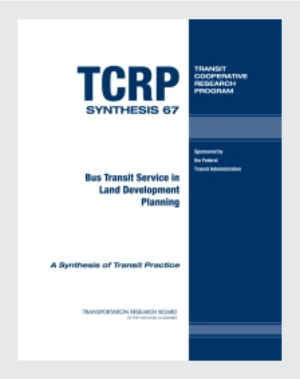


# Bus Transit Service in Land Development Planning

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Mary Kay Christopher; Transportation Research Board

TRANSIT COOPERATIVE RESEARCH PROGRAM

TCRP SYNTHESIS 67

# Bus Transit Service in Land Development Planning

## *A Synthesis of Transit Practice*

**CONSULTANT**
MARY KAY CHRISTOPHER
MKC Associates
Berwyn, IL

**SUBJECT AREAS**
Public Transit

Research Sponsored by the Federal Transit Administration in Cooperation with the Transit Development Corporation

**TRANSPORTATION RESEARCH BOARD**

WASHINGTON, D.C.
2006
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## FOREWORD

*By Staff*
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Transit administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the transit industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire transit community, the Transit Cooperative Research Program Oversight and Project Selection (TOPS) Committee authorized the Transportation Research Board to undertake a continuing study. This study, TCRP Project J-7, "Synthesis of Information Related to Transit Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute a TCRP report series, *Synthesis of Transit Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

## PREFACE

This synthesis will be of interest to transit planners and managers and to those who work with them to develop relationships with local governments and other stakeholders that improve the integration of bus transit and land development. It documents the relationship between bus transit service and planning for new developments. This synthesis identifies successful strategies that assist in the incorporation of bus transit service into land developments, as well as the challenges that transit agencies face when attempting to do so. It also provides the state of the practice regarding the use and components of transit agency development guidelines.

A literature review is presented, along with a discussion of survey results from 32 transit agencies that shared their experiences with land development. Five case studies highlight successful coordination efforts between bus transit planning and land development planning.

Mary Kay Christopher, MKC Associates, Berwyn, Illinois, collected and synthesized the information and wrote the report, under the guidance of a panel of experts in the subject area. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

# CONTENTS

# BUS TRANSIT SERVICE IN LAND DEVELOPMENT PLANNING


## SUMMARY

The purpose of this synthesis project is to document the relationship between bus transit service and planning for land development. The project identifies successful strategies that assist in the incorporation of bus transit service into land development, as well as the challenges that transit agencies face when attempting to do so. The synthesis project included a literature review, a survey of selected transit agencies, and development of case studies.

The literature review revealed that there is relatively little research on the relationship between bus transit and land development. There is substantially more research devoted to the relationship between land development and the various rail modes. More research is needed that specifically addresses bus transit and its relationship to land development.

A survey was conducted of selected transit agencies to determine transit agency experience with land development. Fifty-one transit agencies meeting particular criteria were selected to participate. Thirty-two agencies from 19 states and the District of Columbia responded. Transit agencies were asked what factors contribute to the successful integration of bus transit with developments and the challenges associated with that process. Some of the successful strategies mentioned by the responding agencies included strong comprehensive planning, good communication and coordination with local government, partnerships with building owners and developers, and transit-supportive zoning. The major challenge associated with integrating bus transit into land development is the lack of transit agency resources to plan for land development or to provide new or expanded bus service to serve the development. In addition, the survey identified transit agencies that had produced transit agency development guidelines to assist developers in integrating transit into their developments (see Appendix C).

The following five case studies were undertaken to detail successful developments that incorporated bus transit in their design: the Central Florida Regional Transportation Authority (LYNX) in Orlando, Florida; Centre Area Transportation Authority (CATA) in State College, Pennsylvania; Omnitrans in San Bernardino, California; Metro Transit in Minneapolis, Minnesota; and GO Boulder in Boulder, Colorado.

The synthesis resulted in the following primary findings:

- Bus transit elements are not often considered when planning land developments. The survey revealed that many transit agencies are frustrated by the lack of impact that they have on land development plans. The transit agencies that were successful in integrating bus transit into land developments were generally involved early in the development's design.
- All stakeholders in the land development process agree that transit must be considered early in the planning process for bus transit to be appropriately integrated into the development. Transit agencies identified the following strategies that enabled early participation: solid support by local government officials, a strong land development planning process, and good coordination and communication with local planning and/or government staff.

- There is a lack of resources available to transit agencies to plan for land development and to provide new or expanded service to new developments, and the problem is widespread among transit agencies. It is difficult to negotiate with a developer for transit amenities within new developments when there is no guarantee that transit will be provided. Some transit agencies have been successful in negotiating operating cost subsidies with developers and building owners, although such subsidies are not available in all cases. The issue of transit financing will continue to be a challenge for the foreseeable future.
- Transit agency development guidelines have been used to help integrate bus transit in land developments. Such guidelines provide information on the material needs of transit in the physical environment. Nine respondents provided copies of their guidelines for this report, with content ranging from only a few pages describing bus stop requirements to multiple volumes covering all aspects of land development. The content of the guidelines reflects the issues and concerns that predominate in the respective communities. Because a relatively small number of transit agencies have developed guidelines, it is likely that the industry would benefit from the preparation of a handbook that outlines the preparation and content of transit agency development guidelines.
- Guidelines are used by transit agencies to inform developers of transit needs. At some transit agencies [notably LYNX, King County Metro (Seattle, Washington), and Tri-County Metropolitan Transportation District of Oregon (TriMet)], distribution of guidelines to developers is required as part of the planning or permitting process. Four agencies reported that the guidelines were distributed as a result of formal meetings or informal conversations. Distribution of the guidelines to all stakeholders can be improved by providing the guidelines on transit agency websites. Only four of the nine transit agencies with guidelines currently make them available on the web. Sharing the information in this way could raise awareness of transit's needs within developments among all stakeholders. It could also enable a form of technology transfer among transit agencies that could learn from the experiences in other areas.
- A mix of strategies appears to be the best course of action when integrating bus transit with land development. There are many challenges that bus transit must overcome to successfully integrate with land developments. Cooperation among all stakeholders is needed to develop solutions and strategies that will address the challenges that inhibit the integration of bus transit and land development. Developing a mix of strategies can build relationships among stakeholders and generate interest. Different strategies are needed to fund the operating costs associated with new or expanded bus service. Still other strategies are required to ensure that adjoining land uses are transit-supportive.

CHAPTER ONE

# INTRODUCTION

Bus transit provides many benefits to transit riders, the environment, and the business community. Transit serves low income populations that have no other travel alternatives, but also increasingly serves higher income groups who choose to ride transit because it is cheaper and less stressful than driving. The availability of transit allows for higher density of development and increases the market area of adjoining businesses.

To support transit users there must be coordination between transit agencies and land development projects. This coordination extends beyond the bus stop or the street on which the bus operates. Access to transit from the surrounding environs is as important as the service itself. If access to a bus stop is blocked by physical barriers, such as iron fencing or busy arterial streets without safe crosswalks, then the transit service is effectively unavailable.

Influencing the form of land use and new development is not usually within the scope of transit planners. That responsibility generally rests with local elected officials. Transit planners must build relationships with local governments and other stakeholders to improve the integration of bus transit and land development.

## PROJECT BACKGROUND AND OBJECTIVES

This synthesis documents the relationship between bus transit service and planning for land development. It identifies practices that are used to ensure that transit interests play a meaningful role in the planning and design of new developments. The synthesis also provides the state of the practice regarding the use and components of transit agency development guidelines.

## TECHNICAL APPROACH TO PROJECT

This synthesis is based on a literature review, a survey of selected transit agencies, and development of case studies.

The literature review was conducted to assess the body of research available on this subject. On-line searches were conducted using a variety of government and university databases, including the Transportation Research Information Services (TRIS). Documents directly related to this subject are included as references throughout this report and in the Bibliography. The Bibliography also includes websites that contain relevant and interesting information on this subject.

Transit agencies were surveyed to determine their experiences with land developments. Questions were posed to examine various aspects of the development process, including levels of coordination, relationships with stakeholders, and an assessment of how soon transit is considered in development planning. Agencies were asked to provide examples of successful as well as unsuccessful projects.

The survey of selected transit agencies also explored the purpose and use of transit agency development guidelines. The components of the guidelines were identified and copies of guidelines were requested. In addition, the survey provided an opportunity for transit agencies to answer open-ended questions to probe for best practices and major challenges.

Five case studies were developed to highlight successful coordination efforts between bus transit planning and land development planning. The case studies are the Central Florida Regional Transportation Authority (LYNX) in Orlando, Florida; the Centre Area Transportation Authority (CATA) in State College, Pennsylvania; Omnitrans in San Bernardino, California; Metro Transit in Minneapolis, Minnesota; and GO Boulder in Boulder, Colorado.

## REPORT ORGANIZATION

This report is organized into the following chapters:

- Chapter One—Introduction
- Chapter Two—Literature Review
- Chapter Three—Survey Results
- Chapter Four—Case Studies
- Chapter Five—Challenges to Integrating Bus Transit Service and Land Development Planning
- Chapter Six—Strategies That Support Integration of Bus Transit Service and Land Development Planning
- Chapter Seven—Use and Application of Guidelines to Incorporate Bus Transit Service into New Developments
- Chapter Eight—Conclusions

References and a Bibliography are provided at the end of the report. Appendixes include the survey questionnaire annotated with number of responses (Appendix A), a list of agencies that responded to the survey (Appendix B), and a list of transit agencies that provided transit agency development guidelines (Appendix C). Web links are provided for those agencies with on-line guidelines.

CHAPTER TWO

# LITERATURE REVIEW

This synthesis provides insight into the relationship between bus transit planning and land development planning. A literature review was undertaken to determine the current state of the practice and was conducted using a variety of sources. An on-line search of TRIS was done that yielded many source documents. Additional searches were conducted using other on-line databases; these included the Mineta Transportation Institute, The Brookings Institution, and Northwestern University. Internet searches also found several state and local government websites that contain interesting and pertinent information.

The literature review revealed that there are very few traditional research documents available on the specific topic of coordinating bus transit planning and land development planning. There is a large body of research on transit-oriented development (TOD), joint development, urban villages, and new towns. This literature is primarily focused on development at rail stations, with very little written specifically for bus service. There are however applications of this research that can be transferred to bus transit and these applications are discussed in the report when appropriate.

In addition to a general search of the relationship between bus transit and land development planning, the literature review also investigated two specific aspects of this synthesis effort: transit-supportive regulations and measures of success. However, there are few documents available on either of these topics. Some literature is available on regulations to reinforce transit-supportive development. For the most part, these regulations were written with rail transit in mind, although in some cases the regulations can be applied to bus service. There is a minimal amount of information available on how to measure the success of various transit-supportive actions. These two topics are discussed further later in this chapter and in the body of the report.

The Bibliography at the end of this report and the references throughout this document include reports, books, and articles that can be applied to bus service, although many were written with rail service in mind. Also included in the Bibliography are websites that provide useful and relevant information. The remainder of this chapter reviews the literature in three subject areas: Bus Transit and Land Development Planning, Transit-Supportive Regulations, and Measurements of Success.

## BUS TRANSIT AND LAND DEVELOPMENT PLANNING

A study of transit-supportive development by Robert Cervero (1993) focused on development experiences in the suburbs of large metropolitan U.S. cities where bus transit service predominates. The study examined how recent market and regulatory factors have influenced transit-supportive design. It found few significant examples of transit-supportive suburban projects.

The study effort also included a review of transit design guidelines. The author surveyed 165 transit properties and found that 26 had guidelines in place and an additional 12 agencies were in the process of developing guidelines. The report includes a short section on the preparation of guidelines and provides a section on "Good Practices" in the development of guidelines. Cervero concluded that the guidelines are a useful promotional and marketing tool. The production of guidelines positively raises awareness of transit-supportive development and is helpful to local planning agencies in reviewing development proposals. However, transit officials responding to Cervero's survey were unable to identify many development projects that could be classified as transit-friendly in their design.

Much has been written on the subject of TOD, joint development, new towns, and urban villages. There is excitement in many planning circles over the potential of these types of development to improve the overall quality of life by helping to manage congestion and improve air quality, among other benefits. The literature on these types of developments is overwhelmingly associated with rail service. There are several reasons for this bias towards rail service. Rail service is perceived as being more "permanent" than bus service, because buses can generally be easily rerouted. Rail is also perceived as having a higher level of service and therefore is more competitive with the automobile. Lastly, rail service attracts and supports higher densities of development than typical bus service. As bus rapid transit (BRT) systems increase in number, perhaps more examples of TOD for BRT will be documented. Until then, although existing literature does have some application to bus systems to identify good planning practices and regulatory solutions, there is very little literature directly relevant to bus-based TOD.

A good example of TOD research in the literature is *TCRP Report 102: Transit-Oriented Development in the United*

*States: Experiences, Challenges, and Prospects* (Cervero et al. 2004). This report provides a good overview of TOD and its current state of the practice in the United States. The majority of the projects discussed are centered on train stations. However, the study also reviewed bus transit TOD projects in Boulder, Colorado; Roaring Fork Valley, Colorado; Los Angeles, California; and City Heights in San Diego, California.

In Los Angeles, development activity has centered on rail-oriented TOD projects. However, future Metro Rapid BRT projects have the potential to generate development activity. Cervero et al. observed a lack of new TOD development along existing BRT lines and provided the following factors to explain why development was lagging:

- Owing to lower ridership levels, BRT systems are less attractive to developers than rail systems.
- Developers and investors do not view BRT systems as permanent because they do not require a high capital investment in facilities—inadequate public investment seemingly discourages private investment.
- Metro Rapid BRT was originally envisioned to serve already densely developed corridors and, as a result, vacant land for new development along these corridors is unavailable.

Transit agencies contemplating BRT systems should consider these issues early in the planning process. Such issues indicate that it may be difficult to persuade building owners and developers along the corridor to incorporate amenities for BRT.

Bus TOD projects in the remaining three areas—Boulder, Roaring Fork Valley, and San Diego—are the result of pressures from existing land use, geography and social economics. Bus transit did not have a formative role in these TOD developments. In Boulder, the open space program and the local government's proactive stance toward compact development has positively influenced the formation of TOD projects. The creation of Boulder's unique transit system, the Community Transit Network, is an indirect outcome of the area's growth management policies. In Roaring Fork Valley, geography and land use combined with increasing congestion generated a compelling need for transit service. With only one way in and out of the valley (State Highway 82), severe congestion and high travel times have become commonplace. In an attempt to solve these problems, local governments are adopting policies to support transit, in some cases in the form of operating and capital assistance. In City Heights, San Diego, the impetus behind the effort was economic redevelopment. The City Heights Urban Village development is served by three bus routes that connect the development to downtown San Diego and job opportunities to the north. In all three of the bus TOD projects, bus transit was the obvious and most reasonable solution to existing problems; local decision makers sought out transit to alleviate a pressing problem. These situations are not typical and transit agencies generally do not enjoy such attention in the normal day-to-day operation of bus transit systems.

The literature provided mixed assessments on the success of TOD, joint development, new towns, and urban villages to produce the benefits associated with improved quality of life. Much of this is attributable to the difficulties associated with measuring these benefits. Still, given the recent interest in station-based TOD and the many projects that have been constructed since the mid-1990s, a stronger track record of success would be expected. If rail service has not yet produced a compelling record, then the ability of bus transit to produce quality-of-life benefits will likely be harder to prove. Additional research is needed to produce valid measurements of success for transit-supportive land uses.

## TRANSIT-SUPPORTIVE REGULATIONS

Regulations involving land development are written by state and local governments to guide land use and comply with written policies and plans. Some states have implemented regulations requiring developments to comply with local comprehensive plans. In most areas, local governments are responsible for the structure of land use. Zoning is the most common form of implementing local policies and meeting local goals.

TriMet (Tri-County Metropolitan Transportation District of Oregon) in Portland, Oregon, produced the report, *Planning and Design for Transit Handbook* (1993) that, although written for the Portland area, lays out general possibilities associated with transit-supportive zoning. Chapter five of that report focuses on how transit-supportive development concepts can be implemented through comprehensive planning and zoning. This narrative is supplemented and supported by an appendix, which provides "model regulations" for local governments to use when developing local development codes and zoning ordinances. The model regulations are organized as follows:

- Transit Corridor Overlay District
- Moderate–High Density Pedestrian Overlay District
- Low–Moderate Density Pedestrian Overlay District
- Specific Plan District for Transit Supportive Development
- Urban Planned Unit Developments
- Supplemental Development Standards for Transit Supportive Development
- Use Classifications
- Definitions.

Similar to the TriMet report, the American Planning Association has published *Creating Transit-Supportive Land-Use Regulations* (Morris 1996). The purpose of this report is to assist stakeholders in the development process by providing sample legislative language to implement transit-supportive goals and policies. The book is organized into four chapters

representing various aspects of implementation measures. Listed here are the four chapters and a sampling of the topics included in each chapter.

- Chapter 1: Transit- and Pedestrian-Friendly Site Design
  - Pedestrian and bicycle pathways
  - Building orientation and setback
  - Transit stops, shelters, and benches
  - Landscaping and open spaces.
- Chapter 2: Parking
  - Location
  - Reducing supply
  - Preferences for rideshare vehicles
  - Parking lot design, including pedestrian paths within the lot
  - Bicycle parking.
- Chapter 3: Mixed-Use Development
  - Mixed-use developments in the CBD (central business district)
  - Commercial districts
  - Mixed-use within a single building
  - Ground floor requirements
  - Measures to provide amenities.
- Chapter 4: Increasing Density to Support Transit
  - Single-family neighborhoods
  - Planned residential developments
  - Multifamily options
  - Establishment of minimum densities
  - Incentive approaches.

Both of these documents provide a helpful resource for areas that are investigating regulatory methods to encourage transit-supportive development. They provide sample language that planners can use to draft new transit-supportive regulations.

## MEASUREMENTS OF SUCCESS

Bus transit improves access to developments and increases the market area of a development by bringing more people to it. Transit agency staffs intuitively understand that bus transit adds value to a development. However, it is often the case that developers and local government officials do not understand the transit/land development relationship, or do not believe that transit can be beneficial.

Measurements of success are necessary to convince developers and local governments that integrating transit into new land developments has value. Determining how to measure the success of this arrangement can be difficult because there are so many factors that affect the success of a development. Furthermore, each stakeholder in the land development process has its own way of measuring success. Transit agencies generally use the number of riders as their guiding principle, whereas developers rely on economic indicators to measure the success of a project and community organizations typically measure success with quality of life considerations.

*NCHRP Research Results Digest 294: Transit-Oriented Development: Developing a Strategy to Measure Success* (Renne et al. 2005) identified useful indicators to measure the success of TOD. These measures can be applied to most land development–bus transit coordination projects and include:

- Transit ridership,
- Density,
- Quality of streetscape design,
- Quantity of mixed-use structures,
- Pedestrian activity and safety,
- Increase in property value and tax revenue,
- Public perception,
- Number of mode connections, and
- Parking configuration.

Several of these indicators are difficult to measure because they require qualitative judgment (e.g., quality of streetscape design and public perception); however, these difficulties can be overcome. These indicators can be used to measure the success of integrating bus transit into any land development and provide a good starting point for identifying additional measures.

CHAPTER THREE

# SURVEY RESULTS

A survey of select transit agencies was conducted to obtain the perspective of transit agencies regarding the coordination of bus transit and land development. Sixty transit agencies were selected to participate in the survey. These agencies were chosen to participate if they met one or more of the following criteria:

- Recommended by a topic panel member,
- Participated in FTA's BRT demonstration program,
- Identified during the literature review, or
- Provided balance in terms of size or geographic location.

A total of 32 completed surveys were returned in time for inclusion in this report.

The survey was divided into the following six sections:

A. Transit Agency Characteristics
B. Stakeholders and Communications
C. Transit Agency Development Guidelines
D. Transit-Supportive Strategies
E. Experience in Integrating Bus Service in New Developments
F. Open-Ended Opinions (In Your Opinion . . .).

The survey questionnaire is provided in Appendix A. The number of responses to each question is shown in parentheses on the survey instrument. A summary of the responses by section is provided here.

### SECTION A. TRANSIT AGENCY CHARACTERISTICS

The first section provided contact information on the survey respondents as well as transit agency characteristics in terms of size and modes provided. Of the 32 survey respondents, 11 were returned from transit agencies with more than 500 buses, 13 from agencies with 100 to 500 buses, 6 from agencies with 50 to 100 buses, and 2 from agencies with fewer than 50 buses. The limited representation by smaller agencies may signify that this issue is not perceived as critical for smaller agencies. Respondents represented all areas of the country as surveys were returned from California, Colorado, Connecticut, District of Columbia, Florida, Hawaii, Illinois, Kentucky, Maryland, Michigan, Minnesota, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Texas, Washington, and Wisconsin. The list of responding agencies is presented in Appendix B.

All but one of the respondents reported that they operated bus transit service in multiple jurisdictions. This is notable for this project because local governments retain the responsibility for land use decisions. A good communications network between local government and the transit agency is critical for the successful integration of transit and land use. Developing these networks with multiple jurisdictions can be a monumental task for resource-strapped transit agencies.

### SECTION B. STAKEHOLDERS AND COMMUNICATIONS

This section asked questions about stakeholders in the development process and communications among stakeholders. Respondents were asked, "Typically, how does your organization first become aware of future new developments?" Multiple responses to this question were allowed so the answers total more than the number of respondents. Table 1 illustrates the ways that transit agencies become informed of new developments. The "Other Methods" listed in the table include formal notifications from the state or regional planning agencies and attendance at regularly scheduled planning meetings.

According to the respondents, local jurisdictions, municipalities, and/or counties are primarily responsible for the physical design of public elements within new developments. In a few instances, regional planning agencies and states were cited in addition to the local jurisdictions. Figure 1 illustrates how well these lead agencies supported transit when reviewing plans for new developments.

Several respondents noted that the answer to this question was highly dependent on the jurisdiction. In many areas the transit agency serves multiple jurisdictions, and some jurisdictions do a better job of considering transit elements than others.

Communication methods are also highly variable. Once again this is dependent on the jurisdiction. However, it is also dependent on the size of the development. Larger developments tend to have transit agencies included in the review, but smaller developments "fall through the cracks." Both formal and informal communication methods are used

TABLE 1
HOW TRANSIT AGENCIES BECOME INFORMED OF NEW DEVELOPMENTS

| Methods | Responses | |
|---|---|---|
| | No. | Percent |
| Formal Communications with Local Government | 27 | 24 |
| Informal Communications with Local Government | 21 | 19 |
| Staff Observations | 18 | 16 |
| News Media | 17 | 15 |
| Call from Developer | 16 | 14 |
| Public Inquiries | 8 | 7 |
| Other Methods | 6 | 5 |

between the transit agency and local governments. Transit agencies also have both formal and informal communications with developers, and more than half of the responding transit agencies had formal or informal communications with community groups.

## SECTION C. TRANSIT AGENCY DEVELOPMENT GUIDELINES

Transit agency development guidelines were the subject of the survey's third section. This section probed for the contents of existing guidelines and copies of existing documents were requested. Of the 32 respondents, 9 (28%) had developed guidelines. In addition, four agencies were in the process of developing guidelines and two agencies had developed rail joint development guidelines. A list of the agencies providing guidelines is presented in Appendix C.

The purposes of the guidelines were varied, but most cited by the respondents included one or more of the following elements:

- Provide specific design guidance to developers and jurisdictions.
- Ensure that transit elements are built to appropriate specifications.
- Ensure adequate access to transit.
- Streamline the development process.
- Make all stakeholders aware of the opportunities transit provides.

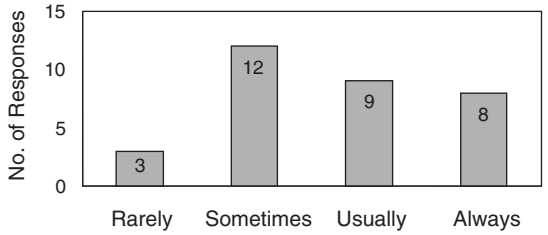


FIGURE 1 Frequency of transit support by lead agencies.

The survey asked, "How are developers (or others) encouraged to use the guidelines?" In Orlando, where there are strong planning requirements, developers are required to use the guidelines, at least for larger developments. In some cases, respondents noted that city governments encouraged developers to use the guidelines, and some cities require it as part of the permit or rezoning processes. In Chicago, the Plan Commission has adopted the Chicago Transit Authority's (CTA's) guidelines. It is interesting to note that only four transit agencies responding to the survey make their guidelines available on-line. On-line access appears to be an easy method of making the guidelines available and could encourage developers' use of them.

