated at 10 mph. It also assumes that designated bike lanes/access continues through all three Transit Transects and can continue on into the T3 suburban area.

The three transects consist of the following:

The 5 to 6 minute walk we called the TT6 or Transit Transect Six [TT6]

The TT5 is the 6 to 12 minute walk

The TT4 is a maximum 15 minute bike ride.

The TT6 is the most pedestrian oriented and least car oriented, the TT 5 is car and pedestrian/ bike balanced while the TT4 is more oriented towards the car and bike with the pedestrian. Of course the T-3 is almost entirely car oriented. None of our calculations included the T-3, 2 or 1. As the distance from the train station increases sustainability also decreases because there is typically greater energy usage and pollution.

How much potential development area is available when these transects are applied? To calculate this, each of the three transects was plotted using GIS over the 251 existing train stations/transit stop The general gross area (using a circle as a surrogate for the actual movement isobar) was determined for each of the transit transects.

TT6: 6 minutes = 1,500 feet or 162 acres_

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

TT4: 2 ½ mile = 13,200 feet 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 and “in-field” investigation of the

vacant land, parking lots and single story building in bad shape in only three of the potential locations.

There are 251 stations, but clearly there is a significant hierarchy of stations and a range of available, vacant and underutilized land. As an example the Hoboken station has multi- modes and heavy usage with important key parcels available within walking distance, as has the Newark Station. The Asbury Park station has only two modes and is located in a smaller town and also has significant vacant land. Elizabeth as a very large amount of land to which this transit transect can apply primarily because of the large amount of vacant and underutilized land and deteriorating, partially used buildings.

The limitations of the studio allowed us to complete field work in only three of the possible cities to +-which this could apply: Asbury Park, Rahway and Elizabeth. Because it was a small studio with limited time constraints a detailed study on only two of these cities was possible. The completion of the application of the urban design plans, to these two cities provided the proof of the methodology and I think credible results.

Our investigation suggested that in the survey sample of the three cities, in the primary TT6, approximately 6% to 20% of the land (nic streets) was either vacant, i.e. cleared of buildings, abandoned one story buildings, surface parking lots or buildings for lease or sale and if occupied was typically only on the ground floor. Some cities were more than 20% some less. This was simplified to a mean of 12% of total land area.

Applying that factor (12%) to the 162 acres we estimated that we could design 19.5+ acres of new development. We then applied a FAR or 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 2,540,000 square feet within the TT-6, the most walkable mixed use transect. This 2,540,000 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. If buildings increase in height, beyond the FAR of 3.0 extra land would be available for these 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 with appropriate setbacks. The proportions of the street to building wall is 1:1.

Once the gross potential development square footage was calculated, the next task was to prepare a preliminary urban design plan (street form, block structure, open space/plazas, general building massing, open space plan and development program) for Elizabeth and Asbury Park to test the concept. We had insufficient person power to complete more than two towns in five weeks. When the preliminary urban design plan was completed, each application of the theory exceeded the minimum expected development program while adding much additional greens paces, plazas and public areas. The urban design theory assumed little or no new parking be built with in the TT6 and where possible move the existing parking to 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.

The issue of parking - where to locate the parking, size , ratios, was the subject of much discussion and debate. Most current urban design plans are requiring significant amounts of parking to be either in the buildings, under the buildings, in a podium or immediately adjacent in a parking structure. If development is adjacent to a train station, the current planning philosophy is to increase the amount of parking. This is anti urban and anti pedestrian whose 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. 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 seems like a development killer. Not to make

it a killer will require that it be replaced with pedestrian places of extraordinary merit and market value.

Observing and research other cities that have a more pedestrian priority, point to the provision of little or no parking in the most used pedestrian places, the provision of remote parking, 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. 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.

How much development opportunity would be available if we used all three of the transects at the determined development opportunity percentage? We assumed that the floor area ratio would be an average of 3.0 in the TT-6 area, to a FAR of 1.5 in the TT6, and a Far of .5 in the TT-4 area. Using a combination of lower floor area ratios and increased land availability because of size, TT4 had the most available land. The following are the general calculations for holding for each TT.

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 15% availability factor using a FAR of 1.5 = 4,587,000 sq. ft.*

TT4 - 11,912 Acres with a 15% availability factor using a FAR of .5 = 38,917,000 sq. ft.

*All of these numbers will vary with lands 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 46,000,000 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 by 50% (6% of TT6, 8% of TT5,

and 7% of TT4) over 5.8 billion ft.² of developable space could be built!

If we presume that our test sample is reasonable, just focusing in the TT-6 areas and multiple it by the 251 stations, we could hypothetically build 637,645,000 square feet of space just within the TT6's.

