

IISTPS Report 00-02

***A New Planning Template for
Transit-Oriented Development***

July 2000

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a publication of the
Norman Y. Mineta
International Institute for
Surface Transportation Policy Studies
IISTPS

Created by Congress in 1991

Technical Report Documentation Page

1. Report No. FHWA/CA/RM2000/06	2. Government Accession No.	3. Recipients Catalog No.	
4. Title and Subtitle A New Planning Template for Transit Oriented Development	5. Report Date July 2000		6. Performing Organization Code
	7. Authors Dick Nelson, John Niles, Aharon Hibshoosh		
9. Performing Organization Name and Address Norman Y. Mineta International Institute for Surface Transportation Policy Studies College of Business—BT550 San José State University San Jose, CA 95192-0219	8. Performing Organization Report No. 00-02		10. Work Unit No.
	11. Contract or Grant No. 65W136		
12. Sponsoring Agency Name and Address California Department of Transportation U.S. Department of Transportation Office of Research—MS42 Research & Special Programs Administration P.O. Box 942873 400 7th Street, SW Sacramento, CA 94273-0001 Washington, D.C. 20590-0001	13. Type of Report and Period Covered Final Report		14. Sponsoring Agency Code
	15. Supplementary Notes This research project was financially sponsored by the U.S Department of Transportation's Research and Special Programs Administration and by the California Department of Transportation (Caltrans).		
<p>16. Abstract: The Norman Y. Mineta International Institute for Surface Transportation Policy Studies (IISTPS) at San José State University assigned a project team to design a planning template for transit-oriented development (TOD) that incorporates an understanding of nonwork travel, that is, trips for shopping, eating out, and engaging in recreational and cultural activities. Nonwork trips are growing in significance and now account for four of every five person trips. At the same time, TOD has become a popular planning response to the impacts of metropolitan growth. Some planners believe that TOD will induce more pedestrian and transit trips, and will reduce the average length and frequency of household auto travel. This effect is assumed to result from improved accessibility to employment and nonwork venues located in compact, mixed-use centers. Planning professionals in many MPOs also suggest that if multiple centers are linked by high quality transit, such as light or heavy rail, access is enabled to the broad range of nonwork activities.</p> <p>The project arrived at these essential findings: (1) Venues for nonwork activities are very numerous and geographically dispersed. (2) The spatial environment for nonwork activities is the result of growing prosperity, technical innovation, and a dynamic, competitive marketplace. (3) The consumer marketplace will provide many more places to go than mass transit can cost-effectively serve. (4) Current metropolitan planning methods and modeling tools focus on the work trip and do not adequately account for the complexity of nonwork trips and their linkage to work trips.</p> <p>These findings support the need for a new regional planning process to complement current methods. One recommended approach is that metropolitan communities establish a Nonwork Travel Improvement Planning Process using a multidisciplinary expert advisory group interacting with a core, Internet-enabled professional transportation planning staff. An iterative interaction across varied but relevant skill sets could be achieved through a Backcasting Delphi process. The focus of the interaction would be on understanding the ramifications of consumer and retail industry behavior for TOD and other new transportation strategies, and then assessing the available strategies for cost-effectiveness in reducing the impacts of growth and automobility in a complex and uncertain metropolitan market environment.</p>			
17. Key Words regional urban planning nonwork travel transit-oriented development	18. Distribution Statement No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161		
19. Security Classif. (of this report) Unclassified	Security Classif. (of this page) Unclassified	21. No. of Pages 120	22. Price \$15.00

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Library of Congress No. 2001095678

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ACKNOWLEDGMENTS

The IISTPS Project Team for this study consisted of Dick Nelson, Research Associate and Principal Investigator, John Niles, Research Associate, and Professor Aharon Hibshoosh, Research Associate. Student assistant Rhys Rowland also contributed to this project by providing important assistance with the maps.

This document has been significantly improved because of constructive feedback received on earlier drafts from Jerry Schneider, Gary Lawrence, Scott Rutherford, Kenneth Dueker, Douglas Porter, Douglas Lee, Ed Mierzejewski, Richard Morrill, Susan Handy, Ed Risse, and Richard Willson.