A list of possible guideline components was provided to the survey recipients as shown in Table 2**.** Guideline components were differentiated into two types: those pertaining to development characteristics and those regarding technical specifications. The survey asked respondents to identify the components contained in their guidelines.

Within the development characteristics, most agency guidelines include the incorporation of bus stops, Americans with Disabilities Act (ADA) requirements, pedestrian amenities, and directness of pedestrian path. Approximately half of the respondents also included recommendations on site planning, land use, density, streets, sidewalks, open space, building design, parking, bicycle amenities, security, and landscaping. A few respondents provided additional develop-

TABLE 2
POTENTIAL COMPONENTS OF TRANSIT AGENCY DESIGN GUIDELINES

| Development Characteristics | Technical Specifications |
|---|---|
| Site Planning | Bus dimensions |
| Density | Bus stop paving |
| Sidewalks | Bus stop placement |
| Bus Stops | News media |
| Parking | Bus turnaround requirements |
| Bicycle Amenities | Turning radii |
| Landscaping | Bicycle storage |
| Directness of Pedestrian Path | Sidewalk width |
| Land Use | Bus stop spacing |
| Streets | Bus stop length |
| Open Space | Bus shelter dimensions/design |
| Building Design | Roadway width |
| Pedestrian Amenities | Roadway paving |
| Security | Parking spaces/lots |
| ADA Elements | ADA requirements |
| Others | Others |

Note: ADA = Americans with Disabilities Act.

ment characteristics such as shelter design, bus pull-out bays, and signalization.

Additional development characteristics are cited by the Valley Transportation Authority (VTA) in San Jose, California. These include the role of local governments, methods to overcome barriers, community area design, and a model policy for integrating transportation and land use. The model policy is an example that jurisdictions can adopt to support VTA's Community Design and Transportation Program.

Technical specifications within transit agency development guidelines include dimensions and overall requirements of transit elements. More than 75% of the survey respondents include in their guidelines technical specifications for bus size, bus stop paving, stop length, shelter size, bus turning radii, and ADA requirements. Technical specifications on bus stop spacing, stop placement, turnaround requirements, shelter design, roadway width, and sidewalk width are included in approximately half of the respondent guidelines. Less than half of the respondents include technical specifications for bicycle storage, roadway paving, parking spaces, or lots. Additional specifications cited by respondents include acceptable walking distance (LYNX) and BRT requirements (VTA).

The survey asked respondents, "Are there elements that you or other stakeholders would like to add to your guidelines to enhance their usefulness?" Responses included pedestrian connections and amenities, bus stop standards, shelter types and dimensions, bus turnaround requirements, sidewalk dimensions, and guidance on which type of transit alternative works best with particular land use types.

Transit agencies were also asked, "Does your agency have any other guidelines, regulatory authority, or published policies that support the integration of bus transit service with new development projects?" The responses included the following: Pedestrian Technical Guidelines, Policy Principles on Service Design, Transit Guidelines for Developing Communities, Transit Development Plan/Program, Transportation Master Plan, Joint Development Policy/Plan, and Bicycle Technical Guidelines.

## SECTION D. TRANSIT-SUPPORTIVE STRATEGIES

Section D requested information on transit-supportive strategies. A list of 10 strategies was provided and respondents were asked to describe each strategy employed in their region. Respondents checked as many strategies as applied to their areas, and the total number of responses to this question was 118 (see Table 3). Transit agency awareness of these types of strategies appears to be low based on the lack of explanatory details provided. Transit planners may not have direct contact with these policies because they are generally the purview of city planners. Although they may be familiar with the terms, they may have little understanding of the

TABLE 3
TRANSIT-SUPPORTIVE STRATEGIES USED IN RESPONDENT AREAS

| Strategies | No. of Responses | Respondents (%)* |
|---|---|---|
| Written Policies in Adopted Plans | 20 | 69 |
| Design Standards | 20 | 69 |
| Zoning | 19 | 66 |
| Parking Restrictions and Fees | 14 | 48 |
| Development Regulations | 12 | 41 |
| Controlled Growth | 10 | 34 |
| Tax Incentives | 8 | 28 |
| Funding Incentives | 6 | 21 |
| Land Incentives | 5 | 17 |
| Others | 4 | 14 |

*Twenty-nine respondents answered this question.

details and how they work. The question may also have been difficult to answer owing to the wide variety of municipalities involved for each agency.

Twenty of the 29 respondents to this question (69%) noted that providing written policies in adopted plans provides positive support for integrating transit into new developments. Most regions produce some type of plan that outlines policy and sets goals to achieve a long-term vision. Some regions produce multiple plans developed by each individual jurisdiction. Transit agencies, especially those that do not produce their own plans, should take advantage of this opportunity and participate in the development of these plans to insert language in support of bus transit design elements. Even though some of these plans may not be implemented, the development and active participation by transit staff builds awareness of transit needs among local stakeholders and improves communication networks.

Design standards were identified by 20 respondents (69%) as a supportive strategy. Some municipalities and other jurisdictions have produced design standards to guide development. These have included building height, parking, color schemes, signage, pedestrian access, transit facilities, and open space.

Zoning is a common strategy to support transit and was cited by 19 respondents (66%). However, fewer than half of those provided explanatory details about the zoning in their areas. In some cases, respondents noted that zoning is used to concentrate higher densities in target areas such as downtowns, "urban villages," or around train stations. Two survey respondents mentioned the availability of "overlay zoning" and one noted the use of "form-based" zoning. Boulder, Colorado, stated that their zoning regulations encourage mixed-use development, which it finds encourages transit use.

Parking restrictions and fees and development regulations were the next most commonly cited strategies among respondents at 14 (48%) and 12 (41%), respectively. Some localities have caps on parking supply or reduced parking requirements to encourage the use of alternative transportation options. Boulder, Colorado, uses the revenue from parking meters in the downtown area to buy Eco Passes for downtown employees. Eco Passes provide employers with a low-cost employee benefit designed to encourage transit use and lessen the demand for on-site parking.

Controlled growth was cited by 10 agencies (34%) as a successful transit-supportive strategy. Examples of controlled growth include the Washington State Growth Management Act; Boulder, Colorado's open space program and annual growth cap; Oregon's urban growth boundary for sewer and water; Adequate Public Facilities Ordinance in Washington, D.C., to encourage TOD with less impact on roads; and a voluntary growth boundary established through the Denver Regional Council of Governments. Other reported transit-supportive strategies included tax incentives, which were cited by eight agencies (28%); funding incentives, cited by six agencies (21%); and land incentives, cited by five agencies (17%).

Twenty-five of the 32 respondents to the survey (78%) stated that they had a role in the development of at least one of the transit-supportive policies discussed earlier. The policies that transit agencies advocated most often included written policies in adopted plans, design standards, and zoning.

The survey asked, "Is your agency an active participant in preparing the long-range *land use* plan for your region?" Twenty-one of the 32 responding transit agencies stated that they did participate in the region's long-range land use plan. Of the 11 (36%) that do not participate, one reported that such a process does not exist and two others participated in other long-range plans of which land use and transportation were a part.

A follow-up question asked, "Aside from the long-range land use plan, is there another planning forum to discuss land development plans?" Twenty-three agencies (72%) responded positively to this question. These respondents noted that the transit agency is invited to participate in the development of plans, which include land use issues, for local municipalities and other governmental entities. Mountain Metropolitan Transit in Colorado Springs, Colorado, participates in a Land Development Technical Committee every 2 weeks to review development proposals. At these meetings, developers and city departments exchange information and ask questions regarding each proposed development. As another example, the Rhode Island Public Transit Authority participated in the state's Housing Resources Commission working group.

The survey probed for information on the methods used to convince stakeholders that transit adds value to land developments. The survey asked, "Has your agency developed communication methods to convince developers (or others) that bus transit adds value to new developments?" Fourteen agencies (44%) responded that they had developed some type of communication for this purpose. The methods that these agencies used included letters and conversations, coordination with other marketing efforts such as location efficient mortgages and transit benefits programs, messages to the news media and the Internet, pressure on developers from other stakeholder agencies, and provision of design guidelines and other documents that outline the advantages of integrating transit. Mountain Metropolitan Transit completed an Economic Benefits Study in 2004 that outlines the benefits associated with transit.

### SECTION E. EXPERIENCE IN INTEGRATING BUS SERVICE IN NEW DEVELOPMENTS

This section of the survey probed for the transit agency experience in new developments. Respondents were asked to provide

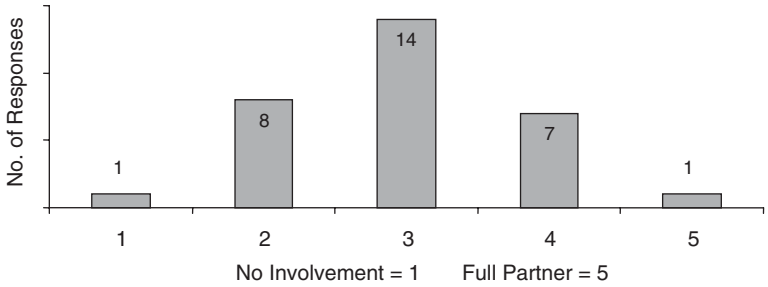


FIGURE 2 Transit agency involvement in the land development process.

examples of successful as well as unsuccessful coordination projects.

The first question in this section asked survey participants, "In the past five years what types of development has your area experienced?" The respondents could choose from any of the following responses:

- Reuse of vacant industrial land (brownfields) along existing transit routes,
- New or more intense use of existing developed land along transit routes,
- Other infill along transit routes,
- Development of previously undeveloped land (greenfields),
- Reuse of vacant industrial land (brownfields) where no transit existed,
- New or more intense use of existing developed land where no transit existed,
- Other infill where no transit existed, and
- None.

Most of the 32 respondents had experienced development across a wide range of land types such as brownfields, infill, or greenfields. The highest number of responses (30) was for development that had occurred in greenfields, where development had not previously existed. For the remaining development types, development along existing transit lines was reported slightly more frequently than development where no transit had previously existed. Only one agency, Honolulu, reported that no development had occurred in their service area.

Transit agencies were asked to rate their involvement in the land development process on a scale of one to five, where one represented no involvement and five represented a full partner in the process. The answers display an almost perfect bell curve (see Figure 2). Fourteen agencies responded in the middle at number 3. Seven believed that they were almost a full partner and one responded that it was a full partner. On the other end of the spectrum, one agency responded that it had no involvement in the process and eight believed that they had almost no involvement. Three respondents noted that this answer was dependent on the particular jurisdiction and one agency did not answer the question.

Transit agencies were also asked to choose a statement that best conveys how well bus transit had been coordinated into new developments. Respondents were asked to choose one of the following:

- All developments are coordinated,
- Most are coordinated,
- About half are coordinated,
- Some are coordinated, or
- None are coordinated.

The responses are shown in Figure 3. Fifty percent of the respondents noted that "some" of the projects are coordinated. Forty-one percent reported that "most" or "all" of the projects are coordinated.

The Roaring Fork Transportation Authority based in Aspen, Colorado, noted that it is typically called after the

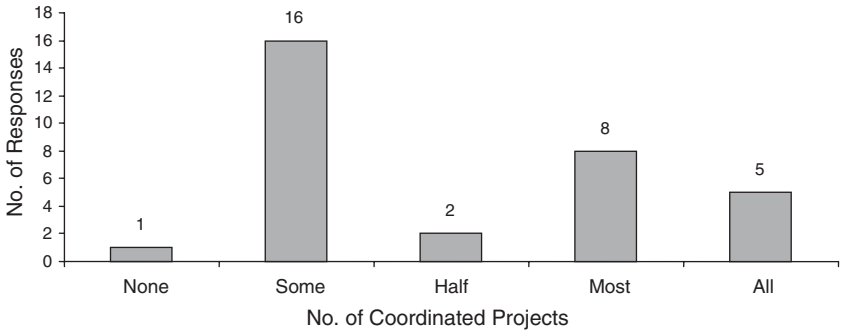


FIGURE 3 Number of new developments coordinated with bus transit service.

development is well on its way to completion and at that time asked where the Authority would like the bus stop located. The developer could have inquired during the design phase whether the Authority would provide service to the development and ask what fee is required to provide new service to this location. Cleveland, Ohio; Miami, Florida; and Ann Arbor, Michigan, noted that much of the development occurs on the fringe or outside of the service area, where it is much more difficult to provide good service levels and where the pedestrian infrastructure is poor.

The survey requested the following information: "In the table below, please list up to three examples of new developments that successfully supported *bus* transit services. For each example cite the primary factors that led to the project's success." Twenty-seven agencies reported that at least one new development built within their service area had successfully supported bus transit. The two factors that were most often cited as the reason for the successful integration of transit into the development included strong support by the local municipality and transit's inclusion in the early planning for the project. Other factors included strong support by a planning organization, initiative by the land owner or developer, and existence of a close working relationship with stakeholders.

Transit agencies were asked to identify one project that they believed was the most successful in integrating transit into the project. Survey participants were then asked a series of questions regarding that one project. The first question agencies were asked was if their organization had been involved in the planning and design decisions affecting the new development. Twenty-three of the 27 agencies with a successful development replied that they were involved in the planning process. Of these 23 agencies, 15 were involved from the very beginning of the planning process, 7 were involved after it started but still early in the process, and 1 was involved about half way through the process. These answers correspond to the preceding question, which identified early inclusion in the planning process as one factor that most contributed to the successful integration of transit with development.

Conversely, the four agencies not involved in the planning process stated that they were contacted late in the process or at the end. It is somewhat surprising that these four agencies still achieved successful projects even when they were not included early in the process. Upon investigation it was learned that two of the projects ultimately were successful as a result of decision makers being transit-supportive. A third project had just initiated construction and it was too early to tell if the project would indeed be successful. The fourth project was the result of a political process that ultimately required the restructuring of service.

Survey recipients were asked if new or realigned bus service had been implemented to serve the development that they identified as successful. Eighteen agencies responded in the affirmative and multiple responses to this question were allowed. The reasons for providing the service are shown in Table 4.

Of the 18 agencies that provided new bus service to a successful development, 10 responded that the bus service itself was successful, although one commented only marginally so. The remaining agencies commented that it was either too soon to tell or that the project was not yet completed. Most respondents replied that ridership levels determine the success of the service. Five agencies reported that productivity measures (e.g., riders per hour) would also be used to gauge the success of the service.

Ten agencies reported that new bus transit service was not provided to the new development. The primary reason given for the absence of new service was that existing service already served the development. New York City Transit noted in its response that King Plaza Mall, an existing bus terminal, had been expanded as part of a redevelopment project, but that no new services can be implemented because there is still no room in the terminal for new services. One respondent had not provided service to the development because the project construction was not yet completed.

The challenges encountered when implementing the new service were varied. One challenge involved the need to realign service to enter a new shopping mall, which inconvenienced through-routing passengers with longer travel times. Some respondents noted that to serve a new development, existing service was restructured and formerly served

TABLE 4
REASONS FOR IMPLEMENTING BUS SERVICE TO NEW DEVELOPMENTS

| | Responses | |
|---|---|---|
| | No. | Percent |
| Desire to Serve a Traffic Generator | 15 | 35 |
| Expected Density Warranted Service | 10 | 23 |
| Request from an Elected Official | 5 | 12 |
| Community Request | 3 | 7 |
| Partnership with Development | 3 | 7 |
| Request from Developer | 2 | 5 |
| Opportunity to Restructure Service | 2 | 5 |
| Utilization of New Facility Within Development | 1 | 2 |
| Policy Decision | 1 | 2 |
| State Provided Funding | 1 | 2 |

areas were left without transit service. One respondent noted that a lack of market research to determine the probable origins and destinations of patrons within the new development was a challenge. Determining what bus lines to reroute or how to design a new route to serve the development is very difficult without adequate market research.

Other challenges included inadequate facilities discovered after construction was completed, such as missing or undersized turnarounds and missing landing pads at bus stops. In one case, the attraction of the newly implemented bus service resulted in a heavy concentration of pedestrians in an otherwise automobile-dominated landscape. This created concern among local elected officials, because adequate facilities for pedestrians were not present.

Inadequate resources to add service is a common problem and service is sometimes restructured to find resources for the new service. One transit agency noted that although there has been growth and development in the area, there has been no corresponding growth in the amount of funding the agency receives for operations. This is probably typical for many transit agencies and points to a major problem for serving new developments. Even in those cases where new service is warranted, there may not be funds to support it.

Respondents were also asked to provide examples of developments that did not support transit service. For each example, the respondents provided factors explaining why transit was not supported in the development. These factors were grouped into "front-end issues" and "outcomes." Front-end issues are related to a lack of regional practices, planning processes, or poor transit perceptions. The outcomes are generally the result of the front-end issues and prohibit the provision of adequate bus transit service in the development. Listed here are the front-end issues and outcomes identified by the survey respondents.

- Front-end issues
  - Lack of financial support for transit service,
  - Lack of political support for transit service,
  - Historical development of land without sidewalks or connected streets,
  - Owners and developers unfavorably disposed to transit,
  - Review process fast-tracked,
  - Refusal to allow transit agency to review plans, and
  - Transit viewed as unimportant to new development.
- Outcomes
  - Poor pedestrian connections,
  - Too much free parking,
  - Poor site design with buildings set back from arterials and/or service,
  - Low-density developments that cannot support transit service,
  - Streetscaping that displaces bus stops,
  - Poor office and shopping center roadway circulation or weight-bearing ability,
  - Inadequate street networks,
  - Cul-de-sacs and gated communities,
  - Inadequate provision of transit facilities, and
  - Developer-operated shuttle competes with transit service.

**SECTION F. IN YOUR OPINION . . .**

This section contained seven open-ended questions designed to obtain respondent opinions on a variety of issues surrounding the integration of land developments and bus transit. These questions are listed here with a summary of the answers.

*What types of facilities or amenities for bus service are generally lacking in new developments?*

The most frequent response to this question was the need to provide basic pedestrian amenities. Sidewalks appear to be a consistent and somewhat surprising oversight on the part of developers. Because all travelers, even automobile users, begin and end their trips as pedestrians, the provision of sidewalks and walkways through parking lots would seem to be an obvious need. Access to bus stops and unobstructed pathways through the surrounding neighborhoods is also inadequate in many developments. Other pedestrian amenities often omitted from development designs included pedestrian-level lighting and crosswalks. One respondent noted: "In the past, sidewalks were not included in many new developments. This is no longer the case, but we are still dealing with their absence in developments from 10–20 years ago."

After pedestrian amenities, the lack of bus stop amenities and adequate street networks was the next most frequent response. Appropriate bus stop locations, shelters, benches, concrete landing pads, roadway width, and an interconnected roadway grid were identified as missing elements in new developments. Transit facilities that should have been incorporated into new developments included bus bays, turnarounds, information displays, and park and ride lots.

Transit-supportive densities, a mixture of land use, appropriate building orientation, funding for new service, and a lack of understanding of the long-term value of transit were all mentioned at least once by respondents as deficiencies in planning for new developments.

*What design aspects of new developments inhibit the effective provision of transit service?*

Survey respondents provided their opinions on the elements of new developments that inhibit the effective provision of transit service. One respondent answered, "PARKING—free and plenty of it! Large setbacks (no street frontage), circuitous access." Building orientation was cited by nine

respondents. Large setbacks from the street with "oceans" of parking between the street and the entrance were a common occurrence. Indirect paths for both pedestrians and the street network were also cited as design problems in new developments. Circuitous street networks with cul-de-sacs and other traffic calming techniques slow transit to a crawl—that is, if provision of bus service is even possible. Likewise, travel times for pedestrians are greatly increased when walled or gated communities obstruct the direct pedestrian path. Another impediment noted by a number of respondents was low-density development, both residential and commercial. It is not economical to serve areas where the market is dispersed over a large geographic area. In addition, walking distances to the building entrances in low-density development are generally too long to make transit use attractive.

*What factors contribute most to the successful integration of bus transit planning and land development planning?*

This question asked respondents to identify factors that contribute most to the successful integration of bus transit planning and land development planning. The factor most often cited was early participation in the development's planning and design. The second factor reported most often was interested, some said "enlightened," developers who were willing to discuss the development's design and who were genuinely interested in providing a quality transit environment. Strong support by local government was cited by seven respondents. Other important factors included transit-supportive densities, good pedestrian connections, a good street network, and good communications between all stakeholders. An interesting factor suggested by one agency was having the in-house ability to "sell" transit to developers, local governments and communities. Unfortunately, transit planners do not necessarily have the skill and/or the time to conduct this activity.

*Why is it difficult to integrate bus transit planning into land development planning?*

Respondents were asked to expand on the challenges associated with integrating bus transit planning and land development planning. Most answers were related to the perceptions of developers and the developer's operating constraints. Respondents reported that developers often had negative perceptions regarding transit and are unable to conceive of any benefits associated with transit. Furthermore, transit requires the removal of parking spaces that developers believe are important to the economic viability of their projects. One respondent noted that ". . . often developers view transit as unattractive and as a parking encroachment problem." In addition to these perceptions, developers have strict schedules and budgets. The incorporation of transit into their developments may expend additional resources, and transit improvements are not viewed as adding to the development's profitability. Lastly, many developers prefer to do what is familiar and develop property in similar styles to what has been built in the past.

Respondents provided additional explanations as to why it is difficult to integrate bus transit planning and land development planning. One respondent offered the following: "Buses are not viewed as permanent fixtures to a development. As a result transit is often an afterthought." Another respondent noted that the many-to-many trip-making pattern common in today's society is not conducive to taking bus transit. At least one respondent noted that bus transit is not considered a viable commuter option for the suburbs.

A lack of resources on the part of transit operators inhibits the integration of bus transit and land development. This was mentioned by several agencies. Transit agencies do not have the financial resources to expand service into new areas or to maintain new transit facilities. Two respondents remarked that human resources are unavailable to participate in land development planning or to review new development proposals. Other factors included the absence of political support and a lack of transit-supportive policies and regulations.

*Do you have any suggestions or ideas to improve the integration of bus service planning and land development planning?*

Several respondents provided suggestions and ideas that they believed would improve the integration of bus service planning and land development planning. Regulatory methods were the most frequently cited. Agencies recommended that zoning ordinances be revised to support transit, improve the pedestrian environment, and encourage infill developments. Impact fees and developer incentives were also suggested. Revisions to parking requirements were advised, including reducing the minimum parking requirements and implementing parking maximums. In terms of process, one agency suggested that transit agencies review all development applications and that this review be mandated through ordinance. Another agency further recommended that any development requiring publicly funded infrastructure improvements or tax support be required to meet with the transit agency and consider transit improvements in the development.

Education for all participants in the development process was an idea offered by several agencies. Transit planning staffs need training to better understand the development process. Education for local government planning staff, municipal officials, public works employees, and developers is needed to promote a better understanding of the value of transit and how transit can positively impact new building projects. One agency recommended the production of a handbook with details on how to incorporate bus transit into small- and large-scale developments, and explain why it is important to do so.

*In cases where new developments require additional resources to provide new bus service, how should the funding of such service be addressed?*

In many cases, new developments require the extension of bus transit service. Agencies were asked how this expanded service should be funded. This was a difficult question for many transit agencies. Certainly, if there was an easy answer, most transit agencies would not face financial difficulty on an on-going basis. That said, the most frequently provided answer was for some type of impact fee (eight responses). In two cases, agencies suggested including developer incentives to offset the impact fee. Also recommended were special tax districts, such as Tax Increment Financing (TIF) districts. Partnerships with developers or corporate land owners were suggested by 11 agencies. These partnerships could take the form of participation in transit benefit programs or service demonstrations for one to two years funded by the developer or land owner. One respondent's idea was to have demonstration funding based on a sliding scale dependent on the cost of the service and the revenue collected. The developer or land owner would pay the difference between the cost of providing the service and the revenue received. One respondent noted that these types of funding arrangements may raise equity concerns if partnerships are not uniformly provided.

*Do you have any additional comments or insights that would be helpful to this synthesis project?*

The last open-ended question solicited any additional comments or insights on this subject. Few agencies had any more to add to what they had already offered. However, three agencies suggested similar products that could be copied by transit agencies to suit their own particular situations. One product was the provision of model codes for transit-supportive land use policies, design ordinances, and subdivision requirements. A second notion was the compilation and distribution of "best practice" guidebooks and other educational materials that could be easily customized by different transit agencies to suit their local conditions. The third recommended establishment of a database that contained the latest best practices for transit site and access planning.

