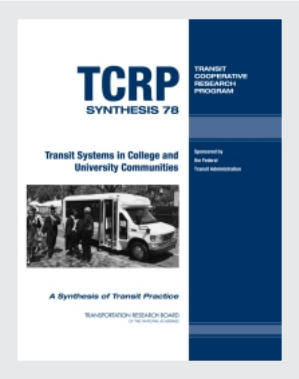

Transit Systems in College and University Communities

DETAILS

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TRANSIT COOPERATIVE RESEARCH PROGRAM

TCRP SYNTHESIS 78

Transit Systems in College and University Communities

A Synthesis of Transit Practice

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TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213—Research for Public Transit: New Directions,* published in 1987 and based on a study sponsored by the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research. TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes a variety of transit research fields including planning, service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, the National Academy of Sciences, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

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The TCRP provides a forum where transit agencies can cooperatively address common operational problems. The TCRP results support and complement other ongoing transit research and training programs.

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Cover photo credit*:* Aaron Donovan. Students and family at Tufts University make use of the "Joey" shuttle service during commencement ceremonies.

ACKNOWLEDGMENTS

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FOREWORD

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

By Donna Vlasak
Senior Program Officer
Transportation
Research Board

This synthesis updates an earlier synthesis offering information on the planning, implementation, and operation of campus transit systems by moving to a focus on the communities in which schools are located. It includes local and regional transportation systems that serve college and university campuses. This report inquires into the current state of the practice with focused case studies. It presents information about practices and trends in the areas of transit operations, and campus policies and planning, with a special focus area in technology and environmental innovations. One underlying question regards the structure of transportation offered, including the interactions between services and unusual and innovative partnership strategies used to enhance services for students, faculty, staff, and the surrounding community.

This report was accomplished through a review of the relevant literature and surveys of transit providers serving college and university communities. Responses were received from a wide variety of schools, local transit systems, and government agencies.

Gail Murray, Nelson/Nygaard Consulting Associates, Inc., San Francisco, California, and Tara Krueger, Nelson/Nygaard Consulting Associates, Inc., Boston, Massachusetts, collected and synthesized the information and wrote the paper, 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

TRANSIT SYSTEMS IN COLLEGE AND UNIVERSITY COMMUNITIES

SUMMARY

Transit Systems in College and University Communities is an update of *TCRP Synthesis 39*, published in 2001. The previous report, *Transportation on College and University Campuses*, surveyed 30 campus communities, offering information on the planning, implementation, and operation of campus transit systems. This 2008 synthesis broadens the scope of the subject by moving from a campus-based focus to a focus on the communities in which schools are located. The study is more extensive including other types of transportation systems—both local and regional—serving college and university campuses.

Colleges and universities and their surrounding communities are often well-served by a diverse and growing array of transportation options, of which transit is a significant element. These communities may be served by transit that is operated by a school-run system, a municipal or regional system, a combination of these, or some other type. This study is an inquiry into the current state of the practice for transit systems that serve college or university communities. Through a review of literature, a survey distributed to transit systems, and focused case studies of a number of systems' best practices in key topic areas, this report presents information about practices and trends in the areas of transit operations, campus policies, and planning, with a special focus on technology and environmental innovations. A profile of the transit systems surveyed is also included.

A survey was distributed to transit providers serving college and university communities and a total of 94 responses were received from a wide variety of schools, local transit systems, and government agencies, which yielded a response rate of 50%. Among the key findings of the survey are:

- Operations
  - Almost all respondents report that transit ridership has recently increased, in some cases very substantially; among the frequently cited causes are increased available service, pass agreements and price incentives, parking issues, and increasing cost of fuel.
  - Operational challenges include provision of accessible services, the seasonality of service (summer's lower volume) and related workforce issues, and rising costs for fuel and other services. One of the successful means of addressing some of these issues is the use of student drivers.
  - Accessibility is an issue for some transit operators, and respondents often reported challenges in meeting the needs of disabled riders.
- Policies and Planning
  - Consideration for transit in the campus planning process varies—public transit operators and local governments report higher rates of transit consideration than schools do. However, campus transit systems have sometimes included the participation of a varied group of stakeholders in the transit planning process.
  - Public transit systems are increasingly looking for opportunities to partner creatively with other entities, both for direct service provision as well as for subsidy of existing services. Many systems describe themselves directly as a partnership between two or more agencies or groups; others described novel approaches to the challenge of supplying campus transportation solutions at an affordable price.

  - Unlimited access to transit services (known as a U-Pass), often through a fee agreement between a school and a local transit operator, is a frequently used method of structuring the fare for members of the school community.
- Technology
  - New technologies have been embraced, and there are clear favorites. Global positioning system (GPS) technologies are growing in popularity, both for vehicle tracking and customer information purposes. Public announcement systems and radio communications are also widely used. Many systems plan to expand use of technologies in the next 5 years.
  - Use of a wide variety of alternative fuels is prevalent. The most popular are low-sulfur diesel and biodiesel. Many fleets use a combination of differently fueled vehicles.

On the whole, there has been a reconsideration of the role of transit within the broader picture of campus transportation options, and a number of schools and communities have taken a multi-modal approach to providing transportation. Although systems have generally aimed to increase ridership on transit, many survey respondents indicated that the goal is ultimately to shift mode-share away from single-occupant vehicle trips to other modes, regardless of what alternative mode is used. To support this, transportation demand management measures are becoming popular. The most popular among them are carpooling-related programs such as preferential carpool and vanpool parking, Guaranteed Ride Home services, and ridematching programs to link potential carpoolers. Investments in transit improvements such as roadway enhancements, transit stop amenities (such as benches and information signs), and on-vehicle systems (such as GPS technologies), as well as programmatic improvements such as high-frequency and late-night service, indicate a strong intention to entice riders through provision of high-quality service that competes with the comfort of travel by car.

CHAPTER ONE

INTRODUCTION

Transit Systems in College and University Communities is an update of *TCRP's Synthesis 39*, published in 2001. The previous report, *Transportation on College and University Campuses*, surveyed 30 campus communities, offering information on the planning, implementation, and operation of campus transit systems (Miller 2001). This 2008 synthesis broadens the scope of the subject by moving from a campus-based focus to a focus on the communities where the schools are located. The study was opened up more extensively to other types of systems, including local and regional transportation systems serving college and university campuses.

This report addresses the breadth of transportation services available in communities with a college or university. These communities may be served by a school-run system, a municipal or regional system, or both (in addition to other types of providers, including private enterprises). One of the underlying questions of this report regards the structure of transportation offered in college and university communities, including the interactions between services and unusual and innovative partnership strategies used to enhance services for students, faculty, staff, and the surrounding community. In conducting the analysis, we found that in many cases respondents provided substantially different answers depending on what type of system they operate: a local public transit operator or local government running a transit system, or a school operating services directly for students and/or the whole community. For this reason, and because we aim to address the nature of transportation in university and college communities comprehensively, we have in some cases described the responses of those two types of systems separately.

METHODOLOGY

Several methods of collecting data were used. First, a review of relevant literature was conducted to evaluate the key trends and issues in planning, developing, and operating transit and transit-related services on or around college and university campuses. Materials examined included articles published in peer-reviewed journals and an industry newsletter, and publications, including annual reports, produced by schools and public transit operators.

The second data collection method was an original survey. The survey was distributed as a web-based survey to which an invitation was e-mailed to a group of respondents as described here. Because the scope of this study is fairly broad, the survey included many questions. To encourage contacts to respond to the survey, two formats of the survey were provided: a full form with 84 questions and a short form with 66 questions. Respondents could choose which survey to answer. Copies of the survey were provided in a printable format to facilitate collection of answers over time, which could then be entered into the web survey forms. Completed surveys were accepted from December 18, 2007 through February 22, 2008. (Copies of the two surveys can be found in Appendixes A and B.)

Potential respondents to the survey included colleges and universities, public transit operators, and private transit operators. Contacts for respondents came from two sources: the initial contact list of the 2001 *TCRP Synthesis 39*: *Transportation on College and University Campuses* (including 30 respondents and 18 non-respondents to the survey solicited for that publication) and contacts derived from three e-mail lists maintained by APTA relating to transit in university communities.

Finally, focused case studies of several transit systems based on literature, documents provided by the systems, responses to the survey, and interviews provide details on exemplary practices in the key content areas of the report.

STATISTICAL CONSIDERATIONS AND RESPONSE RATE

The time frame for completion of this TCRP report was mid-2008. Therefore, the timeline necessitated placing the survey window in part over winter break, when many schools are not in session and holiday periods are typically taken. Moreover, because of the change in topic focus between the 2001 and current study (from a campus-based focus to a focus on the communities where the schools are located), the study was opened up more extensively to other types of systems, including a broader reach toward local and regional (rather than school-based) transportation services. The synthesis panel therefore requested that the survey be distributed widely to reach more types of potential respondents and garner a larger number of responses.

Two groups of potential respondents were invited to complete the survey. Because tracking trends over time across a common peer group is beneficial, the 30 schools that had participated in the 2001 survey were the first group of respondents

recruited for the survey. These original respondents were contacted individually by telephone to announce the upcoming survey. Additionally, the survey was also e-mailed to 18 contacts that had been invited to participate in the 2001 study but had declined at that time. The list of transit providers that responded to the survey is presented in Appendix C; those noted with asterisks were among the original 30 schools.

The survey was also e-mailed to contacts derived from three e-mail lists maintained by APTA relating to transit in university communities. From these lists, a total of 514 electronic addresses were e-mailed the survey. A large number of these addresses, however, can be excluded from consideration (voided) for the purpose of calculating the response rate for several reasons. First, a large number of e-mails bounced and were therefore never received. Second, many e-mail addresses actually represented multiple contacts at the same school or organization, and only one survey from each organization could be expected. Third, some contacts derived from the lists were not eligible respondents because their services were not reasonably related to the content of this study and were therefore eliminated (for example, companies manufacturing components used in the production of buses). Finally, initial survey invitees were eliminated because they responded that they were not valid contacts.

An overall total of 307 valid invitations were issued. In total, 152 transit service providers responded for a response rate of 50%. However, only 94 provided enough complete and useful responses to inform our analysis. Therefore, in final tally, the study team received 77 complete responses to the full survey and 17 responses to the short survey. The list of all respondents for which full and usable surveys were received is presented in Appendix C.

Since not all questions applied to all systems, the response rate to each question varied as some respondents were able to answer different questions about their systems. For example, a greater percentage of schools was able to answer questions about parking policies in campus areas than were government entities. A full breakdown of the response rates to each question is presented in Appendix D. Note that respondents were permitted to estimate answers, and so particularly for the questions about cost figures (fees, financing, etc.) and other numeric values answers have been tabulated in more appropriate summary formats.

There are two important caveats for readers of this report. First, it should be remembered that when percentages or a number of responses are indicated in the question-by-question analysis, this refers to the percentage of responses to that question rather than to the overall survey response rate. In other words, most questions reflect the responses of the *subset* of respondents who answered that question. Second, all answers to the survey are *self-reported* answers—that is to say, respondents supplied what they believed was the most appropriate answer for their system. For example, one question asks about the urban, small urban/suburban, semi-rural, or rural character of the school's setting; these adjectives were not defined in the survey and therefore are up to the interpretation of the respondent. This was intentional, and allowed respondents to reflect their experiences most genuinely at the expense of rigid comparability between systems, and this tradeoff should simply be kept in mind when reading.

REVIEW OF LITERATURE AND INDUSTRY TRENDS

Issues involving transportation in college and university communities must be viewed in the context of a broader set of changes taking place in two industries: higher education and public transit. As enrollment in colleges and universities increases, campuses are adding institutional space, often in settings where land is a significant constraint. Moreover, employees at universities are a significant source of transportation demand for the campus, as employees drive in from more affordable housing in the suburbs. The result is that students, faculty, and staff compete more acutely for fewer available parking spaces. Providing access to college and university campuses has accordingly risen in the list of priorities for cities and higher education administrators. The development and maintenance of parking has grown increasingly costly, spurring administrators to investigate alternative options. Moreover, in situations where available, developable land is constrained, the option to add more parking is unavailable except, perhaps, on the periphery of the campus. The role of transit in supplying access to campuses in both environments has, in many places, shifted in several critical ways in recent years, providing institutions, local governments, and transit providers with both new challenges and new opportunities in increasing mobility and access.

Several main themes emerge from the variety of documents reviewed for this synthesis. Among them are transit funding/fares and community partnerships; sustainability and the focus on environmental initiatives; parking and parking pricing, often as a subset of transportation demand management measures that campuses may use to reduce dependency on the automobile; and promotion and/or improvement of alternative travel mode options, such as walking, bicycling, carpooling, and carsharing.

Public Transit and Partnerships

Transit agencies and universities are increasingly partnering to provide services. *TCRP Report 111*: *Elements Needed to Create High Ridership Transit Systems* states that, among 100 public transit agencies reviewed, partnerships with universities and other schools were the most frequently used specific strategy for increasing ridership (TranSystems et al. 2007). Moreover, partnerships with universities were identified as a strategy that is applicable and appropriate in all types of urban and rural settings for both bus and rail modes. The

particulars may differ from place to place, but the number of inter-agency/school partnerships is large and the types of arrangements diverse.

For all parties, there are significant benefits gained from partnerships. The support (financial and otherwise) of large local institutions can significantly assist local transit agencies that serve students, faculty, and staff as a major component of their customer base; *TCRP Report 111* indicates that "agencies that serve major universities tend to have significantly higher per capita ridership figures than do other comparably sized areas" and that the specific routes serving a campus are often the most heavily patronized (TranSystems et al. 2007). Moreover, universities and colleges can often enhance transit availability on campus by partnering with a local agency to extend specialized services to campus that it might otherwise not sponsor independently, such as a campus circulator. As noted in *Report 111*, for example, Capital Area Transportation Authority in Lansing, Michigan, took over a shuttle previously operated by Michigan State University under a contract arrangement that provided for 28,200 h of vehicle service in its first year. As stated in *TCRP Report 53*: *New Paradigms for Local Public Transit Organizations*, "many universities have rethought both parking and transportation policies and have either abandoned their own separate transit operations or successfully downsized and integrated them with local public transportation services" (Cambridge Systematics, Inc. 1999).

Many transit operations now have enhanced systems of fare integration with local universities. One method of approaching this is the unlimited access pass (or U-Pass), wherein a fee paid by the university (and often passed on to students and/or staff, explicitly or indirectly) purchases or reduces the price for unlimited-ride transit passes on a local transit system. Some of these programs are decades old, and may supplement or wholly replace the need for transit services run exclusively on campus by the school itself, depending on the context of the campus in the urban environment, the services available from the local transit system, and the partnership opportunities available. Some of the benefits of these programs realized by the public-at-large include reduced congestion and improved air quality (McCollom and Pratt 2004).

Parking and Parking Pricing

There is a strong emphasis on the competing demands of parking and institutional uses for prime campus space, underscoring the dilemma of providing consistent access to campus facilities as they expand over a fixed space. Shoup (2007) posits that two frameworks for addressing parking management have emerged—economic and political—and that these greatly influence the parking climate "on the ground." To illustrate the political model, Shoup cites University of California at Los Angeles (UCLA), where 175 different "ranks" of parking permits determine the subset of spaces in which a driver may park (and to an extent, social pecking order). There, the ultimate "X" permit, which allows access to any space on campus, offers the kind of top status that at other schools (including California Institute of Technology and University of California at Berkeley), is bestowed only to Nobel laureates in the form of a reserved parking space.

The economic model attempts to more closely relate parking prices to the cost of supplying parking and, in some cases, the relative convenience of the space obtained. In many cases, the cost to own a parking permit is far lower than the cost to operate and maintain the spot; when the capital cost of construction is considered, the difference amounts to a large subsidy for campus parking. Shoup (2007) notes that, in cases in which parking availability appears to be a challenge, determining appropriate *pricing* (demand-side construction) rather than *quantity of spaces* (supply-side construction) is the issue. Where parking is scarce, the privilege of parking is an asset for which some schools have found staff, faculty, and students willing to pay a high price.

Parking pricing is a crucial issue for university administrators not only for reasons such as faculty and staff recruitment but also because of the very high cost of constructing and maintaining parking (Poinsatte and Toor 1999). Universities can expect to pay between $15,000 and $30,000 per net new parking space constructed on campus, a figure that is independent of the cost for ongoing operations and maintenance (Toor 2003). Some of the parking management strategies universities can employ (in addition to basic price-increase strategies) are regulatory measures, including parking bans for certain groups such as freshmen or other class years. Others are economic incentives: financial incentives for affiliates to drive less, such as parking cash-outs, or to drive more efficiently, such as preferential/lower-cost carpool and vanpool parking; and transportation demand management measures, such as enhancements to facilities for other modes of travel or subsidy of transit (Poinsatte and Toor 1999; Toor 2003).

Livable Campus: Alternative Modes and Environmental Initiatives

Institutions of higher education have recently begun to implement increasingly more aggressive strategies for reducing vehicle emissions and enhancing opportunities for campus access by modes other than single-occupant vehicles (SOVs). For example, many campuses have begun to switch to cleaner fuels such as biodiesel, which can be used in existing diesel-burning vehicles (Toor 2003). Other types of alternative fuels as well as hybrid vehicles offer promise. Others have begun to implement campus-owned vehicle programs (for institutional use) or car-sharing programs (for all uses, including personal use). These programs act as a way not only to enhance transportation as an end in itself, but also to enhance the campus environment and increase livability, including people who cannot or do not wish to drive.

In addition to providing transit services, a growing number of campuses are now focusing on enhanced infrastructure for pedestrian and bicycle travel. At a growing number of schools, transportation to, from, and around campus is programmed comprehensively with recognition of the benefits of accommodating different means of access (Poinsatte and Toor 1999). Some schools, such as the University of California at Davis, employ a full-time bicycle and pedestrian coordinator (Balsas 2003). The presence of a dedicated staff person and modal advisory committees, argues Balsas, increases opportunities for consideration during the campus planning process.

Enhanced transportation connections may also be viewed as a strategy for goals in addition to an improved immediate campus environment. *TCRP Report 22-B* profiles the neighborhood revitalization effort in Davis Square, Somerville, Massachusetts (near Tufts University) in the 1970s that was based on bringing the Massachusetts Bay Transportation Authority's (MBTA) Red Line through the area rather than through a different routing. Today, Davis Square is a vibrant local commercial center and also a key transit hub for connecting Tufts' shuttle system with other transit services, including MBTA services and a bicycle path. In addition to providing a more direct, speedy connection to downtown Boston for Tufts' affiliates, the location also serves as a key local activity center with shops, restaurants, and other activities closer to the immediate campus vicinity (Project for Public Spaces 2001).

This current synthesis addresses and expands on the topics explored in the literature to date. Because U-Passes were covered in depth in the 2001 TCRP synthesis, this report will address a broader range of issues related to partnerships between schools and public agencies. It will also investigate some of the very recent trends in technologies that have shown promise for supporting the critical challenges in transit in college and university communities.

ORGANIZATION OF REPORT

This report is organized in four topical chapters: Profiles of Surveyed College and University Communities, Campus Operations, Campus Policies and Planning, and Technology and "Green" Innovations. Conclusions about the overall state of the practice in transit and transportation on college and university campuses are presented in a final chapter. The appendixes include the surveys (Appendixes A and B), a list of survey respondents (Appendix C), survey responses by questions (Appendix D), ridership data (Appendix E), and a school index (Appendix F).

CHAPTER TWO

PROFILES OF SURVEYED COLLEGE AND UNIVERSITY COMMUNITIES

TYPE OF INSTITUTION

The study surveyed transit providers in college and university communities, and was not limited to those schools that provide transit directly; in many cases, schools are significantly served by a local public transit system instead of, or in addition to, any services provided by the school. Of the organizations completing the survey, 58 identified themselves as from the college or university itself, 32 were from a transit operator (public or private), and seven from the local government (see Figure 1). The three "Other" respondents included a three-way partnership arrangement in Ames, Iowa (see chapter four for a focused case study), home of Iowa State University; a consultant responding for a multi-school system called HEAT serving seven schools in Greensboro, North Carolina; and Clifton Corridor Transportation Management Association, operating services at Emory University in Atlanta, Georgia. Note that respondents were permitted to respond that they represented more than one type of organization; this was the case for six respondents, and therefore, the total number of responses in Figure 1 is 100 while the *n* is 94.

CAMPUS POPULATION

Respondents were asked to answer all questions about a single school; non-schools such as local governments or public transit providers were asked to indicate to which school their survey answers referred (or fill out more than one survey, one for each school). Respondents were also asked to indicate the type of school about which they were responding, categorized by the type of degree offered. A majority of campuses represented in the sample (81 respondents, or 86%) are four-year universities. Only three (3%) are two-year colleges, and two (2%) offer graduate courses only. The remaining 10 (11%) are four-year colleges offering no graduate curricula. (Two respondents classified the school in two different categories; therefore, there are 96 responses in Figure 2 for 94 respondents.)

The survey elicited responses from a range of campus types. Campuses with both primarily residential and primarily commuter populations are included, with a mixture of commuter/residential being the dominant type of campus, accounting for 52% of the responses. Total student enrollment ranges from 2,800 at the Oregon Institute of Technology to 64,000 at Arizona State University. The following chart (Figure 3) illustrates the number of respondents indicating enrollments within each of the listed ranges. The majority of schools had more than 10,001 students. A full list of schools by size (city population and size of enrollment), as well as the location and the school's website (frequently a source of additional enrollment information) is presented in Appendix F. Since some individual respondents reported information about the same school (e.g., a public transit provider and the school itself), the enrollments presented in Figure 3 reflect only one response for each individual school, and so 86 responses are shown.

Forty-three percent of respondents indicated their school includes multiple campuses (see Table 1). This means that, instead of a single contiguous campus that contains all (or most) university buildings' functions, the school is comprised of more than one campus in distinct locations. Some respondents described services at one campus location, whereas others also included information about services that run between campuses.

HOST COMMUNITY CHARACTERISTICS

Respondents indicated that they are located in diverse community settings. The smallest community, Saginaw Valley State University located between Saginaw, Bay City, and Midland, Michigan, has a population of 3,200. At the other end of the spectrum were UCLA and the University of Chicago, situated in two of the nation's largest metropolitan areas. Most campuses surveyed are in urban or small urban areas. Only six are in rural areas (see Figure 4).

CAMPUS TRANSIT CHARACTERISTICS

Within the various communities, many campuses have access to an array of public transit services on or around campus in addition to any services offered by the school itself (see Figure 5 for responses indicating available services). More than 90% of the campuses surveyed are connected to a local fixed-route bus service, while only 9% can access urban/light rail transit. Most schools reported that they themselves provide accessible or other dial-a-ride services. For example, the University of Pennsylvania and the University of Florida each offer services that complement those of the Southeast Pennsylvania Transit Authority (Philadelphia) and Regional Transit System (Gainesville), respectively.

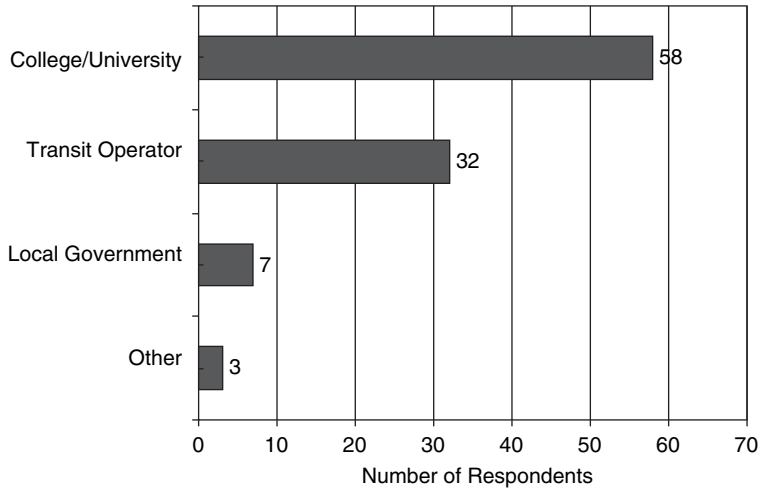

FIGURE 1 Type of organization responding to survey (n = 94).

