



Environment SAWG #6

Introduction to Land Use and its Connection to Transportation

March 6, 2008



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1. Introduction – 6th session of the Environment Stakeholder Advisory Working Group. Focus on an introduction to and the land use – transportation.



Tonight's Agenda

- **Basic introduction to land use, land use policy tools, and role in the EIS**
- **The Transportation-Land Use Connection - Overview and Current Theory**
- **Questions & Discussion**



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2. Agenda begins with land use studies as a basic component of required environmental studies under NEPA and SEQRA. Followed by a more focused review of current thinking on the connections between land use and transportation. Comments and questions are welcome throughout the presentation.



EIS and Land Use

Component of Required Environmental Studies:

- **National Environmental Policy Act (NEPA)**
- **State Environmental Quality Review Act (SEQRA)**



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3. Required land use studies under NEPA and SEQRA address:

- Existing conditions of affected environment
- Existing land use policies
- Assess consistency and compatibility of project alternatives.



Land Use in Environmental Studies

- Existing patterns of land use are major components of “Neighborhood Character”
 - Usually want to preserve and enhance community and neighborhood character
- Also need to predict and accommodate anticipated growth
 - Often tension between preservation and development, need to balance these



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4. Land use is an important component of Neighborhood/community character
 - Usually want to preserve/enhance this.
 - Also need to accommodate anticipated growth
 - Needs a balanced approach.



Land Use in Environmental Studies

Land Use Policy is serious business:

- Major role in creation of values –
 - Economic
 - Social
 - Ecological



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5. Land use as very serious public policy affecting economic, social and ecological values in major ways, e.g., how areas are zoned affects product costs, settlement patterns, and natural habitats.



Land Use Regulatory Environment

- A state police power delegated to local government – “Home Rule” (exceptions, e.g., permits, state projects)
- County review when proximate (500 ft) to state/county roads, parklands, streams, etc.
- Multiple local governments in the I-287 Corridor:
 - Rockland County: 12 municipalities
 - 3 towns/ 9 villages
 - Westchester County: 12 municipalities
 - 2 cities/ 3 towns/ 6 villages



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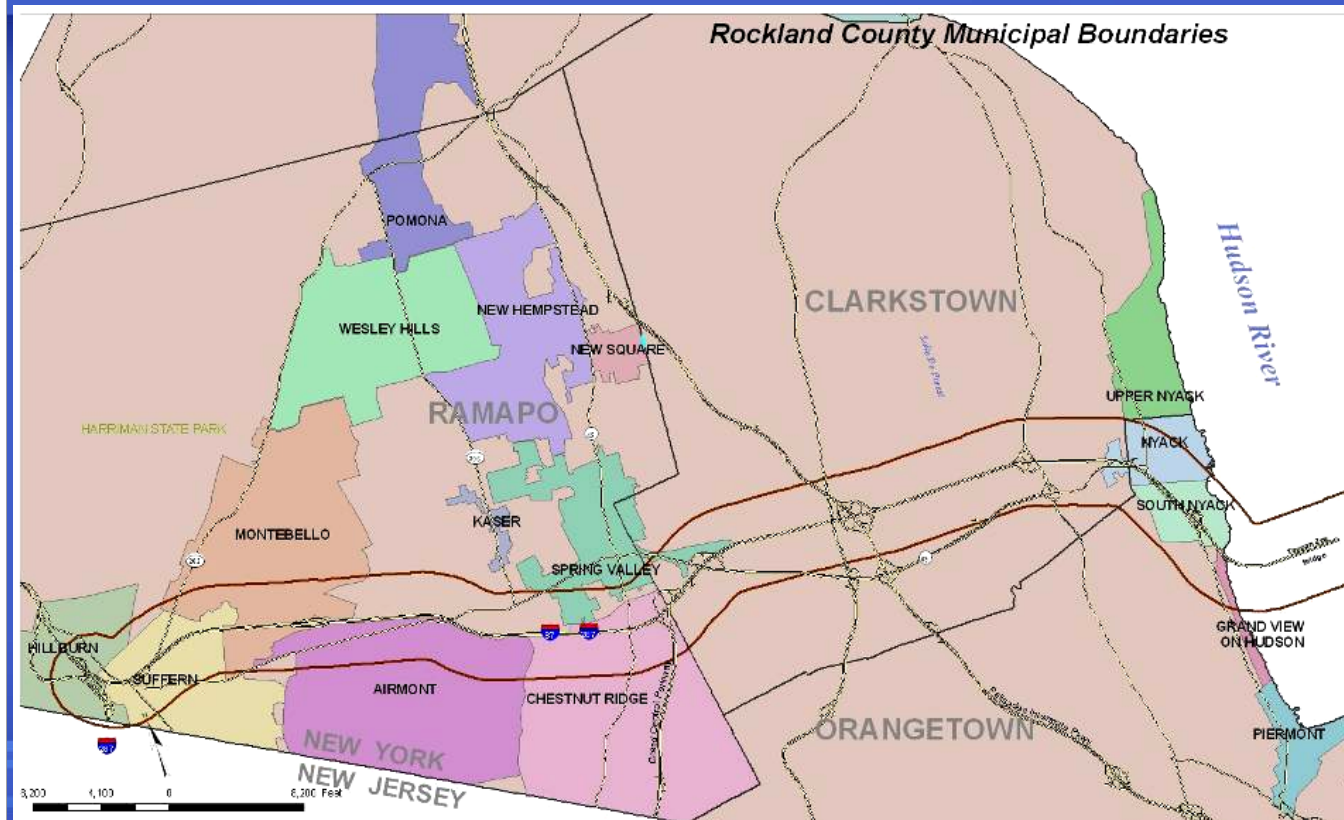
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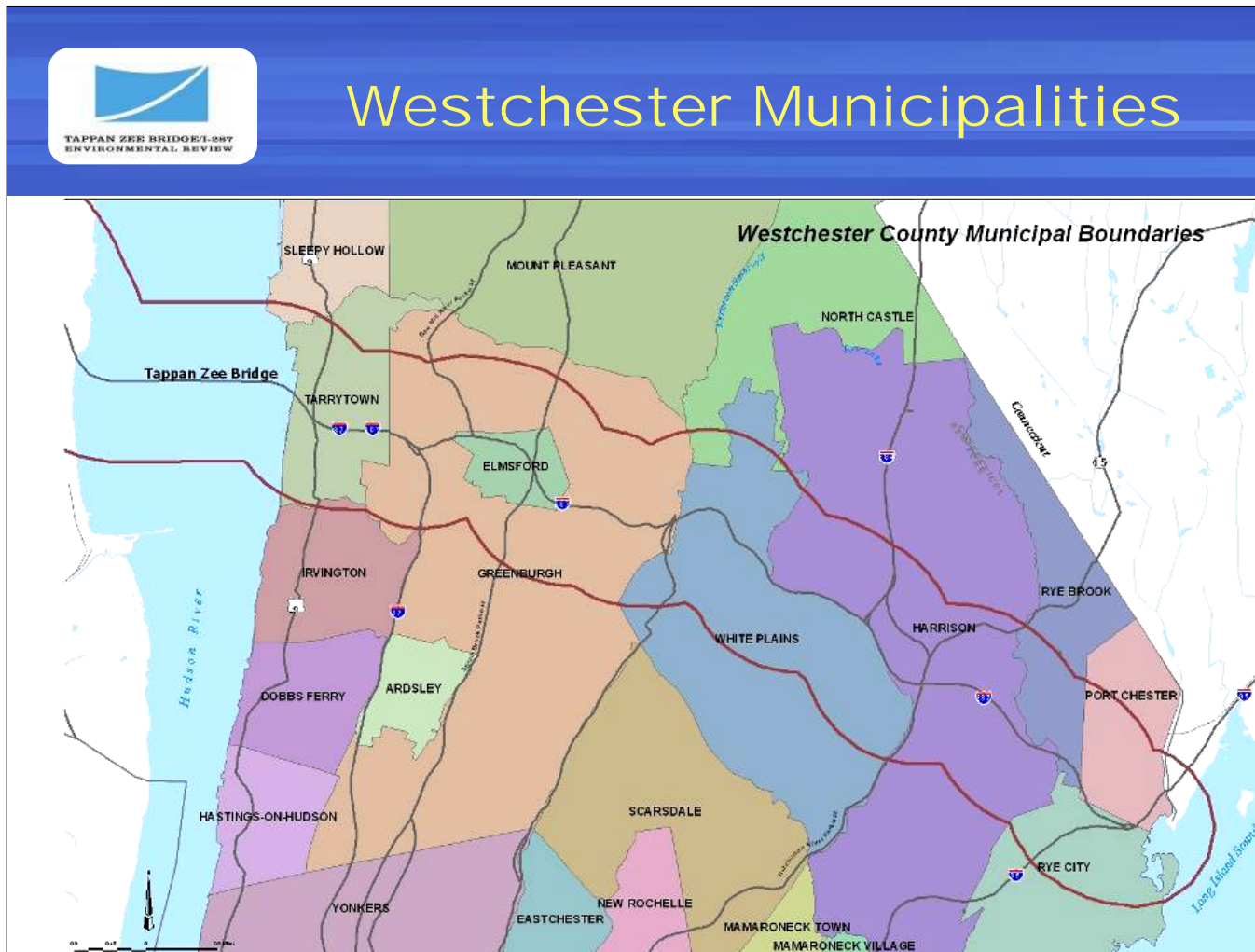
6. This slide discusses the state, county and local roles, and notes the multiple local governments in the Corridor.