CHAPTER FOUR

# CASE STUDIES

Five case studies are presented in this chapter. These case studies highlight successful coordination efforts between bus transit service and land development planning. The case studies include the Central Florida Regional Transportation Authority (LYNX) in Orlando, Florida; the Centre Area Transportation Authority (CATA) in State College, Pennsylvania; Omnitrans in San Bernardino, California; Metro Transit in Minneapolis, Minnesota; and GO Boulder in Boulder, Colorado.

Potential case study areas were initially chosen based on the agencies' response to the survey and recommendations from the topic panel. The agencies were interviewed by telephone to verify information provided in the survey response and to determine their willingness to participate as a case study. Subsequent telephone interviews were conducted with the transit agency and other stakeholders, such as the local government entity, regional planning organization, local community organization, and developers.

Each case study includes a description of projects that successfully coordinated bus transit service with a new development. The strategies that contributed to the success of the projects are also discussed. Table 5 shows the primary strategies that assisted in each agency's success.

## CENTRAL FLORIDA REGIONAL TRANSPORTATION AUTHORITY

LYNX was founded in May 1972 as the Orange–Seminole–Osceola Transportation Authority and has been doing business as "LYNX" since 1992. The agency, headquartered in Orlando, Florida, became the Central Florida Regional Transportation Authority in March 1994.

The LYNX service area is approximately 2,500 square miles and serves 3 counties (Orange, Osceola, and Seminole) and 29 municipalities. LYNX provides a number of services in addition to fixed-route service including LYMMO, a free downtown Orlando circulator; LYNX carpool and vanpool services; ACCESS LYNX, a door-to-door paratransit service; and Road Rangers, a roadside assistance program on Interstate Highway 4 (I-4). LYNX also provides one express service to Volusia County, which is a contiguous county to the northeast of the current service area. LYNX delivers more than 80,000 rides each weekday to a resident population of more than 1.8 million.

The state of Florida has 11 regional planning councils (RPCs), commissioned by state law, that provide comprehensive planning and intergovernmental coordination for managed, responsible growth. Florida state legislation provides that any development that would have a substantial impact on the health, safety, or welfare of citizens in more than one county is considered a Development of Regional Impact (DRI). The RPC has the lead role for coordinating the multi-agency review activities for a proposed DRI within its region. The RPC recommends conditions of approval for DRIs or it recommends denial of DRIs to the local government. The RPC process enables transit agencies to participate early in the review process for large developments.

### Successful Projects

*Altamonte Springs*

Altamonte Springs is located north of Orlando along I-4. In 1986, the business community of Altamonte Springs wanted to invigorate its business environment by creating a central business district and attracting more businesses to the area. To accomplish their goals, a Community Redevelopment Agency (CRA) was established for the Altamonte Springs downtown area, which is approximately 1,400 acres. The CRA is the city's economic development agency and an independent authority under Florida law. The city of Altamonte Springs and the CRA, as the developer, applied to the RPC for approval as a DRI. The purpose of this action was to focus development on the creation of a central business district and provide an alternative to the strip development pattern that currently existed. The DRI and CRA together allow the city to more directly partner with the private sector than traditional regulatory agencies typically can. Individual developments within the CRA boundary do not have to apply individually as DRIs if they are in conformance with the CRA plan.

In 1987, a traffic impact study conducted for the I-4 corridor concluded that road congestion in Altamonte Springs and the surrounding area would continue to get worse. Faced with this conclusion, the city of Altamonte Springs and its neighboring communities began searching for a solution to future congestion. One of the proposed solutions is Flex Bus, a new transit system now in final design.

Flex Bus represents a new concept in bus service. It will combine the advantages of dedicated bus lanes, Intelligent

TABLE 5
MATRIX OF SUCCESSFUL STRATEGIES IN CASE STUDIES

| | LYNX | CATA | Omnitrans | Metro Transit | GO Boulder |
|---|---|---|---|---|---|
| Legislative Framework | X | | X | X | |
| Zoning/Open Space | | | | | X |
| Supportive Local Officials/Champion | | X | X | | X |
| Municipal Financial Support | X | | | | X |
| Communications and Coordination | X | X | X | X | X |
| Staff Technical Knowledge and Negotiation Skills | X | X | | X | |

Transportation Systems (ITS) technology, route deviation, and demand-response systems to deliver fast, economical, and convenient bus service to the community. Flex Bus will operate in dedicated lanes serving predefined primary bus stops. Secondary predefined bus stops located away from the dedicated bus lane will be served on request. Flex Bus customers will have the ability to schedule a trip on the Internet or by phone. The reserved trip is guaranteed to arrive within 12 min of the request. ITS technology will be used for vehicle monitoring, scheduling, and vehicle dispatching.

Developers in Altamonte Springs have promised easements for the Flex Bus exclusive right-of-way and space for shelters, as well as lobby space for Flex Bus reservation kiosks. Completion of the project is expected in 2009 and, to date, 21 developers have contributed to the project. Future developments in Altamonte Springs will provide similar provisions for Flex Bus.

*LYMMO*

LYMMO is a free circulator in downtown Orlando (see Figure 4). The impetus for the project was the city's desire to enhance the quality of life in the downtown area, reduce traffic congestion, and encourage additional growth in the downtown core. Florida state growth management regulations stipulate that new development is permitted only when the infrastructure can support new growth. To expand development in the downtown area, the state required the provision of a downtown transit system.


FIGURE 4 LYNX LYMMO service. (*Courtesy:* LYNX Central Florida Transportation Authority.)

To accomplish its goals, the city created a special taxing district for the downtown area administered by a Downtown Development Board (DDB). The purpose of the DDB is to encourage redevelopment, and tax monies are used for planning and programming. The DDB and the city of Orlando then worked together to create a downtown Community Redevelopment Area that allows for the capture of future tax increments to be used for redevelopment projects and infrastructure improvements. With the formation of these two organizations, the city proceeded with plans to improve downtown transit. Throughout the 1980s the city experimented with two transit circulators. These experiments and a public development process produced the LYMMO concept in 1994. The stated goal of LYMMO was to help the downtown populace and out-of-town visitors park their cars once and then use transit to access downtown destinations.

LYMMO began operations in 1997 and has been a success. It is designed to elicit a fun, whimsical transit experience. The Orlando Museum of Art developed an initial "Moveum of Art" promotional campaign that decorated LYMMO buses as moving works of art. To operate smoothly and reliably, it operates within dedicated bus lanes and takes advantage of ITS technology such as signal priority. LYMMO operates on 5-min headways during rush periods and 10-min headways at other times. Electronic kiosks at each stop show passengers the location of the next LYMMO bus on the 3-mi right-of-way. The service is operated by LYNX using ten 30-passenger, low-floor, compressed natural gas buses. The free service is

supported by revenues from approximately 9,000 downtown parking spaces.

*Plaza Collina Shopping Center*

The proposed Plaza Collina Shopping Center is located in Lake County just west of the Orange County border along State Highway 50. The proposed development is a 142-acre site that is currently vacant land. The development was approved in January 2006 and when completed will be composed of 1.2 million square feet of retail and office space and 200 condominium dwelling units. As a result of the recommendations made by the DRI process, the developer will provide an on-site system of bikeways to be connected to adjoining external bicycle paths, covered bicycle parking, and employee shower facilities. Shaded pedestrian circulation within the development is also required. Transit elements provided by the developer include $200,000 for an express bus service between Orange and Lake counties, and a four-bus-capacity superstop with adequate space for passenger shelters. The passenger shelters will be provided by LYNX and maintained by LYNX. Two additional bus stops equipped with a pole and bus sign will be provided on the property. Fifty commuter parking spaces will be provided within the development to encourage transit use.

*Winter Garden Village*

The Winter Garden Village development is planned as a mixed-use commercial development of big box stores, townhouses, and condominiums. The 175-acre site is located in the city of Winter Garden west of Orlando and is currently used for agricultural purposes. The planned development features an open-air retail village that will include pedestrian-friendly amenities. Storefronts will be closer to the street, with on-street parking and wide sidewalks. The developer will provide circulation for pedestrians and bicycles with covered walkways in front of stores. The developer will also provide bicycle lockers or racks, bus passenger shelters, and bus parking bays within the development. In addition, the developer will provide $125,000 to fund 50% of the operation of one bus route for 2 years.

*Successful Strategies*

LYNX benefits from Florida laws that require a special planning process for DRIs. The RPC receives all applications for DRIs. The Council then initiates a review process among all interested stakeholders, including the transit agency. The RPC requires the developer to forward copies of the application to all interested parties. In this way, LYNX receives plans for the large developments very early in the planning process. A site visit is conducted to discuss the developer's proposal with all interested parties (education, water, police, etc.). A separate meeting is held to discuss transit and roadway issues. It is at this meeting that the transit agency presents needed transit improvements to the developer and county representatives. The RPC summarizes all comments and provides its recommendation to the county. The proposal then passes to the county for its approval process.

All of the successful projects cited here provide transit amenities as a result of the Florida planning process and DRI requirements. The LYMMO project also provides an example of utilizing municipal parking revenues to support transit operations. The city of Orlando, through the DDB and the CRA, provided initial support to plan, design, and construct the physical facilities for LYMMO. The on-going operating costs to provide LYMMO service are funded through the use of downtown parking revenues.

Over time, LYNX has learned to change its approach with developers. The agency requests operating assistance for specific service improvements that will enrich the development. It provides the developer with information on the proposed service improvements and how these services will positively affect the development. This has been a much more successful approach than asking for capital improvements, such as shelters, which can often be funded through other means.

## CENTRE AREA TRANSPORTATION AUTHORITY

CATA, located in State College, Pennsylvania, is a joint municipal authority comprised of six municipalities. The service area is 133 square miles, with a population of approximately 90,000. CATA operates an all CNG fleet of 50 vehicles. Annual ridership is more than 6 million, the third highest ridership of all transit systems in the state. State College is the home of Penn State University, where many students do not own automobiles.

Unemployment in the service area is relatively low at 3.5%. The surrounding areas have higher unemployment and many residents outside the CATA area travel to State College for work. Despite this, there are no local ordinances requiring the consideration of transit or inclusion of transit amenities in developments. Everything that has been accomplished in terms of successful bus transit and land development integration has been through cooperation and negotiation.

### Successful Projects

*Colonnade Shopping Center*

Before development, the 70 acres occupied by the Colonnade Shopping Center was forested land. The neighboring community appreciated the natural environment and used the area for recreation, even though the land had been zoned


FIGURE 5 Bus stop in Colonnade Shopping Center. (*Courtesy:* Timothy C. Geibel.)

commercial for some time. When development discussions began, the community organized to have a say in the development outcome. As a result, a special zoning district was formed. This zoning district had a great impact on the quality of the space within the finished development. The zoning required enhancements if the developer exceeded 110% of the minimum parking requirements. Enhancements were also required if more than 65% of the land area was covered with impervious materials. The development exceeded both of these limits and, as a result, the quality of the shopping center environment for transit was greatly enhanced.

The Colonnade Shopping Center is a commercial and retail center with large retail, electronic, grocery, and other stores. CATA participated in the plan review process and suggested a revised concept plan that was supported by the municipality and incorporated in the final design. As a result, transit became the physical focal point of the development. The plan revisions suggested by CATA included a pedestrian multipurpose path and dedicated bicycle lanes coordinated with four transit stops (see Figure 5). The transit facilities include bus shelters coordinated with the development architecture and multiple bus bays at each stop. In addition, the local ordinance requires that developers provide "green space" in new developments, which are ordinarily complied with through nondevelopable land such as gulleys and steep slopes. In this case, CATA was successful in situating the green space adjacent to the transit stop, which provides an exceptional waiting environment. The transit facility is now an active suburban transit center, which not only provides access to the shopping center, but serves as a transfer location for reverse commuters, who no longer need to travel through downtown.

### *Wal-Mart/Sam's Club*

For this development, CATA successfully lobbied for a redesign of the parking lot to incorporate pedestrian and transit elements. The plan was revised to include a central bus stop and incorporates trees and pedestrian walkways to the main entrances. This was all built within the private property of Wal-Mart and is maintained by the shopping center. Based on CATA's experience with this development, all townships within this authority have revised their local ordinances to require pedestrian walkways and trees in all large parking lots.

The regulations require pedestrian walkways after every three lanes of parking. In addition, developers of large big box centers are requested to prepare a master plan showing pedestrian and transit access within the development. The template that has proven successful over time is that of a central transit roadway within the site, removed from the building facades and containing two or more bus stops. Pedestrian walkways and traffic islands connect the transit stops with the building entrances, which benefits CATA by allowing for quicker travel time through the shopping center. In addition, an improved waiting environment with more transit amenities is provided because the developer can concentrate its resources at a central location. The developer appreciates this arrangement because the bus traffic is removed from the front of the buildings, avoiding potential conflicts with cars and pedestrians. Another benefit for the developer is that it does not have to provide extra weight-bearing roads throughout the shopping center, but can concentrate that expense on the designated transit roadway.

The provision of this type of transit center provides a balance between walking distance, service efficiency, and customer amenities. The transit center arrangement provides fewer bus stops that are located farther away from the storefronts; however, it improves travel time for through-routing bus customers and provides more amenities for waiting customers than are normally available. With each new development, CATA learned more about how to improve on its successes. One of those lessons was to provide shopping cart corrals next to the bus stops. Because the bus stops are located away from the store entrances, customers can push their shopping carts to the bus stop. Provision of the corrals helps to circumvent the problem of loose shopping carts in the bus stop and roadways.

### *Off-Campus Housing*

Within the CATA service area are many off-campus residential housing complexes for undergraduate college students. These complexes can be very large—housing up to 1,000 residents. Generally, they are built along existing transit service. The developers rely on the students using bus transit service, rather than driving, to reduce their parking requirements. CATA worked with the various developers to ensure that good pedestrian access was provided throughout the housing complexes. In addition, the developers provided a bus lane and bus stop amenities suitable to comfortably accommodate

50 to 75 waiting bus passengers. Pull-off bus lanes to hold one or two 40-ft buses out of the traffic lanes are provided along with concrete pads, shelters, and benches. Developers are given the option of providing custom bus shelters, which they must maintain, or providing one of the standard CATA shelters, which would be maintained by the transportation authority. Most developers choose the standard shelter.

Developers are willing to provide these amenities to avoid paying additional roadway impact fees. The provision of pedestrian sidewalks, pull-off lanes, and bus stop amenities is generally less expensive than fees associated with added turn lanes or signalization improvements. The operation of the adjacent bus routes is adjusted to pick up the 50 to 75 students who want to get to school at the same time in the morning, with one or two extra trips scheduled ahead of the regularly scheduled service. The pull-off lanes allow the extra buses to remain out of the traffic lane while picking up the waiting students.

FIGURE 6 Open space adjacent to bus stop in Colonnade Shopping Center. (*Courtesy:* Timothy C. Geibel.)

#### Successful Strategies

Projects that successfully combine bus transit and land development have a champion that persisted in voicing the need for transit considerations. In the CATA region, the local elected officials fill that role. Many of the elected officials in the CATA service area ride the transit system and therefore have a sense of transit's value and are sympathetic to transit needs. Successful development in the CATA region depends on supportive local officials, who together with the regional planning agency are willing to forego a development rather than build an unsuccessful project.

Early participation in the design process by transit planning staff is a key strategy for successful integration of bus transit with land development. CATA has a unique opportunity to ensure this early participation. CATA and the CRPA share a transit planner who spends 20 h per week at each agency. It is through this planner that CATA becomes involved early in the development process.

All development projects are reviewed by the CRPA. When a development proposal is received by the township or local municipality a copy of the plan is sent to the CRPA. This is a voluntary process and is made possible by the support of local officials, as noted previously. It is also possible because many local governments have chosen to have smaller planning staffs, which can be accomplished by including the CRPA in all their planning activities. The CRPA planners provide support for plans within the local areas and also provide the local governments with a regional perspective. When a plan is received, the CRPA planner immediately consults with the CATA planner. The CRPA arranges meetings to include all of the various disciplines involved in the proposed development. This discussion is helpful and can sometimes provide opportunities for the various stakeholders to collaborate on a design idea. For example, during discussions regarding the provision of open space it became known that providing the open space around the bus stop would also help to drain stormwater. The transit interest of providing a more pleasant waiting area at the bus stop was then supported by one of the other disciplines, further strengthening the provision and location of the development's open space (see Figure 6).

This early participation in the process is critical to the successful coordination of bus transit and land development. Once a developer starts the design of a project and has determined where the buildings will be located and how the stormwater will drain, incorporating transit is more difficult. The developer has already invested too much money in the project to be cooperative with transit interests.

In addition to early participation, CATA provides valuable technical expertise to the developer to solve problems associated with the incorporation of transit into the development. The provision of physical design details up front, together with on-going follow-up with the developer by CATA staff, has proven to be a small but influential catalyst in the process. The developers find that CATA is flexible in finding solutions to meet the needs of transit, and this is also a key strategy.

Another meaningful ingredient to CATA's success is related to the knowledgeable staffs at both CATA and CRPA, who have worked together for some time. Management has also been stable. In 18 years, CATA has had only two general managers and both have recognized and understood the relationship between transit and land use. CATA staff has found that requesting reasonable transit elements, gaining respect and credibility among local stakeholders, and building on past accomplishments is a successful strategy. Developer experience is also important. Most developers in the area are now experienced in the process and often expect to incorporate transit needs into the design of their developments.

Lastly, the CRPA has a Regional Growth Boundary. The Comprehensive Plan defines the Regional Growth Boundary and this directs where new growth will occur. Public funding for water and sewer are earmarked for projects within the growth boundary. The Regional Growth Boundary positively assists transit, because it encourages denser growth and defines where future growth can occur. This helps transit planners concentrate their efforts and resources, but does not specifically assist in the integration of bus transit service into land developments. Appropriate land uses and recognition of the importance of transit to serve developments are the primary drivers to integrating transit with new developments.

## OMNITRANS

Omnitrans is headquartered in San Bernardino, California. The service area is located approximately 25 mi west of Los Angeles and includes 15 cities and San Bernardino County. It was formed as a Joint Powers Authority in 1976. Omnitrans serves approximately 1.4 million people within 480 square miles and provides fixed-route service, parallel paratransit service, and two demand-response community shuttle services. Annual ridership is approximately 16 million.

The state of California mandates an environmental review process for projects that can have a significant impact on the surrounding area. Through this process, cities will release a notice to public agencies, including Omnitrans, that a project will be undergoing environmental review. Comments are accepted throughout the stages of the process. In addition to the formal environmental review process, informal communication regarding new developments occurs through contacts established at staff level. Omnitrans also approaches city/county staff when it updates its Short Range Transit Plan to identify the developing areas and the need for transit service.

### Successful Projects

*Chino Preserve*

The Preserve is an area of approximately 5,500 acres located in the southwest corner of San Bernardino County approximately 37 mi east of Los Angeles. The area was annexed to the city of Chino in July 2003. The Preserve development will be a mixture of residential neighborhoods focused around a community core and commercial center. Approximately half of the area will remain as open space for natural, recreational, and agricultural uses. The development will also be integrated with the Chino Airport. Areas adjacent to the airport property to the north of the development are designated for airport uses, light industrial, or public facilities.

The Preserve Specific Plan was completed in March 2003 and lays out a vision for the community. The Plan includes development guidelines, a mobility plan, an infrastructure plan, and design guidelines to direct the type, style, and design of development. Residential construction within the development has already begun.

Transit elements within the Preserve include a one-directional loop connected to a regional bus service planned along the development's western boundary. The loop service will operate within a dedicated right-or-way on 10-min intervals (see Figure 7).

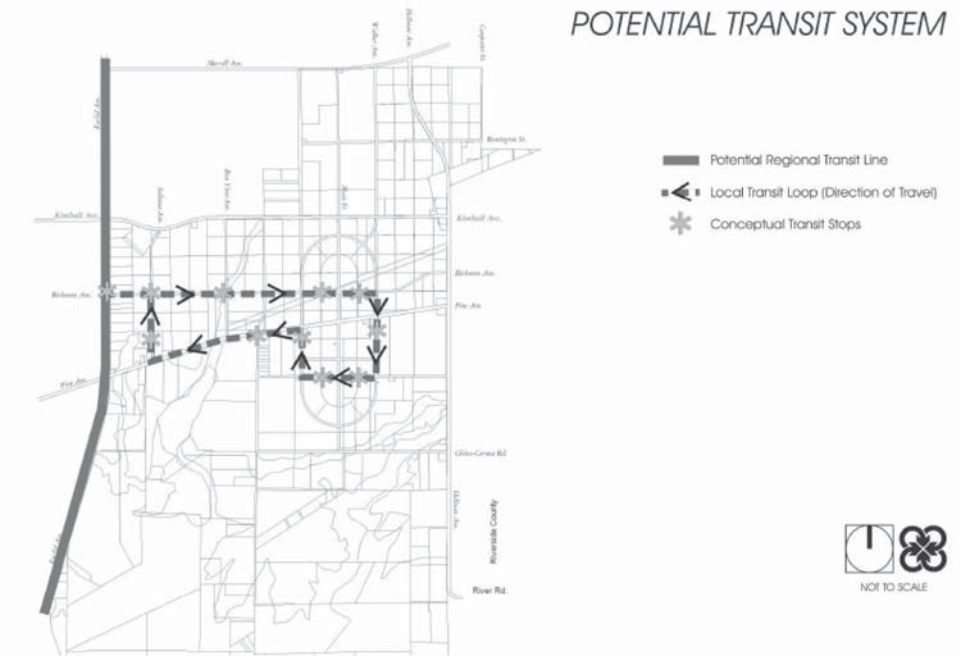


FIGURE 7 Planned transit route in Preserve development. (*Courtesy:* City of Chino, California.)

### Successful Strategies

The commitment to provide dedicated rights-of-way for transit service was made early in the design process. Early commitment is key to successfully integrating transit into this new development. Although sufficient densities to support transit service will not exist for several years, the land has been preserved for this future use. Incorporating the right-of-way into the development was easy to accommodate early in the process when streets, parks, subdivisions, and other major land uses were proposed. However, once this stage of the design process is passed, it would likely become significantly more difficult to include this right-of-way later in the process.

In California, an environmental review planning process assists transit agencies in having input to new developments. The state of California Environment Quality Act requires a review process for projects that have the potential to physically impact the environment. Most development proposals that require some type of government approval are subject to environment review. Examples of projects that are eligible for California Environment Quality Act review include the enactment of zoning ordinances, adoption of a general plan, issuance of conditional use permits, or approval of tentative subdivision maps. Omnitrans was involved in the environmental review process for the Preserve to ensure that future transit needs would not be "developed-out" of the rapidly growing area.

The Preserve, proposed for development in the city of Chino, is part of a larger-scale greenfield development. The city of Ontario, northeast of Chino, has development plans for vacant land adjacent to the Preserve. The cities of Chino and Ontario each developed land use Specific Plans for their developments that were intended to promote transit use. However, the cities recognized that, despite good intentions, the Specific Plans were deficient. To address this, Chino and Ontario undertook a joint effort with Omnitrans to address transit service design, funding, and land use for all the new communities proposed for development. The effort culminated in the June 2005 publication of the Community Based Transportation Plan (CBTP). The CBTP analyzed transit plans within the Preserve and neighboring communities and recommended changes to the operating details prepared in the Specific Plans. The CBTP builds on the transit right-of-way provided for in the Preserve Specific Plan. It expands the utility of the right-of-way by recommending additional bus routes to serve the Preserve's community core, linking the Preserve to neighboring communities. The CBTP is a good example of interagency cooperation, where two cities and the transit authority jointly developed a plan to benefit future residents. The plan transcends municipal borders and integrates proposed new services with an existing network. As the area develops, the need for transit service will grow. Omnitrans and the cities of Chino and Ontario will monitor growth and implement services as necessary.

## METRO TRANSIT

Metro Transit serves the twin cities of Minneapolis and St. Paul, Minnesota, and the surrounding metropolitan areas in its seven-county service area. Metro Transit is one of the country's largest transit systems, providing approximately 70 million bus trips annually. Metro Transit operates the Hiawatha light-rail line, 129 bus routes, and 14 contract service routes, using a fleet of 878 buses.

Metro Transit is part of the Metropolitan Council, the regional planning agency serving the Twin Cities seven-county metropolitan area, with a population of just over 2.6 million people. Inclusion of the transit agency within the regional planning agency is a fairly unique organizational structure. The Metropolitan Reorganization Act of 1994 merged the functions of three agencies (the Metropolitan Transit Commission, the Regional Transit Board, and the Metropolitan Waste Control Commission) into the Metropolitan Council. The Metropolitan Council coordinates regional policy, services, and investments to provide transit service, wastewater treatment, community planning, population forecasting, affordable housing, and parks planning.

