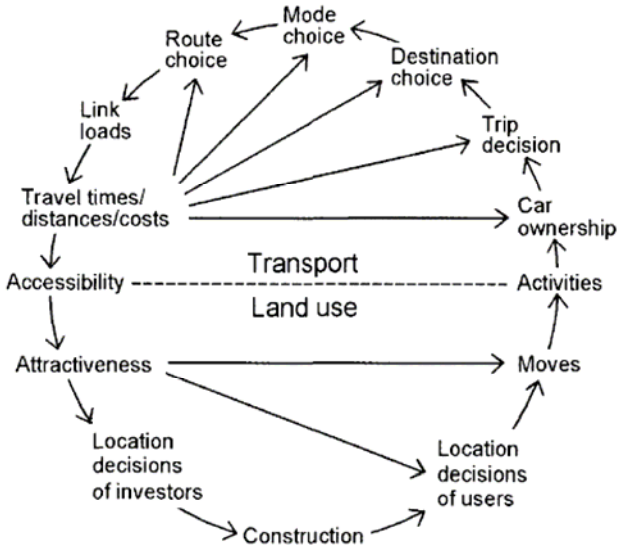
Integrating Transportation and Land Use:
Land Development Plan Standards and Evaluation Tools

Transportation-Land Use Connection

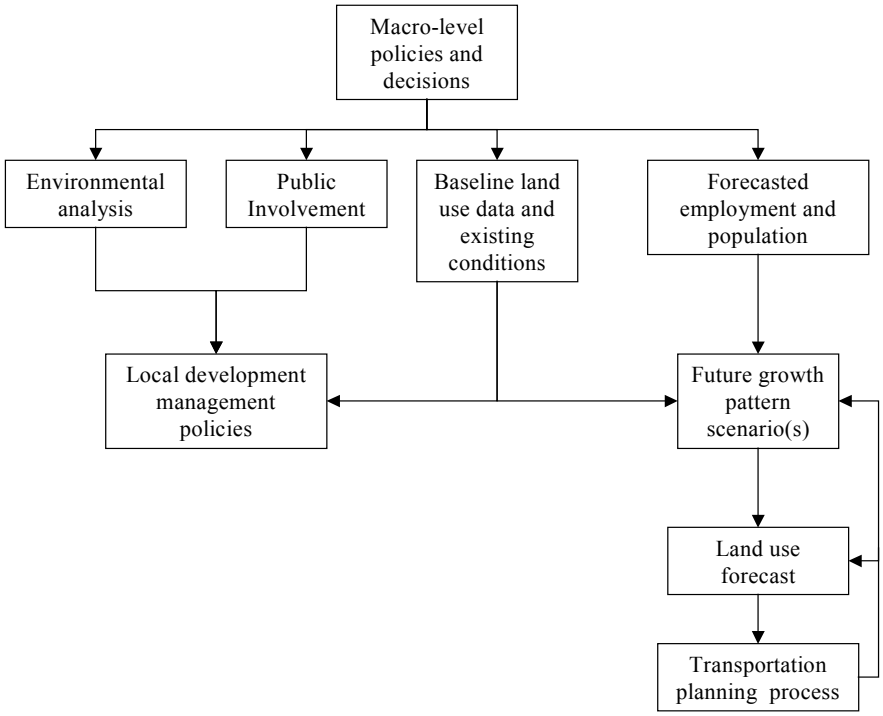
- Development, location decisions based on accessibility
- Transportation infrastructure facilitates land development → land development eventually exerts pressure on transportation infrastructure

Transportation-Land Use Feedback Cycle



Source: (Vande Walle, et al, 2004)

Land Development Planning Process to Feed Transportation Planning



North Carolina Planning Legislation

In 2001, the North Carolina General Statutes were amended to state that, "The Department of Transportation may participate in the development and adoption of a transportation plan or updated transportation plan when all local governments within the area covered by the transportation plan have adopted land development plans within the previous five years. ... A qualifying land development plan may be a comprehensive plan, land use plan, master plan, strategic plan, or any type of plan or policy document that expresses a jurisdiction's goals and objectives for the development of land within that jurisdiction." [1]

Basic goals:

- Consistency between land development, utilities and public facilities plans with the transportation plan
- Coordination with other localities' plans and with regional and state strategic visions
- "Environmentally friendly" plans, which
    - Place development where transportation can reasonably be provided
    - Place transportation facilities for minimal human and natural environment impacts
    - Are consistent with environmental regulations and polices for water supply watersheds, wetlands, high hazard areas, steep slopes, critical habitats, protected farmlands and open space, etc.

