



**New York
Metropolitan
Transportation
Council**

The Metropolitan Planning Organization

Demographic and Socioeconomic Forecasting

*Technical Memorandum
Task 1.1.5.1
Plan For Land Use and Floorspace
Data Collection and Integration*

*Submitted by:
Urbanomics
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NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

**DEMOGRAPHIC AND
SOCIOECONOMIC FORECASTING**

**PLAN FOR LAND USE AND FLOORSPACE
DATA COLLECTION AND INTEGRATION**

TECHNICAL MEMORANDUM No. 1.1.5.1

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Plan For Land Use and Floorspace Data Collection and Integration

1.1 INTRODUCTION

This memorandum describes work for the development of a plan for the collection and integration of land use and floorspace data. Data used to estimate current land use are drawn from a number of primary sources, including a tax parcel level Geographic Information Systems (GIS) database maintained by the New York City Department of City Planning (DCP), a compilation of tax parcel data from local assessors maintained by the New York State Office of Real Property Services (ORPS), and a statewide land use/land cover GIS dataset maintained by the New Jersey Department of Environmental Protection.¹ While in the past, analysis of the New York City and New Jersey data sources has been relatively straightforward, use of the data compiled by ORPS for New York State counties outside New York City has proved much more challenging. Because these data are ultimately collected and maintained by a large number of county and municipal agencies, there exist differences in data collection practices that affect the completeness and quality of data for any given area and which are carried over to the statewide compilation maintained by ORPS. Understanding the nature and extent of these issues, and their implications for estimation of current land use, has required an extensive process of analysis and evaluation. Though ORPS and various local agencies have been engaged in an ongoing process of improving the quality and consistency of tax parcel data and its usefulness for a range of functions beyond tax assessment, an initial review of data for various counties indicates that a substantial effort will be required to address these issues for the current base year land use data collection effort.

Evaluation of land use data involves a range of data integration, GIS processing, querying, reporting and mapping operations. Due to the limitations of software originally adopted for this work during the 1990s, these have been carried out in a variety of different applications including desktop GIS (ESRI's ArcView 3.1), statistical analysis (SPSS), and spreadsheet (Microsoft Excel) packages. The decision of ESRI to move to a database-oriented format for the storage, modeling and analysis of GIS data presents an opportunity to streamline the process of land use data evaluation within a single framework. Data storage, processing (both geographic and attribute-based), querying, analysis, and reporting can all be unified within ESRI's geodatabase framework, as discussed below. This can improve the efficiency and transparency of land use data analysis and evaluation. Improved evaluation can in turn be used to better target the identification of data deficiencies, the acquisition of supplementary data, and the development of estimates where necessary.

¹ For Connecticut, because no central source of land use data exists, current land use estimates have been based primarily on secondary data sources such as housing units and employment, supplemented by local information as available. See section 1.7, below.

A number of areas of work have been undertaken for this draft memorandum. The default data source for land use and floorspace estimates for New York State is the New York ORPS Real Property Data database of parcel records for 2005, also referred to as the RPS dataset.² This information has been obtained, assembled in a geodatabase, and coded by Census geography. Outreach has been conducted with county planning departments to fill outstanding gaps in the RPS data and a methodology has been developed to assess the quality of parcel data from various sources.

Because of the challenges related to the ORPS data discussed above, work for this memorandum concentrates on New York State counties outside of New York City and on land use in particular. Estimates of floorspace by land use class are to be developed in parallel with land use data. However, since data on floorspace are less easily available than land use data, floorspace data rely more heavily on estimation methodologies based on other data sources, including housing units and employment. These methodologies are briefly discussed below and will be described in more detail in the various subregion-specific Land Use and Floorspace Data Collection Technical Memoranda.

This memorandum begins with a general discussion of land use data collection methodology and sources. This is followed by several sections that focus on issues related to collection and evaluation of parcel data for New York State counties outside New York City, including the assembly of a parcel geodatabase; outreach efforts to county planning departments; supplementary sources of land use information beyond parcel records; and an evaluation framework developed to identify data deficiencies and target supplementary data collection efforts. There then follows a review of issues specific to New Jersey and Connecticut, where land use categories and data sources both differ from those used within New York State. This is followed by a section that discusses specific issues related to estimation of vacant land and land available for development. The memorandum concludes with an overview of floorspace estimation methods.

