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Quality of Life: Assessment for Transportation Performance Measures

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Quality of life (QOL) is a commonly used term. Defining QOL, however, is an ongoing challenge that experts often take on with minimal input from citizens. This groundbreaking research sought citizen input on what comprised QOL and what role transportation played in it. Further, this research explored in detail the important factors across the breadth of transportation and how the Minnesota Department of Transportation (MnDOT) was performing on these important factors. The research encompassed three phases between 2010 and 2011: (1) an extensive literature review on QOL, (2) 24 focus groups that asked Minnesota's citizens about their QOL, and (3) a mail questionnaire about what matters in quality of life, transportation and their intersection. Eleven related quality of life factors emerged, including transportation: education, employment and finances, environment, housing, family, friends and neighbors, health, local amenities, recreation and entertainment, safety, spirituality/faith/ serenity, and transportation. Within transportation, seven important areas were identified that predicted satisfaction with MnDOT services: access, design, environmental issues, maintenance, mobility, safety and transparency. Results reveal that a) QOL is complex and transportation plays an important and consistent role in it across Minnesota; b) transportation is critical to QOL because it connects us to important destinations in aspects that matter most; and c) Minnesotans can readily identify what matters and how the state is performing within the breadth of transportation services.

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Executive Summary

Quality of life (QOL) is a commonly used term. Defining QOL, however, is an ongoing challenge that experts often take on with minimal input from citizens. This groundbreaking research sought citizen input on what comprised QOL and what role transportation played in it. Further, this research explored in detail the important factors across the breadth of transportation and how the Minnesota Department of Transportation (MnDOT) was performing on these important factors. Results will inform MnDOT planning, reporting, programming, and services.

The research encompassed three phases between 2010 and 2011: (1) an extensive literature review on QOL, (2) 24 focus groups that asked Minnesota's citizens about their QOL, and (3) a mail questionnaire about what matters in quality of life, transportation and their intersection. Results reveal: QOL is complex and transportation plays an important and consistent role in it across Minnesota; transportation is critical to QOL because it connects us to important destinations in aspects that matter most; and Minnesotans can readily identify what matters and how the state is performing within the breadth of transportation services.

Seeking Citizen Input

The focus groups provided a wealth of information about what constituted QOL. To quantify the importance of different parts of QOL and transportation identified in the focus groups, we used a mailed questionnaire to a representative sample of 7,488 Minnesota residents, stratified by county. Considering traditional survey research responses, an impressive 45% of questionnaires (n=3,484) were returned. Those responding largely mirrored Minnesota although, as we expect in mail survey research, respondents were more frequently older, educated and white. The following information summarizes the key survey findings related to the project goals.

Results

The Quality of Life Context

Overall, Minnesotans are satisfied with their QOL. The average level of satisfaction was nearly 6.15 on a scale from 1 to 7, with 7 being "very satisfied." Eleven QOL areas were examined: education, employment and finances, environment, housing, family, friends and neighbors, health, local amenities, recreation and entertainment, safety, spirituality, faith and serenity, and transportation. All QOL areas were rated as important at some level, including transportation. Notably, transportation held similar importance across all regions of Minnesota. Older Minnesotans rated education and employment as less important than those in the younger group. In contrast, older Minnesotans rated transportation, spirituality, and local amenities and services as more important than those in younger groups. Considering QOL importance by region of residence, differences emerged in six of the areas. Generally, residents in the northeast identified all six of these areas as less important than others in the state.

The eleven QOL areas were analyzed to see if and how they related. The factor analysis revealed the QOL areas fell into 3 broad groups: 1) health, family, and friends; 2) education, environment, employment, transportation and housing; 3) local services/amenities and recreation; with spirituality/faith/serenity remaining on its own.

Transportation Importance and Satisfaction

When Minnesotans described transportation, they talked about it across several major areas (in alphabetical order): access, design, environmental issues, maintenance, mobility, safety and transparency. Accessibility refers to access to destinations or people's ability to reach the destinations they must visit to meet their needs and desire to visit to satisfy their wants. Design describes the physical layout of the transportation system and includes the multiple components that make up the system (e.g. roads, signs, and lights). Environmental issues include air, water, and light. Maintenance is a broad category that describes road surfaces, paint indicators, general repair, and seasonal upkeep. Mobility is defined as the movement of people from one place to another in the course of everyday life. Safety emerged as a primary category in discussing transportation related QOL indicators. Multiple safety elements exist: physical conditions, human behavior, and the interaction among these factors. Transparency included subthemes of communication, finances and planning.

Minnesotans deemed all transportation areas evaluated as important—5.6 and above on a 7-point scale. Much like the older participants found transportation more important than those in younger groups, they also identified specific transportation areas as more important: design, mobility, communications and environmental issues.

Overall, respondents were satisfied with MnDOT services, with a total of 84% satisfied at some level. Considering satisfaction by age, older residents were consistently more satisfied with MnDOT performance in all transportation areas than the other age groups. When region of residence is taken into account, differences in satisfaction with MnDOT performance emerged in all transportation areas except accessibility. The differences varied by region.

Examining gaps between importance and satisfaction, four of the eight transportation areas were rated as MnDOT performing 'good work': accessibility, safety, mobility, and design. Planning, environment, and communications appeared in the 'lower emphasis,' while maintenance was in the 'concentrate here' area. MnDOT's performance on six of eight transportation areas was rated as satisfactory when using a cutoff of 5 on a 7-point satisfaction scale. However, maintenance and planning fell below the 5 level.

To further understand what comprised satisfaction in the important areas of maintenance, respondents rated a number of aspects in each area. Six of the ten items received satisfactory evaluations: visible highway signs, clearing roads of ice and snow, clear pavement/road markings, rest area for road trips, roadside visual appeal, and clearing roads of debris. When these items were used to predict satisfaction with maintenance, the following were significant predictors: smooth road surface, clearly visible road and pavement markings, the visual appeal of the road, clearing road debris, and rest areas for road trips. Notably, visible highway signage, clearing sidewalks of snow, eliminating weeds, and removing litter did not predict satisfaction with maintenance at the state level. However, additional analysis revealed the very high importance of snow and ice removal for roads and its relationship with smooth road surface.

To understand the role of the different transportation areas in determining satisfaction with MnDOT services overall, they were used to predict that satisfaction. Each transportation area had a statistical chance to explain satisfaction. Seven of the eight transportation areas were significant predictors of satisfaction with MnDOT services overall (by importance): maintenance,

planning, accessibility, design, safety, communication and mobility. Environment was not a significant predictor in this model. This model also generally held true for commuters.

Performance Measure Consideration

Comparisons of existing measures with items deemed important by a representative sample of Minnesotans revealed MnDOT is measuring many things that matter to Minnesotans, consistency exists among the data when identifying the most important elements to satisfaction with transportation, and 11 items can explain half the variance in satisfaction with transportation. As such, results from the consumer data affirm many existing measures but offer the opportunity to adjust select reporting and performance indicators. Such adjustments, however, must consider the breadth of factors influencing performance and reporting requirements such as budgetary issues and federal reporting requirements.

Considering all of the performance measures MnDOT reported as of 2011, most were identified as important by Minnesotans. Gaps in what appeared important to project respondents and existing publicly reported indicators existed in safety, the environment, and transparency.

Opportunities

A variety of implications and opportunities for transportation emerge from these results, several of which are highlighted below.

Maintain, Map and Maximize Partnerships

Across Minnesota it is clear that transportation plays an important and consistent role in QOL. However, transportation is one of eleven areas of QOL. As such, connecting and integrating with relevant partners is essential. Certainly MnDOT already has a number of vibrant partnerships in areas most important to Minnesota. Investigating and implementing ways to maximize those partnerships toward seamless and comprehensive services can enhance MnDOT's role in quality of life as well as Minnesotans' satisfaction with QOL.

Attention to maintenance opportunities are very clear. Predictive analysis revealed smooth road surface, clear road and pavement markings, the visual appeal of the road, clearing road debris, and rest areas for road trips predicted satisfaction with maintenance statewide.

Planning is part of a larger 'transparency' area that was identified as a lower emphasis area for the current time period, but does appear to increase as a priority for the future. Notably, at the time of the survey MnDOT was embarking on a 50-year transportation planning process. Certainly residential choice, work patterns, and multimodal developments are important factors for future planning processes.

Given the aged are a large and growing percent of the population, their higher satisfaction with transportation is important to note and retain. Identifying and attending to changing transportation needs through individual life stages is a pressing issue in Minnesota and the U.S. as a whole. Similarly, the role transportation plays for non-white residents and new immigrants is important but under-researched. Ensuring diverse voices are incorporated into MnDOT programs and planning can strengthen them now and for the future.

Chapter 1. Introduction

'Quality of life' (QOL) is increasingly of interest among transportation officials and academics alike. Despite this interest, research on QOL and transportation is in its infancy. Therefore, an opportunity exists to improve transportation planning and management as well as advance transportation knowledge as it relates to QOL. Assessing Minnesotans' content and importance of QOL and how it relates to transportation can inform the Minnesota Department of Transportation (MnDOT) program and service delivery.

1.1 Purpose and Objectives

This study assessed and evaluated transportation-related QOL indicators and the role of MnDOT programs and services in QOL. Three interrelated approaches were undertaken: (1) a literature review (Guo and Schneider 2010), (2) focus groups (Schroeder, Schneider, and Gustafson 2011), and (3) a questionnaire.

Specifically, the project sought to answer five questions:

- If/how does transportation contribute to satisfaction with QOL among Minnesotans?
- If/how does satisfaction with transportation areas (access, etc.) contribute to satisfaction with transportation overall?
- How important is each of the transportation areas (access, etc.)?
- How satisfied are Minnesota residents with each of the transportation areas (access, etc.)?
- How does perceived MnDOT performance compare with perceived importance on each of the transportation areas (access, etc.)?

1.2 Approach

A multiple-methods approach provided data for the project. Both focus groups and a questionnaire were used. Focus groups asked Minnesotans to describe the depth and breadth of the QOL concept and the relationship between transportation and QOL. A questionnaire quantified the concepts identified in focus groups: importance of eleven QOL areas, importance and satisfaction with seven transportation areas, and satisfaction with MnDOT services. The data was combined to inform a comprehensive review of MnDOT performance indicators to assess if and how they could better reflect the concerns of Minnesotans.

Chapter 2. Literature Background

Quality of life (QOL) research within and beyond transportation is briefly reviewed in this section. Researchers with diverse interests have explored QOL with a variety of methodologies. Within QOL research, however, attention to the role transportation plays in QOL remains scant.

2.1 Quality of Life

QOL has been of research interest since the 1960s. As an indicator of the health and function status of individuals and society (Campbell, Converse, and Rodgers 1976; WHOQOL 1998; Das 2008; Sarmiento, Schmid, Parra, Diaz-del-Castillo, Gomez, Pratt, Jacoby, Pinzon, and Duperly 2010), QOL has been studied in various areas including health care (Ferrans 1996; WHOQOL 1998; Moons, Budts and Geest 2006; Sarmiento et al. 2010), gerontology (Gabriel and Bowling 2004; Spinney, Scott, and Newbold 2009), public affairs (Das 2008; Senlier, Yildiz, and Aktas 2009), and community development (Sirgy, Rahtz, Cicic, and Underwood 2000). QOL has been operationalized in a variety of ways (Ferrans 1996; Moons et al. 2006) yet with a shared focus on perceived well-being. Well-being, happiness, life satisfaction, and living standard are used interchangeably in QOL research (Diener, Emmons, Larsen, and Griffin 1985).

2.1.1 Measuring Quality of Life

As early as the 1960s, Cantril (1965) explored people's concerns with QOL. In the 21st century, life domain selection is often highly research-context specific (Malkina-Pykh and Pykh 2008). Campbell et al. (1976) measured general QOL as well as specific domains that included marriage, family life, health, neighborhood, friendships, housework, and job. Similarly, Sirgy et al. (2000) studied general QOL with 14 domains including job situation, financial situation, health, education, leisure life, environment, housing situation, and spiritual life. The World Health Organization's WHOQOL-100 and WHQOL-Brief questionnaires assess six QOL domains, with various subdimensions: (1) physical, (2) psychological, (3) level of independence, (4) social relationship, (5) environment, and (6) spirituality/religion/personal beliefs (WHOQOL 1998). Among them, the environmental domain includes transport, work satisfaction, home environment, health and social care, participation in and opportunities for recreation/leisure activities, and physical environment. In their study, the Cronbach's α for the four-item transportation scale was .83.

Hagerty, Cummins, Ferriss, Land, Michalos, Peterson, Sharpe, Sirgy, and Vogel's (2001) review of the 22 most frequently used QOL indices suggest seven domains for future research: relationship with family and friends, emotional well-being, material well-being, health, work and productive activity, feeling part of one's local community, and personal safety. However, they also suggested that "supplementary domains may be important to particular populations" (Hagerty et al. 2001, p.75).

2.1.2 Predicting and Understanding Variance in Perceived Quality of Life

Conclusive predictive models for QOL remain absent in the published literature. Existing empirical studies that attempt to predict QOL find mixed predictive power and varied sets of

important domains (London, Crandall, and Seals 1977; Michalos and Zumbo 1999; Sirgy et al. 2000; Turksever and Atalik 2001; Kapteyn, Smith, and Soest 2009; Senlier et al. 2009; Power, Bullinger, and Harper 1999; Table 2.1). London et al. (1977) found studied how job and leisure life predicted 25% of the variation in general QOL. In Turksever and Atalik's (2001) study on QOL in seven city districts, the predictive power (R-squared) for each city district ranged from 16.6% to 99.6% and the predictive power for the general model for the city was 32.6%. Michalos and Zumbo (1999) also found differences in the QOL model's predictive power where it explained 49% and 53% of the variation in life satisfaction among rural seniors and university students.

Satisfaction with transportation was a significant predictor of QOL for seniors but not for university students. From a different point of view, Chamberlain (1985)'s early research found an association between QOL and basic life values.

Like the predictive power varies, so do significant predictors of QOL (Table 2.1). For example, London et al. (1977) found four significant predictors to QOL: (1) things done with family, (2) things done with friends, (3) the work itself, and (4) pay, fringe benefits and security. Michalos and Zumbo (1999) also found job opportunities were significant predictors of QOL. However this is not equated with income as Kapteyn, Smith, and Soest (2009) identified income was the least important determinant of global life satisfaction, compared to other predictors. Education has unclear impacts on QOL: Michalos and Zumbo (1999) found that it was not a significant QOL indicator but Senlier et al. (2009) did. Power, Bullinger, and Harper's (1999) cross-culture test of the WHO's instrument found two major domains explained the most QOL variance: physical and psychological. Using a different method, Doi, Kii, and Nakanishi (2008) quantified the weights of five life areas and found "service and cultural opportunity" had the largest weight followed by "environmental benignity," and "safety and security", "spatial amenity" and "economic opportunity."