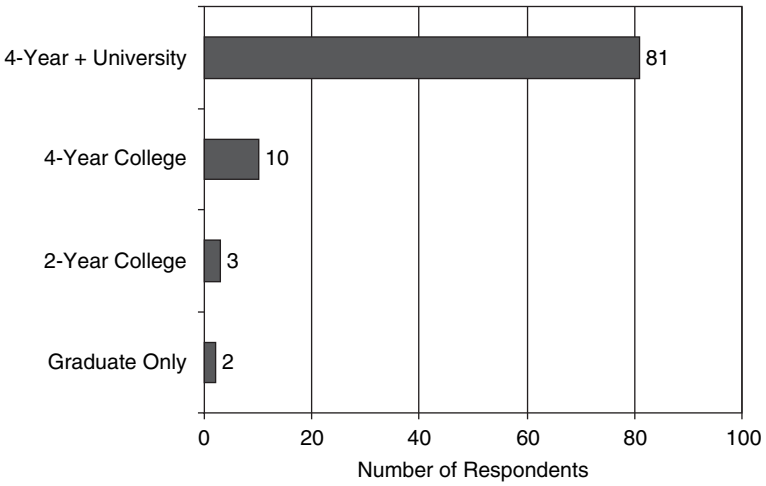

FIGURE 2 Type of school served by transit operator (n = 94).

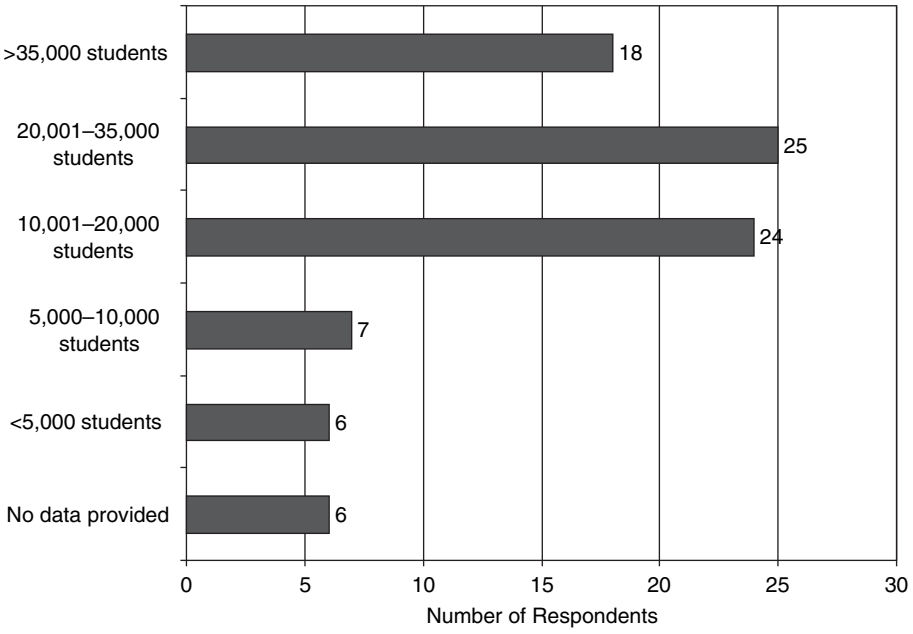

FIGURE 3 What is the overall full- and part-time school enrollment (n = 86)?

TABLE 1
DOES THE SCHOOL HAVE MULTIPLE CAMPUSES SERVED BY TRANSIT?

	% of Total Respondents
Yes	43%
No	57%

n = 75.

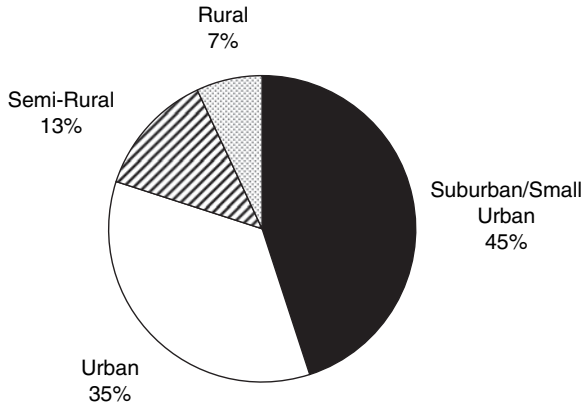

FIGURE 4 How would you classify the school's immediate setting (*n* = 94)?

To gather information about the size of the systems in the respondent pool, respondents were also asked how many bus routes serve the campus (see Table 2). (Additional ways of understanding the "size" of responding transit systems are covered in chapter two.) Table 2 shows how many routes each respondent indicated serve the campus; most respondents indicated that between one and five routes serve the campus.

The survey asked about the structure of the coverage for the transit system provided at the school in order to understand whether the system is geared toward the campus community or the wider population of a city. Most respondents indicated that the system was either centered on the school (which would be typical of a campus shuttle system) or a mixture of campus-centered and community-centered service. Table 3 indicates the results.

The survey respondents were able either to provide details about just one transit service serving a campus or to aggregate responses for multiple services. The respondents' replies are indicated in Table 4 as to which services their survey answers would apply.

Two-thirds of the respondents indicated their answers would apply to local fixed-route bus transit and on-campus circulator shuttles. Between one-quarter and one-third of respondents offered service details about parking shuttles, accessible paratransit, and other on-call services. In general, the college and university respondents focused on on-campus shuttles (79% of school respondents), while 92% of the government agencies and transit providers shared details about local fixed-route bus services. A full list of the survey respondents can be found in Appendix C.

Respondents were asked to indicate the purpose served by transit for the school. Government entities and transit agencies tended to report that transit serves two primary purposes for the school: to link the campus with the surrounding community

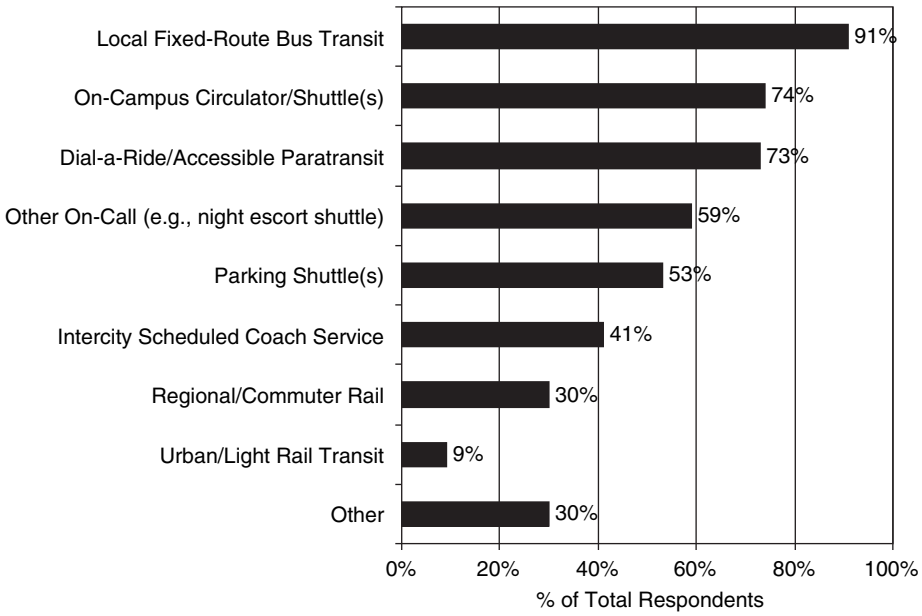

FIGURE 5 What types of transit serve the school (*n* = 66)?

TABLE 2
HOW MANY BUS ROUTES SERVE THE CAMPUS?

	Number of Bus Routes Serving Campus			
	1–5	6–10	11–20	21+
Number of Systems	30	29	22	8

n = 89.

TABLE 3
HOW IS THE COVERAGE OF THE TRANSIT SYSTEM STRUCTURED?

Structure of Coverage	% of Total Respondents
Centered on School	40
Centered on Surrounding Community	9
Both	52

n = 93.

TABLE 4
FOR WHICH OF THESE TRANSIT SERVICES WILL YOU BE PROVIDING SERVICE DETAILS?

Transit Service	% of Total Respondents
Intercity Scheduled Coach Service	10
Local Fixed-Route Bus Transit	65
On-Campus Circulator/Shuttle(s)	66
Parking Shuttle(s)	30
Dial-a-Ride/Accessible Paratransit	36
Other On-Call (e.g., night escort shuttles)	24
Other	1

n = 94.

and to provide on-campus circulation. Not surprisingly, responses from schools indicated that the primary purpose is on-campus circulation, with a generally even balance between all other purposes as listed in Table 5, which shows the purposes listed by respondents, in total as well as broken down by the type of respondent.

Ninety-seven percent of the government and transit agencies indicated their service was open to the public; however only 61% of schools open all of their service to the public. Twenty-two percent of school respondents exclude the public from all of their transit service.

SYSTEM ADMINISTRATION

Respondents were asked to indicate who manages or contracts for the transit service that is provided at the school. This question was designed to allow respondents to indicate how the service is contractually structured, which may be more complex than just a direct operation on the part of the school or the local transit provider (see these results listed in Table 6). For nearly half of the campuses reporting, the college or university operates the transit system. For 18% of schools, the community's public transit provider or local government operates the system.

Hybrid administration models account for the remaining third of the responses, including formal partnerships between some combination of the school, the local government, and/or the public transit agency. Some of these arrangements may simply be a direct contract agreement between a school and a local transit agency that provides a wider range of community services. This is the case at the University of Texas at Austin, where the campus shuttles are contracted from Capital Metro. Some contracts are between entities other than the university administration. For example, Transfort of Fort Collins, Colorado, indicates that the campus services at Colorado State University are provided under a three-year partnership between itself and the student leadership. Other "hybrid" systems may be due to the structure of the transit system itself, where the transit system is a department of another government entity.

Other arrangements describe collaborative agreements between agencies and/or the school. This is the case in Ithaca, New York, between Cornell University, Tompkins County, and the city of Ithaca. (See chapter four for a focused case study of a three-way partnership arrangement in Ames, Iowa.)

TABLE 5
WHAT PRIMARY PURPOSE(S) DOES TRANSIT SERVE FOR THE SCHOOL?

Purpose Served	% of Total Responses	% of School Respondents	% of Govt. or Transit Agency Respondents
On-Campus Circulation	79	93	62
Inter-campus Circulation (multiple campuses)	35	43	19
Link Between Campus and City	73	64	84
Park-and-Ride	47	54	43
Night/Evening Safety	54	63	41
Accessible Services	53	55	49

n = 92.

TABLE 6
WHO MANAGES OR CONTRACTS FOR THE TRANSIT SERVICE PROVIDED AT THE SCHOOL?

	% of Respondents
Campus Operated	48
Public Transit Provider as Operator	18
Hybrid	33

n = 92.

In a reversal of traditional roles, in rural Macomb, Illinois, where students comprise over half the local population, Western Illinois University operates the transit that serves the entire community. The fairly large number of respondents (31) who reported a hybrid administration between the school and the public transit operator or school and local government suggests that partnership arrangements are viewed as an effective way to deliver transit to both a school and the wider community.

CHAPTER THREE

CAMPUS OPERATIONS

HOURS OF OPERATION AND FREQUENCY OF SERVICE

Respondents were asked how frequently services were available during the most frequent period. This was asked to discover the intensity of services available to campuses—a campus with 30-min frequencies at its busiest hour is served very differently from one with shuttles arriving every 5 min. Thirty respondents (33%) indicated that their service is as frequent as up to every 6 min. Another third indicated that their most frequent services were between 7 to 10 min. Sixteen percent indicated 11- to 15-min frequency, 4% indicated 16- to 20-min frequency, and 13% indicated a frequency of over 20 min. Two respondents (both located in New York City) indicated that 84 vehicles per hour serve the campus at the peak time; this is the most frequent service listed. The least frequent service at peak time listed was once per hour, indicated by a semi-rural school.

RIDERSHIP

Ridership is an important measure by which systems benchmark their service effectiveness. A full table of ridership data is presented in Appendix E, including the most recent ridership figures and responses to a question about trends in ridership over time. Almost all operators reporting a trend in ridership experienced an increase over time. In general, these increases were modest—in the range of 1% to 5%—but occasionally were larger (though not all respondents indicated the period of the increase). Respondents expressed a full range of comments about the trends in ridership. Some of the most frequent general explanations about increases in ridership include the following:

- Increasing gas prices,
- New routes or increased service levels,
- U-Pass agreements or other price incentives,
- Growing student enrollment and other demographic shifts,
- Decreases in parking availability on campus,
- Increased awareness of routes, and
- Marketing.

The reasons cited for ridership increases may serve as a useful comparison for systems wishing to enhance their services and address new and changing needs. For example, Mississippi State University in Starkville produced service enhancements by making changes in parking and zoning and streamlining services to bring buses faster to a central hub, and the University of North Texas in Denton experienced a 1,000% growth in ridership over 5 years with a student fee and inter-local agreement. It appears that a number of factors are now coming together to provide a climate that is very favorable for growing system ridership.

Five schools reported a decrease in ridership. Two cited outside circumstances: one school pointed to demographic changes, and another transit system indicated that the construction of dense new housing on campus has resulted in increased walking among students. On the other hand, two respondents indicated that more direct service/funding cuts by the school had resulted in a decline in ridership. The April 16, 2007, shootings at Virginia Tech resulted in a modest decline in ridership owing to the university allowing students to end their school year early.

As one measure of the relative patronage level of the systems, respondents were asked to report on the number of routes that are at "standing room only" capacity at least once per peak period every weekday. Results are indicated in Table 7. Most respondents reported five or fewer routes at standing room only. Interestingly, only two of the respondents who answered the question reported that no routes operated at this level; most systems have at least one route that is very heavily patronized for the capacity level provided.

Of course, the number of at-capacity routes will be higher in larger systems; therefore, the proportion of routes a system runs at capacity is also shown. Systems ranged widely in this proportion (see Table 8). Almost half of systems reported that more than half of their routes are at standing-room only on a consistent basis. These figures strongly suggest that the transit that is available to campuses is very well utilized during commute hours.

Although only one-quarter of respondents overall have transit ridership goals for the campus transit routes, a higher percentage of university respondents than government/transit agencies has these goals. One-quarter of schools have set ridership goals, although less than one-fifth of the government agencies have done so (see Table 9).

TABLE 7
HOW MANY TRANSIT SYSTEM ROUTES HAVE STANDING-ROOM ONLY AT LEAST ONCE PER PEAK PERIOD EVERY WEEKDAY?

	Number of Transit System Routes with Standing-Room Only at Least Once per Peak Period Every Weekday				
	Zero	1 or 2	3–5	6–10	11+
Number of Systems	2	18	24	12	9

n = 65.

CHANGES IN SERVICE AND NEW CHALLENGES

Seventy percent of respondents reported that changes in campus demographics, student body composition, or student residential locations have had an impact on transit cost, service, or effectiveness, whereas only 38% indicate that changes in school administration or school polices have impacted transit service or policies (see Tables 10 and 11). Schools and government/transit agencies had very similar perspectives on which factors have had an impact on transit.

ACCESSIBLE PARATRANSIT SERVICES

Seventy-three percent of campuses are served by dial-a-ride or other paratransit service. As indicated in Table 12, only half (55%) have every vehicle in their fleet equipped with wheelchair lifts, and 18% of fleets have lifts on less than half of their vehicles. Low-floor vehicles add to the overall accessibility of a transit service, as they are easier for all to board, including elderly persons and people with physical disabilities who do not use wheelchairs. More than half (53%) of respondents indicated low-floor vehicles make up less than half of their fleet, while only 12% of fleets utilize low-floor buses exclusively.

The Americans with Disabilities Act (ADA) of 1990 requires the accommodation of persons with disabilities on certain transit services. Survey respondents were asked, "How are the operational and funding challenges of meeting ADA requirements met?" The majority of comments received from schools generally reflected one of two situations: that these demands are simply met within the constraints of the department's budget or otherwise absorbed, or that all of their vehicles are equipped with lifts and so the needs of people with disabilities are met within the context of regular service. For public transit providers and governments, some responded that grants were used to fund the services, whereas others indicated that the costs were otherwise integrated into the budget.

Several creative methods of providing ADA services were reported. UCLA indicated that it is able to use grants to fund services. CyRide of Ames, Iowa, indicated that it has "contracted with [the] regional transit system to operate our paratransit and save about $125,000 per year" (CyRide 2007). Virginia Tech handles it through aggressive pursuit of partnerships and/or advertising and the University of California at San Diego uses citation revenues to increase funds. At the University of South Florida, accommodations are provided by the school, but are broken up departmentally—infrastructure improvements are handled by the university's specific budget for ADA, while transit-specific costs are handled by the operational budget of the transit service.

FUEL COSTS AND OTHER FINANCING CHALLENGES

When asked "What financing challenges have impacted operations in recent years (e.g., interest rates, insurance costs, fuel costs, etc.)?," the overwhelming majority (85%) cited rising fuel costs as a financial challenge impacting transit operations in recent years. It is probable that most of these respondents are referring to rising gasoline and diesel prices, but University of California–Irvine and UCLA specifically indicated the high cost of alternative fuels, so the challenge of rising fuel costs cuts across different technologies.

Reduced state and federal funding for operations or capital investments was the second most common financial concern. Pullman Transit, serving Washington State University, cites the "loss of state funding" and "limited federal capital dollars" as significant challenges; the University of Arkansas is facing "declining subsidies"; and university budget cuts are an obstacle for the University of Arizona. This funding shortfall may help explain why 20% of respondents are struggling to meet operations and maintenance costs and capital improvement costs (e.g., vehicle replacement). In response to limited

TABLE 8
WHAT PROPORTION OF TRANSIT ROUTES HAVE STANDING-ROOM ONLY AT LEAST ONCE PER PEAK PERIOD EVERY WEEKDAY?

	Proportion of Transit System Routes with Standing-Room Only at Least Once per Peak Period Every Weekday					
	Zero	1–25%	26–50%	51–75%	76–99%	100%
Number of Systems	10	9	13	13	10	10

n = 65.

TABLE 9
DO YOU HAVE A GOAL FOR TRANSIT RIDERSHIP ON ROUTES SERVING THE CAMPUS?

	% of School Respondents	% of Govt. or Transit Agency Respondents
Yes	26%	18%
No	74%	82%

n = 56.

funding and rising costs, many respondents have had to raise fares and/or cut service.

Labor costs, plus the rising cost of employee health insurance, are a financial concern for 37% of respondents, and roughly one in five indicated other insurance costs have impacted their transit operations (see Figure 6). Additionally, 14% of the systems are feeling strained owing to increased passenger demand as a result of campus growth or other factors, as reflected in the University of Pennsylvania's statement, "we are constantly requested to do more with less."

The following profile, as reported through an interview with a representative of Chapel Hill Transit, serving the University of North Carolina–Chapel Hill, illustrates how one system approaches the challenge of funding transit services through a special partnership arrangement.

Profile: Funding Partnership Provides Free Transit in Chapel Hill, NC

Everyone rides free on Chapel Hill Transit, thanks to a unique funding partnership among the North Carolina towns of Chapel Hill and Carrboro and the University of North Carolina at Chapel Hill (UNC). The free fare system went into effect in January 2001, raising the ridership in 1 year from 3 million annually to 4.2 million riders in 2002. Ridership for Fiscal Year 2008 to 2009 is projected to be 6.8 million riders.

The free fare system is an outgrowth of a partnership that began at the instigation of Mayor Howard Lee in the early 1970s. Chapel Hill committed itself to growth that sustained the town's charm—tree-lined streets and building heights limited to three stories (except for the hospital). To accomplish this, transit had to be a key element of the town's vision. A study committee, funded by a federal grant, examined the feasibility of a permanent community transit system. Town voters approved a $350,000 bond referendum for local capital match and a 10 cents per $100 valuation ad valorem tax to support operations. Chapel Hill Transit, a department of the town government, began operations in August 1974; when the UNC Student Government's shuttle system merged into Chapel Hill Transit, the funding partnership for shared service began. Carrboro began purchasing transit services in 1977 and merged into the system in 1980, bringing its own ad valorem tax to pay for its share of the service. The system now consists of 31 routes with 99 buses and 15 lift-equipped vans. The routes also serve five public park-and-ride lots and six UNC off-campus lots. The free fare system includes the EZ Rider paratransit service and a Shared Ride Feeder service to the fixed routes. The Feeder service is available on a demand response basis for residents who live more than 2 mi from a bus stop.

The system uses a formula to determine each partner's share of the financing. The total required amount is as follows: Total Budgeted System Expenses Less Operating Revenue, Federal Assistance, and State Maintenance Assist Program (SMAP). Since UNC has approximately 11 routes solely dedicated to the university and university hospitals, this amount is deducted from the balance to be shared and is attributed directly to the school. The split is then determined for each partner based on population (2008 population figures: Chapel Hill: 51,519; Carrboro: 16,782; UNC students: 29,800; UNC faculty and staff: 19,800).

The annual operating budget of $15 million is an Enterprise Fund separate from the town's General Fund, which includes

- Ad valorem property taxes at 4.8 cents per $100 valuation: $2.6 million;
- FTA Section 5307 funds: $1.115 million;
- SMAP: $3.4 million;
- UNC contract: $5.7 million;
- Town of Carrboro contract: $1 million;
- Tarheel Express Shuttle farebox: $400,000 (from ticket sales to provide shuttle from park-and-ride lots to football and basketball games); and
- Miscellaneous revenues (e.g., bus advertising, interest income).

The funding formula for the partnership is set annually through a negotiated contract. A Transit Partnership Committee, comprised of representatives from both towns, UNC, and citizens, meets monthly. They negotiate issues such as how long a new route primarily serving one partner should be solely that partner's responsibility before being added to the formula for shared cost—in this example, the decision was 3 years. Other challenging issues have included whether to reduce service or raise student fees.

Based on a spring 2007 survey, approximately 90% of the riders are affiliated with UNC.

The sources for UNC's share of the funding partnership are parking permits and fines, a departmental assessment based on payroll, and student fees. Student fees are currently set at $92.25 per year; of that amount, $62 is dedicated to Chapel Hill Transit

TABLE 10
HAVE CHANGES IN CAMPUS DEMOGRAPHICS, STUDENT BODY COMPOSITION, OR STUDENT RESIDENTIAL LOCATIONS/GEOGRAPHY IMPACTED TRANSIT COST, SERVICE, OR EFFECTIVENESS?

	% of Total Respondents	% of School Respondents	% of Government or Transit Agency Respondents
Yes	69	70	70
No	31	30	30

n = 70.

TABLE 11
HAVE CHANGES IN SCHOOL ADMINISTRATION OR POLICIES CHANGED TRANSIT SERVICE AND/OR POLICIES?

	% of Total Respondents	% of School Respondents	% of Government or Transit Agency Respondents
Yes	38	37	35%
No	62	63	65%

n = 71.

and the remainder goes to other transit services on campus not operated by Chapel Hill Transit.

Because of its free fare service, Chapel Hill Transit has been able to increase its federal funds, which are based on ridership. As part of its strategy to increase ridership, it has also added $40,000 in the budget for marketing. In addition, the public can see the convenience of transit through new technology announcing when the next bus will arrive (see extended technology description in chapter five). These light-emitting diode signs have been placed at all park-and-ride lots, at key bus stops on the UNC campus, and on each bus traveling through the community. The next bus arrival is also available on the town's website (M. Margotta, Budget Finance Manager, Transportation Department, Town of Chapel Hill, North Carolina, personal communication, Mar. 20, 2008).

STAFFING AND WORKFORCE CHARACTERISTICS

The survey asked a question about how many persons the transit system employs (see Table 13). Systems reported a wide range of staff sizes, commensurate on the whole with the different sizes of transit systems. Although some of these systems are much broader and larger than others (including transit serving larger cities), many of the school-based systems have a significant number of employees and have grown into small industries of their own.

Respondents were also asked to indicate how many (or what proportion) of their workers are direct employees or students of the school. Table 14 shows that only 12 operators exclusively use staff affiliated with the school (those employed directly by the university). The rest likely represent a combination of scenarios. For public transit operators and governments, this is expected as their target customer audience (and hiring pool) is broader. For schools, however, this may indicate that contracting out for employees takes place. Indeed, the comments received in response to a number of the other questions (including seasonality discussed later in this chapter) support this conclusion.

TABLE 12
WHAT PERCENTAGE OF TRANSIT VEHICLES HAS THE FOLLOWING ACCESSIBILITY-RELATED AMENITIES?

	Percentage of Transit Vehicles with Amenity			
	Zero	<50%	>50%	100%
Wheelchair Lifts	1%	17%	13%	55%
Low Floors	14%	39%	25%	12%

n = 84.

