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Exploring the Walking Tolerance of Transitway Users

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To park or to develop is always a key question for transit station area planning. Planners are interested in a hybrid option: siting park-and-ride (P&R) facilities at the periphery of development around transitway stations. However, the literature offers little evidence on how far a P&R lot can be located from transitways while maximizing ridership and revenue. Using a stated preference survey of 568 P&R users in the Twin Cities, this study conducted several experiments to illustrate their walking tolerance and identify built environment attributes that influence the walking distance. Walking distance is much more important than intersection safety, pedestrian infrastructure, and building appearance in affecting P&R users' choice. The average walking distance is three city blocks when the minimum walking distance is set as two blocks in the experiments. Intersection safety, pedestrian infrastructure, and building appearance help mitigate the disutility of walking distance. If all three characteristics are adequate, it seems that P&R users are willing to walk 1.8 blocks farther than their existing facilities. A further analysis shows that the effects of these four dimensions vary by transit type. The analysis of stated importance illustrates that when determining how far P&R users are willing to walk, they value snow clearance, street lighting, and intersection safety the most. In general, the quality of sidewalk network connecting transit stops and P&R facilities is the most important, followed by safety and security attributes associated with the walking environment. However, the aesthetic quality seems to be the least important for P&R users.

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Exploring the Walking Tolerance of Transitway Users

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EXECUTIVE SUMMARY

To park or to develop is always a key question for transit station area planning. Park-and-ride (P&R) is one of the primary means for transit users to access stations. Development around station areas enables residents to access the system without driving and allows passengers to access the activities along a transitway corridor. Although both have the potential to improve ridership, they seem to be mutually exclusive. Planners in the Minneapolis and St. Paul Metropolitan Area (Twin Cities) are interested in a hybrid option: siting P&R facilities at the periphery of development around transitway stations.

Although previous studies have explored transit riders' walking distance to stops/stations and environmental correlates of the distance, the literature offers little evidence on how far a P&R lot can be located from transitways while maximizing ridership and revenue - the tolerance distance P&R users are willing to walk to stations. No studies have explored how the walking tolerance varies by the type of transitways and the design of walking paths between P&R lots and transit stations.

Using a stated preference survey of 568 P&R users in the Twin Cities, this study conducted several experiments to illustrate their walking tolerance and identify built environment attributes that influence the walking distance. The results show that walking distance is much more important than intersection safety, pedestrian infrastructure, and building appearance in affecting P&R users' choice. For all respondents, the average walking distance is three city blocks when the minimum walking distance is set as two blocks in the experiments. Intersection safety, pedestrian infrastructure, and building appearance help mitigate the disutility of walking distance; their marginal utilities are equivalent to 0.62, 0.67, and 0.47 blocks. If all three characteristics are adequate, it seems that P&R users are willing to walk 1.8 blocks (or 0.18 miles if a city block is about 0.1 miles) farther than their existing facilities. A further analysis shows that the effects of these four dimensions vary by transit type, demographics, and travel attitudes.

The analysis of stated importance illustrates that when determining how far P&R users are willing to walk, they value snow clearance, street lighting, and intersection safety the most. In general, the quality of sidewalk network connecting transit stops and P&R facilities is the most important, followed by safety and security attributes associated with the walking environment. However, the aesthetic quality seems to be the least important for P&R users. Reaching the destination is the single most important goal of walking from parking facilities to transit stops. This was also echoed by respondents' comments to the survey.

CHAPTER 1: INTRODUCTION

To park or to develop is always a key question for transit station area planning. Park-and-ride (P&R) is one of the primary means for transit users to access stations. Development around station areas enables residents to access the system without driving and allows passengers to access the activities along a transitway corridor. Although both have the potential to improve ridership, they seem to be mutually exclusive. Planners in the Twin Cities are interested in a hybrid option: siting P&R facilities at the periphery of development around transitway stations.

Although previous studies have explored transit riders' walking distance to stops/stations and environmental correlates of the distance, the literature offers little evidence on how far a P&R lot can be located from transitways while maximizing ridership and revenue - the tolerance distance P&R users are willing to walk to stations. No studies have explored how the walking tolerance varies by the type of transitways and the design of walking paths between P&R lots and transit stations.

Using the data from a self-administered walking tolerance survey, this study aims to answer the following research questions: (1) How far are P&R users willing to walk? (2) Which factors influence the willingness? (3) Which factors are the most important to P&R users' decision to walk?

This report is organized as follows. Section 2 reviews the literature about walking distance of transit riders, the factors influencing the walking distance, and P&R facilities. Section 3 describes research design and data collection. Section 4 presents the results. The last section summarizes the key findings of this study. Section 2 was drafted by Zhang and Cao. Section 3 was drafted by Lampe and Cao. The remainder of the report was completed by Cao.

CHAPTER 2: LITERATURE REVIEW

In recent discussions of walking willingness of transit users, a common question is whether it is reasonable to generalize the distance that users access transit systems by walking. A quarter mile is commonly used as the distance bus riders are willing to walk to/from stops (O'Neill et al., 1992; Zhao et al., 2003) and half a mile is commonly used for rail riders (Kuby et al., 2004; Weinstein Agrawal et al., 2008). Transit planners have widely applied this rule of thumb when estimating users' walking willingness and defining service areas of bus or rail stations (Furth and Rahbee, 2000; Murray and Wu, 2003; TCRP, 2003). However, there is a variation in the distance users are willing to walk to transit stations (TCRP, 2003). Many factors contribute to the variation, and using these generalized distances may erroneously define transit service areas (El-Geneidy et al., 2014; TCRP, 2003).

Table 1. Walking distances to/from rail/bus stations

Authors/Year	**Title**	**Location**	**Mean Walking Distance (in miles)**	
			Rail Station (Self-reported)	**Bus Station (Self-reported)**
Weinstein Agrawal et al./2007	How Far, by Which Route and Why? A Spatial Analysis of Pedestrian Preference	California, Oregon	0.52(actually measured)	
Besser & Dannenberg/2005	Walking to Public Transit: Steps to Help Meet Physical Activity Recommendations	United States		0.26
Daniels & Mulley/2013	Explaining Walking Distance to Public Transport: The Dominance of Public Transport Supply	Sydney, Australia	0.5	0.29

El-Geneidy et al./2014	New Evidence on Walking Distances to Transit Stops: Identifying Redundancies and Gaps Using Variable Service Areas.	Montreal, Canada	0.51	0.23
Olszewski &Wibowo/2005	Using Equivalent Walking Distance to Assess Pedestrian Accessibility to Transit Stations in Singapore	Singapore	0.65	

Many studies have demonstrated that the empirically identified distances are different from the 0.25 mile for bus or 0.50 mile for rail, as Table 1 shows (Besser and Dannenberg, 2005; Daniels and Mulley, 2013; El-Geneidy et al., 2014; Olszewski and Wibowo, 2005; Weinstein Agrawal et al., 2008). Besides the mean walking distance of transit users, previous studies also presented other measures of walking distances to/from transit stations. Burke and Brown (2007) found that the median and 75th percentile walking distances from origins to transit stops are 0.37 mile and 0.81 mile in Brisbane, Australia. Daniels and Mulley (2013) reported that the mean walking distance to Sydney's bus stops is 0.29 mile and the 75 percentile is 0.41 mile. For rail stations, the mean walking distance is 0.5 mile and the 75 percentile is 0.63 mile. El-Geneidy et al. (2014) showed that the mean and 85th percentile walking distances to bus stations are 0.23 and 0.33 miles, respectively, in Motreal, Canada. This study also implies that the 85th percentile should be used to define stop service areas. The area covering 85 percent of users is also chosen for P&R market area in Suburban Seattle, as illustrated in Transit Capacity and Quality of Service Mannual, 2nd edition (TCRP, 2003, Chpater 2, pp. 3-16).