1.2 GENERAL LAND USE METHODOLOGY AND DATA SOURCES

The Land Use Model requires inputs of estimated base year land area by land use class at the Transportation Analysis Zone (TAZ) level. For all areas within New York State, estimates are required for the following categories:

1. Single Family Detached Residential
2. All Other Residential
3. Office
4. Other Commercial
5. Industrial
6. Institutional
7. Other Non-Residential
8. Vacant – Residentially Zoned
9. Vacant – Non-Residentially Zoned
10. Vacant – Not Forest Cover

² “RPS” means Real Property System, and refers to the software designed and distributed by ORPS for assessment administration.

For areas in New Jersey and Connecticut, estimates are required only for major land use categories as follows:

- Residential
- Non-Residential
- Vacant (Developable)
- Other

Different data sources are used that reflect the different levels of land use classification detail. For New York City and other areas in New York State, detailed tax parcel databases are used. For New Jersey and Connecticut more generalized sources are considered adequate. For each area (with the exception of Connecticut) a centralized data source exists that can be used as the primary basis for land use estimation.

For New York City, data on tax parcels have been assembled into a single database from a number of sources by the New York City Department of City Planning (DCP). This is made available to the public as a set of products, subject to the payment of licensing fee, and updated periodically.³ Though based primarily on assessors' data, DCP makes a number of improvements that enhance the data's usefulness for planning purposes, including the consolidation of individual condominium unit records into condominium complexes that are usually equivalent to single buildings, and incorporation of additional sources of information on open spaces.⁴ The following datasets were acquired from the New York City Department of City Planning:

- PLUTO™ (Primary Land Use Tax Lot Output) file version 05D
- Tax Lot Base Map Files™ version 05D
- Political and Administrative Districts version 05C: Borough Boundaries and Community Districts, 2000 Census Tracts, 2000 Census Blocks

For New York State counties outside New York City, a centralized source of parcel data is maintained by the New York State Office of Real Property Services (ORPS).

- Real Property Data 2005⁵

This dataset may also be referred to as the RPS dataset.⁶ Though these data are compiled in a standard format, it is important to note that they are collected from a large number of county and local tax assessment offices that vary considerably in terms of local data collection procedures. Metadata accompanying the RPS file indicates that a spatial check of east and north coordinates is the only review of submitted data conducted by ORPS staff. Additional documentation also notes specific municipalities where data are considered to be incomplete. In past land use data collection efforts, additional data quality and completeness problems were noted for other areas not explicitly cited by ORPS. On the other hand, datasets for some areas considered incomplete by ORPS contained substantial information that was usable as a basis for

³ See www.nyc.gov/html/dcp/html/bytes/applbyte.shtml. Last accessed March 21, 2007.

⁴ See Technical Memorandum No. 1.1.5.2, *New York City Land Use and Floorspace Database*.

⁵ This dataset is distributed through the New York State GIS Clearinghouse at www.nysgis.state.ny.us/gisdata/inventories/details.cfm?DSID=988. Last accessed March 21, 2007.

⁶ See footnote 2, above.

land use estimation when properly analyzed and supplemented by additional sources. Therefore, data obtained from ORPS must be carefully reviewed. A framework for this review has been developed and is discussed in detail below.

For New Jersey, land use estimates are based on a statewide land use layer maintained by the New Jersey Department of Environmental Protection and updated periodically. For Connecticut, no centralized source of data exists and estimates are based on a variety of data sources. New Jersey and Connecticut data sources are discussed further in section 1.7, while the remainder of this section will focus on general issues related to the parcel-based methodology used for New York City and other areas in New York State.

Using tax parcel records to tabulate acreage by land use and Census Tract or Transportation Analysis Zone (TAZ) is in principle a straightforward process. Under state law, the following data should be included in each parcel record:

- Property class code
- Lot area or dimensions
- Parcel location (point location or street address)

A land use classification can be assigned to each parcel based on the property class code. Census Tract location can be determined using a GIS overlay based on parcel point location (or, if point data are unavailable, by first geocoding the parcel record based on street address). Land area by land use type can then be summarized to the Tract or TAZ level.