### Successful Projects

*Midtown Exchange*

Midtown Exchange is the site of the former Sears property, located at Lake Street and Chicago Avenue in Minneapolis. Since Sears closed its doors in 1994, neighborhood groups, local government, and private-sector leaders have worked together to restore the site as a vibrant, mixed-use urban hub. When completed, the Midtown Exchange will contain rental apartments, condominiums, and town homes; the headquarters of Allina Hospitals and Clinics; a Hennepin County service center; a new Sheraton hotel; and the Midtown Global Market. The Global Market will be the city's largest public market. The community adjacent to Midtown Exchange is expected to support the Global Market in large numbers because the market's retail mix was chosen with the neighborhood's ethnic make-up in mind. As of January 2006, the office space was occupied and residents had begun to move in. The Global Market is expected to open in spring 2006.

As part of the Midtown Exchange development, the city of Minneapolis and Metro Transit collaborated on planning a new transit facility within the development. The new transit facility solved many problems associated with the connection of two major bus routes at this intersection. Before the development of Midtown Exchange, the two routes made service stops on the street outside of the Sears complex, and transfers were made between the bus stops on the four street corners. This intersection is one of the busiest in the system,

FIGURE 8 Rendering of transit center in Midtown Exchange. (*Courtesy:* Metro Transit, Minnesota.)

with many passengers transferring at this location. The amount of space available at one of the bus stops was insufficient for the large number of passengers who used that stop. To remedy the situation, one of the bus stops was split into two stops, creating a near-side stop and a far-side stop in the same direction. The sheer number of passengers using this intersection provided the impetus to design a new transfer terminal (see Figure 8).

The transit center, which began operations on March 1, 2006, consolidates all five bus stops and makes transfers between the two bus routes more convenient. The amount of space for waiting customers has been expanded and customer amenities are much improved. Transfers between routes are safer and waiting customers are more protected from the possibility of street crime. The facility provides adequate space for buses and frees up space at the intersection for turn lanes and additional street parking. The development also provides access to a large number of potential

FIGURE 10 Victoria Crossing development. (*Courtesy:* Metro Transit, Minnesota.)

new customers, and ridership on the two routes serving the development is expected to increase (see Figure 9).

*Victoria Crossing*

Victoria Crossing is located at Grand and Victoria Streets in the city of St. Paul (see Figure 10). It is an infill development composed of a collection of small shops and specialty stores anchoring the 100-plus other stores along Grand Avenue's 26 blocks. The city and Metro Transit

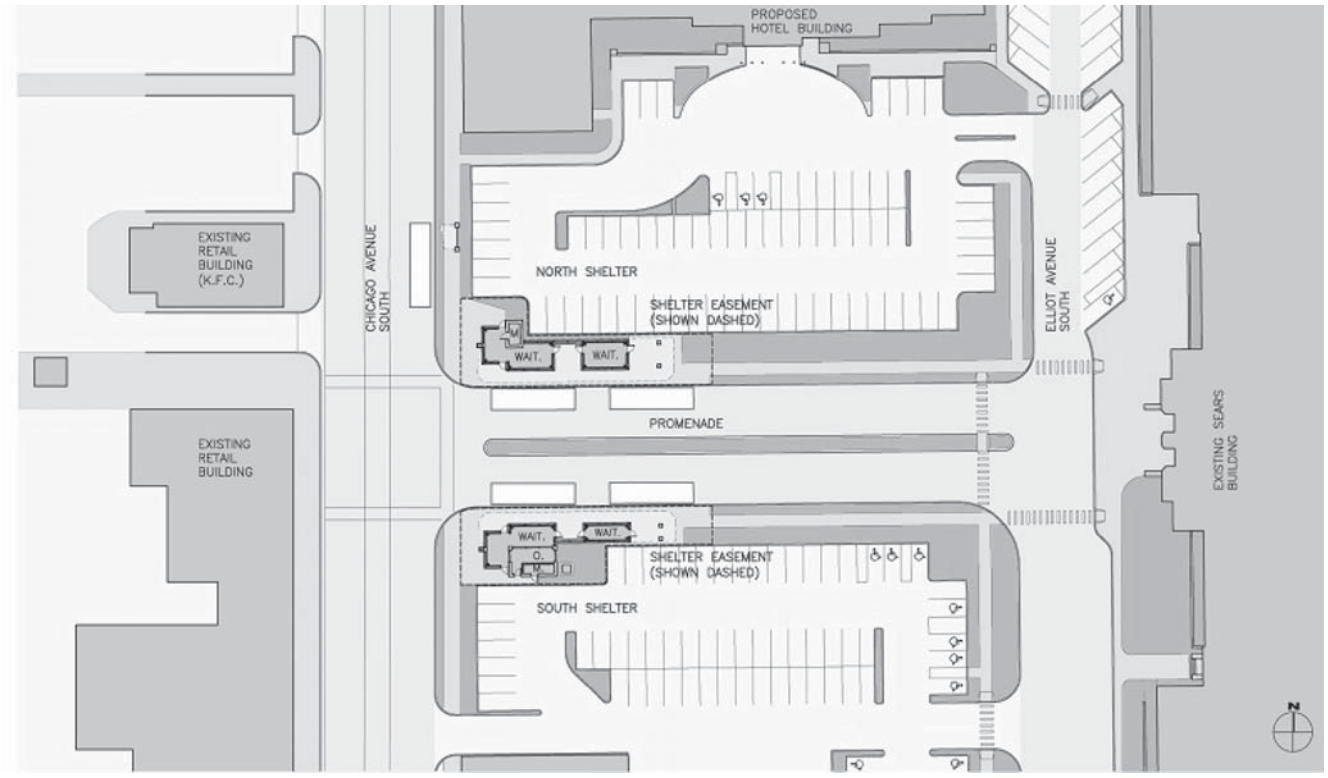


FIGURE 9 Midtown Exchange transit center. (*Courtesy:* Metro Transit, Minnesota.)

consulted on the impact of this development on the existing transit service. As a result, existing bus stops were relocated.

*City Bella*

The City Bella development in the city of Richfield incorporates high-density residential housing units, 18,000 square feet of commercial space, an underground parking garage, a surface parking lot behind the building, and a one-acre park. The city of Richfield understood the relationship between transit and high-density developments and brought Metro Transit into the discussions early in the planning process. This infill development is built on an existing transit line and the existing bus stops were relocated to better serve the area. In addition, the development of City Bella coincided with the execution of a sector study by Metro Transit. A sector study is a comprehensive operational analysis of transit service within one of nine sectors and is conducted in partnership with the local governmental entities. As a result of the sector study, Metro Transit improved the level of service along Lyndale serving the City Bella development.

#### Successful Strategies

Metro Transit noted that one of its most successful strategies is communication networks with local governments. Outreach to the local municipalities is time-consuming; however, coordination becomes easier over time as communication networks and relationships are formed. The eventual pay-off is a high level of cooperation among stakeholders over transit improvement needs.

A second successful strategy is the legislative mandate for a coordinated Comprehensive Plan. The Metropolitan Council coordinates the comprehensive planning process, which provides clear goals for the region. The 2030 Regional Development Framework includes a Transportation Policy Plan, a Water Resources Management Policy Plan, and a Parks Policy Plan. The Metropolitan Land Planning Act of 1976 requires local governments in the seven-county Minneapolis–St. Paul area to develop local comprehensive plans. The local plans must be consistent with the Metropolitan Council regional plan. As part of the planning process, the Metropolitan Council prepares "system statements" for each community in the seven-county area. Preparation of system statements is intended to help communities prepare or update their local comprehensive plans, and informs local officials on how their community is affected by the Council's regional system plans. Local communities submit their local comprehensive plans for Council review at least once every 10 years. At the same time, the local government's Capital Improvement Program and local controls, such as zoning ordinances, must be reviewed for consistency with the comprehensive plan. This process ensures that all plans in the region conform to the same overall goals and are compatible with one another.

The transit agency's unique position within the Metropolitan Council is also a successful strategy to integrate bus transit service with land development planning. As part of the overall planning process, the Metropolitan Council reviews all Environmental Assessment Worksheets, rezoning requests, and amendments to the Comprehensive Plan that are required for new developments. Planning staff reviews these to ensure that they comply with regional policy, and transit staff reviews them to provide comments related to transit. This affords the transit staff the opportunity to review development plans early in the development planning process.

### GO BOULDER

GO Boulder is a division within the city of Boulder Transportation Department in Boulder, Colorado. GO Boulder is responsible for the development of alternative transportation programs to improve the mobility of residents, employees, and visitors within the city of Boulder. GO Boulder developed the innovative Community Transit Network (CTN), which is comprised of high-frequency bus routes with fun names like HOP, SKIP, and JUMP. In addition to continuing the development of new bus routes for the CTN, GO Boulder plans expansions to the extensive system of off-street bicycle paths, pedestrian paths, and underpasses in the city of Boulder.

GO Boulder's service area includes the city of Boulder, which has a population of approximately 100,000. The University of Colorado contributes another 28,000 students to the population. GO Boulder does not directly operate transit service. The CTN is operated by the Regional Transportation District (RTD) headquartered in Denver, except for the HOP service, which is operated by a private contractor. The city of Boulder subsidizes the cost of CTN service that is over and above the service levels acceptable by RTD service standards.

#### Successful Projects

*Twenty Ninth Street Development*

The Twenty Ninth Street Development is the site of the former enclosed Crossroads Mall. The new development, scheduled to open in fall 2006, will be an open air mall offering 850,000 square feet of shops, restaurants, and entertainment venues. The development will be separated into four distinct neighborhoods connected by streets, walkways, and plazas, as shown in Figure 11. The street plan includes a new 29th Street and extensions of Canyon and Walnut streets that will better connect the site with the rest of Boulder.

Transit was considered very early in the development's design. Transit amenities incorporated into the development include new bus stops along 29th Street, which runs east and west through the center of the development, a "super stop" at 28th and Arapahoe with a queue jumper lane, and a HOP stop

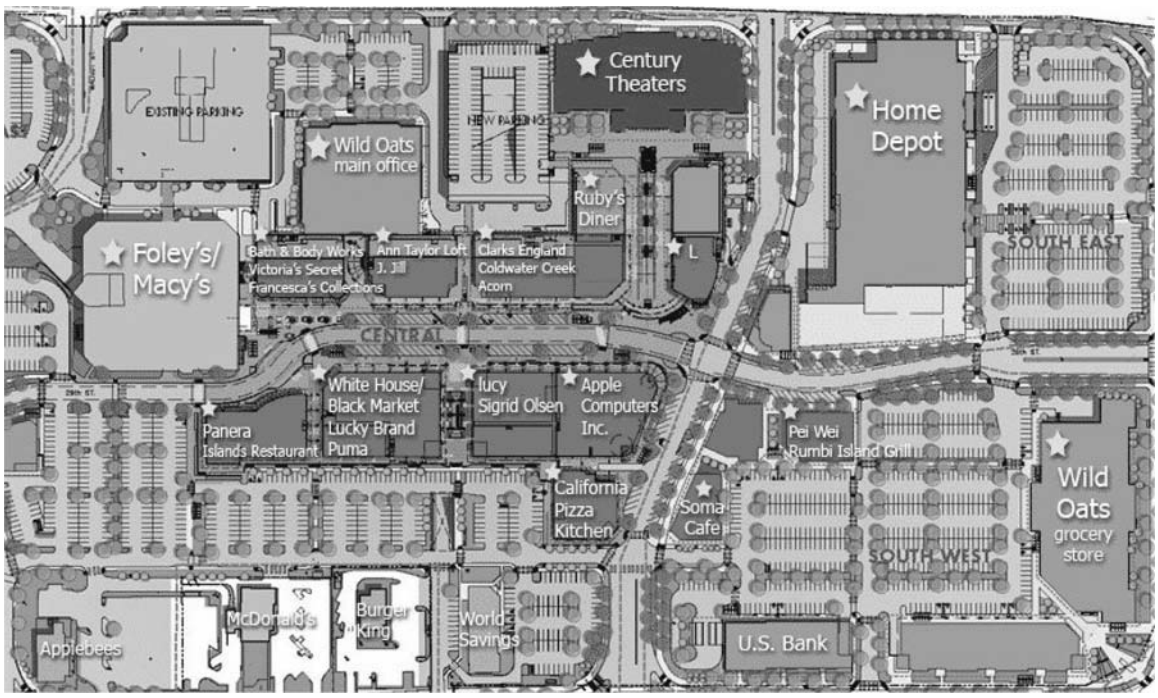


FIGURE 11 Drawing of proposed Twenty Ninth Street Development. (*Courtesy:* Macerich Company.)

at 29th and Canyon. More than 175 spaces will be provided for bicycles. The development will also incorporate special parking spaces for alternative fuel vehicles as well as preferred parking for van and carpools.

*Boulder Transit Village*

To the northeast of the Twenty Ninth Street Development is the Boulder Transit Village, a planned joint development between the city of Boulder and RTD. The development is currently in the planning and public involvement phase. As currently envisioned, the development will become the transportation hub for the immediate area. The development will include a bus transit center, a small parking structure, and space for a future FasTracks rail station. The rest of the land will be developed as high-density residential with underground parking.

*Holiday Neighborhood*

The Holiday Neighborhood is a mixed-use, mixed-income development that incorporates many of the principles of new urban design (see Figure 12). In addition to the 330 homes for sale and rent, the neighborhood includes a two-acre park, a community garden, shops, restaurants, offices, and artist studios. The development was begun in 1998 when Boulder Housing Partners, the housing authority for the city of Boulder, acquired the 27-acre site of the former Holiday drive-in theater in north Boulder. The first residents started moving into the development in February 2004, and the development was scheduled to be completed in the spring of 2006. Most residences within the development are within a one-quarter-mile walk of bus service, and all households receive neighborhood Eco Passes, a discounted annual bus pass that allows unlimited travel on RTD local, regional, express, and light-rail routes.

**Successful Strategies**

GO Boulder is not a transit agency, but a city department that is included as a case study because it provides an example of city government that directly supports transit through its policies, which encourage the use of transit and other alternative travel modes. City policies regarding zoning, open space, and parking management all contribute to an environment that is transit-supportive. In addition, the existence of

FIGURE 12 Holiday Neighborhood street. (*Courtesy:* City of Boulder.)

GO Boulder within the city's organization allows early participation by transit in the planning for new developments. GO Boulder promotes communication with RTD and other stakeholders to encourage partnerships and improve the transit environment.

The zoning within Boulder encourages mixed-use development, which in turn encourages the use of alternative modes, including transit. The city has six mixed-use zoning districts. Since they were created, new developments in Boulder are now more traditional mixed-use developments with multiple stories. The city is gradually becoming new urbanist in character, especially on the western side of the city.

Boulder citizens have historically valued open space for the beauty of mountain vistas and the preservation of natural resources. In 1967, Boulder citizens voted for a sales tax of 0.4% to acquire, manage, and maintain open space. An additional 0.33% was added in 1989. Today, more than 43,000 acres of land have been preserved to create a buffer between Boulder and neighboring communities and to preserve natural areas and resources.

Boulder's open space program limits the amount of land available for development. This encourages higher-density developments capable of supporting high-frequency bus transit service. With less land available for development, transit interests become a louder voice in the planning process. The higher-density land use requires the provision of transit service to alleviate congestion caused by an automobile-dominated environment.

A successful strategy to encourage transit use is parking management. In downtown Boulder, most on-street parking meters are 3-h meters. This discourages the use of on-street parking by downtown employees and provides short-term parking for shoppers. Boulder also offers downtown employees an incentive to take transit to work by offering them an Eco Pass. Revenue from the downtown parking meters is used to fund transit passes for downtown employees. Boulder's downtown Eco Pass encourages transit ridership and provides commuter benefits to more than 8,000 employees.

Parking management is also employed on the Colorado University campus. All parking on campus is paid parking. This encourages the use of transit and other alternative modes by the university population. In addition, students, faculty, and staff can receive Eco Passes for free, unlimited use of the bus system.

Another successful strategy is the funding of CTN bus routes by the city of Boulder, Colorado University, and RTD. RTD supports the operating costs of each route up to the service levels contained in their service standards. In addition, RTD secured federal funds for initial pilot demonstration projects on most of the CTN bus routes. Colorado University subsidizes a portion of the operating costs for the HOP and STAMPEDE bus routes. In addition, the city of Boulder subsidizes the cost of CTN service that is over and above the service levels acceptable by RTD service standards. This partnership support of the CTN allows for higher service levels than would normally be available. This provides a more attractive service, which should draw more customers and increase bus ridership.

CHAPTER FIVE

# CHALLENGES TO INTEGRATING BUS TRANSIT SERVICE AND LAND DEVELOPMENT PLANNING

There are many challenges to integrating bus service with land developments. Among these, the perception of transit in general and of bus transit in particular, is a significant barrier to overcome. Bus transit does not have a positive image in many areas. To overcome poor perceptions when meeting with stakeholders, transit staff must present pertinent knowledge that is clear, concise, and to the point. A good presentation by staff can go a long way toward making stakeholders comfortable and more open to transit considerations.

This chapter will review the challenges of integrating bus transit and land developments in three areas: Institutional Barriers, Resource and Financial Challenges, and Stakeholder Challenges.

## INSTITUTIONAL BARRIERS

Institutional barriers that prevent the integration of bus transit service into land developments include internal issues within the transit agency and the division that typically exists between the transit agency and local government.

A significant institutional barrier can be the transit agency's policymaking board. Many transit boards do not view land use planning as their role, and involvement in contentious land use decisions is not desired. Board members and even top management at transit agencies may not understand the relationship that exists between land use and transit. It may be beneficial to update transit agency decision makers on the transit and land use connection to generate internal support for appropriate land uses. Without this education, it could be challenging to expend resources to advocate for good land use design. Participation by staff in the land development process will be limited, and without internal high-level support, staff cannot effectively participate.

Another institutional barrier is the normal division of responsibilities between transit agencies and the local governments. The transit agency is typically responsible for service provision and service planning, whereas land use policy and planning is the responsibility of local government. Effective communication networks and coordination processes between the two agencies are required if transit is to be consistently integrated into land developments. However, establishing good communication networks and coordination processes is time consuming. Staffs from both agencies are often squeezed by the pressure from other vital activities and staff turnover can bring progress to a halt. Even with suitable networks in place, transit is often inadvertently omitted from the planning arena.

In addition to the challenge of divided responsibilities, local governments may have priorities and goals that differ from those of the transit agency. At times, the goals of the two agencies may be in direct conflict with one another. There may be competition for financial resources. As an example, TIF funds that could be used to add amenities at bus stops may go instead toward roadway improvements desired by the city. This divergence of goals points to the need for land use and transportation decisions to be made concurrently. Decisions on these issues should not be made independent of each other. Based on survey results, the most common method of ensuring concurrent decisions on land use and transportation is through early involvement in the planning process. Areas that do not have a strong planning process are at a great disadvantage. The plans must be enforceable, either through regulation or through strong commitments by local leadership.

## RESOURCE AND FINANCIAL CHALLENGES

The greatest financial challenge to integrating bus service into land developments is associated with the resources available at the transit agency. Resources in terms of staff time and in terms of the operating costs associated with bus route changes are in short supply at most transit agencies. Staff resources are dedicated to planning activities associated with the direct provision of service. Transit planners may not have the time to become involved in land use issues. If a developer or a building owner does not agree initially to the transit planner's recommendation, it is likely that the transit planner will let the matter drop and move on to the next pressing task. In many areas the planner may have little recourse, unless there are policies and institutional practices in place that support transit in these efforts. Most transit agencies cannot force a developer to act and convincing them takes time. Time is a resource that neither the transit planner nor the developer has in great supply.

In addition to the lack of staff resources, there is a limited amount of resources available to extend or improve service levels. One transit system noted that although there has been growth and development in the area, there has been no corresponding growth in the amount of funding the agency receives

for operations. This is probably typical for many transit agencies and points to a major problem for serving new developments. Even in those cases where new service is warranted, there may not be funds to support it. This situation makes it difficult to negotiate with developers for facilities that are needed to accommodate transit at the site, but where there is no guarantee that service will be available. Developers are not likely to build a transit element in their development unless the transit agency agrees to serve the development.

A challenge for large TOD projects is that some lenders are reluctant to finance new types of projects (Cervero and Seskin 1995). Lenders prefer to back a sure thing; proven models that have a history of generating sufficient revenue to make a profit. TOD projects, especially in the suburbs, are not typical development projects and therefore carry greater risk. Lenders are risk-averse and unless they have prior experience with similar developments, they are not likely to finance the project. Lenders are also predisposed to developments providing up to two parking spaces per unit, in large part because current market studies indicate that this is the preferred level. Lenders who rely on those studies will not finance developments that incorporate fewer spaces per unit. *Developing Around Transit: Strategies and Solutions That Work* (Dunphy et al. 2004), notes that the number of lenders that have experience with TOD projects is increasing. However, projects are more likely to obtain financing if some local financial support is provided. This funding support communicates to the lender that transit has value to the community and that the community perceives benefits associated with the incorporation of transit into the development.

## STAKEHOLDER CHALLENGES

Transit agencies have a vested interest in expanding the market for transit, and the integration of transit with new developments is an opportunity to do that. Other stakeholders, such as developers, the community, or even the local municipality, may not have the same interests.

Except in urbanized central cities, transit represents a very small percentage of travel within the United States. It is therefore not surprising that most developers do not consider transit when designing their developments. Many developers are unfamiliar with transit and do not understand transit's potential benefit; therefore, the incorporation of transit early in the development process is very difficult.

Once transit appears on the "radar screen," it still faces an uphill battle. In new developments transit interests are in competition with a host of other interests. During the development's feasibility and design phases, transit competes for scarce resources with a variety of other land uses. For transit to be considered in the competition it must first become known to the developer either through direct contact or as part of a required planning process. Then transit must make the case that space within the development and the expense associated with building a transit facility is appropriate and cost-effective.

Developers will often come to the table with an off-the-shelf design. Large retail chains prefer a standard building and site design that they propose for all new sites. This has advantages for the retailer and is cheaper than designing each development from scratch. This approach, however, is not transit-friendly because it typically is designed for access by automobile only and does not include consideration of alternative travel modes.

Most developments, whether they are commercial, industrial, or residential, are planned without considering transit as an access mode. After designing the first development as autocentric, subsequent developments are proposed in the same mold. This is a difficult habit to break, and developers must be convinced to break the cycle. It is up to local communities to negotiate for a site design that is more in line with their goals. This is happening in some communities, especially for big box developments that have begun to move into urban environments from the traditional suburban areas. For example, in New York, Home Depot has constructed a three-story store in Manhattan and Target a two-story store in Brooklyn. The proposed Midtown Square development in Charlotte, North Carolina, will feature a Target store on top of a Home Depot Expo. It is gratifying that some areas have had success in breaking the big-box mold; however, more needs to be done, because autocentric developments are still the mainstream designs.

The normal developer process begins some time before the public sector is aware that a new development is being considered. Given the standard development process, it is usually too late for collaboration with transit agencies (Cervero et al. 2002). Once major components of the development are planned, it may be too difficult and costly to accommodate transit within the site. It is also difficult to mesh the varying time lines between the local government, developer, and transit agency. For the developer, acquiring approvals from local governments and transit agencies can take an inordinate amount of time and money. This may dissuade many developers from formulating developments that require a lengthy approval process.

Communities can often be an obstacle to new developments for a variety of reasons. Communities have opposed transit expansions because of a poor perception of transit and its customers. A mixed-use development proposal with good potential for increasing transit ridership may be opposed by the surrounding community for a variety of reasons. The community may fear increased traffic congestion or insufficient municipal resources to support the increased population. In lower-income neighborhoods the community may be fearful of property values rising too high and eventually pushing them out of the neighborhood. In higher-income neighborhoods the community may expect property values to fall, perhaps owing to the provision of more bus service to the area. Whatever the reason, experience has shown that early public involvement and education is key to a smoother development process.

CHAPTER SIX

# STRATEGIES THAT SUPPORT INTEGRATION OF BUS TRANSIT SERVICE AND LAND DEVELOPMENT PLANNING

This synthesis found that the inclusion of transit planners early in the development design is key to successfully integrating bus transit service into land developments. All stakeholders agree on this point. Transit agencies identified the following strategies that enabled early participation: strong support by local government officials, an effective land development planning process, and good relationships and communication with local planning and/or government staff. However, finding one strategy that ensures early participation by transit agencies in the development process and one that will be successful in all areas is not likely. The most successful regions incorporate a mix of strategies to ensure adequate coordination between transit service and land development.