2.1 INFLUENTIAL FACTORS OF TRANSIT USERS' WALKING DISTANCE

Previous studies have shown that walking distances to/from transit stations vary based on three groups of factors: (1) socio-demographic characteristics of transit users; (2) mode and trip attributes; and (3) built environment characteristics.

Socio-demographic characteristics are associated with walking behavior of transit users. Kim et al. (2007) found that male riders are willing to walk more to stations than their female counterparts, and Caucasians tend to walk farther than African Americans and Asian Americans. Professions, income, education and car availability also contribute to different walking willingness of transit users. Loutzenheiser (1997) found that walking willingness is positively associated with education levels and certain types of professions. He also concluded that people who earn over $45,000 annually or own more than one automobile are less likely to walk to transit stations than others.

Trip factors including transit modes, trip purposes, the number of transfers, and trip duration affect walking behavior of transit users. The long-trip traveler with few transfers are willing to walk farther to stations than passengers who use transit for a short trip or have multiple transfers (El-Geneidy et al., 2014). Guerra et al. (2012) found that walking willingness to transit increases if transit users travel for work and their workplace is located near a stop. Transit mode and network connection affect the variation in walking willingness. There is an apparent variation between people's walking distance to rail stations and bus stations (El-Geneidy et al., 2014). If there are more lines to connect to and more places to go, transit users are likely to walk farther to reach the station (Tilahun and Li, 2015).

Built-environment characteristics play a major role in determining the distance transit users are willing to walk to/from stations. Table 2 presents several studies about the relationships between the built environment and walking distance (Besser and Dannenberg, 2005; El-Geneidy et al., 2014; Li and Deng, 2015; Townsend and Zacharias, 2010). The three "Ds", density, diversity and design (Cervero and Kockelman, 1997), reflect a general mechanism by which the built environment affects transit users' walking behavior. Many studies point to density as an important factor. In dense areas, origins and destinations tend to be close to transit stations. So it is not surprising that the willingness to walk to transit is generally higher in dense urban areas than in rural or suburban areas (Yang and Diez-Roux, 2012). Density also has a positive association with walking distance to transit (Besser and Dannenberg, 2005). Density may also serve as a proxy for aesthetic qualities and perceived safety, which influence transit users' walking willingness. Moreover, diverse or mixed land-use patterns are positively associated with the willingness to walk because in mixed-use areas, origin and destinations tend to be close to stations (Saelens and Handy, 2008). Studies have also concluded that dense neighborhoods with mixed non-residential land-use patterns tend to be pedestrian-friendly (Cervero and Kockelman, 1997; Greenwald and Boarnet, 2001). Design (including pedestrian infrastructure, street connectivity of routes/network, and attractiveness of walking environments) also influences transit users' walking behavior. Walkable neighborhoods generate longer walking distance to/from stations, whereas automobile-oriented neighborhoods with a large number of roads to cross, traffic conflicts (parking and access driveways) and steps to climb reduce the acceptable walking distance (Olszewski and Wibowo, 2005; Park et al., 2014). Ameli et al. (2015) found that two design qualities, imageability (including proportions of parks, plaza, and outdoor dining etc.) and transparency (such as proportion of first floor with windows and active uses), are positively associated with respondents' willingness to walk in Salt Lake city, Utah. Furthermore, an unsafe environment can be a barrier for transit users to walk. For example, Mason et al. (2011) found a positive association between perceived safety of a neighborhood and walking frequency in the neighborhood.

Table 2. The relationship between built environmental factors and walking distance

Authors/Year	Sample	Data source	Environmental factors examined	Covariates
Besser&Dannenberg/2005	3,312 transit users in the US	2001 National Household Travel Survey	Population density	Demographic characteristics
El-Geneidy et al./2014	16,014 transit trips in Montreal, Canada	2003 Origin-Destination Survey	Population density; street connectivity; Distance to downtown	Demographic, trip characteristics
Li & Deng /2015	586 transit users of Shanghai Rail Transit Line 10, Shanghai, China	Self-collected data by authors	Public security, street business, shelter facilities, sidewalk width, roadside landscape, roadside cleanness, pedestrian crossing, sidewalk obstacle, guide sigh	Demographic, trip characteristics
Towansend &Zacharias /2010	1,520 pedestrians from rail stations in Bangkok	Self-collected data by authors	Pedestrian infrastructure, public sidewalk, platform-level walkways, land-use mix around stations	Demographic, trip characteristics

Since many factors contribute to walking behavior, an open question emerges: which factors are the most important for transit users? This question is critical when there are limited resources for station area investments. Weinstein Agrawal et al. (2008) asked transit users in California and Oregon to rate the importance of environmental factors to their walking route choice to/from transit stations. They found that the top two factors are “shortest/fastest route” (rated as “very important” or “somewhat important” by 99% of the respondents) and “safety” (rated as “very important” or “somewhat important” by 87% of the respondents). Sidewalks in good condition, the presence of attractive buildings, trees and landscaping, and having shops or businesses to stop in were rated as either “very important” or “somewhat important” by more than 50% of the respondents. Vargo (2013) identified the walkability concerns of transit users along the Central Corridor in Minneapolis/St. Paul prior to the opening of the Green Line light rail transit in 2014. He concluded that the top three concerns are the quality of sidewalk network (condition and continuity), safety issues from traffic, and lack of trees and green space. Although these two studies shed light on the major factors of walkability, they focused on transit users and residents in station areas. Park-and-riders differ from general transit users and residents in that they tend to be middle-class professional workers and have other options for travelling.

2.2 STUDIES ON PARK-AND-RIDE FACILITIES AND USERS

The built environment’s effects on transit users’ walking behavior suggest that effective station area planning could encourage riders to walk to stations. In practice, station areas can be planned in two ways to maximize transit ridership: transit-oriented development (TOD) and P&R. TOD enables residents to access transit system and allows passengers to reach various activities along a transitway corridor. P&R is one of the primary means for riders who live beyond service areas of fixed route transit to access stations. These riders have access to automobiles and could drive all the way to their destinations but choose to park and ride. Therefore, P&R facilities provide flexible access for suburban auto users to make part of their journey by transit. However, P&R facilities are oriented towards automobiles and a large amount of parking lots often undermines the walkability around station areas.

P&R users need to access transit stations by walking from parking lots or deck spaces, but their walking willingness is presumably different from that of other groups of transit users. The differences can be explained by P&R users’ unique demographic characteristics, different trip factors and perceptions of pedestrian environment around transit stations and P&R facilities. Studies on P&R facilities and P&R users’ travel behavior are rather limited in the literature. Some aggregate studies investigate the location, physical environment, market area, and occupancy level of P&R facilities (Farhan and Murray, 2005; Horner and Groves, 2007; Wang et al., 2004). In these studies, GIS-based approaches are widely used to identify the walking buffers around P&R facilities. Previous studies also use a disaggregate approach based on P&R user surveys. Some focus on demographic and trip characteristics of P&R users (Shirgaokar and Deakin, 2005). Some include P&R as an access option to transit stations and then predict an individual’s propensity to use transit based on their use of P&R facilities (Roorda et al., 2009). Others investigate P&R users’ attitudes towards to P&R service attributes like parking price and ease (He et al., 2012; Syed et al., 2009). However, no specific studies have addressed P&R users’ willingness to walk and walking distance.