In reality, however, developing land use estimates from parcel data is complicated by issues of data quality, availability, and interpretation. Because collection and maintenance of parcel data are ultimately the responsibility of a wide variety of county and local agencies, there exist substantial variations in data collection practices that affect data availability and quality. Since parcel data are maintained primarily for the purpose of tax assessment, less priority is sometimes placed on maintaining accurate and up-to-date information on non-taxable properties.

In prior land use data collection efforts, it was found that there were substantial problems with the availability and quality of real property data represented in the RPS file for the purpose of developing a consistent and complete set of land use estimates. The majority of the work effort was devoted to assessing data quality, seeking and evaluating alternate sources or making estimates where necessary, and assembling a database of as high a quality and consistency as possible.

The framework for data evaluation presented in subsequent sections of this memorandum has been developed to make this process more consistent and transparent. As mentioned in the introduction, due to the limitations of software originally adopted for evaluation of parcel data during the 1990s, this work has been carried out using a variety of different applications including desktop GIS (ESRI's ArcView 3.1), statistical analysis (SPSS), and spreadsheet (Microsoft Excel) packages. The move of ESRI to a database-oriented format for the storage, modeling and analysis of GIS data presents an opportunity to streamline the process of land use data evaluation within a single framework. The geodatabase is a format developed by ESRI for the representation and modeling of geographic information. It is based on standard

relational database management technologies and supports a number of database application formats including Microsoft Access, which will be used for this project. To support the process of land use database assembly and review, a number of different types of objects can be incorporated in the geodatabase, including:

- Tables representing parcel records.
- Tables representing correspondences between parcel property classifications and NYMTC land use classifications.
- Reports in which availability and quality of data are tabulated in a variety of ways for purposes of assessment and review.

In addition, because the geodatabase stores geographic data readable by ESRI's family of ArcGIS applications, data can be mapped to further facilitate review and analysis.

1.3 GEODATABASE ASSEMBLY

RPS data for 2005 were obtained by NYMTC from the New York State GIS Clearinghouse web site⁷ and conveyed to the consultant. RPS data are delivered as a set of ArcInfo export format point coverages. These coverages were converted to ArcGIS geodatabase point feature classes. Because land use data must be reported on a Census Tract basis, it was necessary to add Census location information to the RPS data. Census Tract, Block and Minor Civil Division (MCD) boundaries were downloaded from the GIS Clearinghouse web site. These are from the NYS Office of Cyber Security and Critical Infrastructure Coordination (CSCIC)'s Accident Location Information System (ALIS) project, under which an up-to-date set of statewide boundary layers has been developed.⁸ The layers were imported to geodatabase feature classes and Census Block and Tract codes were then added to the RPS data for each county using ArcMap's spatial join function.

Metadata accompanying the RPS data describes the completeness of the data set on a county basis. According to the metadata, the following outstanding gaps exist in the RPS data:

- Nassau County data include attributes only, no point locations.
- Suffolk County data are missing for the following towns: Brookhaven, East Hampton, Huntington, and Riverhead. Data are incomplete for Babylon and Islip.
- Westchester County data are missing for the following towns: Rye, Yonkers, Greenburgh, Harrison, Lewisboro, North Castle, Scarsdale, Somers, Yorktown

In order to fill these gaps, outreach has been conducted to the relevant counties as discussed in the following section.

1.4 OUTREACH TO COUNTIES

In conjunction with a planning outreach effort to county executives and planning staff conducted by the Metropolitan Transportation Authority (MTA), Urbanomics participated in a number of meetings at county offices throughout the Region during 2006. The goals

⁷ www.nysgis.state.ny.us

⁸ More information on ALIS is available at www.nysgis.state.ny.us/gisdata/inventories/member.cfm?organizationID=522.

of the land use data collection effort were discussed and contacts were made to assist in further data collection efforts. (See Table 1 for a list of agencies and contact persons.)

Based on these contacts, planning departments for Nassau, Suffolk and Westchester Counties have been contacted regarding data sources to supplement missing RPS data, as discussed in the previous section. License agreements have been obtained and signed for countywide parcel boundary datasets for both Nassau and Suffolk Counties.

