

Best Practices for University Transit Bus Programs:  
Identifying Strategies for Success

by

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## Table of Contents

Abstract.....	1
About the Author.....	2
Chapter I Introduction.....	3
Research Purpose.....	5
Benefits of Research.....	5
University of Texas at Austin Background.....	5
University of Texas at Austin Shuttle Bus Program Background.....	6
Capital Metropolitan Transportation Authority Background.....	10
Summary of Chapters.....	11
Chapter II Literature Review.....	12
Chapter Purpose.....	12
Conceptual Framework.....	13
Operations Model.....	14
Funding Model.....	19
Scope of Service Model.....	24
Environmental Responsiveness Model.....	32
Chapter Overview.....	37
Chapter III Methodology.....	38
Chapter Purpose.....	38
Research Technique.....	40
Document Analysis.....	42
Focused Interview.....	44

Operationalization of the University of Texas at Austin’s Shuttle Bus Program: Focused Interviews.....	45
Operationalization of the University of Texas at Austin’s Shuttle Bus Program: Document Analysis.....	52
Human Subjects.....	53
Chapter Overview.....	53
Chapter IV Research Results.....	54
Operations Model.....	55
Funding Model.....	58
Scope of Service Model.....	62
Environmental Responsiveness Model.....	67
Chapter Overview.....	69
Chapter V Conclusion.....	70
Operations Model.....	71
Funding Model.....	71
Scope of Service Model.....	72
Environmental Responsiveness Model.....	73
Future Recommendations.....	74
References.....	76
Appendix A.....	81
Appendix B.....	83

## Abstract

*Purpose:* The purpose of this research project is to develop a practical ideal type model for university transit programs and to gauge the University of Texas at Austin's Shuttle Bus Program against the practical ideal type model.

*Methodology:* To achieve this purpose, university transit program best practices are identified from the review of literature and a practical ideal type model is developed. The practical idea type includes the following key categories: (1) operations model, (2) funding model, (3) scope of service model, and (4) environmental responsiveness model. Based on these practical ideal type components, a focused interview and document analysis will be conducted to gauge the current program's utilization of these components. The evidence collected from the interview and document analysis will be compiled into a best practice for universities to follow.

*Findings:* Overall, the University of Texas at Austin Shuttle Bus Program meets all of the components of the practical ideal type model with the exception of utilization of alternative funding sources and the adoption of integrated passenger information technologies. Using alternative funding sources faces legal constraints due to the current contractual agreements as well as approval from the University Board of Regents. The adoption of integrated passenger information technologies is currently in the development phases and integration of this technology will not begin until 2012.

## About the Author

Blanca Juarez graduated from the University of Texas at Austin with a Bachelor of Science degree in Advertising in 2000. She also received her Masters Degree in Public Administration and a career emphasis in Urban and Environmental Planning in 2011 from Texas State University. She is currently employed as the Alternative Transportation Manager for Parking and Transportation Services at the University of Texas at Austin. In this role, she manages the shuttle bus, mainline, E-bus, Texas Express, bicycle, pedestrian, car share, Longhorns Express, and event transportation programs.

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## Chapter I Introduction

*“Any university that is attempting to make the transition toward sustainability must confront the issue of transportation. The daily movement of people back and forth to campus in automobiles burning fossil fuels is one of the largest impacts a typical educational institution imposes on the life support systems of the planet.”-Will Toor and Spenser W. Havlick*

The role of higher education in environmental stewardship is more visible than ever. The quote above illustrates the large impact that a university can have on the local community and the environment through vehicle pollution and congestion. Students’ daily automobile usage causes major negative impacts from vehicle congestion to the quality of life on campuses. As a result, universities are more heavily scrutinized and because of this scrutiny, many universities are now taking the lead to identify and develop strategies that help to sustain the quality of campus life and environmental ideals (Toor and Havlick 2004, 1-3).

While universities have the ability to implement policy that effects how students arrive and depart from campus, the university cannot overlook the environmental and growth management image it conveys to the public. By integrating alternative forms of transportation, the university can influence the current travel patterns of students and their future travel practices. As universities continue to experience growth in student population, automobile usage will continue to rise. As a result, this rise has direct effects on vehicle congestion, parking shortages, and increased pollution.

A second reason why universities are more heavily scrutinized is because universities contribute to the growth in knowledge concerning environmentalism and sustainability through community outreach and practice. Universities are creating new campus environmental centers and sustainability departments that focus on greening the campus and promoting alternative transportation initiatives. Students also help with this effort through peer education and the formation of student organizations. These organizations are charged with encouraging the university to become environmentally friendly and whose main objective is to keep environmentalism at the forefront of campus development. These objectives are accomplished through the adoption of green alternatives to everyday tasks, creating sustainable solutions, and pushing for more alternative transportation programs such as carpool, car share, and transit programs that help to alleviate such concerns as pollution and congestion.

Lastly, universities provide the grounds for excellent research opportunities for the development of alternative transportation programs and technologies; as they are at the forefront of emerging research, design techniques, and developing trends. As a result, students and universities are able to be involved in the creation of emerging technologies and adaptation of new practices. The success of these techniques and trends are likely to serve as a framework for use by many universities (Toor and Havlick 2004, p 243-4).

## Research Purpose

This research project assesses current trends in university transit programs. Based on the review of literature, best practices are identified and a practical ideal type model is developed. The research purpose is to gauge the University of Texas at Austin's (UT-Austin) Shuttle Bus Program against the practical ideal type model.

## Benefits of Research

This research project is important for two reasons. First, the research will provide a comprehensive list of best practices. This list will inform the reader of existing university transportation programs and facilitate identification of areas for improvement for these systems. Second, the shuttle bus program for UT-Austin will be assessed and recommendations will be made on how to efficiently improve the program. These recommendations will serve as guidelines for universities to operate transit programs that meet best practices.

## University of Texas at Austin Background

Established in 1883, The University of Texas at Austin is one of one the largest public research universities in the nation as well as the largest institution of The University of Texas System. The University is home to 17 colleges/schools, 51,000 students and 24,000 faculty and staff members as it currently states on its website. UT-Austin is situated on nearly 350 acres and is set in the center of a sprawling central business district, affluent residential areas, and commercial and suburban development. Figure 1.1 provides an illustration of the current campus layout.





Figure 1.1: University of Texas at Austin Map

## University of Texas at Austin Shuttle Bus Program Background

According to Parking and Transportation Services, in 1957 the first student shuttle system was formed by the Phi Kappa Psi Fraternity (PKP). PKP purchased a 1948 school bus and began offering shuttle service from the west of campus area to the main campus for a \$6 monthly fee. Due to the success of the fraternity-run shuttle, several proposed shuttle plans were submitted to the University Board of Regents to create an official program. In 1969, a shuttle bus proposal with a mandatory \$2 per semester student fee was adopted. The contract was awarded to Transportation Enterprises, Incorporated (TEI). As the system expanded, new routes and adjustments to hours of service were added to serve the students living off campus.



Picture 1.1: 1975 Original school buses used by TEI for UT-Austin Shuttle Bus Program

As the program continued to grow, TEI was unsuccessful in meeting the needs of the University and as a result, in 1989 Capital Metropolitan Transportation Authority (Capital Metro) was awarded the contract to provide transit services. As part of the partnership, all students are able to ride all of the mainline and UT-Austin shuttles fare-free with their student identification cards.



Picture 1.2: 1991, Capital Metro UT-Austin Shuttles

Throughout the years, the shuttle system has continued evolve to fit the needs of the University. Currently, there are 14 UT-Austin shuttle routes comprised of 3 circulators that operate around the university grounds, 1 inter-campus that operates to and from offsite facilities, and 10 radial routes that operate throughout the City of Austin.

UT-Austin now has one of the oldest and largest shuttle bus systems in the nation, boarding nearly 6.5 million passengers annually. There are a total 87 buses that make up the fleet and of those, 72 are utilized during peak hours. This makes the shuttle bus program a significant congestion mitigation tool given the number of students that are enrolled. Table 1.1 provides a list of all UT-Austin shuttle routes in operation today.

Figure 1.2, provides a current UT-Austin shuttle route system map.





Picture 1.3: Current UT-Austin shuttle bus fleet

Table 1.1: University of Texas at Austin Shuttle Route Descriptions

Shuttle Route Name	Description
FA- Forty Acres	Campus Circulators
WC- West Campus-	Campus Circulators
EC- East Campus	Campus Circulators
PRC- Pickle Research Center	Inter-Campus Route
CP- Crossing Place	Radial Route
CR-Cameron Road	Radial Route
ER-Enfield Road	Radial Route
FW-Far West	Radial Route
IF-Intramural Fields	Radial Route
LA-Lake Austin	Radial Route
LS-Lake Shore	Radial Route
NR-North Riverside	Radial Route
RR-Red River	Radial Route
WL-Wickersham Lane	Radial Route

Source: <http://www.utexas.edu/parking/transportation/shuttle/>

**CAPITAL METRO  
ROUTES SERVING  
THE UT CAMPUS**

**23RD STREET  
SEE INSET BELOW**

**Legend:**

- Orange line: Campus
- Blue line: Street Outside
- Green line: Near 23rd Street
- Yellow line: Surrounding
- Red line: San Jacinto
- Dark Red line: Clear Forks
- Light Blue line: Liberty
- Dark Blue line: Martin Luther King
- Light Green line: Red River
- Dark Green line: West Campus
- Light Yellow line: Wickham Lane
- Dark Yellow line: North Riverside
- Light Orange line: Far West
- Dark Orange line: International Fields
- Light Blue line: Lake Austin
- Dark Blue line: Lakeshore
- Light Green line: Forty Acres
- Dark Green line: Pickett Research Center
- Light Yellow line: West Campus
- Dark Yellow line: Wickham Lane
- Light Orange line: Far West
- Dark Orange line: International Fields
- Light Blue line: Lake Austin
- Dark Blue line: Lakeshore
- Light Green line: Forty Acres
- Dark Green line: Pickett Research Center

**Routes**

- 1000 Austin-Lamar / South Congress
- 1001 Westview / South Fwy
- 1002 Doss / Doss Springs
- 1003 South First / Red River
- 1004 Martin Luther King
- 1005 East Campus
- 1006 Manor Hill / Burnside
- 1007 Exposition
- 1008 Central
- 1009 Westview / Burnside