Similarly, while intuitively the importance of life domains differ by age and circumstance (Hu 2009), as of the 1990s few studies included these distinctions (Cummins, Mccabe, Romeo, and Gullone 1994). Even into the 21st century, few studies have addressed this issue. Instead, research has tended to focus on single age groups. For example, Gabriel and Bowling's (2004) focus-group study with individuals age 65 and older found several QOL themes were important, including access to local facilities and services, transportation, good health and mobility, good social relationships, help, and support.

Like the paucity of QOL studies by age groups, few research studies compare QOL across different geographic locations. At a national level, Kapteyn, Smith, Soest, and Netspar (2009) compared global life satisfaction in the Netherlands and the U.S. They found that family and social relations best predicted global life satisfaction, followed by job/daily activity, health, and income. At the local level, Moller (2001) identified differences in perceived QOL and satisfaction with public service among residents in Durban, South Africa's living areas. Suburban residents reported significantly higher satisfaction with QOL than those in townships and informal settlements. However, residents living in suburban areas reported significantly lower satisfaction with their Metro Council's performance. Turksever and Atalik (2001) found global satisfaction predictors varied in each urban district they assessed as well as between district and city levels. For example, access to public transportation significantly predicted QOL

in three of Istanbul's seven districts, but it was not a significant predictor at the city level. At the city level, "travel to work" significantly predicted QOL but it was not significant at any district level. The number of predictors between geographic levels was also different: some districts had only two significant predictors of QOL while others had five significant predictors.

Table 2.1: Significant predictors of quality of life in various studies, 2011

Author (Year)	Population	Variance explained (R^2)	Significant predictors	Not significant predictor
London et al. (1977)	U.S. adults	.25	Things done with family, Things done with friends, The work itself, and Pay, fringe benefits and security.	The people you work with, What it is like where you work, What you have available for doing your job, The people you see socially, The organizations you belong to, The sports and recreation facilities you yourself use, or would like to use, The entertainment you get from tv, radio, movies, and local events and places
Michalos and Zumbo, (1999) [a]	University clerical staff	.57	Health, Financial security, Family relations, Job, Friendships, Housing, Recreation activity, Self-esteem, Transportation, and Education	Area lived in
	Rural seniors	.49	Health, Financial security, Family relations, Friendships, Housing, Area lived in, Recreation activity, Religion, Self-esteem, Transportation, Government services, Living partner	-
	Eastern northern community	.53	Health, Financial security, Family relations, Friendships, Housing, Area lived in, Recreation activity, Religion, Self-esteem, Transportation, Government services, Living partner	Job
	University of Guelph students	.53	Health, Financial security, Job, Family relations, Friendships, Housing, Recreation activity, Self-esteem, Education	Area lived in, Religion, Transportation

	World sample of students	.49	Health, Financial security, Family relations, Friendships, Housing, Area lived in, Recreation activity , Self-esteem, Transportation, Living partner, Education	Job, Religion
	Prince George residents in 1994	.60	Job, Friendships, Housing, Self-esteem, Government services, Living partner	Health, Financial security, Family relations, Area lived in, Recreation activity, Religion, Transportation, Education
	Prince George residents in 1997	.64	Financial security, Family relations, Job, Friendships, Self-esteem, Living partner	Health, Housing, Area lived in, Recreation activity, Religion, Transportation, Government services
Power et al. (1999)[b]	Seattle, WA	.75	Physical domain, Psychological domain, Social relationships domain, Environment	-
Sirgy et al. (2000)	Communities from U.S. and Australia	.56	Community, Family, Finances, Personal health, Leisure life, Spiritual life,	Job, Education, Friendship, Neighborhood, Environment, Housing, Cultural life, Social Status
Turksever and Atalik (2001) [b]		.33	Health, Climate, Crowding, Sporting, Housing conditions, Travel to work, Environmental pollution	Shopping facilities, Education provision, Cost of living, Noise levels, Job opportunities, Relation with neighbors, Parks and green areas, Leisure opportunities, Crime rate, Accessibility to public transportation, Traffic congestion
Senlier et al. (2009)	Turkish	.25	Education facilities, Quality of environment, Safety, Public transport, Neighborhood	Social and cultural facilities, Sufficiency of health services, Quality of health services,

Note. [a] Michalos and Zumbo (1999) applied their simple linear QOL life model comprising 14 items to various populations and obtained various predictive power and subset of items that were significant in explaining general QOL. [b]Power et al. (1999) also reported their study finding in other 14 countries, including Japan, Israel, Australia, and U.K. [c]Turksever and Atalik (2001) reported regression model explaining QOL both at city and district levels. The table presented the regression model at the city level.

2.2 Quality of Life and Transportation

Transportation has emerged as an important, yet still not entirely understood element to QOL. Further, rather than a holistic approach to transportation, select transportation areas are typically studied such as public transit and parking (Senlier et al. 2009), accessibility and mobility (Doi, Kii, Nokanishi 2008), or a transportation systems efficiency (Das 2008).

The degree to which transportation or aspects of transportation affect QOL varies. Michalos and Zumbo (1999) found transportation's influence on satisfaction with life was significant, yet very weak ($\beta < .1$). Forkenbrock's (2004) focus group study among Iowa residents found several transportation items were important to residential QOL: commuting, safety, and choice of transportation modes. Turksever and Atalik (2001) found travel to work was a significant predictor to life satisfaction, yet accessibility to public transportation and traffic congestion were not. In contrast, public transport did predict QOL in Turkey according to Senlier et al. (2009). Shafer, Lee, and Turner (2000) studied if and how greenway trails influence QOL, finding urban greenway trails were perceived as contributing most to community QOL through resident health/fitness, the natural areas they provide, better land use, and resident pride.

As of 2011, a single study quantitatively addressed the influence of transportation on QOL by mode of travel (Arlington County 2007). In their assessment, Arlington County determined QOL had several predictors, including transportation. In contrast, safety, shopping opportunities, ease of getting around the area, and diversity were not significant QOL predictors. QOL predictors also differed by mode of travel (Table 2.2).

Table 2.2: Significant predictors of quality of life by different travel modes (Arlington County 2007)

Travel Mode	Significant quality of life predictors
Drive alone	public education, transportation system and services, ease of getting around the area, entertainment and recreation opportunities, safety, attractive residential communities, the economy
Train	ease of getting around the area, public education, safety, entertainment and recreational opportunities, attractive residential communities, transportation system and services, diversity
Bus	ease of getting around the area, entertainment and recreation opportunities, public education, safety
Carpool /vanpool	ease of getting around the area, the economy, public education, attractive residential communities
Bike	job opportunities, transportation system and services, public education, ease of getting, and the economy
Walk	public education, ease of getting around the area, safety, transportation system and services, entertainment and recreational opportunities

As of 2011, several state transportation departments have integrated QOL into their performance measurements, typically with objective measures such as highway fuel use per vehicle mile traveled or population within a two-hour drive of commercial air service (Table 2.3). However,

objective conditions do not always reflect consumer satisfaction (Cummins, 2000; Das, 2008) and thus there is a need to engage consumers and integrate their ideas more explicitly.

Table 2.3: Quality of life related performance measurement among departments of transportation, 2011

Agency	Quality of life related performance measurement
Connecticut Department of Transportation (2009)	Specific projects including Transit Oriented Development, Diesel Locomotive Initiatives; aviation enhancing QOL (Bradley International Airport); airport noise mitigation; Bradley gong green; recycled construction and maintenance materials; improving winter highway maintenance; new M8 rail fleet; buses and bus facilities; congestion; traffic incident management; traffic management systems; bikeways, walkways and trails; business development program
Virginia Department of Transportation (Smith 2009)	Tons per year of mobile source emissions; tons per year of mobile source greenhouse gas emissions; fuel usage per capita; acres of wetlands replaced.
Oregon Department of Transportation (Reif & Brian 2005)	Transportation cost index
Arlington County Commuter Service (2007)	Ease of getting around without car, choice/variety of options, cost, time required to make trips, convenience, dependability, safety, comfort, Arlington County Commuter Service is meeting residents' needs, ability to travel around AC, ease of getting around with car, ease of getting around by bus, ease of getting around by bicycle, ease of getting to other destinations without a car.

Toward a consumer-centric view, several transportation areas of interest were identified in focus groups with Minnesota residents in 2010: access, design, environment, maintenance, mobility, safety, and transparency (Schroeder, Gustafson, and Schneider 2011). Of these, only a few have received any attention in the research literature as they relate to QOL: mobility, safety, and design.

Research regarding the impact of mobility on QOL focuses on the aged and people with functional impairment (Gabriel and Bowling 2004; Hjorthol, Levin, and Siren 2010; Gagliardi, Marcellini, Papa, Giuli, and Mollenkopf 2010). Mobility and accessibility are consistently identified as important among the aged (Spinney et al. 2009; Loti and Koohsari 2009; Hjorthol et al. 2010). For example, Gabriel and Bowling's (2004) focus group study with older people identified mobility as an important theme. Hjorthol, Levin, and Siren (2010) studied mobility of different groups of older people and found car ownership and use among older people was more important than the comparable age groups 20 to 25 years ago. Gagliardi et al. (2010) found driving a car was an important predictor of mobility satisfaction in Italy and Germany but driving was not a significant predictor of life satisfaction. Similarly, use of public transportation

was a significant predictor of mobility satisfaction in Italy, but not life satisfaction in either Italy or Germany.

Safety has been recognized as an important indicator of QOL as well as a transportation evaluation criterion. In Parra, Gomez, Sarmiento, Buchner, Brownson, Schimd, Gomez, and Lobelo's (2010) work, traffic safety was positively associated with health-related QOL among older adults. Chatterjee, Wegmann, Fortey, and Everett (2001) summarized how several metropolitan planning organizations (MPOs) addressed safety and security issue in both the long-range and short-range transportation planning processes. Their case study-oriented project found although safety and security were reflected in planning policies and goals and short-range project selection, there were few instances in which long-range planning incorporated these issues.

Although the general role of transportation system design on QOL is rarely studied, various studies support the link between the built environment, including transportation, and public health (Frank and Engelke 2001; Frank and Kavage 2009). Studies suggest providing a walkable environment increases physical activity levels and promotes neighborhood QOL (Frank and Kavage 2009; Frank, Sallis, Saelens, Leary, Cain, Conway, and Hess 2009). However, Sarmiento et al. (2010) found the walkability indicators such as bike lane density, street network density, and distance to transportation were not significant predictors to WHOQOL scores.

This brief review of QOL research reveals an opportunity for practitioners and researchers alike to better understand the effect of transportation on QOL in general as well as specific transportation areas on QOL. The following chapter introduces the research methods used to address if and how transportation impacts QOL among Minnesotans, the role of various transportation areas to transportation satisfaction, and the relationship between importance and satisfaction with MnDOT performance on various transportation areas.

Chapter 3. Focus Groups

3.1 Study Method

Twenty-four focus groups were conducted across the state of Minnesota in the late summer and early fall of 2010. This section describes the details of those focus groups in the following sections: approach, study setting, sampling, and data analysis.

3.1.1 Approach

Focus groups sought a better understanding of the factors that influence Minnesota residents' opinions, experiences, and descriptions of QOL. Focus groups with Minnesota citizens, from different age groups and from all across the state, qualitatively explored the various factors that constitute QOL and captured citizens' stories and lived experiences in their own voices. This approach was used based on a 2009 MnDOT pilot study of five focus groups in the metropolitan area of Minneapolis-St. Paul, specifically in Woodbury and East St. Paul.

Twenty-four focus group sessions were conducted between August and November 2010. Focus groups were deemed to be most appropriate to elicit deep insights and perceptions to explore and describe the depth and breadth of the QOL concept. Each focus group had between five and twelve participants and standard focus group procedures were followed for each session (Krueger and Casey 2008). Participants were provided a nominal cash gratuity ($75) to participate. Participation was voluntary and all participants were assured of confidentiality and anonymity.

A guide for the focused discussion was developed and used during the pilot study in 2009 (Appendix A). This guide was reviewed and amended by University of Minnesota researchers and MnDOT representatives. The questioning route was then pilot tested on August 31, 2010, in the initial focus group meeting. The purpose of pilot testing was to ensure the questions were delivered in a conservational manner, easily understood by participants, and generated the type of information needed to address the research questions of interest. Approximately six questions were used, and the questions were grouped in a funnel sequence that progressed from simple warm-up questions to more meaningful questions. This technique created a permissive environment and first eased the participants into the focus group setting and encouraged everyone to speak; then later narrowed participant attention in on areas of research interest (Krueger and Casey 2008; Goldenkoff 2004). The opening questions were designed to introduce members of the group to each other and get people comfortable talking. Next, transition questions probed participants to describe the various factors that contribute to or detract from their QOL. The facilitators did not define QOL, instead participants were asked to reflect on their current life stage and describe the factors that influence their life and make-up their own QOL. During these transition questions, the moderator listed all the QOL factors on a flip chart and facilitated discussion to explore how each factor contributed to or detracted from QOL. After the group had generated a complete list of factors describing QOL, participants were asked to select and identify five factors that most contributed to QOL and five factors that most detracted from QOL.

A set of key questions focused specifically on ways in which the transportation system contributes to or detracts from QOL. The participants themselves had conceptualized a meaning for QOL in the previous exercise and used this same framework to describe the impact the transportation system had on QOL. Again, the moderator created a list of the contributing and detracting factors as the group generated ideas. During this discussion, participants were asked to think specifically about MnDOT and to describe how MnDOT could improve QOL. Finally, closing questions explored participants' anticipated future needs from the transportation system and thoughts on how MnDOT could contribute to QOL in the next generation. In conclusion, all participants were invited to make final comments on the topic of the transportation system and QOL.

Each session lasted about an hour and a half, and refreshments were provided during the focus group. Each of the focus group discussions was digitally recorded. The data set includes the audio recordings, the flip charts generated in each session, and the research team's notes from each session.

3.1.2 Study Setting

The focus groups were conducted in 13 communities across Minnesota and the locations were selected to capture a broad state representation. A variety of geographical areas were included as well as variety of community sizes including both metropolitan and micropolitan (Appendix B). At least one community from each of MnDOT's eight districts was represented and between one and three focus groups was conducted at each location. The focus group discussions took place in easily accessible public meeting areas such as a library conference room or classroom. These settings created a neutral atmosphere and were convenient for area residents.

3.1.3 Sampling

A Twin Cities-based market research company obtained the sample from a telephone census-block purchased list. Participants from each community were grouped according to age to represent three major life stages: (1) younger life stage (age 20 to 34), (2) middle life stage (age 35 to 59), and (3) older life stage (age 60 to 75). Participants were screened to meet selected criteria, however, a very diverse sample was still recruited (Appendix C). The focus groups included a mix of ethnic diversity, age, and people who used multiple modes of transportation. All participants were screened to determine they met several criteria: lived within the city limits of their community, lived in the area at least the last three years, lived in Minnesota at least the last five years, between the ages 20 and 75, drive or travel as a passenger at least 20 miles per week, as well as not employed with a company or agency that may bias responses (such as MnDOT).