The strategies employed by transit agencies and other stakeholders can be divided into three types: institutional, financial, and regulatory. Strategies discussed in this chapter are cited here.

- Institutional Policies and Practices
  - Written policies in adopted plans
  - Develop communication networks
  - Transit advocates: "champions" and coalitions
  - Transit agency development guidelines
  - Education
  - Transit agency TOD programs
  - Relationships with developers and building owners
  - Building partnerships.
- Funding Strategies
  - Developer support
  - Municipal support
  - Planning funds
  - Tax increment financing
  - Land incentives.
- Regulatory Tools
  - Zoning
  - Form-based zoning
  - Controlled growth
  - Adequate public facilities ordinance
  - State-mandated planning process.

The process of developing a winning mix of strategies takes time and the task may at first appear overwhelming. However, some communities, notably Boulder, Colorado, have proven that the results are worth the wait.

## INSTITUTIONAL POLICIES AND PRACTICES

The survey responses indicated that most transit agencies rely on institutional strategies to integrate transit and land development. Written policies in adopted plans is one such widely employed strategy. Good communications networks with local governments and planning agencies was noted by several transit agencies as a critical element in coordinating bus service with new development. The presence of a "Champion" to advocate for transit was reported by some agencies to be a helpful strategy. Other institutional strategies include transit agency development guidelines, education, transit agency TOD programs, creating relationships with developers, and building partnerships with building owners.

### Written Policies in Adopted Plans

A good general or comprehensive plan that clearly communicates the region's vision of the future is the best first step in developing a mix of strategies to integrate bus transit service and land development planning. The best plans are developed with public input and are supported with clear steps to achieve the vision. All of the plans developed in a region must relate to the overall vision and to each other. Specific plans can be produced to implement the comprehensive plan in strategic locations, districts, or corridors. For example, specific plans can be developed for business districts, historic districts, redevelopment areas, or conservation areas.

The plan should not just address transit as a separate entity in its own chapter, but should acknowledge the importance of transit-supportive elements throughout the document. For example, a good pedestrian environment is critical to a successful transit system. Sidewalks, the quality of the walking environment, as well as direct pedestrian paths are key components to providing quality pedestrian access. Site design and density are also extremely important factors in transit provision and in successfully integrating transit into land developments. The relationship between these factors and transit should be highlighted in the plans.

Transit agencies benefit by participating in the preparation of general or comprehensive plans. This provides an opportunity to network with representatives from other agencies and spread the word on the importance of transit to the current and future environment. If transit is not desired at the

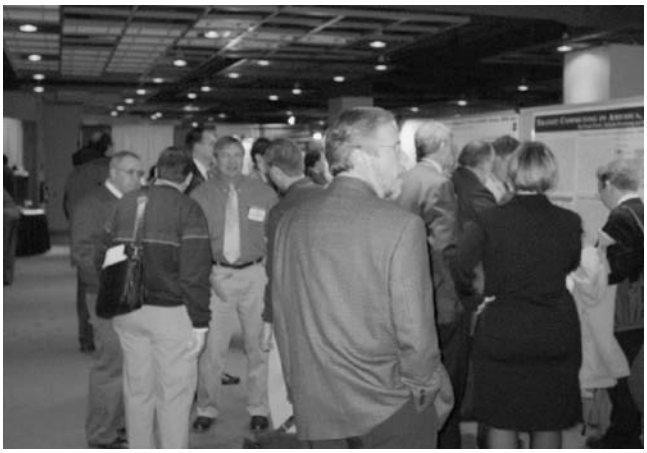

FIGURE 13 Networking can improve communications between stakeholders. (*Courtesy:* Ed Christopher.)

current time, it may be needed as the population and preferences change. It is important that new developments incorporate plans for the future and not just current preferences.

#### Develop Communications Networks

A second successful strategy to incorporate bus transit service and land development planning is the development of good communications networks with stakeholder partners. Metro Transit in the Minneapolis/St. Paul region noted in its survey response that this takes time; however, the rewards are early participation in the planning process and credibility with decision makers. Staff from CATA in State College, Pennsylvania, also found this to be one of the most successful strategies when integrating transit and land development.

Working with outside agencies on comprehensive plans, spreading the word on transit needs, and developing communication networks can be successful strategies (see Figure 13). However, they are only successful if the transit agency has the staff resources to participate in these activities. CATA found an interesting solution to this problem by sharing a transit planner with the CRPA. The transit planner has offices in both agencies and splits the 40-h work week evenly between the two. This arrangement could be considered by some transit agencies, especially those in areas where the other public agencies in the region are facing tight budgets. Some transit agencies are apparently reevaluating their missions and resources. *Policies and Practices for Cost-Effective Transit Investment* (Deakin et al. 2002) reported that transit agencies were hiring staff to act as liaisons to local governments and other agencies in support of transit-supportive land use.

#### Transit Advocates: "Champions" and Coalitions

Strong leadership in the form of a "champion" or coalition of stakeholders can affect the integration of bus transit with development by advocating for transit. Some transit advocates may lobby for a particular project and be active in the planning arena for a relatively short time. Others may have a long-term interest in supporting transit and will advocate for policy initiatives as well as transit projects. Elected officials were recognized as champions by CATA. Transit advocates can have a very positive impact on land use and new development by initiating actions supportive of transit, but their existence can be fleeting. If it is within their power, champions and coalitions should support transit by building a transit-supportive policy structure and process that will have lasting value.

#### Transit Agency Development Guidelines

The development of transit agency development guidelines can be a successful strategy to integrate bus transit and land development. Some of the most successful transit agencies have developed several types of guidelines and make them widely available through the Internet and in published public documents and general plans. The use of transit agency development guidelines and their characteristics is discussed in more detail in chapter seven.

The Central Florida Regional Transportation Authority (LYNX) promotes a checklist, shown in Figure 14, which includes all the major chapters in their *Mobility Design Manual*. LYNX has also developed a Design and Land Use document that is included in the Transit Development Plan Major Update for 2005–2009. The Design and Land Use document summarizes guidelines for development design. It refers readers needing more detail to three LYNX manuals; one each on customer amenities, mobility design, and rail design. The Design and Land Use document is distributed to all counties and municipalities when it is time to update their comprehensive plans.

#### Education

Education is also a successful strategy. During the development of regional plans, the public can be informed of the benefits associated with transit, with mixed-use developments, and with higher densities. Transit planners could benefit from training sessions on the land development process and related financing requirements and zoning regulations. Likewise, city planners and developers could learn about transit needs and benefits. Perhaps the most important stakeholders are the decision makers; local government officials, business leaders, and their staffs. In large measure, these decision makers form the land use policies in each region. Many of these decision makers could benefit from more information on the choices available to them and the affects of those choices. An example of education for decision makers is a series of Leadership Academies that were scheduled to be held in 2006 to discuss growth in Central Florida (see Figure 15). The purpose of the Leadership

**LYNX Development Review Checklist** www.golynx.com | news | publications

This checklist is provided to assist in the review process of proposed developments relating to public transportation elements. These elements extend beyond the simple provision of space for a transit stop and include transit sensitive design, pedestrian access to transit service, bicycle network design, and access routes for transit vehicles. References are provided to elements of the *Central Florida Mobility Design Manual*.

| Pedestrian Circulation | Yes | No | Page(s) |
|---|---|---|---|
| Is the site designed to facilitate safe, convenient, and comfortable pedestrian circulation? | | | 2.1 – 2.5 |
| Does the pedestrian circulation system connect with LYNX service? | | | 2.1 |
| Is the pedestrian circulation system consistent with the American with Disabilities Act? | | | 2.6 – 2.8 |
| **Bicyle Circulation** | **Yes** | **No** | **Page(s)** |
| Is the site designed to facilitate safe, convenient, and comfortable bicycle circulation? | | | 3.1 – 3.4 |
| Does the bicycle circulation system connect with LYNX service? | | | 3.1 |
| Are the bicycle circulation system's functional standards consistent with AASHTO recommended standards? | | | 3.2 – 3.4 |
| **Vehicular Circulation** | **Yes** | **No** | **Page(s)** |
| Does the site plan provide for interconnected streets? | | | 4.1 |
| Are the streets designed for the safe interaction of all users? | | | 4.2 – 4.4 |
| **Transit Circulation** | **Yes** | **No** | **Page(s)** |
| Does the transit circulation plan allow for convenient LYNX service? | | | 5.1 – 5.3 |
| Does the transit circulation plan allow for direct LYNX service? | | | 5.1 – 5.3 |
| Does the transit circulation plan allow for efficient LYNX service? | | | 5.1 – 5.6 |
| **Transit Stop and Terminal Design** | **Yes** | **No** | **Page(s)** |
| Are the transit stops designed to be noticed? | | | 6.1 – 6.6 |
| Are the transit stops designed for pedestrian and bicyclist convenience and comfort? | | | 6.1 – 6.6 |
| **Building Location** | **Yes** | **No** | **Page(s)** |
| Does the building's site facilitate pedestrian access? | | | 7.1 – 7.4 |
| **Building Design** | **Yes** | **No** | **Page(s)** |
| Is the building's architectural design conductive to pedestrian circulation? | | | 8.1 – 8.4 |
| Does the building design provide pedestrian levels of detail? | | | 8.1 – 8.4 |

FIGURE 14 LYNX Development Review Checklist. (*Courtesy:* LYNX Central Florida Transportation Authority.)

Academy is to focus high-level discussion on the question of "How should we grow?" The Leadership Academy will offer educational and interactive programs that show participants the affects of various growth and development decisions. Using interactive computer programs, decision makers will build alternative future developments and observe the results on the environment, transportation system, and congestion.

Informal education can also be an effective method of familiarizing stakeholders with the issues. Lunches, receptions, conferences, and meetings are all opportunities to network with stakeholders and trade information. Transit agency staff can provide additional education by volunteering as speakers at these events. In this way, the benefits of transit can be communicated to a variety of stakeholders in an informal manner.

FIGURE 15 Decision makers in Orlando gather to discuss regional issues. (*Courtesy:* Orlando Regional Chamber of Commerce.)

Staff development can assist the transit agency in improving its ability to have an impact on land use. CATA noted that the technical expertise of its planning staff improved relationships with developers. The provision of pertinent physical details at the outset, together with on-going follow-up to support the developer, has proven to be an important element in its success. Also important are negotiating skills. LYNX learned over time the information needed to influence developers and elected officials. Building staff capabilities in these areas is a strategy that can improve transit's impact on land developments.

### Transit Agency Transit-Oriented Development Programs

Since 1998, King County Metro in Seattle, Washington, has pursued a bus-oriented TOD program. King County's first TOD project was the Overlake Park and Ride project in Redmond, just west of Seattle (see Figure 16). This was a joint project of King County, the King County Housing Authority, and a private developer using tax-exempt financing and federal housing tax credits. A King County Metro surface park and ride lot was converted into a 308-unit affordable housing development above two stories of structured parking. The 536 parking spaces are shared by residents and

FIGURE 16 Transit facility serves the Overlake (Washington State) housing development (*Courtesy:* The Allied Group, Inc., Renton, Washington.)

commuters. The site includes a day care facility and is an active transit transfer facility. Subsidized bus passes are provided to residents as an incentive to ride the bus and help reduce automobile congestion in the region. King County Metro retains ownership of the park and ride lot, receives air rights lease payments from the developer, and will own the entire development after 50 years. King County has completed two other TOD projects and has several others in development. King County uses a variety of means to implement TOD projects, including outright sale of parking lots with the proceeds used to build spaces in the TOD development and the long-term lease of parking in mixed-use facilities.

#### Creating Relationships with Developers and Building Owners

Developers and building owners associate with lenders, consultants, construction engineers, and real estate managers. These decision makers, who can influence the design and form of developments, typically do not interact with transit officials. As a result, developers and building owners are not acquainted with transit interests, and transit provisions in new developments are not at the top of their agenda. To partially remedy this unfamiliarity with transit, transit staff could consider attending meetings, conferences, and other events that are attended by business leaders, developers, and elected officials. Staff could volunteer to give presentations that highlight the benefits of transit to new developments. Providing new ideas and a fresh perspective can raise awareness, generate interest, and build new relationships.

#### Building Partnerships

Building partnerships with building owners is also a successful strategy for integrating bus service into new developments. For example, Pace Suburban Bus in the Chicago, Illinois, region has partnered with United Parcel Service (UPS) in Hodgkins, Illinois, to provide a transit facility within the UPS parking lot. Pace consulted with UPS on the facility design and provided funding for the construction. Construction management was conducted by UPS's Engineering Department which allowed the project to quickly move forward. The Pace/UPS partnership provides a bus terminal facility that improves bus operations and encourages transit use at this large employment site.

### FUNDING STRATEGIES

Funding for the integration of bus transit service and land development can be found in a variety of sources. Two types of funding are generally needed: funding to build the physical facilities in the development and funding to support the operation of desired bus service improvements. The possible funding sources discussed here include developer support, municipal support, planning funds, tax increment financing, and land incentives.

#### Developer Support

The most obvious funding source is to look to the developer to provide transit facilities within the development as part of the project construction costs. The developer is sometimes willing to provide transit facilities in instances where the provision of transit elements offsets the cost of roadway impact fees. In some areas, the roadway improvements that are required as a result of a new development are paid for by the developer. Adding lanes or improving signalization can be very expensive, and it is often less expensive to encourage the use of transit to the development.

In addition to the provision of transit facilities within new developments, transit agencies can partner with developers or building owners to subsidize the operation of new or revised bus service. LYNX has successfully persuaded developers to fund the operating costs of new bus service for up to 2 years. For many transit agencies it is more difficult to fund the operating costs of new bus routes than to obtain capital costs for shelters, benches, etc. Obtaining the start-up costs of a new, unproven route ensures that the service will be provided at least for the first 2 years. After that time, the transit agency can determine if the route will meet performance goals.

In addition to the transit terminal on its property noted previously, UPS actively supports transit to the facility by subsidizing several bus routes. These routes are designed to connect low-to-moderate income neighborhoods with direct service to UPS for all shift changes.

#### Municipal Support

Good communication and cooperation between local governments and the transit agency can result in special funding made available through parking fees or other municipal

sources. In Boulder, Colorado, parking fees from downtown parking meters fund the provision of unlimited ride bus passes for downtown employees. Boulder's downtown parking policies discourage automobile use by downtown employees by providing only short-term, on-street parking, while encouraging the use of transit by providing free monthly passes to downtown employees. In addition, the Community Transit Network in Boulder is supported with additional funds from the city and, for some routes, Colorado University. The operating costs associated with higher levels of service, over and above the service levels acceptable by the RTD in Denver, are subsidized to encourage a greater transit market share in the city.

In Orlando, Florida, the infrastructure development for the downtown circulator system, LYMMO, was funded through the city's Downtown Development Board and the Community Redevelopment Agency. The city contracts with LYNX to operate the LYMMO service and funds the operation through the use of downtown parking revenues.

#### Planning Funds

In some areas, planning and capital funds are available to plan and coordinate transit and land development projects. The Metropolitan Transportation Commission in the San Francisco Bay area provides grants through its Smart Growth/Transportation for Livable Communities program. This program offers planning grants, technical assistance, capital grants, and a housing incentive program to help cities and nonprofit agencies develop transportation-related projects that support connectivity between transportation investments and land uses.

VTA in San Jose, California, has a planning grants program and a capital grants program to support the implementation of the concepts and principles outlined in the Community Design & Transportation (CDT) program. The CDT program is designed to unite VTA transportation planning, land use, design, and development activities. CDT is VTA's primary tool to advance projects, practices, and policies that better integrate transportation systems and land uses. It focuses on how the design of transportation systems and developments can optimize both travel options and community livability.

Although much of this funding is earmarked, funding for planning is available through the Transportation, Community, and System Preservation (TCSP) program authorized by SAFETEA-LU, Section 1117. States, metropolitan planning organizations, local governments, and tribal governments are eligible recipients of TCSP program grant funds. Transit and highway projects that enhance TOD are eligible, along with other broad categories of projects that improve the efficiency of the transportation system and reduce its impacts on the environment. The federal share of TCSP projects is 80%. Grants awarded for planning activities may include public involvement; improving pedestrian and bicycle conditions; development of new types of transportation financing or land use alternatives; better use and safety of existing roads, signals, and transit systems; and development of new programs and tools to measure success. Implementation activities may include community preservation activities to implement TOD plans, traffic calming measures or other coordinated transportation, and community and system preservation practices.

#### Tax Increment Financing

TIF is a tool available to fund improvements within a defined area. TIF funding is frequently used in conjunction with TOD projects. Property values are frozen at a base level and the increment in taxable value above this base, multiplied by the tax rate, is then available for capital improvements. Advance planning is required to take advantage of this source because setting up a TIF district can take some time and may require intergovernmental agreements.

#### Land Incentives

The provision of land incentives is another strategy to successfully integrate transit service into land developments. Land incentives are frequently used in joint development projects. The assembly of disparate land parcels into one package is very helpful to developers, who often cannot devote resources to this time-consuming task. King County's TOD program as described earlier also provides an example of land incentives. King County Metro has leveraged ownership of its surface park and ride lots to negotiate for improved facilities within new developments.

### REGULATORY TOOLS

Regulatory tools that can assist in the provision of appropriate land uses supportive of transit use are zoning, controlled growth, Adequate Public Facilities Ordinance (APFO), and state-mandated planning processes. Zoning was cited by a number of the respondents as a successful strategy. The use of controlled growth strategies, APFOs, and state-mandated planning requirements is limited to those areas that enacted such legislation. It was apparent from the survey results that transit planners are largely unfamiliar with regulatory strategies. This is not surprising, because the use of regulatory tools is normally outside the purview of transit planners.

#### Zoning

Zoning is the fundamental method of land use control by local governments. Well-thought-out zoning regulations guide the location and intensity of development. In some areas, however, zoning codes are written to prevent undesirable results,

rather than stating how things should be. It is better to use zoning to describe what is desired rather than regulate against what is unwanted (Bartsch et al. 2001). Inappropriate zoning regulations can create increased dependence on the automobile, the disappearance of open space and natural areas, and higher infrastructure costs.

The traditional zoning code used most frequently is the "Euclidean" code. Euclidean zoning is named after the village of Euclid, Ohio, whose regulations were upheld in a landmark 1926 Supreme Court case. Euclidean zoning is typically based on a system of zoning districts (residential, commercial, industrial, etc.), a list of uses associated with each district, and dimensional standards, which may include lot size, setbacks, and building height. The disadvantages of traditional zoning are that it is not flexible to respond to the special needs of a particular site, and because it is not prescriptive, the development's ultimate "look and feel" is uncertain. Euclidean zoning also discourages mixed-use development—land use that is conducive to transit.

There are several zoning tools available to local governments that are more flexible and will encourage and support the integration of transit service and land development. One example is the designation of a transit zone or use of transit overlay zoning. These can allow, for example, the provision of mixed-use developments at high density where high-quality transit service is provided. Minimum densities or floor area ratios can be set for these zones, as can reduced setback requirements or maximum parking requirements. These measures also provide a financial incentive for developers. Overlay zones can also be created to support other purposes such as pedestrian mobility or historic preservation.

Planned development zones or planned unit developments provide a process to bend rigid rules in favor of better site design and land use patterns. The advantages associated with these zones are maximum design flexibility and the ability to negotiate public benefits that would otherwise be unattainable. Because planned unit developments are negotiated on a development-by-development basis, the unique transit needs of each site can be addressed for each development.

Incentive zoning encourages particular development aspects through incentives such as density bonuses, fee waivers, expedited review, and reduced parking requirements. Incentive zoning is often used to encourage TOD, and could be used to integrate transit facilities into new developments. Incentive zoning leaves the option to the developer as to whether the development takes advantage of the offered incentives. The use of incentive zoning requires a delicate balance between providing sufficient incentives to attract developer interest, but not generating so much interest that the incentives are overused.

The reduction of zone size is a simple method under traditional zoning that brings differing land uses into closer proximity and encourages more pedestrian traffic. Large zones of single individual land uses discourage walking between land uses and therefore encourage use of the automobile. Reducing the zone size will bring compatible zones within walking distance of one another.

Local governments generally have control over land use and zoning. However, many transit agencies, especially the larger ones, have hundreds of local governmental agencies to deal with. This is a problem for agencies that wish to promote changes in local zoning codes. "Shopping" a package of recommended zoning reforms to more than a handful of local governments is a daunting task. This could be overcome in part by presenting the new zoning ideas to groups of local elected officials and other decision makers at regional meetings.

Cleveland, Ohio, has been revamping its zoning code for the last several years. It has created new districts for planned unit development, pedestrian retail overlay, live–work overlay, and urban townhouses. In the mid-1990s, the Cleveland City Planning Commission approved the creation of smaller urban lots where such lot sizes are characteristic of the neighborhood. Cleveland has also instituted a prohibition on the creation of downtown surface parking lots. This was to prevent widespread demolition of older buildings to create parking lots for the Gateway sports complex. This has contributed to the preservation and reuse of downtown buildings. Recently, the Midtown neighborhood in Cleveland adopted form-based zoning in part to complement the Euclid BRT corridor.

#### Form-Based Zoning

Form-based zoning is used to regulate the "form" of the environment. It prescribes the desired physical form of a community, as opposed to traditional zoning, which attempts to control land use and density. Form-based zoning is generally developed in concert with a community visioning process. Residents are asked how they want their neighborhood to look and an illustrative plan is drawn to fit that vision. The next step is to transform the illustrative plan into a more detailed regulating plan.

The regulating plan indicates where form-based codes apply. It includes illustrations of projected building footprints, location of public spaces, and allowable building types for each site. Standards are written to describe the physical elements of the plan. Building standards are developed for each building type and typically include minimums and maximums for building height, site requirements, dimensions, and building elements such as windows, doors, and courtyard placement. Thoroughfare standards are essential to establish a coherent and efficient street network. Some elements that these standards cover include parking lanes, sidewalks, and medians. Other standards within form-based zoning describe landscaping or architectural details.

### Controlled Growth

Controlled growth is another strategy that encourages the type of land use that can sustain transit. Several of the transit agencies responding to the survey cited the use of various controlled growth measures in their areas as successful tools that support transit.

The Washington State Growth Management Act (GMA) passed in 1990 is one of the most aggressive statewide growth management laws in the country. The GMA was created to address uncoordinated growth, improve quality of life and economic development, and protect critical areas. In 1991, it created growth management hearings boards in three areas to resolve land use disputes quickly. The GMA requires state and local governments to prepare comprehensive plans and implement them through capital investments and development regulations. By all accounts the GMA is still a work in progress, being both criticized and praised by different groups within the state. In a report conducted for the National Association of Realtors, Douglas Porter (2005) found that the GMA had succeeded in promoting comprehensive planning by local governments, in using development to improve communities, and in preserving sensitive environmental areas.

In 1973, the state of Oregon passed state-wide planning legislation to preserve farm and forest lands, manage urban growth, control rising public costs, and conserve natural resources and coastland. The legislation requires the designation of Urban Growth Boundaries (UGB) for all municipalities in the state. The land within the UGB is supported with public services such as water and sewer, schools, parks, roads, and police and fire protection. UGBs concentrate public resources for a more cost-efficient provision of services, and they clearly detail where future development will occur.

In states without controlled growth laws, some local governments have passed reforms to concentrate development and thereby support local transit systems. Citizens in Boulder, Colorado, have twice voted to tax themselves to support and expand the city's open space program. The open space program limits the amount of land that is available for development. In addition, Boulder instituted a 2% annual cap on the residential growth rate in the late 1970s. This slowed residential, but not commercial or industrial growth. Within Boulder this policy has created an imbalance between jobs and population, which causes increased congestion. Of the two programs, the open space program has had the greatest positive influence on encouraging transit-supportive development within the city of Boulder.

In 1997, the Denver Regional Council of Governments published the Metro Vision 2020 plan, which included a voluntary 750-square-mile urban growth boundary. The Metro Vision 2030 plan, adopted in January 2006, retained the urban growth boundary at 750 square miles despite development pressure to expand the zone. The organization has worked with local governments to promote the characteristics of smart growth and has encouraged them to include growth boundaries in their own plans.

### Adequate Public Facilities Ordinance

Another method used to control growth is an APFO. The purpose of an APFO is to ensure that the public facilities needed to support a proposed new development are in place concurrent with the development's opening. It also requires a connection between the area's development plans and the capital improvement program. APFOs can be written for specific, publicly provided facilities such as schools, or they may encompass a host of public facilities, such as water, sewer, transit, roads, etc. APFOs encourage development where adequate facilities are already provided, such as infill developments in urban areas.