**Stops**

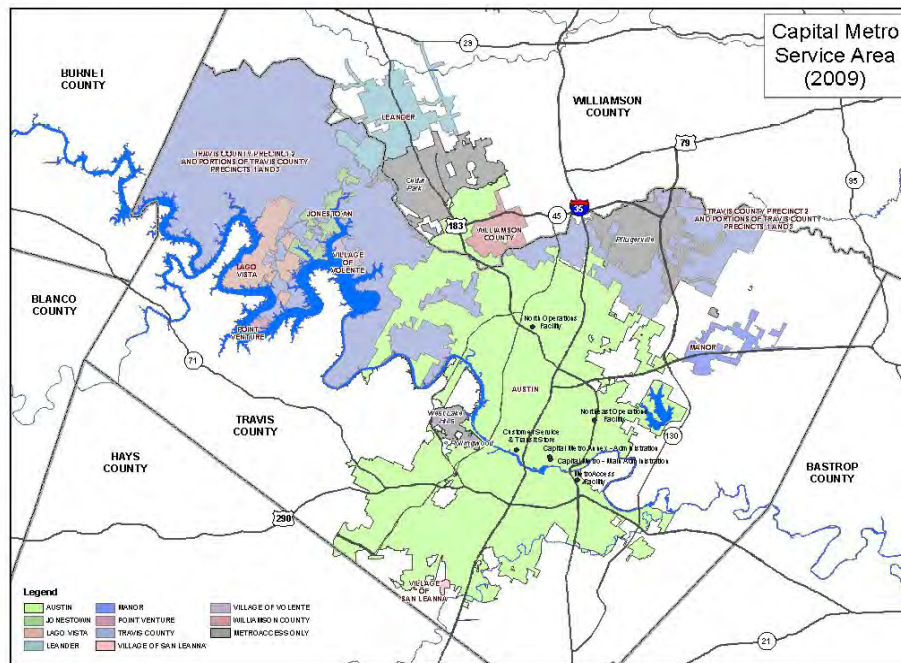
- 1010 23rd St. / 38th St.
- 1011 42nd St. / 45th St. / 47th St.
- 1012 48th St. / 51st St.
- 1013 52nd St. / 55th St.
- 1014 58th St. / 61st St.
- 1015 65th St. / 68th St.
- 1016 72nd St. / 75th St.
- 1017 80th St. / 83rd St.
- 1018 88th St. / 91st St.
- 1019 95th St. / 98th St.
- 1020 102nd St. / 105th St.
- 1021 110th St. / 113th St.
- 1022 118th St. / 121st St.
- 1023 125th St. / 128th St.
- 1024 132nd St. / 135th St.
- 1025 140th St. / 143rd St.
- 1026 148th St. / 151st St.
- 1027 155th St. / 158th St.
- 1028 162nd St. / 165th St.
- 1029 170th St. / 173rd St.
- 1030 178th St. / 181st St.
- 1031 185th St. / 188th St.
- 1032 192nd St. / 195th St.
- 1033 200th St. / 203rd St.
- 1034 208th St. / 211th St.
- 1035 215th St. / 218th St.
- 1036 222nd St. / 225th St.
- 1037 230th St. / 233rd St.
- 1038 238th St. / 241st St.
- 1039 245th St. / 248th St.
- 1040 252nd St. / 255th St.
- 1041 260th St. / 263rd St.
- 1042 268th St. / 271st St.
- 1043 275th St. / 278th St.
- 1044 282nd St. / 285th St.
- 1045 290th St. / 293rd St.
- 1046 298th St. / 301st St.
- 1047 305th St. / 308th St.
- 1048 312nd St. / 315th St.
- 1049 320th St. / 323rd St.
- 1050 328th St. / 331st St.
- 1051 335th St. / 338th St.
- 1052 342nd St. / 345th St.
- 1053 350th St. / 353rd St.
- 1054 358th St. / 361st St.
- 1055 365th St. / 368th St.
- 1056 372nd St. / 375th St.
- 1057 380th St. / 383rd St.
- 1058 388th St. / 391st St.
- 1059 395th St. / 398th St.
- 1060 402nd St. / 405th St.
- 1061 410th St. / 413th St.
- 1062 418th St. / 421st St.
- 1063 425th St. / 428th St.
- 1064 432nd St. / 435th St.
- 1065 440th St. / 443rd St.
- 1066 448th St. / 451st St.
- 1067 455th St. / 458th St.
- 1068 462nd St. / 465th St.
- 1069 470th St. / 473rd St.
- 1070 478th St. / 481st St.
- 1071 485th St. / 488th St.
- 1072 492nd St. / 495th St.
- 1073 500th St. / 503rd St.
- 1074 508th St. / 511st St.
- 1075 515th St. / 518th St.
- 1076 522nd St. / 525th St.
- 1077 530th St. / 533rd St.
- 1078 538th St. / 541st St.
- 1079 545th St. / 548th St.
- 1080 552nd St. / 555th St.
- 1081 560th St. / 563rd St.
- 1082 568th St. / 571st St.
- 1083 575th St. / 578th St.
- 1084 582nd St. / 585th St.
- 1085 590th St. / 593rd St.
- 1086 598th St. / 601st St.
- 1087 605th St. / 608th St.
- 1088 612nd St. / 615th St.
- 1089 620th St. / 623rd St.
- 1090 628th St. / 631st St.
- 1091 635th St. / 638th St.
- 1092 642nd St. / 645th St.
- 1093 650th St. / 653rd St.
- 1094 658th St. / 661st St.
- 1095 665th St. / 668th St.
- 1096 672nd St. / 675th St.
- 1097 680th St. / 683rd St.
- 1098 688th St. / 691st St.
- 1099 695th St. / 698th St.
- 1100 702nd St. / 705th St.
- 1101 710th St. / 713th St.
- 1102 718th St. / 721st St.
- 1103 725th St. / 728th St.
- 1104 732nd St. / 735th St.
- 1105 740th St. / 743rd St.
- 1106 748th St. / 751st St.
- 1107 755th St. / 758th St.
- 1108 762nd St. / 765th St.
- 1109 770th St. / 773rd St.
- 1110 778th St. / 781st St.
- 1111 785th St. / 788th St.
- 1112 792nd St. / 795th St.
- 1113 800th St. / 803rd St.
- 1114 808th St. / 811st St.
- 1115 815th St. / 818th St.
- 1116 822nd St. / 825th St.
- 1117 830th St. / 833rd St.
- 1118 838th St. / 841st St.
- 1119 845th St. / 848th St.
- 1120 852nd St. / 855th St.
- 1121 860th St. / 863rd St.
- 1122 868th St. / 871st St.
- 1123 875th St. / 878th St.
- 1124 882nd St. / 885th St.
- 1125 890th St. / 893rd St.
- 1126 898th St. / 901st St.
- 1127 905th St. / 908th St.
- 1128 912nd St. / 915th St.
- 1129 920th St. / 923rd St.
- 1130 928th St. / 931st St.
- 1131 935th St. / 938th St.
- 1132 942nd St. / 945th St.
- 1133 950th St. / 953rd St.
- 1134 958th St. / 961st St.
- 1135 965th St. / 968th St.
- 1136 972nd St. / 975th St.
- 1137 980th St. / 983rd St.
- 1138 988th St. / 991st St.
- 1139 995th St. / 998th St.
- 1140 1002nd St. / 1005th St.
- 1141 1010th St. / 1013th St.
- 1142 1018th St. / 1021st St.
- 1143 1025th St. / 1028th St.
- 1144 1032nd St. / 1035th St.
- 1145 1040th St. / 1043rd St.
- 1146 1048th St. / 1051st St.
- 1147 1055th St. / 1058th St.
- 1148 1062nd St. / 1065th St.
- 1149 1070th St. / 1073rd St.
- 1150 1078th St. / 1081st St.
- 1151 1085th St. / 1088th St.
- 1152 1092nd St. / 1095th St.
- 1153

## Capital Metropolitan Transportation Authority Background

Capital Metro has a service area of approximately 560 square miles and services nearly 1 million riders annually. In 2010, Capital Metro reported ridership of 130,000 trips per day, and the highest per capita ridership in the state of Texas. Capital Metro

currently operates 90 metro routes. Figure 1.2, provides an illustrated description of the Capital Metro service area.

Figure 1.2: Capital Metro Service Area Map



Source: <http://www.capmetro.org/gisdata/gisdata.asp>

## Summary of Chapters

Chapter Two provides a synopsis of the scholarly literature that was used for the applied research project. This literature helped to develop the practical ideal types for the conceptual framework. The conceptual framework was operationalized and the data collection details are presented in Chapter Three. In this chapter, the methodology is discussed in further detail including the analysis of data and the focused interview questions. Chapter Four examines the results of the data that was collected from the documents and the focused interview. The final chapter, Chapter Five summarizes the findings.

## Chapter II Literature Review

### Chapter Purpose

The purpose of this chapter is to review the literature examining university transit programs and develop a practical ideal type model. The practical ideal type model will represent the best practices that are identified by the scholarly literature (Flores 2010, 15). For this applied research project, a review of the literature will emphasize the best practices for university transit programs and incorporates the components of operations model, funding model, scope of service model, and environmental responsiveness model. The identified components are converted into a practical ideal type for university transit programs and are described in detail below. Creating a practical ideal type model is important because will provide the researcher with best practices that will allow the individual to understand and improve on reality (Shields and Tajalli 2006, 325; Shields and Tajalli 1998, 215).

Universities are able to improve the livability of their campus through the reduction of emissions as they face rapid student and general population growth in the surrounding areas (Toor and Havlick 2004, 1-3). Rapid growth in populations results in vehicle traffic, parking shortages, air pollution, and ultimately diminishing quality of life. Factors such as the shortage of land, high costs associated with construction of parking facilities, and the desire to preserve campus green space has forced institutions to take action and find ways to mitigate traffic congestion, improve mobility options, and increase student accessibility to campus.

Best practices in student transportation access and mobility are still emerging as universities continue to grow (Balsas 2003, 35). While no university transit program uses all of the best practices, a review of the effective practices has resulted in practical ideal type standards. Many of these standards can be attained when universities choose to partner with public transit agencies.

### Conceptual Framework

The conceptual framework is organized into four sections including: (1) operations model, (2) funding model, (3) scope of service model, and (4) environmental responsiveness model and is presented in Table 2.1. The conceptual framework will list all the elements of a successful practical ideal type model and will link the components to their supporting literature (Whitmore 2006, 21). Each of the components and subcomponents identified in the conceptual framework are described in detail within the following section.



Table 2.1: Conceptual Framework as it Links to the Literature

Ideal Type Categories	Supporting Literature
<b>Operations Model</b> <ul style="list-style-type: none"> <li>Joint Partnership Model</li> </ul>	Miller, 2001; Krueger and Murray, 2008; Brown et al., 2001; Toor and Havlick 2004; Meyer and Beimborn, 1998; Nuworsoo, 2005; Brown et al., 2003; Williams and Petrait, 2008
<b>Funding Model</b> <ul style="list-style-type: none"> <li>Mandatory Student Fee Model</li> <li>Alternative Funding Model</li> </ul>	Block-Schachter and Attaanucci, 2008; Toor and Havlick, 2004; Daggett and Gutkowski, 2003; Bond and Steiner 2006; Myers et al., 2006; Addonizio, 2000; Millard-Ball et al., 2004
<b>Scope of Service Model</b> <ul style="list-style-type: none"> <li>Levels of Service</li> <li>Safety and Security</li> <li>Integrated Passenger Information Technologies</li> </ul>	Balsas, 2003; Daggett and Gutkowski, 2003; Toor and Havlick, 2004; Bond and Steiner, 2006; Brown, et al., 2001; Boyd et al., 2003; Brown et al., 2003; Meyer and Beimborn, 1998; Myers et al., 2006; Salter and Miller, 1983; Gerhard, 1984; Millard-Ball et al., 2004; Miller 2001; Molloy, 1974; ; Williams and Petrait, 2008; Poinsette and Toor, 1999; Elam et al., 2006; Burt 2008
<b>Environmental Responsiveness Model</b> <ul style="list-style-type: none"> <li>Utilization of Green Fuels</li> </ul>	Department of Energy, 2003; Cohen et al., 2003; Schimek, 2001; Sutcliffe, 2000; Toor, 2003; Patil et al., 2010; Galivan, 2003; General Accounting Office, 1999; Union of Concerned Scientists, 2003; Davis and Hale, 2007; Martinez and Castaneda-Calleros, 2009

## Operations Model

The operations model determines the mobility alternatives available to universities who are adopting or managing a transit program. The literature identifies three different types of commonly utilized practices for university transit operations: (1) a privately operated program which is operated and managed solely by the university,

(2) a regional or municipal program which is operated and managed solely by the transit provider with no input from the university, and (3) a combination of the two, known as a joint partnership program which is based on an agreement where the transit agency operates the service but the university manages it (Miller 2001, 14).

Determining which of these transit models is the best method is difficult to answer as it depends heavily upon the priorities of the university. The joint partnership model has been adopted by many universities across the U.S., supporting the view that these partnerships are an “effective way to deliver transit to both a school and the wider community” (Krueger and Murray 2008, 11).

University transit programs at their core serve two main purposes for a campus, to link the students to the campus and the surrounding community and to provide campus and city circulation as demonstrated in Table 2.2. This table lists the primary purposes of university transit programs as identified by 30 surveyed universities (Krueger and Murray 2008, 9-10). The joint partnership model best addresses the top three highest rated purposes of providing on campus circulation and providing a link between the campus and the city.

Table 2.2: What Primary Purpose(s) Does Transit Serve for the School?

Purpose Served	% of Total Responses	% of School Respondents	% of Government or Transit Agency Respondents
On-Campus Circulation	79	93	62
Inter-Campus Circulation	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

Source: TCRP SYNTHESIS 78

The joint partnership model is the optimal choice for many universities because of the following characteristics: (1) lowest possible cost per student; (2) possibility to negotiate the inclusion of unlimited fare-free and flexible access to other transit services for the term of the partnership; (3) university control on how campus-specific routes are operated; and (4) shared cost on transit expenses such as vehicles, insurance, gas, and bus shelter infrastructure (Brown 2001; Toor and Havlick 2004).

The other operations models, including privately operated systems and regional or municipal systems may not have the ability to offer such extensive services at a low cost while being university managed. Further, they do not maximize a student's access and mobility to campus because of financial and/or municipal/campus planning limitations. The joint partnership practical ideal type component is discussed in detail in the next section.

### *Joint Partnership Model*

A joint partnership is formalized through a partnership/contractual agreement between a university and a local transit provider. A joint partnership agreement provides student access to the public transit system at a negotiated rate (Krueger and Murray 2008, 10-11). For those joint partnerships that are university-managed, the agreement can allow the creation of a dedicated campus shuttle fleet, negotiate the inclusion of unlimited fare-free and flexible access to other transit services, provide input on the structure of existing public routes, and develop new routes as well as other transit related amenities that directly affect the students (Toor and Havlick 2004)

Gaining insight into university expectations in regard to direct routes, extended service times, better frequencies, as well as providing a service that meets the student's needs, is vital to the success of the partnership. A number of universities rely on student government and other forms of student leadership to provide input. Their input can have significant impacts in developing a system that meets the needs of the students (Toor and Havlick 2004, 66-67). Some universities are able to establish transportation/shuttle bus committees comprised of these identified stakeholders that oversee the transit planning process. Table 2.3 identifies common stakeholders in university transit program.

**Table 2.3: Who Participates In The Campus Transit Planning Process?**

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

Source: TCRP Synthesis 78

When universities partner with transit agencies to form a joint partnership, the university benefits. These benefits include: the option of creating a dedicated shuttle fleet for university specific routes, the ability to provide increased service, flexible route planning, better access to campus, employment, housing, as well as the reduction of vehicle traffic and emissions (Meyer and Beimborn 1998, 137). These benefits make this model the most effective operational model.

Partnerships not only benefit universities but also transit agencies, in particular those that are experiencing low ridership. The partnership allows transit agencies to receive guaranteed revenue from universities while filling empty seats with students during off-peak periods (Meyer and Beimborn 1998, 136-7). This is important because during transit's peak in the 1940s, average ridership equated to 24 billion passengers annually across the nation. Today, annual transit ridership has fallen to less than 9 billion passengers nationwide (Nuworsoo 2005, 151). This decline in ridership has placed universities in a favorable negotiation position that may result in more benefits that favor the university such as lower costs, leverage on route planning, and increased bus frequencies. As a result of all these factors, a joint partnership program is becoming increasingly popular across the U.S. (Brown et al. 2001, 235-8).

Thus, the joint partnership program is considered a best practice because it is one of the most comprehensive transportation management programs available. Programs such as this are able to offer flexible, high-occupancy vehicle options while decreasing single occupancy vehicle trips (Williams and Petrait 2008, 73).

Following the adoption of a joint partnership, the university must decide how the program will be funded. Best practices suggest that a mandatory student fee option is the most common and effective way to fund the program. This component is discussed in detail in the next section.