Policy Information to feed Transportation Modeling/Planning

The most important data and policy information include:

Legal Issues, Policies

- Inventory and assessment of local, state, and federal policies, ordinances, and programs that affect development and redevelopment
- The legality of any local planning activities – Consider Dillon's Rule

Land Districts

- Vacant and developable areas
- Environmental policies
- Policies for hazard mitigation, as applicable to the area – hurricane, flood, landslides, drought, ice storms. These hazards affect the transportation system, both in terms of flooding across roads, etc, or roads and evacuation plans.
- Environmental suitability of areas for development or transportation projects
- Broad classification of use (industrial, commercial, residential), including holding capacity
- Priority land use outcomes and "second-choice" outcomes if transportation plans cannot adapt to the land use. This can be used to model scenarios
- Description of employment or the types of retail development that is allowed in certain areas, with some estimate of numbers of employees

Infrastructure

- Plans to extend water and sewer facilities, as well as other public infrastructure
- Long term growth in areas that use septic systems – need to keep them very low density if not going to extend water and sewer. Would extension promote more growth?

Timing

- Phasing and timing of growth
- Priority areas for development – to help schedule priority areas for transportation improvements

Transportation Connection

- Desired roadway projects
- Areas that can support public transit or pedestrian and bicycle travel
- Transportation improvements in the TIP planned for the town and policies for managing land development along the new or improved roadways
- Access management strategies along state highways
- Particular areas of concern that need to be served (i.e., EJ populations, etc.)

[1] G.S. 136-66.2 (b1)

Table 1: Land Development-Related Data Needed for Transportation Planning

Data Element	Land Development Plan Component
Developable Land	
Vacant lands and their designations	Land Supply and Capacity
Areas for infill, redevelopment, or adding greater intensity	Land Supply and Capacity
Roofed space available (possibly by industrial, commercial, other services) – this is comparable to building footprint.	Land Supply and Capacity
Land Classification (resulting from Suitability Analysis)	
Areas designated for residential development, explanations of "high" or "low" density	Land Classification Districts
Industrial areas	Land Classification Districts
Commercial areas (greater detail about different kinds of retail/commercial areas and #s of employees)	Land Classification Districts (detail will come from standards and policies in Land Vision and Principles)
Land use mix	Land Classification Districts
Facilities that may attract or stimulate additional development (location, number, timing, and capacity)	
Water and sewer	Land Classification Districts, Needs Assessment
Hospitals	Land Classification Districts, Needs Assessment
Schools	Land Classification Districts, Needs Assessment
Density	
Persons per acre or square mile	Standards, Districts, Capacity
Households per acre or square mile	Standards, Districts, Capacity
Employment, employees, or jobs per acre or square mile	Standards, Districts, Capacity
Current transportation facilities	
Sidewalks	Existing Conditions
Bicycle and pedestrian paths	Existing Conditions
Parking lots	Existing Conditions
Transit stops	Existing Conditions
Local streets, collectors, arterials, thoroughfares, and highways	Existing Conditions
Airports	Existing Conditions
Goals for promoting bike/ped/transit modes, areas that may facilitate use of other modes	Existing Conditions
Clear maps with transportation information	Existing Conditions
Demographics by zone	
Number of residents	Existing Conditions
Age distributions	Existing Conditions
Income ranges	Existing Conditions
"Environmental justice" communities	Existing Conditions
Other sensitive populations	Existing Conditions
Labor participation	Existing Conditions
Neighborhood stability and cohesion	Existing Conditions
Environmental Attributes and Considerations	
Open space, buffers	Suitability Analysis
Impervious surfaces: consider both water contamination and stormwater control	Suitability Analysis
Critical habitat, endangered species	Suitability Analysis
Wetlands	Suitability Analysis

Table 1 (cont.): Land Development-Related Data Needed for Transportation Planning

Data Element	Land Development Plan Component
Floodplains	Suitability Analysis
Land suitability analysis for development classifications	Suitability Analysis
Landscape-scale map with notable features and impacts	Suitability Analysis
Land use related minimization and mitigation strategies for use in the land development process	Suitability Analysis
Explanation of Public Involvement Process	
Stakeholder groups involved	Public Involvement Section / Questionnaire
Outreach methods	Public Involvement Section / Questionnaire
Visioning techniques	Public Involvement Section / Questionnaire
Maps	
Land use inventory – shows allocation for residential, commercial, industrial, public, parks and open space, institutional, and mixed uses	
Water – lakes, wetlands, rivers, streams, drainage courses. Should also show lands that affect these water sources.	
Floodplains, steep slopes, and other conditions not suitable for development	
Water supply network, sewer system, etc.	
Existing transportation facilities, capacity and conditions	