STUDENT DRIVERS

The use of student drivers has become commonplace. Indeed, since half of the systems responding replied affirmatively to a question asking whether they allow student drivers (65% of them *actively recruit* student drivers), the use of students as a major component of the school transit workforce has become standard practice. College and university systems are more likely (53% versus 42%) than government or transit agencies to allow student drivers, and far more likely to *actively* recruit student drivers than government and transit agencies. Only three of the 28 schools that permit student drivers do not actively recruit.

Using students as drivers provides cost-savings opportunities. Student drivers are likely recruited since their wage rate would be lower than a more experienced transit operator, and since they work part-time they typically do not qualify for extended benefits. Moreover, although one might assume that these student drivers would generally need more training, the survey responses indicated that systems that rely on student drivers do not spend the extra resources providing them with special training beyond what is given to other drivers. No government or transit agency provides extra training; the six systems that offer special student driver training are colleges or universities.

Eighteen systems indicated that their student drivers are subject to restrictions that may not apply to other drivers. Eight systems reported an age limit (six reported age 21, and two reported age 18). This may overlap in part with the stated requirement that drivers all have commercial drivers licenses (CDLs), which is typical for transit bus drivers; one respondent, however, indicated that their age 21 minimum was a requirement for coverage under insurance rather than (or in addition to) a CDL requirement. Two systems noted a clean driving record requirement, and two indicated a drug testing requirement. Three systems limit the number of hours that students may work (one stated no overtime, and one caps the hours per week to 25). Finally, three systems had unique requirements: one has a grade point average limitation of 2.0 minimum, one has a limited geographic service area in which students may drive, and one limits students to driving only small vehicles (fewer than eight passengers).

Those schools that offer special training reported a range of curricula. University of Michigan–Ann Arbor realizes that

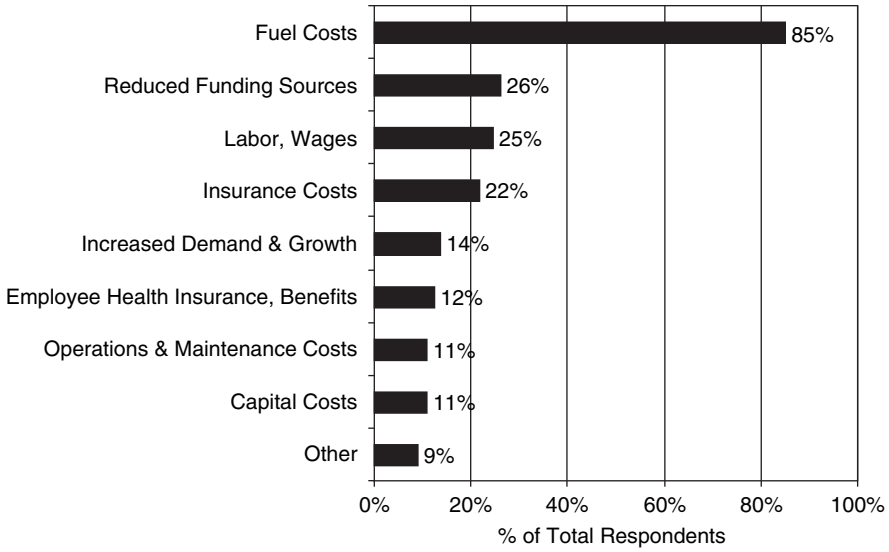

FIGURE 6 Financial challenges cited by survey respondents (n = 74).

most students do not enter with a CDL; they therefore "train vehicle skills, routes, passenger relations, system dynamics, [and] geography." Rutgers in New Brunswick, New Jersey, echoes the sentiment about passenger relations: "Our student drivers are also community service officers who are trained on how to help the community," while the University of South Florida in Tampa provides similar training to get the CDL. Two schools indicated that extra training also comes with heightened testing requirements: Loyola College in Baltimore, Maryland, requires drivers to pass a long road test, and the University of Pennsylvania in Philadelphia conducts quarterly safety classes plus semi-annual driving evaluations.

Profile: Student Drivers Serve at CyRide, Ames, Iowa

The transit system in the university city of Ames, Iowa, offers an example of a blended transit system that serves both university affiliates and the public at large. CyRide, named after Iowa State University's Cyclones, is operated by the city of Ames under a funding partnership among the city, the university, and the student body government. (For a more extensive examination of CyRide's partnership origins and funding structure, see a separate case study in chapter four.) Ames Transit Agency (CyRide's official name) operates 10 routes, three of which are exclusive to Iowa State University. The system employs 24 full-time drivers as well as 83 part-time drivers, of whom 57 (69%) are students. (Part-time is defined as working 15 h to 39 h per week.) Students also serve as dispatchers, bus cleaners, and trainers.

Serving transit in a community in which university students comprise more than half of the population has presented challenges that CyRide has addressed with programmatic innovation. In this moderately-sized community of 52,000, recruitment of students is necessary to fill the driver slots. This need is exacerbated by the low unemployment rate in Ames (2% in 2008). The primary means of recruitment is the Job Board on the campus. Students are attracted to CyRide because the starting pay is $11.36/h, which is better than most other jobs posted. As CyRide employees, they receive sick pay and vacation pay if they work over 20 hours per week. Job openings are also announced on the buses' destination signs ("CyRide Hiring") and are spread word-of-mouth by other student drivers.

Employment of student drivers differs in some ways from other types of employees. Drivers typically work part-time for 5 or 6 years before becoming full-time and receiving full benefits, so no students generally receive health benefits. Full-time drivers belong to the Operating Engineers union, and one or two students have also joined. Although there is no policy against employing freshmen, CyRide encourages sophomores and older to apply as drivers due to their perceived higher level of maturity.

Safety is a chief concern when student drivers are hired, so recruits may have no more than two violations on their driving record, and no incidents of driving while intoxicated. Progressive, CyRide's property insurance company, checks only on driving records, and is not concerned about the age of the student drivers. Collision insurance is provided by the city's self-insurance. CyRide has an extensive driver training program of 120 to 130 h on its 40-ft buses, which includes out-of-service and in-service driving. As a result, it has won national safety records for its performance. It has only five or six claims a year, usually not totaling more than $10,000 annually. According to Tom Davenport, Transit Coordinator, it is easier to train students than to train former truck drivers, who must unlearn bad habits (T. Davenport, Transit Coordinator, CyRide, Ames, Iowa, personal communication, Mar. 21, 2008).

A high turnover rate means that training is a continuous activity; student drivers tend to have somewhat different employment cycles than full-time workers for several reasons. At the end of the school year, CyRide loses 10 to 15 students and about 15 to 20 take a leave of absence to work summer jobs with more hours. It must then conduct hiring in August and train the new hires. During the school year, the buses operate for 250 service hours per day and 93% of the riders are students. Consequently, although student drivers are less available seasonally, demand is also lower; the service is reduced to 120 h in summer. Finally,

TABLE 13
HOW MANY PEOPLE DOES THE TRANSIT SYSTEM EMPLOY?

	Number of Transit System Employees			
	1–50	51–100	101–200	201+
Number of Systems	21	15	17	25

n = 78.

TABLE 14
WHAT PROPORTION OF TRANSIT SERVICE EMPLOYEES ARE STUDENTS OR DIRECT EMPLOYEES OF THE SCHOOL?

	Proportion of Transit Employees That Are Students/Direct Employees					
	Zero	1%–25%	26%–50%	51%–75%	76%–99%	100%
Number of Systems	27	11	3	2	5	12

$n = 60$.

CyRide is often the first structured job that a student has held. A few want the freedom to take off when they feel like it and find that they no longer have a job when they return. Two or three quit each semester when they get their grades after the first midterm.

However, despite the headaches that turnover creates, the overall quality of student drivers "is worth it," according to Sheri Kyras, Director of Transit. She came to CyRide from a more urban transit system and notes that students bring new ideas and excitement to the workplace: "They are more educated than the typical urban driver and have better customer service skills." And the system is well thought of by the public, she says, as a professionally run organization (S. Kyras, Director of Transit, CyRide, Ames, Iowa, personal communication, Mar. 21, 2008).

MARKETING TO NEW RIDERS

It is often not enough to simply provide transit services to a campus. To make members of the school community aware of services provided, the transit operator must advertise its existence and use. In college and university communities, operators face the particular challenge of *certain* turnover of incoming and outgoing students every year—often coming from completely different communities and different levels of transit riding experience—in addition to any turnover in faculty and staff. The survey asked a question about how transit systems advertise their services to potential riders. Respondents reported utilizing a variety of tools; results are indicated in Figure 7. Advertising occurs during freshman orientation or pre-matriculation events on 92% of campuses and more than four-fifths utilize brochures and the school's website. Transportation management associations (TMAs) are multi-institution task forces that coordinate and administer transportation demand management (TDM) programs for an area. One of their services frequently provides consolidated advertising campaigns for constituent members, which usually include transit service providers. However, TMAs were reported to be the least common transit advertising technique. Bus wraps (exterior bus advertising) are also infrequently used.

University transit providers reported that they take advantage of opportunities to advertise the transit service online to potential customers. For example, 83% of those organizations that reported posting transit system maps or schedules on a school or transit agency website (in response to the question described by Figure 7) also indicated they incorporate online advertising in an attempt to market the service. In other words, only 17% of systems are posting customer information online, but not directly advertising the transit service online.

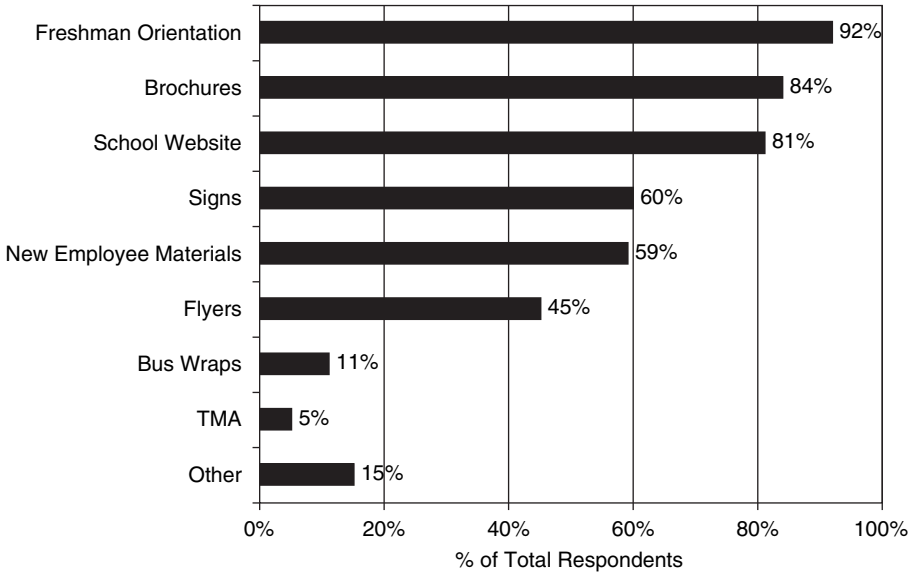

FIGURE 7 How is the transit service advertised to potential riders ($n = 60$)?

SEASONALITY OF SERVICE

The seasonality of the school year can present major problems for attracting, training, and retaining staff to work for school-oriented transit agencies. Summer is generally a slow period during which the campus is less populated and therefore service requirements are lower. This can have impacts on operator staffing and training, vehicle inventories, service consistencies, and other areas of operations. The survey asked how the seasonality of the school year is handled by the transit service. Almost everyone who responded to the question (almost 50) indicated (directly or implied) that the seasonality does result in some action, generally in seasonal service cuts. Many respondents, however, did not read the question as asking about how staff fluctuations are handled (and full-time workers' needs accommodated); many simply stated that service is cut, so it is possible in many cases that workers are simply laid off or given no work for the summer. Others stated explicitly that this is the case.

A number of respondents offered information about balancing employees' needs with operating efficiency. Several respondents stated that their use of student drivers solves the problem; student employees "naturally" follow the school schedule. Several others replied that use of contract workers addresses the issue, although this may be more from the perspective of transit systems' hiring and cost needs rather than addressing the desire of employees to work full-time year-round. Some also indicated that giving summer vacation time is a strategy that can be used to offset the problem.

HANDLING SPECIAL EVENTS

Special events such as sports, games, and other large attractions can pose a challenge for transit services. On-campus parking may not be able to accommodate the demand, and the heavy congestion generated by cars circling to find spaces and get around the campus can be unattractive and frustrating to campus residents and the surrounding community alike. Almost all respondents answering a question about how special events are handled responded that they have methods to deal with the extra strain by adding more service to existing lines or using an in-house or contracted charter service to provide relief. A few indicated that they do not handle special events at all, although some may have understood the question to be asking about whether buses or vans may be hired case-by-case for smaller university events (such as field trips) rather than about how the transit service handles the large amount of traffic generated by big special events (such as sports events, concerts, graduation, etc.). Note also that this study was conducted prior to new FTA charter regulations going into effect in spring 2008, which may have impacts on transportation services provided at and around campuses. Additional study to investigate the impacts of these regulations is suggested.

Only one respondent, the University of Washington, indicated that it has an extensive action plan for handling sellout (72,000-person capacity) special events at Husky Stadium. The school is held responsible for reducing the number of driving trips. Its program involves other elements of the school's TDM program, as well as special game-time carpool parking pricing incentives, free use of King County Metro by showing the bus driver a game ticket, plus five special additional bus routes operated for games only, free park-and ride service with courtesy shuttles, and other measures that encourage more efficient means of travel to and from games. The effort also involves an extensive survey mandated by the city of Seattle of game attendees to determine mode share and other travel characteristics. Their report indicates that the strategies used are highly successful at encouraging high transit and walking mode share, and in particular the carpool pricing incentives result in a higher proportion of non-SOV parking during games (University of Washington Transportation Office 2006).

As noted in the earlier profile of Chapel Hill Transit, shuttles are provided from park-and-ride lots to University of North Carolina football and basketball games. The shuttles are financed by a portion of the ticket sales for the games, amounting to $400,000 per year in revenues.

CHAPTER FOUR

CAMPUS POLICIES AND PLANNING

FINANCING—TRADITIONAL AND CREATIVE TOOLS

One of the important inquiries of this synthesis study was to discover the means through which transit systems support themselves financially. The survey asked specifically what sources of funding are used by the transit system for operating and capital costs, and the results indicated that a variety of traditional and innovative tools are used to fund both school and non-school systems. This information may be useful to systems comparing their source of funding to that of others. The tables indicate only those cases in which a respondent entered that they *do* use at least a small amount of each source of funding (indicated by entering the dollar amount, the percentage that the amount used represents in their total budget, or an "X" to indicate that they use this type of funding but do not know a specific amount) or do *not* use the source of funding. The totals on each row will not add up to the total number (the "*n*") for the question because those who left some rows of the question blank were not counted as having answered that they do not use the source.

Tables 15 and 16 summarize sources of funding for operational costs by school and non-school operators. (Capital funding sources are described later in Tables 17 and 18.) Respondents indicated that a broad variety of sources are used to fund operating costs. For schools, student fees, school general funds, parking fees, and advertising revenues are some of the more frequently used non-government sources. Four school respondents indicated that 100% of their funding for operations came from a single source; most respondents used more than one source. Schools using a singular-source type funding were Indiana University in Bloomington, Indiana, from student fees; Loyola College in Baltimore, Maryland, from the school general fund; the University of Arizona in Tucson, from parking fees; and the University of Delaware in Newark, from an "other" source. All four of these schools reported that 100% of their capital dollars also come from these respective sources (although a wider array of schools also indicated singular-source types of capital funds).

For non-schools, government sources are very frequently used, as are fares and advertising sources. Fares are explicitly reported as a source of funding much more frequently for schools than for non-schools, as is advertising. Private subsidies are very infrequently used by both schools and non-schools for operating funds. Student fees are also reported as a source of funding for non-school operators, indicating that, in these cases, there is a connection between the school and public operators, local governments, or the partnership arrangement that allows a special fee for students to be passed on to the operator.

Capital funding mechanisms differ for schools and non-schools. Although the array of sources is broad for both groups, the schools reporting a specific amount on this question tended to get all of their capital from one source—most typically a non-government source. Non-schools, on the other hand, more frequently reported explicitly that their capital funding comes from multiple sources, and, consistent with the fact that this sample group includes partnership arrangements between schools and other entities, a handful of these indicated that school funding sources are used. Just one non-school operator indicated that 100% of its capital funding comes from parking fees; this was the University of Minnesota in Minneapolis, Minnesota (which listed itself as a public transit operator). Tables 17 and 18 indicate how schools and non-schools indicated that they fund capital expenses.

An item of interest from the survey was the degree to which transit providers are working toward partnerships allowing expanded access to existing and new funding sources. Nearly 60% of respondents (36 of 61) have made, or will make, efforts to partner with other local agencies to boost transit services or to gain access to funds through the Small Transit Intensive Cities Program or other similar programs. The Small Transit Intensive Cities Program is a grant program under federal SAFETEA-LU legislation that offers performance-based awards to cities with populations between 50,000 and 200,000 persons that perform well on six transit performance criteria. A number of small cities with a strong higher education institution presence are eligible for additional funding under this program. It is likely that partnership alliances put operators in a strong position for such grants and awards, and it is clear from the strong response on this question that there are perceived benefits (in terms of awards or otherwise) to be derived from working collaboratively. Schools and governments and/or transit agencies are equally likely to develop innovative funding partnerships.

Profile: City, University Form Funding Partnership in Ames, Iowa

Ames Transit Agency in Ames, Iowa, is a partnership between the city of Ames, Iowa State University, and the university's student government. CyRide, as it is known, is supported by funds from

TABLE 15
WHAT ARE THE SOURCES OF TRANSIT SYSTEM OPERATING FUNDS FOR SCHOOLS?

	Schools Reporting Use of This Source	Schools Reporting No Use of This Source
Federal	5	18
State	5	18
Public Transit Operator	0	23
Local Government	3	20
School General Fund	12	13
Student Fees	15	10
Parking Fees	8	16
Fares	4	19
Advertising	9	14
Private Subsidy	2	21
Other	12	12

n = 60.

all three entities under an agreement that is negotiated annually. Officially, the transit system is a unit of the city of Ames. The partnership was coordinated by the local League of Women Voters in the late 1970s. The joint system began operations in 1981 as a door-to-door service with 80,000 riders annually. CyRide is now a fixed route system with 4.5 million riders per year.

All university affiliates receive free or half-cost fares. In the 2007 to 2008 school year, in exchange for free fares, full-time students paid $54.50 per semester. Free fares, which were instituted in 2003, created a 57% increase in ridership. However, the fees collected by CyRide from the student government have since dropped by 20% due to a decision to pro-rate the fee for part-time students and to a drop in enrollment. Faculty and staff can buy a semester pass for $65, which is half of the full-fare cost.

The funding negotiations are performed by a Transit Board of Trustees, comprised of two student government representatives, an Ames City Councilmember, the Ames City Manager, an Iowa State University representative, and a mayoral appointee. According to Sheri Kyras, Director of Transit, the negotiations are "fluid and flexible." When enrollment dropped, the student government couldn't contribute its share and the others picked up the cost. When the city experienced a property tax freeze, the city put in less and the other partners put in more. CyRide also receives federal and state funds, along with fares and miscellaneous funding (S. Kyras, Director of Transit, CyRide, Ames, Iowa, personal communication, Mar. 21, 2008).

TABLE 16
WHAT ARE THE SOURCES OF TRANSIT SYSTEM OPERATING FUNDS FOR NON-SCHOOLS?

	Non-schools Reporting Use of This Source	Non-schools Reporting No Use of This Source
Federal	29	4
State	26	7
Public Transit Operator	6	27
Local Government	24	9
School General Fund	8	25
Student Fees	18	15
Parking Fees	11	22
Fares	22	11
Advertising	20	13
Private Subsidy	2	30
Other	17	15

n = 60.

TABLE 17
WHAT ARE THE SOURCES OF TRANSIT SYSTEM CAPITAL FUNDS FOR SCHOOLS?

	Schools Reporting Use of This Source	Schools Reporting No Use of This Source
Federal	2	10
State	2	10
Public Transit Operator	2	10
Local Government	2	9
School General Fund	7	7
Student Fees	3	8
Parking Fees	1	10
Fares	1	10
Advertising	1	10
Private subsidy	5	6
Other	11	2

n = 53.

FARES

The survey asked what the "base" per-ride transit fare is, exclusive of passes or discounts, on local bus service and on-campus circulator service. Seventy-two respondents provided

TABLE 18
WHAT ARE THE SOURCES OF TRANSIT SYSTEM CAPITAL FUNDS FOR NON-SCHOOLS?

	Non-schools Reporting Use of This Source	Non-schools Reporting No Use of This Source
Federal	23	8
State	6	19
Public Transit Operator	21	8
Local Government	6	20
School General Fund	8	17
Student Fees	6	19
Parking Fees	2	22
Fares	3	21
Advertising	2	21
Private subsidy	4	20
Other	19	1

n = 60.

TABLE 19
WHAT IS THE BASE PER-RIDE TRANSIT FARE FOR THE GENERAL PUBLIC (exclusive of passes or discounts)?

	Base Per-Ride Fare for General Public				
	Free	<$1.00	$1.00–$1.50	$1.50–$2.00	>$2.00
Local Bus Service	7	9	42	5	2
On-Campus Circulator Service	39	3	6	0	0

n = 71.

information about general public fares on local buses (see Table 19). Seven systems offer free local bus service, and a majority (39 respondents) offer on-campus circulator service free of charge to the general public. Among those services that are not free a majority (42 respondents) charge between $1.00 to $1.50. Of the nine services that charge the general public to use campus-circulator service, two-thirds charge between $1.00 to $1.50 and the others less than $1.00.

Seventy-one respondents provided information regarding base fare per ride for students on local buses and on-campus shuttles. Nearly 40% of respondents (29 systems) indicated that students are allowed to ride local buses free of charge (see Table 20). Among those systems that charge students, fares ranged from $0.25 at the University of Texas at Austin (by Capital Metro) to $2.75 at the University of Minnesota. On a majority of local bus services, however, student fares are similar to the general public fares, between $1.00 and $1.50.

Most campuses provide on-campus transit service free of charge to students. Only five campuses charge a student fare for on-campus shuttles, ranging from $0.25 at the University of Austin to $1.50 at Cabrillo College in Santa Cruz, California.

UNLIMITED ACCESS PASSES

U-Passes are a form of transit access agreement between a university and a transit provider. Typically, a school will pay for members of the school community (students and/or faculty and staff) to have free or discounted access to transit services provided by a local transit provider. (Note that this differs from free transit offered directly by a school; generally, U-Pass is a collaborative arrangement wherein transit service offered by *another* provider is subsidized.) Thirty-five respondents (51%) indicated a formalized U-Pass program is available to faculty, staff, and students. Whether formalized or not, a diversity of transit subsidy programs exist on campuses. Some universities provide monthly, semester, or annual transit subsidies to faculty, staff, and students. In other cases, campus riders pay a fee directly to the local transit provider for free service, and several universities simply offer free transit to all riders.

The survey asked a question about whether any transit subsidies are provided by the school, and if so, requested the details of these programs (average percentage of subsidy, maximum allowable subsidy and over what period, and percentage of each group receiving the subsidy for faculty, staff, and students). Respondents reported in very different ways, with many adding clarifying comments, suggesting that information about U-Pass programs is recorded differently by different providers (or that there are additional details that respondents felt it was necessary to supply to understand the U-Pass program as a whole).

Subsidies differ across schools; some examples of programs are included in the following discussion. The maximum allowable subsidy for faculty, staff, and graduate students at the University of California at Davis is $18 per month, a subsidy received by about 2% of faculty and 25% of staff; all undergraduate students have unlimited access after paying a student fee. On average, the transit subsidies provided by the University of Washington, Seattle, cover 41% of transit costs for members of the school community, and 68% of faculty, 70% of staff, and 85% of students at University of Washington have U-Passes. The fee to students for this U-Pass product is $44 per quarter. At Cornell University in Ithaca, New York, the local transit service provider, Tompkins Consolidated Area Transit, receives $1/passenger as a volume discounted fare for serving the campus, and the university contributes a portion of a partner share. Faculty and staff at the University of Texas at Austin may choose to pay a nominal fee to Capital Metro for unlimited transit rides, while a mandatory student fee enables all students to ride free. At the University of

TABLE 20
WHAT IS THE BASE PER-RIDE TRANSIT FARE FOR STUDENTS (exclusive of passes or discounts)?