### State-Mandated Planning Process

The LYNX and Omnitrans case studies illustrate the transit benefits of having a legislative framework in place. The states of Florida and California have passed laws requiring a structured review process for certain developments. These laws make it possible for the transit agency to become involved early in the development design process. Early participation greatly assists in the successful integration of transit into new developments.

These state laws do not attempt to control land use. Rather, they provide a forum for the public to review and perhaps influence the form of proposed developments. The prevalent preference for a market approach to development in the United States has an impact on local regional plans and regulations. Legislative requirements to include transit agencies and other stakeholders in the development review process can improve the quality of the environment.

CHAPTER SEVEN

# USE AND APPLICATION OF GUIDELINES TO INCORPORATE BUS TRANSIT SERVICE INTO NEW DEVELOPMENTS

One section of the transit agency survey conducted for this synthesis focused on the use of transit agency development guidelines. Transit agency development guidelines provide a handbook of information on the material needs of transit in the physical environment. The survey probed for the contents of existing guidelines and copies of existing documents were requested. The purpose of this research was to determine if the existence of such guidelines is a helpful tool for transit operators when incorporating bus transit service into land developments. Of the 32 transit agencies responding to the survey, 9 (28%) had developed guidelines and 4 (13%) were in the process of developing guidelines. Appendix C provides a list of the transit agencies that provided transit agency development guidelines. For those agencies that provide their guidelines on-line, links to those websites are provided.

The guidelines provided by the respondents covered a wide range of publications. The city of Madison's (Wisconsin) *Development Guide* is a guide to the land use and construction approval process. This document is not a transit agency development guideline, but it does provide a clear description of the land development process in Madison. Because transit agencies may find it an interesting and educational piece, it is listed in Appendix C and is available on-line (http://www.cityofmadison.com/planning/2005DevBook.pdf). Some guidelines, such as Cleveland's *Transit Waiting Environments* (http://www.cudc.kent.edu/d-Service-Learning/PDFs/TWE%20screen%20shortpdf), and Portland's *Bus Stop Guidelines* are primarily dedicated to the improvement of bus stops. Others, such as VTA's *Community Design and Transportation*, is one of a multivolume set that incorporates a myriad of issues than can affect transit and land development. All of the documents reflect the issues and concerns that predominate in their community.

The guidelines also vary in scale and in topical content. Some agencies provided documents of only a few pages, whereas others, such as VTA, provided multiple volumes. All the guidelines reviewed for this paper included technical specifications for bus vehicle dimensions, bus stop length, and ADA requirements. Most included the physical attributes and specifications for bus stop spacing, bus stop pavements, stop placement, shelter size, turnarounds, and turning radii. Approximately half of the guidelines included recommendations on the characteristics of land developments such as site design, land use, streets, sidewalks, open space, building design, parking, pedestrian amenities, bicycle amenities, security, landscaping, ADA elements, and directness of pedestrian paths. A suggested table of contents for transit agency development guidelines is presented here.

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Acknowledgments

## PURPOSE AND USE OF GUIDELINES

Respondents to the survey provided a brief summary describing the purpose of their guidelines. A typical response to this question was to "Provide specific design guidance to devel-

opers and local jurisdictions on transit operating and facility requirements." Most of the purpose statements included developers as their target audience and wanted to provide information that would improve the transit environment. The responses can be summarized into the following elements:

- Provide specific design guidance to developers and jurisdictions,
- Ensure that transit elements are built to appropriate specifications,
- Ensure adequate access to transit,
- Streamline the development process, and
- Make all stakeholders aware of the opportunities transit provides.

The stated purposes within the guidelines themselves are, of course, much longer but the message remains the same. For example, the LYNX *Central Florida Mobility Design Manual* states that: "This manual is a definitive statement of the actions needed to successfully integrate the physical design of independent projects into comprehensive sustainable communities that are served by a balanced transportation system."

Another example, from Pace, the Suburban Bus Division in the Chicago area, states that their *Development Guidelines* were prepared "to encourage the coordination of real estate development and transit service." And furthermore, that the "recommendations in this manual are designed to help municipalities and the development community accommodate transit service in their development plans."

## DISTRIBUTION OF GUIDELINES

It is unclear from the survey responses how often guidelines are actually used by stakeholders outside of the transit agency. In Florida, the larger developments are subject to a regional review mandated by the state, and the guidelines are required reading for developers when planning those large developments. King County Metro in Seattle and TriMet in Portland noted that developers will receive the guidelines when required as part of the permitting process. For other transit agencies it is not clear how often the guidelines are transmitted to developers. Based on the survey responses, it is apparent that the distribution of guidelines to stakeholders outside of the transit agency can be improved.

Eight of the nine transit agencies that have produced guidelines make them available as a printed document. The exception is King County Metro, and their guidelines are available on-line. Also available on-line are the documents produced by Pace Suburban Bus, LYNX, and Cleveland RTA. See Appendix C for links to the on-line versions. VTA in San Jose, California, has a PowerPoint version of their guidelines available, and LYNX includes its guidelines in several planning documents including the Transit Development Plan. Transit agencies could do more to publicize the existence of their guidelines. With widespread use of the Internet, all transit agencies now have their own websites. Publication of the guidelines on the website would be a simple and inexpensive method of distributing the information contained in the guidelines. Many local government websites have pages to explain the permitting and zoning processes in their areas. Links between the local government website and the transit agency website would increase the outreach.

## DEVELOPMENT CHARACTERISTICS INCLUDED IN GUIDELINES

Development characteristics include items that affect not only the look and feel of a project, but also the innate ability of the project to support transit service. Characteristics such as site planning, land use, density, street pattern, sidewalks, open space, building design, parking, pedestrian amenities, security, ADA elements, and directness of pedestrian path are considered development characteristics. This list of characteristics was presented in the survey and transit agencies were asked to identify those characteristics that are included in their guidelines.

The discussion of development characteristics included in the agency guidelines echo the literature on TOD, New Urbanism, and Urban Villages. The concepts of pedestrian scale, quality environments, pedestrian mobility, and bicycle paths are common in both. Transit is dependent on a diverse and lively environment to provide transit riders in sufficient numbers to enable cost-effective provision of service. The goals of transit planners and TOD proponents often coincide.

The following discussion highlights some of the development characteristics discussed in the guidelines provided by the survey participants.

Density is clearly one of the major determinants of successful transit provision. A good example of a density discussion is found in VTA's *Community Design & Transportation Manual* (see Figure 17). VTA cites best practices for the various aspects of integrating transportation and land use, and provides four best practices related to density: "Put density where it belongs," "Build to planned densities," "Consider design with density," and "Match densities to transportation resources." VTA's document also includes an appendix devoted to development density. The appendix presents recommendations on minimum and average building densities for various land uses.

Building orientation and/or design is addressed in the guidelines from LYNX, CTA, VTA, Pace, and Cleveland RTA. All recommend that buildings front onto the main street to provide a better pedestrian environment and reduce walking distances for transit customers. LYNX also adds an alternative suggestion to front at least part of the building on the street (see Figure 18).

| LAND USE | Within 1/3 Mile of Train Station or Major Transit Center | | Within 1/3 Mile of Major Bus Stops | |
|---|---|---|---|---|
| Residential | Average Density* | Minimum Density* | Average Density* | Minimum Density* |
| Regional Core *[1] | 85 [1] | 60 [1] | 50 [1] | 30 [1] |
| County Core | 45 | 25 | 25 | 20 |
| Local Core | 40 | 20 | 20 | 15 |
| Station Area—regional *[2] | 75 [2] | 55 [2] | 35 | 25 |
| Station Area—local | 45 | 30 | 20 | 15 |
| Rail Transit Corridor [3] | 35 [3] | 20 [3] | 25 [3] | 15 [3] |
| Bus Rapid Transit Corridor [4] | 40 [4] | 20 [4] | 40 [4] | 20 [4] |
| Suburban Areas | 18 | 12 | 10 | 7 |
| Office | Target Floor to Area Ratio (FAR) | | Target Floor to Area Ratio (FAR) | |
| Regional Core | 5.0 | | 2.5 | |
| County Core | 3.0 | | 2.0 | |
| Local Core | 2.0 | | 1.0 | |
| Station Area—regional | 4.0 | | 2.0 | |
| Station Area—local | 2.0 | | 1.0 | |
| Rail Transit Corridor [3] | 3.0 | | 1.5 | |
| Bus Rapid Transit Corridor [4] | 2.0 [4] | | 1.0 [4] | |

*Dwelling units per acre
[1]Project target density for Regional Core: 150–200 DUA
[2]Project target density for Regional Station Area: 100–150 DUA
[3]Within _ mile of the corridor
[4]Within 1–2 blocks, or approximately 100–200 meters of the corridor

FIGURE 17 Minimum and average building density recommendations. (*Courtesy:* Valley Transportation Authority, Santa Clara, California.)

Directness of pedestrian path is clearly a topic that all transit agencies appreciate as a critical element in the successful provision of transit service. Many transit agencies reported that their areas were severely lacking in this critical area. Disjointed developments, decorative fences, and severe changes in grade prohibit direct pedestrian paths. These are often greater deterrents to pedestrian traffic than a lack of sidewalks. It is therefore not surprising that most agencies include a discussion of this element in their guidelines. CTA's guidelines recommend the creation of shortcuts through long blocks and across corner parks. The guidelines note that "pedestrians seek the most direct route and are discouraged by circuitous pathways." VTA's guidelines recommend the creation of "a continuous pedestrian network that connects buildings to each other and to transit facilities."


FIGURE 18 Front buildings onto streets. (*Courtesy:* LYNX Central Florida Transportation Authority.)

Closely related to the directness of pedestrian paths is the presence of sidewalks. Many suburban developments have been built so that pedestrians must walk in the road with the automobile traffic. This is true for all types of developments—residential, industrial, and commercial. Commercial big box retailers recently started to move from traditional suburban environments into the urban environment. The typical big box development set within an urban area with good pedestrian access provides a visual contrast of the worst and the best in providing pedestrian pathways.

The guidelines provided by survey respondents indicated that transit agencies recognized the need to provide good pedestrian sidewalks. King County Metro in Seattle recommends a good durable sidewalk pavement that provides adequate traction to reduce slips and falls. LYNX

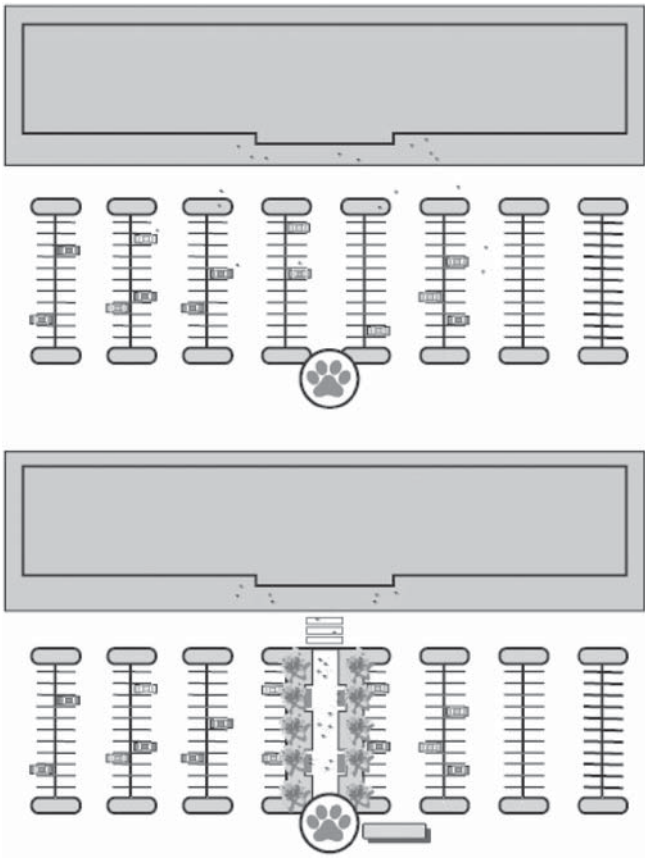

FIGURE 19 Clearly delineated pedestrian paths through parking lots. (*Courtesy:* LYNX Central Florida Transportation Authority.)


FIGURE 20 Façade architecture provides shelter. (*Courtesy:* LYNX Central Florida Transportation Authority.)

adds that a clearly delineated pedestrian path through parking lots is required to safely accommodate pedestrian activity (see Figure 19).

VTA's *Pedestrian Technical Guidelines* is a textbook that addresses all aspects of the pedestrian environment. It provides guidance on how to plan for pedestrians and discusses pedestrian interaction with multiuse streets, street crossings, access to transit, site design, and building design. It is a useful reference for communities that are interested in improving their pedestrian environment.

In Florida, where the average summer temperature is 94°F and the average annual rainfall is 48 in., the provision of shelter for pedestrian circulation is an important feature for new developments and for redevelopment projects. The LYNX guidelines recommend the integration of awnings, arcades, and shelters into the façade architecture to provide shelter for pedestrians from the sun and rain (see Figure 20). Pedestrians in all parts of the country could benefit from this simple provision.

The Cleveland RTA guidelines address the pedestrian experience and the impact that the surrounding development has on the quality of the waiting environment. A well-designed bus stop located in a dreary area may be a comfort for waiting customers; however, the surrounding area will overshadow the bus stop "oasis." Cleveland's guidelines note that the quality of the surrounding area is just as important as the quality of the transit waiting environment itself (see Figure 21).

Landscaping is included in some of the transit agency development guidelines to address a multitude of various issues. It is recommended as a buffer to protect pedestrians from street traffic, because the buffer gives pedestrians a feeling of comfort and protection. Landscaping also provides shade for pedestrians while walking and while waiting for a bus. The judicious choice of trees, shrubs, and flowers improves the appearance of an area and creates a pleasing environment. Landscaping is also used to shield parking lots and blank walls from view. The use of trees to shade vehicles in park and ride lots is also noted in the guidelines.

Although landscaping has many virtues, it must be properly chosen, placed, and maintained. Plants must be appropriate to the use envisioned and must be of the appropriate size. Landscaping should not interfere with bus boarding and alighting. Regular maintenance is needed to reduce interference with pedestrians and passing vehicles. Overgrown shrubs encroach

FIGURE 21 A mix of land uses and landscaping provide an interesting pedestrian environment. (*Courtesy:* Mary Kay Christopher.)

on sidewalks and low-hanging branches can hit pedestrians. For a good, brief synopsis on landscaping see VTA's *Pedestrian Technical Guidelines*.

A good integrated street network is a basic requirement for an efficient transit system (see Figure 22). CTA's guidelines note that a direct and interconnected street network provides for regularly spaced and direct connections to transit. LYNX recommends that new developments should provide street connections in all major directions and connect to the existing street network. In places where new developments abut areas that are not yet developed, the use of interim stub-outs to identify where streets will connect in the future is recommended. VTA observes that streets are not just the means to transport vehicles, pedestrians, transit riders, and bicycles. Streets are also places in their own right where children play and where neighbors gather. Streets are the largest single source of public space in urban areas, and planners must balance the street's transport role with its role as land use.

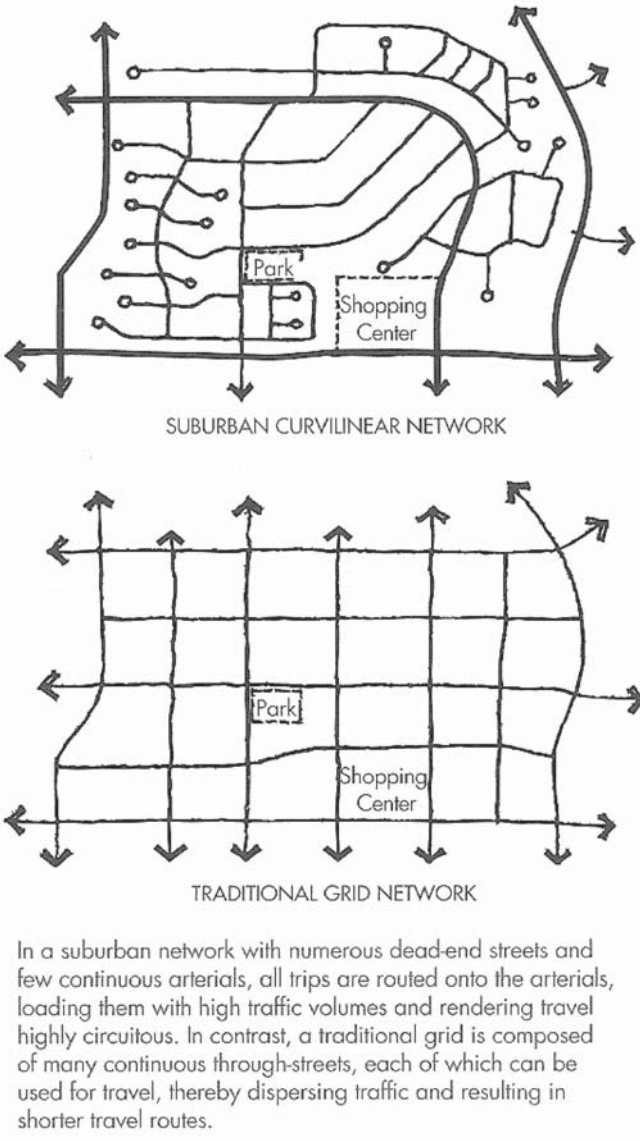


FIGURE 22 Curvilinear versus grid street networks. (*Courtesy:* Valley Transportation Authority.)

## SPECIFICATIONS INCLUDED IN GUIDELINES

Specifications include the physical dimensions of transit equipment and facilities, and the overall requirements of these transit elements. Technical specifications provide straightforward, quantitative information that involves very little policy or planning involvement. Engineering drawings of the various transit elements provide a clear picture of what is needed. This information is readily available within the transit agency and is generally easy to provide when requested.

Bus vehicle specifications are typically the guidelines that developers will request when considering transit needs. How big is a bus, how much does it weigh, and what is the turning radius? These are basic questions that must be answered if a single bus stop is to be accommodated in a development (see Figure 23). However, additional information can be given to developers whether they request it or not. For example, that buses have both a front door and a rear door may escape their notice. Landing pads should be provided for both doors and unobstructed access to both doors is needed. Although developers are familiar with general ADA requirements, the ADA implications of providing transit within their development should be pointed out. Developers also need to learn that the stop must be longer than the length of a bus to provide for pull-in and pull-out space; therefore, appropriate stop length must be supplied. Specifications for amenities required by the transit agency should be provided. These are likely to include specifications for informational signage and may include specifications for shelters, benches, and trash receptacles. The

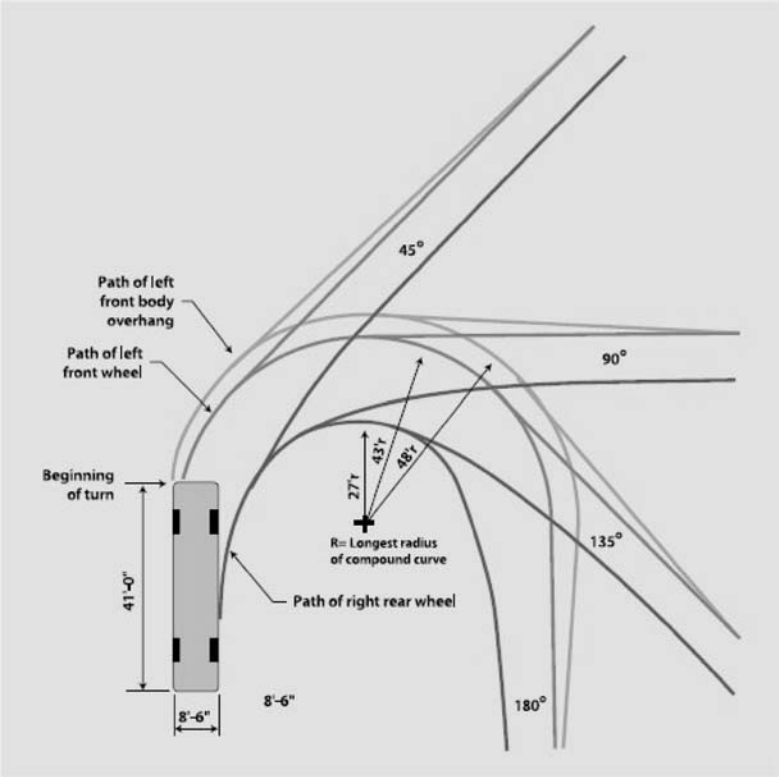


FIGURE 23 Bus turning template. (*Courtesy:* LYNX Central Florida Transportation Authority.)

expected volume of passengers at the development is helpful to lay out a properly sized waiting area and provide an appropriate number of amenities. This type of information is also helpful to convince the developer that the expense is justified.

Beyond the simplest provisions associated with a single bus stop, a development that will include more complex transit facilities will require the provision of additional specifications. If the development will house a bus terminal, then the developer will need to be aware of bus operator needs for a washroom. The likely layover time should be provided, as well as the maximum number of buses in the terminal at one time. The transit agency should be in a position to provide guidance on the type of terminal that is desired (sawtooth, pull-through bays, etc.) and have specifications available for each type (see Figure 24).

The provision of additional specifications on sidewalk width, roadway width, and roadway paving provides the developer with the benefit of the transit agency's experience on what works best. VTA points out that a typical, 4-ft

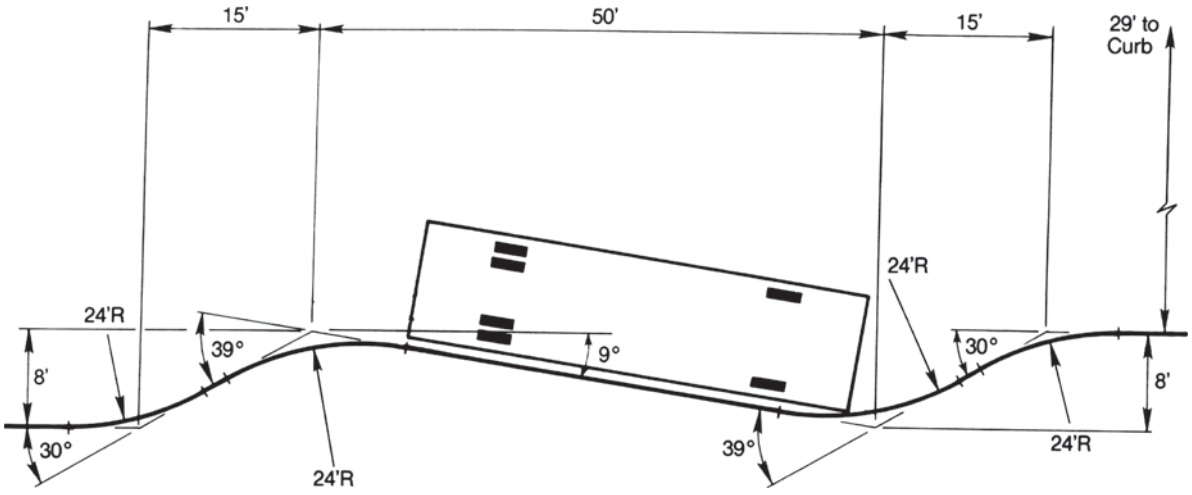


FIGURE 24 Detail of sawtooth bus stop. (*Courtesy:* Pace.)

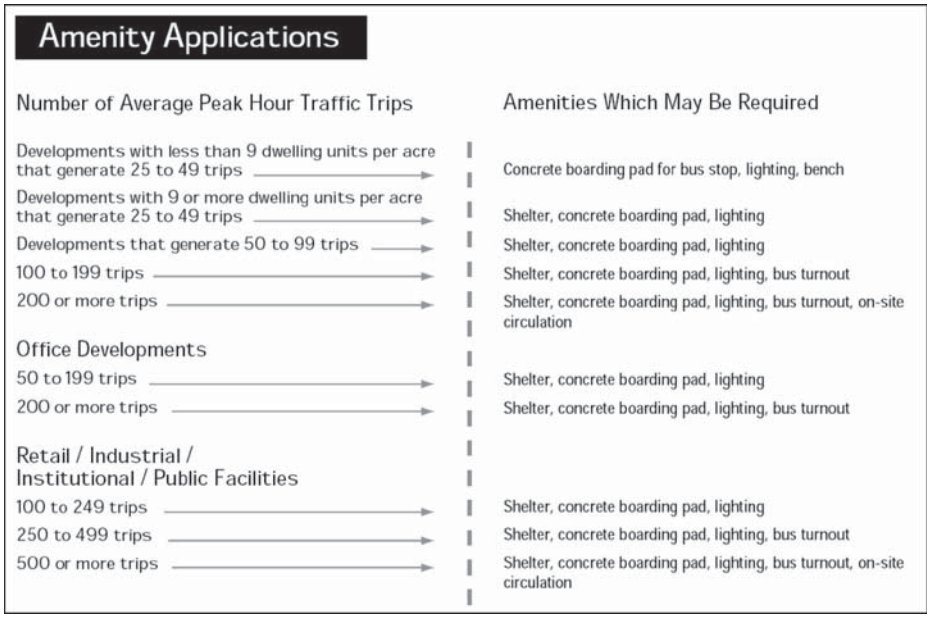


FIGURE 25 Criteria for the provision of bus stop amenities. (*Courtesy:* Lane Transit District.)

sidewalk is inadequate for any foot traffic beyond one pedestrian. This is especially true if street furniture such as light poles or utility boxes are also provided within the confines of the pedestrian sidewalk.