2.3 SUMMARY

Transit riders in different regions tend to walk different distances to reach transit stations and many factors influence their willingness to walk and walking distance. This review concludes that besides built environment attributes, socio-demographics and transit and trip attributes also influence transit users' walking distance. Therefore, when exploring environmental correlates of transit riders' walking distance, it is necessary to account for the effects of socio-demographic, transit and trip characteristics.

Previous studies have found environmental correlates to walking behavior, including various measures of density, diversity, and design, and safety. In an editorial for a special issue on walkability and walking behaivor, Forsyth and Southworth (2008a) summarizes that a walkable environment should include the following five dimensions: a short distance, free of major barriers, a safe environment in terms of traffic and crime, adequate pedestrian infrastructure, and a walking area with attractive landscaping and architecture design. Among the factors, previous studies have highlighted the importance of distance, safety from traffic and crime, pedestrian infrastructure (such as sidewalks, trees and landscaping), and the presence of businesses and attractive buildings.

Transit-oriented development around transit stations is a commonly used planning paradigm to achieve a walkable environment around transit corridors and P&R facilities is a planning alternative for TOD to attract riders living beyond transit service areas to use transit. Combining these two planning tools, planners in the Twin Cities are interested in a hybrid option: siting P&R facilities at the periphery of development around transit stations. However, no studies have explored how far P&R users are willing to walk and how build environment characteristics influence walking tolerance of P&R users. These are the key research questions of this ongoing study.

CHAPTER 3: SURVEY DESIGN AND ADMINISTRATION

3.1 SURVEY DESIGN

The survey is a web-based questionnaire developed using Qualtrics software. The survey contents are described here. The survey began with a consent form that explained the context and sponsors of the research, and listed the closing date for the online survey, as well as the confidentiality of the responses. The consent form also made the respondents aware that by taking the survey, they had a chance of winning one of ten $50-dollar gift cards. Lastly, the names and contact information of the researchers were listed if respondents had any questions or concerns. It duplicates the recruitment letter (Figure 1).

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October 10, 2016

Dear users of park-and-ride facilities,

In partnership with Metro Transit and the Minnesota Valley Transit Authority, University of Minnesota is conducting a research study on the preferences of users of park-and-ride facilities. If you agree to participate, we would ask you to complete a one-time online survey at the following website: **tinyurl.com/HHHPNR1-0** or scan the QR code at the bottom of the letter. This survey is a research project of the University of Minnesota and is not connected to separate surveys being conducted by the Metropolitan Council. The survey should take approximately 15 minutes. **Please complete the survey by November 21, 2016**.

Respondents who choose to provide contact information will be entered into a drawing to receive one of ten $50 gift cards. You will not receive payment for this study. The study does not entail any personal risk. **In any report we might publish, we will not include any information that will make it possible to identify a subject**. Your contact information will be stored securely and only researchers will have access to the records for the purpose of mailing gift cards. Although confidentiality is not 100% guaranteed when using survey applications such as Qualtrics, every precaution to protect your identity will be taken.

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Thank you in advance for participating in this study. If you have any questions, please contact me at 612-625-5671 or cao@umn.edu, or my assistant Joe Lampe at 412-680-3515 or lampe037@umn.edu. If you have any questions or concerns regarding this study and would like to talk to someone other than the researchers, you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

Sincerely yours

Jason Cao, Project director

1

Figure 1. Survey Recruitment Letter

Section 1: Your Last Park-and-ride Trip followed the consent form and contained 13 questions regarding respondents' most recent trip when they used a P&R facility. The questions included what P&R station they used, what their destination station was, the purpose and duration of their trip, time of departure, residential and destination locations, frequency of transit use, travel time if they were to drive, as well as cost of parking at destination if they were to not use the P&R facility. Many of these questions required the respondents to type in their response.

Section 2: Your Attitudes posed 18 questions related to respondents' attitudes with respect to their daily travel habits. Respondents were asked to indicate the extent to which they disagreed or agreed to a list of statements related to transit and daily commuting, on a five-point ordinal scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

Section 3: Your Preferences asked a series of four questions about respondents' situational behavior in the absence of a P&R station. This section utilized Qualtric's skip logic, changing the questions each respondent is faced with based on their previous answer. This section sought to understand how P&R users would have arrived at the destination in the absence of the P&R facility.

In *Section 4: Pedestrian Environment*, respondents were asked to imagine themselves walking through a shopping area from a P&R lot in order to reach their bus stop or train station. They were presented with four scenarios. In each scenario, we asked respondents to choose one of three images, with each image representing a different environment based on the metrics of walking distance (the number of blocks from the lot to transit stop or station), intersection safety, pedestrian infrastructure, and building appearance. In the other questions, they were asked to rate how important 15 aspects of the built and natural environment are when they decide how far they are willing to walk. The characteristics in question included temperature, an area free of trash, benches/places to sit, the condition of the sidewalk, shops/businesses to stop in, and other people out walking, among others. The importance of these characteristics was measured on a four-point ordinal scale ranging from "Not Important At All" (1) to "Extremely Important" (4).

Specifically, this section aimed to explore respondents' tradeoffs among walking distance, intersection safety, pedestrian infrastructure, and building appearance. Walking distance has four variations: walking two city blocks, three blocks, four blocks, and five blocks (Figure 2). Intersection safety includes two variations: relatively safe and unsafe designs (Figure 3). Pedestrian infrastructure and building appearance have four variations: abundant pedestrian infrastructure and attractive buildings, abundant pedestrian infrastructure and unattractive buildings, few pedestrian infrastructure and attractive buildings, and few pedestrian infrastructure and unattractive buildings (Figure 4). These dimension can generate 1,024 ($=4^2 \times 2^2 \times 4^2$) combinations. In reality, it is difficult to investigate individuals' preference under these 1024 combinations. To obtain a manageable number of combinations, an orthogonal factional factorial design is often employed by ignoring some interaction terms of different attributes (e.g., Louviere et al., 2000). Using this design method, 32 scenarios were derived in SPSS 16.0. Because the 32 scenarios included some combinations with an obvious choice, we further removed eight scenarios. To reduce respondents' burden, the remaining 24 scenarios were further randomly grouped into six blocks, each of which includes four scenarios. Accordingly, we created six different versions of the survey, which were identical and differed only in which scenarios they showed for Section 4. The scenarios are presented in images. An example image is shown in Figure 4. In the survey, each respondent was randomly assigned one version of the survey. Among the three images in each scenario (Figure 5), they were asked to choose the image that they would feel the most comfortable walking through to and from their departure stop or station and the P&R lot.