	Base Per-Ride Fare for Students				
	Free	<$1.00	$1.00–$1.50	$1.50–$2.00	>$2.00
Local Bus Service	29	5	26	5	1
On-Campus Circulator Service	52	2	3	0	0

n = 70.

Wisconsin, Madison, all faculty, staff, and students receive subsidies covering 100% of their transit costs.

A second question on the survey asked how the subsidy provided by the school is paid for. As respondents indicated, transit subsidies tend to be funded through parking or student user fees, and not general funds (see Table 21). One-quarter of respondents rely on parking charges, and one-fifth on student fees. Because governments and transit agencies are eligible for federal transportation funding and universities typically are not, it is not surprising that schools are more likely to rely on parking and student fees to fund their transit subsidies. Three university respondents also indicated relying on other funding sources, including grants, parking citation revenue, and other institutional resources.

The following profile of University of Massachusetts Transit in Amherst, Massachusetts, offers an example of how an unlimited access transit pass program operates.

Profile: Unlimited Access Transit at UMass Transit, Amherst, Massachusetts

The main campus of University of Massachusetts (UMass) in Amherst has been fare-free since it began as a student-run organization in 1969. By 1976, it partnered with the Pioneer Valley Transit Authority (PVTA) to receive federal operating subsidies and access improved equipment. UMass insisted on keeping its system fare-free (PVTA charges $1 per ride in the rest of its system). Over the years, UMass transit's operations expanded in partnership with other local colleges. It now serves Amherst College, Mount Holyoke College, Hampshire College, and Smith College, providing service in eight communities on 14 routes with 40 buses of 40- and 60-passenger capacities. Although members of the general public are required to pay a fare, farebox revenues in the system are very low. Today, about 25% of the $4 million annual budget is covered by student fees, 12% comes from parking permit revenues, and most of the remainder is paid by the state (the federal government no longer provides operating subsidies).

UMass' system has been highly successful, even though the system has had limited capital resources and has installed very few bus shelters, transit maps, or benches anywhere in its system. Operating on frequencies as high as 60 min, the system has nonetheless seen a 40% student and 60% university staff commute mode share. Limited parking availability in campus lots is cited as a large reason for transit utilization. With approximately 35,000 members of the UMass community, there are only 11,000 parking spaces. As a rural campus, vehicular access is an important component for students and especially for faculty; however, UMass has successfully increased remote parking rates from $10 per year to $120 over the past few years, largely to cover increased transit fuel costs.

UMass Transit continues to see 5% annual ridership increases and expects to seek federal funds from alternate sources to continue providing its current service levels. Non-union student employment is the biggest reason the system is able to operate without substantially greater subsidies. However, the system continues to try to improve its system's cost effectiveness and plans to implement an automated vehicle locator service in the coming years to improve customer service and ridership (A. Byam, General Manager of UMass Transit, personal communication, April 14, 2008).

TABLE 21
IF A TRANSIT SUBSIDY IS PROVIDED BY THE SCHOOL, HOW IS IT PAID FOR?

	% of Total Respondents
Fee to Students	20
Parking Charges	25
General Fund	12
Subsidy from Partner Agency	2
Other	5

n = 85.

PARKING POLICY RELATIONSHIPS TO TRANSIT

Access and mobility to and around the school campus is affected by the complete set of transportation options available to commuters. Amply available parking on a campus may act as an incentive to drive; on the other hand, if there are negative aspects such as having to park in a remote park-and-ride lot or a costly fee to park, driving may be discouraged. Commuters will therefore make choices about getting around campus after considering the "costs" involved with various modes, including the costs in time, money, and convenience or inconvenience. For schools, choices about how to provide parking are influenced by a number of motives (including, but not limited to, the cost to construct and maintain parking, pressures to offer parking as a benefit to compete for faculty, TDM goals, environmental motives, and so on). Park-and-ride lots are one parking provision option that campuses frequently use.

Sixty percent of campuses reported having remote park-and-ride lots; nearly half of the campuses have limited parking in the center of campus, but have availability on the periphery or in park-and-ride lots. Eighty-seven percent of campuses with park-and-ride lots charge a fee to park on campus. Only 5% of these systems indicated the on-campus parking fee was designed to encourage park-and-ride lots. Charging for parking on campus and providing park-and-ride lots, although not necessarily intentional, can have the effect of encouraging commuters to park in the peripheral lots and transfer to a different mode to access campus.

Eighteen percent of respondents believe the parking supply is insufficient to meet demand, and this opinion is more prevalent among government and transit agencies than schools (25% to 13%). Parking is available but not convenient on 34% of campuses. Nearly one-third of respondents indicated the campus provides access to parking for faculty or staff, but limits student parking.

As shown in Table 22, just over half of campuses limit parking permits in some way. Twenty-two percent utilize waiting lists or lotteries to limit parking permits to the capacity of campus, while 19% offer parking permits only to certain

TABLE 22
IF YOU USE A PARKING PERMIT SYSTEM, IS THE NUMBER OF PARKING PERMITS LIMITED?

	% of School Respondents	% of Government or Transit Agency Respondents
No, we do not limit permits or we do not have a permit system at all	33	31
Yes, we utilize waiting lists/lotteries to limit parking to the capacity of campus	28	16
Yes, we do not offer permits to some groups or classes (e.g., freshmen)	22	16
Yes, other	15	9

n = 85.

drivers or student class levels. Ninety-five percent of campuses charge a fee for parking; however, the majority of universities and government/transit agencies agree that their parking fees do not deter people from driving.

The following profile of Stanford University in Palo Alto, California, highlights this school's innovative transit-supportive programs and shuttle system that contribute to a transportation "system approach" on the campus.

Profile: Investing in Transit, Not Parking, Stanford University, Palo Alto, California

In the late 1980s, Stanford University set out to expand the campus by 25%—or over 2 million sq ft of new development. Stanford's host community, Palo Alto, was very concerned about the potential traffic impacts and was prepared to delay build-out through a detailed Environmental Impact Report process for each new building. So in 1989, Stanford agreed to abide by a General Use Permit for the campus that allowed 2.4 million additional sq ft on the condition that no new automobile commute trips would be produced. Stanford began a detailed annual monitoring program.

To meet this goal, Stanford undertook a unique and simple calculation. To displace surface parking for new buildings and build replacement parking structures, the university realized that each new garage space added costs of over $150 per month, every single month for the 40-year useful lifetime of each parking structure. With land valued at $1 million per acre, building new surface lots wasn't much cheaper and had greater environmental impacts. Instead, Stanford followed four main strategies to avoid replacing the parking supply: adding transit, adding housing, adding bicycles, and most importantly, just paying people not to drive—a "parking cash-out."

Stanford expanded its Marguerite shuttle from a small commute-hour shuttle to a free, all-day transit system, running every 12 to 15 min with over 100 timed transfers to commuter rail trains every day. Its budget increased 70% to almost $1 million per year. However, Stanford realized that the subsidy of $2 per commuter per day on the shuttle was far less than the average cost of $7 per commuter per day to build and operate parking garages.

Marguerite shuttle ridership quintupled in 10 years from 700 per day to 3,500 per day. Stanford's savings on parking construction enabled the university to build other transit amenities including a new transit mall, which runs for 1-1/2 mi through the heart of the campus. Over 5 mi of campus streets were closed to cars (J. Tumlin, Stanford University Office of Transportation Programs, personal communication, Jan. 11, 2008).

PARKING PRICING

Parking pricing is a critical issue for campuses and campus communities alike. A balance between price and supply will result in a more efficient use of available facilities, since commuters with good alternatives available will switch if the price to park becomes sufficiently high. The cost to park, therefore, has a strong influence on the overall transportation network. Moreover, pricing parking to reflect the real cost to build and maintain parking means that drivers more closely pay for what they use.

Table 23 is a general summary of the parking pricing on campus reported by various respondents. These figures are provided as a general review of prices, but are offered with a caveat: because respondents reported figures in very different ways, some averaging was necessary. For example, a number of respondents gave several figures associated with various parking lots. In this case, prices were averaged, which affects the accuracy of the tabulations. "Unknown" represents those responses for which a respondent entered an "X" to indicate that that type of parking pricing schedule was available, but no specific price was actually given.

In general these prices appear to be fairly low in comparison to the relative cost to build and maintain parking lots and parking structures (see the Literature Review for a discussion). For example, in some areas these prices will be comparable to the price to use transit, depending on the travel behaviors of the commuter. The rising price of gasoline, however, may result in an external price disincentive to drive. Two interesting pricing schemes were also presented that are not included in Table 23. One school, Florida State University in Tallahassee, prices parking based on the total number of hours

TABLE 23
WHAT IS THE AVERAGE FEE FOR PARKING ON THE MAIN CAMPUS (i.e., not park-and-ride) FOR STUDENTS, FACULTY, AND STAFF?

	Average Main Campus Hourly Parking Fee					
	<$1	$1	$1–$2	$2–$3	>$3	Unknown
Students—Hourly	5	8	15	2	4	1
Faculty/Staff—Hourly	5	9	14	2	4	1

	Average Main Campus Daily Parking Fee					
	<$4	$4–$6	$6–$8	$8–$10	>$10	Unknown
Students—Daily	4	8	8	4	4	0
Faculty/Staff—Daily	4	8	7	5	5	1

	Average Main Campus Monthly Parking Fee					
	<$21	$20–$40	$41–$60	$61–80	>$80	Unknown
Students—Monthly	4	3	2	5	2	0
Faculty/Staff—Monthly	5	3	3	3	4	1

	Average Main Campus Quarterly Parking Fee					
	<$100	$101–$150	$151–$200	$201–$250	>$250	Unknown
Students—Quarterly	3	1	2	2	1	0
Faculty/Staff—Quarterly	2	2	2	2	1	1

	Average Main Campus Semester Parking Fee					
	<$25	$25–$50	$51–$150	$151–250	>$250	Unknown
Students—Per Semester	3	6	3	2	2	0
Faculty/Staff—Per Semester	1	0	2	2	0	1

	Average Main Campus Annual Parking Fee					
	<$100	$101–$250	$251–$500	$501–$750	>$750	Unknown
Students—Annually	10	21	10	6	4	0
Faculty/Staff—Annually	9	17	11	7	5	2

$n = 61$.

a student is enrolled—the cost is $6.50 per credit hour per semester. Rutgers University in New Brunswick, New Jersey, bases the annual cost to park on a percentage of an employee's salary. It also prices student passes slightly differently based on each student's commuter status, charging $160 to residents and $171.20 to commuters.

TRANSPORTATION DEMAND MANAGEMENT PROGRAMS

A range of formalized TDM programs or services is available to faculty, staff, and students on campuses. The most popular programs are carpooling-related programs; these programs all aim to add incentives to increase the number of riders per car (although specific requirements differ by school or locality). Guaranteed Ride Home, for example, acts as insurance for riders and drivers in a carpool group who face unexpected circumstances such as unscheduled overtime requests or unexpected personal or family sickness, thereby alleviating the worry that such events will leave a worker without a ride home with the carpool. More than half of schools offer ride matching, guaranteed ride home programs, free transit passes through a U-Pass program, and preferential carpool and vanpool parking (see Table 24). Twenty-four percent allow

TABLE 24
WHICH OF THE FOLLOWING PROGRAMS/SERVICES ARE FORMALIZED AND AVAILABLE TO FACULTY, STAFF, AND/OR STUDENTS OF THE SCHOOL?

Program/Service	% of Total Respondents
Ridematching	60
Preferential Carpool/Vanpool Parking	49
Subsidized Vanpools	31
Guaranteed Ride Home Program	56
Flex Hours Program for Employees	34
Bike Lockers/Staffed Bike Desk	19
Telecommute Program for Faculty	24
Universal (Free) Transit Passes (U-Pass)	51
Parking Cash-Out	1

$n = 68$.

faculty to telecommute and only one respondent offers a parking cash-out program, whereby students and/or faculty and staff receive payment to forego their right or permit to park on campus.

Forty-four respondents provided information about their (or their corresponding school's) budget for TDM programs including ridematching, transit subsidies, parking cash-out, pedestrian, and bicycle programs. The total *reported* budgets ranged from $0 to $14 million; however, it is possible that some respondents may have reported a figure for overall transportation services including TDM. Fifty-seven percent of respondents had a TDM budget of less than $100,000; 23% had a budget between $100,000 and $1 million; and only 21% had a budget greater than $1 million. However, since these figures are very high, these respondents may have been reporting on a combined transportation improvements budget.

The existence of (and participation in) a local TMA can indicate a strong commitment locally to reducing the share of SOV trips. Schools often play a strong role in these organizations, especially because they are often a large anchor institution within the community and frequently the largest employer. Only one-third of respondents are members of a TMA or other rider outreach and advocacy organization, with only a slightly higher percentage of schools than government/transit agencies indicating they are TMA members.

Pressure is high and mounting on schools and on school communities to handle the high volume of movement that campus activities generate. While schools frequently aim to improve mobility for members of the school community in and around the campus area, the amount of traffic generated by faculty, staff, students, and campus visitors to and from the campus is a key concern because it necessarily affects both the campus and the surrounding community. The split among commute modes of transit, car/vanpool, SOVs, bicycling, and walking varied widely across different universities.

To illustrate the differences that are possible among campuses, the travel mode share for faculty, staff, and students (combined) reported by four example schools is presented in Table 25. It is extremely difficult to draw comparisons of mode share across schools because of the drastically different characteristics of each location. These cases are presented to show that a very wide range of mode splits is possible on college and university campuses. Some of the factors that may influence mode share at a school include the availability of on- and near-campus residences; the incentives used to encourage walking, bicycling, transit use; or disincentives used to discourage driving; and the urban or rural character of the school's location, among others. Although it is possible to speculate on the effects of these factors on mode split, the influence of these factors is not entirely clear. Some rural campuses may have an advantage when it comes to walking and bicycling mode shift opportunities owing to the availability of on- and near-campus residences.

The University of Washington, Seattle, has one of the highest transit mode shares, and also indicates a nearly even split between SOV and walking. As noted in a case study in the following section, it also invests heavily in programs that aim to reduce the mode share of SOVs. University of California–Davis and University of Texas at Austin, two suburban/small urban campuses, have similar transit mode share, but Davis has 16% bicycling mode share, one of the highest reported, while the majority of Austin's commuters drive SOVs. Sixty percent of commuters to the semi-rural campus of Montana

TABLE 25
COMMUTING MODE SHARE AT EXAMPLE SCHOOLS

School	Community Character	% Transit	% Car/ Vanpool	% Single Occupant Vehicle	% Bicycle	% Walking	% Other
University of Washington, Seattle	Urban	39	3	25	7	21	5
UC Davis	Suburban/ Small Urban	15	8	36	16	5	20
University of Texas, Austin	Suburban/ Small Urban	15	0	75	0	2	8
Montana State University	Semi-Rural	1	1	60	5	30	3

State University drive alone, but 30% walk and another 5% bicycle.

BICYCLE ACCOMMODATIONS

Bicycle infrastructure planning, and policies that encourage cycling mode share are an important element of a campus TDM program. Bicycle racks at transit stops and on the front of buses facilitate transfers between bicycle and transit, possibly encouraging a mode shift from automobiles to other modes. Likewise, bike lockers for faculty, staff, and students provide commuters with a secure place to leave their bicycle during the day, simplifying a bicycle commute.

The amount of investment in bicycle infrastructure on campus can indicate the level of support for alternative mode travel around the school. Sixty percent of all respondents have bike racks on at least half of their transit vehicles, but only 20% have bike racks positioned at more than half of their transit stops. In general, government/transit agencies provide bike racks at more of their transit stops than do universities. Perhaps this reflects that campuses often provide bicycle racks in front of dorms and other buildings and so do not see the need to offer bicycle parking adjacent to transit stops. Bicycle lockers are formally available at 19% of campuses. Safety of bicyclists and pedestrians is also a concern in mixed traffic; the majority of systems (84% of respondents) provide transit drivers with special bicycle or pedestrian safety training. The following case study is based on a telephone interview with a representative of the University of Washington, who described the university's forthcoming electric bicycle program. This case study illustrates an innovative practice in bicycle services on campus.

Profile: University of Washington Brings e-Bikes to Campus, Seattle

The University of Washington's (UW) U-PASS program encompasses a broad suite of TDM programs, of which the unlimited transit pass is just one component. Although the school has made significant strides in reducing SOV commute mode share to campus, for some drivers, having a car on campus means having the mobility at midday to complete errands, attend meetings, or go out for lunch. To address this critical barrier to achieving further reduced vehicle trips, UW has recently announced that a self-service electric bicycle rental program for its Seattle campus will be launched in autumn of 2008.

The program, funded primarily by a performance-based grant from the Washington State Department of Transportation (WSDOT), will bring 40 electric bikes to campus at 10 station locations. These "pedal-assist" cycles supplement the rider's own pedaling with electric assistance, a particularly useful feature on Seattle's hilly terrain. Bicycles are unlocked from the station using a personal key fob called a GoKey™ (in combination with a typed personal security code) and can be returned to the same station from which they were rented or to another station location. Each station has five extra slots to accommodate an excess of bikes in one place. The per-hour fee is yet to be determined, but is likely to be in the range of about $5/h, with a $1/h discount for U-PASS holders; partial-hour fees will also be available.

The system is operated in partnership with Intrago Mobility Corporation, the vendor who will provide the bicycles and station facilities. UW and Intrago Mobility partnered to write the grant application and were awarded up to $225,000 to establish the system, a figure that will be supplemented with in-kind operations and administration contributions from the university. Fifty percent of the funding ($112,500) is available immediately for infrastructure investments, while the remaining 50% is paid based on the number of commute trips reduced. WSDOT defines a commute trip reduction as one round-trip commute no longer made by an SOV, 5 days per week, for a period of 1 year, and values a commute trip reduction at $375. The total goal for the project is the reduction of 534 SOV commute trips (as defined by WSDOT). With the first 50% of the funding used for infrastructure costs, WSDOT will begin paying from the remainder of the award when the number of commute trips reduced exceeds 267. WSDOT bases the goals for this grant program, called the Trip Reduction Performance Program, on a 1-year timeline; UW, however, must complete it by the end of the fiscal year, June 30, 2009. The actual commute trip reduction targets are therefore adjusted to account for the shorter performance period.

The program is available for all university faculty, staff, and students, who must register directly with Intrago Mobility; eligibility verification is provided by UW, but the relationship is between the client and the vendor. To start service, riders watch a training video and pick up a member packet that includes the key fob.

When it launches, the pilot program will be the first self-rental electric bicycle system in the world. Some operational aspects are still in the planning phases:

- Since the system permits one-way rentals, periodic rebalancing of the bikes to keep even numbers at each station is necessary; initially, this will take place daily at the end of the day. Additional rebalancing will be done as needed. Intrago subcontracts to a local scooter rental company, Scoot About, for routine vehicle maintenance as well as the rebalancing.
- Riders must supply their own helmets in accordance with Seattle safety law. UW had initially considered providing helmets as a part of the rental, but found that concerns over sanitation and the possibility of imperceptible damage to the helmets that could compromise safety were significant barriers.
- Users will not be able to make a reservation to rent the bikes; this first-come first-serve policy may be modified at a later date.

To address safety concerns, the bikes, which can travel at up to 20 mph, will be permitted for use only on multi-use paths but not on sidewalks. (In Seattle, regular bicycles are permitted on sidewalks.) (Celeste Gilman, Transportation Systems Manager, University of Washington, personal communication, April 1, 2008.)

RELATIONSHIP OF CAMPUS LAND USE POLICIES TO TRANSIT

There generally seems to be a lack of integrated, multidisciplinary planning that takes into account how transit relates to the physical and economic development of the broader community. For example, only half of campuses have policies requiring that transit be considered when planning for new campus buildings, with this more common among government/transit respondents than universities. When asked whether transit is considered by policy in the planning for

changes to the campus, 68% of government/transit agencies responded affirmatively, although only 46% of schools responded affirmatively.

Many of the respondents that consider transit when planning new buildings indicated that transportation representatives participate in campus planning meetings or site reviews. For some, city policies, campus master plans, or, in the case of the University of California at Santa Cruz, the state's environmental laws (California Environmental Quality Act) require that campus planning address the transportation impact of new developments. According to the Centre Area Transportation Authority of State College, Pennsylvania, Penn State "routinely considers transit service in the planning for new buildings on campus. The university also has a Master Plan Transportation Committee that includes transportation staff from various elements of both town and gown."

The technical details of synergistic planning for campus expansion and transit are considered by a number of respondents. Two respondents explicitly mentioned that they take into consideration the increased parking demand of the new campus buildings, and evaluate whether additional parking garages must be constructed or whether increasing transit access will yield a better result. Several respondents consider how to serve new buildings with transit, by either expanded transit routes or adding bus stops. At Florida Gulf Coast University "additional University Shuttle services are planned as new student housing opens," and at the University of Wisconsin–Madison, planning for new buildings includes an assessment for the capital costs needed to install passenger amenities at adjacent bus stop locations.

COMMUNITY INTEGRATION

As noted previously, the campus planning process does not consistently take transportation issues into consideration. On the other hand, campuses do attempt to include a variety of stakeholder parties in the process of planning for the transit systems themselves. The transit provider and school are the primary participants, although riders and local government representatives are included less than half of the time. Not surprisingly, significantly more government/transit agencies reported including local government representatives in the planning process (see Table 26).

COMMUNITY RELATIONS

Transit is an element of campus and community operations that may offer opportunities to bridge town and gown boundaries. For example, some of the creative community partnerships that have arisen out of the need to provide mobility around the campus area could be viewed as ways to enhance relations between the school and the community in a joint process. In order to gauge the level of satisfaction with community assets, the survey asked a question about the perceived levels of satisfaction among various parties. There are several notable differences in university and government/transit agency perceptions of the community's satisfaction with the transit service, as indicated in Table 27. Fewer universities than government/transit agencies think the community is satisfied with the available transit service. Potentially, this could reveal that the two groups are attuned to different community issues. Or, this could be related to the nature of the systems themselves. Those offered by governments and public transit operators tend to be more focused on service to the wider community, while campus transit systems are strongly oriented toward providing service primarily to campus affiliates.

TABLE 26
WHO PARTICIPATES IN THE CAMPUS TRANSIT PLANNING PROCESS?

Participant	% of Total Respondents
Transit Provider	84
School (If Not Also the Transit Provider)	75
Riders	45
Local Government	33
Other(s):	13

n = 79.

The government/transit agencies overestimate the schools' satisfaction with their financial contribution to the transit system. Only 18% of schools responding indicated they are satisfied with the public transit operator's financial contribution, and 45% of government/transit agencies believe the schools are satisfied. Similarly, more government/transit agency respondents believe the surrounding community is satisfied with the school's financial contributions to the transit service than do school respondents.

The following example profiles MASCO (Medical Academic and Scientific Community Organization, Inc.), a private transit provider serving multiple campuses including an institutional medical area in Boston, as well as Harvard University.

Profile: Meeting Community Needs Through Private Transit, MASCO, Boston, Massachusetts

The Longwood Medical Area (LMA) of Boston has long been a dense community of private medical and academic institutions, but it is situated about 3 mi from downtown Boston and the hub of most regional transit services. Access has long been an issue. In 1972, five major LMA hospitals and the Harvard University Medical School jointly asked MASCO to provide joint support and planning services—chief among them was bus service to remote park-and-ride lots for employees and faculty. Harvard also sought to connect its Medical School to the main Harvard campus across the Charles River in Cambridge, and MASCO began running the first "LMA Shuttle." This route, the M2, was an instant success as it provided a critical cross-town express connection that was not available through the regional transit provider, the Massachusetts Bay Transit Authority (the "T"). Over the years, the M2 has evolved into a commuter shuttle for university staff, faculty, and students that is also open to the

TABLE 27
PLEASE RATE THE FOLLOWING STATEMENTS REGARDING VARIOUS PARTIES' SATISFACTION WITH AVAILABLE TRANSIT

	Unsatisfied		Somewhat Satisfied		Satisfied		Very Satisfied	
	% Schools	% Govt. or Transit Agencies	% Schools	% Gov't. or Transit Agencies	% Schools	% Gov't. or Transit Agencies	% Schools	% Gov't. or Transit Agencies
How does the school community & its affiliates rate the quality of the transit service available?	4	4	16	13	48	57	26	26
How does the surrounding community rate the quality of the transit service available?	10	4	16	20	32	56	14	20
How does the school rate the community or local public transit operator's financial contribution to the transit system?	8	5	14	25	18	45	16	25
How does the surrounding community or local public transit operator rate the school's financial contribution to the transit system?	6	17	10	17	24	43	24	22

n = 76.

public for a fare (currently $2.35), operating frequent peak and daily service with up to six 40- and 60-passenger buses. MASCO's commuter mission has grown over the years with the addition of similar successful commuter shuttles to the Ruggles Orange Line "T" stop and most recently to the JFK Station "T" stop.