Land use controls operate under the state’s “police power” (to protect the public’s health, safety and welfare) delegated to local governments (“home rule”)

Rockland Municipalities



7. Map shows Rockland municipalities.



8. Map shows Westchester municipalities.



Reasons Public Intervention

- Avoid negative spillovers
- Location of non-market activities
- Conservation of land
- Preservation (neighborhoods/historic/etc.)
- Attraction of activities
- Future activity – residential balance



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9. Reasons for intervention focus on negative spillover effects and market failures.



Land Use Tools

- Comprehensive Plans
- Community Visioning -
- Zoning Ordinances
- Subdivision Regulations
- Waterfront Revitalization Plans
- Context-sensitive Design
- Others: capital programs/ urban renewal/
environmental review/ tax incentives/, etc.



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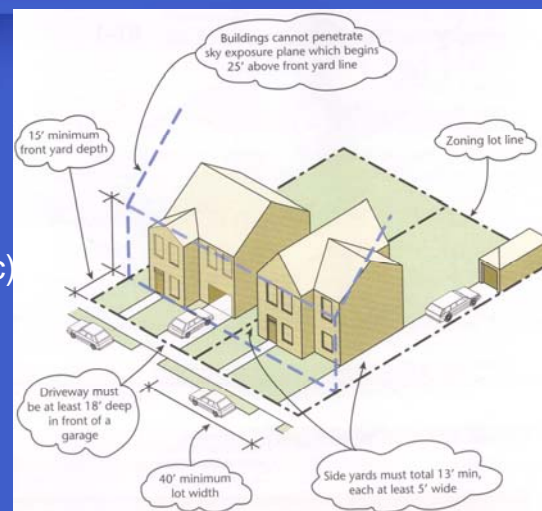
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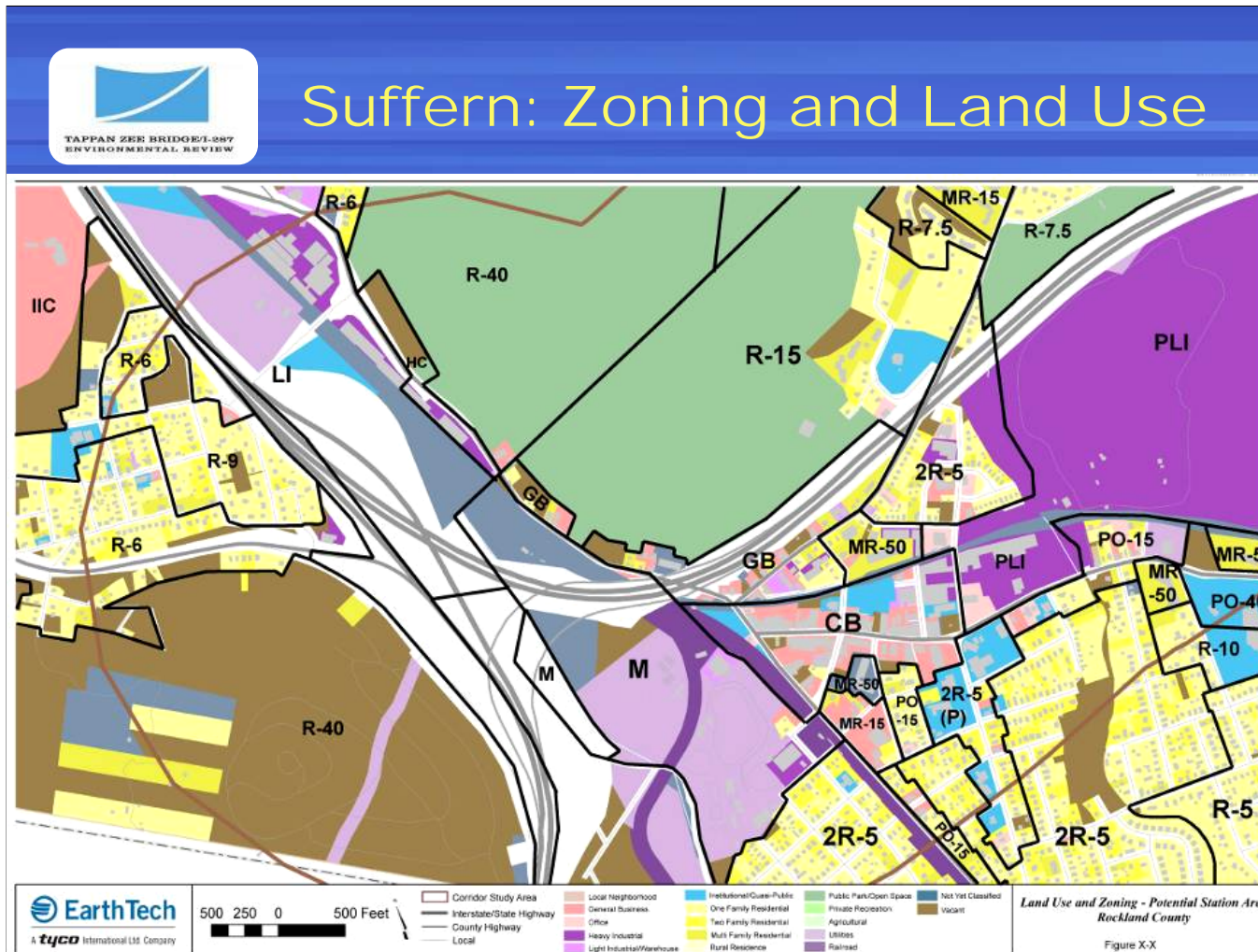
10. Slide shows list of tools, most based on “police power”.

Zoning Terms/Concepts

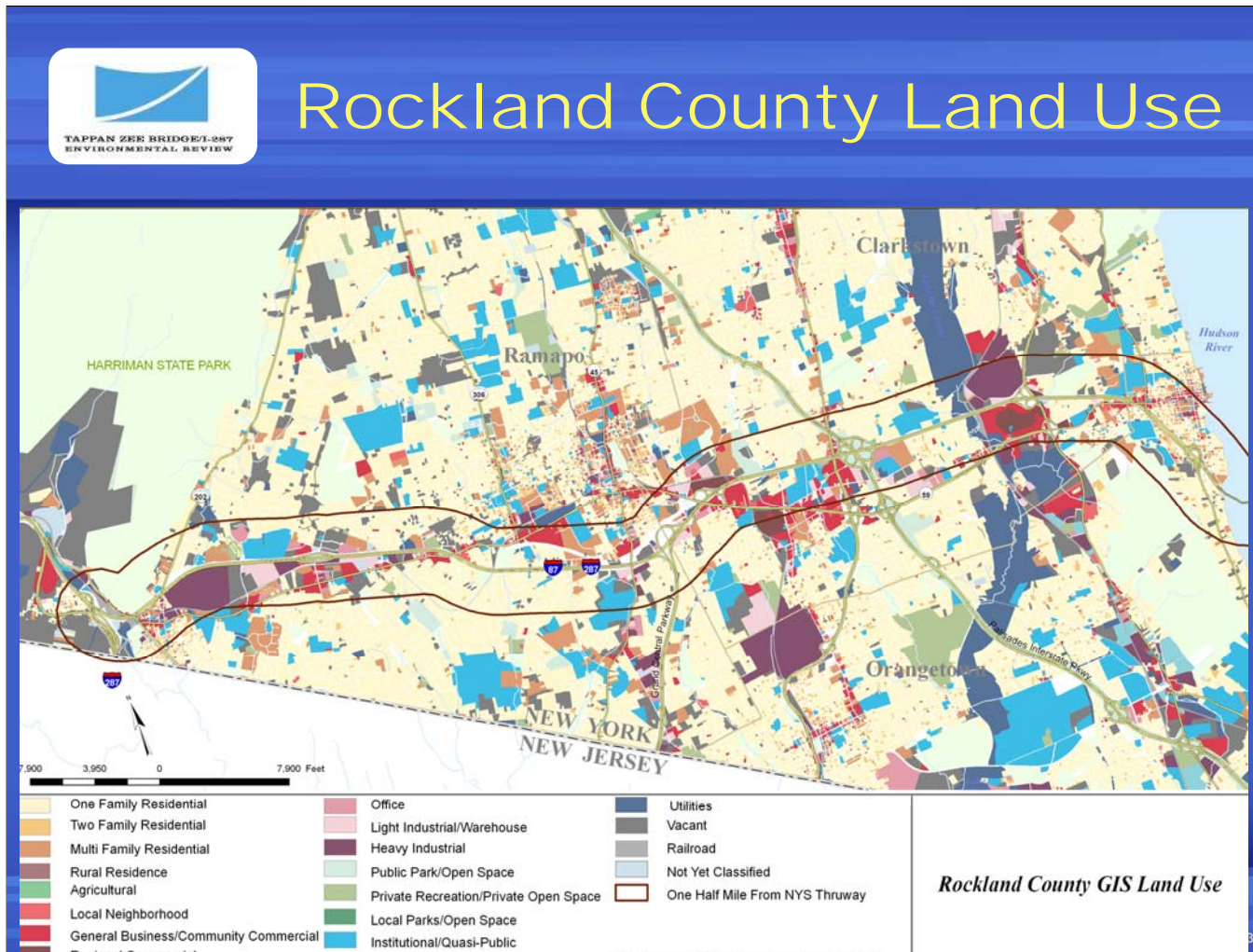
- “As-of-Right” and Special Permits
- Use (manufacturing/commercial/residential, etc)
- Bulk (FAR/OSR/lot size per dwelling, etc)
- Setbacks, yards, sky exposure planes
- Parking
- Community facilities
- Special districts
- Bonus/TDR
- Variances
- Non-conforming (use), non-complying (bulk)
- Rezoning (text and/or map changes)