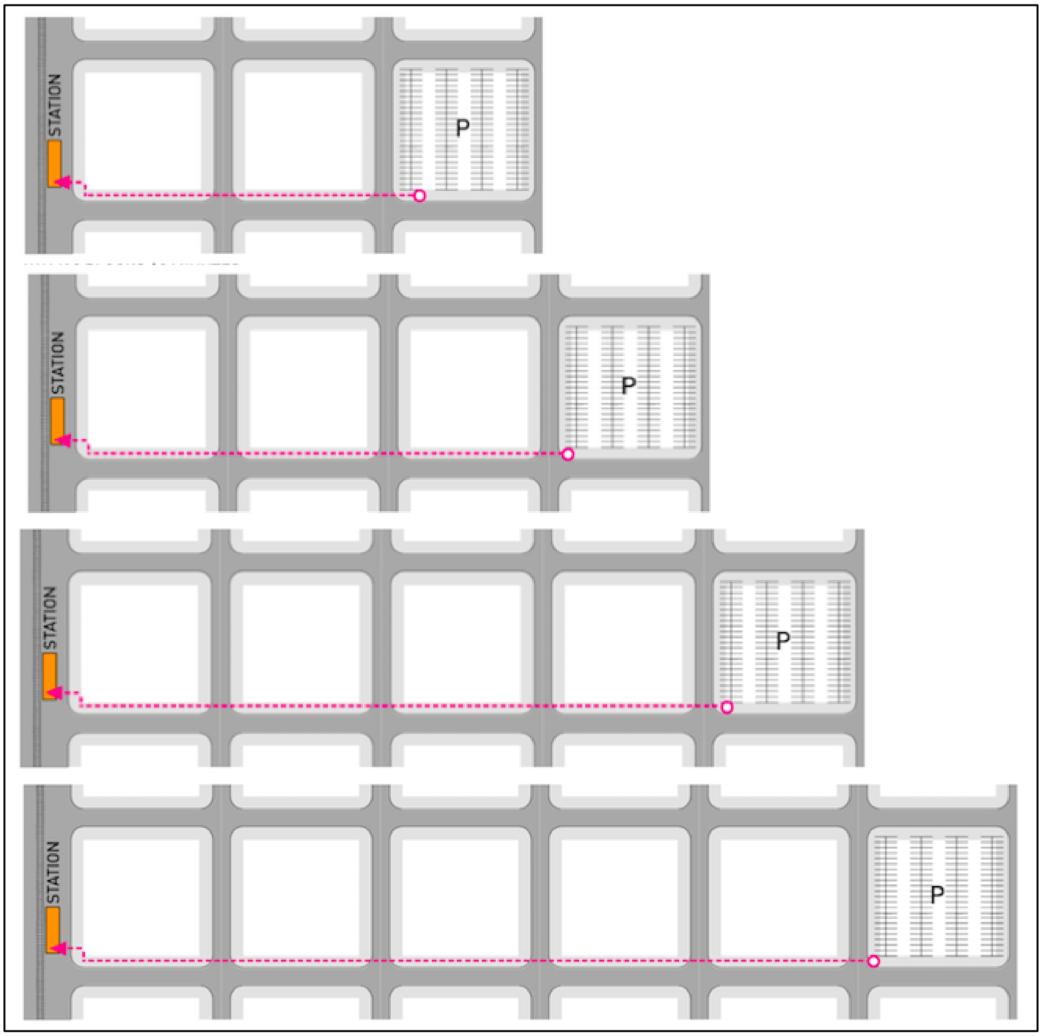

Figure 2. Walking Distance

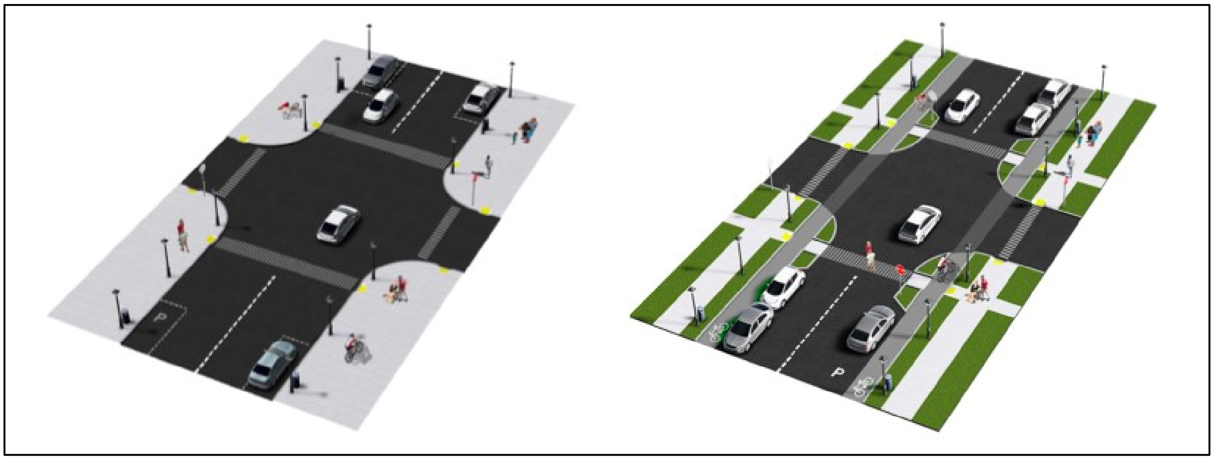

Figure 3. Intersection Safety

Figure 4. Pedestrian Infrastructure and Building Appearance

Section 5: Your Household had respondents answer personal questions related to age, gender, race, educational attainment, employment status, walking constraints, car ownership, household structure, housing tenure, and income. A statement at the beginning of the section clearly stated that the information in this section would be kept 100% confidential.

The last section, which was optional to complete, asked respondents to enter a daytime phone number and email address if they were interested in participating in a random drawing for the opportunity to win a $50 gift card. Finally, respondents had the opportunity to enter any opinions regarding the P&R facility.

Choice A

Choice B

Figure 5. An Example Scenario

3.2 SAMPLING PLAN

The sampling plan for this study aims to capture a number of P&R lots, serving a variety of transit modes and locations, throughout the region. The lots selected, and the subsequent transit modes that they serve, are the following:

- **Along the Northstar Commuter Rail:** Fridley, Riverdale, Anoka, and Ramsey Stations
- **Along the Hiawatha LRT Line:** 28th Street Station and Fort Snelling Station
- **Along Suburban Bus and BRT Line:** Apple Valley Transit Station
- **Along Suburban Bus and Future BRT Lines:** Guardian Angels Church at Oakdale, Woodbury Theatre, and Burnsville Transit Station

These P&R facilities serve all rapid transit services (LRT, commuter rail, and express service) in the region and take into account lot locations that are located along future transit development.[1] Except for the Northstar stations, all other stations are large P&R lots. Table 3 illustrates the 2015 capacity and occupancy of these lots. We initially did not choose small lots because of the shortage of survey team members and survey time.[2]

[1] Most if not all lots were recommended by the members of technical advisory group.

[2] Because one team left 150 reminder letters, they were placed roughly evenly on the windshields of vehicles parked at three small lots: Lower Afton and Highway 61, Woodbury Lutheran Church, and Como and Highway 280.

Table 3. The 2015 report of park-and-ride facilities

Name	Capacity	Use	Name	Capacity	Use
Anoka	377	163	Fort Snelling	398+675	284+556
Riverdale	455	226	Guardian Angels Church	415	412
Fridley	668	52	Woodbury Theatre	550	488
Ramsey	360	331	Apple Valley	768	759
28^{th} Ave	1383	861	Burnsville	1428	1196

Source: Kleingartner (2016)

3.3 DATA COLLECTION

The data were collected over a period of one month, from October 21 to November 21, 2016. The first step in the process was to collect data on-site at various P&R station locations. Teams of two students went to the stations during morning peak hours (6am to 9am) to hand out recruitment letters to patrons as they waited for their train or bus. These letters contained information presented in the consent form as well as a link to one of the six versions of the survey (Figure 1). Recruitment letters were distributed at random in order to ensure equality among the different survey versions. Teams went to each P&R station twice: the first time to distribute recruitment letters and a second time to place letters on the windshields of vehicles parked in the lot. The second visit was to serve as a reminder to patrons. While distributing the letters, the students would approach a person waiting for their bus or train, explain to them that they were with the University of Minnesota, explain the basis for the study, hand them a recruitment letter, and explain to them how to access the online survey. However, because many passengers walked into transit vehicles directly, instead of waiting in the shelters, the students may not have been able to explain all the information before handing the letter to patrons.