As stated earlier, there are multiple disparities between stations in terms of available land. The 12% land availability and FAR's within the TT6's, could not be applied unilaterally to all stations. Even if half of that amount of land was used, (some towns will object to any development) an enormous amount of square footage can still be built i.e 318,770,000 square feet . As an example, if the available square footage just within all the TT-6's areas was simply divided into 1000 ft.² increments, i.e, one urban apartment at 1000 ft.², a total of 318,770 new units could be built. We know of course, that this would have to be balanced with retail, job generating square footage, service facilities, civic and culture uses, which would add an estimated 1,200 square foot to each unit size to generate a gross square footage needed. If we assume that a person in the future consumes 2,200 sq ft of floor space for home, retail, jobs, civic uses etc. we 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.

The more interesting question is, “is there even a market for so much housing?”

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 person per household and assuming that this increase will form households, as a crude estimate, a total of 109,000 housing units would be needed or about 12,000 per year. Assuming the very low minimum potential using the land analysis above that suggests that 145,000 housing units and their parallel non residential requirements could be developed using the TT-6, with a build out of 12 years. (Assuming that no other housing was built or occupied elsewhere and the existing vacant houses remain vacant which is an unlikely scenario.) [check on the number of housing

starts in new jersey for the past 10 years] It is unclear in this economically constrained “wait and see” economy how much growth will actually happen.

You can see there is significant capacity when considering all the transects to build an enormous number of great housing units and civic space. These area could consume the market for the next 50 to 60 years. Can you imagine what this would be like with these great walkable and bicycle urban city centers with its preserved, agricultural lands, continuous green space extending into the cities, great walkable cities with multi modal transit working at optimum capacity.

To test the concept, the urban design studio focused only on the TT6, in two cities. For each of these cities, a Land Utilization and Susceptibility to Change map was completed after field visits and before the urban design concept was applied. For each city a preliminary urban design plan, massing, phasing and development program was developed. 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.

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 openspace emerged. This was 15 times the minimum estimate which was 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 represent the conceptual urban design massing models that illustrate the application. (see attached)

It can be done, but can these places where growth is potentially most sustainable attract the market? My guess that it will be an uphill climb until the first phases of success can be demonstrated. Clearly our preliminary numbers are excessive for the market need. With concentrated development in transects, utilization of our existing car and truck oriented highways for Special District Transect designation for major industrial and commercial uses, and with new development focused on transit oriented areas, preservation of agricultural land for food production is not possible. This unified urban+ design theory, could transition New Jersey to one of the most sustainable states in the union., as the small country of Holland is in the world. It is theoretically possible.

Imagine a vision of the future where we had transit transect designed cities with economic regions of high density, connected with a range of transit options. Imagine the economic and positive life quality advantages. The application of the transit transect concept would be a rational model for the future.

As interesting as this is, unfortunately, this urban+ standard is politically not possible to implement today. It is still perceived to be cheaper and easier to continue to expand into the suburbs or so many people think, until the total real price is calculated and understood. It is clearly easier to accommodate the cars right next to her train stations and forgo pedestrian in city centers than it is to think about the alternative, and even more to implement the alternative even though it may be healthier for people and create more value in the center cities.

This will not happen because the special interests still do not see an easy economic advantage. To accomplish this would require a consensus vision, a public relations and advertising push would have to be generated that would have a real buy-in. The 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.” A “real virtual” plan and place would have to be presented first in a video form like an advanced video game or I Max movie or a 3D movie. If enough people participated in the creation of the plan now and with perhaps in a few years as the constraints and economics of sprawl development become more apparent the alternative vision will move from virtual to real, small at first then growing as the new reality after the crisis is seen.

For this to happen in reality, higher intensity and density cities with great public spaces and transit, there will have to be public investments in urban infrastructure like sewer water, energy production, train station improvements, bicycle lanes and pedestrian networks, along with parks and plazas, all of which are in the public domain.

This is a real vision for a very small percentage of the land area that could be developed. Clearly there is a litany as to why this will be difficult to accomplish. It is perhaps an understanding why it cannot be immediately accomplished and what needs to be done to change the institutional framework, that, over time, will be the most important. But this framework cannot be done without the acceptance and the need for a physical manifestation of what this vision could and should look like. 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.

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.

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, 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.

If a unified theory of urban design was applied to zoning and it allowed many small developers to participate, there is 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. The capital improvements that are required and in essence should be budgeted capital improvements plans for each municipality and should probably be financed through mechanisms like a TIFF. Incentivizing developers with tax credits short term abatements and building bonuses will certainly be required.

Current little or no physical planning is being done because there is little money to plan. We are generating a lot of metrics and many “shovel ready projects” are being completed. The question is, what happens after these projects are completed. What then?

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