11. This slide shows common terms and concepts used in zoning.



12. The slide shows an example of zoning maps (Suffern & Hillburn) overlaid on land use map, showing general conformity but many nonconforming elements also.



13. The map of Rockland's land uses in the I-287 Corridor is used to point out traditional centers, dispersed patterns of low-density residential, limited commercial corridors, and industrial activities.



Overview of Existing Land Use Plans/Policies

- County Plans:
 - *River to Ridge* (2001) in Rockland (never adopted)
 - *Patterns of Westchester* (1996) currently being updated
- Local Plans:
 - Diverse mosaic – hard to interpret what neighbors are doing/planning
 - Often very old
 - Often more as-of-right development potential than desired, and sometimes restricts development where appropriate to develop
 - Continuing updates and evolution



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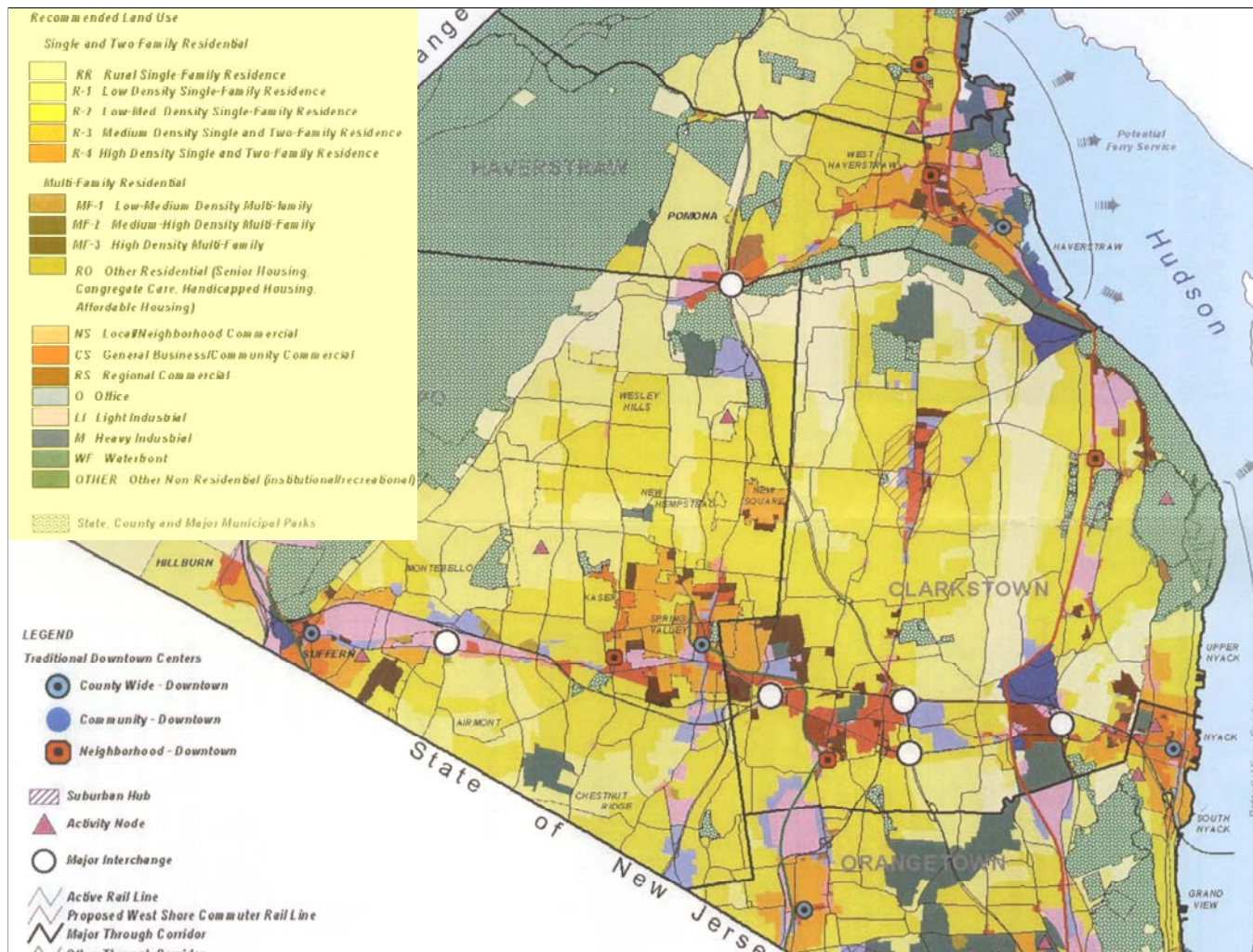
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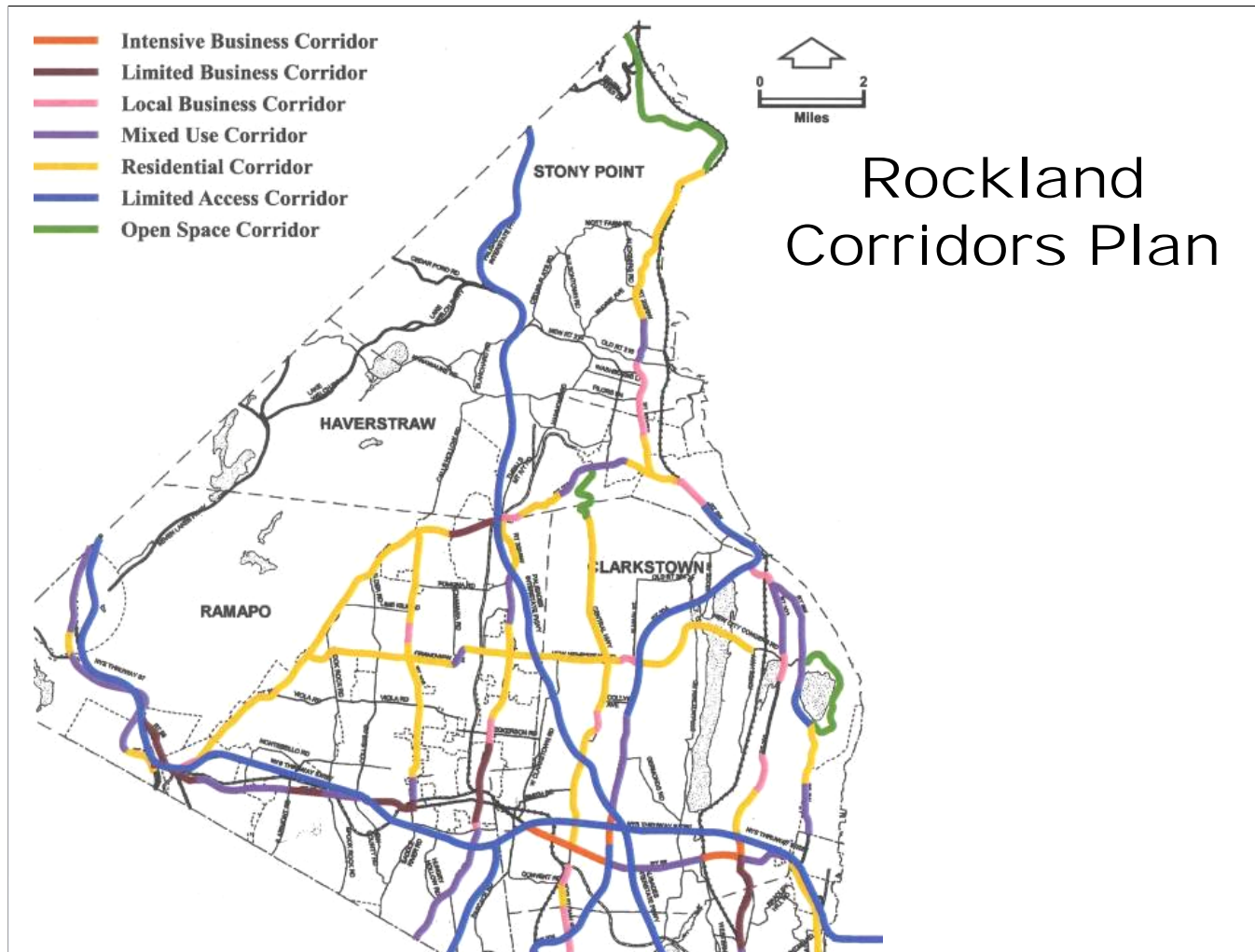
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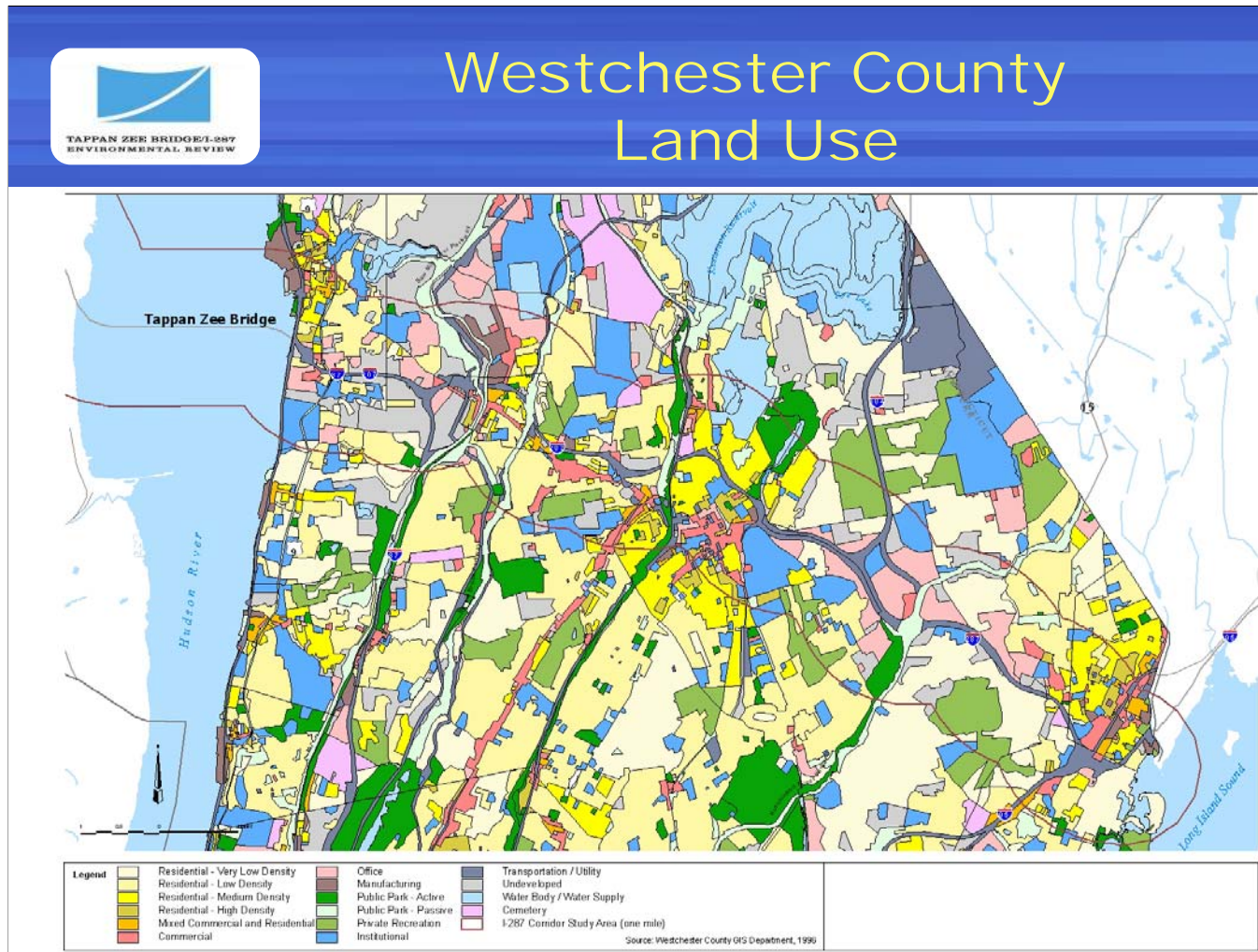
14. This slides notes the two county plans and some of the issues associated with local plans.