A total of 4,200 letters were printed: half were planned for recruitment and half were planned as a reminder. We planned to distribute 800 letters at LRT stations, 650 letters at Apple Valley and Burnsville Transit Stations, 300 letters at the two lots in Oakdale and Woodbury, and 350 recruitment letters at Northstar stations. In practice, we distributed 762 letters at LRT stations, 626 letters at Apple Valley and Burnsville Transit Stations, 374 letters at the two lots in Oakdale and Woodbury, and a few dozen letters at Northstar Stations.

After distributing recruitment letters at the Northstar P&R locations, the project team realized that they were not able to distribute as many letters as they had hoped. The headway of the Commuter Rail is about 30 minutes and all riders walk to the platform almost at the same time. There is no time for the students to recruit riders. Accordingly, the team decided to rely on placing about 700 recruitment letters on the car windshields for the Northstar P&R lots. Once this procedure was carried out, the number of respondents grew rapidly.

After distributing the reminder letters at the planed P&R stations, about 150 letters were left. Then they were placed on the windshields of cars parked at three small lots: Lower Afton and Highway 61, Woodbury Lutheran Church, and Como and Highway 280.

The number of respondents totaled 570. The real response rate should be lower than 27.1% (=570/2100) because some reminder letters reached riders who did not receive the recruitment letter previously. That is, some respondents received only recruitment letters; some received only reminder letters, and others received both letters. However, the response rate should be higher than 20.0% based on the number of responses before we distributed the reminder letter.

Among the 570 respondents, two accessed P&R facilities by bicycle and walking. Because this study is interested in the walking tolerance of car drivers who use P&R facilities, these two respondents were removed from further analysis. Table 4 shows sample characteristics. Almost all the respondents are frequent transit users and travel for work/school-related purposes. More than 90% of the respondents need to pay parking at their destinations if they drive there. Nine out of ten respondents are Caucasians. The median income of the respondents is $100,000-125,000. The sample includes more women than men, consistent with the observations of surveyors.

Table 4. Characteristics of 568 respondents

Variables		Share
Transit type		
	LRT	32%
	Commuter rail	13%
	Express bus (Southern suburbs)	28%
	Express bus (Eastern suburbs)	24%
	Others	2%
Transit use frequency		
	Five or more times per week	72%
	Three or four times per week	23%

Work/school-related trips	98%
Pay parking at destination	91%
White	91%
Female	56%
Income	
$35-75,000	17%
$75-100,000	16%
$100-125,000	22%
$125,000 or more	43%

CHAPTER 4: RESULTS

4.1 DESCRIPTIVE ANALYSIS

In the survey, each respondent was asked to assess four scenarios and in each scenario we asked respondents to choose one of three images. Accordingly, each respondent assessed 12 images altogether. The data include 6,816 (=568×12) respondent-image combinations. Among them, 2240 were chosen by the respondents. Table 5 shows the walking distances available to respondents and their choices of walking distance. Two and three blocks were available in about half of the respondent-image combinations, but about 73% of the respondents chose these two levels of walking distance. The average walking distance is three blocks (note that two blocks is the minimum distance given to the respondents). These statistics suggest that the respondents tend to prefer walking a shorter distance. Similarly, the respondents tend to prefer safe intersection and good pedestrian infrastructure (Tables 6 and 7). However, building appearance seems to be not important (Table 8). Taken all evidence altogether, walking distance seems to outweigh the other three dimensions in the SP experiments.

Table 5. The distribution of walking distance

Walking Distance	Available	Chosen
Two blocks	21.1%	38.8%
Three blocks	30.1%	34.0%
Four blocks	21.7%	15.9%
Five blocks	27.1%	11.3%
Total	6,816	2,240

Table 6. The distribution of intersection safety

Intersection Safety	Available	Chosen
Unsafe	50.0%	43.0%
Safe	50.0%	57.0%
Total	6,816	2,240

Table 7. The distribution of pedestrian infrastructure

Pedestrian infrastructure	Available	Chosen
Poor	51.8%	38.4%
Good	48.2%	61.6%
Total	6,816	2,240

Table 8. The distribution of building experience

Building appearance	Available	Chosen
Unattractive	48.2%	51.6%
Attractive	51.8%	48.4%
Total	6,816	2,240

4.2 MULTINOMIAL LOGIT MODELS

A multinomial logit model was used to estimate the relative importance of the four dimensions of the pedestrian environment in the SP experiments. In particular, the probability that an individual *i* chooses Image *j* among 3 images (P_{ij}) can be expressed in the following equations:

$$P_{ij} = \frac{\exp(V_{ij})}{\sum_{k=1}^{3}\exp(V_{ik})}, \quad (1)$$

$$V_{ij} = constant + \beta_1 distance_{ij} + \beta_2 safety_{ij} + \beta_3 infrastructure_{ij} + \beta_4 building_{ij} + \varepsilon_i. \quad (2)$$

The four variables are alternative specific. Therefore, asclogit was used to develop models in Stata 14.0. Because each respondent was given four scenarios to assess, the four scenarios were not evaluated independently. The variance–covariance matrix corresponding to the parameter estimates were developed using a clustered sandwich estimator.

Table 9 shows model results. All four dimensions are significant in the model: walking distance has a negative influence and the other three variables have positive signs. The shorter the walking distance between P&R facilities and transit stops is, the more likely an image is to be chosen. Relative to an unsafe intersection, the utility of a safe intersection is equivalent to 0.622 blocks of walking distance (=0.538/0.865). Similarly, the utilities of good pedestrian infrastructure and attractive building appearance are equivalent to 0.674 and 0.472 blocks, respectively. The cumulative utility of all three dimensions is equivalent to 1.8 blocks. Thus, if city and transportation planners can design safe intersection, ample pedestrian infrastructure, and attractive buildings along the walking path, P&R users seem to be willing to walk 1.8 blocks farther away from their existing P&R facilities.

Table 9. Multinomial logit model for all respondents

Variables	Coefficients	P-values	Utility
The number of blocks (walking distance)	-0.865	0.000	
Intersection safety	0.538	0.000	0.622
Pedestrian infrastructure	0.583	0.000	0.674
Building appearance	0.408	0.000	0.472

Constant for Image 2	0.075	0.241	
Constant for Image 3	0.016	0.801	
Total utility			1.768
Wald Chi2	408	0.000	
N	2,240		

Table 10 shows the results for LRT users that were surveyed. Building appearance seems to be more important for these LRT users than all respondents as a whole as its utility is equivalent to 0.865 blocks. For commuter rail users that were surveyed, intersection safety and building experience are insignificant but pedestrian infrastructure becomes more important as its utility is equivalent to 1.019 blocks (Table 11). Tables 12 and 13 illustrate the results for users mainly from P&R facilities in southern suburbs (Burnsville and Apple Valley) and in eastern suburbs (Woodbury), respectively. It is worth noting that the different preferences for the four dimensions may result from both the type of transit and the environment surrounding P&R stations. For instance, users of the Fort Snelling LRT station appear to have stronger preferences for pedestrian infrastructure and attractive buildings than users of the 28th Ave LRT station, as shown in the Appendix Table. The difference may also be due to the characteristics of P&R users (Table 14).