According to Westchester County planning staff, parcel boundaries for that county are maintained separately by the various municipalities. The county GIS service has recently established a web page making available downloads of parcel data layers for selected municipalities and contact information for others.⁹ A town-by-town outreach effort will be necessary for those municipalities missing from both the county GIS web site and the RPS data set. To address the fragmented nature of tax mapping in Westchester County, the County government has recently launched a countywide study focusing on the feasibility of increased county participation in tax map maintenance and standardization. This study is funded by a grant from the New York State Office of Real Property Services, and involves the participation of county and municipal GIS and tax assessment personnel, with James W. Sewall Co. providing consultant support. According to the Westchester GIS newsletter, study findings and recommendations were scheduled for completion by the end of 2006.¹⁰ Prior to the development of land use data for the Mid-Hudson subregion, Urbanomics will attempt to obtain a copy of this study to gain a better understanding of current tax parcel mapping efforts in Westchester County, and will also contact county staff in charge of coordinating the study.

An additional effort has also been made to obtain parcel boundary layers for other counties. While this is not strictly necessary where RPS parcel centroid point data are available, boundary layers may still be helpful for a number of purposes, including providing a separate check on parcel acreage data reported in the RPS attribute table, facilitating more detailed land use mapping, and supporting further analysis during the development of TAZ forecasts. To date, a parcel boundary layer has been received for Dutchess County.

1.5 ADDITIONAL DATA SOURCES

In addition to parcel data, independent sources of information on land use have been collected from web sites of various county planning agencies and other planning bodies. (See Table 2 for a list of web sites reviewed.) These include county master plans, land use studies, estimates of vacant developable land, and studies on specific land use related topics such as agricultural land preservation and open space resources. This information can be used in future tasks to help assess the reasonableness of the land use estimates developed from parcel data. However, it should be noted that the usefulness of these sources can be limited by a number of factors. For example, land use categories vary between different studies and are generally not completely consistent with the categories used by NYMTC. Because counties in the Region do not conduct ongoing land use monitoring programs, land use studies tend to be conducted

⁹ See the Local Government GIS section of the Westchester GIS site, giswww.westchestergov.com.

¹⁰ "ORPS Update," *Westchester County Geographic Information Systems*, Volume 10, Number 2, Summer 2006, p. 2.

irregularly. Quantitative reporting of land use acreage, where it exists, is typically on a county or town basis and therefore lacks Census Tract level detail.

In spite of these limitations, these external land use data sources can be helpful in several ways. First, they provide a picture of the state of local knowledge of land use conditions. Second, they can provide information on the interpretation of parcel data, particularly for public and other non-taxable properties where assessor's data is sometimes incomplete. Planning data can also provide a more accurate picture of open space uses than is available in parcel records. Studies of vacant and agricultural land can help provide a reality check on parcel-based vacant land estimates. Finally, aggregate estimates of land use acreage at the town or county level can be incorporated into the post-classification screening process to be conducted on all Tract-level land use estimates, as described in the following section.

1.6 EVALUATION FRAMEWORK

In order to assess the completeness and quality of parcel data, both from the RPS and supplementary sources, development of a geodatabase based evaluation framework has been initiated. This includes development of a geodatabase schema, as well as a related set of queries, reports and thematic maps, as illustrated in Figure 1.

Assessment of land use data can be divided conceptually into three phases: pre-classification screening of parcel records; classification of parcel records by land use; and post-classification screening.

Pre-classification screening includes flagging parcel records to indicate missing or suspect data for the parcel attributes relevant to land use and floorspace estimation, including parcel acreage, property class, lot dimensions and floor area information where available. The set of attributes to be reviewed may be based on initial pre-classification processing, such as the determination of the best source of attributes such as lot area where multiple sources are available. Flagged records are then reported in a number of ways. Tabular reports at the county level indicate the overall quality of the dataset and any consistent problems in data availability and quality. Tabular reporting at the town level indicates more detailed patterns of land use data availability and quality. This is important because quality of parcel records can vary between different parts of a county based on local conditions and data collection practices. Therefore, a high level of data availability at the countywide level can mask problems for particular local areas. In addition to varying geographically, data availability can vary by type of property use. For example, information on public and non-profit uses that are not taxable may be less complete than other uses. Reports of data availability by property class type can therefore reveal problems with specific categories of use. Reporting on a town and property type basis can both be used to focus the collection of supplementary information based on plans, studies, and follow-up with local officials. In addition to tabular reporting, GIS maps of data availability are used to identify spatial patterns of data quality at both the parcel and town levels.