The Project Team thanks the Staff of the Puget Sound Regional Council for critical data files that were used to prepare maps and tables.

The report authors integrated data from many sources and made numerous critical interpretations, and any opinions expressed are solely those of the authors.

The Project Team also thanks the Mineta Transportation Institute staff, especially Research Director Trixie Johnson for her guidance, and Communications Manager Jeanne Dittman and Student Editorial Assistant Robyn Whitlock for their editing and publishing assistance. The U.S. Department of Transportation's Research and Special Programs Administration and Caltrans funded this project through the Mineta Transportation Institute.

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EXECUTIVE SUMMARY

PROJECT OVERVIEW

The purpose of this project is to improve the planning methodology for Transit-Oriented Development (TOD) by bringing into sharp focus the dynamics of the retail marketplace and nonwork travel demand. TOD involves increasing the density of housing, offices, stores, and services around mass transit stations in an urban region, and making pedestrian access very easy, in order to encourage more use of transit and a reduction in automobile driving. TOD is intended to influence both travel to work (commuting and business travel), as well as all of the other reasons for local travel (so-called nonwork trips, including shopping and leisure travel). Specifically, the project has sought to:

- Analyze nonwork travel demand as influenced by retail market dynamics on a national and regional level.
- Review the state-of-the-art in regional transportation planning by Metropolitan Planning Organizations (MPOs) with respect to nonwork travel.
- Create a planning template for regional transportation and land use planners who are pursuing TOD that encompasses nonwork travel.

The central Puget Sound region of Washington State (four counties making up the Seattle-Tacoma-Bremerton-Everett metropolitan area) was used as a case study for the development of the template. The nonwork travel environment of the region was mapped and analyzed, and the findings generalized to other large metro regions. Of particular interest were the myriad “retail” activities from which consumers choose their shopping and recreational destinations. As a group, these activities generate more than half of all person trips: shopping for goods and services, eating out, entertainment, recreation, culture, and other leisure pursuits.

A basic planning template was designed that generates three new kinds of data: specification of the major nonwork venues that generate travel demand and that should therefore be mapped and spatially analyzed, listing of the forces shaping urban form that need to be monitored and understood for travel generation and land-use implications, and the identification of the factors that will determine the regional (not just station-area) success of TOD in stimulating a shift from driving to mass transit patronage.

The framework for measuring the success of TOD that we use throughout this project is comparing public costs to public benefits. According to this cost-

benefit framework, a necessary part of the regional planning process is comparing the estimated future benefits from TOD to the benefits from alternative investments. The most critical regional public benefits come from the expected market share shift from automobile to public transit: increased transit ridership, reduced average travel times and vehicle congestion, and measurable environmental gains such as improvement in air quality. In order for a TOD plan to be judged as successful in our framework, the plan's level of expected future benefits must be commensurate with the level of capital investments made to implement TOD. Those investments include new transit facilities and the financial incentives and other public costs incurred to shape private real estate development toward the more compact and mixed land use forms required to make TOD successful.

NONWORK TRAVEL: IMPLICATIONS FOR TRANSIT-ORIENTED DEVELOPMENT

Travel to nonwork activities has grown steadily over the last three decades in the United States. It now accounts for about three-fourths of all household vehicle trips and four of every five person trips. Nonwork is the major travel purpose even in weekday peak periods, both morning and afternoon. As people strive to make efficient use of valuable time, nonwork trips are increasingly linked into trip chains or tours involving several stops. This is true for travel to and from work as well as for travel to purely nonwork activities. More than half of all trips from work to home involve a stop to shop, pick up a family member, or conduct personal business.

The observed growth of nonwork travel is directly related to the relentless progression of changes that have occurred in the retail and consumer services marketplace. Technological innovation, combined with increasing wealth, has produced a greater variety of business opportunities and consumer choices.

Nonwork travel, because of its magnitude, has important implications for transportation and land use policy, particularly transit-oriented development. TOD is a policy response to the impacts of metropolitan growth and its effects, including traffic congestion and travel-related environmental impacts, and to the concern that growth patterns threaten the livability of American communities.