3.1.4 Data Analysis

Multiple audio reviews of the recorded discussions and meticulous reading and rereading of the focus group notes was the focus on the analysis. Each focus group session was first summarized in a table to document the key themes and perspectives that emerged during the session. The multiple tables were then synthesized to facilitate a side-by-side comparison among the sessions. Finally, across cases, the textual data were organized in categories and subcategories. During this

coding process similar themes were identified across focus groups and were grouped under a representative name. Field notes from multiple facilitators added to data verifiability as did significant researcher corroboration and discussion.

3.2 Results

A total of 215 Minnesota residents participated in 25 focused discussions between August and November 2010 (Appendix B). These facilitated meetings across the state revealed multiple dimensions that contribute to and detract from area residents' QOL as well as the variety of ways in which the transportation system influences QOL. Findings that describe overall QOL are presented first, and then transportation- related QOL indicators. Next, findings are compared among the age groups, between the metropolitan area and the outstate regions, and among select diverse groups. Finally, findings on communications and future needs related to the transportation system are presented.

3.2.1 Quality of Life

Focus group participants were asked to discuss the quality of their lives and identify factors that contribute to and detract from QOL. The term "quality of life" was not predefined; instead, each group was encouraged to conceptualize what it meant in terms of their own life experiences. Across cases, similar themes emerged to describe QOL. Notably the themes were reflective of the findings from the 2009 pilot study and also of the QOL themes documented in existing literature. Similar to the pilot study, the factors that made up QOL were generally uniform across ages, locality, and gender. Nearly all groups identified the same basic factors that make up QOL; however, there was some variety in the discussion of how each factor contributed to or detracted from QOL. The 11 categories most frequently were used to describe QOL included: education, employment and finances, environment, housing, family, friends and neighbors, health, local amenities, recreation and entertainment, safety, spirituality/serenity/faith, and transportation.

- Education: Pre-kindergarten through post-secondary education contributed to overall QOL across all the focus groups. The younger age group represented the most parents of school-aged children, and good local schools were considered the most important. Good schools were also identified as important features of a community and schools played a part in attracting residents to a town and motivating them to stay. Quality of education and access to higher education were other parts of this QOL factor.
- Employment and finances: Many QOL factors acted as simultaneous contributors and detractors. While financial safety and secure employment were cited as QOL contributors, other employment and financial concerns were frequently identified as QOL detractors. Having a job was important, as were opportunities for advancement. Job opportunities and the current state of the economy were listed as concerns, particularly among the middle age group. The younger age group identified student loans and being in debt as examples of financial strains.
- Environment: The lakes, good air quality, and the four seasons were frequently described as QOL contributors. However, for some Minnesotans, the winter season in particular was cited as a QOL detractor.
- Housing: Clean, safe, and affordable housing was identified among the categories of QOL. If housing was not affordable or safe, then housing became a detractor.

- Family, friends and neighbors: A social community made up of family, friends, and neighbors was cited by all groups as an important QOL factor. Good neighbors and sense of a tight-knit community positively impacted QOL and was described frequently. Family relationships including spouse, children, parents, siblings, and extended family were also important QOL factors, and proximity of family members also influenced QOL. The types of relationships varied by aged; however, this category emerged as an important QOL factor across all the focus groups.
- Health: Good health was cited a QOL contributor, while health problems or poor health was a serious QOL detractor. Health concerns were addressed most by the older age group but all groups described access to quality healthcare as a QOL contributor.
- Local amenities: All groups expressed a sense of regional or local pride and a strong community identity. A variety of local amenities were cited as participants described their QOL. Examples include community services, clean streets, library, farmers market, local parks, shopping, town sized "just right," and community situated with good access to surrounding towns and areas.
- Recreation and entertainment: Although examples of activities varied, recreation and entertainment was described as a QOL factor by all groups. Most frequently recreation and entertainment contributed to QOL, but in some cases the lack of recreation options or limited activities were described as QOL detractors.
- Safety: Safety was a top of mind QOL factor across all cases. A safe and secure neighborhood and community contributes to QOL. On the other hand, safety concerns and issues of crime, vandalism or violence are QOL detractors. Safety issues were described most by the middle and older age group.
- Spirituality/serenity/faith: Faith in a higher power and involvement in church or a religious community contributed to QOL. Individuals differed in practices and beliefs, but spirituality consistently added to QOL among participants. Serenity included descriptions of feelings of peace and freedom; some examples include relaxing and enjoying free time, valuing honesty, visiting a peaceful area, and feeling rooted in an area.
- Transportation: This category was described as both a detractor and a contributor. Participants also noted that transportation was interrelated with other QOL factors. Specifically, respondents discussed how transportation facilitates other QOL factors. For example, respondents relied on transportation to enjoy local amenities, access to health care facilities, connect with family and friends, and travel to work. Transportation QOL contributors include safe roads, ease of getting around, convenient access to destinations, a variety of transportation options, and good snow removal. Transportation issues were also identified as QOL detractors in some cases: long commute times, construction detours and delays, dangerous road areas, and distracted drivers.

3.2.2 Transportation System and Quality of Life

Participants described the primary factors within the transportation system that contributed to or detracted from QOL. Notably, respondents seemed very unclear about transportation system jurisdictions. Rather than a concern with who managed the transportation systems, respondents were concerned about the systems themselves. The most frequently mentioned factors included (in alphabetical order): access, design, environment, maintenance, mobility, safety, and transparency (communications/planning). These seven concepts are interrelated. For example,

safety is influenced by maintenance of road surfaces and mobility or movement depends first on access to destinations. Focus group participants across cases discussed these concepts both in terms of contributing to and detracting from QOL. Within each of the categories, subthemes emerged providing additional depth of meaning to the construct (Appendix D).

- Access: Accessibility refers to access to destinations or people's ability to reach the destinations they must visit in order to meet their needs and desire to visit to satisfy their wants (Center for Transportation Studies). Much of the existing research as of 2010 measured access in terms of people's ability to reach a destination in a personal automobile. This auto-based conceptualization is limited and measures of access are expanding to reflect the variety of access opportunities people may reach their destinations. As such, subthemes of this category include: public transportation, service transportation, air travel, nonmotorized transportation, trains, and light rail transit.
- Design: The concept of transportation system design is particularly related to access and mobility. Design describes the physical layout of the transportation system and includes the multiple components that make up the system (e.g. roads, signs, and lights). Local neighborhood streets, regional roads, and interstate connections are all dynamic; as such, design improvement emerged as a subtheme in this category. However, these changes require funding and subsequently, costs emerged as another subtheme. In some cases the physical layout of the transportation system was easy to use and expedited travel, in other cases the layout was poor and confusing to use. Related to this, quality and efficiency were additional subthemes of design.
- Environment: Several characteristics of the environment are shaped and influenced by the transportation system. Respondents noted carbon emissions and air pollution as subthemes for this category. Beyond atmospheric emissions, the transportation system is also responsible for adding considerable sound and light to the environment, and, as such, noise and light pollution are additional subthemes of this category.
- Maintenance: Maintenance is a broad category that describes road surfaces, paint indicators, general repair, and seasonal upkeep. Potholes and other poor road surfaces can negatively influence pavement ride quality and reduce customer satisfaction with state highway maintenance. Snowfall and Minnesota winters make seasonal maintenance particularly important. Therefore, respondents described subthemes of this category that included road quality, snow and ice removal, and efficiency.
- Mobility: Mobility describes movement, the actual process or experience involved with moving from one point or another. Mobility is defined as the movement of people from one place to another in the course of everyday life (Hanson 2010). While access is required for people to reach desired destinations, mobility refers to the physical movement to get there. This concept of mobility describes movement, such as congestion or free-flowing traffic, travel time, and total hours of delay. Subthemes of this include: traffic flow, commute time, construction, congestion, and travel time within and between communities.
- Safety: Safety emerged as a primary category in discussing transportation related QOL indicators. Multiple safety elements exist: physical conditions, human behavior, and the interaction among these factors were frequently described as safety concerns. Driver behavior emerged as an important subtheme related to safety: distracted drivers as well as speeding drivers were mentioned most frequently. Other safety subthemes included

troubled intersections or poorly marked streets, railroad crossings, and interactions between vehicles and bikers or pedestrians.

- Transparency: Several subthemes emerged in the focus groups adding depth and breadth to the concept of transparency. Communication in its various forms appears to be most associated with transparency; specific subthemes include communication about finances and planning.

3.2.3 Transportation System and Quality of Life: Comparisons by Age Group

Each focus group defined QOL and identified the ways in which the transportation system impacts QOL. Many similarities emerged across all the groups, specifically the seven major themes described above were discussed by all participants. However, the importance of each theme and the examples mentioned differed among the groups. Those age group differences are presented below.

- Younger Age Group (20 to 34): For this age group, discussions around the transportation systems focused most on access, specifically connectivity and ability to reach destinations related to employment and family activities. This group represented a variety of young professionals and also young parents; as such, their experience with the transportation system was primarily related to travel associated with employment, schools, and shopping. Public transportation, a subtheme of the access category, was also discussed most frequently by this age group. Participants in the younger aged focus group sessions identified ways in which public transportation was both a contributor and a detractor to QOL. Light rail, inexpensive options, access to multiple destinations, park and rides at bus stops, and free bus rides for children and students were mentioned as public transportation QOL contributors. On the other hand, long waits for the bus and limited distances and destinations available with public transportation were identified as QOL detractors.
- Middle Age Group (35 to 59): Much of the discussion among the middle age group participants was an overlap between the younger and older groups. Access was an important QOL factor within the transportation system, and service transportation options were discussed frequently in addition to public transportation options. Examples of service transportation, a subtheme of the access category, include taxi service, dial-a-ride, door-to-door bus services, and grocery and drug store deliveries. Service transportation was generally a QOL contributor; however, limited hours and schedules for some of these services were identified as QOL detractors.
- Older Age Group: This group experienced the transportation system differently because nearly all the participants in the older age group were retired or not employed full time. This group talked about the transportation system primarily in terms of access to health care, shopping, leisure travel, visiting family, and other personal trips. Much more than the younger group and somewhat more than the middle age group, the older age group identified service transportation as the most important subtheme of the access category. Like the middle age group, service transportation was frequently a QOL contributor; examples include taxi service, intercity shuttle service, medical van service, home pick-up options, and specialized services such as meals on wheels and other medical services. The cost of some of these services and limited availability were mentioned as QOL detractors. For all groups, particularly the middle and the older age group, safety was a

top of mind transportation QOL factor. The middle group and older age group also had transportation system-related safety factors as top of mind contributors to QOL. Examples of such factors include flashing emergency lights, rumble strips, brighter lights and intersections, and overhead signs giving advance warning about a crash, road conditions, or other safety hazard.

3.2.4 Transportation System and Quality of Life: Metropolitan Area and Non-Metro Minnesota

At least one focus group was conducted in each MnDOT region, and a many communities were represented, including several Twin Cities Metropolitan groups and a variety of towns and cities outside the metro. Each group experienced the transportation system somewhat differently as a result of its specific locality; overall, differences emerged particularly between metropolitan area groups and non-metro groups. Across the state, the same seven main categories were identified as ways in which the transportation system influences QOL; however, certain factors were emphasized more by non-metro Minnesota groups while other factors were more important to the metropolitan groups.

- Access: Within the metropolitan area, accessibility was a greater QOL contributor and mobility was frequently described as a QOL detractor. Access, or the ability to reach destinations, was mentioned as a positive aspect to living in the metro area. The Twin Cities were described as accessible, and participants explained that multiple transportation options are available to connect people with destinations. This variety of transportation modes included light rail, public bus, private bus, shuttles, personal automobile, light rail, air travel, and nonmotorized transportation. As participants discussed nonmotorized transportation, the idea of connectivity and access again emerged as a QOL contributor. Specifically the Greenway trail in Minneapolis and the Grand Rounds facilitated access to destinations by bike or on foot.
- On the other hand, non-metro focus groups participants more frequently noted access issues as transportation-related QOL detractors. These respondents described different transportation modes as limited as the variety of options available as insufficient. Participants explained that their ability to reach regional destinations was restricted, and connectivity to the Twin Cities was inadequate. Non-metro focus group participants expressed a desire for improved accessibility and noted that increased transportation options with a greater variety of destinations and longer distances would enhance access.
- Mobility: Mobility issues were often noted as transportation-related QOL detractors in the metropolitan focus group sessions. Mobility describes movement, and participants in these groups experienced several factors that inhibited quick and efficient movement. Such factors that restricted mobility include rush hour traffic, congestion, long commute times, road construction, and delays.
- Restricted mobility was not experienced as frequently by non-metro respondents compared to focus group participants in the metro area. In fact, several examples of mobility were noted as transportation-related QOL contributors by outstate respondents: increased speed limits on the freeways, roadways expanded to four lanes, and added bridges and bypasses. These features decreased travel time and efficiently streamlined movement during travel.

3.2.5 Transportation System and Quality of Life: Findings among Select Ethnically Diverse Groups

To capture viewpoints from some of the ethnically diverse groups that make up the Minnesota population, a limited number of focus groups were conducted. These sessions included an American Indian group, an African/African American group, a Hispanic group, and a group of people from various areas of Asia. Due to the limited data, the statements and themes expressed in these sessions are not generalizable, but provide emerging population perspectives.

The eleven QOL and seven transportation-related QOL factors emerged in these groups, like the others. However, participants in these groups described some of the distinctive ways in which transportation-related factors presented QOL constraints. One participant in Willmar noted that "transportation is a barrier for getting out of poverty, especially in rural areas." English was not a first language for all respondents, and one person stated that "Language is a barrier for transportation" (Willmar). Public transportation was an important theme in the diverse groups. Many participants relied on public transportation to reach destinations, and the accessibility provided by public transportation was frequently described as a QOL contributor. However, some concerns were also expressed in regards to public transportation. These participants felt that public transportation did not always meet the needs of the users. One participant explained the issue this way: "People making decisions (about public transportation) don't see the need because they don't use it" (Bemidji). Further, the public transportation experience was sometimes uncomfortable for members of ethnically diverse groups.

3.2.6 Transportation System and Quality of Life: Communications

Participants were asked to describe where and how they obtained information about MnDOT activities and projects. Many people stated they did not know where to get such information and some expressed frustration at being unable to locate details about MnDOT's activities. Respondents identified the following as sources of information about MnDOT: the MnDOT website, 511 system, radio and television, and newspapers.

- MnDOT website: The MnDOT website was mentioned in all the focus group sessions as an information source; however, in general, less than half the participants had actually used the site. The younger and middle age groups had the most experience using the website. The older age group, although less likely to visit the website, did use technology such as GPS, Google maps, and other websites. Across all the age groups, the website was identified as the most used source of information about MnDOT activities such as construction, weather conditions and road closures. All groups suggested that MnDOT publicize their website more.
- 511 System: Across all focus group sessions, participants had very limited knowledge of and experience with the 511 system. The system was most frequently used by the middle age group. Across all age groups, comments were mixed about the ease and usefulness of the 511 system. Many participants noted that although they had never used the 511 system, that they intended to use it in the future.
- Radio and Television: These sources of information were identified more frequently by the middle and older age groups than the younger age group. The non-metro middle and older age groups indicated they relied on local radio news as a major source of local and

regional road information. The older age group most frequently mentioned television as a source of news and information.