Classification of parcels by land use category is facilitated by a correspondence table, maintained in the database, which relates the parcels' property class codes to NYMTC's land use classifications. Based on the correspondence table, update queries are used

to add a land use class attribute code to each parcel record. (See section 1.2, above, for a list of NYMTC land use classifications.)

Once parcel records have been assigned an initial land use classification, an additional set of assessments can be carried out. Parcel acreage by land use class can be tabulated at the county and town levels. A review of these tabulations can reveal any obvious problems with underlying data or classification methodologies. In addition, these tabulations can be assessed against independent sources of aggregate land use data, including existing land use studies and information in master plans. For example, prior land use studies can be used to determine reasonability thresholds for indicators such as percentage of land devoted to residential or open space uses, or concentration of commercial uses in various municipalities. Any outstanding discrepancies or changes can be flagged for further review.

Because different sources of land use information vary considerably in terms of the classifications used, a further set of correspondence tables may be developed to support a more structured evaluation. These would include rules for relating NYMTC's land use categories to the various classification systems used by different studies. While these rules should not be taken to indicate a one-to-one correspondence, nevertheless rough comparability assumptions can be made that help identify problems in the parcel-based land use estimates. For example, NYMTC's Single Family Residential category might be assigned a correspondence with a Low Density Residential category used by an independent data source. Then database queries using SQL (Structure Query Language) can be performed to assess difference and percent difference between the two classifications on a town-by-town basis. Any major discrepancies between the two sources can then be flagged for further review.

In addition to tabular reporting and queries, the land use estimation geodatabase is designed to support links to GIS for mapping of land uses at the parcel and town levels. These can then be compared to land use maps collected from various plans and studies, as discussed in section 1.5, above.

The geodatabase schema, land use classification procedures, pre- and post-classification reporting, and GIS mapping links are designed to support an iterative process of land use estimation, review, and revision. As problems are identified, parcel data can be supplemented or revised, land use tabulations re-run, and new reports generated to assess the revised estimates.

1.7 NEW JERSEY AND CONNECTICUT LAND USE DATA

Unlike New York City and State, land use data collection for New Jersey and Connecticut relies on generalized land use data, where available, and on estimates based on Census and other data sources elsewhere. Land use classifications are required only for broad categories including residential, commercial and vacant land. Therefore, the parcel-based evaluation framework described above is not applicable in these areas.

For New Jersey, the primary land use data source is a set of generalized GIS Land Use/Land Cover layers maintained by the New Jersey Department of Environmental

Protection (NJDEP). The latest set of layers available represents spring 2002 conditions. Data are developed by visual interpretation of color infrared photography, which results in a set of GIS polygon layers where each polygon represents a distinct land use/land cover type. These files are provided by NJDEP on a Watershed Management Area (WMA) basis. GIS processing is therefore necessary to reassemble the data on a minor civil division (MCD) basis.

According to NJDEP, the current land use/land cover layers represent preliminary versions, and the structure and coding of the files may change with the final version. The latter is to be made available when the project is complete statewide. In addition, incremental changes to draft layers may be periodically published. Most changes are anticipated to occur near WMA boundaries as improvements to edge polygons are made after all WMAs are complete. The NJDEP data sets have been obtained and a draft set of land use estimates developed under Task 1.1.5.4, *New Jersey Land Use and Floorspace Database*.¹¹ The 2002 New Jersey land use data were updated to estimated 2005 conditions on an MCD basis based on an analysis of building permits data and prior changes in land use.