Table 14 presents a model with interactive terms, which shows how the impacts of the four design dimensions are moderated by transit type, demographics, and travel attitudes (which consist of five factors as illustrated in Table 15). When the interactive effect is significant, explaining the unconditional effect of a base variable is misleading, because its effect depends on the level of the other variable (Brambor et al., 2006; Seltman, 2015). Therefore, we pay more attention to the coefficients of the interactive terms. In terms of walking distance, commuter rail users have a willingness to walk more blocks than riders of other types of transit although all riders prefer a shorter walking distance. By contrast, White riders prefer to walk fewer blocks than riders of other races. Further, those who do not like walking prefer to walk fewer blocks than those who like walking. Compared to riders of other types of transit, commuter rail users care less about intersection safety. By contrast, affluent people, the disabled, renters, and those who prefer driving care more about intersection safety than others. Full time workers and students care more about pedestrian infrastructure. By contrast, those who think parking is affordable at destinations care less about pedestrian infrastructure. LRT users, White respondents and those with higher education care more about building appearances.

Table 10. Multinomial logit model for LRT users

Variables	Coefficients	P-values	Utility
The number of blocks (walking distance)	-0.929	0.000	
Intersection safety	0.593	0.000	0.638
Pedestrian infrastructure	0.629	0.000	0.677
Building appearance	0.804	0.000	0.865
Constant for Image 2	0.048	0.676	
Constant for Image 3	0.044	0.688	
Total utility			2.180
Wald Chi2	149	0.000	
N	717		

Table 11. Multinomial logit model for commuter rail users

Variables	Coefficients	P-values	Utility
The number of blocks (walking distance)	-0.530	0.000	
Intersection safety	0.106	0.544	0.200
Pedestrian infrastructure	0.540	0.000	1.019
Building appearance	0.036	0.867	0.068
Constant for Image 2	-0.001	0.996	
Constant for Image 3	-0.010	0.947	
Total utility			1.287
Wald Chi2	26	0.000	
N	291		

Table 12. Multinomial logit model for express bus riders in eastern suburbs

Variables	Coefficients	P-values	Utility
The number of blocks (walking distance)	-0.886	0.000	
Intersection safety	0.500	0.001	0.564
Pedestrian infrastructure	0.549	0.000	0.620
Building appearance	0.315	0.013	0.356

Constant for Image 2	0.227	0.064	
Constant for Image 3	0.119	0.372	
Total utility			1.540
Wald Chi2	141	0.000	
N	552		

Table 13. Multinomial logit model for express bus riders from southern suburbs

Variables	**Coefficients**	**P-values**	**Utility**
The number of blocks (walking distance)	-0.992	0.000	
Intersection safety	0.763	0.000	0.770
Pedestrian infrastructure	0.541	0.000	0.546
Building appearance	0.254	0.087	0.256
Constant for Image 2	0.008	0.949	
Constant for Image 3	-0.026	0.833	
Total utility			1.572
Wald Chi2	130	0.000	
N	628		

Table 14. Multinomial Logit Model for all respondents with interactive terms

Variables	Coefficients	P-values
The number of blocks (walking distance)	-0.708	0.000
# block X commuter rail	0.431	0.002
# block X White	-0.285	0.042
# block X dislike walking	-0.173	0.006
Intersection safety	-0.770	0.133
Safety X commuter rail	-0.411	0.037
Safety X income	0.164	0.010
Safety X disabled	0.808	0.023
Safety X renter	0.450	0.040
Safety X prodrive	0.221	0.010
Pedestrian infrastructure	0.051	0.825
Infrastructure X fulltime worker	0.559	0.019
Infrastructure X affordable parking	-0.128	0.089
Infrastructure X student	0.540	0.045
Building appearance	-1.132	0.002
Building appearance X LRT	0.556	0.001

Building appearance X White	0.918	0.000
Building appearance X education	0.131	0.056
Constant for Image 2	0.081	0.242
Constant for Image 3	0.024	0.720
Wald Chi2	436	0.000
N	2096	

Table 15. Pattern Matrix for Travel Attitudes

	Protransit	Parking affordable	Dislike walking	Transit reliable	Prodrive
Taking transit during rush hour is comfortable	0.617				
Public transit can sometimes be easier for me than driving	0.585				
My time on the bus/train is productive	0.554				
I like taking transit	0.735				
I prefer to drive rather than take transit	-0.416				
Parking at work is costly		-0.794			
It is easy to find affordable parking at work		0.841			
There is affordable parking near my workplace		0.893			
I prefer to drive rather than walk			0.687		

Walking can sometimes be easier for me than driving	-0.619		
I like walking	-0.682		
When I use transit, I usually arrive at the destination on time		0.513	
My bus/train is often late		-0.728	
In general, transit has predictable travel times from day to day		0.649	
I do not mind driving during rush hour			0.882
Driving during rush hour is stressful			-0.591
Driving time is generally wasted time			

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization

Loadings smaller than 0.33 are suppressed

Total variation explained = 63%

4.3 STATED IMPORTANCE

In the survey we also asked respondents to indicate the importance of 15 attributes in determining how far they are willing to walk through a shopping area from a P&R lot in order to reach their bus stop or train station, on a four-point scale from “not important at all” (1) to “extremely important” (4). Table 16 illustrates the ranking of these attributes by all respondents and riders of different types of transit. In general, the ranking orders are mostly consistent among all respondents and users of different types of transit. The three most important attributes are sidewalks and crosswalks cleared of snow in winter, adequate street lighting, and presence of crosswalks and pedestrian signals. Sidewalks in good condition is also very important, ranking fourth. The three attributes related to sidewalks and crosswalks directly determine ease of walking between transit stops and P&R facilities. The quality of lighting is an indicator of security. The other two indicators of security (area is free of trash and vacant and rundown buildings) rank fifth and sixth among the 15 attributes. These three indicators are mostly associated with psychological aspects of walking. On the other hand, the attributes associated with aesthetic quality of the environment are not that important. This finding is mostly consistent with the modeling results in Table 9. The attribute of benches and places to sit is the least important. Walking trips of P&R users are more of direct travel to destinations (either P&R facilities or transit stops), and hence are utilitarian rather than recreational. Therefore, it is not surprising that these characteristics are less important than sidewalks and crosswalks, as well as security.

The comments of respondents also offer supportive evidence to the findings (Appendix Table 2). In particular, many respondents highlighted the importance of short walking distance, lighting, safety, weather-friendly conditions. Some respondents also mentioned coffee places and restrooms.

Table 16. Stated importance of the attributes of pedestrian environment

Characteristics	All	R	LRT	R	Commuter rail	R	Bus	R	BRT	R
Sidewalks and crosswalks cleared of snow in winter	3.80	1	3.79	1	3.85	1	3.82	1	3.77	1
Adequate street lighting	3.60	2	3.59	2	3.71	2	3.63	2	3.51	2
Presence of crosswalks and pedestrian signals	3.38	3	3.28	3	3.43	3	3.51	3	3.31	3
Sidewalks in good condition	3.19	4	3.19	4	3.36	4	3.18	4	3.10	5
Area is free of trash	3.14	5	3.06	7	3.29	5	3.14	5	3.19	4
Area is free of vacant or rundown buildings	3.10	6	3.13	6	3.22	6	3.11	6	3.00	6
Temperature	3.06	7	3.16	5	2.97	8	3.06	7	2.96	7
Other people out walking	2.89	8	2.88	8	3.07	7	2.89	8	2.80	8
Slow traffic speeds	2.76	9	2.73	9	2.78	10	2.84	9	2.70	9
Presence of public space	2.62	10	2.55	10	2.94	9	2.66	10	2.50	10

Presence of trees and landscaping	2.52	11	2.45	11	2.71	11	2.54	11	2.47	11
Presence of attractive buildings	2.48	12	2.44	12	2.68	12	2.47	12	2.45	12
Shops/businesses to stop in	2.01	13	2.09	13	2.06	14	1.94	13	1.96	13
Shops/businesses with windows to look in	1.94	14	1.98	14	2.10	13	1.88	14	1.86	14
Benches/places to sit	1.57	15	1.55	15	1.79	15	1.56	15	1.48	15

Note: R= ranking; BRT means users of future BRT route in eastern suburbs (Woodbury).