## Funding Model

To operate a transit program that is acceptable to the university, sufficient and reliable financial resources must be acquired. These resources can come from a variety of different sources. However, there are three funding sources that are commonly used by universities: (1) opt in which is when the student has the choice to pay into the system; (2) opt out which is when the student has the choice to not pay for service; and (3) universal coverage which is when a mandatory fee is required from all students (Block-Schachter and Attaanucci 2008, 54).

The most common and most effective funding strategy is the mandatory student fee model because the students receive the lowest cost possible per ride while the university is able to generate the largest amount of guaranteed funding. Although, the mandatory student fee option may be more difficult to adopt and may call for student referendums, public hearings and university support, the argument can be made that funding a transit program through mandatory fees is no different than funding any other campus service such as libraries or recreational centers. All students help pay for these services, although some may use it more often than others. Another reason is that the program will reduce driving to campus resulting in less roadway congestion and air pollution. Lastly, those who opt to drive will benefit because there is now a lowered

demand for parking. The other two types of funding: opt in and opt out, force students to pay a higher price for limited service and there is also less of a chance of attracting potential riders (Toor and Havlick 2004, 114-6). The mandatory student fee subcomponent is discussed in detail in the next section.

### *Mandatory Student Fee*

University transit programs funded through a mandatory student fee is the most effective and most utilized form of funding. This form provides the university with the ability to offer fare-free, unlimited access to students at the lowest cost possible per rider. The university prepays the provider to carry members of its community without charging them a fare. By prepaying for services, universities eliminate the individual fare barrier that often keeps students from using public transit (Daggett and Gutkowski 2003, 45).

The extensive use of this model is important because it suggest useful benchmarks for fee structures. Fees for university transit programs typically range from \$10 to \$30 per semester per student. The average cost to students is approximately \$15 per semester (Toor and Havlick, 2004, 25-26). These fees are included as part of the tuition, resulting in a reliable, stable and new revenue stream that is necessary for effective transit planning and the operation of a successful program.

How these fees are collected varies. When there is broad involvement from campus stakeholders, a more transparent and accountable approach can be seen. For example, at the University of Florida students are required to pay a transportation fee as part of their tuition. The seven-member committee comprised of faculty, students, and administrators directs the responsibility of setting and allocating this fee. The student

members serve as the voice of the student body and are charged with deciding how the student fee should be allocated each year. The committee also decides what type of services should be operated. The transportation access fee is authorized as a required fee for all students under the Florida State Statute 240.209 (3) (e) 8 stating that the fees “*support the transportation infrastructure of the university for the purpose of increasing student access to transportation services*” (Bond and Steiner 2006, 134). Table 2.4, provides fee information for what universities charge students to provide service.

Table 2.4: Unlimited Access Program Student Fee Costs (1997-98)

University	Annual Student Fee
University of Florida	\$5
University of Georgia at Athens	\$11
University of New Hampshire-Durham	\$10
Cal State University, Sacramento	\$15
Appalachian State University, NC	\$19
University of Pittsburgh	\$74
University of California, Santa Barbara	\$23
Santa Barbara City College	\$26
University of Massachusetts at Amherst	\$24
Ohio State University	\$27
University of Wisconsin at Madison	\$36
Virginia Polytechnic	\$33
Auraria High Education Center	\$33
University of California, Davis	\$39
University of Colorado at Boulder	\$40
Western Michigan University	\$38
Edmonds Community College	\$60
Marquette University	\$62
University of Wisconsin at Milwaukee	\$60
University of Illinois at Urbana-Champaign	\$50
University of Texas at Austin	\$90
University of California, Santa Cruz	\$83

Source: Brown, Baldwin Hess & Shoup 2001, 236-7



Thus, adopting a mandatory student fee is the best practice because of advantages such as: cheapest cost per ride, the generation of a new guaranteed source of revenue, and the ability to use the fund to pay for other parts of the program including transit stops and passenger schedules (Toor and Havlick 2004, 59-63).

While considered a key element of a practical ideal type funding model, mandatory student fees can sometimes fail in covering the entire cost of the program, additional services, and rises in fuel prices. Therefore, universities must also consider identifying alternative sources of funding. This component is discussed in detail in the next section.

### *Alternative Funding*

To achieve an optimal level of transit service on a university campus, supplemental funding sources should be utilized, especially when the mandatory student fee does not cover the entire cost of the program. Universities have access to other commonly used funding sources including: parking permit, citations, and daily parking revenues (Myers et al. 2006, 133). For instance, the University of Washington currently invests \$4 million of their parking funds into their Transportation Management Program that supports university transit operations (Toor and Havlick 2004, 63-64). The rationale for using parking revenue to help fund all or some of a transit program is the ability to decrease demand for parking. At the University of Western Washington, the transit program is primarily funded by a transportation access fee but also by parking revenues that are used to supplement what the fee fails to cover (Myers et al. 2006, 133).

There are many additional alternative sources of funding available that universities can adopt other than parking permit and citation revenue (Addonizio 2000, 70). These sources include: transportation impact fees, campus general fund revenues, optional user fees, federal enhancement funds, as well as Federal Congestion Mitigation Air Quality (CMAQ) funds. Transportation impact fees stipulate that new construction projects must pay for some cost of providing parking and other transportation infrastructure that is generated by the building. Campus general fund revenues are generated by the allocation of funds set aside from core operating revenues and are used to cover the cost of all or some of the program. Federal enhancement funds are primarily used for capital investments in transportation infrastructure enhancements such as curb cut outs, shelters, and bus lanes. Lastly, CMAQ funds are available to help support clean air regulations in areas that may not meet air quality standards and can be used for transit improvements such as converting a fleet to a cleaner fuel (Toor and Havlick 2004, 64-5).

Using CMAQ funds to pay for a transit program is common among universities as they can collaborate with transit agencies on grant applications for CMAQ funding (Millard-Ball et al. 2004, 39). For example, *GO RIO*, the shuttle program for Rio Hondo College, obtained CMAQ funds from the South Coast Air Quality Management District to help fund their university shuttle bus program (Martinez and Castaneda-Calleros 2009, 890). The University of Minnesota used CMAQ funds to start a university transit program for their students while the University of Colorado used CMAQ funds to develop a new high-frequency transit route on their campus (Toor and Havlick 2004, 65).

Thus, identifying and adopting alternative sources of funding is a best practice because the funds can be used to help pay for service; expand routes, hours, and days of service; and cover the cost of rising fuel prices.

Student transit program standards indicate that the provision of services is crucial in sustaining the program. Of those standards, key elements such as levels of service, safety and security, and integrated passenger information technologies must be addressed. These components are discussed in detail in the next section.

### Scope of Service Model

A university transit program's primary purpose is to connect students to campus by providing economical and reliable transportation. This is accomplished through the provision of services based primarily through on-campus and off-campus service planning. On-campus service planning elements include circulator and inter-campus services by moving students around the campus grounds and connecting them with off-site university facilities. Off-campus service planning includes elements such as connectivity to metropolitan areas for activities such as shopping, cultural events, neighborhood/residential housing, and employment sites.

### *Levels of Service*

Campus transit planners and local transit agencies both play an integral role in providing mobility to campus (Balsas 2003, 35). Both entities have developed new and innovative ways to provide economical and efficient transportation options to students (Daggett and Gutkowski 2003, 42). One such development is to provide students with unlimited access to the buses. The success of unlimited access depends heavily on student

adoption of the program and the transit agency's ability to take full advantage of its transportation options by linking bus services to other forms of mass transportation such as heavy/light rail, ferries, and street carts (Toor and Havlick 2004, 41).

Unlimited access systems are growing in popularity across the U.S. due to their effectiveness in providing transportation equity to university communities and maximizing student mobility. Figure 2.1, illustrates the adoption of collegiate unlimited access programs throughout the U.S. Since 1970, universities have implemented variations of the program successfully. This success is measured in the overall growth of ridership after the unlimited access program's adoption. Many universities have experienced an increase in ridership by nearly 50 percent within the first year of implementation and continue to rise within the following years as the program grows and gains popularity (Bond and Steiner 2006, 128). Thus, adoption unlimited access is a best practice because it allows students to take full advantage of the partnership through routes and additional services provided by the transit agency.

Figure 2.1: University Unlimited Access Programs in the U.S.



Source: Brown, Baldwin Hess & Shoup 2001, 238

For a university transit program to sustain itself, the program must take into account several important elements ranging from levels of service allocated, safety and security, and integrated passenger information technologies. These elements are of importance because they represent different areas that involve strategic planning for program success.

For a university transit program to attract new riders and shift students from vehicles, services must meet their needs. This is accomplished through increased frequency and direct routes serving the campus as well as city locations (Bond and Steiner 2006, 128). Improving and adding specialized services, transit programs have the potential to increase student access as well as engage students in local community activities (Brown et al. 2001, 240). Transit use among students indicate that 47 percent of

university transit programs are aimed to provide trips from home to school, 14 percent are geared to provide services to remote park-and-ride facilities or remote campus parking lots, 23 percent are aimed to provide campus circulator services, and 15 percent geared to provide services for student needs off campus (Daggett and Gutkowski 2003, 46).

Programs such as the ULCA *Bruin GO* demonstrate that students utilize services for trips other than just to and from the campus. Students utilized the *Bruin GO* program for personal trips and to connect them to the metropolitan area of Los Angeles and cultural sites (Boyd et al. 2003, 102-108; Brown et al. 2003, 75). For a majority of students at the University of Wisconsin-Madison and Western Washington University, transit bus programs provided transportation, safety, monetary savings, and environmental benefits. A survey of 935 students at Western Washington University found that bus service was the only mode of transportation available for them to access recreational activities, retail, and their employment sites (Meyer and Beimborn 1998, 136; Myers et al. 2006, 138).

Along with course schedules, student employment and entertainment/extra-curricular activity planning considerations are necessary components in providing transportation to students. Several factors play a role in allocating hours and days of service including peak period usage, class changing periods, and employee shift changes (Salter and Miller 1983, 79).

One component in developing a transit program is the consideration of student employment trends. Often, to finance their education and cost of living, students work part-time jobs that require transportation to their place of employment, which is off

campus in most cases (Gerhard 1984, 17). Therefore, university transit programs should provide routes to areas near off-site work facilities and/or extend hours and days of operations to serve these students.

Off-campus housing based on student density is another important planning factor for university transit programs. Due to overall increases in housing costs, student housing has been moving further from campus resulting in the need for additional bus services. University transit programs are often coordinated to provide access to students who choose or are forced to reside off campus. By providing bus service, students can easily adjust their housing locations for more economical living quarters. The University of Pittsburgh transit program has allowed students to move away from housing located near the university and into outlying areas that have better housing opportunities and lower rent (Brown et al. 2001, 244).

As a result, more university transit programs are providing services to dense residential areas in an effort to provide services to students who cannot afford or choose to not live on or near campus (Millard-Ball et al. 2004, 38). Providing transportation options to off-campus housing areas, university transit programs are able to provide transportation services to students while reducing the overall cost of education (Daggett and Gutkowski 2003, 46).

Thus, best practice identifies student's needs and provides them with equitable transportation with minimal interruption to their daily lives. This is accomplished through serving off-campus housing sites, access to the city, transportation to employment sites, and coordinating days and hours of service based on the academic calendar.

The ability to provide safe transportation options is crucial in partnering with a transit agency and convincing students to utilize the transit program as an alternative. These components are discussed in further detail in the following section.

### *Safety and Security*

Safety and security is another important element of the scope of service practical ideal type model. The provision of safety and security has become a motivating factor for adoption or expansion of transit services. University transit programs support safety and security initiatives in three ways: (1) prevention of hitchhiking or walking along unsafe roadways, (2) operation of late into the evening hours which reduces the risk of exposing students to unsafe conditions such as rape and other assaults, and (3) promotion of responsible drinking behavior among students by providing them with an alternative to drinking and driving (Miller 2001, 25-26).

Expansion of late-night transit services provides a higher degree of safety than that of walking or bicycling alone at night or in bad weather. In many past cases, hitchhiking was a common problem that often led to student safety and security issues. With the adoption of late-night transit services or the expansion of current services to extend the operating hours, universities such as Wisconsin and Massachusetts have virtually eliminated the need for hitchhiking and increased safety and security among their students (Brown et al 2001, 240; Molloy 1974, 3). The extension of operation hours is of most importance for students who take evening classes. With the extended service hours, students indicated they felt safer with this option available to them (Williams and Petrait 2008, 79). Other services such as the *Night Safety Shuttle* at the University of



California Berkeley was created as a safe option for pedestrians who study late into the evening or have night classes (Poinsette and Toor 1999, 35).

These types of programs operate late evening hours and provide a driving alternative for students from social establishments to university area housing. Services such as the one at Midwestern University provide students with a safe ride home after campus and city shuttles have stopped services for the evening while addressing safety and security concerns (Elam et al. 2006, 329-72). Safe ride services such as the *Later Gator* bus route at the University of Florida operate special evening routes from 8:30 p.m. to 3:00 a.m. Wednesday through Saturday in response to student suggestions to promote responsible drinking behavior. These routes were created to connect students with evening activities including downtown bars and restaurants. The *Later Gator* has three objectives: (1) to provide evening service to students, (2) reduce the frequency of students driving under the influence of alcohol, and (3) to alleviate parking shortages within the university and city (Bond and Steiner 2006, 137).

Thus adopting evening hours is a best practice because it addresses the university's concern for student safety. The adoption of evening hours is accomplished through the prioritization of student safety needs identified by the university and transit agency. Both parties work together to ensure that the evening services provided are maintained, safe, reliable, and attractive to students.

In order to successfully push transit initiatives, universities and transit agencies must make transit services as convenient as possible. One way of achieving convenience is through offering onboard passenger amenities that fit the lifestyle needs of students. These components are discussed in further detail in the following section.