As in the past, there exists no suitable statewide source of land use data for Connecticut. In previous land use data collection efforts, a methodology was developed to estimate land use based on Census data for population and employment. This was supplemented by generalized land use layers as available from Regional Planning Organizations (RPOs). This effort will be repeated for the current land use database development effort under Task 1.1.5.6 (*Connecticut Subregion Land Use and Floorspace Database*). MCD level population and employment data for the 2002-to-2005 period have been assembled for Connecticut under Tasks 1.1.5.7¹² and 1.1.5.8¹³.

An additional potential source of useful statewide information is the University of Connecticut's Center for Land use Education and Research (CLEAR) program. This is a partnership between the Connecticut Department of Natural Resources Management and Engineering (NRME) and the Cooperative Extension System (CES), two units of the College of Agriculture and Natural Resources (CANR). CLEAR focuses on both education and training, and landscape research, based on a common foundation of remote sensing and GIS techniques. CLEAR operates a number of programs at scales ranging from the local to regional and statewide. These include topics such as coastal area land cover analysis, impervious surfaces, land cover change, and forest fragmentation. A forthcoming urban growth model may also provide useful information to land use estimation. These data sources will be assessed for their relevance to estimation of 2005 land use conditions under Task 1.1.5.6.

¹¹ Draft Technical Memorandum submitted February 15, 2007.

¹² *2005 SEDS Data Inputs for BPM*, draft Technical Memorandum submitted March 12, 2007.

¹³ *2002-2005 County/Subregion Time Series*, draft Technical Memorandum submitted January 10, 2007.

1.8 LITERATURE SEARCH ON LAND AVAILABLE FOR DEVELOPMENT ESTIMATION METHODOLOGIES

Estimation of land available for development represents one of the most important inputs for the forecasting of future patterns of land use change and travel demand. Various studies, both within the Region and elsewhere in the country where active growth management programs exist, have recognized the shortcomings of tax assessors' designations of vacancy as a sole source of information on land available for development. Because parcels are capable of being subdivided, parcel boundaries often represent arbitrary units of analysis in the estimation of vacant versus developed land. Several studies have shown that parcel subdivision represents a significant potential source of development in already built-up areas. Agricultural lands also represent a significant source of land development in many areas. However, the conversion of agricultural land to other uses is a complicated and often politically charged issue.

Based on the above considerations, one of the challenges for New York State counties is how to best reflect aggregate vacant land acreage at the Tract level based on parcel records. Therefore, a literature search has been conducted to identify appropriate methodologies to address this issue. Studies conducted within the Region may provide a direct source of information for vacant land analysis. For example, the *2001 Land Available for Development Long Island Sound Study*, conducted by the Suffolk County Department and released in April 2005, includes a detailed analysis for portions of that county. In other areas, such as Portland, Oregon, and Montgomery County, Maryland, growth management programs have funded significant research. The secondary literature has been reviewed for information on these efforts as well as relevant academic research.

The 2001 Suffolk County study defines land available for development as a superset of vacant land including additional land that has not been developed to the maximum extent permitted by municipal zoning law. This includes, for example, residentially zoned properties where subdivision is possible under residential density regulations, government surplus property, and large privately owned recreation parcels, such as golf courses and camps, capable of further intensification of development. Prior to the development of land use estimates a decision should be made on whether these or comparable categories would provide a useful extension of the concept of vacant land used for land use classification, which is currently based only on assessors' property class designations.

1.9 FLOORSPACE ESTIMATION METHODOLOGY

Direct information on floorspace by use type is generally more limited than data on land use. The major exception is New York City, where the Department of City Planning's PLUTO™ dataset contains parcel-level floor area broken down by a number of types. Even there, the level of floorspace classification detail is not nearly as great as the level of building classification detail. The RPS dataset, which is used as the major source for New York State counties, contains a single field for square feet of living area only. The land use data source for New Jersey contains no floor area data.

In the past, floorspace for areas outside of New York City has been estimated based on a combination of housing unit, building permit and employment data, together with

estimated floor area rates per housing unit and employee by industry. This method is described in detail in Technical Memoranda 8.41.2¹⁴ and 8.42.2¹⁵ and will be repeated for year 2005 conditions.