MASCO's primary transit service continues to be providing park-and-ride shuttle service into the LMA. It operates over 2,700 remote spaces serving 22 member institutions in the LMA, comprising over 37,000 employees and 13,000 students. MASCO operates 29 buses on 8 routes with a $5.3M annual budget that is financed by $325 per-space-per-month member fees to park in its lots and institutional contributions for the commuter shuttles based on their percentage of ridership. Members fully recognize the value of the shuttle services and continue to approve annual parking rate increases of approximately $25 per year.

MASCO now also offers a full suite of TDM services, including "T" pass subsidy programs and ridesharing. Over the years, other academic institutions have become a part of MASCO and benefit from its transit station commuter shuttles and TDM programs, including Emmanuel College, Massachusetts College of Art, Massachusetts College of Pharmacy and Health Sciences, Simmons College, Wentworth Institute of Technology, Wheelock College, and the Windsor School (D. Eppstein, Vice President for Operations, MASCO, personal interview, April 15, 2008).

CHAPTER FIVE

TECHNOLOGY AND "GREEN" INNOVATIONS

New technologies offer promise to enhance the operation of transit on campuses and in communities with a campus. These technologies are a top issue for transit systems that are looking both at ways to improve the efficiency and cost-effectiveness, as well as to transition transit from a mode that has historically frequently been marginalized as a second-class mode of travel. Moreover, systems hope to appeal strongly to college students, who are often more tech-savvy and are also more likely to use transit to get around than other groups, and who are perceived as the "next generation" of riders that transit systems aim to attract to habitual use. The survey asked respondents about the technologies they currently use in several areas of transit operations: onboard vehicle systems; roadway technologies, such as bus lanes and bus pullouts; roadside improvements, including stops and shelters; information technologies, including marketing technologies such as websites and real-time bus information systems; and other technologies. It also asked about those technologies respondents are planning to implement in the near future.

TRANSIT STOP IMPROVEMENTS AND AMENITIES

Attractive, high-quality transit amenities on vehicles and at transit stops can increase passenger comfort and entice more people to ride. To discover how transit systems have enhanced their amenities, the survey asked about the percentage (or number) of total transit stops on campus that have certain improvements; responses are indicated in Table 28. Most of the survey respondents have not standardized the use of high-quality transit stop designs that would improve waiting passengers' comfort, but many are using some of the enhancements at a portion of their stops.

Bus stop pull outs allow vehicles to move out of the flow of street traffic before loading and unloading passengers, thus reducing the impact of operating in mixed traffic (competing with other vehicles) on service reliability. Similarly, pavement markings designating bus stop locations can help reduce transit delays by signaling to drivers they need to yield these areas to buses. Few of the survey respondents are taking advantage of these amenities at every stop, but some have implemented them strategically. Only 17% of respondents have bus pull-outs at more than half of their stations, and only 11% use bus stop pavement markings at the majority of their transit stops.

Other transit stop amenities, such as passenger information and signage, can improve customer satisfaction and help to reduce waiting times. Nearly half of respondents display transit route names and numbers at all transit stops, but a surprising 12% never display this basic information. Roughly 40% of the systems responding have fixed schedule information boards or holders in at least half of their bus stops, but another 40% have installed only this basic passenger information amenity in less than one-quarter of their stops. And finally, three-quarters of respondents do not provide real-time schedule or vehicle arrival information at any of their bus stops.

Nearly three-quarters of respondents have transit shelters or covered waiting areas at fewer than half of their bus stops. Three government respondents and two university respondents have covered shelters at all transit stops. Eighty percent of all respondents indicated that they have uncovered benches at less than half of their bus stops. (Bike rack amenities close to transit stops are described in chapter four.)

Dedicated lighting increases passenger safety and comfort, but only 4% of systems light all of their transit stops. Again, nearly three-quarters of systems have lighting at fewer than half of their stations. Generally, college and university respondents tend to incorporate lighting at more of their stops than their government/transit agency peers; this could be related to the more frequently stated purpose in school systems of providing nighttime/evening safety, since lighting is of particular importance for waiting passengers after dark.

TRANSIT VEHICLE TECHNOLOGIES

Technologies on board vehicles can enhance the experience of riding in a range of ways. Respondents were asked what percentage of their vehicles implement on-board technologies (see Table 29 for their responses). Some features, such as automated stop announcements, ease the learning process for new riders or for those using an unfamiliar route. Automated passenger count systems give administrators information about the patronage on their system, and can give detailed data about exactly how many people get on and off at each stop. By far the most widespread technology in use is radio communications, in which nearly all respondents answering the question indicated that every vehicle has such a system in place. While public announcement systems for communication between the driver and riders are relatively popular, automated stop

TABLE 28
WHAT PERCENTAGE OF TRANSIT STOPS AT THE SCHOOL HAS THE FOLLOWING AMENITIES?

	Percentage of Transit Stops with Amenity					
Amenity	None	1%–25%	26%–50%	51%–75%	76%–99%	100%
Transit Shelters or Dedicated Cover	1	48	13	6	10	5
Dedicated Lighting	19	31	14	6	8	3
Bus Pull-Outs	11	50	7	3	7	4
Bus Stop Pavement Markings	34	30	5	2	4	3
Uncovered Benches	18	37	12	6	1	2
Display Route Numbers/Names	10	9	4	6	9	42
Have Fixed Schedule Information Boards/Holders	12	22	10	6	13	16
Real-Time Schedule/Arrival Information Sign	65	8	0	1	3	3

n = 85.

announcements and other video and audio systems are relatively rare, indicating that, by and large, systems still rely on the driver to handle dissemination of most on-board navigation information to customers. A relatively more recent technology to hit the market, automatic vehicle locators (AVLs) are based on GPS technology and have quickly become popular. AVL allows transit systems to read bus movements and either track vehicle positions (for internal monitoring and system efficiency enhancement—buses can be staggered in real-time to overcome "bunching") or to output information electronically to customers. Automated scheduling equipment might include software designed to make the process of scheduling door-to-door dial-a-ride services easier.

The following technology profile sheds some additional light on emerging GPS-based technologies.

Profile: Transit Providers Offer Real-Time Vehicle Information

In an effort to make public transit a more appealing transportation option, many universities are employing GPS technology to provide real-time vehicle information to reduce passenger waiting times.

Two popular systems using AVL technology convey real-time information. *Vehicle arrival information systems* take into account the vehicle location, stops, and typical traffic conditions to estimate how many minutes before the next bus arrives at a particular stop location. *Vehicle location information systems* monitor the position and motion of the vehicles en route and report the vehicles' current locations and next transit stops.

In addition to the arrival time and next stop data, both types of real-time vehicle systems can include graphic user interfaces with detailed route maps displaying or even animating transit vehicles' current locations. The maps and information can be viewed online or via a web-enabled phone or handheld computer, and the arrival time or current vehicle location information can also be sent as a text message alert.

Some of the transit systems serving college and university communities already utilizing vehicle arrival or vehicle location information systems include:

- Auburn University Tiger Transit, Auburn, AL;
- Case Western University shuttle, Cleveland, OH;
- Chapel Hill Transit, Chapel Hill, NC;
- Emory University shuttles, Atlanta, GA;
- CUE Bus, Fairfax, VA;
- Harvard University shuttles, Cambridge, MA;
- North Carolina State University Wolfline, Raleigh, NC;
- Oklahoma City Metro Transit, Oklahoma City, OK;

TABLE 29
WHAT PERCENTAGE OF TRANSIT VEHICLES HAS THE FOLLOWING ON-BOARD TECHNOLOGIES?

	Percentage of Transit Vehicles with Technology					
On-Board Technology	None	1%–25%	26%–50%	51%–75%	76%–99%	100%
Public Announcement System	4	3	7	5	13	40
Automated Stop Announcements (Audio or Marquee)	31	5	1	3	7	10
Other Interior Video/Audio	23	5	2	0	3	7
Flashing Lights and/or Projecting Stop Signs	27	0	1	0	1	14
Front, Side, or Back-Up Cameras	30	2	2	0	1	9
Interior (Security) Cameras	19	7	3	1	2	19
Automatic Vehicle Locator (AVL) Systems	23	2	1	1	6	23
Automated Scheduling Equipment	30	1	0	1	3	8
Automated Passenger Count Systems	24	8	5	2	4	6
Radio Communications	3	0	2	1	2	73

n = 84.

TABLE 30
IS REAL-TIME ARRIVAL INFORMATION AVAILABLE ON THE WEB OR BY PHONE?

	% of Total Respondents	% of School Respondents	% of Govt. or Transit Agency Respondents
On Web	31	35	26
By Phone	25	30	18
Neither	62	59	65

n = 87.

- Rutgers University shuttle, New Brunswick, NJ;
- University of Alabama CrimsonRide, Tuscaloosa, AL;
- University of South Carolina, Columbia, SC; and
- Yale University Transit, New Haven, CT.

ROADWAY TECHNOLOGIES

Most systems (29 respondents) responding to a question about special transit-related roadway technologies or treatments indicated that none were in use, and 19 respondents reported that these improvements are used locally. Seven systems indicated current use of bus-only exchanges or transit transfer centers, and seven systems indicated that bus lanes are available. Four respondents indicated that other roadway technologies are in use. Indiana University–Bloomington uses concrete bus stop pads built into the streets, and Georgia Institute of Technology has bus turnouts. King County Metro in Seattle, Washington, reported the most comprehensive set of roadway treatments: in addition to bus-only lanes and high occupancy vehicle lanes, it also has business access and transit lanes, a type of treatment where the outside lane is designated specifically for use by buses and vehicles entering and exiting businesses. Metro also reports use of transit-only signals, advance green signal priority, and bus bulb-outs.

CUSTOMER INFORMATION: HIGH- AND LOW-TECH

The advent of GPS technology permitted the creation of AVL technology, which in turn allows the delivery of real-time schedule and arrival information. This information may be available in several ways, including online, by phone (text messaging, voice, or web-enabled), and at transit stops themselves. The majority of systems do not provide real-time schedule and arrival information at their transit stops; only 4% include it at every station stop (see Table 30). A similar percentage of schools and government/transit agencies (21% and 18%) indicated they provide this customer information, but of these, more universities include it at more than half of their transit stops. If a government/transit agency provides real-time information, it is most likely at less than half of the system's transit stops.

Instead of displaying real-time arrival information at transit stops, some systems make this information available online or by phone. Thirty-one percent of all respondents provide real-time arrival information for their transit systems on the web, while one-quarter make this information available by phone. Slightly more schools than government/transit agencies rely on the Internet or phone to distribute real-time arrival information.

Transit schedule information and system maps are made available to the public in a variety of ways, as indicated in Table 31. Overall, on-board paper schedules and transit provider websites are the dominant methods of distributing transit schedules, whereas electronic information boards are the least common. Schools and government/transit agencies each rely heavily on their own websites for distributing this information to passengers.

A higher percentage of the government/transit agencies rely on low-tech communication devices such as paper

TABLE 31
HOW IS THE TRANSIT SCHEDULE INFORMATION DISTRIBUTED?

Schedule Distribution	% of Total Respondents	% of School Respondents	% of Gov't. or Transit Agency Respondents
On-Board Paper Schedules	85	81	92
Distributed Transit Schedule Holders	66	62	73
Static Information Board/Kiosk Posting(s)	57	50	69
Electronic Information Board	24	26	23
School Website	66	71	58
Transit Provider Website	79	71	92
Phone Line	46	31	69
Other	18	24	12

n = 67.

schedules, static kiosks, and phones, which perhaps reveals that the agencies themselves or their customers are most comfortable with established technologies or that cost of implementation is a challenge for these typically larger systems. Electronic information boards are not well-utilized overall, but a slightly higher percentage of school respondents make use of them.

As described in Table 31, more than 70% of systems make their transit system maps available via on-board paper maps, brochure holders, or the transit provider's website. The school website and static kiosks are less frequently utilized. Again, both schools and government/transit agencies rely heavily on their own websites to disseminate maps.

The following case study on North Carolina State University's (NCSU) Wolfline transit service highlights a high-tech implementation that offers new options to travelers. Data for this profile were gathered from NCSU's website and from their survey responses.

Profile: NCSU Transportation's Web-Enabled Passenger Information

NCSU Wolfline bus service is integrated into the Raleigh–Durham regional trip planner website, www.gotriangle.org, so passengers can seamlessly customize and optimize trip itineraries to and from campus using all of the major area transit services.

Passengers can also track their Wolfline bus online. All buses have AVL systems, so real-time vehicle arrival information is available online, or on a mobile phone through TransLoc's Transit Visualization System. The user interface displays a campus map showing the active bus routes and bus stop locations. An icon moving along the route represents the current bus location. Passengers waiting for a Wolfline bus can see its current position along the route, and estimate how long it will take to arrive at their location. This web-enabled real-time passenger information system effectively shortens the perceived waiting time for Wolfline passengers, increasing the attractiveness of the transit system. This online information is also available on a web-enabled cell phone.

NCSU's WolfTrails alternative transportation program also uses several web-based tools to promote and facilitate ridesharing. An online carpool matching website for staff and faculty called www.sharetheridenc.org matches drivers and riders with similar schedules and routes, and identifies park-and-ride lots, public transit services, and bicycle routes convenient to the carpoolers. Students are encouraged to form their own carpools with AlterNetRides.com, a free online ridesharing bulletin board. The website sends e-mail, voicemail, or text message alerts of a ridesharing match, allowing students to make last minute carpool arrangements (NC State Transit—Wolfline Website 2008).

ALTERNATIVE FUELED VEHICLES

Many transit providers indicated that they now use an alternative energy source to fuel the vehicles in their fleet, including sources that are considered environmentally less harmful than traditional fuels. Moreover, fleets appear to be diversifying: among the 80 respondents who answered this question, just over half indicated that their fleet does not rely on vehicles of one energy type, but rely on a varied fleet of vehicles that use different types. However, the number of respondents (33) who indicated that their whole fleet uses "green fuels" (i.e., other than gasoline or diesel) is substantial. Only seven respondents reported a sizeable proportion of their fleet is gasoline-powered, although more (23) indicated that more than a quarter of the fleet was diesel, and 16 reported that 100% of their fleet used diesel.

The most popular among the green fuels are low-sulfur diesel and biodiesel, for which 23 and 26 providers, respectively, indicated that more than a quarter of their fleet uses these fuel types. Compressed natural gas (CNG) was the next most popular choice, with 10 providers indicating that more than a quarter of the fleet was CNG. Just one provider (University of Madison–Wisconsin) reported a significant proportion of hybrid diesel-electric vehicles in use—seven of its eight vehicles are hybrids. Only one provider reported any use at all of hydrogen power or battery-only vehicles—Emory University uses five battery-powered vehicles out of a fleet of 56 vehicles (24 are biodiesel and 27 are CNG). Among the "other" types of fuels listed by respondents were ultra-low sulfur diesel, hydrogen/CNG mixes, and liquid natural gas; a number of respondents indicated that their biodiesel was a blended formula, most frequently a 5% mix.

Chapel Hill Transit, located in a college and university community, reported that it has undertaken an environmental initiative in its administrative location, as profiled in this vignette:

Profile: Chapel Hill Transit, NC, Goes "Green"

Chapel Hill Transit, a department of the town government in Chapel Hill, North Carolina, relocated to a new building in July 2007. The building has been certified under LEED (Leadership in Energy and Environmental Design), a rating system for environmentally efficient buildings organized by the U.S. Green Building Council. It features solar panels, geothermal flooring, and uses reclaimed water to wash the bus fleet.

PLANNED TECHNOLOGY IMPLEMENTATIONS

Respondents were asked the question, "What additional technologies (vehicle, roadway, or other) do you plan to implement within the next 5 years (for example, pavement lighting, passive pedestrian detection, AVL, etc.)?" By far the most prevalent new technology slated for implementation is GPS. Thirty-two respondents reported plans to introduce GPS-based technologies within the next 5 years. Some indicated that these will include features such as automated stop announcements on board, and others indicated that real-time information will be available by phone, on the web, or via electronic signs at transit stops.

Five respondents will implement bus signal priority/pre-emption. In these systems, a bus approaching certain

intersections will cause the traffic signal to change (when safe) to allow it to proceed before other signal phases occur. Often, this is accomplished by a transponder placed on a bus that can communicate with a receiver device on a traffic signal. Several technologies will be implemented by four of the respondents: automated passenger counters, roadway improvements such as bus bulbs, and surveillance/safety improvements such as enhanced lighting or cameras. Three respondents indicated that they would add wireless network connections (wi-fi) on vehicles and solar-powered shelters; three respondents indicated that other new technologies would be added.

CHAPTER SIX

CONCLUSIONS

Transit Systems in College and University Communities is an update of *TCRP Synthesis 39*, published in 2001. The previous report, *Transportation on College and University Campuses*, surveyed 30 campus communities, offering information on the planning, implementation, and operation of campus transit systems. This 2008 synthesis broadens the scope of the subject by moving from a campus-based focus to a focus on the communities in which the schools are located. The study included a survey that was opened up more extensively to other types of systems, including local and regional transportation systems that served college and university campuses.

The result of this current research is a discovery that the array of transit options has grown far beyond the U-Pass, which provides unlimited free rides on transit to eligible individuals, and was the focus of *TCRP Synthesis 39*. The evidence can be seen in the myriad creative partnerships, new uses of technology, and other innovative practices to streamline, expand, and market services described in the survey responses, literature review, and case studies. Systems are adapting to new demands and new opportunities to increase transit presence on and around campuses.

Because each geographic area is unique, and the circumstances at each school so varied, the transit and transportation options evidenced in this synthesis cannot be generalized into a single package for all colleges and universities. To illustrate, 25 systems reported that they have over 200 employees, and 21 systems reported that they have 50 employees or less. In 12 systems, 100% of the employees (including student drivers) are employed by the school, whereas 26 systems have no employees connected to the school. With such diversity, clearly there are no "one size fits all" in transit strategies. Instead, there is a menu of activities and approaches used by schools. The range of responsibilities overseen by transit providers in school communities has increased substantially over time; in other words, the business itself has become more complicated and providers are operating in a complex environment.

This synthesis covers a profile of the campuses' populations and community characteristics with detailed survey information on

- Operations, including fuel, staffing, student drivers, and marketing;
- Policies and planning, including financing, parking, transportation demand management (TDM) programs, bicycling, fares, and community integration; and
- Technology and "green" innovations.

For example, survey results about the use of technology found that global positioning system-based systems are among the most popular, both in current and planned future implementation. The early support for this type of technology hints that it may provide some of the most substantial gains for the amount of investment—including as a way to market transit as a sleek product and a strong competitor for the single-occupancy vehicle (SOV). Other older technologies, such as radio communications and passenger announcement systems, are also highly utilized.

Although systems have reported an overall aim to increase transit ridership, many respondents indicated that an ultimate goal is to shift away from SOV trips to other modes, regardless of what actual alternative mode is used. Thus, in the section on Policies and Planning, a large number of transit providers reported having a discrete budget for TDM programs, which include U-Passes, parking incentives and disincentives, and bicycle facilities. The most popular TDM programs are carpool-related programs, such as preferential carpool and vanpool parking, ridematching to link potential carpoolers, and guaranteed ride home services.

On the other hand, some campuses have not maximized the use of parking pricing strategies to achieve the goal of reducing the SOV. This is evidenced by the number of campuses that reported relatively low parking prices. For example, nine schools reported charging faculty and staff less than $100 for an entire year of parking.

Although transit is already considered a "green alternative" to driving to campus, a greater focus on environmental awareness is causing transit providers to look deeper into their role. Thirty-three respondents indicated that their whole fleet uses fuels other than gasoline or diesel. The most popular "green" fuels are low-sulfur diesel and biodiesel, with compressed natural gas the next most popular choice.

A variety of traditional and innovative tools are being used to fund both school-based and non-school systems. The most interesting are interagency partnerships, such as

between a university and a local government. The strength of the partnership arises from several parties bringing resources and skills to the table. These partnerships may lend flexibility to a system in times of change, whereby changes in campus population and costs can be approached collectively to ensure continuation of service. Moreover, the partnerships can put systems in a good position to obtain funding from new or expanded sources—such as revenue streams for which only individual members of the agreement may be eligible.

Although this research was very comprehensive on the state of the practice regarding transit systems in college and university communities, it revealed a number of topics in which further future research is recommended. The following areas were only lightly touched on in the survey results and could benefit from a deeper exploration:

- Safety, including late-night transit service, transit emergency response planning, and pedestrian and bicycle conflicts with transit;
- Impacts of the seasonality of university schedules on transit operations, including operator staffing and training, cyclical vehicle inventory needs, and inconsistent levels of service required;
- Transit marketing techniques for university communities, including parent education on transportation alternatives; and
- Emerging technologies, such as web-enabled phones for real-time information and fare payment, which contribute to "the informed traveler."

In an era of increasing campus populations, higher fuel prices, and concern about climate change, transit systems are adapting to new demands and opportunities. They are becoming part of a broader transportation network to enhance campus livability, which includes amenities for walking and bicycling as well as customer-friendly delivery of information. Finally, the research revealed emerging partnerships that present transit systems in college and university communities with the opportunity to bridge town and gown boundaries and form stronger community relationships.

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APPENDIX A

TCRP University Transit Survey—Full

TCRP Synthesis SA-19:
"Transit Systems in College and University Communities"

Nelson\Nygaard Consulting Associates for the Transportation Research Board

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Instructions

This study, sponsored by the Transportation Research Board, will collect information about the transit services available to universities through multiple types of providers. Those invited to participate include colleges and universities with responsibility for transit, transportation, and parking; public transit authorities; and others who provide services at an institute of higher education. We believe that this study will be of direct value to you and your organization, and its quality is enhanced with every response we receive. We are asking a number of questions, but we have made every attempt to create questions that are quick and easy to answer. We appreciate your time and effort on this survey, and it concludes with an opportunity for you to let us know how we can make the study more valuable for your needs.

This Word document version of the survey is intended to help you collect information before beginning the Web survey, for which you should have a link in your email. Please submit your answers via the web form rather than mail. You may save your progress in the web form and come back to it at a later time by clicking on the same link you originally received.

You only need to answer questions for which data is available to you. If a question does not apply to the transit system or school, please indicate "N/A." If you cannot answer a question, you may leave it blank. When *estimating* a number or a percent, please precede it with a tilde (~), for example ~25%.

We will begin our data analysis on January 20th and ask that you answer the survey by early January. If you have any questions, please contact Tara Krueger at 617-399-8395 or tkrueger@nelsonnygaard.com. Thank you kindly for your participation, and we hope to hear from your organization soon.