As TOD has been implemented, it has come to mean compact, mixed-use centers made up of residential units, offices, and stores, supported by and, in turn, supporting new rail transit investments. Pedestrian movement is emphasized, and parking is limited. The number of metro areas, large and small, that have embraced this approach to managing growth has increased over the last two decades to the point that it can be said that rail-TOD is one of

the most important urban planning paradigms in the United States. Federal policies, especially the land-use criteria that must be met to qualify for “new starts” fixed-guideway transit funding, encourage TOD.

These efforts are motivated by the belief that TOD will induce more pedestrian and transit trips and will reduce both the average length and frequency of household auto travel. This is assumed to result from improved accessibility to work locations and to better proximity to nonwork venues. Further, it is suggested that if multiple centers are linked by high quality transit, access is enabled to a broad range of nonwork activities across a metropolitan region.

SUMMARY OF FINDINGS

The research arrived at a number of key findings that support the initial project premise of a need for a new regional planning process to complement current methods.

- Although support for transit-oriented development is based, in large part, on the assumption that when venues for nonwork activities are located at TOD station areas more people will use transit, there has not been a careful analysis of the actual spatial environment for nonwork activity and the travel patterns it engenders.
- The consumer marketplace for goods, services, eating out, and leisure activities in a metropolitan region is exceedingly large, varied and geographically dispersed. For example, a map prepared by the authors (Figure 3-4) indicates the locations of approximately 1900 major nonwork destinations in the Puget Sound region, overlaid on the 21 urban centers around which TOD will be emphasized.
- The number and location of, and the spatial relationships for, the myriad nonwork venues is the result of growing prosperity, technological innovation, and a highly adaptive entrepreneurial market that seeks to satisfy consumer needs and wants.
- Nonwork activities, which now account for approximately two-thirds of all personal travel, will continue to grow in variety as wealth and prosperity spread, and as the nation becomes more ethnically diverse.
- Since the consumer marketplace for goods and services will inevitably provide many more places to go than mass transit can effectively serve, the success of TOD as measured by less automobility cannot be taken for granted.
- Even the choice of mode for the work trip is determined in large measure by nonwork activities, as people make stops during the commute to shop,

- drop off and pick up family members, and conduct personal business.
- For the purpose of gauging the success of TOD, it is important to distinguish between local (station-area) benefits and costs, and corridor or regional benefits and costs.
 - Academic research to date suggests that neotraditional forms of development in a station area, such as grid street patterns and compact, mixed-use centers, alone will not have a significant impact on personal travel patterns.
 - A benefit-cost ratio for the TOD paradigm that is superior to other investments that increase transit market share may not be an *a priori* possibility in every metropolitan region. Regions differ greatly from each other in their existing land use pattern, travel pattern, transit corridor availability, topography, political culture, and governmental structure. One size does not fit all.
 - Metro regions may discover greater net public benefits by exploring a wider range of paradigms that encompass other strategies for dealing with the large growth in automobility associated with nonwork activities.
 - The current metropolitan planning process is focused on the work trip and produces a limited set of strategies that do not bracket the range of possible cost-effective alternatives that are needed to address the variety and volume of nonwork travel.
 - If a broader search for cost-effective alternatives is to be carried out, a new complementary planning process is required, one that involves a much wider and deeper knowledge base and range of expertise than is typically included in the current process.
 - Unlike the current process, the new planning process must be able to account for the inherent complexity of human behavior and associated land use and travel patterns, and it must address the large uncertainty attached to the prediction of future patterns and the impact of government actions on these patterns.

RECOMMENDATIONS

In response to these findings, we recommend:

- Development and testing, in a few metro areas, of an explicit augmentation to the metropolitan planning process that responds to complexity and uncertainty, and that deals with nonwork travel in the context of transit-oriented development.
- In response to the realities of and reasons for consumer behavior and retail

industry practices as seen now and as predicted for the future, the new process should strive to specify ways that TOD can be strengthened so that consumers more often use mass transit and walking to shop and recreate. This specification would describe how and to what extent the market economy can be influenced to support TOD land use patterns.