- Newspaper: The younger age group mentioned newspapers least frequently as a source of information about MnDOT activities. The middle and older age groups described reading local newspapers, rather than state or national publications, as a source of information.

3.3 Transportation System and Quality of Life: Future Needs

Participants were asked to forecast future needs related to the transportation system, both for the near-term and the long-term future. Similar overall transportation-related categories emerged in the future needs as in the general discussion.

- Design: Design considerations were particularly important in the discussion of future needs. Participants mentioned the need to design transportation projects to match projected future growth and development, and they emphasized the need for an inclusive and transparent design process where citizens are involved and information about jurisdictions and priorities are clear. In addition, respondents noted the need to be proactive in designing today to meet the needs of future conditions. For example, several groups forecast increased use of electric cars in the future and stated that the future need for charging stations should be considered in the design process. A major theme related to future transportation needs had to do with increased capacity. Several groups claimed that soon another beltway or a new beltway would be needed and that future design must focus on growth, new construction, and increased capacity. In addition, light rail, and to a lesser extent, high-speed rail, were mentioned as opportunities to address future transportation needs. However, costs were of concern with the various mass transit and rail options proposed.
- Environment: Across cases, participants were aware of the environmental implications and problems associated with the transportation system. When assessing future needs, respondents noted environmental considerations and an increasing need to plan for sustainable environmental management. Development and growing the transportation system will impact the environment and increase pollution; Minnesotans are aware of this impact and expressed the need for improved environmental solutions.
- Maintenance: The topic of maintenance relates to regular upkeep, ongoing projects, and new construction. Many focus group participants explained that in the near future they would like to see existing projects completed; specifically, respondents hoped that construction of the current system would be finished before any new projects were started. Projecting into the long-term future, participants described the need to develop more durable road surface materials and to introduce more efficient construction materials.
- Mobility: Mobility was a top-of-mind category in the discussion of future transportation-related needs. Participants would like to see increased travel speed, more free-flowing traffic, less congestion, and reduced commute times. The proposed ideas to enhance and improve mobility include: add passing lanes, widen roads and add lanes, provide express commuter lanes, develop new beltways and bypasses, add more over- and underpasses, increase use of round-a-bouts, and develop system to better match routes, speed limits, and stoplight timing.

- Safety: Safety concerns were described as ongoing, and participants described future safety concerns as similar to the safety issues of today. However, the focus groups did identify a number of possible future safety improvement measures they hoped to see implemented in both the near and long-term future. Participants agreed that rumble strips serve as effective safety precautions and as such, would like to see more rumble strips used in the future. Other future safety measures included: development of accident avoidance technology, development of new safety features in new vehicles, increased and improved road signage, safer highway entrances and exits, and development of snow melting systems.
- Transparency: The subthemes of communications and planning emerged as the most important in the discussion of transparency both now and in the future. Participants described a need for MnDOT to be more open and encouraged an increased online presence for the agency. Minnesotans in these focus groups stated they want access to information about MnDOT's projects and priorities. Respondents felt that overall communication between MnDOT and the public could increase and improve overall. In the future, participants expressed an interest in MnDOT serving the system-users and reducing politics in the Department.

Chapter 4. Questionnaire Study

4.1 Study Method

Data representing how Minnesota residents perceive and evaluate transportation with regards to their QOL were obtained by a self-administered mail questionnaire in spring 2011. The data sought to answer the five research questions of interest as well as provide detailed information for various MnDOT departments.

4.1.1 Data Collection

A representative sampling frame of 7,488 Minnesota residents, stratified by county, was obtained from Survey Sampling International. Counties were grouped into five regions based on other state administered regions and include metro, central, northeast, northwest, and south (Figure 4.1 and Table 4.1).

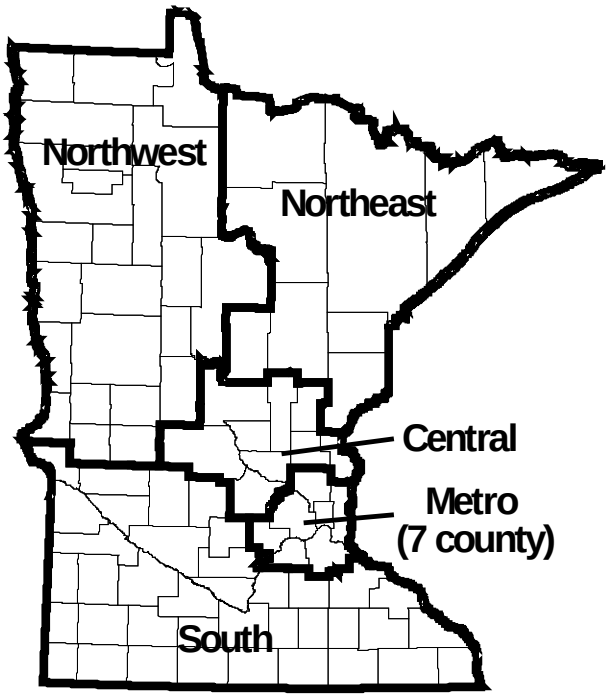

Figure 4.1: Regions identified and used for data acquisition and analysis

The mailing process followed a modified Dillman, Smyth, and Christian (2007) survey method. Selected residents received an initial mailing packet that included a letter requesting they complete the questionnaire (Appendix E) along with a self-addressed, stamped envelope. One week later potential respondents received a reminder postcard (Appendix F) and two weeks later, nonrespondents received a second mailing of the entire survey packet. All of the mailings were conducted April through May 2011.

Table 4.1: Counties identified and regions used for data acquisition, Minnesota, 2011

Region	County
Central	Isanti, Sherburne, Stearns, Wright, Benton, Kanabec, Mille Lacs, Morrison
Metro	Chisago, Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington
Northeast	Koochiching, Aitkin, Crow Wing, Itasca, Cook, Lake, St. Louis, Carlton, Pine
Northwest	Kittson, Marshall, Pennington, Red Lake, Roseau, Becker, Douglas, Otter Tail, Todd, Beltrami, Lake of the Woods, Cass, Clearwater, Hubbard, Wadena, Grant, Pope, Stevens, Clay, Mahnomen, Norman, Polk, Traverse, Wilkin
South	Dodge, Freeborn, Le Sueur, Mower, Rice, Steele, Waseca, Big Stone, Blue Earth, Brown, Chippewa, Cottonwood, Faribault, Jackson, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Martin, McLeod, Meeker, Murray, Nicollet, Nobles, Pipestone, Redwood, Renville, Rock, Sibley, Swift, Watonwan, Yellow Medicine, Fillmore, Goodhue, Houston, Olmsted, Wabasha, Winona

4.1.2 Measures

A mail questionnaire was developed based on previous QOL and transportation research. The questionnaire was reviewed by MnDOT personnel and pre-tested with an online community sample that MnDOT maintains. The questionnaire included several sections: (1) residential experience, (2) travel mode for various trips, (3) general QOL satisfaction, (4) importance of various life areas, (5) the importance and satisfaction with several transportation areas (accessibility, design, environment, maintenance, mobility, safety, long-term planning, and communications), (6) satisfaction with transportation in community, (7) satisfaction with MnDOT services, as well as (8) demographics (questionnaire is Appendix E).

QOL. QOL was measured with a scale of general satisfaction and a rating of the importance of 11 life areas. Based on the widely used World Health Organization scale, the general satisfaction with QOL was measured with the question "how satisfied are you with the quality of your life" using a 7-point scale, where 1 = very dissatisfied and 7 = very satisfied (WHOQOL 1998). The 11 life areas were developed based on a literature review (Guo and Schneider 2010) and previous focus group study of QOL (Schroeder et al. 2011). The 11 life areas included (1) education; (2) transportation; (3) environment; (4) housing; (5) family, friends, and neighbors; (6) health; (7) safety and security; (8) spirituality, faith, and serenity; (9) local services and amenities; (10) recreation and entertainment; and (11) employment and finances. Respondents indicated the importance of each area "as a contributor to your quality of life" with a 7-point scale where 1 = very unimportant to 7 = very important.

Satisfaction. Satisfaction with community transportation and the current transportation situation was measured with four items adopted from WHOQOL (1998). A single item requested respondents to rate their satisfaction with transportation in their community on a scale from 1 = very dissatisfied to 7 = very satisfied. Three more specific items inquired "to what extent do you have adequate means of transportation," "how much do difficulties with transportation restrict your life," and "to what extent do you have problems with transportation options." Respondents

indicated the current transportation situation with these items by rating them on a 5-point scale where 1 = completely to 5 = not at all.

Satisfaction was assessed for seven transportation areas identified in the focus groups: accessibility, design, environment, maintenance, mobility, safety, and transparency. Each area was measured using items developed from the 2010 literature review (Guo and Schneider 2010), previous MnDOT research, and the results from 2010 focus groups (Schroeder et al. 2011). The number of items measuring each transportation area ranged from four to ten (Table 4.2). For example, accessibility items included "access to taxis and other similar service transportation options" and "access to buses between cities." Design items included "highway sign placement (including alternate route signs, speed limit)" and "stoplight timing." Environment items included, "noise pollution from traffic" and "air pollution." Maintenance items included "clearing roads of snow and ice" and "keeping road surfaces smooth." Mobility items included "travel time to or from the Twin Cities" and "commute time to or from work." Transparency was measured with a four-item scale. Because communications and planning were identified as subthemes of transparency in the focus groups (Schroeder et al. 2011), they were only examined as individual variables and not scaled variables.

Respondents rated their satisfaction with each item using 7-point scales, where 1 = very (unsatisfied or unsafe) and 7 = very (satisfied or safe). Various question constructions were used to elicit responses, including "How satisfied are you with the following parts of (transportation area)", "How safe do you feel on the road with other drivers", and "How safe is your community for bicyclists." Some questions used a slightly different approach by asking respondents to rate their agreement with statements such as "There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood" and "My neighborhood is safe enough for an 80-year-old senior to walk around the block."

Table 4.2: Item and scale statistical summary for predictor variables, Minnesota, 2011

Scale	Questionnaire item number	# of items	Scale mean	Cronbach's Alpha
General transportation satisfaction	Q8	3	4.61	.62
Quality of life assessment	Q10	11	6.39	.82
Satisfaction with roadway design	Q11	9	4.78	.83
Evaluation of transportation- and environmental-related issues	Q12	6	3.16	.85
Evaluation of safety	Q13 & Q15	12	5.09	.84
Satisfaction with accessibility	Q14	11	4.94	.87
Satisfaction with mobility	Q14	7	4.98	.83
Satisfaction with maintenance	Q16	10	5.01	.87
Satisfaction with MnDOT transparency	Q20	4	5.11	.90
Importance of transportation areas	Q17	8	6.32	.80
Satisfaction with transportation areas	Q18	8	5.37	.89

Importance and gap analysis. Respondents rated the importance and satisfaction with each transportation area (accessibility, design, environment, maintenance, mobility, safety, and

communications and planning) on 7-point scales. Respectively, the 7-point scales ranged from 1 = very unimportant to 7 = very important and 1 = very dissatisfied to 7 = very satisfied.

Satisfaction with MnDOT and its services was also assessed with a general question: "Considering what you know about the Minnesota Department of Transportation overall, how satisfied are you with the services provided" on a 7-point scale where 1 = very dissatisfied and 7 = very satisfied. Four specific questions sought respondents' level of agreement that MnDOT "does what is best for Minnesota," "acts in a financially responsible manner," "considers customer concerns and needs when developing transportation plans," and " provides helpful and relevant information to citizens."

Respondent background information. Community living experience was measured with three items. Specifically, respondents were asked to report (1) how many years they have lived in Minnesota, (2) how many years they have lived in the community in which they were surveyed, and (3) how many months of the year they lived in the community.

Travel behavior measures included those specific to commuters (travel distance, number of days commuting, trip timing, and satisfaction with predictability of commute) as well as mode choice for various types of trips. In addition, the frequency of using public transportation and riding their bike outdoors annually in Minnesota were queried.

Sociodemographic variables were assessed mirroring past research and the U.S. Census. Variables included gender (male, female, prefer not to answer), age (what year were you born?), ethnicity/race, employment status, education, income, disability, number people living in household, and number of automobiles in household. Also, current or former employment with MnDOT was also asked to understand if and how MnDOT employment influenced answers to these responses.

4.1.3 Data Analysis

Data analysis was done in SPSS version 19.0. First, the data were checked for accuracy and usability. Second, descriptive statistics were performed on all data to answer the basic questions about the sample and their responses. Third, former or current MnDOT respondents were identified (n = 35) and then differences between them and non-MnDOT employees were explored. Specifically, differences in QOL assessments and satisfaction with the transportation areas were assessed using t-tests. MnDOT employees differed on only one of the eleven QOL items (health) but differed consistently on satisfaction with transportation areas (employee means were consistently higher). Therefore, former and current MnDOT employees were removed from the analysis on transportation satisfaction.

The first research question focused on if and how transportation contributed to satisfaction with QOL among Minnesotans. To address this question, the QOL areas and the single QOL satisfaction item were used. Correlations among the variables revealed that neither singularity nor multicollinearity were a problem. Stepwise regression was performed where the areas were regressed on the single QOL measure. This predictive procedure was repeated with each of the five administration regions identified as well as with three age groups (18-34, 35-59, 60+). Checks for suppressor variables were conducted by comparing the sign of the dependent and

independent variables correlations and regression coefficients: a change in direction indicates suppression. To compare the importance of QOL area across regions, analysis of variance (ANOVA) was performed with the appropriate comparison tests employed (Tabachhik and Fidell 2006). For regional comparisons, Tukey's post-hoc test was used to identify differences among the regions. For comparisons by age groups, respondents were grouped into age categories based on previous MnDOT work (18-34; 35-59; 60+) and compared with a Bonferroni as appropriate.

The second research question focused on if and how satisfaction with transportation areas (access, etc.) contributed to satisfaction with transportation overall. To address this question, the multiple items measuring the transportation areas were of interest as were the single satisfaction items with these broad categories. Similarly, three potential measures of transportation satisfaction were of interest. Two approaches were taken to predict satisfaction with transportation: (1) single satisfaction measures were used to predict different transportation satisfaction measures, and (2) scaled transportation areas were used to predict different transportation measures. In the first approach, respondents' single satisfaction ratings with each of the broad categories was of interest (i.e. how satisfied are you with your ability to get places you need and want to go). Satisfaction with transportation was assessed three different ways: (1) a three-item scale that assessed the current transportation situation (Appendix E, Question 8); (2) a single measure of satisfaction with the transportation in a community (Appendix E, Question 7); (3) a single measure of satisfaction with MnDOT services overall (Appendix E, Question 19 single item). The three-item, transportation-situation scale had a reliability of .61. Correlations among the variables revealed that neither singularity nor multicollinearity were a problem. Given there is little empirical evidence and theory related to these areas, stepwise regression was employed and significant predictors retained in the analysis. Specifically, stepwise regression was performed where satisfaction with each of the transportation areas were regressed on the (1) three-item scale, (2) single community transportation satisfaction, and (3) MnDOT service satisfaction question. The latter was of primary interest and retained in the main results.