A. Overview

1. ***Name*** _____

   Title _____

   Organization _____

   City _____

   State _____

   Phone Number _____

   Email Address _____

   Website _____

2. ***What type of organization do you represent:***

   ☐ 1 College/University Operator ☐ 2 Local Government ☐ 3 Public Transit

   ☐ 4 Private Transit Operator ☐ 5 Other _____

3. ***What is the name of the (main) college or university served by this system?*** *(For the rest of the survey, please answer questions in reference to this school only.)*

   _____

4. ***What is the total population of the city/community in which the school is located?***

   _____

5. ***How would you classify the school's immediate setting?***

   ○ 1 Rural ○ 2 Semi-Rural ○ 3 Suburban/Small Urban ○ 4 Urban

B. About the School

6. ***What type of school is this?***

   ☐ 1 2-Year College ☐ 2 4-Year College ☐ 3 4-Year+ University ☐ 4 Graduate Only

7. ***What is the overall school enrollment?*** Full-Time _____ Part-Time _____

8. ***How many of these students are:*** Undergraduates? _____ Graduates? _____

9. ***Is this school predominantly commuter or residential?***

   ○ 1 Predominantly commuter ○ 2 Predominantly residential ○ 3 Mix

10. ***How many faculty and staff are employed at your university?*** *(Either total or Full-time Employees, please specify)*

    Faculty _____ **Staff** _____

11. What types of transit serve the school? *(indicate a service's availability by entering the name of the service operator(s))*

Regional/Commuter Rail	Name of Operator(s):_____
Urban/Light Rail Transit	Name of Operator(s):_____
Intercity Scheduled Coach Service	Name of Operator(s):_____
Local Fixed-Route Bus Transit	Name of Operator(s):_____
On-Campus Circulator/Shuttle(s)	Name of Operator(s):_____
Parking Shuttle(s)	Name of Operator(s):_____
Dial-a-Ride/Accessible Paratransit	Name of Operator(s):_____
Other on-call (e.g. night escort shuttles)	Name of Operator(s):_____
Other	Name of Operator(s):_____

12. For which of these transit services will you be providing service details? *(check only one unless you are aggregating responses for multiple services)*

Intercity Scheduled Coach Service	☐ 1
Local Fixed-Route Bus Transit	☐ 2
On-Campus Circulator/Shuttle(s)	☐ 3
Parking Shuttle(s)	☐ 4
Dial-a-Ride/Accessible Paratransit	☐ 5
Other on-call (e.g. night escort shuttles)	☐ 6
Other	☐ 7

C. About Transit on Campus

13. Who manages or contracts for the transit service that is provided at the school? *(check one)*

○ 1 School Administration	○ 2 Local Government	○ 3 Public Transit Operator
○ 4 Formal partnership between School and Local Government	○ 5 Formal partnership between School and Public Transit Operator	○ 6 Formal partnership between Local Government and Public Transit Operator

If a partnership, please describe briefly.

_____

14. How is the coverage of this transit system structured?

○ 1 Centered on school ○ 2 Centered on surrounding community ○ 3 Both types of service

15. Is the service open to the general public?

○ 1 Yes, all of the services are open ○ 2 Some are open and some are for school affiliates only
○ 3 No, these services are for school affiliates only

16. Does the school have multiple campuses (i.e. clusters of buildings located in separate areas) served by transit?

○ 1 Yes ► How many, and how far apart are they? _____
► Which ones are served by this transit service? _____

○ 2 No

17. What primary purpose(s) does transit serve for the school? *(check all that apply)*

☐ 1 On-campus circulation ☐ 2 Inter-campus circulation (for multiple campuses) ☐ 3 Link between campus and city
☐ 4 Park-and-Ride ☐ 5 Night/Evening Safety ☐ 6 Accessible services

18. How many bus routes serve the campus? _____

What are the hours of service? Weekdays: _____ Weekends: _____
How frequently do buses run in the most frequent peak period (indicate "per hour" or "every X minutes")?
_____

19. What is the annual number of passenger trips for the transit system about which you are reporting? *(as specified in Question 12)*

For Fiscal Year: _____
Annual passenger trips, total system: _____
Annual passenger trips, routes serving school only: _____

20. If you have information on ridership trends, has your ridership...

grown? _____(%) declined? _____(%) stayed the same? ____ (enter an X)

21. What, in your opinion, are the reasons for changes in ridership?

_____

22. How many of your routes have standing-room-only riders for at least one peak period every weekday?

_____

23. For each Weekday time period, what is the average headway for the most frequent and the least frequent route? *(or put an "X" in "on-call")*

Time Period	Most Frequent *(in minutes)*	Least Frequent *(in minutes)*		On Call (enter X)
Morning			or	
Mid-day			or	
Evening			or	
Late-night			or	

Fleet and Technology:

24. How many vehicles are in the transit fleet serving the school? _____

25. How many vehicles in the fleet use the following fuel types? *(You may answer as a percentage if desired – please indicate with a "%")*

	Number (or percentage) of vehicles
Diesel	
Low-sulfur diesel	
Biodiesel	
Hybrid diesel-electric	
Gasoline	
Hydrogen	
Battery-only	
Compressed natural gas	
Other: _____	

26. How many vehicles in the fleet have the following passenger capacities? *(You may answer as a percentage if desired – please indicate with a "%")*

	Number (or percentage) of vehicles
Less than 8	
8-12	
13-20	
21-40	
41-60	
61+	

27. How many vehicles have . . . ? *(You may answer as a percentage if desired – please indicate with a "%")*

	Number (or percentage) of vehicles
Wheelchair-lifts	
Low floors	
A Public Announcement system	
Automated stop announcements (audio or marquee)	
Other interior Video / Audio	
Bike racks	
Flashing lights and/or projecting stop signs	
Front, side or back-up cameras	
Interior (security) cameras	
Automatic Vehicle Locator (AVL) systems	
Automated scheduling equipment	
Automated passenger count systems	
Radio communications	
Other pedestrian or bicycle safety devices (indicate type): _____	
Other on-board vehicle technologies (indicate type): _____	

Infrastructure (for the immediate campus area only):

28. How many transit stops are there at the school? _____

29. What percentage of transit stops at the school have…?

	Percentage of stops					
	None	1-25%	26-50%	51-75%	76-99%	All
Transit shelters or dedicated cover	○	○	○	○	○	○
Dedicated lighting	○	○	○	○	○	○
Bus pull-outs	○	○	○	○	○	○
Bus stop pavement markings	○	○	○	○	○	○
Uncovered benches	○	○	○	○	○	○
Nearby bike racks	○	○	○	○	○	○
Display route numbers/names	○	○	○	○	○	○
Have fixed schedule information boards/holders	○	○	○	○	○	○
Real-time schedule/arrival information sign	○	○	○	○	○	○

30. Is real-time arrival information available on the web or by phone?

☐ 1 On Web ☐ 2 By Phone ☐ 3 Neither

31. What special roadway technologies or treatments do you utilize for transit (transit malls, bus lanes, signal pre-emption, etc.)?

_____

32. What additional technologies (vehicle, roadway or other) do you plan to implement within the next five years (for example, pavement lighting, passive pedestrian detection, AVL, etc.)?

_____

Operations:

33. How many people does the transit system employ? _____

34. How many employees are students or direct employees of the school (number or percentage)? _____

35. Are drivers given bicycle and/or pedestrian safety training? ○ 1 Yes ○ 2 No

36. How do you handle special events?

_____

37. Are student-drivers allowed? (If no, skip to Q41) ○ 1 Yes ○ 2 No

38. Are student-drivers actively sought by the transit system? ○ 1 Yes ○ 2 No

39. What special restrictions are student drivers subject to, if any?

_____

40. Is any special training given to student drivers that is not given to other drivers? ○ 1 Yes ○ 2 No

► **If so, what?** _____

_____

D. Financials

41. What is the annual transit system operating budget? $_____

42. What amount of the operating budget is paid by the school (dollars or percent)? _____

43. What are the sources of transit system operating revenue and their dollar amounts (or percentage)? *(Enter an X if the system receives this revenue type but you do not know the amount)*

In Fiscal Year: _____

Federal_____
State_____
Public Transit Operator_____
Local Government_____
School general fund_____
Student fees_____
Parking fees_____
Fares_____
Advertising_____
Private subsidy_____
Other_____

44. What is the school's annual budget for Travel Demand Management (TDM) programs, including ridematching, transit subsidies, cash-out, walking & biking programs, etc.? $_____

45. What is the average annual transit system capital budget? $_____

46. What amount of the capital budget is paid by the school (dollars or percent)?

_____

47. What are the sources of transit system capital funds and their dollar amounts (or percentage)? *(Enter an X if the system receives this revenue type but you do not know the amount)*

In Fiscal Year: _____

Federal_____
State_____
Public Transit Operator_____
Local Government_____
School general fund_____
Student fees_____
Parking fees_____
Fares_____
Advertising_____
Private subsidy_____
Other_____

48. How are the operational and funding challenges of meeting ADA requirements met?

_____

49. How are the operational and funding challenges posed by the seasonality of the school handled?(i.e. summer staffing levels, fare structures, etc.)

_____

50. Have any studies been conducted to determine the economic impact of school transit in the community?

○ 1 Yes ► **If so, may we contact you for a copy:** ○ 1 Yes ○ 2 No
○ 2 No

51. What financing challenges have impacted operations in recent years? (e.g., interest rates, insurance costs, fuel costs, etc.)

_____

52. Are there (or will there be) any efforts to partner with other local agencies in order to boost transit services or to gain access to funds through the Small Transit Intensive Cities Program or through other programs? If so, please describe.

_____

53. Are there any creative partnering programs to finance transit service? (For example, apartment developers paying a fee to gain access to the transit system; partnerships between urban and school transit systems.) If so, please describe.

_____

_____

E. Policy & Planning

Service Planning:

54. Is transit considered, by policy, in the planning for changes to the campus (e.g. new buildings)?

○ 1 Yes ► Please describe: _____
○ 2 No

55. Who participates in the campus transit planning process? *(check all that apply)*

☐ 1 Transit provider ☐ 2 School (if not also the transit provider) ☐ 3 Riders ☐ 4 Local government
☐ 5 Other(s):_____

56. Have any changes in campus demographics, student body composition or student residential locations/geography impacted transit cost, service or effectiveness?

○ 1 Yes ► Please describe: _____
○ 2 No

57. Have changes in school administration or policies changed transit service and/or policies?

○ 1 Yes ► Please describe: _____
○ 2 No

58. How is transit schedule information distributed? *(check all that apply)*

☐ 1 On-board paper schedules ☐ 2 Distributed transit schedule holders ☐ 3 Static information board/kiosk posting(s)
☐ 4 Electronic information board ☐ 5 School website ☐ 6 Transit provider website
☐ 7 Phone line ☐ 8 Other _____

59. Where are transit system maps available? *(check all that apply)*

☐ 1 On-board paper maps ☐ 2 Distributed transit brochure holders ☐ 3 Static information board/kiosk posting(s)
☐ 4 School website ☐ 5 Transit provider website ☐ 6 Other _____

Parking:

60. How many cars are registered or known to park on campus on an average day? _____

61. Are there any remote park & ride lots?

○ 1 Yes ► How many lots? _____
► Approximately how many total spaces are there in the park and ride lots? _____
○ 2 No

62. How many total parking spaces of all types (permit, meter etc.) directly serve the school, including park & ride lots? _____

63. How would you describe the parking situation on or around campus? *(check all that apply)*

☐ 1 Parking is readily available to everyone
☐ 2 Parking is available, but it is not convenient
☐ 3 Parking is provided to faculty/staff, but student parking is limited
☐ 4 Parking is provided to students, but faculty/staff parking is limited
☐ 5 Parking is limited in the core of campus, but available on the periphery or in park and ride lots
☐ 6 There is not enough parking to meet demand

64. If you use a parking permit system, is the number of parking permits limited?

☐ 1 No, we do not limit permits or we do not have a permit system at all
☐ 2 Yes, we utilize waiting lists/lotteries to limit parking to the capacity of campus
☐ 3 Yes, we do not offer permits to some groups or classes (e.g. freshmen) ***(describe below)***
☐ 4 Yes, other: _____

Groups to which permits are limited: _____
Other permit limitations: _____

65. Is there a fee to park? ○ 1 Yes ○ 2 No (If no, skip to **Q69)**

66. What is the average fee for parking on the main campus (i.e. not park and ride) for…? *(enter prices for all that apply)*

Students

Hourly $ _____ Daily $ _____ Monthly $ _____

Quarterly $ _____ Per semester $ _____ Annually $ _____

Faculty and Staff

Hourly $ _____ Daily $ _____ Monthly $ _____

Quarterly $ _____ Per semester $ _____ Annually $ _____

67. Does the charge act as a deterrent to driving? ○ 1 Yes ○ 2 No

68. Is this charge designed to encourage the use of park & ride lots? ○ 1 Yes ○ 2 No

Travel Demand Management (TDM) Programs:

Please answer TDM questions about services available to school students, faculty and staff regardless of the TDM program provider.

69. Is the organization a member of a Transportation Management Association (TMA) or other rider outreach & advocacy organization?

○ 1 Yes ► What is its name? _____
○ 2 No

70. How is the transit service advertised to potential riders? *(check all that apply)*

☐ 1 Signs ☐ 2 Bus wraps ☐ 3 Flyers ☐ 4 Brochures ☐ 5 School website
☐ 6 A Transportation Management Association ☐ 7 Freshman orientation/pre-matriculation
☐ 8 New employee materials ☐ 9 Other: _____

71. If you have data on commute modes, approximately what percentage of each group commutes by . . .

	All		Students	Faculty	Staff
Transit?	%	and/or	%	%	%
Carpool/vanpool?	%	and/or	%	%	%
Single-occupant vehicle?	%	and/or	%	%	%
Bicycle?	%	and/or	%	%	%
Walking?	%	and/or	%	%	%

72. Which of the following programs/services are <u>formalized</u> and available to faculty, staff and/or students of the school?

Ridematching	○ 1 Yes	○ 2 No
Preferential carpool/vanpool parking	○ 1 Yes	○ 2 No
Subsidized Vanpools	○ 1 Yes	○ 2 No
Guaranteed ride home program	○ 1 Yes	○ 2 No
Flex hours program for employees	○ 1 Yes	○ 2 No
Bike Lockers / Staffed bike desk	○ 1 Yes	○ 2 No
Telecommute program for faculty	○ 1 Yes	○ 2 No
Universal (free) transit passes (UPass)	○ 1 Yes	○ 2 No
Parking Cash-Out*	○ 1 Yes	○ 2 No

* (i.e., can students and/or faculty/staff receive a payment to give up their right/permit to park on campus?)

73. Are any transit subsidies provided by the school? *(Skip to Question 75 if no subsidies are provided)*

	Average % of cost subsidized	Max. Allowable Subsidy		Percentage of this Group Receiving Subsidy
		$	per (day, mo., etc)	
Faculty	%			
Staff	%			
Students	%			

74. How is this subsidy paid for? *(check all that apply)*

☐ 1 Fee to students ☐ 2 Parking charges ☐ 3 General fund
☐ 4 Subsidy from partner agency ☐ 5 Other

If other, please specify what:

_____

If there is a fee to students, please specify the amount: $_____ per _____ (semester, month, etc.)

75. What is the "base" per-ride transit fare for the <u>general public</u> (exclusive of passes or discounts)?

For local bus service: $_____
For on-campus circulator service: $_____

76. What is the "base" per-ride transit fare for <u>students</u> (exclusive of passes or discounts)?

For local bus service: $_____
For on-campus circulator service: $_____

77. What other Travel Demand Management (TDM) programs are offered by the school or the TMA?

_____

78. Do you have a goal for transit ridership on routes serving the campus?

○ 1 Yes ► What is the target percentage increase? _____
► Over how many years?_____
○ 2 No

Community Interaction:

79. Please rate the following statements regarding various parties' satisfaction with available transit:

	Very Satisfied	Satisfied	Somewhat Satisfied	Unsatisfied	N/A
How does **the school community & its affiliates** rate the quality of the transit service available?	○	○	○	○	○
How does **the surrounding community** rate the quality of the transit service available?	○	○	○	○	○
How does **the school** rate the community or local public transit operator's financial contribution to the transit system?	○	○	○	○	○
How does **the surrounding community or local public transit operator** rate the school's financial contribution to the transit system?	○	○	○	○	○

80. Please describe any notable interactions, relationships or issues between the community and the campus transit system.

_____

Industry Changes:

81. What, if any, changes in the transit or higher education fields do you anticipate may affect transit operations on the campus in the upcoming years (for example, charter regulation changes)?

_____

F. Other Thoughts?

82. Is there anything else you'd like to add about your system, the university, or transit on university campuses?

_____

_____

83. Would you be willing to provide additional information about your experience and be considered as a case study for this synthesis project?

○1 Yes ○2 No

84. Do you have any questions about transportation on colleges and university campuses that we could address in this study? How could this or future studies of campus transportation better help your system?

_____

_____

Thank you very much for your assistance in completing this survey. We will inform you of the results when the study is completed.

APPENDIX B

TCRP University Transit Survey—Short

"Transit Systems in College and University Communities"

Nelson\Nygaard Consulting Associates for the Transportation Research Board

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Instructions

This study, sponsored by the Transportation Research Board, will collect information about the transit services available to universities through multiple types of providers. Those invited to participate include colleges and universities with responsibility for transit, transportation and parking; public transit authorities; and others who provide services at an institute of higher education. We believe that this study will be of direct value to you and your organization, and its quality is enhanced with every response we receive. We are asking a number of questions, but we have made every attempt to create questions that are quick and easy to answer. We appreciate your time and effort on this survey, and it concludes with an opportunity for you to let us know how we can make the study more valuable for your needs.

This Word document version of the survey is intended to help you collect information before beginning the Web survey, for which you should have a link in your email. Please submit your answers via the web form rather than mail. You may save your progress in the web form and come back to it at a later time by clicking on the same link you originally received.

You only need to answer questions for which data is available to you. If a question does not apply to the transit system or school, please indicate “N/A.” If you cannot answer a question, you may leave it blank. When *estimating* a number or a percent, please precede it with a tilde (~), for example ~25%.

We will begin our data analysis on January 20th and ask that you answer the survey by early January. If you have any questions, please contact Tara Krueger at 617-399-8395 or tkrueger@nelsonnygaard.com. Thank you kindly for your participation, and we hope to hear from your organization soon.

A. Overview

1. ***Name*** _____

   Title _____

   Organization _____

   City _____

   State _____

   Phone Number _____

   Email Address _____

   Website _____

2. ***What type of organization do you represent:***

   ☐ 1 College/University ☐ 2 Local Government ☐ 3 Public Transit Operator
   ☐ 4 Private Transit Operator ☐ 5 Other _____

3. ***What is the name of the (main) college or university served by this system?*** *(For the rest of the survey, please answer questions in reference to this school only.)*

   _____

4. ***What is the total population of the city/community in which the school is located?***

   _____

5. ***How would you classify the school's immediate setting?***

   ○ 1 Rural ○ 2 Semi-Rural ○ 3 Suburban/Small Urban ○ 4 Urban

B. About the School

6. ***What type of school is this?***

   ☐ 1 2-Year College ☐ 2 4-Year College ☐ 3 4-Year+ University ☐ 4 Graduate Only

7. ***What is the overall school enrollment?*** Full-Time _____ Part-Time _____

8. ***How many of these students are:*** Undergraduates? _____ Graduates? _____

9. ***Is this school predominantly commuter or residential?***

   ○ 1 Predominantly commuter ○ 2 Predominantly residential ○ 3 Mix

10. ***How many faculty and staff are employed at your university?*** *(Either total or full-time employees, please specify)*

    Faculty _____ **Staff** _____

11. What types of transit serve the school? *(indicate a service's availability by entering the name of the service operator(s))*

Regional/Commuter Rail	Name of Operator(s):_____
Urban/Light Rail Transit	Name of Operator(s):_____
Intercity Scheduled Coach Service	Name of Operator(s):_____
Local Fixed-Route Bus Transit	Name of Operator(s):_____
On-Campus Circulator/Shuttle(s)	Name of Operator(s):_____
Parking Shuttle(s)	Name of Operator(s):_____
Dial-a-Ride/Accessible Paratransit	Name of Operator(s):_____
Other on-call (e.g. night escort shuttles)	Name of Operator(s):_____
Other	Name of Operator(s):_____

12. For which of these transit services will you be providing service details? *(check only one unless you are aggregating responses for multiple services)*

Intercity Scheduled Coach Service	☐ 1
Local Fixed-Route Bus Transit	☐ 2
On-Campus Circulator/Shuttle(s)	☐ 3
Parking Shuttle(s)	☐ 4
Dial-a-Ride/Accessible Paratransit	☐ 5
Other on-call (e.g. night escort shuttles)	☐ 6
Other	☐ 7

C. About Transit on Campus

13. Who manages or contracts for the transit service that is provided at the school? *(check one)*

○ 1 School Administration
○ 2 Local Government
○ 3 Public Transit Operator
○ 4 Formal partnership between School and Local Government
○ 5 Formal partnership between School and Public Transit Operator
○ 6 Formal partnership between Local Government and Public Transit Operator

If a partnership, please describe briefly.

_____

14. How is the coverage of this transit system structured?

○ 1 Centered on school
○ 2 Centered on surrounding community
○ 3 Both types of service

15. What primary purpose(s) does transit serve for the school? *(check all that apply)*

☐ 1 On-campus circulation
☐ 2 Inter-campus circulation (for multiple campuses)
☐ 3 Link between campus and city
☐ 4 Park-and-Ride
☐ 5 Night/Evening Safety
☐ 6 Accessible services

16. How many bus routes serve the campus? _____

What are the hours of service? Weekdays: _____ Weekends: _____
How frequently do buses run in the most frequent peak period (indicate "per hour" or "every X minutes")?
_____

17. What is the annual number of passenger trips for the transit system about which you are reporting? *(as specified in Question 12)*

For Fiscal Year: _____
Annual passenger trips, total system: _____
Annual passenger trips, routes serving school only: _____

18. What, in your opinion, are the reasons for changes in ridership?

_____

Fleet and Technology:

19. How many vehicles are in the transit fleet serving the school? _____

20. How many vehicles in the fleet use the following fuel types? *(You may answer as a percentage if desired – please indicate with a "%")*

	Number (or percentage) of vehicles
Diesel	
Low-sulfur diesel	
Biodiesel	
Hybrid diesel-electric	
Gasoline	
Hydrogen	
Battery-only	
Compressed natural gas	
Other: _____	

21. How many vehicles have . . . ? *(You may answer as a percentage if desired – please indicate with a "%")*

	Number (or percentage) of vehicles
Wheelchair-lifts	
Low floors	
A Public Announcement system	
Automated stop announcements (audio or marquee)	
Other interior Video / Audio	
Bike racks	
Flashing lights and/or projecting stop signs	
Front, side or back-up cameras	
Interior (security) cameras	
Automatic Vehicle Locator (AVL) systems	
Automated scheduling equipment	
Automated passenger count systems	
Radio communications	
Other pedestrian or bicycle safety devices (indicate type): _____	
Other on-board vehicle technologies (indicate type): _____	

Infrastructure (for the immediate campus area only):

22. What percentage of transit stops at the school have…?

	Percentage of stops					
	None	1-25%	26-50%	51-75%	76-99%	All
Transit shelters or dedicated cover	○	○	○	○	○	○
Dedicated lighting	○	○	○	○	○	○
Bus pull-outs	○	○	○	○	○	○
Bus stop pavement markings	○	○	○	○	○	○
Uncovered benches	○	○	○	○	○	○
Nearby bike racks	○	○	○	○	○	○
Display route numbers/names	○	○	○	○	○	○
Have fixed schedule information boards/holders	○	○	○	○	○	○
Real-time schedule/arrival information sign	○	○	○	○	○	○

23. Is real-time arrival information available on the web or by phone?

☐ 1 On Web ☐ 2 By Phone ☐ 3 Neither

24. What special roadway technologies or treatments do you utilize for transit (transit malls, bus lanes, signal pre-emption, etc.)?

_____

Operations:

25. How many people does the transit system employ? _____

26. Are drivers given bicycle and/or pedestrian safety training? ○1 Yes ○2 No

27. Are student-drivers allowed? (If no, skip to Q 31) ○1 Yes ○2 No

28. Are student-drivers actively sought by the transit system? ○1 Yes ○2 No

29. What special restrictions are student drivers subject to, if any?

_____

30. Is any special training given to student drivers that is not given to other drivers? ○1 Yes ○2 No

► **If so, what?** _____

_____

D. Financials

31. What is the annual transit system <u>operating</u> budget? $_____

32. What amount of the operating budget is paid by the school (dollars or percent)? $_____

33. What is the school's annual budget for Travel Demand Management (TDM) programs, including ridematching, transit subsidies, cash-out, walking & biking programs, etc.? $_____

34. What is the average annual transit system <u>capital</u> budget? $_____

35. What amount of the capital budget is paid by the school (dollars or percent)? _____

36. How are the operational and funding challenges of meeting ADA requirements met?

_____

37. Have any studies been conducted to determine the economic impact of school transit in the community?

○1 Yes ► **If so, may we contact you for a copy:** ○1 Yes ○2 No

○2 No

38. What financing challenges have impacted operations in recent years? (e.g., interest rates, insurance costs, fuel costs, etc.)

_____

39. Are there (or will there be) any efforts to partner with other local agencies in order to boost transit services or to gain access to funds through the Small Transit Intensive Cities Program or through other programs? If so, please describe.

_____

40. Are there any creative partnering programs to finance transit service? (For example, apartment developers paying a fee to gain access to the transit system; partnerships between urban and school transit systems.) If so, please describe.