- If, on the other hand, the recommended augmentation to the process reveals that transit investments and government policies cannot realign the market to yield a larger transit market share in the urban travel market, then the planning process should direct attention to the specification of paradigms other than TOD.

A Backcasting Delphi process, previously used to predict the efficacy of transportation and land use strategies outside the US, can be a useful supplement to the current method. It is expected that each metro region that uses the process will elaborate on the basic template to meet their specific circumstances and needs. The process would have the following key characteristics and elements:

- Defining the problem in terms of desirable behavior change to be achieved as measured by actual improvements in transportation system performance and environmental externalities, as opposed to simply providing options for behavior change.
- Focusing on choice of mode for travel to nonwork activity.
- Creating a knowledge-based understanding of nonwork activity and travel trends in the region, including new trends that are difficult to quantify but that may affect future travel and land use patterns.
- Designing the process to be carried out either by the MPO as an augmentation to existing procedures, or else by a civic organization acting in parallel to complement the existing MPO process.
- Recruiting and using multidisciplinary professionals in a structured, interactive process in which they share ideas and learn from each other and educate the regional leadership and populace.
- Employing an iterative process (Backcasting Delphi) of designing feasible transportation investments and strategies with costs and risks that are justified by the likely transportation performance to be achieved.

Although the focus of the research leading to the above recommendations was on nonwork travel, we suggest that the supplementary planning process examine the growing geographic dispersion of employment sites, the diverse requirements of journeys to work and work-related travel, and the increasing

linkage of work and nonwork trips in complex trip chains. In other words, all trip types in a metropolitan area should be covered in the planning process we have sketched in this report. The planning template would be useful whether or not the metro region has embarked, or plans to embark, on TOD.

The USDOT should support the refinement and testing of the new planning tool through its grant process, just as it now supports conventional regional planning.

Several actions should be taken to provide empirical data and other information in support of TOD planning, whether or not it is undertaken with the recommended planning process.

- Federal and local government consumer surveys should be structured to shed more light on the reasons people choose to live in a TOD. This would help in understanding whether TOD attracts people other than current transit users.
- Similarly, surveys should identify the locations for nonwork stops on the commute trip to assist in understanding the malleability of these locations, i.e., can they be induced to relocate to station areas?
- Studies should be undertaken of how well older neighborhood commercial areas and central business districts have adapted to the changes that have occurred in the larger retail marketplace.
- Research should be conducted to identify and catalog existing and emerging retail goods and services business strategies that have demonstrated synergy with the public policy requirements (for example, floor space and parking limitations) of locating facilities within transit-oriented developments.
- Other nonwork, nonretail activities may involve personal choices that result in trips outside the household's immediate neighborhood even though there are closer opportunities. The travel patterns associated with these activities, such as visits to the family doctor, and trips to school and church, should be investigated.

PROJECT REPORTS

During the course of the project, the authors produced five documents that are referenced in this final report. These documents, summarized below, are available for access and review at <http://www.globaltelematics.com/mineta/>

Report One, The Growing Importance of Nonwork Travel: The first report summarizes national trends for nonwork activities and travel patterns. Growth of nonwork travel is related to the changes that have occurred in the retail and

consumer services marketplace, particularly in shopping for goods and services, eating out, and engaging in leisure activities. The travel impacts of these activities estimated by aggregating four of the trip purposes in the Nationwide Personal Transportation Survey (NPTS): shopping, eating out, recreation, and other kinds of personal business. In the NPTS of 1995, these four categories encompass 54 percent of person trips. Report One also assesses the state of the art in the modeling of future nonwork travel behavior.

Report Two, Preliminary Template Design: In the second report, the TOD paradigm and the impetus for its widespread adoption is described. The report reviews the limited experience of TOD's effect on travel and land use patterns, and it summarizes the growing critique of TOD's benefits compared to its costs as measured by changes in regional transportation systems performance and development patterns.