In the second approach, each of the transportation areas with multiple items assessing respondent satisfaction or perceived impact (accessibility, design, environment, maintenance, mobility, safety,), were scaled and the average scale score used as a predictor variable. All scales had acceptable reliabilities as they were above a Cronbach's alpha of .82 (Table 4.2). Correlations among the variables revealed that neither singularity nor multicollinearity were a problem. Given there is little empirical evidence and theory related to these areas, stepwise regression was employed and significant predictors retained in the analysis. Specifically, stepwise regression was performed where the transportation area scales were regressed on the (1) three-item scale, (2) single community transportation satisfaction, and (3) MnDOT service satisfaction question. The third research question addressed the importance of each of the transportation areas. Importance was assessed with both a rating and a prioritization method. Respondents rated the importance of each transportation item and 5.0 was used as the lowest score where items were considered important. Respondents then prioritized the two most important transportation areas by identifying from the provided list them in writing. ANOVA with Tukey's post-hoc test identified differences in importance among the regions. For comparisons by age groups, respondents were grouped into age categories based on previous MnDOT work (18-34; 35-59; 60+) and compared with a Bonferroni if appropriate.

The fourth research question addressed satisfaction with each of the transportation areas. Respondents rated their satisfaction with MnDOTs performance on each transportation area and 5.0 was used as the lowest score where respondents were considered satisfied. ANOVA with Tukey's post-hoc test identified differences among the regions when appropriate. For comparisons by age groups, respondents were grouped into age categories based on previous MnDOT work (18-34; 35-59; 60+) and compared with a Bonferroni if appropriate.

The fifth and final research question focused on perceived MnDOT performance compared with perceived importance (satisfaction) of each transportation area. To assess this, importance and performance analysis (I-P) was performed. This is an effective evaluation tool to understand importance and either customer satisfaction with or agency performance on these same attributes (Hendricks, Schneider, and Budruk 2004). In this case, the attributes were the transportation areas. To conduct I-P analysis, multiple steps are involved: (1) identify relevant attributes (transportation areas); (2) obtain key market ratings of the importance and performance of each; and (3) develop these ratings in a two-area grid where the vertical axis shows the importance and the horizontal axis shows the satisfaction with the attribute. For example, the attributes placed in the upper right part of the grid demonstrate high importance and high satisfaction, which indicates these attributes are well managed. The attributes with high importance and low satisfaction need more attention while the attributes with low importance and high satisfaction may show overemphasis. In this analysis, we identified relevant transportation areas from the focus group portion of the study (Schroeder et al. 2011), measured Minnesotans' perceived importance and satisfaction with these transportation areas using the questionnaires, and then graphed the mean scores on these items.

Factor analysis examined how QOL areas related to one another and could be categorized. Oblique factor analysis using eigen values of 1.0 and factor loadings of .4 identified underlying factors.

A high response rate to the questionnaire provided a geographically representative sample from which a robust analysis could then investigate the importance of select QOL areas and the role transportation plays in QOL. Results of these analyses are presented in the next section.

4.2 Results

Analysis of a mail questionnaire to a geographically representative sample of Minnesotans presents data both on (1) how Minnesota residents perceive and evaluate transportation with regards to their QOL and (2) residents' satisfaction with various transportation components. This project focused on five major research questions related to the relationship of transportation and QOL, satisfaction with transportation, and the importance of and MnDOT performance on transportation services. Results on the primary research questions are presented followed by a descriptive analysis of the sample.

4.2.1 Response Rate

Of the 7,488 mailed questionnaires, 3,484 were returned. Of these, 3,308 were identified as usable as the data were at least 60% complete. Therefore the valid response rate was 45.4% (Table 4.3). The respondents were distributed across the five pre-identified regions as follows:

53.2% Metro, 8.7% Central, 8.3% Northeast, 9.2% Northwest, and 20.6% South, mirroring the state population percentages (Table 4.4). Common to survey research, respondents were older and more frequently non-Hispanic white than the state population, however.

Table 4.3: Response rate of quality of life and transportation survey, Minnesota, 2011

Item	Number/%
Mailed questionnaires	7,488
Undeliverable	175
Deceased/changed address	35
Valid total	7, 278
Returned	
Received questionnaires	3484
Unusable	176
Valid response	3308
Valid response rate	45.4%

Table 4.4: State population distribution compared to sample representation, Minnesota, 2011

	Population estimate 2009[a]		Sample	
Region	N	%	N	%
State	5,192,122	100.0	3,308	100.0
Metro	2,932,301	56.5	1,750	53.2
South	996,762	19.2	677	20.6
Central	511,961	9.9	286	8.7
Northwest	449,066	8.7	304	9.2
Northeast	410,852	7.9	272	8.3

Note. [a] cited from Minnesota State Demographic Center (2007)

4.2.2 Research Questions

4.2.2.1 If/how Does Transportation Contribute to Satisfaction with Quality of Life Among Minnesotans?

Both descriptive and predictive analyses were employed to identify if and how transportation contributes to satisfaction with QOL among Minnesotans. Simple descriptive analysis indicated each of the 11 QOL areas was rated as somewhat important to very important. All areas had an average score of at least 6.06 on the 7-point scale, where 7 was very important. The three areas with the highest importance means were health ($\overline{X}$ =6.84), family, friends and neighbors ($\overline{X}$ =6.71), and safety and security ($\overline{X}$ =6.71). Areas lowest on the list were spirituality, faith, and serenity ($\overline{X}$ =6.10) and recreation and entertainment ($\overline{X}$ = 6.06; Figure 4.2 and Table 4.5). When respondents identified the three most important areas from the list, those most frequently cited were health (61.0%), family, friends and neighbors (54.6%), and employment and finances (34.5%; Figure 4.3). When comparing mean importance among the life areas, transportation was the ninth most important QOL factor among the eleven rated. Similarly, when respondents were

able to write-in the most important areas to satisfaction with QOL from the provided list, transportation was the ninth most frequently identified.

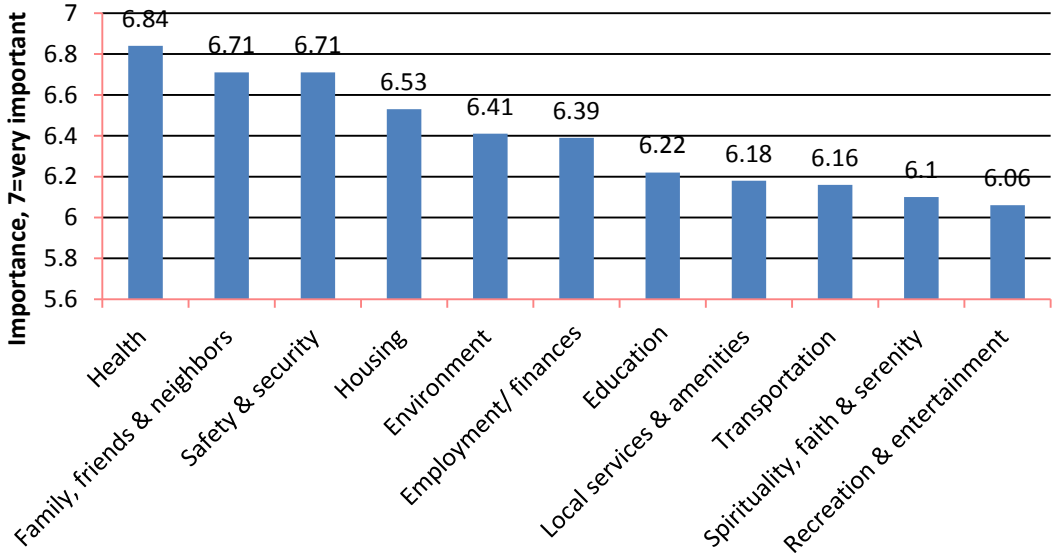

Figure 4.2: Mean importance of quality of life areas among Minnesotans, 2011.

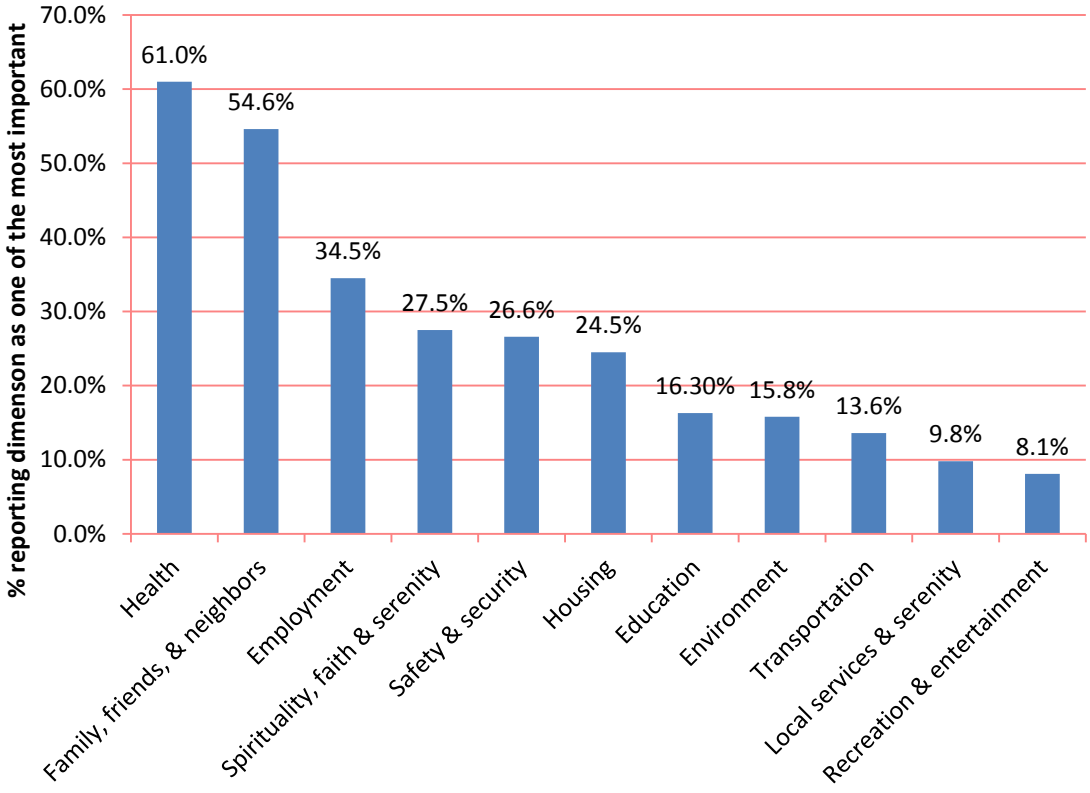

Figure 4.3: Percent of respondents reporting life area as one of most important.

Table 4.5: Importance of various quality of life areas among Minnesotans, 2011

	State (n=3308)		Metro (n=1750)		Central (n=286)		Northeast (n=272)		Northwest (n=304)		South (n=677)		F statistic
Life Area	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Health	6.84	0.57	6.84	0.61	6.87	0.51	6.85	0.52	6.88	0.38	6.81	0.61	0.96
Family, friends & neighbors	6.71	0.72	6.72	0.73	6.77[a]	0.58	6.60[a]	0.83	6.77	0.52	6.68	0.78	2.83*
Safety & security	6.71	0.73	6.72	0.70	6.79	0.53	6.62	0.88	6.68	0.83	6.7	0.74	2.21
Housing	6.53	0.92	6.57	0.87	6.54	0.86	6.42	1.04	6.45	1.07	6.49	0.93	2.88*
Environment	6.41	1.01	6.44	0.96	6.5	0.88	6.32	1.14	6.41	1.10	6.36	1.09	1.73
Employment/ finances	6.39	1.13	6.43[a]	1.12	6.38	1.15	6.17[ab]	1.34	6.31	1.10	6.43[b]	1.05	3.39**
Education	6.22	1.29	6.26[a]	1.27	6.22	1.21	6.00[a]	1.43	6.25	1.36	6.26	1.25	3.34*
Local services & amenities	6.18	0.98	6.20	0.99	6.16	0.88	6.14	1.00	6.19	1.02	6.17	0.97	0.36
Transportation	6.16	1.18	6.13	1.18	6.2	1.08	6.08	1.33	6.09	1.21	6.22	1.15	1.50
Spirituality, faith & serenity	6.10	1.36	5.97[a]	1.46	6.31[ab]	1.08	5.9[bcd]	1.44	6.33[ac]	1.20	6.31[ac]	1.14	13.74***
Recreation & entertainment	6.06	1.06	6.10[ab]	1.06	6.04	0.91	5.90[b]	1.13	5.99	1.18	6.08[a]	0.99	2.71*

Note. Quality of life scale reliability strong: Cronbach α = .82. Means with same superscripts are significantly different.

Importance of various areas to QOL measured with 7 point scale: 1= Very unimportant; 2= Somewhat unimportant; 3= Slightly unimportant; 4=Neither; 5= Slightly important; 6= Somewhat important; 7= Very important. * p< .05 ** p< .01 ***p<.001

Predictive analysis with stepwise multiple regression revealed significant but low predictive ability of six areas to predict satisfaction with QOL, depending on statistical method used. The adjusted explained variance was 5% and included health, recreation/entertainment, education, spirituality, housing, and transportation as significant predictors of QOL (Table 4.6; Figure 4.4). In the analysis, transportation served as a "suppressor" variable, which enhances the explanatory power of other predictors by suppressing irrelevant variance.

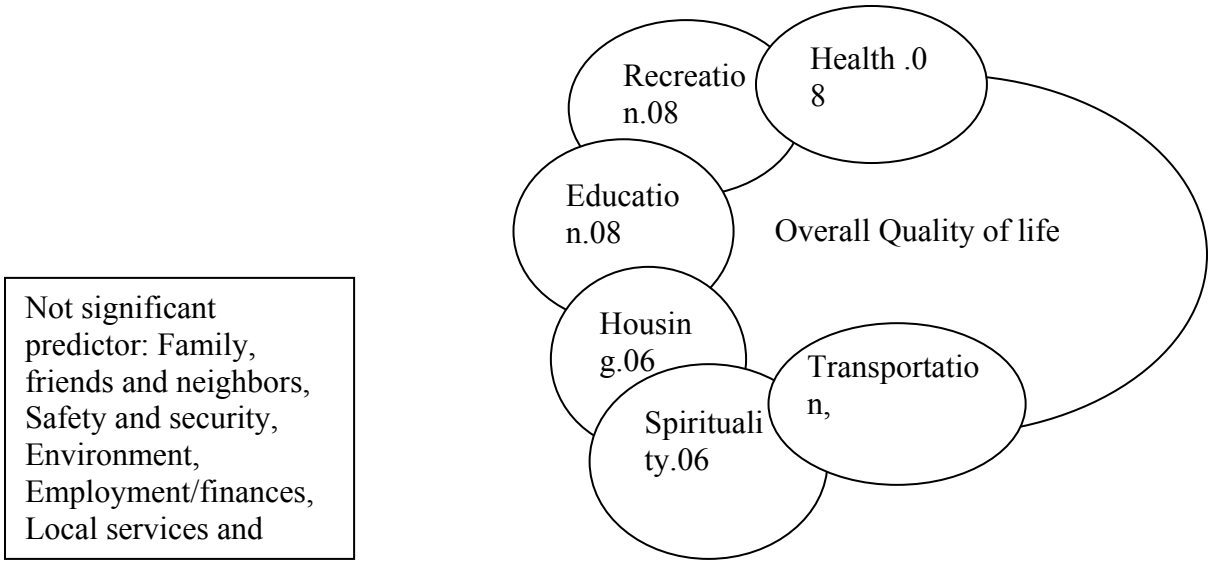

Figure 4.4: Diagram illustrating relative contribution of various life dimensions to explain overall quality of life among Minnesotans, 2011.