### *Integrated Passenger Information Technologies*

Transit technologies, including Advanced Public Transportation Systems and information technology services (ITS), are now being applied to the operations of transit systems across the U.S. ITS services include smart card readers on fare boxes, automatic vehicle locaters (AVL) or geographic positioning satellite (GPS), wireless fidelity (WIFI), and electronic passenger schedule information.

Transit technologies are being integrated to help improve efficiency and passenger satisfaction. Technologies such as real-time schedule information that is typically displayed on electronic signboards are now available to passengers on the bus, at transit stops, and in terminals (Miller 2001, 26). These types of services have helped transit agencies maintain passengers and attract new riders by eliminating passenger barriers such as reducing wait times and providing better access to information (Balsas 2003, 38).

Transit traveler information is popular among universities and transit agencies due to the emergence of personal information devices. Devices such as cell phones, PDAs, MP3 players, and laptop computers are able to make transit related information available to the passenger. Automated traveler information can be dispensed in three ways: (1) pre-trip information can be provided to a passenger for the purpose of planning their trip with the information being provided in real time or with static information through posted schedules at transit stops, online, call centers, or published in brochures; (2) wayside/in-terminal information provides real-time and static information on the arrival and departure of buses at stops, terminals, stations, and platforms;

and (3) in-vehicle information provides visual and/or audio announcements for onboard passengers (Burt 2008, 19-20).

Thus, the adoption of passenger information technologies such as AVL, WIFI, and electronic signs for next bus arrival information is a best practice because it addresses customer satisfaction, helps to attract new riders, and maintain existing riders.

As more universities move towards providing equitable transportation to students, they are also responding to the need to provide mobility services that help reduce emissions and improve the environment overall. These components are discussed in further detail in the following section.

### Environmental Responsiveness Model

The last factor that makes up a successful university transit program is the environmental responsiveness model. The most important elements of this model includes: the utilization of green fuels and the reduction of emissions.

As environmental sustainability within higher education receives increased attention, there is now a need to adopt new measures that reduce the university's carbon footprint. Campus transportation services offer opportunities for reducing pollutants and Green House Gas (GHG) emissions as well as reducing energy consumption. Universities that are seeking to reduce their emissions are looking towards alternative fuels and more fuel-efficient vehicles for their fleets (Department of Energy 2003, 13). To help address this concern from universities as well as cities, transit agencies are now adopting alternative fuel technologies to help reduce emissions. The most popular of these

alternatives are emission controlled diesel buses that burn ultra-low sulfur diesel (USLD) fuel (Cohen et al. 2003, 1477).

The US Environmental Protection Agency (EPA) has passed additional policies that transit agencies must comply with to help decrease vehicle emissions. In 2004, the EPA proposed that buses that use USLD mixed with heavy-duty particulate matter and nitrous oxide reduce their emissions by an additional 90 percent. This proposal surpasses the previous levels that were set in 2000. Additional emission reduction programs are included in the 1990 Clean Air Act Amendments to retrofit or rebuild bus engines from transit agencies in the 50 largest urban areas (Schimek 2001, 433-441). According to INFORMA, a nationwide environmental non-profit organization, these new stricter requirements have forced cities and agencies to turn towards the procurement of alternative fueled buses. This represents a major shift by the transportation sector to help reduce air pollution caused by buses (Sutcliffe 2000, 1).

Federal requirements regarding air quality, increased congestion, lack of parking infrastructure, high cost of parking construction, reduction of traffic congestion, and constraints on financial resources have led to the exploration of other options by universities (Balsas 2003, 35). The utilization of green fuels and implementation of alternative transportation to reduce emissions are some of the most common and easily implemented solutions to addressing environmental impacts by universities and are addressed in detail within the next section.

### *Green Fuel Utilization*

Because alternative fuel and cleaner buses are now of importance for cities and universities trying to reach emissions reduction targets, studies indicate that new bus technologies should be reliable, efficient, and environmentally friendly. New emission standards not only decrease emissions and curb climate change; they can create incentives for sustainability. Throughout the years, bus manufacturers and fuel producers have developed new innovative technologies to reduce emissions so they are able to comply with the new standards and provide transit agencies with newer and more efficient technologies (Patil et al. 2010, 129).

Public transit agencies were some of the first organizations to use alternative fuels in transit buses (Cohen et al. 2003, 1477; Schimek 2001, 433). As technology continues to improve, more efficient options are now available. However, most cost-effective alternatives tend to be retrofitting older engines with emission controls and new vehicle standards (Schimek 2001, 433).

Another approach that transit agencies and universities are considering is the use of biodiesel fuel to run shuttle buses. From the low capitol cost for the conversion to the reduction in lifecycle emissions from CO<sub>2</sub>, there are many advantages to making this switch (Toor 2003, 132). Transitioning to greener fuels is a step towards creating a more sustainable campus. Universities across the U.S. have already started the conversion from diesel to other sources of fuel and have observed tremendous benefits. Emory University is operating under a directive to incorporate compressed natural gas shuttles and buses into their campus fleet. They have 20 compressed natural gas buses that are used for shuttling purposes. Pennsylvania State University partners with Centre Area Transit

Authority, among other organizations, and companies to retrofit its transportation fleet with hydrogen and hybrid compressed natural gas/hydrogen engines (Department of Energy 2003, 22-4).

For transit buses, alternative fuels and new vehicle technologies can reduce the amount of GHG emissions per vehicle mile traveled. Nearly 80 percent of U.S. transit buses are powered by conventional diesel engines. Alternative fuels for transit buses include Compressed Natural Gas (CNG), Liquefied Natural Gas, Propane, Biodiesel, Hydrogen, hybrid propulsion systems, and electricity. The rise of alternative fuels has grown over the years; electric vehicles have increased by 18 percent from 1995 to 2006 while CNG has also increased by 14 percent during the same time period (Galivan 2003, 24).

Universities are contributing to GHG emission reductions as transit buses have decreased vehicle traffic and congestion throughout communities (Molloy 1974, 3). At Rio Hondo College, within the first year of implementing their collegiate transit program, nearly 1 ton of emissions were eliminated, ridership increased by 50 percent, and over 500 vehicles were removed from campus (Martinez and Castaneda-Calleros 2009, 889). All of these reductions helped Rio Hondo College promote sustainable transportation initiatives on their campus while creating a cleaner community. The University of Vermont is using 20 percent biodiesel mix on their campus shuttles and the University of California at Davis is in the process of replacing 10 diesel buses with new, low emission shuttles. The clean fuel shuttles will be used frequently, accounting for 85 percent of the mileage accrued for campus travel (Toor 2003, 132).

As universities progress towards pedestrian-friendly campuses, parking real estate diminishes across campuses, and the U.S. Government continues to release new emission standards, universities will be faced with finding new ways to access their campuses by providing equitable transportation alternatives. The daily movement of people in SOVs to and from campus while polluting the atmosphere with fossil fuels is considered to be one of the largest impacts a university can have on its local community. Developing and implementing a transit program for students can reduce the carbon footprint of a university by limiting the need for personal vehicles.

The personal vehicle is now the dominant mode of transportation for individuals across the U.S. with more than 95 percent of personal trips being made by SOVs (Toor 2003, 131). According to the Bureau of Transportation Statistics, vehicle miles traveled in 2001, 2.3 trillion miles, equating to 1,500 trips per person per year. With the staggering implications that an automobile can have on the environment, universities are seeking alternatives to not only promote sustainability but also save money and provide students with accessibility to campus and the community by partnering with local transit providers.

There are a wide variety of options and strategies available that can curb emissions and reduce congestion. Thus the utilization of green fuels is a best practice because it addresses the university's concern for reducing their carbon footprint and the promotion of environmental stewardship among the students.

## Chapter Overview

Chapter Three will outline the methodology that is used to assess The University of Texas at Austin's Shuttle Bus Program. The chapter will also connect the methods used to the conceptual framework.



## Chapter III Methodology

### Chapter Purpose

The review of the literature established four main components of a university transit program. These main components include: (1) operations model, (2) funding model, (3) scope of service model and, (4) environmental responsiveness model. All of the components contain several subcomponents and together they will all be used to gauge the University of Texas at Austin's Shuttle Bus Program against the developed practical ideal type model. Focused interviews and document analysis methods of data collection are used for this research. Table 3.1 describes how each of the components and subcomponents are operationalized. The operationalization table presented is an effective method to attain a comprehensive analysis of the practical ideal components and subcomponents (Munoz 2011, 31).

### Case Study

This project uses the case study method. Case study methods use pre-specified procedures for data collection (Yin 2009, 21). The case study method is best used when a researcher is seeking to explain how or why a social phenomenon works or when the questions that are being asked require an in-depth description (Yin 2009, 4). Focused interviews and document analysis are the methods used for data collection. The use of multiple research practices is considered to be one of the many strengths of the case study method (O'Neil 2008, 42). The focused interview questions were created and reviewed

prior to the interview and correlated to a scoring system that measures the response.

Document analysis added support to the responses given by the subject.

While case study methods are effective, there are also weaknesses including the idea that the examination of previous studies can lead to biases in research due to preconceived expectations (Yin 2009, 102). Further, another weakness identified by Yin is that “the entire nature of the case study may shift, unbeknownst to the researcher, during the course of the study” (2009, 52).

The risks of these weaknesses do not apply because proper steps were taken to ensure that the focused interview and document analysis was conducted in such a way that safeguarded against any possible errors in data collection. Utilizing the focused interview method allows the researcher to review questions and address any poorly articulated questions. Utilizing the document analysis method allows the researcher to review documents to confirm that the practices of the practical ideal type components and subcomponents exist.

UT-Austin’s Shuttle Bus Program is an excellent case for a variety of reasons. The physical location of the university is important because UT-Austin is a campus set in the middle of the City of Austin near the central business district, residential and commercial areas, and the university has very limited options for expansion. As a result, the university is under pressure to provide access to the campus in the most economic and fiscally responsible way possible. As a campus located in an urban area, there are opportunities to pursue partnerships, reduce parking shortages, and curb vehicle emissions.

## Research Techniques

This study utilizes focused interviews and document analysis to gauge the practical ideal type model identified in Chapter 2. Tables' 3.1a-d operationalizes the components and subcomponents of the practical ideal type model for university transit programs. Operationalization links the conceptual framework and the practical ideal type components by identifying the operational relationship between each of the components and the related methodology that is used to gauge each one.

**Table 3.1a.: Operationalization of Conceptual Framework: Operations Model**

Practical Ideal Type Categories	Research Method/Source	Evidence
<b>Operations Model</b>		
<i>Joint Partnership</i>	Document Analysis/ University of Texas at Austin and Capital Metro's Inter Local Agreement (ILA) current and past	The ILAs will provide detailed information on the type of partnership that is agreed upon.
	Focused Interview	Q1) Why was a partnership used vs. other operational models? Q2) What factors are considered in the creation of this agreement? Q3) What is the process for approval for this document? Q4) Do you face any challenges when trying to implement this agreement?

Table 3.1b.: Operationalization of Conceptual Framework: Funding Model

Practical Ideal Type Categories	Research Method/Source	Evidence
Funding Model		
<i>Mandatory Student Fee</i>	Document Analysis/ The University of Texas at Austin's Student Services Fee Bill committee documentation	This documentation will provide information on what type of fee is assessed as well as how much.
	Focused Interview	Q5) What factors are considered when deciding the cost of the program? Q6) What happens when the cost of the program exceeds the amount the university is allocated to pay?
<i>Alternative Funding</i>	Focused Interview	Q7) Because the University shuttle system has faced budget deficits in the past why has advertising not been considered to help subsidize the cost? Q8) Has the University considered using parking citation and permit fees to subsidize service? Q9) What other types of barriers exist to increase funding for the program?

Table 3.1c.: Operationalization of Conceptual Framework: Scope of Service Model

Practical Ideal Type Categories	Research Method/Source	Evidence
Scope of Service Model		
<i>Levels of Service</i>	Document Analysis/ Capital Metro/UT-AUSTIN shuttle service planning documentation.	This documentation will provide detailed information and descriptions on types of routes, hours and headways, days of service and areas serviced as well as what elements Capital Metro takes into consideration when planning routes.
	Focused Interview	Q10) How large of a role does student input/feedback play in determining university specific routes and altering mainline routes? Q11) What barriers exist to expand services including hours and routes?
<i>Safety and Security</i>	Focused Interview	Q12) What was the primary factor and supporting factors considered in providing late night and safe ride transit services?
<i>Integrated Passenger Information Technologies</i>	Focused Interview	Q13) What type of transit management software is used to monitor operations, planning and scheduling and performance including Real-Time Passenger Information Systems (RTPIS)? Q14) Are there any plans to add additional features such as automatic vehicle locators, mobile data terminals, and electronic signage at bus shelters?

Table 3.1d: Operationalization of Conceptual Framework: Environmental Responsiveness Model

Practical Ideal Type Categories	Research Method/Source	Evidence
Environmental Responsiveness Model		
<i>Utilization of Green Fuels</i>	Focused Interview	Q15) What type of green fuels is currently being used in the shuttle fleet? Q16) Why were these fuel types chosen over other types of fuel?

## Document Analysis

Document analysis was selected as a source of review because it provides information on the current contractual agreement for UT-Austin’s program. Documents that were analyzed include: (1) Inter Local Agreements (2000-2010 and 2010-2020), (2) student fee bill committee documentation (2010-2011), and (3) shuttle service planning documentation (2010-2011). As with any type of analysis, document analysis has limitations including the possibility that the documents include biased information from the standpoint of the producer of the document. In addition, the documents can be outdated and certain documents may not be available for review (Yin 2009, 102). However, because the documents are public records they should be complete and available. All of the requested documents used for analysis are current since they apply to the current contract.