15. This slide shows Rockland's River to Ridge comprehensive plan, an ambitious 2001 effort.



16. This example from the Rockland's comprehensive plan, looks at diversity of corridors and sets future policies, from intensive business to open space corridors.



17. Slide shows Westchester's land use in the I-287 Corridor from the county's geographic Information System (GIS).



Westchester County Plan - Land Use Policies and Changes

- County policies:
 - Steering development to established urban centers with appropriate infrastructure
 - Transportation corridors as a key for economic development, including upgrading public transit, e.g., on I-287 Corridor where other corridors intersect it
 - Transit Oriented Development (TOD) opportunities
 - Preserving open space, especially protecting water-supply lands



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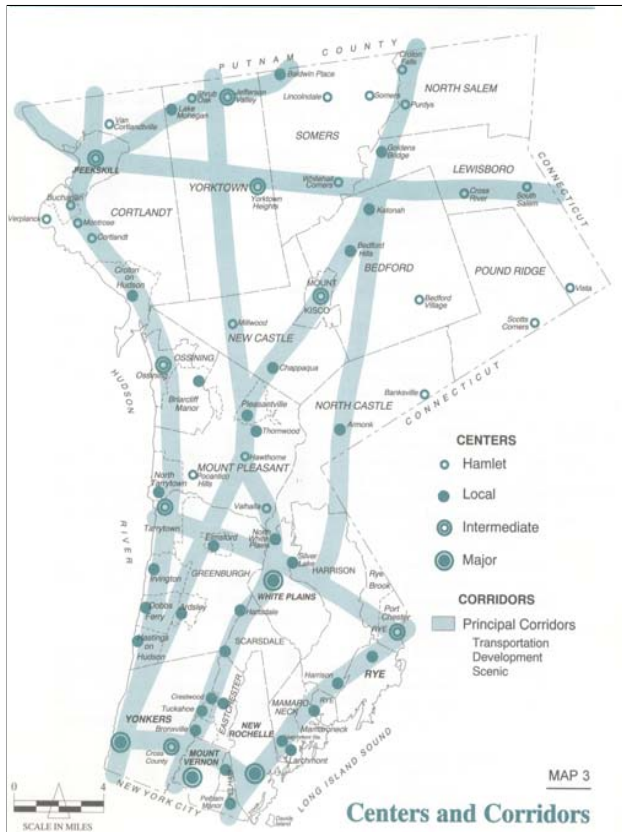
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18. Westchester's plan is in the process of being updated as Westchester 2025, expected 2008. This slide highlights county policies, e.g., a transit-oriented development (TOD) focus.



<http://www.westchestergov.com/corridors.htm>



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20. Slide shows the Corridors and Centers shown in the Patterns plan.



Refining Alternatives

We're using the land use data and our understanding of local and county land use policies to refine the design of project alternatives:

- Avoid acquisitions, displacements wherever possible
- Refining alignments to avoid sensitive locations, improve local “fit”
- Optimize station locations of Transit Alternatives in Tier II Transit EIS



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21. Using our understanding of local land uses and policies to better understand refine project alternatives, e.g., improve local “fit,” and avoid property acquisitions wherever possible.