When predictive models were employed among regional respondents, all regions produced significant models but with low explained variance and inconsistent predictors (Table 4.6). The Metro predictive model included only health, recreation/entertainment, and education. The Central region model included family and health. Both the Northeast and Northwest models had single significant predictors: family and recreation/entertainment, respectively. The model for southern Minnesota residents included safety/security, education, recreation/entertainment, and employment/finance.

Similarly, when comparing predictive models by age groups, significant models emerged but they had low explained variances and inconsistent predictors (Table 4.7). Specifically, among those 18-34 years of age (n=149), the two significant predictors of satisfaction with QOL were safety and recreation/entertainment (Adjusted R^2 = .104). Among those 35-59 years of age (n= 1460), the four significant predictors were health, education, spirituality/faith/serenity, and transportation (Adjusted R^2 = .069). Finally, among those sixty years and older (n=1639), the three significant predictors were recreation/entertainment, education, and housing (Adjusted R^2 = .045).

Table 4.6: Stepwise regression analysis explaining the variance in quality of life among Minnesota residents, 2011

Life Areas	State [a] (n=3308)		Metro [b] (n=1705)		Central [c] (n=286)		Northeast [d] (n=272)		Northwest [e] (n=304)		South [f] (n=677)	
	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic
Health	.084	3.76***	.127	4.36 ***	.142	2.10 *	-		-		-	
Recreation & entertainment	.081	3.74***	.094	3.18 **	-		-		.206	3.20 **	.158	3.38**
Education	.081	3.90***	.070	2.47 *	-		-		-		.152	3.49**
Spirituality, faith & serenity	.059	2.96**	-		-		-		-		-	
Housing	.059	2.48*	-		-		-		-		-	
Transportation	-.046	-2.13*	-		-		-		-		-	
Family, friends & neighbors	-		-		.165	2.44 *	.150	2.21 *	-		-	
Safety & security	-		-		-		-		-		.166	3.45 **
Employment/ finances	-		-		-		-		-		-.107	-2.22 *

Note. [a.] Adjusted R square= .048 (R square = .051), F(2,629)=23.363, p<.01;
[b.] Adjusted R square= .047 (R square = .049), F(1,402)=24.221, p<.01;
[c.] Adjusted R square= .054 (R square = .063), F(228)=7.617, p<.01;
[d.] Adjusted R square= .018 (R square = .022), F(214)=4.900, p<.05;
[e.] Adjusted R square= .038 (R square = .043), F(230)=10.221, p<.01;
[f.] Adjusted R square= .085 (R square = .092), F(530)=13.457, p<.001.
* p< .05, ** p< .01, ***p<.001;Only variable retained in final models

Table 4.7: Stepwise regression analysis explaining the variance in quality of life among Minnesota residents of varying age groups, 2011

Life Area	Younger Group[a] (18-34) (n=149)		Middle Group[b] (35-59) (n=1460)		Older Group[c] (over 60) (n=1639)	
	Beta	t-statistic	Beta	t-statistic	Beta	t-statistic
Health	-		.159	5.39***	-	
Recreation & entertainment	.179	2.15 *	-		.111	3.65***
Education	-		.140	4.83***	2.158	2.16 *
Spirituality, faith & serenity	-		.105	3.67 ***	-	
Housing	-		-		.112	3.60 ***
Transportation	-		-.060	-2.07*	-	
Safety & security	.275	3.30 **	-		-	

Note. [a.] Adjusted R square = .104 (R square = .118), F(129)=8.59, p<.01;
[b.] Adjusted R square = .069 (R square = .072), F(1229)=23.966, p<.001;
[c.] Adjusted R square = .045(R square = .047), F(1222)=20.240, p<.001;* p< .05, ** p< .01, ***p<.001

When predictive models were employed comparing commuters and noncommuters, significant models with low explained variance and inconsistent predictors emerged yet again (Table 4.8). The commuter predictive model included only seven variables: health, recreation, education, spirituality, housing, family and friends, and finally employment and finances. In contrast, the noncommuter included only three predictors: education, recreation, and safety and security.

Table 4.8: Stepwise regression analysis explaining the variance in quality of life for commuters and noncommuters in Minnesota, 2011

Life Area	Commuter [a]		Noncommuter [b]	
	Beta	t-statistic	Beta	t-statistic
Health	.115	3.59***	-	
Recreation & entertainment	.059	2.04*	.094	2.78**
Education	.097	3.63***	.080	2.49*
Spirituality, faith & serenity	.062	2.41*	-	
Housing	.063	1.99*	-	
Safety & security	-		.071	2.14*
Family, friends & neighbors	.061	1.97*		
Employment and finances	-.097	-3.44**	-	

Note. [a.] Adjusted R square= .073 (R square = .077), F(1553)=18.62, p<.01;
[b.] Adjusted R square= 0.030 (R square = 0.032), F(1,041)=11.66, p<.01;
* p< .05 ** p< .01 ***p<.001
Only variables retained in final models

Similarly low predictive capabilities emerged when considering only people with disabilities (Table 4.9). Employment and finances was the sole predictor for the model and it explained only 4% of the variance in QOL.

Table 4.9: Stepwise regression analysis explaining the variance in quality of life among people with disabilities in Minnesota, 2011

	Model	
Life Area	Beta	t-statistic
Employment and finances	.206	3.46**
Note. Adjusted R square= .039 (R square = .042), F(271)=11.95, p<.01; Only variable retained in final models; * p< .05 ** p< .01, ***p<.001		

4.2.2.2 If/how Does Satisfaction with Each Transportation Area Contribute to Satisfaction with Transportation Overall?

Predictive analysis with stepwise multiple regression revealed significant predictive ability of transportation areas to predict satisfaction with MnDOT services overall. Using the single item "satisfaction with MnDOT overall" (Question 19), the adjusted explained variance is 55%. Using stepwise/model building analysis, all transportation areas are significant (in order) except environment: maintenance, long term planning, accessibility, design, safety, communications, and mobility (Table 4.10; Figure 4.5). This model also held for commuters (Table 4.11). However, when examining the model for people with disabilities, mobility, maintenance, and environment were not included in the final model (Table 4.12).

Table 4.10: Stepwise regression analysis explaining satisfaction with MnDOT services, 2011

Transportation Areas	Model	
	Beta	t-statistic
Maintenance	.268	14.67***
Planning	.166	10.16***
Accessibility	.133	6.91***
Design	.132	7.03***
Safety	.113	5.96***
Communications	.111	6.87***
Mobility	.044	2.05*
Note. [a.] Adjusted R square = .553 (R square = .555), F(2,874)=511.07, p<.001; *; p< .05 **; p< .01 ***p<.001		

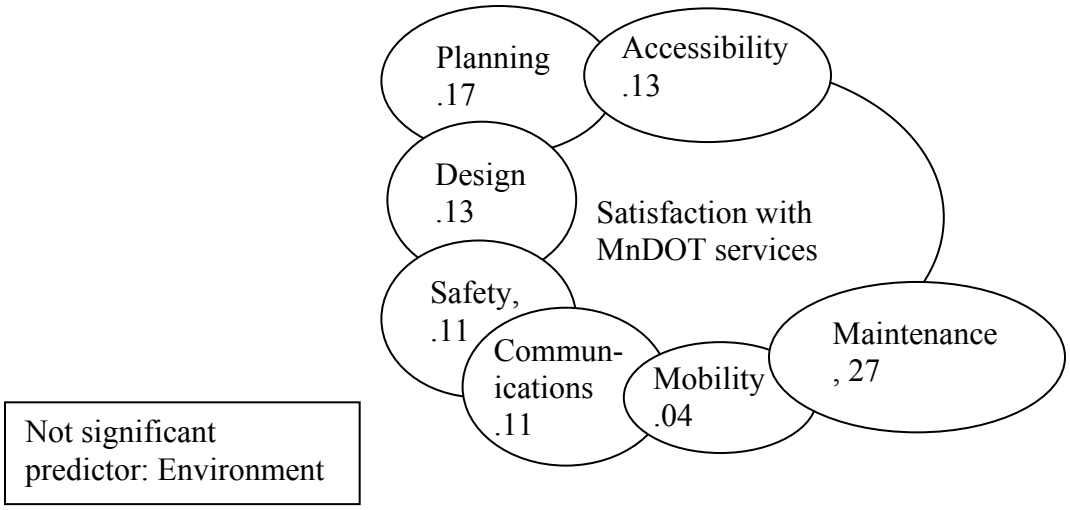

Figure 4.5: Diagram illustrating relative contribution of various transportation areas to explain satisfaction with MnDOT services among Minnesotans, 2011.

Table 4.11: Stepwise regression analysis explaining commuter satisfaction with MnDOT services, 2011

	Model	
Transportation area	Beta	t-statistic
Maintenance	.250	10.80***
Planning	.179	8.58***
Design	.154	6.39***
Accessibility	.126	5.06***
Communications	.119	5.76***
Safety	.089	3.66***
Mobility	.071	2.61**

Note. [a.] Adjusted R square= .569 (R square = .571), F(1,666)=316.45, p<.001; *; p< .05 **; p< .01 ***p<.001

Table 4.12: Stepwise regression analysis explaining satisfaction with MnDOT services among people with disabilities, 2011

	Model	
Transportation Area	Beta	t-statistic
Planning	.236	4.14***
Safety	.214	3.90***
Accessibility	.165	3.12**
Design	.139	2.40*
Communications	.137	2.30*

Note. [a.] Dependent variable Adjusted R square = .481 (R square = .490), F(296)=56.77, p<.001;
* p< .05 ** p< .01 ***p<.001

4.2.2.3 How Important is Each Transportation Area?

Descriptive analysis identified the importance of transportation areas overall. Using a cutoff of 5.0 where 7 = very important, all transportation areas were identified as important among respondents. In rank order, the importance was as follows: accessibility ($\overline{X}$ =6.79), safety ($\overline{X}$ =6.72), maintenance ($\overline{X}$ =6.64), mobility ($\overline{X}$ =6.57), design ($\overline{X}$ =6.36), long-term planning ($\overline{X}$ =6.15), environment ($\overline{X}$ =5.77), and transparency ($\overline{X}$ =5.60; Table 4.13; Figure 4.6). When given the opportunity to write in their choices for the most important areas, respondents identified (in order), access, maintenance, mobility, and safety (mirroring quantitative results; Figure 4.7).

With one exception, respondents in the five pre-identified regions of Minnesota rated the importance of the transportation areas the same (Table 4.13; Figure 4.8). Accessibility was rated as the most important transportation area by all regions and communications was rated as the least important transportation area by all regions. Of the eight transportation areas, only communications' importance was significantly different among regions (F=4.01, p= .003) where respondents from the South indicated communication was more important ($\overline{X}$ =5.74) than those in the Metro ($\overline{X}$ =5.54). Although statistically significant, the meaningfulness of this difference is debatable due to the small difference in means.

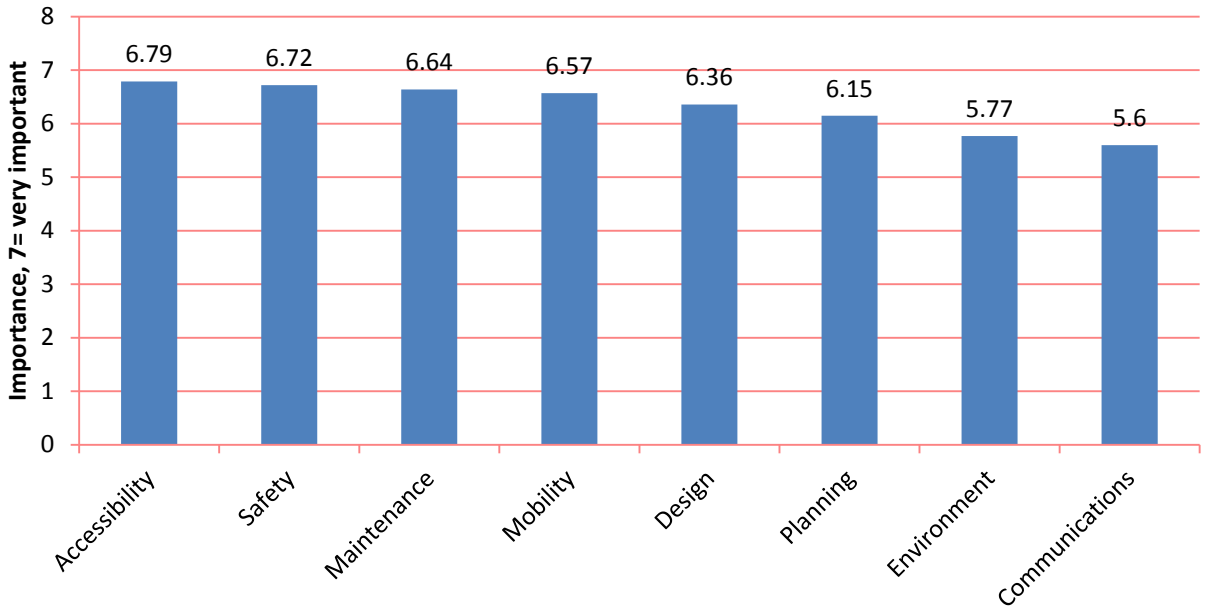

Figure 4.6: Importance of transportation areas among Minnesota residents, 2011.