CHAPTER 5: CONCLUSIONS

This study adopted stated preference experiments to understand P&R users' willingness to walk and the factors that influence that willingness. The results show that walking distance is much more important than intersection safety, pedestrian infrastructure, and building appearance in affecting park-and-riders' choice. The dominance of walking distance is consistent with Weinstein Agrawal et al. (2008). For all respondents, the average walking distance is three city blocks when the minimum walking distance is set as two blocks in the experiments. If a city block is about 0.1 miles, the marginal utilities of intersection safety, pedestrian infrastructure, and building appearance are equivalent to 0.062, 0.067, and 0.047 miles. That is, the three dimensions of the pedestrian environment can offset some negative utilities of walking—small but nontrivial. If all three characteristics are adequate, it seems that P&R users are willing to walk 1.8 blocks (or 0.18 miles) farther than their existing facilities. A further analysis shows that the effects of these four dimensions vary by transit type, demographics, and travel attitudes.

The analysis of stated importance illustrates that when determining how far park-and-riders are willing to walk, they value snow clearance, street lighting, and intersection safety the most. In general, the quality of sidewalk network connecting transit stops and P&R facilities is the most important, followed by safety and security attributes associated with the walking environment. These results are mostly consistent with Vargo (2013). However, the aesthetic quality seems to be the least important. Although Forsyth and Southworth (2008b) state that a walkable environment should include a short distance, free of major barriers, a safe environment in terms of traffic and crime, adequate pedestrian infrastructure, and a walking area with attractive landscaping and architecture design. Landscape and architecture design is not very important for P&R users. This was also reflected in respondents' comments to the survey.

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APPENDIX A: BUILT ENVIRONMENT AND SURVEY DATA

Table A1: Models for Individual Stations/Stops

28th Ave			
Variables	**Coefficients**	**P-values**	**Utility**
The number of blocks	-0.998	0.000	
Intersection safety	0.622	0.001	0.623
Pedestrian infrastructure	0.431	0.010	0.432
Building appearance	0.559	0.038	0.559
Wald Chi2	55		
N	750		
Fort Snelling			
Variables	**Coefficients**	**P-values**	**Utility**
The number of blocks	-0.933	0.000	
Intersection safety	0.576	0.001	0.618
Pedestrian infrastructure	0.723	0.000	0.776
Building appearance	0.935	0.000	1.002
Wald Chi2	100		
N	1389		

Burnsville

Variables	Coefficients	P-values	Utility
The number of blocks	-0.992	0.000	
Intersection safety	0.630	0.005	0.635
Pedestrian infrastructure	0.546	0.009	0.550
Building appearance	0.093	0.678	0.093
Wald Chi2	47		
N	828		

Apple Valley

Variables	Coefficients	P-values	Utility
The number of blocks	-1.013	0.000	
Intersection safety	0.884	0.000	0.872
Pedestrian infrastructure	0.597	0.000	0.590
Building appearance	0.375	0.050	0.370
Wald Chi2	88		
N	1056		

Woodbury

Variables	Coefficients	P-values	Utility
The number of blocks	-0.803	0.000	
Intersection safety	0.285	0.265	0.355
Pedestrian infrastructure	0.525	0.009	0.654
Building appearance	0.451	0.029	0.561
Wald Chi2	48		
N	708		

Oakdale

Variables	Coefficients	P-values	Utility
The number of blocks	-0.970	0.000	
Intersection safety	0.713	0.000	0.888
Pedestrian infrastructure	0.562	0.001	0.700
Building appearance	0.191	0.245	0.238
Wald Chi2	81		
N	948		

Table A2: Respondents' comments

ID	Remarks
2	The closer we can park to where we catch the bus, the better. Shops or no shops doesn't matter to me. And it needs to be safe.
21	I am concerned about winter use due to ice and snow build-up at Fort Snelling. I am able to walk, but I do have a disability that makes it imperative that I do not fall - no more broken bones on my left side! I am working out a back-up plan including parking in a skyway connected parking garage even if it is a mile away form my office via skyway.
42	I appreciate that the Woodbury Movie Theatre lets us stand inside in the lobby to wait for the bus during the winter.
48	I prefer that people can stay inside of the building when waiting the bus.
50	If I have to walk further than across a parking lot, there had better be buildings with sufficient heat in the event I have to wait for a delayed train during the winter (which seems to be frequent in cold weather). The current style of building and heating at the North Star Park and Rides is totally inadequate.
62	Coffee shops and places to use the bathroom!!
84	Have more parking space in stead of other buildings, covered parking lots, have garbage cans on the bus stops, heated bus stops, more buses during rush hours
97	Covered parking is critical in MN. I would not use an open lot park and ride in the winter. I don't want to scrape windows!
103	Covered parking
114	multi-level park and rides are better for working commuters, they provide a closer proximity to the actual train/bus and some shelter from weather. A shopping center or

	other large parking lot can take several minutes to get across and seem scary as far as safety. Lighting is critical
123	I really wish the parking lot at Fort Snelling were much closer to the train than it is. It is very uncomfortable walking such a long distance, especially in bad weather.
129	If you have to walk a block or more from where you park to the bus stop, then it is NOT a park and ride. It's just a parking lot.
131	It is helpful that it has an enclosed area to use while waiting for the bus. It would be nice if it were more like some of the mixed use facilities Southwest Transit offers in Eden Prairie.
134	It is nice to have a dry place to wait inside until the bus arrives in the morning. Many thanks to Woodbury Theater for allowing us into their vestibule to wait.
137	I chose the scenarios first by walking distance, then by neighborhood. I preferred the nice areas with small shops but walking 6 blocks to the station from the park and ride in winter is just too far.
141	* A coffee shop would be a great addition.* Separate entrance and exit for cars (one-way traffic) would be safer for pedestrians
166	The highly coveted parking spots are closest to where you catch the bus and the interior spots, shielded from wind, rain and snow. The kiosks where you can add $$ to your transit card are very helpful. A little convenience store where you could pick up milk, bread or roasted chicken for dinner would be nice.
171	Convenience is paramount.
172	I couldn't care less about beautifully landscaped facilities that take me through shopping districts if they make me walk 6 blocks. I take park and ride solely to save the cost of parking downtown. Anything that would increase the amount of time that my overall trip takes, including increased walking distance, would make me less likely to take mass transit. I prefer driving to taking the bus, except for the cost. \\The most important thing to me when it comes to park and ride is convenience. i would prefer a

	run-down, litter-strewn, dark lot that is only 100 feet from the bus stop to a six-block stroll through a beautiful shopping district.
173	when dressed in work attire, it is more important to have close parking and shelter from the elements when waiting for a bus then if the trip was not work related.
178	I don't mind walking, but only indoors and in a safe environment.
197	Affinity for park and ride is based on time and lack of parking at destination. Would rather drive. More traffic lanes to ease congestion would likely result in a difficult decision as to whether I would park downtown instead of bussing.
208	I have trouble walking, so keep that in mind as you analyze the results. I'm not your typical pedestrian.
214	Shops are not that important to me unless there were coffee or eating establishments on the walk.
220	I would like there to be more covered park and ride facilities.
225	Apple Valley's park and ride has an attached parking garage so the choices about park and ride environments weren't really applicable to what I experience. I'd also add the ability to park inside the garage is appealing during winter months to eliminate the need to clear the windows of snow/ice before departing.
227	My Apple Valley Transit Center (on Cedar Avenue) contains many dead trees and shrubs that have been dead for YEARS; pavement lines and markings that are completely faded away to the point that they no longer exist (creating danger for drivers and pedestrians); vast amounts of trash throughout the landscaped areas and in the paved parking areas, including in the ramp. It is a complete disgrace. Also, MVTA and Metro Transit signs have fallen off of the Apple Valley Transit buildings themselves, and these missing signs have not been replaced. There are bare light bulbs exposed to the weather, where the signs used to be. There is woefully inadequate presence of transit police to prevent vandalism at this station, which attracts many suburban teenagers who have mischief in mind. Please tell the transit authorities about this comment. Thank you.