Example of How Land Use Data Has Already Been Used

- Avoidance of acquisitions/displacements at Wayne Avenue, Suffern, prompted reconsideration of using Piermont Line



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22. Slide shows Suffern with two commuter rail alignments. Option on south side of Thruway would impact Wayne Avenue, prompting reconsideration of use of Piermont Line.



Balancing Transportation + Land Use = Smart Growth

- 1. Market Forces in the History of Urban Development**
- 2. Growth and Congestion: Policy Options**
 - Efficient pricing of highway transportation
 - Efficient pricing of land development
- 3. Achieving a Balanced Transportation and Land Use Policy – Smart Growth Concept**
 - Demand management/ Access Management
 - Higher densities and mixed use development
 - Limiting urban sprawl – Concentrating growth in and around existing and new centers



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23. The second part of the presentation will focus on three topics:

1. Market forces and urban development patterns
2. Growth and congestion and economic policy options, focusing on efficient pricing of highways and land development
3. A balanced transportation-land use policy emphasizing demand management, higher densities and mixed use development, and the need to limit urban sprawl.



1. Market Forces and Models of Urban Development



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Market Forces and History of Urban Development

- Huge shifts in scale and pattern of urban development
- Advances in technology of goods production, communications and transportation
- Continuing potential for innovation and demographic shifts



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25. The US has seen huge changes in the scale and pattern of urban development. In 1810 only 10% of the US population lived in towns and cities. The US now has 55 times the population, and 80% lives in towns and cities. This shift largely has been made possible because of the advances in technology. We face the prospect of continuing change, innovation, and demographic shifts. In our region, we can see particular changes in the patterns of immigration, the aging population, and rapidly growing areas like Orange County.



Economic Model of Urban Development

Primary forces driving urbanization:

- Key rationale of cities is to economize on transportation costs:
 - Economizing on transportation costs also distributes urban areas around a region
 - Land is so expensive in cities because transportation savings are so valuable
 - Internal economies of scale
- Economic advantages of clustering
 - External economies of scale



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26. From an economic perspective, there is a generalized “sorting-out” process that determines the location of land uses by their willingness to pay for highly accessible locations. Land in central cities tends to be more expensive because the transportation cost savings have significant value. Another economic efficiency is associated with the advantages of specialized clusters of activity, trade, or industry.



Historic Models of Urban Development

Size and regional distribution of cities:

1. ***Central Place Theory*** – market-driven hierarchy of cities/towns in a region
2. ***Monocentric urban development*** – central import/export node, near ports/railroad stations:
 - Land uses tend to be segregated
 - Land values and intensity of development fall with distance from center
 - Most travel is radial
 - Land uses distribute in concentric rings based on transportation costs



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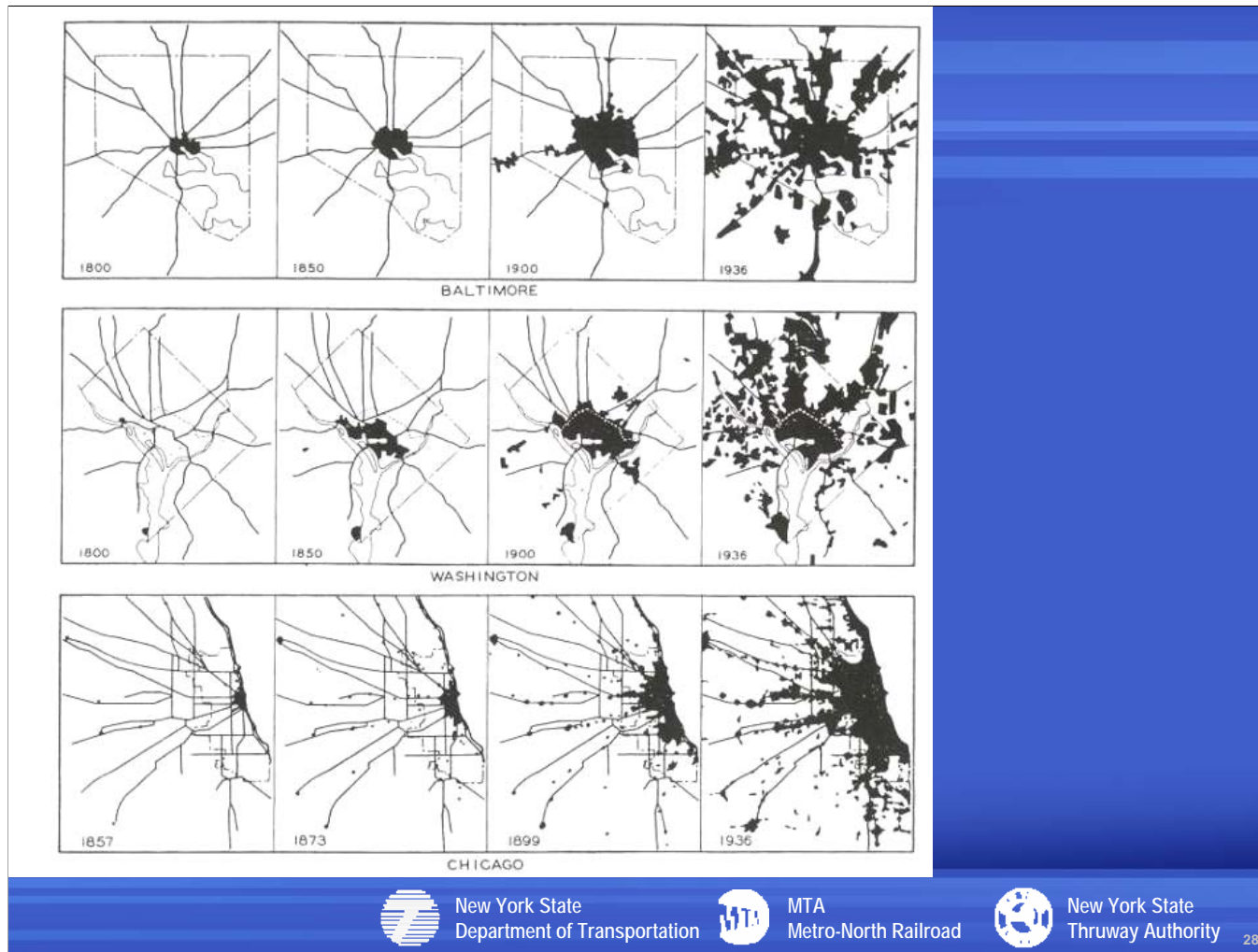


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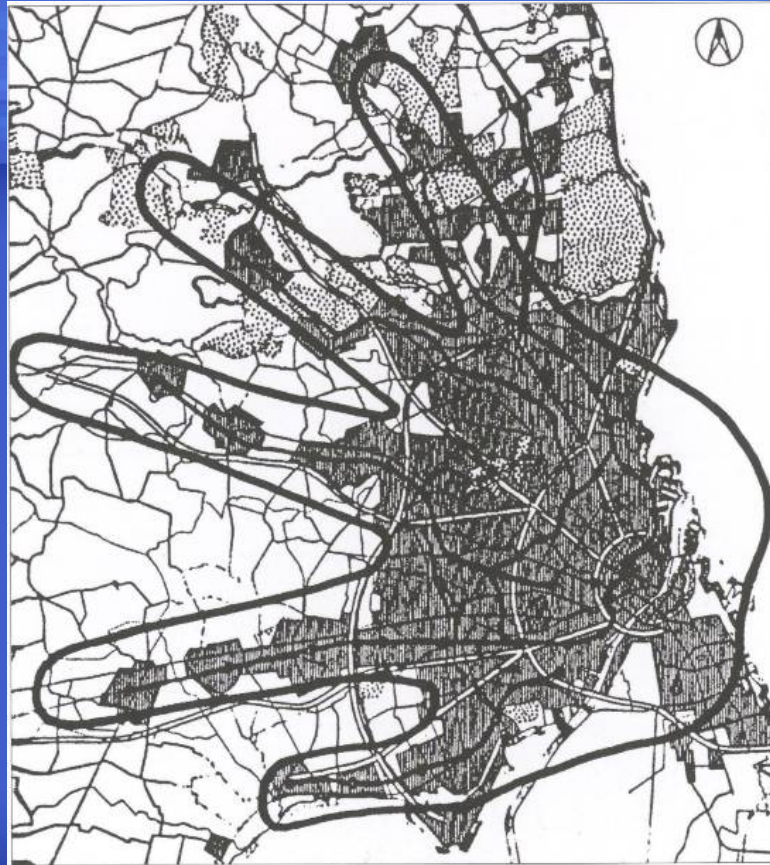
27. Three models of urban development are notable for our review:

1. Walter Christaller's Central Place Theory of the 1920's and 1930's was a very useful abstract of how activities confirm to a hierarchy of places and centers in a region. It is still very relevant in market studies today.
2. Monocentric urban development – the pattern that dominated the 19th century and early 20th century, where cities developed around some transportation node. Some of the key features are noted on the slide, especially how values decline rapidly with distance from the center, and most travel is radial.
3. Polycentric urban development.