Additional specifications and technical details provided by transit agencies in their guidelines include:

- A concrete pad at bus stops. Asphalt pavement is often inadequate at bus stops with heavy bus traffic. Hard braking by many vehicles over time will cause asphalt to slide and form mounds and gulleys.
- Requirements that are unique to an agency's operating environment. King County Metro, for example, provides technical information on the trolley overhead system employed by its fleet of trolley buses. Its guidelines also include provisions for other nontypical facilities such as high-occupancy vehicle lanes and motorbike parking.
- Specific criteria to guide the provision of transit elements (see Figure 25). Lane Transit in Eugene, Oregon, for example, sets criteria for the provision of transit amenities based on the number of average peak-hour traffic trips. Pace and TriMet provide guidelines for bus stop spacing based on population and/or employment density.

CHAPTER EIGHT

# CONCLUSIONS

Research on the relationship between bus transit and land developments is relatively limited. The majority of the research on transit and developments is concentrated on the rail modes. The literature indicates that bus transit service is not viewed as positively as rail service in having the ability to influence land use. The reasons for this include:

- Bus transit is not viewed as permanent in comparison with rail transit.
- The quality and level of service for bus transit is lower than for rail transit.
- Rail transit encourages higher densities than bus transit.
- Bus transit has a poor public image.

Bus changes are typically incremental and relatively small, implemented as part of an existing system, whereas new rail stations are major investments that are associated with specific efforts related to land use. Presumably, this would also be the case for major bus rapid transit (BRT) investments. BRT systems are relatively new in the United States and in the research field. Thus far, the evidence indicates that BRT has not significantly influenced land use where new BRT systems have been employed. Perhaps this will change as BRT systems evolve and grow in number.

For regular bus systems in most communities, there appears to be little consideration of bus transit in land developments. The survey uncovered frustration on the part of most transit agencies that are contending with inappropriate and misplaced land developments. New developments are often constructed outside of the transit agency service area, making the development expensive if not impossible to serve. Even developments within the service area are often designed inappropriately for bus transit service. One example that was cited most often was big box retail development. The provision of a bus stop pole and sign at the front door of a big box retailer is not considered an ideal integration of bus transit and land development. The operation of a bus route through a busy parking lot slows down bus service, increasing customer travel time and bus operating costs, and increasing the likelihood of conflicts with automobiles and pedestrians. From a transit perspective, a successful big box development would incorporate smaller setbacks with less parking and good pedestrian connections, and would provide a separate bus lane, a bus stop with customer amenities, and/or a terminal facility.

Bus transit generally requires a significant amount of land area to provide appropriate facilities and amenities. Therefore, bus transit cannot be an afterthought if good connections between transit and the development are desired. To successfully integrate bus transit into land developments, all stakeholders agree that transit must be considered early in the planning process.

The research, survey results, and case studies all indicate that differing strategies have been successful in different regions. A mix of strategies appears to be the best course of action to build relationships among stakeholders and generate their interest. What has worked in some areas is an effective planning process that provides an overall vision for the region, including how the community will look and how it will manage future growth. The building of relationships among stakeholders begins with the preparation of this plan, and the implementation of revised zoning codes generally follows the production of the plan.

The case studies showed that it is useful to have a legal or planning framework in place that requires the inclusion of transit in the development process. In those areas with such legislation, transit is brought to the planning table early in the development process. Examples include the states of California and Florida, and the Metropolitan Council in Minnesota.

Strong leadership and/or the existence of a “champion” for transit can be found in many successful areas. Champions and strong leadership can be vital for the initiation of actions supportive of transit, but their existence can be fleeting. It is more prudent to use strong leadership and champions to build an accepted structure and process that will have lasting effects. Transit agencies should not rely on champions to be there forever.

There is a wide range of guidelines produced by transit agencies. The scale and content of guidelines varies from just a few pages on bus stop requirements to multiple volumes covering all aspects of land development. In most cases, for those agencies with guidelines, the distribution of those guidelines could be improved. Only four of the nine agencies that supplied guidelines for this synthesis make them available on their websites. Supplying this information on the agency website seems to be a simple and inexpensive method of providing this information. Website access could create a greater awareness of the issue and act as an educational tool

for all stakeholders. Furthermore, website publication permits transit agencies to easily share these documents, enabling them to learn from each other's experiences.

A major finding was the lack of resources in terms of operating funding and personnel available to transit agencies to plan for land developments and to provide new or expanded service to new developments. Many transit agencies noted that human resources were unavailable to participate in planning for new developments, and financial resources for new or expanded services were also unavailable. Some transit agencies provided information on innovative funding mechanisms that they had used successfully. The Centre Area Transportation Authority in State College, Pennsylvania, shares a transit planner with the Centre Regional Planning Agency. The transit planner has offices in both agencies and splits the 40-h work week evenly between the two agencies. This arrangement addresses the issue of inadequate human resources to conduct land development planning and encourages good communication between agencies.

Other agencies have convinced developers and building owners to finance the operation of new bus routes. LYNX in Orlando has succeeded in procuring the first two years of operating costs for new bus routes serving new developments. In addition, the LYMMO downtown circulator system is funded by the city through parking revenues. Pace Suburban Bus in Arlington Heights, Illinois, partners with the United Parcel Service for the provision of several bus routes serving the United Parcel Service facility. There are similar examples in other cities. However, these partnerships are not available in every case. Transit funding to serve new developments, as well as to maintain existing service, will continue to be a major on-going issue for transit agencies across the nation.

This section will introduce ideas for further research and development of products that will support the integration of bus transit into land developments. Most of these future efforts are related to education. Transit officials, transit planners, developers, city officials, city planners, and business leaders are largely unaware of each other's processes and interests. Educational tools are recommended to bridge the knowledge gap that exists. These diverse groups each have differing needs and might best be served by different formats and methods. Examples of educational tools are described for each group.

Research is also suggested to provide lenders with more appropriate market studies and to provide transit agencies with helpful information on appropriate walking distances and regulatory tools.

Transit planners can benefit from additional knowledge regarding the development process and how regulations can influence developments. Transit planners need to understand the developer's process, the timeline associated with that process, the economics of land development, and the incentives that developers look for from local governments. Knowing how the process works and how to approach developers sufficiently early in the process will greatly improve the chances that transit can be included in the development. Once the transit planner understands the development process, it could be beneficial to also have some pointers to "sell" transit to developers. A simple primer on the development process, written for transit planners, will improve communications between transit planners and developers, and will assist in the negotiation of transit elements. This primer could be used by multiple audiences, including community leaders and city planners.

Transit planners can reach developers through networking opportunities such as luncheon meetings and conferences. An example presentation on the benefits of transit that might be persuasive to developers could be a useful resource for the transit industry.

Another educational tool that might be helpful to transit planners is a "How To" document on preparing transit agency development guidelines. The document should outline a minimum level of transit-supportive design elements and technical specifications. National examples of recommended treatments for individual design elements and specifications should be included. A transit agency can choose the elements that meet its local needs or use the examples as a starting point to develop its own design treatments and specifications. If the transit agency prefers to contract with a consultant for the preparation of such guidelines, this How To document could provide transit planners with information useful in preparing an appropriate Request for Proposal.

Developers are generally unaware of transit and the benefits that it can provide in some developments. A tutorial on where transit is appropriate and how it can benefit development would be useful. This document should include economic and quantitative benefits as well as the qualitative benefits that transit provides to land developments. Examples that describe how transit increased the success of selected developments are recommended. This tutorial should be specifically focused toward developers and written in terms that they will appreciate. It is recommended that the tutorial be published by an entity familiar to developers and made available through venues frequently used by developers.

Education for officials from local government can increase their knowledge of transit-supportive development. A handbook or toolkit with presentation materials can provide guidance for local decision makers involved in the land development process. Short explanations of the critical transit-supportive elements, such as density and pedestrian access, should be presented. The handbook or toolkit could include recommendations on how to incorporate transit into developments and why it is important to do so. Examples of large and small scale developments should be included, as well as suburban and urban environments.

Workshops on transit-supportive developments and land uses would be beneficial for all stakeholders. Research could include the identification of the appropriate topics to consider in a transit-supportive workshop, and development of exercises that would involve participants and educate them on the importance of transit-supportive land use. The workshops could be designed as on-site or web-based sessions. Recommendations on how to conduct the workshops are required. For example, on-site workshops should include participants with a wide array of backgrounds, and participants could be intermixed throughout the room to provide attendees with the widest possible range of perspectives. Transit agencies, local governments, planning organizations, and community groups could use the workshop outline and exercises to conduct educational workshops in their own regions.

Further research is needed on the impact of bus systems on land use and on the economic development of the adjoining area. Methods to measure the impacts of bus service are needed to support future bus transit and land use coordination projects. This research could also include an investigation specifically focused on BRT systems. BRT is still an emerging technology in the United States. More research is needed on the benefits associated with BRT, especially as it relates to land developments. BRT proponents need documentation regarding the positive aspects of BRT on economic development and the benefits associated with BRT for adjoining developments. This documentation will improve the ability of transit planners and officials to negotiate for dedicated BRT rights-of-way and space provisions for customer amenities with building owners and developers.

A standard component of new developments includes provisions for automobile users. In addition, developers may be requested to provide for transit and bicycle access. Research is needed to determine how a planned transit improvement may affect mode choice to the development. For example, if high-frequency bus service will serve the development, how much of an impact will this have on the projected requirements for the number of parking spaces or roadway improvements? There needs to be credible research that developers, lenders, and municipalities can use to determine the trade-off between the various modes. The availability of this type of research would provide developers with further incentive to implement transit elements in the development.

The survey did not question transit agencies on the level of effort expended by transit planners on planning for new developments, and the literature review did not reveal that any analysis had been conducted on this topic. A study is needed that examines the level of staff effort required for development review, negotiation meetings, alternative plan development, and related activities. The study should identify representative transit agencies for examination, and include for each area an indication of the amount of development occurring and the relative success in building transit elements into new developments. Such a study would give transit agencies baseline information on which to gauge their current efforts. It could provide them with information to determine if additional, or fewer, expenditures may be appropriate for their planning efforts.

Lenders who finance large developments are skeptical of a transit-supportive development because the development proposes reduced parking or mixed uses. Lenders need to receive appropriate information that considers the benefits associated with transit within new developments. Studies that examine the true number of parking spaces needed within a transit-supportive or transit-oriented development are required. In addition, the advantage of mixed-use developments, especially with regard to generation of fewer trips, requires further research.

Research on regulatory policies that support the integration of bus transit into land developments would be a useful reference tool. Transit agencies and local governments endeavoring to encourage transit-supportive land uses could use the document to recommend changes in their areas. State policies and programs should be investigated, as well as regional and local programs. This research could also update the American Planning Association's report on model legislative language. This could provide planners with an up-to-date guide on model codes for transit-supportive land use policies, design ordinances, and subdivision requirements.

Lastly, more research is needed on the pedestrian environment. Many survey respondents voiced concern that adequate pedestrian environments are not provided in new developments or in the adjoining areas. The impact of the walking environment on acceptable walking distance is not well known. It is suspected that pedestrians are willing to walk farther in pedestrian-friendly environments than in environments hostile to walkers. It also follows that a greater number of walking trips will be made in pedestrian-friendly environments. If this is the case, documentation would provide evidence that lower vehicular trip rates are achievable in pedestrian-friendly environments. This would encourage expenditures to create pedestrian-friendlier environments. A study to examine the impact of the environment on walking trips by trip purpose and trip length together with associated demographic characteristics is needed.

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# APPENDIX A

# Survey Questionnaire

**(The number of responses is shown in parentheses)**

| | |
|---|---|
| Contact name | |
| Title | |
| Name of agency | |
| Phone number | |
| E-mail address | |

### A. Transit Agency Characteristics

1. In the drop-down list below, please indicate how many buses your agency operates.
   - (2) ☐ <50
   - (6) ☐ 50–100
   - (13) ☐ 100–500
   - (11) ☐ >500

2. What transit modes does your agency operate? Please check all that apply.
   - (32) ☐ Bus
   - (7) ☐ LRT
   - (6) ☐ Heavy rail
   - (2) ☐ Commuter rail
   - (27) ☐ Demand-responsive/paratransit
   - (2) ☐ Ferry
   - (5) ☐ Other (Please specify): Van–carpools, trolley, Trailpath, AGT

3. Please describe your agency's service area in terms of the number and size of the municipalities or governmental areas served.

### B. Stakeholders and Communications

1. Typically, how does your organization first become aware of future new developments?
   - (17) ☐ News media
   - (18) ☐ Staff observations
   - (16) ☐ Call from developer
   - (8) ☐ Public inquiries
   - (27) ☐ Formal communication from local government
   - (21) ☐ Informal communication from local government
   - (6) ☐ Other (Please describe): Attendance at meetings, notification from state or regional planning agencies

2. In your area what agency has the *primary* responsibility for the physical design of public elements within new developments (i.e., street width, sidewalks, parking availability, etc.)?
   - (15) City
   - (2) County
   - (1) No answer
   - (8) City or county
   - (2) Regional planning agency
   - (3) Local government
   - (1) County/state

3. Overall, how well does this agency support transit when reviewing plans for new developments?
   - (8) ☐ Always considers transit
   - (9) ☐ Usually considers transit
   - (12) ☐ Sometimes considers transit
   - (3) ☐ Rarely considers transit

4. Please describe how this agency communicates with you to discuss new developments and cite whether these are formal or informal communications. (Note that formal communications involve a pre-organized, standard process, whereas informal communications rely on individual and personal networks.)
   - (16) Formal communications
   - (4) Interagency cooperation
   - (9) Informal communications
   - (2) Rare informal communication
   - (4) Depends on local government
   - (1) Self-informed

5. The following table lists additional stakeholders that may be involved in planning for new developments. Please indicate how your agency communicates with each stakeholder regarding new development projects. (Note that formal communications involve a pre-organized, standard process, whereas informal communications rely on individual and personal networks.)

| Stakeholder | Formal Process | Informal Process | No Process |
|---|---|---|---|
| Metropolitan planning organization (MPO) | (15) | (8) | (13) |
| Developer | (16) | (20) | (5) |
| Local government | (26) | (20) | (2) |
| Community organization | (7) | (19) | (7) |
| Other (please identify)* | (3) | (5) | |
| Other (please identify) | | | |
| Other (please identify) | | | |

* Economic development organizations, regional planning agencies, state governments.

**C. Transit Agency Development Guidelines**

1. Does your agency (or other stakeholders) have a published set of guidelines to assist developers who are designing new developments?
   (9) ☐ Yes (23) ☐ No (skip to Section D "Transit Supportive Strategies")
   If a set of design guidelines is available, please transmit a copy to Mary Kay Christopher, MKC Associates, 3112 Maple Avenue, Berwyn, IL 60402. Or, if an electronic version is available, e-mail to marykay@mkcassociates.com.

2. What is the purpose of the guidelines?

   - Aid developers in the provision of transit to their development.
   - Bus stop guidelines provide construction standards for bus facilities.
   - Inform anyone involved in suburban development how to accommodate pedestrian and transit into their new or redeveloped project.
   - Primarily bus stop/bench installation.
   - Assist developers by making it easy to consider transit needs through published guidelines. The guidelines also help promote transit in developing areas and provide the needed design standards to incorporate in any development to have transit and pedestrian-friendly developments.
   - Make developers, businesses, institutions, and public agencies aware of opportunities that exist to capitalize on the large market of transit riders in the service area.
   - Make developers and municipalities aware of transit patron requirements.
   - Provide specific design guidance to developers and local jurisdictions on transit operating and facility requirements.

3. In what formats are the guidelines available?
   (8) ☐ Printed document
   (1) ☐ PowerPoint presentation
   (0) ☐ Video
   (4) ☐ Other (Please identify): Online

4. How are developers (or others) encouraged to use the guidelines?
   (2) Required for permit process
   (2) Through personal networks
   (2) Formal planning or environmental review
   (2) Local government encouragement
   (2) No answer

5. What development characteristics are addressed in the guidelines? Please check all that apply.
   (5) ☐ Site planning
   (3) ☐ Density
   (5) ☐ Sidewalks
   (9) ☐ Bus stops
   (4) ☐ Parking
   (5) ☐ Bicycle amenities
   (5) ☐ Landscaping
   (5) ☐ Directness of pedestrian path
   (5) ☐ Land use
   (5) ☐ Streets
   (4) ☐ Open space
   (4) ☐ Building design
   (5) ☐ Pedestrian amenities
   (5) ☐ Security
   (6) ☐ ADA elements
   (3) ☐ Other (Please specify):
   Roadway design, signalization, bus pull-out bays, shelter design

6. What technical specifications are provided in the guidelines? Please check all that apply.
   - (9) ☐ Bus dimensions
   - (8) ☐ Bus stop paving
   - (7) ☐ Bus stop placement
   - (7) ☐ Bus turnaround requirements
   - (8) ☐ Turning radii
   - (4) ☐ Bicycle storage
   - (4) ☐ Sidewalk width
   - (9) ☐ ADA requirements
   - (7) ☐ Bus stop spacing
   - (9) ☐ Bus stop length
   - (8) ☐ Bus shelter dimensions
   - (7) ☐ Bus shelter design
   - (5) ☐ Roadway width
   - (4) ☐ Roadway paving
   - (3) ☐ Parking spaces/lots
   - (3) ☐ Other (Please specify): Bus–rail transit, walking distance, templates

7. Are there elements that you or other stakeholders would like to add to your guidelines to enhance their usefulness? Please describe.
   - (2) Pedestrian connections/amenities
   - (2) Shelter types/dimensions
   - (1) Bus turnaround requirements
   - (1) Bus stop standards
   - (1) Sidewalk dimensions
   - (1) Transit alternatives for different land uses

8. Does your agency have any other guidelines, regulatory authority, or published policies that support the integration of bus transit service with new development projects? If so, please describe.

   - Pedestrian technical guidelines
   - Policy principles on service design
   - Transit guidelines for developing communities
   - Transit development plan/program
   - Transportation master plan
   - Joint development policy/plan
   - Bicycle technical guidelines
   - Transit improvements and land use system statements
   - Customer amenities design manual

**D. Transit Supportive Strategies**

1. Does your area have regional or local policies in place that provide positive support for integrating transit into new developments? Please check all that apply and provide a brief description of each.
   - (19) ☐ Zoning
   - (14) ☐ Parking restrictions/fees
   - (10) ☐ Controlled growth
   - (12) ☐ Development regulations
   - (20) ☐ Written policies in adopted plans
   - (8) ☐ Tax incentives
   - (5) ☐ Land incentives
   - (6) ☐ Funding incentives
   - (20) ☐ Design standards
   - (4) ☐ Others (please identify and describe): Community redevelopment areas, transit fare subsidy for highway construction

2. Did your agency take a proactive role in the development of any of the policies above?
   - (25) ☐ Yes
   - (7) ☐ No

3. Please list the policies that your agency advocated.
   - (6) Policies in adopted plans
   - (6) Zoning
   - (4) Design standards
   - (3) Parking
   - (1) Development regulations
   - (1) Transit fare subsidy

4. Is your agency an active participant in preparing the long-range land use plan for your region?
   - (21) ☐ Yes
   - (11) ☐ No

5. Aside from the long-range land use plan, is there another planning forum to discuss land development plans?
   - (23) ☐ Yes
   - (7) ☐ No
   - (2) ☐ Do not know

6. If the answer to Question 5 was yes, please describe this forum.

- County is conducting a visioning process and action plan that we are sponsors with.
- MPO uses a portion of its planning funds to foster local planning efforts and requires program participants to attend quarterly information sharing sessions.
- Metropolitan Transportation Commission.
- Local jurisdictions' plan area projects; pre-application conferences.
- MPO process.
- Land Development Technical Committee every 2 weeks for development review.
- Regional Planning Council and Land Use Subcommittee (MPO).
- On receipt of Planned Development applications.
- Invited on a case-by-case basis by the planning commission to discuss projects and plans with some influence on transit demand. Also invited to discuss transit plans by the county, city, and suburban municipalities.
- All new development requires the approval of our Planning Board. Approval requires several meetings that incorporate public input and often require several development revisions.
- The city has a preconference development process where a developer can request a meeting with city departments and transit to discuss what facilities the developer will need to address.
- Small area plans, neighborhood plans, etc., sponsored by each local jurisdiction's planning office.
- The regional transportation plans use land use as one of its base elements.
- Each city has a land development process that includes public review and comment.
- Neighborhood development plans reviewed and approved by Plan Commission.
- Metropolitan Planning Organization (MPO) Long Range Transportation Plan, Comprehensive Development Master Plan (CDMP) amendments.
- Master plans and sub-area plans, both of which usually have extensive provisions for input from county government and from the community at large. Development Review Committee for specific developments, meetings of the Planning Board.

7. Has your agency developed communication methods to convince developers (or others) that bus transit adds value to new developments?

(14) ☐ Yes (18) ☐ No

8. Please describe the methods used.

(3) Personal networks
(3) Written reports
(3) Outreach through meetings/planning activities
(1) Distribution of guidelines
(1) Transit-oriented development program

9. Please describe why the methods have been either successful or unsuccessful.

- In most cases the planning commissions and city councils have supported inclusion of walkways to connect to bus stops.
- Depends on the municipality and the developer.
- Developers are motivated by the bottom line and will do anything to avoid incurring any extra costs.
- If we can convince the developer of the importance, they tend to begin including us in all their developments. The "sell" is difficult, but the buy-in once the sell is successful tends to be long-term.
- Successful report, but seldom used.
- Methods were successful, because empirical data were provided to support the changes, and regional consensus was gained before moving forward.
- Sometimes too late, as we are notified late in the development planning process; we depend on timely notification by city staff.
- As a region we are headed in the right direction and continue to build partnerships with local communities.
- Area real estate and job market is soft.
- In some cases the efforts have been very successful. Conditions imposed by local jurisdictions as part of the project approval process have been instrumental in instances where transit facilities have been incorporated into new construction.
- I believe over time we will be able to add more staff to help us undertake more of these types of activities in a more proactive fashion.

**E. Experience in Integrating Bus Service in New Developments**

1. In the past five years what types of development has your area experienced? Please check all that apply.
   (24) ☐ Reuse of vacant industrial land (brownfields) along existing transit routes
   (29) ☐ New or more intense use of existing developed land along transit routes
   (27) ☐ Other infill along transit routes
   (30) ☐ Development of previously undeveloped land (greenfields)
   (19) ☐ Reuse of vacant industrial land (brownfields) where no transit existed
   (24) ☐ New or more intense use of existing developed land where no transit existed
   (22) ☐ Other infill where no transit existed
   (1) ☐ None (skip to Section F "In Your Opinion")

2. On a scale of 1 to 5, how would you describe your agency's involvement in the land development process in your service area? (Where 1 equals no involvement and 5 represents a full partner in the process.)

| (1) ☐ | (8) ☐ | (14) ☐ | (7) ☐ | (1) ☐ |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

3. In the drop-down list below, please choose the statement that best conveys how well bus transit service has been coordinated with new developments.
   (5) ☐ All developments are coordinated
   (8) ☐ Most are coordinated
   (2) ☐ About half are coordinated
   (16) ☐ Some are coordinated
   (1) ☐ None are coordinated

4. In the table below, please list up to three examples of new developments that successfully supported *bus* transit services. For each example cite the primary factors that led to the project's success. If none, please leave blank and skip to Question 6.
   None = 2
   No answer = 3
   27 respondents reported at least one successful project

| No. | Project Name | Factors for success |
|---|---|---|
| 1 | | |
| | | |
| 2 | | |
| | | |
| 3 | | |
| | | |

5. In your opinion, which of the three projects identified above is the most successful overall? Please write the project name here.