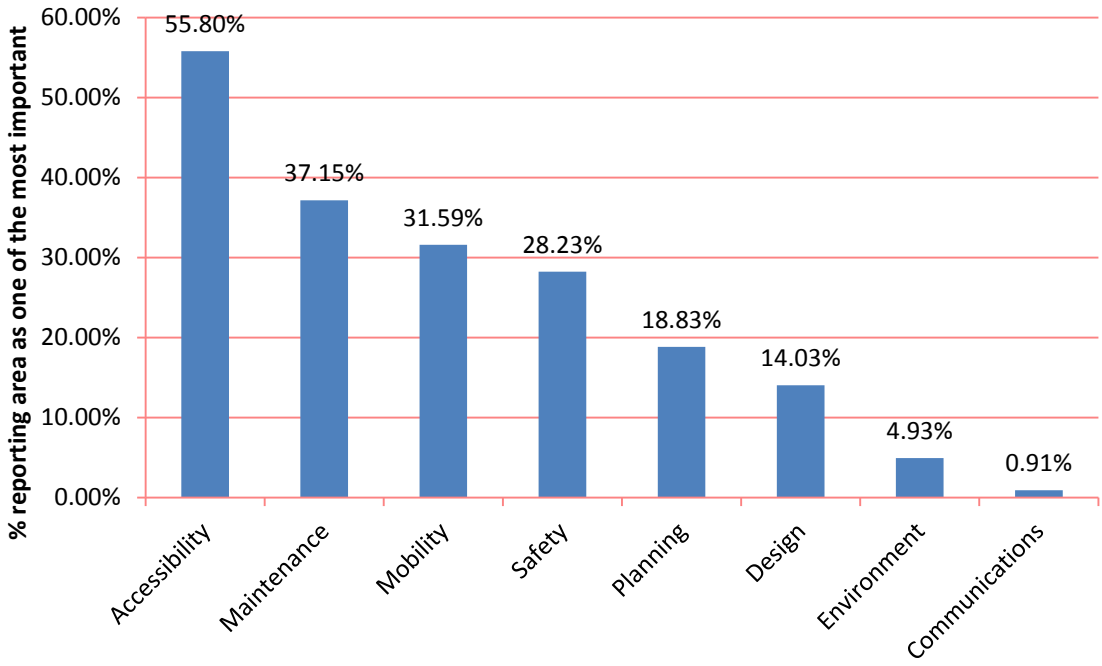

Figure 4.7: Qualitative assessment of most important transportation areas in Minnesota, 2011.

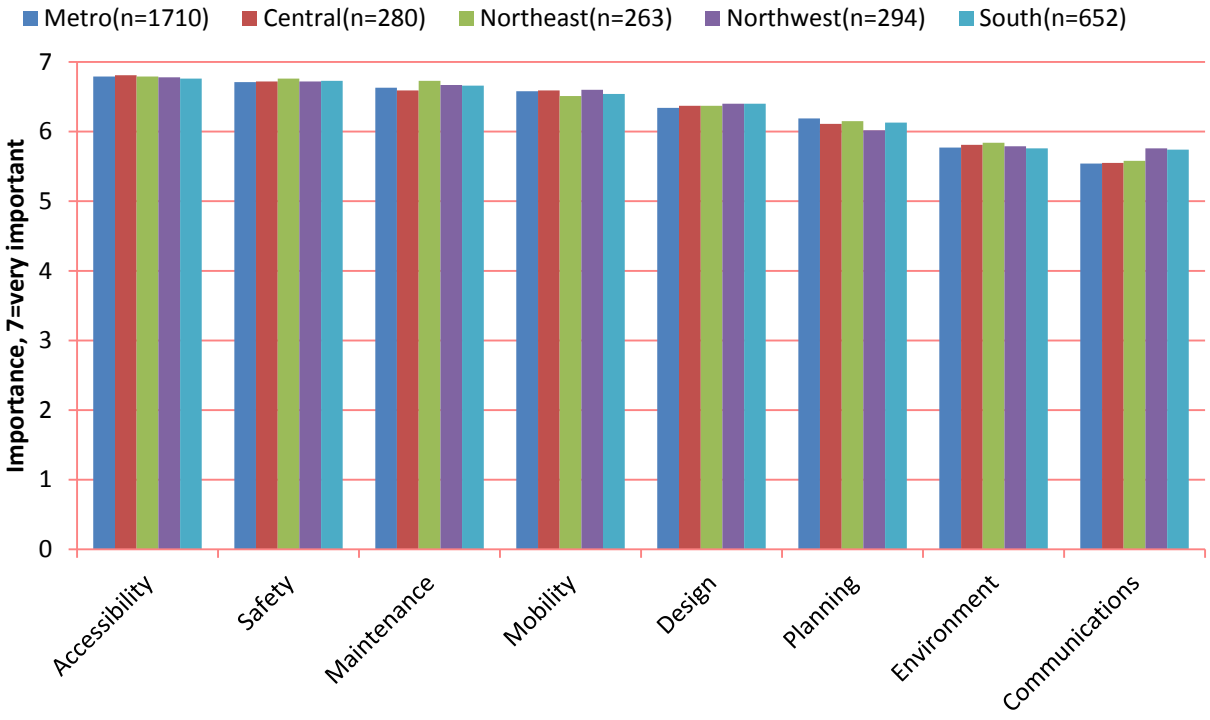

Figure 4.8: Importance of transportation areas by region, Minnesota 2011.

Table 4.13: Importance of transportation areas among Minnesota residents, 2011

	State (n=3215)		Metro (n=1710)		Central (n=280)		Northeast (n=263)		Northwest (n=294)		South (n=652)		F Statistic
Transportation Area	Mean[1]	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Accessibility	6.79	0.60	6.79	0.61	6.81	0.57	6.79	0.69	6.78	0.61	6.76	0.55	0.37
Safety	6.72	0.67	6.71	0.70	6.72	0.64	6.76	0.65	6.72	0.71	6.73	0.58	0.37
Maintenance	6.64	0.71	6.63	0.71	6.59	0.69	6.73	0.64	6.67	0.80	6.66	0.63	1.59
Mobility	6.57	0.71	6.58	0.70	6.59	0.70	6.51	0.85	6.60	0.71	6.54	0.70	0.92
Design	6.36	0.89	6.34	0.91	6.37	0.84	6.37	0.93	6.40	0.91	6.40	0.79	0.66
Planning	6.15	1.16	6.19	1.13	6.11	1.14	6.15	1.18	6.02	1.19	6.13	1.14	1.69
Environment	5.77	1.34	5.77	1.37	5.81	1.28	5.84	1.32	5.79	1.27	5.76	1.28	0.26
Communications	5.60	1.29	5.54[a]	1.29	5.55	1.27	5.58	1.36	5.76	1.31	5.74[a]	1.20	4.01**

Note: Importance of transportation areas measured with 7 point scale: 1 = Very unimportant; 2 = Somewhat unimportant; 3 = Slightly unimportant; 4 = Neither; 5 = Slightly important; 6 = Somewhat important; 7 = Very important. p<.01, * p< .05 , ***p<.001

Means with same superscripts are significantly different.

In contrast, respondents in different age groups had significantly different perceptions on the importance of about half of the transportation areas (Table 4.14; Figure 4.9). Specifically, younger-, middle-, and older-aged groups showed statistically significant differences in their perceived importance of four transportation areas: mobility (F=6.54, p=.001), design (F=35.09, p=.000), transparency (F=27.86, p=.000), and environment (F=3.65, p=.026). Overall, the older group attributed more importance to these four areas than the other groups: the older-aged group rated design and communications significantly more important than both the younger- and middle-aged groups but attributed significantly higher importance to mobility and environment than only the middle-aged group. The middle-aged group attributed greater importance to design than did the younger-aged group.

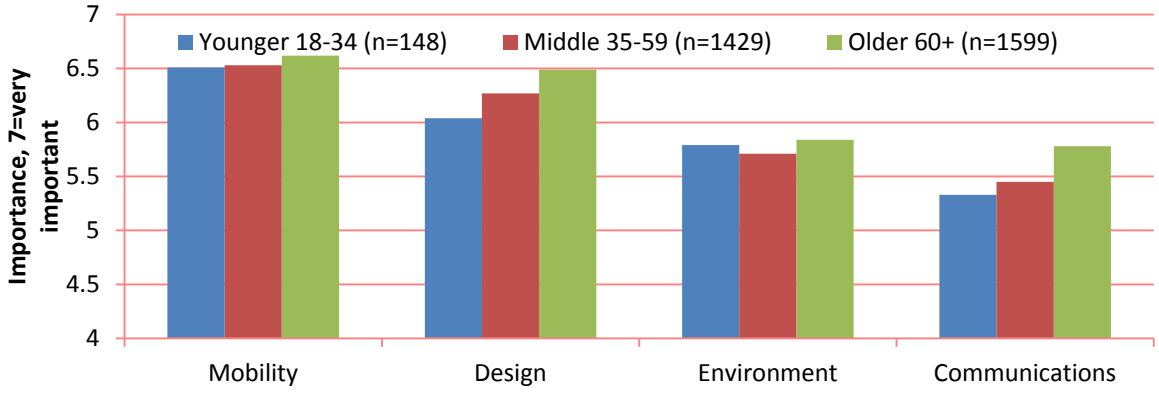

Figure 4.9: Differences in importance of transportation areas by age groups in Minnesota 2011.

Table 4.14: Analysis of variance comparing importance of transportation areas among age groups, 2011

	Younger 18-34 (n=148)		Middle 35-59 (n=1429)		Older 60+ (n=1599)		F Statistic
	Mean[1]	SD	Mean	SD	Mean	SD	
Accessibility	6.78	0.58	6.77	0.61	6.81	0.58	1.19
Safety	6.71	0.63	6.70	0.70	6.75	0.64	2.06
Maintenance	6.57	0.64	6.63	0.69	6.66	0.71	1.52
Mobility	6.51	0.71	6.53[a]	0.73	6.62[a]	0.69	6.54 **
Design	6.04[ab]	1.03	6.27[ac]	0.91	6.49[bc]	0.83	35.09 ***
Planning	6.12	1.16	6.19	1.12	6.13	1.17	1.69
Environment	5.79	1.34	5.71[a]	1.37	5.84[a]	1.30	3.65 *
Communications	5.33[a]	1.34	5.45[b]	1.33	5.78[ab]	1.22	27.86 ***

Note. Importance of transportation areas measured with 7-point scale: 1 = Very unimportant; 2 = Somewhat unimportant; 3 = Slightly unimportant; 4 = Neither; 5 = Slightly important; 6 = Somewhat important; 7 = Very important. * p<.05, * * p< .01 ***p<.001.Means with same superscripts are significantly different.

When comparing commuters and noncommuters, four differences in the importance of transportation areas arose. Specifically, commuters identified planning as more important than noncommuters. However, noncommuters attributed greater importance to communications, design and the environment (Table. 4.15).

Table 4.15: Differences in importance of transportation areas between commuters and noncommuters in Minnesota, 2011

Transportation areas	Commuter (n=1806)		Noncommuter (n=1353)		t-statistic
	Mean	SD	Mean	SD	
Accessibility	6.79	0.60	6.79	0.60	0.07
Safety	6.71	0.68	6.74	0.64	1.57
Maintenance	6.63	0.70	6.65	0.71	1.07
Mobility	6.55	0.71	6.60	0.72	1.91
Design	6.30	0.90	6.45	0.86	4.83***
Planning	6.19	1.14	6.09	1.17	-2.36*
Environment	5.71	1.37	5.85	1.29	2.85**
Communications	5.48	1.33	5.74	1.22	5.60***

Note. Importance of transportation areas measured with 7-point scale: 1 = Very unimportant; 2 = Somewhat unimportant; 3 = Slightly unimportant; 4 = Neither; 5 = Slightly important; 6 = Somewhat important; 7 = Very important. * p<.05, * * p< .01 ***p<.001

4.2.2.4 How Satisfied are Minnesota Residents with MnDOT's Performance on Each Transportation Area?

Descriptive analysis identified respondent satisfaction with MnDOT performance on each transportation area overall. Using a cutoff of 5.0 on the 7-point scale, MnDOTs performance on six of the eight areas assessed were ranked as satisfactory (Table 4.16, Figure 4.10). Maintenance and planning were below the 5.0 level (4.89 and 4.63, respectively). In rank order, satisfaction with MnDOT performance on the transportation areas is as follows: accessibility ($\overline{X}$ =6.09), followed by mobility ($\overline{X}$ =5.84), design ($\overline{X}$ =5.79), safety ($\overline{X}$ =5.53), communications ($\overline{X}$ =5.13), environment ($\overline{X}$ =5.05), maintenance ($\overline{X}$ =4.89), and planning ($\overline{X}$ =4.63).

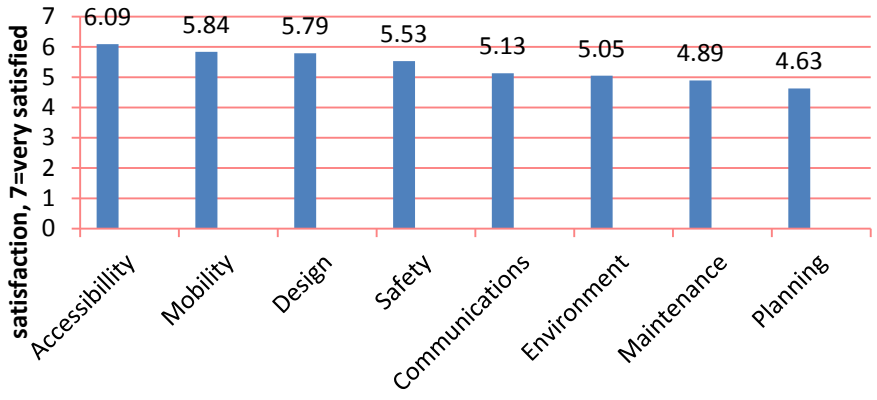

Figure 4.10: Satisfaction with transportation areas among Minnesota residents, 2011.

Table 4.16: Satisfaction with transportation areas among Minnesota residents, 2011

	State (n=3215)		Metro (M) (n=1710)		Central (C) (n=280)		Northeast (NE) (n=263)		Northwest (NW) (n=294)		South (S) (n=652)		F statistic	Regional Difference
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Accessibility	6.09	1.10	6.07	1.07	6.01	1.22	6.16	1.01	6.18	1.13	6.14	1.08	1.65	No diff.
Mobility	5.84	1.23	5.76	1.26	5.72	1.28	5.99	1.05	6.02	1.21	5.97	1.13	6.82***	M < NE, NW & S; C < NW & S
Design	5.79	1.23	5.73	1.26	5.67	1.28	5.96	0.97	5.96	1.21	5.89	1.16	5.48***	M > all; C < NE/NW;
Safety	5.53	1.39	5.49	1.38	5.41	1.41	5.55	1.34	5.79	1.31	5.58	1.44	3.48**	NW > M & C
Communications	5.13	1.32	5.08	1.32	5.04	1.32	5.09	1.25	5.28	1.37	5.25	1.31	3.16*	S > M
Environment	5.05	1.34	4.96	1.35	5.07	1.31	5.11	1.31	5.22	1.33	5.17	1.30	4.42**	M < NW & S
Maintenance	4.89	1.75	4.77	1.78	4.85	1.69	4.84	1.76	5.41	1.55	5.01	1.73	9.49***	NW > all; S > M
Planning	4.63	1.62	4.49	1.67	4.61	1.62	4.75	1.43	4.96	1.55	4.84	1.54	9.38***	NW > M & C; C > M

Note. Satisfaction of transportation area measured with 7-point scale: 1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Slightly dissatisfied; 4 = Neither; 5 = Slightly satisfied; 6 = Somewhat satisfied; 7 = Very satisfied. ANOVA was conducted to identify the importance differences among regions; * p< .05 ** p< .01 ***p<.001

Satisfaction with accessibility was the only factor that did not differ among regions. Satisfaction significantly differed by region across the other seven areas: mobility (F=6.82, p=.000), design (F=5.48, p=.000), safety (F=3.48, p=.008), communications (F=3.16, p=.013), environment (F=4.42, p=.001), maintenance (F=9.49, p=.000), and planning (F=9.38, p=.000). The metro area had lower satisfaction on most items than other regions (Table 4.16; Figure 4.11).