### *Sampling: Document Analysis*

All of the documents utilized for the project were made available by the staff from Capital Metro and UT-Austin’s Parking and Transportation Services. All reviewed documents were presented in their most current and complete state, as all documents

were dated. Each document offered vital information regarding the program's contractual partnership and procedures for planning and payment that are necessary for the completion of this project.

The Inter Local Agreements (ILAs) between Capital Metro and UT-Austin were selected because these documents provide evidence including historical insight as to why the agreement was created and under what conditions/terms the partnership is based upon. The ILAs also provide valuable information on mobility options such as revenue vehicles, performance standards, routes (inter-campus, radial, circular), and non UT-Austin shuttle services including: E-bus, Local Fixed Routes, Limited, Flyer, Express, Metro Rail, Metro Access, and Bus Rapid Transit. The ILAs will also provide detailed information concerning the term of the agreement, cost, and scope of services.

The Student Services Fee Bill was reviewed because it provides detailed information such as how much student fee money is allocated towards shuttle bus service. The fees are set through a transparent system that is governed by a student body. The student fee bill committee adheres to certain expectations of how the money is spent and must determine the funding for the program based on necessary scope of services set by the shuttle bus committee and the university. The process for the determination of funds allocated by the committee must mirror the same "good practice methodology" that public agencies follow so that the program is not compromised. These practices include the notion of accountability and transparency so that the student body can see exactly how their money is being utilized.

Capital Metro planning documents were reviewed because the documents provide detailed information on service guidelines and planning (specific routes, student housing

density considerations, service hours, headways, areas to be services, number of buses allocated to each route, and shelters and stops). Further, the planning documentation will provide detailed information on safety and security measures and integrated passenger technologies currently in place and planned future integrations.

## Focused Interviews

Interviews are essential for case study research and provide an effective method to collect data and gather other types of information (Wood 2011, 69). Interviews provide important insight into events that are being studied (Yin 2009, 106-108). As Babbie suggests, there are many advantages to using focused interviews including: high response rates, an increased level of clarity, and lastly the opportunity to have first hand observations from the respondent (2009, 274-275). A major benefit of using the focused interview technique is the use of open-ended questions that allow for the respondent to answer with his or her own opinion and even a solution to the question being asked (Yin 2009, 107). Further, the respondent will have the ability to add additional clarification as well as elaborate on specific issues (Babbie 2009, 262).

Even though interviews can be a better tool than surveys, they do have weaknesses. These weaknesses include: inaccurate information due to poorly constructed/weak questions and biased responses (Babbie 2009, 287-288; Yin 2009, 102).

Interview questions focused on obtaining information about UT Austin's Shuttle Bus Program's current practices and policies relating to the conceptual framework. The Contract Services Coordinator is the best person to interview because this person is the

liaison for Capital Metro and the University and is responsible for overseeing the day-to-day operations of the program based on the scope of services outlined in the ILA.

## Operationalization of University of Texas at Austin's Shuttle Bus Program: Focused Interview

The focused interview questions were developed to probe elements of the practical ideal type conceptual framework in the previous chapter.

### *Focused Interview*

Tables 3.2-3.6 present the focused interview questions used to operationalize the conceptual framework components and subcomponents. Based on the response from the focused interview a scoring system is used to gauge UT-Austin's program.

### *Operations Model: Focused Interview Questions*

Table 3.2 presents the interview questions and anticipated responses that correspond to the operations model of the conceptual framework. To further analyze the responses, follow up questions were asked to obtain the most thorough answer possible as it pertains to the operations model. The discussion in Chapter IV will present the responses; the responses will be analyzed against the anticipated responses to see if the answers are congruent. An independent assessment of the answers suggests that UT-Austin is meeting the practical ideal type for the operations model. The respondent is asked about motivations to form partnerships. There are good and bad reasons to form a



partnerships. The best reason is the strategic interests of both parties. The weakest reason is that a partnership was the only option.

*Question 1*, is a closed ended question that identifies the type of agreement the university has with the transit authority. *Question 2*, is a open ended question that addresses the factors that are considered in this agreement. *Question 3*, is a closed ended question that identifies the approval stages for the agreement. *Question 4*, is a open ended question that identifies the particular barriers associated with UT-Austin and Capital Metro to implement the agreement.

Table 3.2: Interview Questions- Operations Model

1. Why was a partnership used versus other operational models?
<p><i>Anticipated Responses:</i></p> <p>a=Did not want to just use mainline services</p> <p>b=No available funding to run an in-house operation</p> <p>c=Best option available because of strategic vision (economic and option of dedicated fleet)</p>
2. What factors are considered in the creation of this agreement?
<p><i>Anticipated Responses:</i></p> <p>a= Funding factors considered</p> <p>b= Infrastructure factors considered</p> <p>c= University population factors considered</p> <p>d= Funding, Infrastructure, Student Density, etc are considered</p>
3. What is the process for approval of this document?
<p><i>Anticipated Responses:</i></p> <p>a= No approval needed</p> <p>b= Student committee approval</p> <p>c= University approval</p> <p>d= Capital Metro approval</p>

#### 4. Do you face any challenges when trying to implement this agreement?

*Anticipated Responses:*

*a = No challenges*

*b = Some challenges*

#### *Funding Model: Focused Interview Questions*

Table 3.3 presents the interview questions and anticipated responses that correspond to the funding model of the conceptual framework. To further analyze the responses, follow up questions were asked to obtain the most thorough answer possible as it pertains to the funding model. The discussion in Chapter IV will present the responses; the responses will be analyzed against the anticipated responses to see if the answers are congruent. An independent assessment of the answers suggests that UT-Austin is meeting the practical ideal type for the funding model with the exception of the subcomponent of alternative funding. The respondent is asked about financial resources that must be secured to provide the service. There are good and bad reasons to impose a mandatory student fee. The best reason is the students receive the lowest cost possible per ride for the program. The weakest reason is equity as some students may not use the program and still have to pay for it.

*Question 5*, is a open ended question that examines the factors associated with the cost of the agreement. *Question 6*, is a closed ended question that identifies the factors considered by the partners when the cost of the agreement exceeds the available funding. *Question 7*, is a open ended question and *Question 8*, is a closed ended question that focuses on why particular alternatives were and were not utilized to help fund the

program. *Question 9*, is a closed ended question that identifies what barriers are present when seeking and approving additional funding measures.

Table 3.4: Interview Questions- Funding Model

5. What factors are considered when deciding the cost of the program?
<p><i>Anticipated Responses:</i>  <i>a= Operating budget allocated by university</i>  <i>b=Administrative costs</i>  <i>c=Insurance costs</i>  <i>d=Infrastructure and vehicle costs</i>  <i>e= Fuel</i></p>
6. What happens when the cost of the program exceeds the amount the university is allowed to pay?
<p><i>Anticipated Responses:</i>  <i>a= Headways are adjusted</i>  <i>b=Routes are modified or combined</i>  <i>c=Routes are eliminated</i></p>
7. Because the University shuttle system has faced budget deficits in the past, why has advertising not been considered to help subsidize the cost?
<p><i>Anticipated Responses:</i>  <i>a= University will not allow, Capital Metro will</i>  <i>b= Capital Metro will not allow, University will</i></p>
8. Has the University considered using parking citation and permit fees to subsidize the service?
<p><i>Anticipated Responses:</i>  <i>a= Yes</i>  <i>b= No, because existing revenues used to cover other programs</i></p>

9. What other types of barriers exist to increase funding for the program?

*Anticipated Responses:*  
*a=No barriers exists*  
*b=Student funding barriers*

*Scope of Service Model: Focused Interview Questions*

Table 3.5 presents the interview questions and anticipated responses that correspond to the scope of service model of the conceptual framework. To further analyze the responses, follow up questions were asked to obtain the most thorough answer possible as it pertains to the scope of service model. The discussion in Chapter IV will present the responses; the responses will be analyzed against the anticipated responses to see if the answers are congruent. An independent assessment of the answers suggests that UT-Austin is meeting the practical ideal type for the scope of service model with the exception of the integrated passenger information technologies subcomponent. The respondent is asked about the social services that are designed to serve the needs of the students. There are effective strategies that must be considered when designing a scope of services. The best strategies to incorporate in the design of the scope of service including maximizing coverage at low frequencies, providing fast and direct routes, providing safe rides, and adopting passenger information convenience technologies.

*Question 10*, is a open ended question that focuses the role of the student body in planning shuttle service. *Question 11*, is a closed ended question that identifies the barriers associated with expanding service. *Question 12*, is a closed ended question *that* identifies the factors involved with safety and security and late night shuttle service. *Questions 13 and 14* are both closed ended questions that identify the technologies

currently utilized on the shuttle system and any plans to increase or update the technologies.

Table 3.5: Interview Questions- Scope of Service Model

10. How large of a role does student input/feedback play in determining university specific routes and altering mainline routes?
<p><i>Anticipated Responses:</i>  <i>a=Small impact</i>  <i>b=Large impact</i>  <i>c=Only impact</i></p>
11. What barriers exist to expand services including hours and routes?
<p><i>Anticipated Responses:</i>  <i>a= Funding barriers</i>  <i>b= University approval barriers</i>  <i>c= Capital Metro approval barriers</i></p>
12. What was the primary factor and supporting factors considered in providing late night and safe ride transit services?
<p><i>Anticipated Responses:</i>  <i>a=Student safety factors</i>  <i>b=Academic calendar factors</i>  <i>c=Public input factors</i>  <i>d= Funding factors</i></p>
13. What type of transit management software is used to monitor operations, planning and scheduling and performance including Real-Time Passenger Information Systems (RTPIS)?
<p><i>Anticipated Responses:</i>  <i>a=No software used</i>  <i>b=Specific software used</i></p>

14. Are there any plans to add additional features such as automatic vehicle locators, mobile data terminals, and electronic signage at bus shelters?
<p><i>Anticipated Responses:</i>  a= <i>No</i>  b= <i>Yes</i></p>

### *Environmental Responsiveness Model: Focused Interview Questions*

Table 3.6 presents the interview questions and anticipated responses that correspond to the environmental responsiveness model of the conceptual framework. To further analyze the responses, follow up questions were asked to obtain the most thorough answer possible as it pertains to the environmental responsiveness model. The discussion in Chapter IV will present the responses; the responses will be analyzed against the anticipated responses to see if the answers are congruent. An independent assessment of the answers suggests that UT-Austin is meeting the practical ideal type for the environmental responsiveness model. There are good and bad reasons why the adoption of green fuels is important. The best reason is that the utilization of green fuels ensures that the university is decreasing its carbon footprint and ensuring a livable campus community. The respondent is asked about the utilization of green fuels and technologies that help to reduce the carbon footprint of the university. *Questions 15*, is a closed question and *Question 16*, is a open ended question that identifies the types of alternative fuels used, and explores why the fuels were chosen, and the type of environmental impacts the program has.

Table 3.6: Interview Questions- Environmental Responsiveness Model

15. What type of green fuels is currently being used in the shuttle fleet?
<p><i>Anticipated Responses:</i>  <i>a=No green fuel is used</i>  <i>b=Specific type(s) of fuel is being used</i></p>
16. Why were these fuel types chosen over other types of fuel?
<p><i>Anticipated Responses:</i>  <i>a=Produced best environmental and economic results for transit buses</i>  <i>b=Only fuel available at the time</i>  <i>c=Economical</i></p>

#### *Sampling: Focused Interview*

The research centers on UT-Austin's program therefore the focused interview that was conducted was internal. All the information gathered was obtained through a focused interview with the contracted services coordinator. The coordinator provided detailed information on the management of the program. The reason this subject was chosen for the focused interview is because the coordinator has extensive knowledge on the history, operations, as well as the contractual agreement of the program. Therefore, this subject was able to provide in-depth and detailed information for the study.

#### **Operationalization of the University of the University of Texas at Austin's Shuttle Bus Program: Document Analysis**

##### *Document Analysis*

A three-point Likert scale will be utilized to measure the data collected from the document analysis portion of this project. If the data collected surpasses the standards assigned in each of practical ideal types, the measured component will be assigned a

rating of “(2) exceeds the standard” which represents the highest rating achievable. If all the criteria is met, the rating of “(1) meets the standard” will be assigned. If the data collected does not meet the standards that were assigned to each component, a rating of “(0) failed to meet standard” the lowest rating achievable will be allocated.

## Human Subjects

Focused interviews were the only unit of analysis that involved human subject participation. Therefore, the impact on human subjects must be reviewed. Since the subject volunteered to participate in the focused interview, there are no anticipated risks or discomforts associated with this research as the focused interview did not call for the disclosure of any confidential information. The contract services coordinator will serve as the only subject of the interview.

As participation in this study was strictly voluntary and the information provided in this interview is not considered to be confidential, the subject that was interviewed is only identified by their title. Any questions or concerns that pertain to the focused interview should be directed to Blanca Juarez, Alternative Transportation Manager for Parking and Transportation Services at the University of Texas at Austin. She can be contacted by phone at (512) 471-6214 or by email at [bj Suarez@austin.utexas.edu](mailto:bj Suarez@austin.utexas.edu).

## Chapter Overview

Chapter Four will present the case study results used to assess the University of Texas at Austin’s Shuttle Bus Program.



## Chapter IV Research Results

This study identified four components of a practical ideal type model developed from scholarly literature. This chapter summarizes the results of the case study. Focused interviews and document analysis were used to assess the UT-Austin Shuttle Bus Program using an ordinal rating system. The chapter presents the results of the focused interviews and document analysis.

As suggested by the practical ideal type, UT-Austin's Shuttle Bus Program utilizes all four of the components including: 1) operations model, 2) funding model, 3) scope of service model, 4) environmental responsiveness model, and nearly all of the subcomponents with the exception of alternative funding and integrated passenger information technologies.