28. Shows the evolution in the 19th century of three cities in the US (Baltimore, Washington and Chicago), show the monocentric node and typical radial pattern that evolved along railways.

Copenhagen's 1947 "Finger Plan"



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29. The radial pattern was used as a planning tool to try to preserve the open spaces between the "fingers" in this famous 1947 plan of Copenhagen by Rasmussen.



Models of Urban Development (Cont.)

3. *Polycentric urban development (since 1920s):*

- Cars, trucks and highways lowered transportation costs and filled the spaces of radial networks
- Reduced relative importance of CBD
- New sub-centers form
- New hierarchy of highways connecting them
- By 2000, suburbs contained the majority of jobs
- In 2000, central cities' share of metro population was 36%
- Minority of Metro-North riders now commute to Manhattan (49.4% in 2005 vs. 65.3% in 1984)



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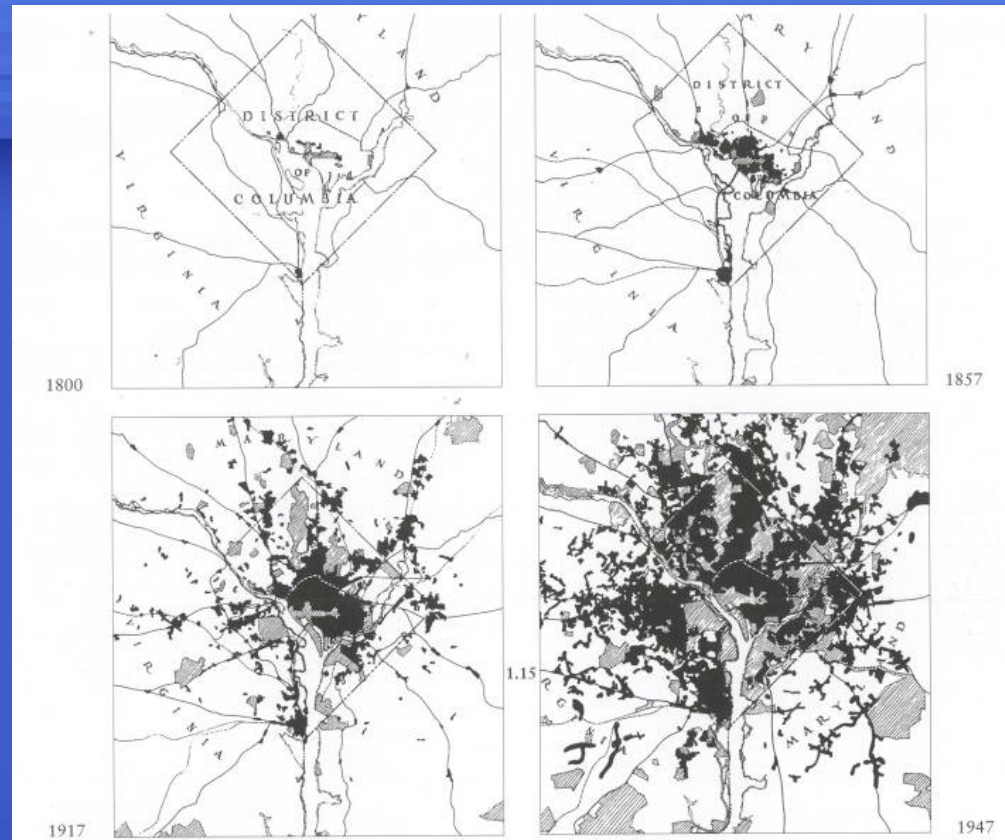
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30. Most such efforts were swamped by the third model of Polycentric urban development, where the flexibility of cars and trucks filled the open spaces.

New subcenters formed, reducing the relative importance of central cities, and a new hierarchy of highways connected the subcenters.

Notable that Metro-North riders to Manhattan are now a minority and that growing shares have been in reverse commuting, intermediate destinations, and recreational travel.



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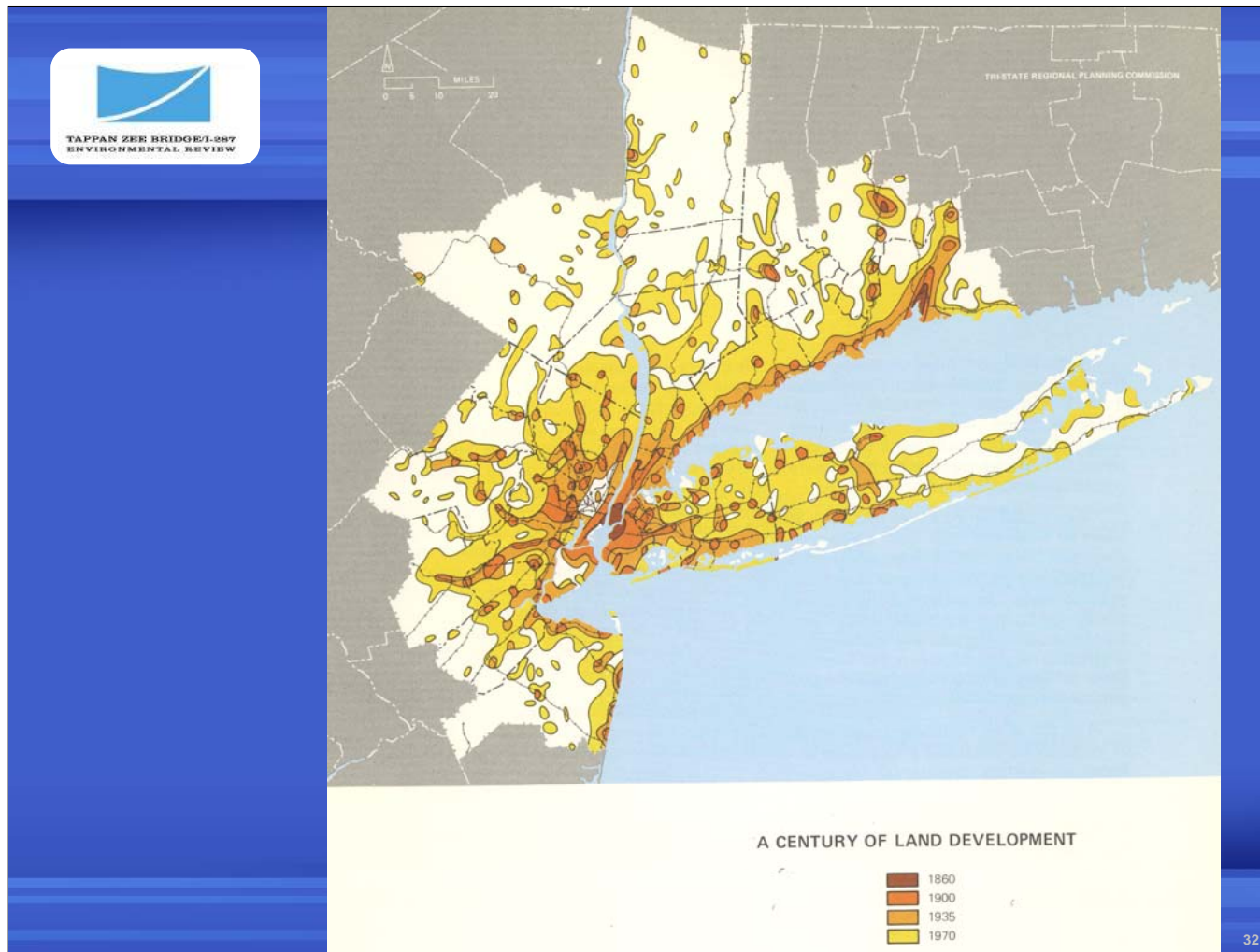
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31. The slide shows how Washington DC's urban pattern morphed into a polycentric one by mid-20th century.



32. Similarly the in the New York region as this slide shows a century of urban development. We should note that another 35 years of development have further absorbed the white spaces on the slide and if we anticipate 35 years into the future, current patterns will likely absorb everything else that is not dedicated parkland or protected in some other way.



Transportation in a Polycentric City

- 1. Subcenters grow until growth-induced costs overwhelm the savings from clustering**
- 2. Complex trade-offs make for difficult transportation planning**
- 3. An efficient transportation system experiences congestion**



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33: Important dynamics to consider of transportation in a polycentric urban region are:

1. the cycles of development, stasis, and possibly decline, as the costs overwhelm the savings of clustering;
2. the complex trade-offs in the “sorting-out process” make for a very difficult transportation planning function;
3. congestion is a normal feature of an efficient transportation system; and



Land Use SAWG

2. Growth and Congestion: Policy Options



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34. Growth and congestion are central to our studies and economists focus especially on two policy options to address these: more efficient pricing of highways and more efficient pricing of land development.