1.10 CONCLUSION

Additional work to implement the land use data evaluation framework discussed above is being conducted in conjunction with each of the subregional land use database development Tasks. Due to differences in source data, some variations in the framework are necessary on a subregional or county basis, particularly in the initial processing and pre-classification screening phases. Land use and master plan information collected in this Task will be reviewed for the development of correspondence tables between local and NYMTC land use classification systems, which can be used to support the post-classification review process under the various land use database development Tasks.

¹⁴ *Floorspace, Housing Units & Employment by Land Use: New York City & New York State*, Technical Memorandum submitted September 10, 1999.

¹⁵ *Floorspace, Housing Units & Employment by Land Use: New Jersey & Connecticut*, Technical Memorandum submitted September 30, 1999.

Table 1. Agencies Contacted in Outreach to Counties *

County/Subregion	Agency	Contact Persons
<i>Long Island Subregion</i>		
Nassau	Nassau County Planning Commission	Patricia Bourne, Bob Brickman
Suffolk	Suffolk County Planning Department	Tom Isles, Carrie Meek Gallagher
<i>Mid-Hudson Subregion</i>		
Dutchess	Dutchess County Department of Planning and Development	Rich Birch
	Poughkeepsie-Dutchess County Transportation Council	Kealy Salomon
Orange	Orange County Department of Planning	David Church, John Czamanske, Susan Metzger
Putnam	Putnam County Division of Planning and Development	John Lynch
Rockland	Rockland County Department of Planning	James Yarmus, Doug Schuetz
Westchester	Westchester County Department of Planning	Jerry Mulligan, Ed Burroughs
<i>New Jersey Subregion</i>		
	North Jersey Transportation Planning Authority	David Stein, Brian Fineman, Keith Miller, Kevin Twine
<i>Connecticut Subregion</i>		
	Connecticut Department of Transportation	Roxane Fromson, Peter Richter, Carmine Trotta, Donna Weaver, Paul Buckley
	Southwest Regional Planning Agency	Sue Prosi

*A series of strategic outreach meetings were conducted during the summer of 2006 and were attended by representatives of NYMTC, Urbanomics, the Metropolitan Transportation Authority, and various county and other agencies. The meetings concerned a range of issues relevant to NYMTC's current forecast updates and were not limited to land use issues.

Table 2. Web Sites Reviewed for Sources of Land Use Information *

Organization	URL
<i>Regionwide</i>	
Regional Plan Association	www.rpa.org
New York State Geographic Information Systems Clearinghouse	www.nysgis.state.ny.us
<i>New York City</i>	
New York City Department of City Planning Bytes of the Big Apple	www.nyc.gov/html/dcp/html/bytes/applbyte.shtml
<i>Long Island Subregion</i>	
Long Island Index	www.longislandindex.org
Long Island Geographic Information Systems Users Group	www.ligis.org
Nassau County Planning Commission	www.nassaucountyny.gov/agencies/Planning/index.html
Suffolk County Planning Department	www.co.suffolk.ny.us/webtemp3.cfm?dept=11&ID=131
<i>Mid-Hudson Subregion</i>	
Dutchess County Department of Planning & Development	www.state.nj.us/dca/osg
Orange County Department of Planning	www.co.orange.ny.us/orgMain.asp?orgid=53&storyTypeID=&sid=&
Putnam County Division of Planning and Development	www.putnamcountyny.com/planning/index.html
Rockland County Department of Planning	www.co.rockland.ny.us/planning/index.htm
Westchester County Department of Planning	www.westchestergov.com/planning/
Westchester County GIS Department	giswww.westchstergov.com
<i>New Jersey Subregion</i>	
New Jersey Department of Environmental Protection	www.state.nj.us/dep
New Jersey Department of Community Affairs Office of Smart Growth	www.state.nj.us/dca/osg
<i>Connecticut</i>	
University of Connecticut Map and Geographic Information Center	magic.lib.uconn.edu
CLEAR (Center for Land Use Education and Research)	clear.uconn.edu
NEMO (Non-point Education for Municipal Officials)	nemo.uconn.edu
Connecticut Department of Environmental Protection	www.ct.gov/dep

* Additional sources of detailed data will be investigated under each subregional Task

Figure 1. Land Use Estimation & Assessment Methodology Conceptual Organization