The shuttle bus program for UT-Austin could be strengthened if alternative funding sources such as university general funds and/or advertising revenue were adopted. Adopting alternative sources of funding would have direct effects on all other components of the program because additional funds would be made available to increase and expand service. Further, the program could also be strengthened if integrated passenger information technologies were adopted so that the program could maintain and attract new riders with added conveniences such as WIFI and AVL. Each of the major findings are discussed below.

## Operations Model

The first component of the practical ideal type for university transit programs is the operations model. The joint partnership model is the best practice utilized by many universities versus of other options such as a private university owned and operated system or a city owned and operated public system.

### *Document Analysis: Operations Model*

UT-Austin and the Capital Metro's ILA clearly outlines the type of agreement entered into by both parties, the cost of service, the description of service to be performed (scope of service), as well as the deliverables agreed upon by the parties. For example, according to the current agreement, the joint partnership is emphasized in Article IV: Description of Service, section D, pg 3 of 19, where it states “*The parties agree that the routes, hours and days of service provided may be altered by mutual written consent on an annual basis. Each year, UNIVERSITY and CAPITAL METRO will agree on the specific number of scheduled hours, routes, days, types or levels of service hours of service each day, and numbers of vehicles that will be used.*” Based on review of this document, the ILA was assigned a 1 (meets the standard). Table 4.1 summarizes the findings from this document.

Table 4.1: Operations Model Document Analysis Results

Operations Component	Method	Evidence	Code
Joint Partnership	Document Analysis of ILA	<i>-Specifies type of partnership -Details scope of service -Cost of service for each year</i>	<i>Meets the Standard (1)</i>

### *Focused Interview: Operations Model*

Focused interviews were used to better understand why UT-Austin chose to adopt a joint partnership operations model with Capital Metro and the factors that were involved in the creation of the ILA. Interview responses indicate that the joint partnership model was adopted because it was the most economical and comprehensive option available for the UT-Austin.

The ILA provided UT-Austin with strong influence on how the program would be managed. The partnership was viewed as the most effective way for providing transportation to the school and the community. Through this partnership, UT-Austin was able to secure a dedicated university fleet and they were able to leverage the use of Capital Metro's capital assets from ADA equipped buses, bus shelters, professional planning and customer assistance financed by federal funding. UT-Austin benefits indirectly from federal funding to purchase and operate a program when partnering with Capital Metro. Based on the respondent's answers, this response was assigned a score of 1 (meets the standard) because it was the most economical and comprehensive option for the university.

The operations model establishes the joint partnership because of many factors that were identified and agreed upon by both parties. Such factors include: shuttle bus funding, insurance, fuels, tires, radio time, route infrastructure including planning of routes and the placement of bus shelters and stops. Further, planning of bus stop includes such factors as: shelters, flag stop poles, ADA accessibility ramps, and sidewalks. Based on the respondent's answers, this response was assigned a 1 (meets the standard), because the listed factors matched what was pre-determined. The ILA agreement between

UT-Austin and Capital Metro is based on creating a cost model that both parties agreed too. Past agreements (2000-2010) were based on a 65/35 percent split, where UT-Austin paid 65 percent of the operating costs and Capital Metro paid the remaining 35 percent. The current ILA (2010-2020) calls for a 50/50 percent split, where Capital Metro now charges for fixed route services. Thus, the ILA is being modified in ways that meet student demands and financial limitations. The agreed cost model and scope of services is created it is then presented to UT-Austin officials, shuttle bus committee members, student government, and UT-Austin Board of Regents for final approval before being presented to the Capital Metro Board of Directors for approval. Based on the respondent's answers, this response was assigned a 1 (meets the standard) as the respondent included all predetermined answers.

A well-executed contract or ILA satisfies both parties. UT-Austin and Capital Metro have found an option that satisfies the fees and services provided. UT-Austin deemed it necessary that they receive the same rate per rider as Austin Community College for the first contract year. Based on the respondent's answers, this response was assigned a 1 (meets the standard) since some challenges were faced. Tables' 4.2a-d summarizes the findings from the interview.

Table 4.2a: Operations Model Focus Interview Results

1. Why was a partnership used vs. other operational models?
<i>Response summary: UT-Austin indirectly benefits from federal funding through Capital Metro.</i>
<i>Score: 1= Best option available because of strategic vision.</i>

Table 4.2b: Operations Model Focus Interview Results

2. What factors are considered in the creation of this agreement?
<i>Response summary: Factors considered meet the scope of service needs including funding, insurance, planning, etc.</i>
<i>Score: 2= Funding, Infrastructure, Student Density, etc are considered.</i>

Table 4.2c: Operations Model Focus Interview Results

3. What is the process for approval of this document?
<i>Response summary: Drafting the Scope of Services Model that can be accomplished based on the Cost Model before approval.</i>
<i>Score: 1= Approval based on deliverables and committee approval.</i>

Table 4.2d: Operations Model Focus Interview Results

4. Do you face any challenges when trying to implement this agreement?
<i>Response summary: Development of a cost model split that satisfies both parties.</i>
<i>Score: 1= Both parties face challenges that effect the agreement.</i>

### *Funding Model*

#### *Document Analysis: Funding Model: Mandatory Student Fee*

Review of the UT-Austin Student Services Fee Bill Committee documents for 2010-2011 school year demonstrated that the ILA was to be paid for through student fees only. Student fees were to be accessed each semester from enrolled student regardless of their classification. Approximately, 1/3 of the student fees collected would be allocated funds for the shuttle bus program each year. Based on review of these documents, the Student Services Fee Bill Committee documents were assigned a 1 (meets the standard). Table 4.3 summarizes the findings from this document.

Table 4.3: Funding Model (Mandatory Student Fee) Document Analysis Results

Funding Component	Method	Evidence	Code
Mandatory Student Fee	Document Analysis: Review of Student Service Fee Bill Committee Document	-1/3 of fee used to pay for service -Committee decides how much to allocate -Only funding used for program	Meets the Standard (1)

*Focused Interview: Funding Model: Mandatory Student Fee*

The cost of a shuttle program for UT-Austin was based upon the scope of services required. Several elements make up this factor including: fuel cost, radio time insurance, vehicle maintenance, number of routes, hours of service, and administrative costs such as planning and customer service. Based on the respondent's answers, this response was assigned a 1 (meets the standard) as all predetermined factors were considered.

Exceeding a fixed budget can have serious effects for both partners and users. Fortunately, safety net features were built into the creation of this ILA. One important feature is that the program is not allowed to exceed the allocated cost. If the forecasted cost was to exceed the set budget, Capital Metro has the ability to reduce services to help balance the budget. If the budget cannot be balanced, Capital Metro will pay for all additional hours of service. Based on the respondent's answers, the response was assigned a 1 (meets the standard) as all predetermined factors were considered. Tables' 4.4a-b summarizes the findings from the interview.

Table 4.4a: Funding Model (Mandatory Student Fee) Focused Interview Results

5. What factors are considered when deciding the cost of the program?
<i>Response summary: All the items indicated in the scope of service from fuel to administrative costs.</i>
<i>Score: 1= Cost includes all deliverables identified in scope of services</i>

Table 4.4b: Funding Model (Mandatory Student Fee) Focused Interview Results

6. What happens when the cost of the program exceeds the amount the university is allowed to pay?
<i>Response summary: Capital Metro not allowed to exceed set hours must cut service to balance budget.</i>
<i>Score: 1= Capital Metro takes the necessary steps to balance budget.</i>

#### *Focused Interview: Funding Model: Alternative Funding*

Alternative sources of funding are a crucial element in funding a program that has a fixed budget. One of the most common forms of alternative funding is advertising. Based on previous and current ILAs, UT-Austin has never allowed advertising outside of UT-Austin departments and student organizations due to Board of Regent mandates. Because the university operates on a lean budget and has been faced with eliminating routes and cutting hours in the past, additional funding is always an option to be considered. The current contract does allow for the possibility of outside advertising should the budget be faced with unexpected short falls. Based on the respondent's answers, this response was assigned a 0 (failed to meet the standard) as the University has not adopted any sources of alternative funding. However, the University is currently working towards adopting outside advertising guidelines as a future option to fund the program as specified by the current agreement.

Based on research, many universities who operate a transit program do have alternative funding sources available. Of those sources, parking revenues such as permit fees and citations fees subsidize the program. For UT-Austin, the only available funding

is the student fee. Based on the respondent's answers, this response was assigned a 0 (*failed to meet the standard*) as the student fee is the only funding available.

Increasing funding for a shuttle bus program can encounter many barriers. Those additional barriers can include: non-approval of student fee referendums and a decrease in sales taxes for Capital Metro. Based on the respondent's answers, this response was assigned a 1 (*meets the standard*) as the student fee referendum is voted down and the possibility that existing fees are allocated to other programs. Although, UT-Austin has failed to meet the best practice of alternative funding, the University is working towards the adopting of this subcomponent by modifying the contract to identify sources of alternative funding such as advertising. Tables' 4.5a-c summarizes the findings from the interview.

Table 4.5a: Funding Model (Alternative Funding) Focused Interview Results

7. Because the University shuttle system has faced budget deficits in the past why has advertising not been considered to help subsidize the cost?
<i>Response summary: Prohibited by Board of Regents in the past, current agreement allows for advertising opportunities to be explored.</i>
<i>Score: 0= Constraints set by University.</i>

Table 4.5b: Funding Model (Alternative Funding) Focused Interview Results

8. Has the University considered using parking citation and permit fees to subsidize the service?
<i>Review summary: University does not use.</i>
<i>Score: 0= University only allows student fees to fund program.</i>

Table 4.5c: Funding Model (Alternative Funding) Focused Interview Results

9. What other types of barriers exist to increase funding for the shuttle program?
<i>Review summary: Barriers exist including student referendums and declining sales tax revenue.</i>
<i>Score: 1= Barriers exists on both parties sides.</i>



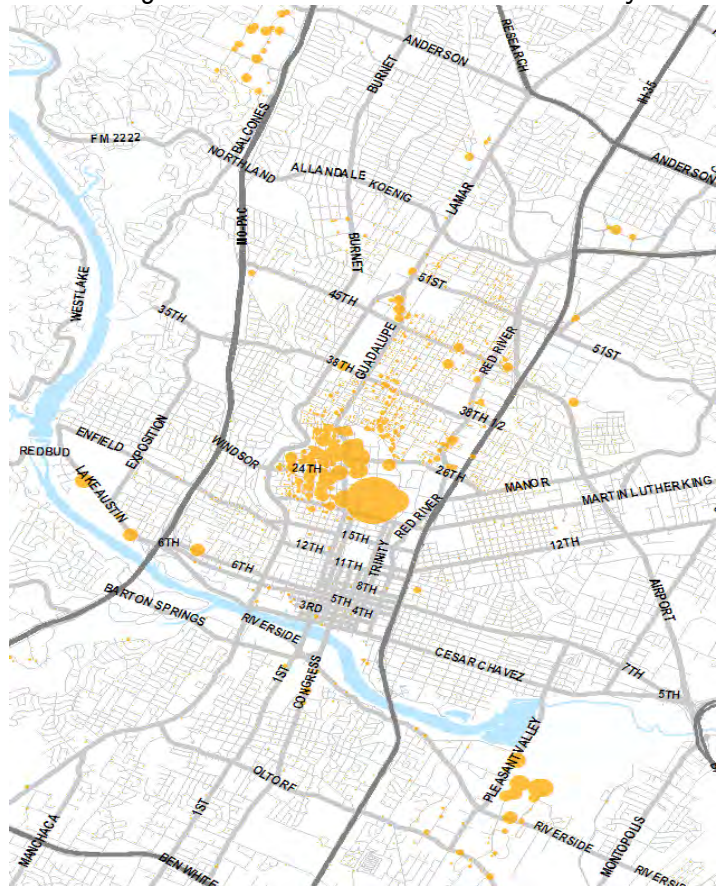
## Scope of Service Model

### Document Analysis: Scope of Service Model: Levels of Service

Transportation planning for a transit program can be extensive. Planners must account for types of routes, hours and headways, days of service, and service areas. Review of Capital Metro and UT-Austin shuttle service planning documents indicate that such factors are taken into consideration each year when planning or adjusting shuttle routes and hours. Each year Capital Metro request student's local addresses so planners can plot student-housing areas around the city. By plotting this type of information, they are able to identify student migration patterns and adjust routes to meet the student housing needs. Table 4.6 and Figure 4.1 provide a review of student population figures.

Table 4.6: UT-Austin Student Distribution      Figure 4.1: UT-Austin Student Density

Area	2005	2010
UT-Austin Campus (FA)	19%	21%
West Campus (WC)	15%	21%
North Campus (IF, RR)	15%	16%
Riverside/Oltorf (CP, NR, LS, WL)	13%	8%
Far West (FW)	4%	3%
Lake Austin (LA)	2%	2%
Cameron Rd (CR)	1%	1%
Enfield Rd (ER)	1%	<1%



Source: Capital Metro/University of Texas at Austin Shuttle Bus Committee Presentation 2010

The planners also review the academic calendar and create levels of service for each year. These levels of service are based on campus hours and days of operation. UT-Austin's levels of service include: full level, finals level, Sunday level, summer level, no school level, and no service level. The hours of operation are determined by class meeting times. During the fall and spring semester's standard Monday, Wednesday, and Friday classes are scheduled starting at 8 a.m. and the latest class ends at 6 p.m. For Tuesdays and Thursdays classes, the earliest class is scheduled for 8 a.m. and the latest class ends at 6:30 p.m. Below, Table 4.7 explains each level of service in detail.

