Vertical Integration of Land Use and Transportation Planning

Shirin Najafabadi

September 11th Memorial Recipient (2017-2018)
Project Outline

1. Literature Review & State of the Knowledge

2. Benchmarking
   - Research the land use-transportation planning practices of peer MPOs and develop a comparative analysis of the practices of these MPOs.

3. Information Gathering
   - Collect the relevant Information from all the local municipalities in the NYMTC region.
   - Catalogue access to these documents and the contact information of the relevant municipalities /counties.

4. Synthesis
   - Analyze some CDEAs in NYMTC’s Plan 2045 relative to the local master planning and zoning.
   - Develop recommendations for planning practices that could be employed by NYMTC to foster the vertical integration of transportation and land use planning.
Project Timeline

09/12/2017

September

Task 1 ✓
Literature Review & State of the Knowledge

January

Task 2 ✓
Benchmarking

March

Task 3 ✓
Information Gathering

June

Task 4 ✓
Synthesis & Case study

September 09/12/2018
Project Description

**Coordinated Development Emphasis Areas (CDEAs)**

NYMTC’s members introduced the idea of CDEAs in Plan 2045, the recently adopted Regional Transportation Plan.

CDEAs: Areas within the NYMTC planning area, where land development and transportation investment planning are to be coordinated to achieve environmental sustainability, local economic revitalization, and improved quality of life.
Project Description

• Objectives
  - Research methods to enhance the influence of NYMTC’s regional transportation plans on municipal land use planning decisions.
  - Research methods to help NYMTC ensure that municipal planning efforts are incorporated into the regional planning perspective.

• Challenges
  - This coordination will challenge NYMTC as land use decisions are locally controlled within its planning area.
What We Mean by “Vertical Integration”

• Regional planning primarily involves connecting regional level efforts with federal- and state-level policymaking, as well as with local jurisdiction standards and actions.

• To integrate the regional project (such as highway corridor) with different local land Uses.

An example of vertical integration for transportation network
Transport Planning Process

**Goals & Objectives**
- Integrated planning
- Use of public transport
- Raise of non-motorized modes
- Accessibility & Reliability
- Travel demand reduction
- Clean energy usage
Transportation Planning Process Includes

**FORECASTING**
- Employment growth
- Population

**ASSESSING**
- Projected land uses

**IDENTIFYING**
- Major growth corridors

**ANALYZING**
- Transportation improvements

**ENHANCE**
- The transportation system

**ASSESSING**
- Natural environment impacts

**DEVELOPING**
- Financial plan
- System maintenance
- New capital investments
The Transportation Land Use Linkage
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In NYS, land use decisions are made locally.

Counties are an intermediate level between local and state governments. With responsibility limited to county-owned lands.

Provision of transportation facilities and services affects land use patterns.

All land use decisions will ultimately affect travel patterns and, thus, be influenced by planning and programming.

Land use-transportation relationships can lead to:

- Reduce vehicle miles of travel
- Improvements in air quality
- Increase levels of walking, bicycling and transit use
- Economic and community revitalization
- The preservation of neighborhood character
Land Use & Transportation & Economic Development Linkage

- **Land Use**: Land development generates travel
- **Transportation**: Travel generates the need for new facilities
- **Economic Development**: Further development is attracted as accessibility increases
# Examples of Planning Jurisdictions

## Mega Regional
- Regional Greenhouse Gas Initiative (RGGI)
- The I-95 Corridor Coalition

## Regional
- Long Island Regional Planning Council
- Metropolitan Transportation Authority (MTA)

## State
- NYS Department of State
- New York Planning Federation
- NYS Department of Environmental Conservation
- NY DOT

## County
- Industrial Development Agency
- Office of Economic Development
- Environmental Management Council
- Department of Planning

- Westchester
The Overall Evolution of Urban Planning Issues

One-dimensional

- Single Topic
  - Transportation
  - Economic Development
  - Housing
  - Parks

Multidimensional

- Integrated Topics
  - Land Use Transportation & Air Quality
  - Open Space & Parks & Water Resources