_____

_____

E. Policy & Planning

Service Planning:

41. Is transit considered, by policy, in the planning for changes to the campus (e.g. new buildings)?

○ 1 Yes
○ 2 No

42. Who participates in the campus transit planning process? *(check all that apply)*

☐ 1 Transit provider ☐ 2 School (if not also the transit provider) ☐ 3 Riders ☐ 4 Local government
☐ 5 Other(s):_____

43. Have any changes in campus demographics, student body composition or student residential locations/geography impacted transit cost, service or effectiveness?

○ 1 Yes ► Please describe: _____
○ 2 No

44. Have changes in school administration or policies changed transit service and/or policies?

○ 1 Yes ► Please describe: _____
○ 2 No

Parking:

45. How many cars are registered or known to park on campus on an average day? _____

46. Are there any remote park & ride lots?

○ 1 Yes ► Approximately how many total spaces are there in the park and ride lots? _____
○ 2 No

47. How many <u>total</u> parking spaces of all types (permit, meter etc.) directly serve the school, <u>including</u> park & ride lots? _____

48. How would you describe the parking situation on or around campus? *(check all that apply)*"

☐ 1 Parking is readily available to everyone
☐ 2 Parking is available, but it is not convenient
☐ 3 Parking is provided to faculty/staff, but student parking is limited
☐ 4 Parking is provided to students, but faculty/staff parking is limited
☐ 5 Parking is limited in the core of campus, but available on the periphery or in park and ride lots
☐ 6 There is not enough parking to meet demand

49. If you use a parking permit system, is the number of parking permits limited?

☐ 1 No, we do not limit permits or we do not have a permit system at all
☐ 2 Yes, we utilize waiting lists/lotteries to limit parking to the capacity of campus
☐ 3 Yes, we do not offer permits to some groups or classes (e.g. freshmen) ***(describe below)***
☐ 4 Yes, other ***(describe below)***

Groups to which permits are limited: _____
Other permit limitations: _____

50. Is there a fee to park? ○ 1 Yes ○ 2 No (If no, skip to **Q54)**

51. What is the average fee for parking on the main campus (i.e. not park and ride) for…? *(enter prices for all that apply)*

Students

Hourly $ _____ Daily $ _____ Monthly $ _____

Quarterly $ _____ Per semester $ _____ Annually $ _____

Faculty and Staff

Hourly $ _____ Daily $ _____ Monthly $ _____

Quarterly $ _____ Per semester $ _____ Annually $ _____

52. Does the charge act as a deterrent to driving? ○ 1 Yes ○ 2 No

53. Is this charge designed to encourage the use of park & ride lots? ○ 1 Yes ○ 2 No

Travel Demand Management (TDM) Programs:

Please answer TDM questions about services available to school students, faculty and staff regardless of the TDM program provider.

54. How is the transit service advertised to potential riders? *(check all that apply)*

☐ 1 Signs ☐ 2 Bus wraps ☐ 3 Flyers ☐ 4 Brochures ☐ 5 School website
☐ 6 A Transportation Management Association ☐ 7 Freshman orientation/pre-matriculation
☐ 8 New employee materials ☐ 9 Other: _____

55. Which of the following programs/services are <u>formalized</u> and available to faculty, staff and/or students of the school?

Ridematching	○ 1 Yes	○ 2 No
Preferential carpool/vanpool parking	○ 1 Yes	○ 2 No
Subsidized Vanpools	○ 1 Yes	○ 2 No
Guaranteed ride home program	○ 1 Yes	○ 2 No
Flex hours program for employees	○ 1 Yes	○ 2 No
Bike Lockers / Staffed bike desk	○ 1 Yes	○ 2 No
Telecommute program for faculty	○ 1 Yes	○ 2 No
Universal (free) transit passes (UPass)	○ 1 Yes	○ 2 No
Parking Cash-Out*	○ 1 Yes	○ 2 No

* (i.e., can students and/or faculty/staff receive a payment to give up their right/permit to park on campus?)

56. Are any transit subsidies provided by the school? *(Skip to Question 58 if no subsidies are provided)*

	Max. Allowable Subsidy	
	$	**per (day, mo., etc)**
Faculty		
Staff		
Students		

57. How is this subsidy paid for? *(check all that apply)*

☐ 1 Fee to students ☐ 2 Parking charges ☐ 3 General fund
☐ 4 Subsidy from partner agency ☐ 5 Other

If other, please specify what:

_____

If there is a fee to students, please specify the amount: $_____ per _____ (semester, month, etc.)

58. What is the "base" per-ride transit fare for the <u>general public</u> (exclusive of passes or discounts)?

For local bus service: $_____
For on-campus circulator service: $_____

59. What is the "base" per-ride transit fare for <u>students</u> (exclusive of passes or discounts)?

For local bus service: $_____
For on-campus circulator service: $_____

60. What other Travel Demand Management (TDM) programs are offered by the school or the TMA?

_____

Community Interaction:

61. Please rate the following statements regarding various parties' satisfaction with available transit:

	Very Satisfied	Satisfied	Somewhat Satisfied	Unsatisfied	N/A
How does **the school community & its affiliates** rate the quality of the transit service available?	○	○	○	○	○
How does **the surrounding community** rate the quality of the transit service available?	○	○	○	○	○
How does **the school** rate the community or local public transit operator's financial contribution to the transit system?	○	○	○	○	○
How does **the surrounding community or local public transit operator** rate the school's financial contribution to the transit system?	○	○	○	○	○

62. Please describe any notable interactions, relationships or issues between the community and the campus transit system.

_____

Industry Changes:

63. What, if any, changes in the transit or higher education fields do you anticipate may affect transit operations on the campus in the upcoming years (for example, charter regulation changes)?

_____

F. Other Thoughts?

64. Is there anything else you'd like to add about your system, the university, or transit on university campuses?

_____

_____

65. Would you be willing to provide additional information about your experience and be considered as a case study for this synthesis project?

○ 1 Yes ○ 2 No

66. Do you have any questions about transportation on colleges and university campuses that we could address in this study? How could this or future studies of campus transportation better help your system?

_____

_____

Thank you very much for your assistance in completing this survey. We will inform you of the results when the study is completed.

APPENDIX C

List of Survey Respondents

TABLE C1
LIST OF SURVEY RESPONDENTS (ALPHABETICAL BY UNIVERSITY)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	AppalCART	Transportation Director	Transportation Department	Appalachian State University	Boone	North Carolina
	City of Tempe, Arizona	City of Tempe Senior Transit Coordinator	City of Tempe Senior Transit Coordination	Arizona State University	Tempe	Arizona
	Auburn University	Parking and Transit Services Director	Parking & Transit Services	Auburn University	Auburn	Alabama
	Santa Cruz Metropolitan Transit District	Transit Planner	Transit Planning	Cabrillo College	Santa Cruz	California
	Clemson Area Transit	Executive Director	Clemson Area Transit	Clemson University	Clemson	South Carolina
	SunLine Transit Agency	Director of Planning	Planning Department	College of the Desert (Community College)	Thousand Palms	California
*	Transfort	City of Fort Collins Transit Planner	City of Fort Collins Transit Planning	Colorado State University	City of Fort Collins	Colorado
*	Cornell University	Asst. Director for Public Information	Transportation & Mail Services	Cornell University	Ithaca	New York
*	East Carolina University Student Transit Authority	Director	East Carolina University Student Transit Authority	East Carolina University	Greenville	North Carolina
	Emory University	Director of Transportation/Executive Director CCTMA	Transportation Department & CCTMA	Emory University	Atlanta	Georgia
	Lee County Transit	Principal Planner	Planning Department	Florida Gulf Coast University	Fort Myers	Florida
	Florida State University	Associate Director Business Services	Business Services	Florida State University	Tallahassee	Florida
	George Mason University	Director, Parking & Transportation	Parking & Transportation	George Mason University	Fairfax	Virginia
	Georgia Institute of Technology	Assistant Director, Transportation	Transportation	Georgia Institute of Technology	Atlanta	Georgia

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TABLE C1 (*Continued*)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	Harvard University	Director of Transportation Services & Operations Manager	University Operations Services	Harvard University	Cambridge	Massachusetts
*	Indiana University Campus Bus Service	Operations Manager	Operations	Indiana University	Bloomington	Indiana
	Citilink	Asst. GM	Citilink	Indiana University-Purdue Universitv Fort	Fort Wayne	Indiana
	I ndianapolis Public Transportation Corp. (IndyGo)	Vice President Business Development	Business Development	Indiana University-Purdue Universitv	Indianapolis	Indiana
*	Ames Transit Agency (CyRide)	Transit Coordinator	Transit Planning	Iowa State University	Ames	Iowa
*	Louisiana State University	Director	Parking/Traffic/Transportation	Louisiana State University	Baton Rouge	Louisiana
	Loyola College in MD	Manager Loyola T &P	Transportation & Parking	Loyola College in MD	Baltimore	Maryland
	MIT Parking and Transportation	MIT Parking & Transportation Operations Manager	Parking & Transportation Operations	Massachusetts Institute of Technology	Cambridge	Massachusetts
	Miami University	Director, Parking & Transportation Services	Parking & Transportation Services	Miami University	Oxford	Ohio
	Capital Area Transportation Authority	Assistant Executive Director	Capital Area Transportation Authority	Michigan State University	Lansing	Michigan
	Mississippi State University	Director of Parking Operations	Parking Operations	Mississippi State University	Starkville	Mississippi
	GALAVAN/Streamline Advisory Board	Chairman	GALAVAN/Streamline Advisory Board	Montana State University	Bozeman	Montana
*	NC State University	Transit Manager	Transit Department	North Carolina State University	Raleigh	North Carolina
*	Huskie Line	General Manager	Huskie Line	Northern Illinois University	DeKalb	Illinois
	Oklahoma State University	Parking and Transit Services	Parking and Transit Services	Oklahoma State University	Stillwater	Oklahoma

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TABLE C1 (*Continued*)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	Oregon Institute of Technology	OIT Civil Engineering Department	Civil Engineering Department	Oregon Institute of Technology	Klamath Falls	Oregon
*	Centre Area Transportation Authority	General Manager	Centre Area Transportation Authority	Pennsylvania State University	State College	Pennsylvania
	Purdue University	Professor	Civil Engineering Department	Purdue University	West Lafayette	Indiana
*	CityBus of Greater Lafayette	General Manager	CityBus of Greater Lafayette	Purdue University	Lafayette/West Lafayette	Indiana
	Rutgers University, Busch Campus	Professor and Director	Rutgers University	Rutgers University, Busch Campus	Piscataway	New Jersey
	Rutgers University, College Avenue Campus	Manager of Transit Services	Transit Services	Rutgers University, College Avenue	New Brunswick	New Jersey
	Saginaw Transit Authority Regional Services (STARS)	Planning Director	Planning Department	Saginaw Valley State University	Saginaw	Michigan
	Dallas Area Rapid Transit	Service Planner III	Service Planning	Southern Methodist University	Dallas	Texas
	SUNY Geneseo	Division of Student and Campus Life, SUNY Geneseo	Division of Student and Campus Life	State University of New York College at Geneseo	Geneseo	New York
	Central New York Regional Transportation Authority	Director of Planning	Planning Department	Syracuse University	Syracuse	New York
	Syracuse University	Manager of Parking & Transit Services	Parking & Transit Services	Syracuse University	Syracuse	New York
	Southwest Region University Transportation Center	Director	Southwest Region University Transportation Center	Texas A&M University	College Station	Texas
	Fort Worth Transportation Authority	Fort Worth Transportation Authority Executive Vice President /COO	Fort Worth Transportation Authority	Texas Christian University	Fort Worth	Texas
	First Transit, Inc.	General Manager	First Transit, Inc.	Texas State University	San Marcos	Texas
	Citibus	Director of Planning	Planning Department	Texas Tech University	Lubbock	Texas

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TABLE C1 (*Continued*)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	Texas Tech University	Student Government Association External VP	Student Government Association	Texas Tech University	Lubbock	Texas
	Thomas M. Cooley Law School	Associate Dean of Community Relations	Community Relations Department	Thomas M. Cooley Law School	Lansing	Missouri
	University of Alabama	Assistant Director of Transportation Service/Transit		University of Alabama	Tuscaloosa	Alabama
	University of California, Irvine	UC Irvine Parking and Transportation Services	Parking & Transportation Services	University of California, Irvine	Irvine	California
*	Razorback Transit	Associate Director	Razorback Transit	University of Arkansas	Fayetteville	Arizona
*	Unitrans	Assistant General Manager	Unitrans	University of California, Davis	Davis	California
	University of California, Los Angeles	Associate Director	UCLA Transportation	University of California, Los Angeles	Los Angeles	California
	Riverside Transit Agency	Director of Business Development	Business Development	University of California, Riverside	Riverside	California
*	University of California, San Diego	Director	Parking/Transportation Services	University of California, San Diego	San Diego	California
	Santa Cruz Metropolitan Transit District	Transit Planner	Transit Planning	University of California, Santa Cruz	Santa Cruz	California
	The University of Chicago	Director of Transportation & Parking	Transportation & Parking	University of Chicago	Chicago	Illinois
	University of Connecticut	Transportation Services Administrator	Transportation Services	University of Connecticut	Storrs	Connecticut
	University Of Delaware	Transportation Manager	Transportation	University of Delaware	Newark	Delaware
	City of Gainesville Regional Transit System	Chief Transit Planner	Transit Planning	University of Florida	Gainesville	Florida
	University of Florida	Director	University of Florida	University of Florida	Gainesville	Florida

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TABLE C1 (*Continued*)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	Champaign-Urbana Mass Transit District	Champaign-Urbana Mass Transit District	Champaign-Urbana Mass Transit District	University of Illinois	Urbana	Illinois
*	Champaign-Urbana Mass Transit District	Marketing Director	Marketing Department	University of Illinois at Urbana-Champaign	Urbana	Illinois
*	The University of Iowa – Cambus	Cambus Manager	Cambus	University of Iowa	Iowa City	Iowa
*	Umass Transit	General Manager	Transit Services	University of Massachusetts	Amherst	Massachusetts
	University of Michigan	Parking and Transportation Services – Transit Services	Parking and Transportation Services	University of Michigan	Ann Arbor	Michigan
*	Ann Arbor Transportation Authority	Manager of Service Development	Service Development	University of Michigan	Ann Arbor	Michigan
	Mass Transportation Authority	Assistant General Manager	Mass Transportation Authority	University of Michigan, Flint	Flint	Michigan
	University of Minnesota	Transit Supervisor	Transit	University of Minnesota	Minneapolis	Minnesota
	Associated Students of The University of Montana	Director – The Associated Students of The University of Montana	ASUM Office of Transportation	University of Montana	Missoula	Montana
	Mountain Line Transit	Transit Planner and Development Coordinator	Transit Planning & Development	University of Montana	Missoula	Montana
	University of Nebraska at Omaha	Manager, Support Services	Support Services	University of Nebraska at Omaha	Omaha	Nebraska
	Regional Transportation Commission	Public Transportation Director; Marketing Specialist	Public Transportation & Marketing Departments	University of Nevada, Reno	Reno	Nevada
*	University Of New Hampshire	Operations Manager, Campus Planning – Special Projects	Transportation Services & Campus Planning Departments	University of New Hampshire, Durham	Durham	New Hampshire
	UNC Chapel Hill	UNC Transportation Planner	Transportation Planning	University of North Carolina at Chapel Hill	Chapel Hill	North Carolina
	Clear View Strategies LLC	Clear View Strategies LLC	Clear View Strategies LLC	University of North Carolina, Greensboro	Pittsburgh	Pennsylvania

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TABLE C1 (*Continued*)

Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
University of North Texas	UNT Associate Director	University of North Texas	University of North Texas, Denton campus	Denton	Texas
Northern Iowa Student Government	President of the Student Body	Student Government	University of Northern Iowa	Cedar Falls	Iowa
Penn Transit	Associate Director	Transportation Services	University of Pennsylvania	Philadelphia	Pennsylvania
University of Pittsburgh	Assistant Director for Transportation; Manager, Travel and Transportation	Travel & Transportation Department	University of Pittsburgh	Pittsburgh	Pennsylvania
Hillsborough Area Regional Transit Authority	Director of Community Relations & Marketing	Community Relations & Marketing	University of South Florida (USF)	Tampa	Florida
* University of Texas at Austin	Alternative Transportation Coordinator; Associate VP for Campus Safety and Security	Parking and Transportation Services & Safety and Security Departments	University of Texas at Austin	Austin	Texas
Capital Metropolitan Transportation Authority	Director of Transportation	Transportation Department	University of Texas at Austin	Austin	Texas
University of Washington	Transportation Systems Manager	Transportation Systems Department, Commuter Services	University of Washington, Seattle	Seattle	Washington
King County Metro	Senior Transportation Planner	Transportation Planning	University of Washington, Seattle	Seattle	Washington
Metro Transit, City of Madison	Transit Planner	Transit Planning	University of Wisconsin, Madison	Madison	Wisconsin
University of Wisconsin	Transportation Services – Program Planning Analyst Senior	Transportation Services – Program Planning	University of Wisconsin, Madison	Madison	Wisconsin
University of Arizona	Parking & Transportation Services	Parking & Transportation Services	University of Arizona	Tucson	Arizona
University of South Florida	Transportation Manager	Transportation Department	USF – Tampa Campus	Tampa	Florida
Utah State University Aggie Shuttle	Supervisor	Aggie Shuttle	Utah State University	Logan	Utah
Virginia Tech	Alternative Transportation Manager	Alternative Transportation	Virginia Tech	Blacksburg	Virginia

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TABLE C1 (*Continued*)

	Responder's Organization	Title	Respondent's Department	Primary Associated University	City	State
	Pullman Transit	Transit Manager	Pullman Transit	Washington State University	Pullman	Washington
*	Go West Transit	Director	Go West Transit	Western Illinois University	Macomb	Illinois
	Western Kentucky University	Parking and Transportation	Parking and Transportation	Western Kentucky University	Bowling Green	Kentucky
	Kalamazoo Metro Transit System	Executive Director	Kalamazoo Metro Transit System	Western Michigan University	Kalamazoo	Michigan

* indicates one of original 30 respondents

APPENDIX D

Survey Responses by Questions

TABLE D1
SURVEY RESPONSES BY QUESTION

	All respondents	Schools	Gov't/Transit Agencies
	Count	Count	Count
2. What type of organization do you represent?	94	58	37
3. What is the name of the (main) college or university served by this system? (For the rest of the survey, please answer questions in reference to this school only.)	94	58	37
4. What is the total population of the city/community in which the school is located?	93	58	37
5. How would you classify the school's immediate setting?	94	0	0
6. What type of school is this?	94	59	25
7. What is the overall school enrollment?	85	54	30
8. How many of these students are: undergraduates/graduates?	82	52	30
9. Is this school predominantly commuter or residential?	67	44	24
10. How many faculty and staff are employed at your university? (Either total or full-time employees, please specify)	76	50	27
12. For which of these transit services will you be providing service details?	94	58	37
13. Who manages or contracts for the transit service that is provided at the school?	92	56	37
14. How is the coverage of this transit system structured?	93	58	37
15. Is the service open to the general public?	76	46	31
16. Does the school have multiple campuses served by transit?	75	45	31
17. What primary purpose(s) does transit serve for the school?	92	56	37
18. How many bus routes serve the campus?	89	58	37
19. What is the annual number of passenger trips for the transit system about which you are reporting? (as specified in Question 12)	81	50	32
20. If you have information on ridership trends, has your ridership...	62	40	25
21. What, in your opinion, are the reasons for changes in ridership?	62	0	0
22. How many of your routes have standing-room-only riders for at least one peak period every weekday?	65	0	0
23. For each weekday time period, what is the average headway for the most frequent and the least frequent route?	62	0	0
24. How many vehicles are in the transit fleet serving the school?	76	0	0
25. How many vehicles in the fleet use the following fuel types?	81	0	0
26. How many vehicles in the fleet have the following passenger capacities?	66	0	0
27. How many vehicles have the following features?	84	0	0
28. How many transit stops are there at the school?	64	0	0
29. What percentage of transit stops at the school have the following amenities?	85	53	33
30. Is real-time arrival information available on the web or by phone?	87	54	34
31. What special roadway technologies or treatments do you utilize for transit (transit malls, bus lanes, signal pre-emption, etc.)?	48	0	0
32. What additional technologies (vehicle, roadway or other) do you plan to implement within the next five years (for example, pavement lighting, passive pedestrian detection, AVL, etc.)	47	0	0

(continued on next page)

TABLE D1 (*Continued*)

	All respondents	Schools	Gov't/Transit Agencies
	Count	Count	Count
33. How many people does the transit system employ?	79	0	0
34. How many employees are students or direct employees of the school (number or percentage)?	60	0	0
35. Are drivers given bicycle and/or pedestrian safety training?	83	50	34
36. How do you handle special events?	57	0	0
37. Are student-drivers allowed?	80	49	33
38. Are student-drivers actively sought by the transit system?	46	26	14
39. What special restrictions are student drivers subject to, if any?	39	0	0
40. Is any special training given to student drivers that is not given to other drivers?	39	24	14
41. What is the annual transit system operating budget?	75	0	0
42. What amount of the operating budget is paid by the school (dollars or percent)?	73	0	0
43. What are the sources of transit system operating revenue and their dollar amounts (or percentage)?	60	0	0
44. What is the school's annual budget for Travel Demand Management (TDM) programs, including ridematching, transit subsidies, cash-out, walking & biking programs, etc.)	61	0	0
45. What is the average annual transit system capital budget?	60	0	0
46. What amount of the capital budget is paid by the school (dollars or percent)?	60	0	0
47. What are the sources of transit system capital funds and their dollar amounts (or percentage)?	53	0	0
48. How are the operational and funding challenges of meeting ADA requirements met?	56	0	0
49. How are the operational and funding challenges posed by the seasonality of the school handled? (i.e. summer staffing, fare structures, etc.)	50	0	0
50. Have any studies been conducted to determine the economic impact of school transit in the community?	70	42	21
51. What financing challenges have impacted operations in recent years? (e.g., interest rates, insurance costs, fuel costs, etc.)	74	0	0
52. Are there (or will there be) any efforts to partner with other local agencies in order to boost transit services or to gain access to funds through the Small Transit Intensive Cities Program or through other programs. If so, please describe.	61	39	17
53. Are there any creative partnering programs to finance transit service? (For example, apartment developers paying a fee to gain access to the transit system; partnerships between urban and school transit systems.) If so, please describe.	94	0	0
54. Is transit considered, by policy, in the planning for new buildings?	78	50	22
55. Who participates in the campus transit planning process? (check all that apply)	79	51	29
56. Have any changes in campus demographics, student body composition or student residential locations/geography impacted transit cost, service or effectiveness?	70	37	20
57. Have changes in school administration or policies changed transit service and/or policies?	71	42	20
58. How is transit schedule information distributed? (check all that apply)	67	42	26
59. Where are transit system maps available? (check all that apply)	68	43	26

(continued on next page)

TABLE D1 (*Continued*)

	All respondents	Schools	Gov't/Transit Agencies
	Count	Count	Count
60. How many cars are registered or known to park on campus on an average day?	51	0	0
61. Are there any remote park & ride lots?	77	51	22
62. How many total parking spaces of all types (permit, meter etc.) directly serve the school, including park & ride lots?	56	0	0
63. How would you describe the parking situation on or around campus? (check all that apply)	85	54	32
64. If you use a parking permit system, is the number of parking permits limited?	85	54	32
65. Is there a fee to park on campus? (If no, skip to Question 69)	73	52	18
66. What is the average fee for parking on the main campus (i.e. not park and ride)?	61	0	0
67. Does the charge act as a deterrent to driving?	69	50	17
68. Is this charge designed to encourage the use of park & ride lots?	69	48	18
69. Is the organization a member of a Transportation Management Association (TMA) or other rider outreach & advocacy organization?	53	33	16
70. How is the transit service advertised to potential riders? (check all that apply)	75	48	27
71. If you have data on commute modes, approximately what percentage of each group commutes by each mode?	18	0	0
72. Which of the following programs/services are formalized and available to faculty, staff and/or students of the school?	68	47	25
73. Are any transit subsidies provided by the school?	30	0	0
74. How is this subsidy paid for?	85	54	32
75. What is the "base" per-ride transit fare for the general public (exclusive of passes or discounts)?	71	0	0
76. What is the "base" per-ride transit fare for students (exclusive of passes or discounts)?	70	0	0
77. What other Travel Demand Management (TDM) programs are offered by the school or the TMA?	19	0	0
78. Do you have a goal for transit ridership on routes serving the campus?	56	34	17
79. Please rate the following statements regarding various communities' satisfaction with available transit:	76	50	28
How does the school community & its affiliates rate the quality of the transit service available?	75	50	23
How does the surrounding community rate the quality of the transit service available?	75	50	25
How does the school rate the community or local public transit operator's financial contribution to the transit system?	76	50	20
How does the surrounding community or local public transit operator rate the school's financial contribution to the transit system?	76	50	23
80. Please describe any notable interactions, relationships or issues between the community and the campus transit system.	35	0	0
81. What, if any, changes in the transit or higher education fields do you anticipate may affect transit operations on the campus in the upcoming years (for example, charter regulation changes)?	32	0	0

(continued on next page)

TABLE D1 (*Continued*)

	All respondents	Schools	Gov't/Transit Agencies
	Count	Count	Count
82. Is there anything else you'd like to add about your system, the university, or transit on university campuses?	32	0	0
83. Would you be willing to provide additional information about your experience and be considered as a case study for this synthesis project?	72	46	21
84. Do you have any questions about transportation on colleges and university campuses that we could address in this study? How could this or future studies of campus transportation better help your system?	23	0	0

APPENDIX E

Ridership Data

TABLE E1
RIDERSHIP DATA

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
Ames Transit Agency (CyRide)	Ames	IA	2007	4,314,151	4,301,955	---	We went fare free for ISU students in 2003 and ridership increased 57% in three years, then decreased 9.9% as international student enrollment and Iowa high school enrollment dropped.
Ann Arbor Transportation Authority	Ann Arbor	MI	2007	5,470,854	3,876,946	30% in the last 3 years	Agreement with university to pay the fares for students
AppalCART	Boone	NC	2007	889,979	844,990	13%	Going fare free, getting newer low floor buses, adding service
Capital Area Transportation Authority	Lansing	MI	2007	10,630,000	3,500,000	---	---
Capital Metro	Austin	TX	2007	~33,400,000	~5,160,000 (UT Shuttle)	~ -15%	Additional on-campus housing has been constructed in recent years; additional dense development surrounding the main campus has been constructed; both allow more students to relocate closer to campus and reach by walking or biking.
Central New York Regional Transportation Authority - CNYRTA	Syracuse	NY	2007	~1,074,000	~120,000	---	---
Centre Area Transportation Authority	State College	PA	2006-2007	6,146,522	3,960,583	1.1%	Factors include the high cost of gasoline, the development of student housing out beyond a reasonable walking distance from the campus, and the expansion of CATA's prepaid apartment complex pass program.