A new Nonwork Travel Improvement Planning Process (NWTIPP) is proposed that would provide additional guidance to metropolitan decision makers beyond the traditional transportation planning protocol that focuses on journey-to-work and four-step demand modeling. The NWTIPP centers on aggregating diverse expert opinion, and is intended to cope realistically with considerable complexity in the present and with much uncertainty about the future.

Report Three, Prototype Nonwork Database: The third report presents an example database of maps, tables, and commentary that would serve as a key input to the Nonwork Travel Improvement Planning Process sketched in the previous report. The central feature of this database (covering for purposes of illustration, the Seattle metropolitan region in western Washington State) is a series of maps that illustrate key elements of the retail and consumer services environment that generate nonwork travel. Other parts of the database include information on residential and employment conditions, transportation system performance, land use planning status, current planning tools now used in the region, and a summary of exogenous forces potentially shaping activities, land use, and travel.

Report Four, Revised Template Design: This document revises the template in Report Three based on a more thorough review of the literature for the Backcasting Delphi procedure and recent research on transit-oriented development, and the completion of the prototype nonwork database assembled in Report Three.

Report Five, Final Template Design: The fifth report sets out the final template design that was arrived at after submitting the revised design to a peer review of transportation and land use planners.

Nonwork Travel Improvement Planning Process

Project Title: A New Planning Template for Nonwork Travel and Transit-Oriented Development

What's this research about?
[Read the project overview here.](#)

- [Final Report from Mineta Transportation Institute in PDF Format \(2.5 MB\)](#)



- Executive Summary of Final Report

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- [Biographical information on Project Leader Dick Nelson and project researcher John Niles.](#)
 - [Report Number One \(updated to reflect comments\) is here in Adobe Acrobat format \(PDF\).](#) 311 KB
Title is "The Growing Importance of Nonwork Travel."
 - [Report Number Two \(updated to reflect comments\) is here in Adobe Acrobat format \(PDF\).](#) 331 KB
Title is "Preliminary Template Design."
 - [Report Number Three \(updated to reflect comments\) is here in Adobe Acrobat format \(PDF\).](#) 1.32 MB
Title is "Prototype Nonwork Database." Does not include retail map appendix, available separately, next.
 - [The appendix from Report Number Three containing 17 maps showing retail site locations is here in Adobe Acrobat format \(mapbook.pdf\).](#) 1.15 MB
 - [Sample map from Report Number Three](#) in htm format. 80 KB. The point of the maps is to illustrate variety and dispersion in shopping, recreation, and cultural activities that are the destination of non-work travel. These maps cover the central Puget Sound region. Data were obtained from Puget Sound Regional Council, and from Yellow Pages listings.
 - [Report Number Four is here in Adobe Acrobat format \(PDF\).](#) 277 KB
Title is "Revised Template Design."
 - [Report Number Five is here in Adobe Acrobat format \(PDF\).](#) 192 KB
Title is "Template Review Forum & Final Template Design."

Questions or comments? Contact Dick Nelson and John Niles as follows:
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or call Dick Nelson at 206-781-0915 in Seattle,
or leave a message at 1-800-767-9493 with some good times to call back,
or fax comments to 206-374-2705

[Access to our earlier papers on TOD and nonwork travel \(three for TRB and one for APA\)](#)

[Access to Dick Nelson's earlier papers on least-cost transportation planning](#)

Links to related information:

- Professor Jerry Schneider's active website on [Transit-Focused Development](#).
- [King County \(Seattle\) Washington's web site](#) on Transit Oriented Development
- This search engine Google generates over a [thousand hits for "transit oriented development."](#) Most of these are about particular station-area projects, or about guidelines for station-area development. Our interest as the researchers in this project is the metro area region-wide transportation system performance likely from TOD. Would TOD at ten, or even twenty transit stations in a new system make any difference in how much people drive their cars?

[Home page of the Mineta Transportation Institute at San Jose State University.](#)

Our San Jose State faculty colleague for this project is [Professor Aharon Hibshoosh](#).

We are appreciative of the research funding support from Mineta Institute. All research and analysis for this project has been conducted independently, and our work does not necessarily represent the views of this Institute.