Integrating multiple issues into multidimensional planning frameworks

- Integrated Systems Planning
  - Regional Blueprint
  - Climate Action Plan
  - Public Health & Wellness Plan
  - Regional Comprehensive Plan

Early 20th century

Early 21st century
Integrating Land Use and Transportation Strategies
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1. Create specific funding programs for transportation projects that support community and land use goals

San Francisco Metropolitan Transportation Commission’s (MTC) North Central Texas Council of Governments (NCTCOG, 2002-2004) Provided $41 million in STP and CMAQ funds for 19 transportation improvements supporting TODs and mixed-use developments.
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2. Include land use goals as part of scoring criteria for analyzing potential transportation projects

Atlanta Regional Commission (ARC, 2025 Regional Transportation Plan) For federal STP funds included support of local land use, which can provide a maximum of 15 points out of 135 total.
Denver Regional Council of Governments (DRCOG, 2005-2010 TIP plan) Include up to 16 points (out of 100) for various local actions supporting the regional Metro Vision.
Puget Sound Regional Council’s (PSRC, 2002 TIP plan)
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   - Puget Sound Regional Council’s (PSRC, 2002 TIP plan)

3. Transit Oriented Development (TOD)
   - Region Plan Association (RPA, 2009) Springdale Village Center in Stamford
   - Many Westchester communities are TODs such as Tuckahoe, Rye, and Chappaqua are walkable, mixed-use communities with transit access in the community center.
Transit Oriented Development (TOD)

TOD is regional planning, local development, revitalization and walkable neighborhoods combined.

<table>
<thead>
<tr>
<th></th>
<th>New Development</th>
<th>Existing Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Transport</strong></td>
<td>Self contained development anchored solely on a new transport node or corridor</td>
<td>Route or stop in an under-served or inaccessible area. Diversifying or changing land uses, increasing activity along side the new transport</td>
</tr>
<tr>
<td><strong>Existing Transport</strong></td>
<td>Infill development around an under utilised node or corridor</td>
<td>Improving capacity or quality of transport in under-served or inaccessible area. Diversifying or changing land uses, increasing activity along side the upgraded transport</td>
</tr>
</tbody>
</table>
Other Methods for Regional Integration

Funding for Regional Plan Implementation
The distribution of regionally managed funds to specific projects in local jurisdictions that support regional planning goals and policies.

Collaboration with Implementation Partners
These partners may be governmental or quasigovernmental bodies. Collaborative efforts can help obtain funding for plan implementation and translate regional objectives into local actions.

Technical Assistance & Performance Monitoring
These programs include performance monitoring, which relates to tracking whether established goals have been achieved as a result of actions taking place.
Comprehensive Appraisal of Transportation and Land Use: Node- Place Approach
The Node-Place assessment is a good example of a process that assesses land use-transport networks in a comprehensive and integrated way; providing opportunities for both new and existing developments to better integrate.

The Node-Place assessment appraises the nodes in a transit system for their accessibility to transportation against the land uses that form the ‘Place’ surrounding these nodes.
Node and Place Indicators

- Frequency of modes
- Direction of modes
- Stops reachable within X mins
- Jobs reachable within X mins

Node

Place

- Land use diversity
- Walking/cycling accessibility
- Density of land use
- Daytime population

Intensity of the activities
Number of employees

Number of directions connected
Accessibility of the locations
Type of connections
1) **Balance**: A node and a place are as strong.

2) **Stress**: The intensity of both mobility flows and urban activities are maximal.

3) **Dependence**: There is no competition for free space, and the demand of infra flows is so low (e.g. Small-town stations.)