233	In choosing a location to reside, I always consider the closest or easiest way to take public transportation to work. Closing or moving my park and ride further from my home would be extremely frustrating.
242	For me speed to final destination is the number one factor over walking distance or other factors.
252	It is nice to have an inside/heated space to wait for the bus in winter.
257	It is very import that the facilities remain clean and in good working order. If non transit riders are using the facilities as a gather place or hang out I will not use the facilities - feel unsafe.
261	Interior spaces at park and ride lots and ramps are important as well - lighting, internal traffic circulation, cleanliness, others using the station - and would also impact my use
262	The stop (northstar, light rail, or bus) needs to be well lit with emergency contacts available. I normally park at the Elk River Station, but needed to attend an appointment in Anoka, thus the survey info. Before that I was at the Ramsey Northstar where I lived. I had no worry about safety at Ramsey - it was well lit, shelter doors were unlocked, it was clean, close to police, and had the safety of the skyway over the tracks. Anoka has homeless people sleeping there, alcohol, needles. Elk River doesn't turn on the lights when it is dark out, it is poorly lit, not all shelter doors are unlocked (bad for extreme cold or rain), they are filthy, and you have the dangerous process of having to walk across tracks...too many stupid people try to run it, some have tripped and fallen on the tracks. Access in and out of parking lots should be signal controlled - it is difficulty getting out of Elk River versus Ramsey. I would also like to see the Nice Rides located just outside the Target Field (not blocks away). There are a number of us that ride bikes to the Northstar then to our final destinations in the summer. Since moving, it is too far (and dangerous) for me to ride from Zimmerman. I would love to pick up a Nice Ride at Target Field.
288	A ramp is very important versus an open parking lot
291	clearing the park and ride area of snow and ice during the winter is also important

307	Some park and rides have warm places to wait for the bus, while others do not. Having a warm place to wait makes it much easier to use a park and ride during the winter.
309	I would like to see more covered ramp parking at the Apple Valley Park & Ride Station. Too many cars don't have an option of covered parking due to only having ramp.
327	There should be a couple of more shelters and the shelters should have more than one heating element. In the winter they are cold and catch the wind, the one heating element doesn't really help, its not enough.
338	A BIG influencer for me regarding a park and ride facility is the presence of adequate coverage to wait for the bus in, especially during inclement weather and the cold weather months. If that is not present and I have to walk far to the actual stop - I'll find another P&R. This is MN. It gets COLD and I'm not going to get frostbite just waiting for the bus. Also, another very nice perk, but far less of a make or break than the presence of coverage is whether or not the parking facility itself is covered. The Maplewood Transit Center is nice for this - its a ramp. So vehicles are covered and out of the elements during the day, which means no scraping of snow/ ice in the winter.
361	I like park and ride facilities that are sheltered with heat during the winter months. Using the park and ride helps to minimize the number of miles I would otherwise incur if I drove. It would be nice to leverage park and rides for other destinations besides downtown Minneapolis.
364	The Burnsville Park and Ride facility and landscaping improvements are wonderful! Very nice!\There is one area for improvement by pick up area "D", the sidewalk always collects large puddles that are really sloppy to have to walk in or around depending on line and sometimes ice in the winter.\The drivers are all prompt and kind. It sure would be nice if the buses were allowed to pull up earlier than 3 minutes or so before scheduled departure time in the winter months. It is really cold outside. \I appreciate the park and ride facility and love taking this transportation!\I used to drive from Savage every day for 4 years and now due to my home location change, I walk to the bus station. The intersections are dangerous for getting to the Burnsville Park and Ride when have to cross Highway 13. Not comfortable with that at all. It would be great to have a walking bridge that goes over Hwy 13 (north / south). I see Moms with kids with strollers and young kids with bikes, older people, youth, working adults and adults with

	bikes cross that intersection. I am feeling uncomfortable with this upcoming winter and having to cross the highway on foot.
375	I'd much prefer (in order of importance) more parking spaces, more covered spaces to wait in, and a shorter walk. I am very grateful that there are designated areas for parking.
386	Well maintained, safe, well lit with adequate parking and frequent service. Critical to enable growing suburbs efficient transport into cities.
391	I wished it had more light in the winter as it gets dark earlier. When you stay later at work and your walking alone it can get a bit creepy.
412	People pee on floor, elevator and garbage cans at 28th street ramp. People in sleeping bags sleeping in stairwell area, usually on 4th floor. Equally sad and gross.
413	It would be beneficial to have restrooms
421	I enjoy walking, however, when it comes to catching the bus and getting home - I prefer to be located as closely to the station as possible. If there is time when I arrive downtown, I will get off at an earlier stop and walk a little farther to my destination. When I get off the bus at the end of the day, I want to get to my car as fast as possible so I can get past my commute time and back to my life!
449	It is important that the park and ride is safe and free from crime. A local park and ride (Paul Parkway) has had problems with theft and vehicle damage ever since it has opened. The police have had to install a portable camera system
452	Convenient to get in and out of parking lot. Not too much distance from where I park my car to where I actually board the train/bus. Safe area.
460	It doesn't make sense to have stores at a transit station. People aren't there for leisure.
461	The traffic lights for letting buses go vs. letting normal cars go is very difficult to differentiate, especially to people who visit for the first time, or those who are unaware of the situation.

481	I would prefer to not walk through a shopping area to get to the bus. I would prefer that the bus come to the parking area.
496	Safety is very important and shelter from elements
525	It would be really nice if the parking was covered so snow didn't get in our cars in winter\I like that it's a direct express bus from the park and ride versus getting on a bus at the end of my street that isn't express and requires a transfer to get to my destination \On the way home the bus is sometimes full so I have to stand and that isn't fun at all for the 30-40 minute trip
533	Not much protection form the weather
542	A short walking distance versus a loner walking distance is very important to me because frequently carrying heavy bags (laptop, work papers, etc) to/from workplace.
554	Covered park and ride facilities are a very important factor in winter.
561	It sure would be nice if the sloping sidewalk along the light rail facility at Target Field could be enclosed to keep ice from forming on it. A fairly good job is done at keeping it clear, but sometimes walking up/down the sidewalk, baby steps need to be taken to keep from slipping. I've seen way too many people slip and fall during the winter. \\It puzzles me that an indoor option from the Northstar train to inside Garage B was not part of the Target Field design.
570	Walk is long with our weather. Safety at all hours is important to me.
583	The buses need to pull up immediately once the previous bus leaves. Not enjoyable standing out when it rains, snows, cold weather when the bus is just sitting on street.