(continued on next page)

TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
Champaign-Urbana Mass Transit District	Urbana	IL	2006-2007	9,468,647	3,955,503	---	---
Citibus	Lubbock	TX	2007	3,040,414	1,892,278	~ -19%	Campus ridership has decreased dramatically due to the University's decision to curtail funding for off-campus routes. Ridership on other segments (fixed route and paratransit) is up by approximately 20%.
Citilink	Fort Wayne	IN	2007	2,000,000	Unknown	---	---
City of Gainesville Regional Transit System	Gainesville	FL	2007	8,939,334	7,860,243	~3.4% over last fiscal year	Gradual increases in enrollment, more parking restrictions (less availability), increasing bus service, and citywide population growth
City of Tempe, Arizona	Tempe	AZ	2007	58,020,189	11,320,099	4%	Overall increasing use of transit. University students & staff are eligible for free transit passes sponsored by ASU.
CityBus of Greater Lafayette	Lafayette/West Lafayette	IN	2007	4,664,581	---	7.2%	Gas prices and limited parking
Clear View Strategies LLC	Pittsburgh	PA	---	3.2M	400,000	15%	More and more frequent services provided.
Clemson University	Clemson	SC	2007	1,771,346	---	17%	Higher gas prices, more buses, more often, more places
Dallas Area Rapid Transit	Dallas	TX	2006	102,900,000	210,000	---	---
Division of Student and Campus Life, SUNY Geneseo	Geneseo	NY	2006-2007	232,577	112,054	27%	1. Driver education and risk management trends. 2. Fewer students are coming to campus with cars. 3. More international students and students from urban areas.

(continued on next page)

TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
East Carolina University Student Transit Authority	Greenville	NC	2006/2007	2,017,730	---	20%	Increased enrollment, lack of parking, construction of 500+ bed off-campus student housing, expansion on Medical Campus
Emory University	Atlanta	GA	2007	2,811,054	2,318,144	---	---
Florida State University	Tallahassee	FL	2006	---	2,100,000	~15%	---
Fort Worth Transportation Authority	Fort Worth	TX	2007	12,000,000	150,000	13% over the last two years	Increased gas prices, influx of people from New Orleans and Ridership from the Commuter rail.
GALAVAN/Streamline Advisory Board	Bozeman	MT	2007	75,868	75,868	20%	We began service in FY 07. People are getting used to the service and using it more.
George Mason University	Fairfax	VA	---	200,000	200,000	---	---
Georgia Institute of Technology	Atlanta	GA	2007	~2,300,000		Average 5% to 6% per year for last 5 years	Cost of campus parking; increasing cost of operating a vehicle; incentives offered for using alternate mode
Go West Transit, Western Illinois University	Macomb	IL	2007	~1,570,000	~1,450,000	18%	More service, gas prices
Harvard University	Cambridge	MA	2007	---	---	10%	Additional services and an increase in charter services
Hillsborough Area Regional Transit Authority	Tampa	FL	2007	11,000,000	1,687,983	---	---
Huskie Line	DeKalb	IL	---	1,800,000	---	15%	Areas of growth to accommodate more students
Indiana University Campus Bus Service	Bloomington	IN	2007	~3,100,000	~3,100,000	100% increase in the past 3 years	Universal pre-paid access was implemented for the FY 2005-2006 school year

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TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
Indianapolis Public Transportation Corp. (IndyGo)	Indianapolis	IN	2006	~8,300,000[1]	2,198,000	4.3%	Increase in fuel costs and traffic congestion
Kalamazoo Metro Transit System	Kalamazoo	MI	2007	~3,000,000	687,000	-10 to -15%	Reduction in service levels by the university due to budget constraints
King County Metro	Seattle	WA	2006	~103,200,000	~21,700,000	2.0%[3]	Limits and cost and parking, gas prices, campus population growth, targeted service enhancements
Lee County Transit	Fort Myers	FL	2007	3,037,194	23,578	36% over six years	Population growth
Louisiana State University	Baton Rouge	LA	2006-2007	Unknown	2,300,000	---	---
Loyola College in MD	Baltimore	MD	---	160,000	160,000	12%	More students more routes, crime
Mass Transportation Authority	Flint	MI	2007	~5,300,000	---[2]	~14.5% increase	Fuel prices, local economy, wide variety of services offered, growing work related transportation needs
Metro Transit, City of Madison	Madison	WI	2006	12,306,641	9,709,475	4.9%	Unlimited ride pass programs (University and other large employers) have had the greatest impact on growth, and increasing gas prices have helped maintain this growth where a leveling-off trend might have otherwise been expected.
Miami University	Oxford	OH	2006-2007	766,241	766,241	---	---
Mississippi State University	Starkville	MS	2006-2007	506,668	6,098	~10%	Zoning parking and cutting stops on campus. This helps to be more efficient in bringing transporting to a central hub.

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TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
MIT Parking and Transportation	Cambridge	MA	2007	700,000	700,000	---	---
Montana Office of Transportation	Missoula	MT	2007	274,628	---	2008 ridership is up 11.5%	Added new route
Mountain Line	Missoula	MT	2007	735,243	---	---	---
NC State University	Raleigh	NC	---	1,845,399	1,845,399	---	---
Northern Iowa Student Government	Cedar Falls	IA	2006	46,800	46,800	10%	1 - Students are more aware of this service. 2 - The route has expanded its service.
Oklahoma State University Parking and Transit Services	Stillwater	OK	---	750,240	460,455	4.96%	Increased awareness of routes to campus from off-campus students/lack of on-campus parking
Oregon Institute of Technology	Klamath Falls	OR	---	---	---	---	---
Parking and Transit Services	Auburn	AL	2007	656,208	203,112	---	---
Pullman Transit	Pullman	WA	2006	1,260,194	1,260,194	3.55%	Better service along with an increase in students living in off campus apartments
Purdue University	West Lafayette	IN	---	~4,500,000	---	---	Free rides to Purdue students, faculty, and staff
Razorback Transit, University of Arkansas	Fayetteville	AR	2007	1,272,041	---	-3.9%	Shifting demographics
Riverside Transit Agency	Riverside	CA	2006-2007	~7,000,000	~1,500,000	~3%	Growing population, price of gasoline
Rutgers University	New Brunswick	NJ	---	6,113,545	---	---	---
Saginaw Transit Authority Regional Services (STARS)	Saginaw	MI	2007	771,299	33,600	Approx. 11% over FY2006	Reliable service, poor local economy, higher gas prices

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TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
Santa Cruz Metropolitan Transit District	Santa Cruz	CA	2007	5,610,543	2,307,457	~5%	Growing student enrollment
Santa Cruz Metropolitan Transit District	Santa Cruz	CA	2007	5,610,543	1,358,981	Stayed the same	Probably would have grown until Cabrillo built new parking garages.
Student Government Association - Texas Tech University	Lubbock	TX	---	1,800,000	1,150,000	6%	Better structuring of our routes. Consistent service throughout the day instead of great service in mornings and poor service in the afternoons.
SunLine Transit Agency	Thousand Palms	CA	---	---	---	---	---
Syracuse University	Syracuse	NY	2007-2008	---	120,000	---	---
T&PS	UC San Diego	CA	2007	12,400,000	400,000	---	---
Thomas M. Cooley Law School	Lansing	MI	---	---	---	grown	Increased presence of CATA on the Cooley Law School campus at student fairs, etc.
Transfort	City of Fort Collins	CO	2006	1,479,717	516,747	10.9%	Addition of three new routes to an unserved portion of the city has assisted in this growth.
Transportation & Mail Services, Cornell University	Ithaca	NY	2007	~3,000,000	~2,400,000	33% since 1999	Due largely to parking fees and gas fees
Transportation Services (Penn Transit)	Philadelphia	PA	2007	553,962	451,541	---	---
UC Irvine Parking and Transportation Services	Irvine	CA	---	---	---	~10%	Campus population growth
UCLA Transportation	Los Angeles	CA	---	~1,200,000	~1,200,000	~2%	Growing student population
UMass Transit	Amherst	MA	2007	2,553,359	2,553,359	5%	Increase in fuel prices
UNC Chapel Hill	Chapel Hill	NC	---	1,800,000	1,800,000	12%	Decrease in on campus parking availability

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TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
Unitrans	Davis	CA	2007	3,174,000	3,124,000	Over the past three years, about the same; growth over a longer time period	---
Univ. of North Texas	Denton	TX	---	1,800,000	1,500,000	1000% in five years	Student fee and interlocal agreement
University of Alabama	Tuscaloosa	AL	---	---	---	~5%	Positive experiences when students are riding
University of Arizona Parking & Transportation Services	Tucson	AZ	2006-2007	504,402	504,402	10%	Increased enrollment, high quality service, and increased cost of fuel
University of Chicago	Chicago	IL	2007	1,027,666	165,741	54%	Improved routes and schedules, faculty and staff ride more routes for free
University of Connecticut	Storrs	CT	---	1,340,000	1,300,000	25-50% over 7-9 years	Publicity, expanded routes, reliability
University Of Delaware	Newark	DE	2007	584,820	584,820	15%	Increased enrollment & housing consolidation
University of Iowa - Cambus	Iowa City	IA	2007	3,706,997	3,706,997	4.6% since FY 06	Parking availability & cost, changes in facilities, reduced use of cars by students, pedestrian improvements
University of Michigan Parking and Transportation Services	Ann Arbor	MI	2006-2007	5,827,942	5,827,942	3%	Growth in student body, growth in need for travel between campuses as development continues
University of Minnesota	Minneapolis	MN	2006-2007	3,768,912	3,768,912	3.10%	Introduction of UPass/MetroPass bus pass program. Fewer people driving to campus and parking at the parking lots we service
University of Nebraska @ Omaha	Omaha	NE	2006-2007	---	265,000	10%	Less available parking on campus due to construction

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TABLE E1 (*Continued*)

Respondent			Ridership for System Reported			Ridership Trends	
Organization	**City**	**State**	**Fiscal Year Reporting**	**Annual passenger trips, total system:**	**Annual passenger trips, routes serving school only:**	**Ridership growth or decline**	**Given Reasons for Change in Ridership**
University of New Hampshire Transportation Services	Durham	NH	2007	1,088,474	1,088,474	16%	Gas prices, limited parking on campus
University of Pittsburgh	Pittsburgh	PA	---	1,000,000	1,000,000	4%	Increased enrollment
University of South Florida	Tampa	FL	2006-2007	877,198	301,774	---	---
University of Washington	Seattle	WA	2007	331,859	---	2%	---
University of Wisconsin Transportation Services	Madison	WI	---	---	---	---	---
Utah State University Aggie Shuttle	Logan	UT	2007	196,000	196,000	---	---
Virginia Tech	Blacksburg	VA	2007	2,445,799	---	-2.5%	Total ridership declined by 2.5% following the shootings on April 16th at Virginia Tech. Students were given the option of not returning to VT after the shootings. Prior to the shootings, ridership had been up 2% over the same period in 2006.
Western Kentucky University	Bowling Green	KY	2007	388,975	388,975	75%	Adjustments to routes to meet needs of customers; Improvements in reliability and frequency of service; New transit equipment (as opposed to school buses)

[1]Fixed route only.
[2]New service, began August 2007.
[3]Fall 2005 to Fall 2006 on routes serving University of Washington.
--- indicates data not available or appropriate. (Short-form survey did not contain the questions on growth/decline in ridership or reasons for the change.)

APPENDIX F

School Index

TABLE F1
SCHOOL INDEX

School Name	City	State	City Population	City Character	Full Time Enrollment	Part Time Enrollment	School Website
Appalachian State University	Boone	NC	15,000	Suburban/Small Urban	13,000	2,000	www.appstate.edu
Arizona State University	Tempe	AZ	165,000	Suburban/Small Urban	49,441	14,953	www.asu.edu
Auburn University	Auburn	AL	42,987	Semi-Rural	24,137	--	www.auburn.edu
Cabrillo College	Santa Cruz	CA	250,000	Suburban/Small Urban	13,000 [combined full & part-time]		www.cabrillo.edu
Clemson University	Clemson	SC	15,000	Rural	17,309	--	www.clemson.edu
College of the Desert (Community College)	Thousand Palms	CA	415,000	Urban	--	--	www.collegeofthedesert.edu
Colorado State University	Fort Collins	CO	130,000	Suburban/Small Urban	21,510	3,473	www.colostate.edu
Cornell University	Ithaca	NY	30,000	Suburban/Small Urban	19,639	--	www.cornell.edu
East Carolina University	Greenville	NC	75,000	Urban	18,607	5,744	www.ecu.edu
Emory University	Atlanta	GA	292,000	Suburban/Small Urban	12,338	--	www.emory.edu
Florida Gulf Coast University	Fort Myers	FL	585,608	Suburban/Small Urban	6,534	2,859	www.fgcu.edu
Florida State University	Tallahassee	FL	275,000	Urban	40,000	--	www.fsu.edu
George Mason University	Fairfax	VA	260,000	Suburban/Small Urban	16,267	13,622	www.gmu.edu
Georgia Institute of Technology	Atlanta	GA	4,029,400	Urban	16,668	2,074	www.gatech.edu
Harvard University	Cambridge	MA	101,355[4]	Urban	11,000	10,000	www.harvard.edu

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TABLE F1 (*Continued*)

School Name	City	State	City Population	City Character	Full Time Enrollment	Part Time Enrollment	School Website
Indiana University	Bloomington	IN	60,000	Suburban/Small Urban	39,000	--	www.indiana.edu
Indiana University-Purdue University Fort Wayne	Fort Wayne	IN	220,000	Suburban/Small Urban	7,000	5,000	www.ipfw.edu
Indiana University-Purdue University Indianapolis	Indianapolis	IN	1,000,000	Urban	29,800	--	www.iupui.edu
Iowa State University	Ames	IA	52,319	Suburban/Small Urban	--	--	www.iastate.edu
Louisiana State University	Baton Rouge	LA	450,000	Suburban/Small Urban	30,000+ [combined full & part-time][5]		www.lsu.edu
Loyola College in Maryland	Baltimore	MD	1,000,000	Urban	3,400	3,300	www.loyola.edu
Massachusetts Institute of Technology	Cambridge	MA	102,000	Urban	10,000	0	web.mit.edu
Miami University	Oxford	OH	15,000	Suburban/Small Urban	15,000	2,000	www.muohio.edu
Michigan State University	Lansing	MI	250,000	Urban	40,500	6,000	www.msu.edu
Mississippi State University	Starkville	MS	40,000	Rural	17,000	--	www.msstate.edu
Montana State University	Bozeman	MT	40,000	Semi-Rural	9,615	2,723	www.montana.edu
North Carolina State University	Raleigh	NC	1,500,000	Urban	21,696	6,842	www.ncsu.edu
Northern Illinois University	DeKalb	IL	50,000	Semi-Rural	25,000	--	www.niu.edu
Oklahoma State University	Stillwater	OK	38,000	Semi-Rural	17,187	3,769	www.okstate.edu
Oregon Institute of Technology	Klamath Falls	OR	55,000	Semi-Rural	2,000	800	www.oit.edu
Pennsylvania State University	State College	PA	85,000	Suburban/Small Urban	42,000	1,000	www.psu.edu
Purdue University	West Lafayette	IN	125,000[1]	Suburban/Small Urban[2]	39,228[3]	--	www.purdue.edu
Rutgers University, Busch Campus	Piscataway	NJ	150,000	Suburban/Small Urban	38,400	1,400	nb.rutgers.edu
Rutgers University, College Avenue Campus	New Brunswick	NJ	50,000	Urban	28,432	5,960	nb.rutgers.edu
Saginaw Valley State University	Saginaw	MI	3,200	Rural	6,656	3,006	www.svsu.edu

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TABLE F1 (*Continued*)

School Name	City	State	City Population	City Character	Full Time Enrollment	Part Time Enrollment	School Website
Southern Methodist University	Dallas	TX	1,000,000	Urban	10,941	--	www.smu.edu
State University of New York College at Geneseo	Geneseo	NY	9,600	Rural	5,344	204	www.geneseo.edu
Syracuse University	Syracuse	NY	456,777[1]	Urban	13,000	3,000	www.syr.edu
Texas A&M University	College Station	TX	150,000	Rural	47,000	--	www.tamu.edu
Texas Christian University	Fort Worth	TX	850,000	Urban	6,000	2,000	www.tcu.edu
Texas State University	San Marcos	TX	50,000	Suburban/Small Urban	28,123	--	www.txstate.edu
Texas Tech University	Lubbock	TX	210,000[1]	Suburban/Small Urban	23,800[3]	4,200[3]	www.ttu.edu
Thomas M. Cooley Law School	Lansing	MI	200,000	Urban	--	3,500	www.cooley.edu
University of Alabama	Tuscaloosa	AL	75,000	Suburban/Small Urban	24,000	--	www.ua.edu
University of Arizona	Tucson	AZ	1,000,000	Urban	36,337	--	www.arizona.edu
University of Arkansas	Fayetteville	AR	200,000	Suburban/Small Urban	18,000	N/A	www.uark.edu
University of California, Davis	Davis	CA	68,000	Suburban/Small Urban	30,000	--	www.ucdavis.edu
University of California, Irvine	Irvine	CA	202,079	Suburban/Small Urban	N/A	N/A	www.parking.uci.edu
University of California, Los Angeles	Los Angeles	CA	8,000,000	Urban	35,000	1,000	www.ucla.edu
University of California, Riverside	Riverside	CA	305,000	Suburban/Small Urban	17,943	--	www.ucr.edu
University of California, San Diego	San Diego	CA	45,000	Suburban/Small Urban	30,000	4,000	www.ucsd.edu
University of California, Santa Cruz	Santa Cruz	CA	55,000	Semi-Rural	--	--	www.ucsc.edu
University of Chicago	Chicago	IL	9,725,317	Urban	13,750	0	www.uchicago.edu
University of Connecticut	Storrs	CT	32,500	Semi-Rural	22,400	--	www.uconn.edu
University Of Delaware	Newark	DE	28,547	Suburban/Small Urban	17,679	2,663	www.udel.edu

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TABLE F1 (*Continued*)

School Name	City	State	City Population	City Character	Full Time Enrollment	Part Time Enrollment	School Website
University of Florida	Gainesville	FL	123,000[1]	Suburban/Small Urban	--	--	www.ufl.edu
University of Illinois at Urbana-Champaign	Urbana	IL	111,649	Suburban/Small Urban	39,017	3,309	www.uiuc.edu
University of Iowa	Iowa City	IA	82,000	Suburban/Small Urban	24,631	5,778	www.uiowa.edu
University of Massachusetts, Amherst	Amherst	MA	40,000	Semi-Rural	22,500	2,500	www.umass.edu
University of Michigan	Ann Arbor	MI	114,024[1]	Suburban/Small Urban	38,096	2,946	www.umich.edu
University of Michigan, Flint	Flint	MI	450,000	Urban	~2510	~3017	www.umflint.edu
University of Minnesota	Minneapolis	MN	2,820,000	Urban	50,402	4,200	www.umn.edu
University of Montana	Missoula	MT	100,000[1]	Suburban/Small Urban	13,961[3]	--	www.umt.edu
University of Nebraska at Omaha	Omaha	NE	350,000	Urban	12,000	2,800	www.unomaha.edu
University of Nevada, Reno	Reno	NV	400,000	Suburban/Small Urban	12,500	--	www.unr.edu
University of New Hampshire, Durham	Durham	NH	12,600[4]	Semi-Rural	--	--	www.unh.edu
University of North Carolina at Chapel Hill	Chapel Hill	NC	40,000	Suburban/Small Urban	24,000	5,800	www.unc.edu
University of North Carolina at Greensboro	Greensboro	NC	250,000	Suburban/Small Urban	14,300	600	www.uncg.edu
University of North Texas, Denton campus	Denton	TX	108,000	Suburban/Small Urban	34,153	10,141	www.unt.edu
University of Northern Iowa	Cedar Falls	IA	36,000	Semi-Rural	12,000 [combined]		www.uni.edu
University of Pennsylvania	Philadelphia	PA	1,500,000	Urban	20,000	2,000	www.upenn.edu
University of Pittsburgh	Pittsburgh	PA	352,000	Urban	24,000	6,800	www.pitt.edu
University of South Florida (USF)	Tampa	FL	1,000,000[1]	Suburban/Small Urban[2]	25,663	9,407	www.usf.edu
University of Texas at Austin	Austin	TX	1,012,638[1]	Urban[2]	50,201	N/A	www.utexas.edu
University of Washington, Seattle	Seattle	WA	~600,000[1]	Urban	33,480	6,740	www.washington.edu

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TABLE F1 (*Continued*)

School Name	City	State	City Population	City Character	Full Time Enrollment	Part Time Enrollment	School Website
University of Wisconsin, Madison	Madison	WI	203,704[1]	Urban	39,873	1,593	www.wisc.edu
Utah State University	Logan	UT	100,000	Semi-Rural	17,000	--	www.usu.edu/parking
Virginia Tech	Blacksburg	VA	~50,000	Semi-Rural	27,572	--	www.vt.edu
Washington State University	Pullman	WA	27,000	Rural	17,000	800	www.wsu.edu
Western Illinois University	Macomb	IL	21,000	Rural	10,990	2,341	www.wiu.edu
Western Kentucky University	Bowling Green	KY	100,000	Suburban/Small Urban	14,010	5,255	www.wku.edu
Western Michigan University	Kalamazoo	MI	172,000	Suburban/Small Urban	~25,000	N/A	www.wmich.edu

Some respondents included N/A as a response. This could mean either that the data are unavailable or the question is not applicable.
[1]Public agency's city population estimate used.
[2]Public agency's community character response used.
[3]School's estimate of student enrollment used.
[4]2000 Census data.
[5]Data from university website.
-- Indicates no response provided, or the respondent indicated they did not know the answer.

Abbreviations used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
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	Air Transport Association
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
NASAO	National Association of State Aviation Officials
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