4) **Unbalanced node**: Where transportation supply is relatively much more developed than urban activities (e.g. a newly opened stations on the urban fringe)

5) **Unbalanced place**: The urban activity is more intense than transportation supply. (e.g. old or ancient part of the city with low accessibility to transit system)
Node-Place Benefits

- Deep collaboration between transport and land use planners.
- Develop a strong base of evidence that provides decision makers and the public with a clear guide of how transport and land use work together.
- Provide a robust basis for decision makers to distribute infrastructure/land use development or change according to their objectives.
Coordinated Development Emphasis Areas (CDEAs)
Case Study: I-287 Corridor
I-287 Corridor CDEAS

Sustainable Development Centers:

- Village of Tarrytown
- Village of Elmsford
- Town of Greenburgh
- City of White Plains
- Town of Harrison
- Village of Rye Brook
- City of Rye
- Village of Port Chester
Review the local land use plans to find potential for development and growth
Land Use Assessment for Towns and Villages Close to I-287 Corridor

- This assessment shows the lots and lands with potential for development in each jurisdiction close to the I-287 corridor.

- For example Tarrytown and Greenburgh have lands with higher potential for development.
Node-Place Model

**Node Index**

\( y_1 = \text{Average Annual Daily Traffic (AADT)} \)

\( y_2 = \text{Number of highway lanes} \)

\( y_3 = \text{Connection to other highways} \)

\( y_4 = \text{Number of train station (within 15 min of travel)} \)

\( y_5 = \text{Number of bus lines (r < 1 mile)} \)

\( y_6 = \text{Land Use (Vacant lands and Mixed Use < 1 mile)} \)

\( y_7 = \text{Distance to next highway exit} \)

**Potential node Index**

- Car parking capacity
  - No data available
- Bicycle parking capacity
  - No data available
- Bicycle access
  - No data available

**Place Index**

\( x_1 = \text{Population (r < 1 mile)} \)

\( x_2 = \text{The number of workers in labor force} \)

\( x_3 = \text{Degree of functional mix} \)

\[
x_3 = 1 - \left( \frac{a-b}{d} - \frac{a-c}{d} \right)
\]

with

\[
\begin{align*}
a &= \max\{x_1, x_2\} \\
b &= \min\{x_1, x_2\} \\
c &= \frac{1}{2}(x_1 + x_2) \\
d &= (x_1 + x_2)
\end{align*}
\]
The aim of this approach is:

- Not to advise a particular development path.
- To gain a better understanding of development dynamics.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Highway Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village of Tarrytown</td>
<td>3-4</td>
</tr>
<tr>
<td>Village of Elmsford</td>
<td>1-2</td>
</tr>
<tr>
<td>Town of Greenburgh</td>
<td>13</td>
</tr>
<tr>
<td>City of White Plains</td>
<td>5-6-7-8</td>
</tr>
<tr>
<td>Town of Harrison</td>
<td>9-10</td>
</tr>
<tr>
<td>City of Rye</td>
<td>12</td>
</tr>
<tr>
<td>Village of Port Chester</td>
<td>11</td>
</tr>
</tbody>
</table>

The further development could cause conflicts due to the limited amount of space available.
Conclusions

VERTICAL INTEGRATION OF LAND USE & TRANSPORTATION PLANNING CAN BE ENHANCED IN NYMTC’S PLANNING AREA

- THE NODE-PLACE APPROACH, OR SIMILAR APPRAISAL METHOD, CAN IDENTIFY POTENTIAL FOR IMPROVED VERTICAL INTEGRATION
- THE LAND USE COMPONENT OF THE REGIONAL TRANSPORTATION PLAN CAN GUIDE THE APPLICATION OF THE APPRAISAL METHOD

LOCAL OFFICIALS MUST BE BROUGHT TO THE PLANNING TABLE IN A TARGETED FASHION

LOCAL OFFICIALS CAN BE INCENTED THROUGH THE:

- ASSESSMENTS OF DEVELOPMENT POTENTIAL
- TECHNICAL ASSISTANCE
- FUNDING FOR TRANSPORTATION PROJECTS AND STUDIES
- COLLABORATION WITH IMPLEMENTATION PARTNERS

LAND USE GOALS CAN BE APPLIED TO SCORING CRITERIA FOR POTENTIAL TRANSPORTATION PROJECTS
Thank You