**Table 4.7: University of Texas at Austin Shuttle Program Service Levels**

<b>Full Level</b>	East Campus and Forty Acres shuttles operate until 11 p.m. Buses depart every 5 to 18 minutes on all routes from approximately 7 a.m. to 7 p.m. (check schedules for individual route times). After 7 p.m., buses depart approximately every 20 to 40 minutes. Departure times after 7 p.m. are posted at major stops.
<b>Finals Level</b>	Buses depart approximately every 8 to 12 minutes on all routes from 6:45 a.m. to 7 p.m. From 7 p.m. to 11 p.m., buses depart approximately every 40 minutes. Departure times after 7 p.m. are posted at major stops. *East Campus and Forty Acres operate until 11 p.m. PRC does not operate on Saturday during finals.
<b>Summer Level</b>	Buses depart approximately every 8 to 12 minutes on all routes from 6:45 a.m. to 7 p.m. From 7 p.m. to 11 p.m., buses depart approximately every 40 minutes. Departure times after 7 p.m. are posted at major stops.
<b>Registration Level</b>	Buses depart approximately every 35 minutes on all routes from 6:45 a.m. to 11 p.m.
<b>Sunday Level</b>	Buses depart approximately every 20 to 70 minutes from 2 p.m. until 11 p.m. *There is no PRC service.
<b>No School Level</b>	PRC runs on a reduced schedule.

Source: <http://www.utexas.edu/parking/transportation/shuttle/calendar.html>

After reviewing these documents, a score of 1 (meets the standard) was assigned for factors that make up levels of service for the UT-Austin program. Table 4.8 summarizes the review of the documents.

Table 4.8: Scope of Service Model (Levels of Service) Document Analysis Results

Scope of Service Component	Method	Evidence	Code
Levels of Service	Document Analysis: Planning Documents	-Follows academic calendar -Maps student population -Adjust service to meet student needs	<i>Meets the Standard (1)</i>

*Focused Interview: Scope of Service Model: Levels of Service*

Student input and feedback is crucial for transit programs based solely on student fees. If students are paying for the system, it is only right that they have a say on how the system is operated. If changes in the system are necessary, Capital Metro will propose the changes first to UT-Austin officials for approval. If the decision to move forward with the change is collectively agreed upon; the changes are presented to the shuttle bus committee for approval. Should the committee decide to vote against the change or reassess the proposal, the change will not move forward. The committee has final say on how the shuttle bus program is operated. Based on the respondent's answers, this response was assigned a 1 (meets the standard) as the student input plays a large role in determining specific routes.

The decision to expand services including routes and hours can face many barriers. Of those barriers, funding is the largest to overcome. Since UT-Austin has a limited set of funds that cannot be exceeded, Capital Metro does not have the ability to increase services if the set budget is reached. For instance, if fuel costs increase over the academic year, a decision to cut hours or service will have to be made by the shuttle committee in order to maintain the budget. Based on the respondent's answers, this response was assigned a 1 (meets the standard) as the funding barrier plays the largest

role in expanding hours and routes. Tables' 4.9a-b summarizes the findings from the interview.

Table 4.9a: Scope of Service Model (Levels of Service) Focused Interviews Results

10. How large of a role does student input/feedback play in determining university specific routes and altering mainline routes?
<i>Review summary: A democratic approach requiring approval from several bodies.</i>
<i>Score: 1= Approval from all committees must be obtained.</i>

Table 4.9b: Scope of Service Model (Levels of Service) Focused Interviews Results

11. What barriers exist to expand services including hours and routes?
<i>Review summary: Funding for program is the largest barrier.</i>
<i>Score: 1=Funding is the largest barrier parties face.</i>

#### *Focused Interview: Scope of Service Model: Safety and Security*

The safety and security of those who come to UT-Austin whether it is for academic, entertainment, or any other reason is of the utmost concern. The decision to provide late night and safe ride services was requested by the UT-Austin administration knowing that students would stay late on campus to study, work in labs, and also for entertainment reasons. The E-Bus, which is the Eating and Entertainment bus that operates Thursday through Saturday from 8:30 p.m. to 3 a.m., provides students with a safe alternative to driving to and from the entertainment district. This option provides student with a safe mode of transportation other than walking alone at night and driving while intoxicated. Based on the respondent's answers, this response was assigned a 1 (*meets the standard*), as student safety was the primary factor in adopting these services.

Table 4.10 summarizes the findings from the interview.

Table 4.10: Scope of Service Model (Safety and Security) Focused Interview Results

12. What was the primary and supporting factors considered in providing late night and safe ride transit services?
<i>Review summary: E-bus and late night services are provided to students so that they have a safe option for travel.</i>
<i>Score: 1=Student safety is the primary source for creation/expansion of services.</i>

*Focused Interview: Scope of Service Model: Integrated Passenger Information*

*Technologies*

Transit management software is standard in operating any type of public transportation program. Through this software, providers are able to have the ability to provide dispatch operating communications, schedule routes and headways, and plan new or adjust existing routes based on certain criteria. Currently, Capital Metro utilizes transit management software called Trapeze to fulfill these needs. Trapeze also has the ability to integrate with the AVL system that Capital Metro has purchased. The integration of this software is important because it will allow Capital Metro to cross reference the location of a bus with schedules for next bus arrival information. Further, this software has the added convenience for the customer by offering applications that can be downloaded onto a phone so that the user can know exactly when the next bus is arriving. Based on the respondent's answers, this response was assigned a 1 (meet the standard) as specific software is utilized to help meet customers' needs.

The ability to improve services with new technology is important when it comes to customer service. New technologies on the market for public transportation include innovations such as: AVL or GPS, mobile data terminals, and electronic signage at bus shelters and stations. Capital Metro is currently installing technologies into their fleet. Based on the respondent's answers, this response was assigned a

0 (failed to meet the standard) since Capital Metro indicates that currently none of the technologies are available on the university fleet but there are future plans to add additional features to the system. UT-Austin encourages the adoption of these technologies and supports this best practice because it will increase ridership, lower the demand for parking, and curb vehicle congestion and pollution. Tables' 4.11a-b summarizes the findings from the interview.

Table 4.11a: Scope of Service Model (Integrated Passenger Information Technologies) Focused Interview Results

13. What type of transit management software is used to monitor operations, planning, scheduling, and performance including Real-Time Passenger Information Systems (RTPIS)?
<i>Review summary: The industry standard is used, Trapeze.</i>
<i>Score: 1=Transit management software is used to manage all aspects of program.</i>

Table 4.11a: Scope of Service Model (Integrated Passenger Information Technologies) Focused Interview Results

14. Are there any plans to add additional features such as automatic vehicle locators, mobile data terminals, and electronic signage at bus shelters?
<i>Review summary: Customer focused convenience services will be added within the following year.</i>
<i>Score: 0=Services to be added in the future.</i>

## Environmental Responsiveness Model

### *Focused Interview: Environmental Responsiveness Model: Utilization of Green Fuels*

The utilization of environmentally friendly fuels on public transit buses is important. For Capital Metro, 100 percent of the UT-Austin fleet runs on USLD, which is environmentally friendly and utilized by most transit agencies. Based on the respondent's answers, this response was assigned a 1 (meets the standard) since Capital Metro indicates that they currently utilize a specific green fuel on the UT-Austin fleet.

Personal vehicles driven by students on a university campus has made it essential to adopt solutions that address alternative transportation issues. The UT-Austin Shuttle Program has proved itself successful in reducing SOV usage and curbing vehicle emissions, and decreasing the demand for parking.

Operating an environmentally friendly fleet while being economically sensitive to a limited budget can be challenging for universities who partner with transit agencies as they try to provide the most optimal level of service possible. USLD was chosen because of its economic value. There are many alternative fuels that transit agencies can incorporate into their fleet including: Compressed Natural Gas, Electric Hybrid, All Electric and Liquid Propane. Currently, diesel engines have the capability of running continuously for 18 to 20 hours whereas newer engines that operate on other types of fuel do not. As technologies continue to improve, Capital Metro will continue to consider the possibility of acquiring a fleet of compressed natural gas shuttle buses as well as hybrid electric and all electric shuttle buses. Based on the respondent's answers, this response was assigned a 1 (meets the standard) as Capital Metro indicates that using USLD produces the most optimal results for both the environment and their operating budget. Tables' 4.12a-b summarizes the findings from the interview.

Table 4.12a: Environmental Responsiveness Model (Utilization of Green Fuels)  
Focused Interview Results

15. What type of green fuels is currently being used in the shuttle fleet?
<i>Review summary: USLD is used.</i>
<i>Score: 1=A green fuel is used.</i>

Table 4.12b: Environmental Responsiveness Model (Utilization of Green Fuels)  
 Focused Interview Results

16. <i>Why were these fuel types chosen over other types of fuel?</i>
<i>Review summary: USLD chosen for economic value.</i>
<i>Score: 1=Produced best environmental and economic results for transit buses.</i>

Operating a shuttle fleet to curb vehicle pollution and mitigate congestion will help preserve the environment. Offering fare-free unlimited access to a dedicated shuttle fleet and mainline services, Capital Metro estimates that they save millions of metric tons of CO<sub>2</sub> each year. Capital Metro currently utilizes special exhaust filters that help to capture particulate matter that is released into the atmosphere. With the use of USLD and these filters, Capital Metro is able to reduce the amount of NO<sub>x</sub> and particulate matter into the atmosphere.

While UT-Austin benefits there is still an issue of reducing the University's carbon footprint further. While, Capital Metro utilizes USLD and particulate filters on the entire UT-Austin fleet, the carbon footprint could still be reduced if other forms of environmentally friendly public transit vehicles were adopted such as hybrid and electric. Further, to strengthen the adoption of this best practice, in 2006 the President of UT-Austin inaugurated a Sustainability Task Force with a primary mission of "minimizing the environmental footprint of the campus," according to the University Handbook of Operating Procedures.

## Chapter Overview

The final chapter will provide a conclusion and offers recommendations for areas of improvement for UT-Austin's Shuttle Bus Program.



## Chapter V

### Conclusion

The final chapter of this research project summarizes the information and results presented. This project has a research purpose of gauging the University of Texas at Austin's Shuttle Bus Program against the practical ideal type created from the literature review. Document analysis and a focused interview were conducted to address the research purpose.

The UT-Austin Shuttle Bus Program is notably one of the most effective and efficient transit programs in the U.S. For the program to continue to be a success, the program must be further advanced with new features as they become available. The program's success is due to the fact that it has a dedicated shuttle fleet that brings students directly to campus from where they live, delivers students to the core of campus and along heavily utilized pedestrian routes, provides frequent service, has ensured unlimited access to all bus mainline routes as indicated by the Transportation Master Plan for UT-Austin.

#### Practical Ideal Type Components and Subcomponents

UT-Austin Shuttle Bus Program meets most standards of the practical ideal type program except for the utilization of alternative funding and the adoption of integrated passenger information technologies. This chapter makes specific recommendations about how to sustain or improve the quality of the program. These recommendations are based on the findings from the focused interview, document analysis, and a comparison with the literature.

## Operations Model

UT-Austin utilizes the practical ideal type joint partnership model. This model has proven to be the best possible option for both UT-Austin and Capital Metro because the University is able to provide unlimited fare-free access to the students, while not investing in transit infrastructure and administrative services including: buses, tires, radio time, shelters, bus depots, maintenance, customer and planning services. Further, Capital Metro is able to benefit by filling empty seats during off peak periods. Through this model, the University was able to negotiate unlimited and fare-free access to all of Capital Metro's services from mainline fixed route services to rail and paratransit. This has allowed the university to obtain leverage on how these routes are operated. This partnership also indirectly benefits the City of Austin, as Capital Metro is able to report higher annual ridership numbers resulting in increased federal funding. This increased funding helps to expand and increase services that benefit all.

## Funding Model

UT-Austin uses the practical ideal type mandatory student fee. By instituting a mandatory fee, the university is able to purchase transit access at a reduced rate from Capital Metro. However, UT-Austin does not utilize alternative funding to help offset the cost of the program or to cover what the mandatory student fee does not. Alternative forms of funding can include: advertising, outside grants, parking revenues, and funds from the university general fund. This is a real priority because of the unpredictability of fuel costs, increases in insurance requirements, expansion of services to meet student needs, and other unexpected incremental costs. UT-Austin needs to identify other sources

of funding when the fixed budget does not cover the entire cost of the program. To accomplish this, UT-Austin needs to work with their partner, Capital Metro in devising strategies that can identify potential funding sources such as allowing outside advertising on all UT-Austin shuttle buses and shelters, applying for federal grants, and possibly allocating university and or parking revenues towards the program.

In the past, when the University has been faced with budget shortfalls, measures such as decreasing frequency of routes, combining routes during the evening and summer were implemented in order to stay within budget. Should the University not seek alternative means to fund the program, reducing service through the decrease in frequency and eliminating routes such as campus circulators and routes with low ridership would be the only options available.

### Scope of Service

UT-Austin integrates all the components identified in the scope of service model. The shuttle bus program has a dedicated shuttle fleet that is planned on levels of service that match the academic calendar time frames including: a.m./p.m. peak hours of service, midday service, full service levels during the semester, summer levels, finals levels and registration levels of service. The University also plans and adjusts its radial routes based on off campus student housing populations. Tracking student housing trends is important because the partnership allows unlimited fare-free access to the mainline routes. Therefore, the university is able to provide students with mainline services that cover the areas of the city that the UT-Austin routes are not able too. The University has also adopted features of the safety and security component into their program.

The program provides evening services till 11 p.m. Monday to Friday and on Sundays.

The University also provides a safe ride program named, the E-bus that operates Thursday through Saturday from 8:30 p.m. to 3:00 a.m. This service provides unlimited fare-free access to and from the downtown entertainment district as an alternative to drinking and driving.

Currently, Capital Metro is unable to provide the university's fleet with AVL, WIFI, and next bus arrival technologies. However, Capital Metro has expressed that they will begin to integrate AVL and next bus arrival information within the coming year on all buses including the UT-Austin fleet.