Transportation and Land Use Policy Options

1. Efficient pricing of highway transportation
2. Efficient pricing of land development



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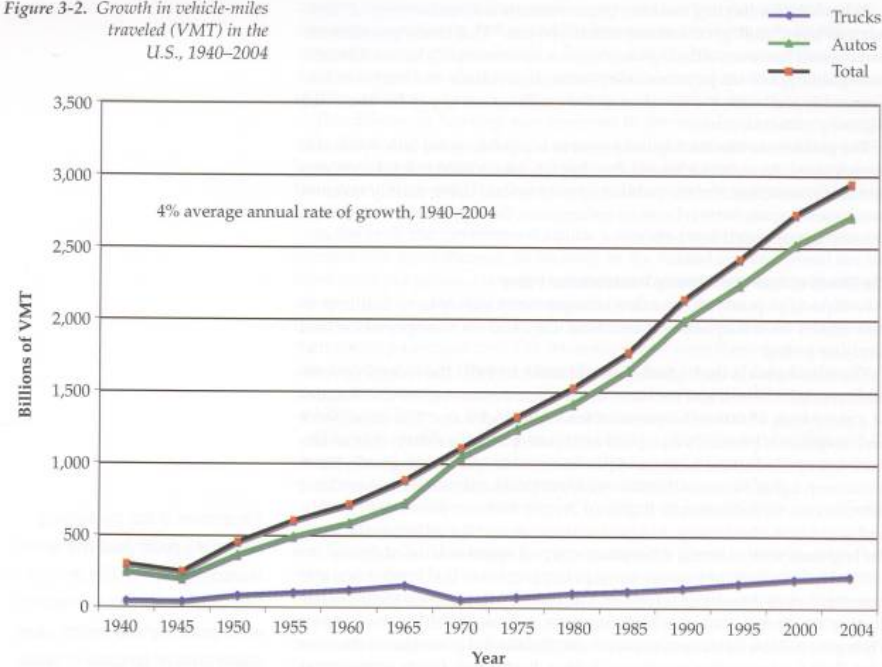
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35. Growth and congestion are central to our studies and economists focus especially on two policy options to address these: more efficient pricing of highways and more efficient pricing of land development.

Growth and Congestion

Figure 3-2. Growth in vehicle-miles traveled (VMT) in the U.S., 1940-2004



Source: Federal Highway Administration, Highway Statistics, Summary to 1995, and 1996-2004.



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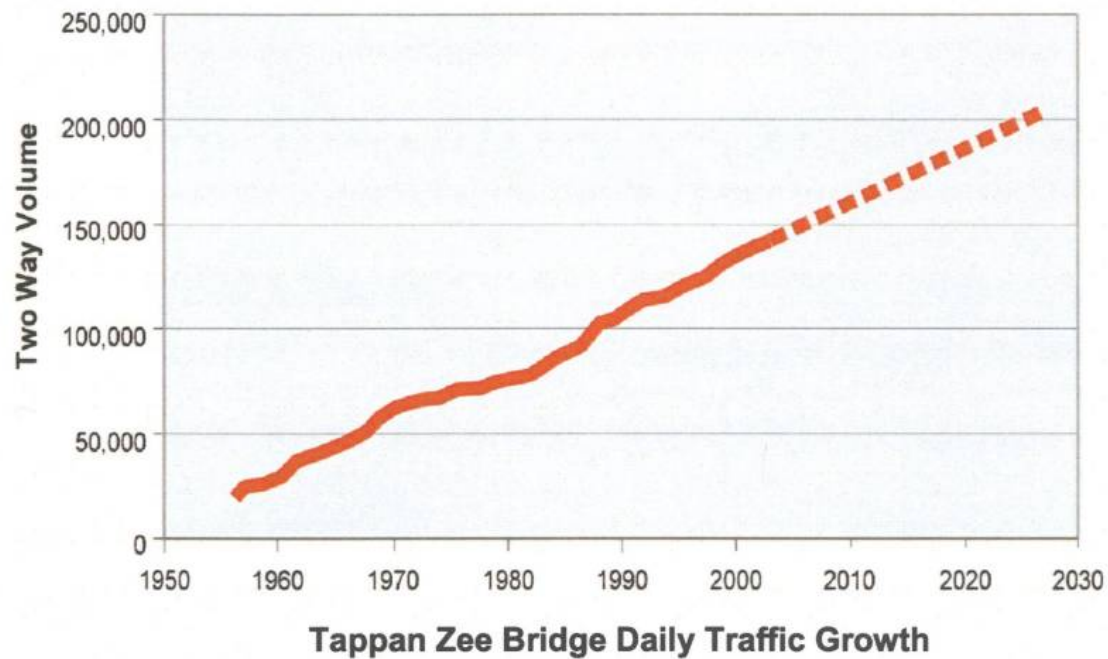
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36. The issue is growth and congestion impacting mobility in the corridor. In the US there has been an annual 4% growth of vehicle miles traveled (VMT).



Tappan Zee Bridge



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37. This growth pattern is similar to that experienced on the Tappan Zee Bridge, where a 4.7 percent annual growth rate occurred 1956-2000.



Pricing of Highways

- Simple concept – charge tolls that vary by time of day/demand: area cordons or lane tolls
- Have variable truck tolls now on TZB
- Additional HOT Lane being considered for Rockland



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38. Variable pricing policies are nothing new, all familiar with how restaurants have a different price structure for lunch, when demand may be less, than for dinner. By encouraging consumers at lunch they are able to spread their fixed overhead costs over a larger demand pool.

With highways, want to discourage riders in the peak hours from making unnecessary and discretionary trips, and trips in vehicles with single-riders. Higher rates at this period can be used to provide a more reliable service for essential trips.

This can be done with cordons (as in London and now proposed for NYC) or by toll lanes, as the project proposes additional high occupancy toll (HOT) lanes in Rockland.



39. Turning to land development policy, one distinct feature in the US is how most land development regulation is lodged with local government, of which there are 87,000 units with tax powers.



Land Development Policy

- Fragmented local government regulation of urban land development in US:
 - Directly through zoning, subdivisions codes, etc.
 - Indirectly through transportation & other infrastructure



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40. Turning to land development policy, one distinct feature in the US is how most land development regulation is lodged with local government, of which there are 87,000 units with tax powers.



Land Development Policy

Zoning:

- first in NYC in 1916
- Widely adopted with development of trucks/autos
- Preserved segregated use patterns of prior era
- With new highways, suburban development became explicit objective



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41. Zoning is the most typical land development regulatory tool and has been around at least since NYC's zoning resolution of 1916.

Widely adopted as trucks and autos evolved and created new urban patterns. Its historic source was nuisance law and it has been used to limit the negative spillovers (or externalities) from one land use on others, typically creating single use districts and exclusionary patterns of development.



Some Disadvantages of Zoning

- Disadvantages:
 - income segregation
 - fragmented decision-making
 - increasing commuter distances/sprawl/ congestion
- Separating uses & limiting densities = more congestion & sprawl



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42. As a land development tool zoning has some disadvantages, including: income segregation; the fragmentation of decision-making; increasing commuting distances, sprawl, and congestion.



Efficient Pricing of Land Development:

- Zoning to equitably price spillovers:
 - Industrial performance zoning or emissions trading
- Impact fees
 - e.g., Retail parking taxes or standards based on traffic impacts
- Inclusionary zoning
 - rather than exclusionary zoning



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43. Efficient pricing of land development would focus on pricing negative spillover effects; performance zoning, e.g., where an industry's emissions are regulated to the degree it is compatible with nearby residential uses; impact fees and taxes that reflect the costs to others, e.g., retail clusters and associated parking can have major congestion impacts on local highways, so these retail uses should contribute to these costs, perhaps by a tax on parking; and inclusionary zoning, rather than exclusionary, would allow for a mix of uses and housing types, e.g., assuring the availability of affordable housing rather than excluding it.



Efficient Pricing of Land Development : Urban Services

- Equitably pricing extensions of urban services:
 - Until 1970s funded by average cost prices but costs vary
 - Better located, higher density development subsidizes higher cost development
 - $\frac{1}{4}$ of localities now use development impact fees



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44. Municipal provision of new urban services is another typical feature of inefficient land development. Frequently the real costs of development are not born by developers but are passed along to the larger community or more efficient developments. Only one quarter of localities use impact fees to charge developers for the true costs of extending services. The consequences are typically more sprawl and more/longer auto trips.