**Please answer Questions 6–13 only for the project identified in Question 5.**

6. Was your organization involved in the planning and design decisions affecting the new development?
   (23) ☐ Yes (4) ☐ No

7. How early in the planning and design process was your agency involved?
   (15) ☐ At the very beginning
   (7) ☐ After it started, but still early in the process
   (1) ☐ About half way through
   (2) ☐ Late in the process
   (2) ☐ At the end
   (0) ☐ Never

8. Has your agency implemented new (or realigned) bus transit service to serve the new development?
   (17) ☐ Yes (10) ☐ No (skip to Question 13)

9. What was the reason(s) for implementing the service?
   (11) ☐ Expected density warranted service (5) ☐ Request from elected official
   (17) ☐ Opportunity to serve traffic generator (3) ☐ Request from community
   (10) ☐ Other (please describe): Partnership, new facility, developer request, service restructure, policy decision, state provided funding

10. Please identify any obstacles or challenges you encountered when implementing the service (e.g., inadequate pedestrian access, lack of resources, inadequate facility design, etc.).
   (3) Lack of resources
   (2) Need to restructure service to obtain resources
   (2) Inadequate transit facilities
   (1) Lack of market research
   (1) Increased travel time for through-routing customers
   (1) Coordination with private services
   (1) Travel through large parking lots
   (1) None

11. Has the new bus service been successful?
   (10) ☐ Yes (0) ☐ No (3) No answer
   (1) Too soon to tell (1) Mixed results (1) Service not implemented

12. Please specify the measures used to determine the success or failure of the new service.
   (9) Ridership (5) No answer
   (5) Productivity (1) None

13. If you have not provided new bus service to the development, please explain why.
   (8) Existing service already in place
   (1) Project not completed
   (1) No room in terminal

14. In the table below, please list up to three examples of new development projects that do not support bus transit service and describe the primary factors that explain why transit is not supported.
   None = 2
   No answer = 6
   24 respondents reported at least one unsuccessful project

| No. | Project Name | Factors—Why Transit Is Not Supported |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |

**F. In Your Opinion . . .**

1. What types of facilities or amenities for bus service are generally lacking in new developments?

- Adequate sidewalk systems and design of street networks to support walking and transit. Densities are often too low and too much single-use land use.
- Pedestrian accommodations, passenger waiting facilities, pedestrian level lighting, too much free parking (no incentive to do anything but drive alone).

- Big box stores.
- Sidewalk connections, building orientation.
- Sidewalks.
- Roadway width, separation of transit vehicle travel path from parking, appropriate passenger waiting areas.
- Pedestrian connections to transit stops. New housing developments are "walled" from main streets that prevent convenient access to transit stops.
- Shelters, pedestrian crossings, restrooms dependent on transit frequencies.
- Pedestrian connections through parking lots.
- Street design inadequate for bus traffic, lack of sidewalks, lack of transit stops, auto-oriented design.
- Sidewalks, shelters.
- Site design. Matching the right design to the adjacent transit service to maximize convenience.
- Pedestrian—sidewalks, convenient sites for bus stops.
- Arterial street grids; provisions for bus turnaround (terminal) facilities.
- In the past, sidewalks were not included in many new developments. This is no longer the case, but we are still dealing with their absence in developments from 10–20 years ago.
- Passenger boarding amenities such as shelters and benches at properly placed boarding locations are often overlooked.
- Good pedestrian connections between the development and transit stops.
- Funds to support local circulators to connect residents to our main line trunk service; or funds to support development of regional park and rides so we can limit main trunk line service to key stops or stations, large activity nodes.
- Information display.
- Parking as well as suitable engineering/design for ingress/egress into the developments themselves. Quite often the buses are limited to use of existing street right-of-way for alighting and departing passengers. Such interface locations may not be appealing to new bus patronage.
- Park and ride, passenger shelter, access paths.
- Access, bus bays, shelters.
- Proper street design; right-of-way for facilities; low-density, single-use areas; opposition (or lack of vision)—a lack of understanding of the long-term value of integrating transit from elected officials and the community.
- Passenger amenities—sidewalks, concrete boarding pads, benches/shelters.
- Connected road grid, bus stops/bus shelters, nonmotorized facilities and amenities.
- Sidewalks—especially with regard to connections with surrounding neighborhoods.
- Pedestrian friendly design—adequate sidewalks and good pedestrian connectivity.
- Weather-protected, comfortable, attractively designed waiting areas integrated into the design of the development. We try to add these with shelters, but they often do not work as well as accommodations would if they were incorporated into the design from the outset.
- Site plans that allow bus service or easy pedestrian access to off-site bus service and bus shelters.

2. What design aspects of new developments inhibit the effective provision of transit service?

- Low densities and auto-oriented transportation system.
- Parking—free and plenty of it! Large setbacks (no street frontage), circuitous access.
- Large parking area between street and building.
- Lack of direct and safe pedestrian access between bus stop location, destinations within the site, and the adjacent properties.
- Gated communities, cul de sacs, incomplete street grid, overly wide and fast streets, driveway locations, and large blocks.
- Parking and big setbacks.
- Access limitations as a result of decorative paving, landscaping, or entry design.
- Low densities; unlimited parking.
- For commercial developments, parking that fronts the street and does not provide a safe pedestrian path to the building. Meandering sidewalks and streets can also prohibit the effectiveness of transit service. Landscaping between the sidewalk and curb make it difficult for a person in a wheelchair to board and exit from a bus.
- Lack of signalization, gated communities, and speed devices.
- Setback of development and low density (campus setting).
- Street pattern does not have through streets.
- Building access/placement is sometimes separated from bus access by parking or non-transit user type development.
- Road designs that preclude or are non-conducive to transit buses, building faces far removed from existing bus lines, developments nowhere near existing major travel corridors and bus lines.

- Cul-de-sac street patterns; walled city pattern of fences, or walls surrounding residential developments have the effect of increasing walking distances for pedestrians; lack of continuous sidewalk networks inside residential developments and along some arterials; low-rise campus-type commercial development that increases pedestrian walking distances to the nearest arterials where transit may operate; abundant free parking combined with relatively inexpensive gasoline costs in real terms, recent increases notwithstanding.
- Distance of development from street, particularly for commercial developments. This requires riders to walk a long distance between bus stop and building entrance.
- Narrow circuitous streets.
- Building orientation and pedestrian connections.
- Large lots for luxury homes.
- Conflict between uses for prime space. For example, the best place for bus bays at a bus/rail station is near the rail station entrance. This is also the best place for retail space and the entrances to office buildings and apartment houses. Except in the most urban areas, developers generally see bus stops as uses that detract from the value of their buildings.
- Street design and internal geometry; ability to use planned parking for commuter/joint use.
- Cul-de-sac-type developments.
- Limitations on off-site improvements; for example, a bus stop on one side of street (where development is) but not the other.
- Lack of sidewalks; lack of obvious pedestrian amenities leading riders to and from sites.
- Traffic calming devices and poorly interconnected street grids.
- Gated communities.
- Location—developers rarely consider access to transit.
- Lack of density to support transit, pedestrian connectivity, street standards that help to create barriers for the pedestrian (wide lanes, lack of consideration for the pedestrian or transit, etc.).
- Prioritizing automobile access over bus access, ample parking, employer-paid or free parking.

3. What factors contribute most to the successful integration of bus transit planning and land development planning?

- City provides incentives for higher density and in-fill development.
- Local policy and support at the Planning Board level.
- Consideration of passengers; easy access for the transit vehicle.
- Early participation in the process, reasonable requests for transit accommodations, and support from the municipality reviewing and approving the plan.
- State/regional policies and standards. Oregon's Transportation Planning rule required local zoning codes to have development standards for transit streets. Local permitting staff must be knowledgeable about transit needs.
- Developers who are actually interested in transit and in developing sites where transit exists.
- Open discussion early on to understand what all parties hope to achieve with the new development.
- Densities.
- Factors that contribute to successful integration of transit and land planning include local support from elected officials and staff members as well as private developers.
- Local government support.
- Effective and direct communication between transit agency and private developer; ability of transit agency to sell the service to developers.
- Early coordination; political support for transit; enlightened developers; cooperation and support from city, county, and state entities that dictate street design and layout; effective transit agency outreach and education.
- Involvement in process, easy bus access, pedestrian paths.
- High-density development, good pedestrian access, good passenger waiting facilities/bus stop amenities.
- When developers, community officials, transportation planners, and road engineers are all sincerely interested in maximizing the number of access modes to specific projects.
- Higher density organized along major arterials, short walking distances, a street grid, availability of continuous sidewalk networks, and mixture of land uses rather than segregation of land uses.
- The understanding and cooperation of cities and townships in the desirability of providing for transit and pedestrians. This is now very good throughout our area. A tight labor market greatly increases the interest of developers in providing for transit.
- High-density development with limited/paid parking facilities.
- Willingness of developer and planners to coordinate with transit agencies early on and ability of local planners to require contributions for transit; willingness/ability of transit agency to say "no" and to require exactions, fees.
- Including bus planners in the charrettes, task forces, etc., used to develop plans for transit station areas.
- Being involved early in the process; a developer who can envision public transit, especially bus service, as an attractive, alternative transportation option and a marketing advantage to their proposed development; and of course being a partner

in the development review and zoning process, which otherwise provides an ability to at least have the conversation with the developer regarding transit amenities.
- Early participation by our agency.
- Local government support.
- Consideration of transit access/amenities early in the design process along with a formal local process for inclusion of transit planning in new developments.
- Consideration of and planning for transit early in the planning and design process.
- Comprehensive street grid permitting multiple routing options upon introduction of transit service.
- Density, road capacity, accessibility, transfer areas (park and ride, transit hubs).
- A cooperative community and site designers that understand the benefits and needs of transit.
- Early consideration of transit-supportive uses/design within the development.
- Commitment/motivation on the part of land development planning agency; education of development community on benefits of bus transit.
- Early coordination with the developer and developer interest in transit service.

4. Why is it difficult to integrate bus transit planning into land development planning?

- Lack of policies and design requirements. Too much parking required and orientation toward single-occupancy vehicle.
- Bus not sexy like rail, used by "others," not perceived as permanent like rail.
- Political will. Most developers do not appreciate the benefit of good transit access.
- Developers resist because it almost always increases initial cost to develop the site.
- Perceived conflict between cars, pedestrians, and transit. Lack of regulatory authority. Lack of resources to review and track new development.
- Most new developments happen outside of the transit agency's service area. Transit agencies (unlike utilities) have no way of adequately recouping the cost to extend service to far areas. Infill is ultimately easier to serve.
- In the suburbs, transit is not seen as a viable commuting option.
- Housing preference by the public; travel patterns of the single-occupancy vehicle.
- First, bus routes can change, which creates the belief that incorporating transit amenities can be a poor investment. Maintenance of the amenities such as shelters and trash is another issue, since it is the responsibility of local agencies to clean and maintain shelters.
- Cost of transit and convincing developers of the benefits unique to their development.
- Developers do not envision transit components as profitable.
- In this area, lack of knowledge and appreciation for the role transit can play, negative perception of transit customers, banking industry pressure to stick with what works and not try anything new or unconventional, developer tendency to go with what they have always done, inertia, etc.
- Planning is still auto-oriented, not a priority with local governments.
- Difficulty depends on where a project is located—urban core versus outer-ring suburb, and depends on city policy and developer cooperation.
- Developer schedules, limited funding to carefully design for transit, limited number of transit planning staff; non-supportive zoning.
- Authority and funding are fragmented. Basically, local jurisdictions (incorporated cities) control most urban land use. There is no connection between incremental population and employment growth and the budget resources to support expansion of transit service and facilities. It is hard for transit to compete when the automobile mode receives so many direct and indirect subsidies.
- In this area, the absence of any regional planning makes it very difficult.
- Buses are not viewed as "permanent" fixtures to a development. As a result, transit is often an afterthought.
- Lack of understanding and vision by the politicians.
- Often it is way too late to incorporate design changes and planners do not have "teeth." They need to require exactions; ability of transit agency to say "no" and to require exactions, fees.
- Designing streets or plazas to accommodate bus stops or bus bays presents difficulties for architects and engineers in preparing land use plans.
- Often the site plan will require adjustment in terms of engineering and in terms of depth of paving/types of paving materials and in geometry to allow for appropriate access (which translates into capital costs); often developers view transit as unattractive and as a parking encroachment problem.
- Buses are seen as a lesser choice of transport versus the automobile.
- Added expense to developer that is passed on to public.
- There is no formal process and no formal requirements.

- It is often an afterthought and is added retroactively—and then most often relegated to the periphery of developments or to locations where it will not [cannot] well serve the development; transit often has an unwarranted negative public perception; the current many-to-many trip-making pattern for our county is not conducive to efficiently linking transit trips—origins and destinations are so spread out that when new development comes into these locations transit is often not capable of serving the projects efficiently.
- Operating funding for future service expansions is not identified at the time of land development, and placing passenger amenities without knowing future routing corridors is impossible.
- Difficulties related to transit hubs, owing to environmental impacts.
- We often encounter developers and architects who are unwilling to incorporate the needs of transit. Developers and most communities are still very "auto-centric."
- Perception of buses as a secondary form of transportation; rail is much more widely accepted by the general public.
- Developer opposition based in part on image of bus service/riders; less certainty about long-term commitment to bus routes versus fixed rail.
- Often the developer is not interested in facilitating transit service, but the eventual businesses or residents who occupy the site are interested. When they become involved it is sometimes too late because the physical plan cannot be changed.

5. Do you have any suggestions or ideas to improve the integration of bus service planning and land development planning?

- Revise city ordinances to require transit supportive development to the same level that single-occupancy vehicle systems are required.
- Education of planning staffs, hiring of planning staffs!, modernizing zoning regulations particularly around parking and pedestrian accommodation.
- Code provisions supportive of transit; incentives to developers.
- More training about transit for local planning, zoning, and transportation (roads) officials. Development standards.
- Our ongoing outreach through our Business Development office is helping to make private sector aware of the benefits that can be realized through the incorporation of transit.
- More incentives for infill development; impact fees to support transit in low-density areas.
- Improving the connectivity between the public sidewalk and development is critical since every transit trip begins and ends as a pedestrian trip. Cooperative efforts between the cities and the transit agency in trying to understand what types of land uses (e.g., residential, commercial, etc.) can benefit from different types of transit services (e.g., regional express, local circulator, etc.) is also a way to integrate land development and transit planning.
- Review applications and require as part of ordinances.
- Include bus service physical needs in zoning ordinances.
- Beef up development standards, change parking requirements to reduce minimums and implement maximums, educate key stakeholders, provide incentives for reducing automobile trips, praise and publicly celebrate transit-oriented development projects, etc.
- Convincing local municipalities of the value of transit.
- Continue corridor and nodal development concentration and coordination with transit and regional planning agencies.
- As a requirement of receiving any publicly funded infrastructure improvements or taxpayer funding, public officials, designers, and developers sponsoring such projects must demonstrate in advance of receiving same that transit bus service was duly considered by the plans and incorporated where feasible. Such consideration would include demonstrating that public transit provider staff was consulted.
- Increasing the amount of budget resources to deliver new service, coupled with demand management programs such as pass subsidy and parking management programs.
- Incorporate even the finest details into a long-term master plan so developers can become accustomed to consistent requirements.
- Local planning agencies must be given "teeth"; need to work on education of elected officials on transportation and land use connection and how it impacts even the short term! They also have to make it a priority to require their staff to change their development code accordingly.
- Involve bus planners early and often in the land use planning process.
- A handbook or tool kit for local government on why and how to incorporate bus improvements into small- and large-scale developments would help. Current national focus is on high-density, transit-oriented development connected to rail stations. Need something for the less dense suburban environment.
- Locations of new, large developments in fringe areas are eligible to provide transit facilities and/or amenities as required.
- States could mandate that developments of a certain size require that transit agencies be included in the planning process from the beginning.

- Require developer to meet with transit agency early in the process, prior to initial concept design, to ensure incorporation of transit-friendly features. Prioritize bus access over automobile access and ample parking.
- Zoning could require consultation by developers with the transit agency, along with some degree of compliance with transit recommendations.

6. In cases where new developments require additional resources to provide new bus service, how should the funding of such service be addressed?

- Our funding system includes property taxes. An unlimited access service based on the municipalities subsidizing the service in a similar way to the current subsidization of automobile travel by investing in building and maintaining roadways.
- By developer mitigation fees, corporate participation in transit benefit programs, by demonstration funds for trial periods.
- Developers should be given incentives to offset the cost of transit provision.
- Our transit investment plan designates priorities for investment in service. Most service is paid for by a payroll tax. There have been a couple instances where service is provided or continued because large employers agree to provide transit passes to all employees or agree to pay directly for particular service, such as an express route.
- Involve the employer in a funding agreement that is mutually beneficial.
- Impact fees.
- Any form of financing that can provide additional funds for improving operation should be explored. This can include voter-approved bonds, development fees, and special taxes.
- From the developers through impact fees.
- Development incentives, Tax Increment Financing subsidies (where applicable).
- Partnership efforts are paramount because no increase of service is going to pay for itself. Consider using a sliding scale program where subsidy is tied to ridership and if the service is successful the subsidy declines.
- Public–private partnerships.
- One avenue is Congestion Mitigation Air Quality (CMAQ); another is Job Access Reverse Commute (JARC). It is valuable to test new markets on a demonstration basis. However, if developments occur on existing transit routes (as we would hope they would), frequency and span would be demand driven.
- I have no idea. Let the developers show some creativity.
- It is difficult to condition new development on provision of new bus service, since the operating cost of new service is an ongoing one, whereas facility costs are one-time costs (at least for the life of the facility). Short of concentrating authority for overall land use and transportation funding decisions in one body, there is no good solution to the present discontinuities. One potential direction might involve toll pricing of key highway facilities gauged to level and time of congestion, and using the resulting revenues to improve transit service.
- Region does not permit impact fees. The local jurisdiction is required to fund local share of the cost of service.
- Setting up a General Improvement District can be effective for large commercial developments, whereas a general sales tax increase might be more appropriate for residential developments.
- Funds should be exacted by and provided to local municipalities or counties for them to pay for transit improvements as they desire.
- Traffic management districts and Tax Increment Financing.
- Can be a mixed bag. New service has to be judged on its cost-effectiveness overall. Additionally, to the degree that the new development generates sales tax, and that tax is available county-wide or city-wide (or already legally obligated) for public transit, the developer will typically make the case that the sales tax should be used for public transit as opposed to any kind of special assessment.
- Demonstration project funding would be nice.
- Good question—I'd like an answer, too.
- It should be included in the regular transit operating budget.
- I'm not sure if there is a "best" way of funding service in this type of situation, but here are a few general thoughts: through transit benefits or other assessment districts, development fees, and possibly through association fees (depending on the type of development).
- Impact fees, direct operating subsidy from developer for minimal peak-hour services.
- Funding new service continues to be a problem. Often, new developments are not served unless they are built on an existing bus line or if a development is large enough to restructure the bus route.
- Resources can be provided by the developer, city, or other agency in support of creating transit-oriented development.
- Developer contributions, fees; developer provision of shuttle services, grants, etc., are options for funding (with service planned in concert with the transit agency). However, provision of this type of special funding can create equity issues—that is, how do you justify providing service to one new development (just because they have special funding) when many others also warrant new service, but may not have access to such funding. Sometimes access to funding may be

based on factors unrelated to documented transit needs (e.g., political factors). There are also risks that these dedicated funding sources may not continue indefinitely, and then the question becomes whether to continue the service with other funding sources and where this fits within the county's service priorities.
- If serving new development requires significant route extension, the development should fund the service.

7. Do you have any additional comments or insights that would be helpful to this synthesis project?

- Model codes for cities that demonstrate those components necessary to support transit. Land use policies, design ordinances, and subdivision requirements, and support all modes of travel.
- You may want to consider contacting major developers or cities, if you may have not already done so, to get their viewpoint on this issue. They face different challenges and constraints that may impede the provision of transit service into their new developments and it may be valuable to identify these challenges to find any similarities.
- The compilation and distribution of "best practice" guidebooks and other educational materials would be very helpful. Development and distribution of a basic document of the sort that could be easily customized by different transit agencies to suit their local conditions would also be helpful.
- A database should be established with the latest best practices for transit station site and access planning, if it has not been done already.
- Many cities and developers in our suburban area do not believe that there is a "nexus" between development and bus service that warrants private investment, since not enough people (less than 5%) use the bus service. Unlike providing infrastructure for automobile use the numbers do not justify investing in public transit infrastructure.

# APPENDIX B

# Agencies Responding to Survey

**Responding Transit Agencies by State**

| | |
|---|---|
| Golden Gate Transit | California |
| Omnitrans | California |
| Santa Clara Valley Transportation Authority | California |
| City of Boulder | Colorado |
| Mountain Metropolitan Transit | Colorado |
| Regional Transportation District | Colorado |
| Roaring Fork Transportation Authority | Colorado |
| Greater Bridgeport Transit Authority | Connecticut |
| Washington Metropolitan Area Transit Authority | District of Columbia |
| Central Florida Regional Transportation Authority (LYNX) | Florida |
| Miami–Dade Transit Agency | Florida |
| City and County of Honolulu | Hawaii |
| Champaign–Urbana Mass Transit District | Illinois |
| Chicago Transit Authority | Illinois |
| Pace Suburban Bus Division | Illinois |
| Transit Authority of River City | Kentucky |
| Montgomery County Ride-On | Maryland |
| Ann Arbor Transportation Authority | Michigan |
| Metro Transit | Minnesota |
| Charlotte Area Transit | North Carolina |
| Capital District Transportation Authority | New York |
| New York City Transit | New York |
| Greater Cleveland Regional Transit Authority | Ohio |
| Lane Transit District | Oregon |
| Salem Area Mass Transit District | Oregon |
| Tri-County Metropolitan Transportation District of Oregon | Oregon |
| Centre Area Transportation Authority | Pennsylvania |
| Southeastern Pennsylvania Transportation Authority | Pennsylvania |
| Rhode Island Public Transit Authority | Rhode Island |
| VIA Metropolitan Transit | Texas |
| King County Metro Transit | Washington |
| Madison Metro Transit | Wisconsin |

# APPENDIX C

## Transit Agencies with Guidelines

**Transit Agencies That Have Transit Agency Development Guidelines:**

Central Florida Regional Transportation Authority (LYNX), Orlando, Florida
Web link: http://www.golynx.com/media/pdfs/lynxdocs_mobility_manual.pdf

Chicago Transit Authority, Chicago, Illinois

Greater Cleveland Regional Transit Authority, Cleveland, Ohio
Web link: http://www.cudc.kent.edu/d-Service-Learning/PDFs/TWE%20screen%20short.pdf

King County Metro Transit, Seattle, Washington
Web link: http://metrokc.gov/extranet/transit/dcs/standards/PassFac/KCMFacDes.pdf

Lane Transit District, Eugene, Oregon

Mountain Metropolitan Transit, Colorado Springs, Colorado

Pace, Arlington Heights, Illinois
Web link: http://www.pacebus.com/sub/guidelines/guidelines.asp

TriMet, Tri-County Metropolitan Transportation District of Oregon, Portland, Oregon

Valley Transportation Authority, Santa Clara, California

**Transit Agencies with Joint Development Guidelines:**

Miami–Dade Transit Agency, Miami, Florida

Washington Metropolitan Area Transit Authority, Washington, D.C.
Web link: http://www.wmata.com/bus2bus/jd/revised_policies/RevisedGuidelines.pdf

**Web Links to Other Guidelines:**

City of Madison Development Guide: Land Use and Construction Approval Processes, March 2005
http://www.cityofmadison.com/planning/2005DevBook.pdf

City of Boulder Design and Construction Standards, November 2000
http://www.ci.boulder.co.us/buildingservices/dcs/index.htm

Abbreviations used without definitions in TRB publications:

| | |
|---|---|
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACRP | Airport Cooperative Research Program |
| ADA | Americans with Disabilities Act |
| APTA | American Public Transportation Association |
| ASCE | American Society of Civil Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| ATA | American Trucking Associations |
| CTAA | Community Transportation Association of America |
| CTBSSP | Commercial Truck and Bus Safety Synthesis Program |
| DHS | Department of Homeland Security |
| DOE | Department of Energy |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| ITE | Institute of Transportation Engineers |
| NASA | National Aeronautics and Space Administration |
| NCFRP | National Cooperative Freight Research Program |
| NCHRP | National Cooperative Highway Research Program |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| SAE | Society of Automotive Engineers |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005) |
| TCRP | Transit Cooperative Research Program |
| TEA-21 | Transportation Equity Act for the 21st Century (1998) |
| TRB | Transportation Research Board |
| TSA | Transportation Security Administration |
| U.S.DOT | United States Department of Transportation |