### Environmental Responsiveness Model

The shuttles that operate at the university are environmentally friendly. The entire fleet runs on USLD and uses filters that capture particulate matter before it is released into the air, reducing the University's carbon footprint. However, UT-Austin can further reduce their carbon footprint if they were to urge Capital Metro to integrate or retrofit the dedicated UT-Austin buses with other forms of alternative fuels such as electric or CNG as technologies continue to improve. Historically, Capital Metro utilized CNG buses in their fixed route services, however due to the technologies available at that time and the efficiency of the vehicles, the use of CNG did not meet the efficiency standards held by Capital Metro and hindered their ability to provide suitable services to the community.

The University however must look to the future of student transit. The reduction of the number of vehicles and single occupant trips is a goal for a university that has or is looking to start a transportation demand management program.

Starting a car sharing service, promoting bicycle use, carpool and vanpool services, using alternative fueled buses, to creating a pedestrian friendly campus will help fulfill this goal.

One of the most powerful tools to meet this goal is to increase the cost of parking permits resulting in a lower demand for parking. Universities can also force more students from their cars by increasing citation fees, placing limitations on the availability of parking permits based on a student's local address and proximity to campus, instituting a parking waitlists for convenient parking lots, and discouraging first and second year students from bringing a car.

In closing, based on the research presented above, it is the author's belief that UT-Austin and Capital Metro do an excellent job of operating and managing a transit program of this magnitude that efficiently serves a student population of over 50,000.

### Future Recommendations

All of the practical ideal type components are met by UT-Austin but may not be available in the future should current conditions change. Should there be decreases in funding resulting in changes or cuts in services, changes in contractual commitments, and the elimination of the E-Bus program due to ridership difficulties and bus staging locations, the program could become less successful in meeting the University's needs. Therefore, the University must be proactive in ensuring that Capital Metro is able to grow and expand with the program as the University sees fit.

For the University to accomplish these goals and continue to foster a relationship with Capital Metro that allows the program to grow and expand; the University will need

to begin to take steps to address the areas that were not met in the practical ideal type model. The University will need to take a proactive stance and begin to develop a plan that will identify alternative funding opportunities for the program. The University may also consider pursuing the contractual option of advertising to generate funding by working with Capital Metro to develop a business model that will satisfy both partners' requirements. Both Capital Metro and UT-Austin will need to review the guidelines for both the Federal Transportation Agency as well as the University of Texas System to ensure that the appropriate steps are taken to allow this option.

Further, it is the author's belief that in order to maintain current ridership and attract new riders, the University must continue to push Capital Metro in the direction of integrating passenger information technologies on to the existing fleet. The University should develop a plan that prioritizes the requested technology along with a timeframe for installation. The University should work with Capital Metro to identify areas of the plan that will require additional funding and other such requirements so that both partners can work towards developing a feasible solution that meets all elements of the plan.

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## Appendix A

### Interview Questions

#### Operations Model: Joint Partnership

- Q1) Why was a partnership used vs. other operational models?
- Q2) What factors are considered in the creation of this agreement?
- Q3) What is the process for approval of this document?
- Q4) Do you face any challenges when trying to implement this agreement?

#### Funding: Mandatory Student Fee

- Q5) What factors are considered when deciding the cost of the program?
- Q6) What happens when the cost of the program exceeds the amount the university is allowed to pay?

#### Funding: Alternative Funding

- Q7) Because the University shuttle system has faced budget deficits in the past why has advertising not been considered to help subsidize the cost?
- Q8) Has the University considered using parking citation and permit fees to subsidize service?
- Q9) What other types of barriers exist to increase funding for the program?

#### Scope of Service: Levels of Service

- Q10) How large of a role does student input/feedback play in determining university specific routes and altering mainline routes?
- Q11) What barriers exist to expand services including hours and routes?

#### Scope of Service: Safety and Security

- Q12) What was the primary factor and supporting factors considered in providing late night and safe ride transit services?

### Scope of Service: Integrated Passenger Information Technologies

Q13) What type of transit management software is used to monitor operations, planning and scheduling and performance including Real-Time Passenger Information Systems (RTPIS)?

Q14) Are there any plans to add additional features such as automatic vehicle locators, mobile data terminals, and electronic signage at bus shelters?

### Environmental Responsiveness: Utilization of Green Fuels

Q15) What type of green fuels is currently being used in the shuttle fleet?

Q16) Why were these fuel types chosen over other types of fuel?

## Appendix B IRB SYNOPSIS

### Best Practices For University Transit Bus Systems

1. The potential subject that will be interviewed for this research project will be the Capital Metropolitan Transit Authority (Capital Metro) Contract Services Coordinator. The materials utilized in this research project will include: The University of Texas at Austin (UT-Austin) and Capital Metro Inter Local Agreement, The UT-Austin's Student Fee Bill Committee Documentation, UT-Austin's Parking and Transportation fiscal budget documentation, and Capital Metro service planning documentation. The subject that will be interviewed has been selected based on their job description as the Contract Services Coordinator for Capital Metro.
2. The subject will be contacted via e-mail. The body of the email will consist of a brief introduction of who I am followed by information pertaining to the research I am conducting and why they were chosen to partake in the study. I will conclude the email by seeking permission for them to participate in the focused interview followed by instruction on how to return the consent form. The consent form will be attached for the subject to read, sign and return on the day of the interview if they choose to participate.
3. The project's methodology will be conducted through document analysis and performing one focused interview with a preselected subject. The documents which will be analyzed include: The University of Texas at Austin (UT-Austin) and Capital Metro Inter Local Agreement. This document will provide information on the type of agreement that is utilized. The UT-Austin's Student Fee Bill Committee Documentation, which will provide information on what type of fee is assessed as well as how much. UT-Austin's Parking and Transportation fiscal budget documentation which will provide information on what funds are used to pay for the program. Lastly, the Capital Metro service planning documentation which will provide information and descriptions on types of routes, hours, headways, days of service and areas that are serviced.

Please see focused interview questions attachment.

4. There are no potential risks associated with this study.

5. Since no risks are associated with this study, procedures were not created. The subject's information other than their job title will remain confidential and all contact information will remain secured in the supervising professor's office.
6. There are no identified benefits associated with this study.
7. No compensation will be offered/provided to the participant.
8. Because there are no potential benefits associated to this study there are no risks in relation to the anticipated benefits.
9. The specific sites that will be used in this study will be Capital Metro and UT-Austin Parking and Transportation Services. Please see attachments for approval documentation for each site.
10. The research that I am conducting relates to my program of work by administrating program development at the state level and developing and identifying program management practices between government entities. My supervising sponsor is Dr. Thomas Longoria.
11. Please see evidence of approval from supervising faculty.
12. The proposal has not been reviewed/approved by another IRB.
13. Dr. Longoria and I, Blanca Juarez will be the only two individuals who will have access during and after completion of results of the study whether they are published or unpublished.

## IRB Consent Form

### CONSENT FORM

IRB Approval Number: 2011H5035

#### Best Practices For University Transit Bus Systems.

The purpose of this applied research project is to gauge The University of Texas at Austin's shuttle bus program against identified university transit bus standards that fit the practical ideal type model.

I, Blanca Juarez, candidate for the Master of Public Administration Degree, ask that you read this document in its entirety and ask any questions before you agree to participate in this study. Should you have any questions regarding the study I can be contacted at (512)471-6214 or by email at [bj Suarez82@gmail.com](mailto:bj Suarez82@gmail.com)

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The Texas State University-San Marcos, Master of Public Administration Program  
Applied Research Project.

#### Background Information:

To gauge The University of Texas at Austin's (UT-Austin) transit bus program against identified best practices and offer recommendations on how to improve the program. The main objective will be achieved through two approaches: 1) Research and review of documents provided by Capital Metropolitan Transportation Authority (Capital Metro) which pertain to the partnership with UT-Austin and 2) Focused interview with the selected Capital Metro representative.

#### Procedure:

You have been chosen to participate in this interview because you are the Contract Services Coordinator for the UT-Austin and Capital Metro shuttle bus system and I am interested in your feedback regarding the partnership. The interview will consist of 20 questions pertaining to the UT-Austin and Capital Metro partnership including areas such as: operations, funding, services and environmental response. The interview should take no longer than 30 minutes to complete.

#### Risks and Benefits of Being in the Study:

The following risks are associated with this study:

*There are no risks involved by being part of this research project.*

The following benefits are associated with this study:

*There are no benefits involved by being part of this research project.*



### Confidentiality:

The participant's identity will be kept confidential. The participant of the interview will only be identified by their employment title for reporting data related to this study. Other identifying information such as name and contact information will not be requested.

### Voluntary Study:

Participation in this study is voluntary. You may choose not to answer any questions for any reason and you are free to withdraw at any time during the study. Withdrawing at any time from the study will not affect your standing with the Texas State University and Capital Metro. All data records will be kept confidential and secured in the supervising professor's office.

### Contacts and Questions

Any questions, you may contact me (Blanca Juarez) directly (512) 471-6214 or by email at [bjuaraz82@gmail.com](mailto:bjuaraz82@gmail.com)

Any questions about this research, participant's rights may be directed to the IRB chair, Dr. Jon Lasser (512-245-3413- [lasser@txstate.edu](mailto:lasser@txstate.edu) ), or to Ms. Becky Northcut, Compliance Specialist (512-245-3413).

You will be given a copy of this consent form to keep for your personal records.

If requested, a summary of the findings shall be provided to the participant upon completion of the study. The final report will be made available to you on eCommons at Texas State University's website.

---

### Statement of Consent:

I have read the above information and I consent to participate in this study.

Signature\_\_\_\_\_ Date \_\_\_\_\_

Signature of Investigator or Person Obtaining Consent\_\_\_\_\_

Date \_\_\_\_\_

IRB Research Approval  
Parking and Transportation Services, UT-Austin

**Juarez, Blanca U**

---

**From:** Baker, Jeri  
**Sent:** Monday, January 24, 2011 8:37 AM  
**To:** Juarez, Blanca U  
**Cc:** Stone, Bobby J  
**Subject:** RE: Research Approval

Blanca,

We support your efforts to complete the ARP for your course work and approve you reviewing documents related to the shuttle system here at UT. Please let us know if you need anything.

Thanks,

Jeri

---

**From:** Juarez, Blanca U  
**Sent:** Friday, January 21, 2011 5:33 PM  
**To:** Baker, Jeri  
**Subject:** Research Approval

Jeri,

I am conducting an applied research project (ARP) for the completion of my degree requirements for the Masters of Public Administration from Texas State University.

My ARP will focus on *Best Practices for University Transit Bus Systems* and upon completion of this project, my research will be posted to the Texas State Library eCommons section for download and review.

My project will consist of the following areas of study:

- Research the history of university transit systems
- Creation of a practical ideal type model for university transit system best practices
- Gauge The University of Texas at Austin's shuttle program using the practical ideal type model created
- Make recommendations to improve the current program if necessary

I would like to gain approval to review documents related to the shuttle bus program for the purpose of my ARP.

Thank You,  
Blanca Juarez

## IRB Research Approval Capital Metro

**Juarez, Blanca U**

---

**From:** Watkins, Dottie [dottie.watkins@startrn.org]  
**Sent:** Monday, January 24, 2011 5:02 PM  
**To:** Juarez, Blanca U  
**Cc:** Gonzalez, Roberto  
**Subject:** RE: Research Approval

Blanca,

We would be happy to provide any information you require to assist you with your review. In fact, I'd love to see a copy of your findings when you are done. When you're ready to request specific information, please let me know and I'll work with Roberto and his folks to get you the information you need.

Thanks!  
Dottie

---

**From:** Juarez, Blanca U [mailto:[bjvarez@austin.utexas.edu](mailto:bjvarez@austin.utexas.edu)]  
**Sent:** Monday, January 24, 2011 9:45 AM  
**To:** Watkins, Dottie  
**Subject:** Research Approval

Dottie:

I am conducting an applied research project (ARP) for the completion of my degree requirements for the Masters of Public Administration from Texas State University.

My ARP will focus on *Best Practices for University Transit Bus Systems* and upon completion of this project, my research will be posted to the Texas State Library eCommons section for download and review.

My project will consist of the following areas of study:

- Research the history of university transit systems
- Creation of a practical ideal type model for university transit system best practices
- Gauge The University of Texas at Austin's shuttle program using the practical ideal type model created
- Make recommendations to improve the current program if necessary

I would like to gain approval to review planning documents related to the shuttle bus program for the purpose of my ARP.

Please feel free to contact me if you have any questions regarding my ARP.

Thank You,  
Blanca Juarez

## IRB Research Approval Faculty IRB Approval

**Juarez, Blanca U**

---

**From:** Blanca Juarez [bj Suarez82@gmail.com]  
**Sent:** Monday, January 31, 2011 4:39 PM  
**To:** Juarez, Blanca U  
**Subject:** Fwd: IRB Application 2011H5035: Application Approved by faculty

----- Forwarded message -----

**From:** AVPR IRB <ospirb@txstate.edu>  
**Date:** Mon, Jan 31, 2011 at 9:03 AM  
**Subject:** IRB Application 2011H5035: Application Approved by faculty  
**To:** [bj Suarez82@gmail.com](mailto:bj Suarez82@gmail.com)

DO NOT REPLY TO THIS MESSAGE. This email message is generated by the IRB online application program.  
The faculty has reviewed the student's application and has approved the submission. The application is now ready for review. The application number is: 2011H5035.

You can click the following link to log into IRB Online Application System:  
<http://www.osp.txstate.edu/irb/index.php?appNum=2011H5035>

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Institutional Review Board  
Office of Research Compliance  
Texas State University-San Marcos  
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**Juarez, Blanca U**

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**From:** Blanca Juarez [bj Suarez82@gmail.com]  
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The project is approved.

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