Efficient Pricing of Land Development: Property Tax

Same tax rate on values of both land and improvements:

- Tends to discourage improvements with no effect on land consumption
- Reducing tax rate on structures while increasing the rate on land, encourages more intensive use of land
- Tax abatements are common economic development tool



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45. Property taxes are another vector of distortion and inefficiency in land development.

The same tax rate is applied to both land and improvements, with the consequence of discouraging improvements with no effect on land consumption. And yet there is widely accepted use of tax abatements on property improvements for economic development purposes, acknowledging the validity of differential tax rates.



3. A Balanced Transportation/ Land Use Policy



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46. Moving towards a more balanced transportation–land use policy.

Historically transportation planning has led because of its geographic scope and scale (federal, state and metro levels) and their greater revenue sources, whereas, land development planning is local, fragmented and under-funded.



Achieving a Balanced Transportation/Land Use Connection

- Most transportation planning at large geographic scale (fed/state/metro) with large revenue sources
- Most land development policy is local (fragmented and under-funded)



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47. Moving towards a more balanced transportation–land use policy.

Historically transportation planning has led because of its geographic scope and scale (federal, state and metro levels) and their greater revenue sources, whereas, land development planning is local, fragmented and under-funded.



Adjusting the Balance of Land Use and Transportation Policy

Major Issues:

- Should transportation's leadership role continue?
- Pricing could be a powerful tool but often lacks political support
- Land use and urban design are central to growing focus on quality of life
- Effective land use policy requires a regional perspective



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48. Major debates continue around the following issues:

1. should transportation's leadership role continue
2. the political controversies surrounding pricing policies, including equity issues and impacts on lower-income households
3. growing focus on land use and urban design as central to quality of life concerns
4. effective urban land use policy requires a regional perspective, overcoming fragmented local decision-making.

There are no simple resolutions of these debates.



Land Use Policies Affecting Transportation

TABLE 5-1. ANOTHER CLASSIFICATION OF LAND-USE POLICIES LIKELY TO AFFECT TRANSPORTATION

DEFINING A REGIONAL DEVELOPMENT PATTERN	CREATING LIVABLE PLACES
Regional planning	Zoning: mix of use
Transit-oriented development	Zoning: density
Corridor planning	Performance zoning
Jobs-housing balance	Designing for density/amenity
Urban growth boundaries	Street connectivity
	Streetscape
PROVIDING PUBLIC INFRASTRUCTURE AND SERVICES	MISCELLANEOUS POLICIES
Provision: where and how	Pricing externalities
Pricing	Changes in property taxation
Concurrency/impact fees	Purchase or transfer of development rights
	Location-efficient mortgages

Source: ECONorthwest



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49. This table is from the new American Planning Association's (APA) book *The Transportation/Land Use Connection* (2007). It shows a classification of land use policies that affect transportation on different dimensions or levels:

- at the regional scale, land use tools such as transit-oriented development or growth boundaries are very relevant to shape more efficient regions and transportation systems;
- the provision of infrastructure/services is more intermediate and relies on tools such as impact fees;
- at the level of creating livable places, tools such as zoning controls of density, the mix of uses, and performance standards have been widely used;
- other miscellaneous policies include changes to property taxes and the transfer of development rights.



Built Environment's Influence on Travel Behavior

Five Dimensions or “Ds”:

Regional Scale

1. Destinations (balance of jobs & housing)

Neighborhood Scale

1. Density (correlates to auto use)
2. Diversity (mixed use)
3. Distance (proximity to transit)
4. Design (balance of form & function)



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50. To summarize the built environment's effects on transportation, can emphasize the five “Ds” or dimensions: destinations; density; diversity; distance; and design.



Land Use Policies Affecting Transportation

Regional form:

- **Creating boundaries: zoning and urban growth containment**
- **Creating centers and corridors: TOD & retrofitting corridors**
- **Pricing public infrastructure & services: impact fees**
- **Incentives and public investment: expediting, supportive zoning, land assembly, TDR**

Neighborhood form:

- **Urban design**



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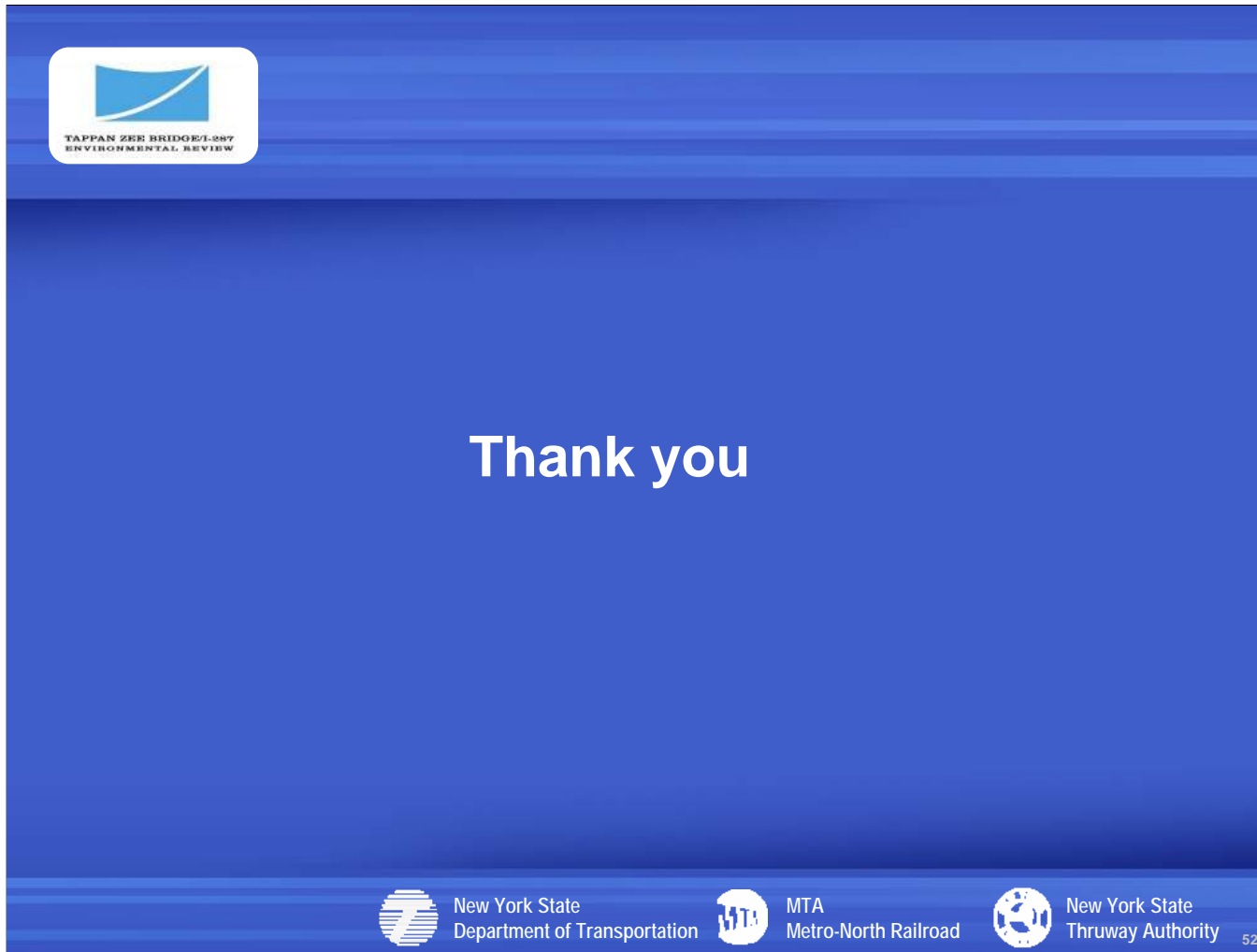
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51. To conclude, at the regional level we see the relevance of:

- creating growth boundaries to contain development;
- creating centers and corridors by the use of TOD and the retrofitting of corridors;
- the appropriate pricing of public infrastructure and services using impact fees to charge developers the true marginal social costs of their developments;
- adopting public incentives, including expediting appropriate development approvals, land assemblage, transfer of development rights, and supportive zoning.

At the neighborhood level, the relevant tools focus on: Livable places using urban design, connectivity, and streetscapes.



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- creating growth boundaries to contain development;
- creating centers and corridors by the use of TOD and the retrofitting of corridors;
- the appropriate pricing of public infrastructure and services using impact fees to charge developers the true marginal social costs of their developments;
- adopting public incentives, including expediting appropriate development approvals, land assemblage, transfer of development rights, and supportive zoning.

At the neighborhood level, the relevant tools focus on: Livable places using urban design, connectivity, and streetscapes.