Design Residents from the metro area had significantly lower satisfaction with design ($\overline{X}$ =5.73) than those from the northeast ($\overline{X}$ =5.96), the northwest ($\overline{X}$ =5.96), and the south ($\overline{X}$ =5.89). Residents from the central area were significantly less satisfied with design than those from northeast and northwest ($\overline{X}$ =5.67 vs $\overline{X}$ =5.96).

Mobility Residents from the northeast ($\overline{X}$ =5.99), the northwest ($\overline{X}$ =6.02), and the south ($\overline{X}$ =5.97) were significantly more satisfied with their mobility than residents in the metro area ($\overline{X}$ =5.76). Residents from northeast and northwest were also significantly more satisfied then residents in central area ($\overline{X}$ =5.72).

Maintenance Residents from the northwest ($\overline{X}$ =5.41) were significantly more satisfied than all other four regions, metro ($\overline{X}$ =4.77), central ($\overline{X}$ =4.85), northeast ($\overline{X}$ =4.84), and south ($\overline{X}$ =5.01). Residents from the south were significantly more satisfied with maintenance than those from the metro.

Safety Safety was rated significantly higher in the northwest ($\overline{X}$ =5.79) than in the metro ($\overline{X}$ =5.49), and the central ($\overline{X}$ =5.41).

Communication Residents from the south ($\overline{X}$ =5.25) were significantly more satisfied with transparency than residents from the metro ($\overline{X}$ =5.08).

Environment Residents from the northwest ($\overline{X}$ =5.22) and the south ($\overline{X}$ =5.17) were significantly more satisfied with environment than residents from the metro ($\overline{X}$ =4.96).

Planning Planning was rated significantly higher in the northwest ($\overline{X}$ =4.96) and in the south ($\overline{X}$ =4.84) than in the metro ($\overline{X}$ =4.49).

Respondents in different age groups had significantly different satisfaction assessments with MnDOT performance on all of the transportation areas (Table 4.17; Figure 4.12). In particular, the older aged group reported significantly higher satisfaction with all eight transportation areas than the younger and middle aged group.

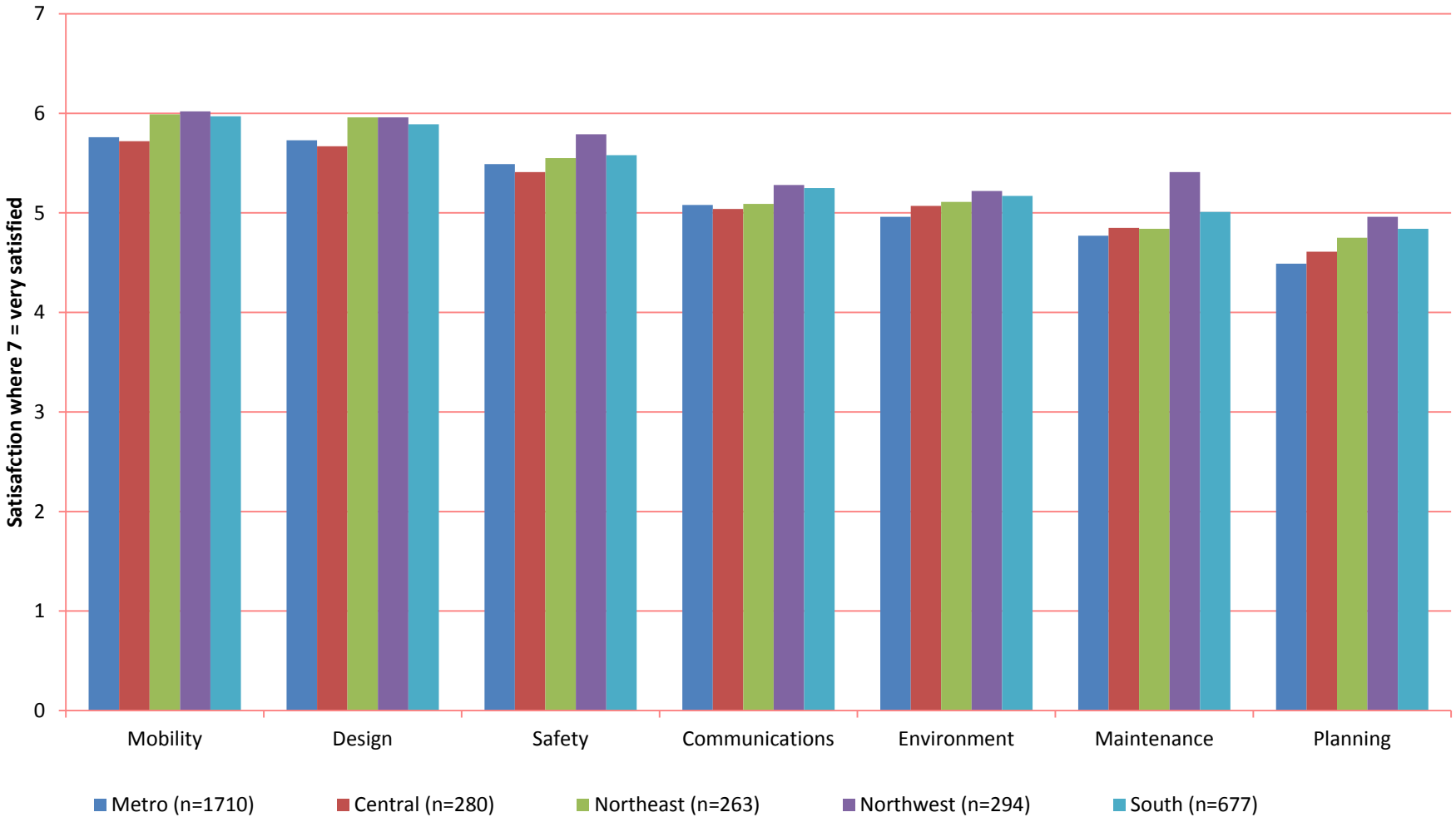

Figure 4.11: Differences in satisfaction with transportation areas by regional residence among Minnesotans, 2011.

Table 4.17: Satisfaction with transportation areas among different age groups in Minnesota, 2011

	Younger 18-34 (n=148)		Middle 35-39 (n=1429)		Older 60+ (n=1599)		F statistic
	Mean	SD	Mean	SD	Mean	SD	
Accessibility	5.95[a]	1.10	5.99[b]	1.16	6.22[ab]	1.02	17.62***
Mobility	5.52[a]	1.28	5.67[b]	1.30	6.04[ab]	1.11	40.41***
Design	5.51[a]	1.24	5.63[b]	1.29	5.98[ab]	1.12	36.22***
Safety	5.21[a]	1.49	5.37[b]	1.44	5.72[ab]	1.31	27.66***
Communications	4.93[a]	1.25	4.96[b]	1.36	5.32[ab]	1.28	30.13***
Environment	4.82[a]	1.35	4.87[b]	1.35	5.24[ab]	1.31	30.91***
Maintenance	4.25[a]	1.77	4.57[b]	1.79	5.24[ab]	1.64	67.66***
Planning	4.39[a]	1.59	4.33[b]	1.63	4.94[ab]	1.56	55.09***

Note. Satisfaction of transportation areas measured with 7-point scale: 1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Slightly dissatisfied; 4 = Neither; 5 = Slightly satisfied; 6 = Somewhat satisfied; 7 = Very satisfied. * p<.05, * * p< .01 ***p<.001 Means with same superscripts are significantly different.

Commuters and noncommuters reported significantly different satisfaction with all transportation areas. Noncommuters rated all transportation areas as more satisfactory than commuters (Table 4.18).

Table 4.18: Differences in satisfaction with transportation areas between commuters and noncommuters in Minnesota, 2011

	Commuter (n=1806)		Noncommuter (n=1353)		t-statistic
	Mean[1]	SD	Mean	SD	
Accessibility	6.02	1.14	6.18	1.04	-4.04***
Mobility	5.71	1.29	6.00	1.23	-6.72***
Design	5.67	1.28	5.95	1.12	-6.37***
Safety	5.42	1.44	5.67	1.32	-5.01***
Communications	5.00	1.35	5.31	1.25	-6.44***
Maintenance	4.94	1.33	5.21	1.66	-9.32***
Environment	4.63	1.78	5.19	1.33	-5.34***
Planning	4.41	1.63	4.91	1.56	-8.46***

Note. Satisfaction of transportation areas measured with 7-point scale: 1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Slightly dissatisfied; 4 = Neither; 5 = Slightly satisfied; 6 = Somewhat satisfied; 7 = Very satisfied. * p<.05, * * p< .01 ***p<.001

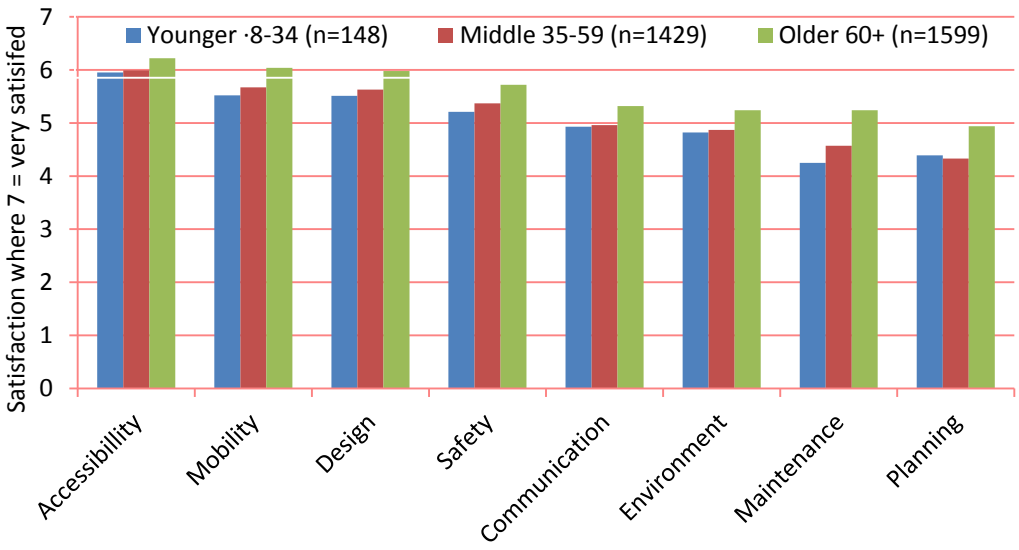

Figure 4.12: Differences in satisfaction with transportation areas by age group among Minnesota residents, 2011.

4.2.2.5 How Does Perceived MnDOT Performance Compare with Perceived Importance on Each Transportation Area?

Of the eight transportation areas, four were rated high both in importance and in satisfaction; accessibility, safety, mobility, and design (Figure 4.13). Maintenance was rated high in importance, yet relatively lower in satisfaction. Transparency and environment were rated relatively low in both importance and satisfaction.

This pattern of importance-performance was repeated in each region where the areas were in the same quadrants, but in slightly different locations within the quadrants (Figures 4.14 to 4.18). Similarly, with one exception, the pattern of perceived importance-performance was repeated among respondents in three age groups. However, design fell into the lower satisfaction quadrant for both younger and middle-aged respondents (Figures 4.19 to 4.21).

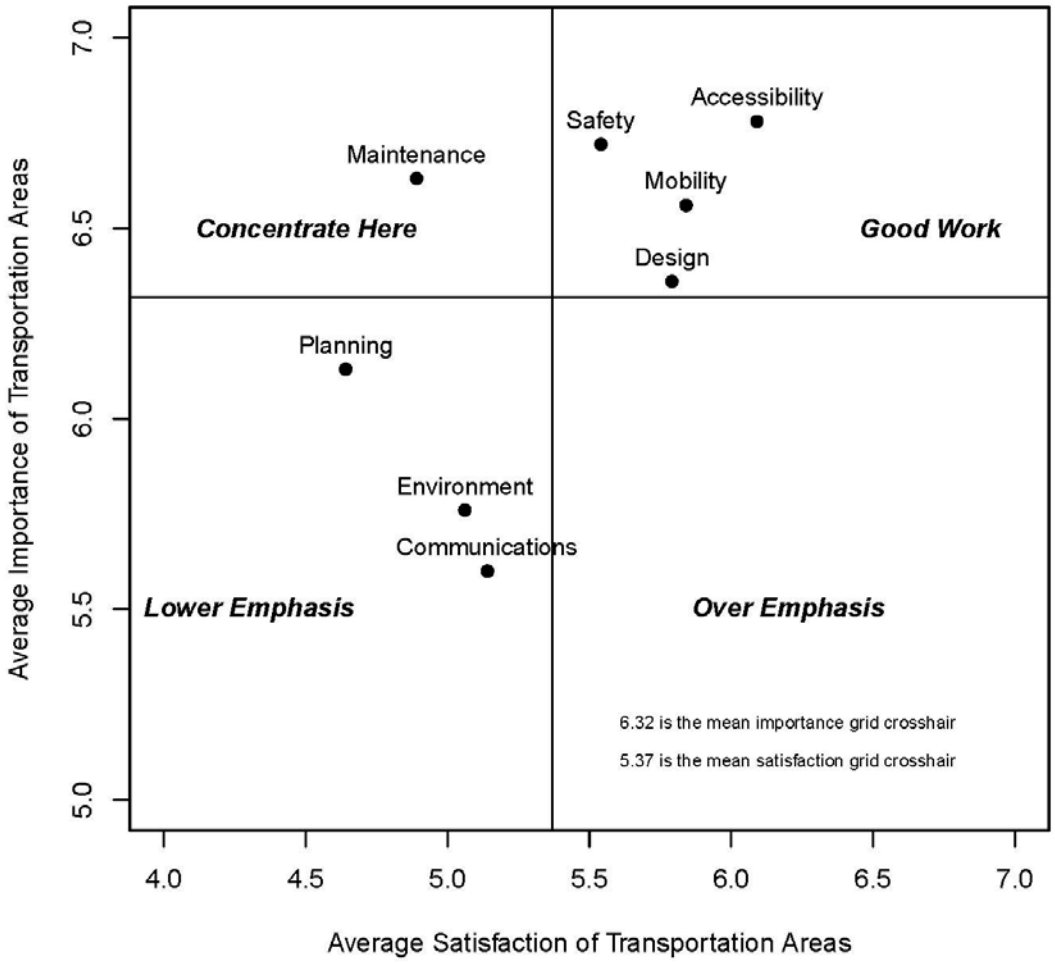

Figure 4.13: Importance and performance analysis plot of transportation areas among Minnesota residents, 2011.

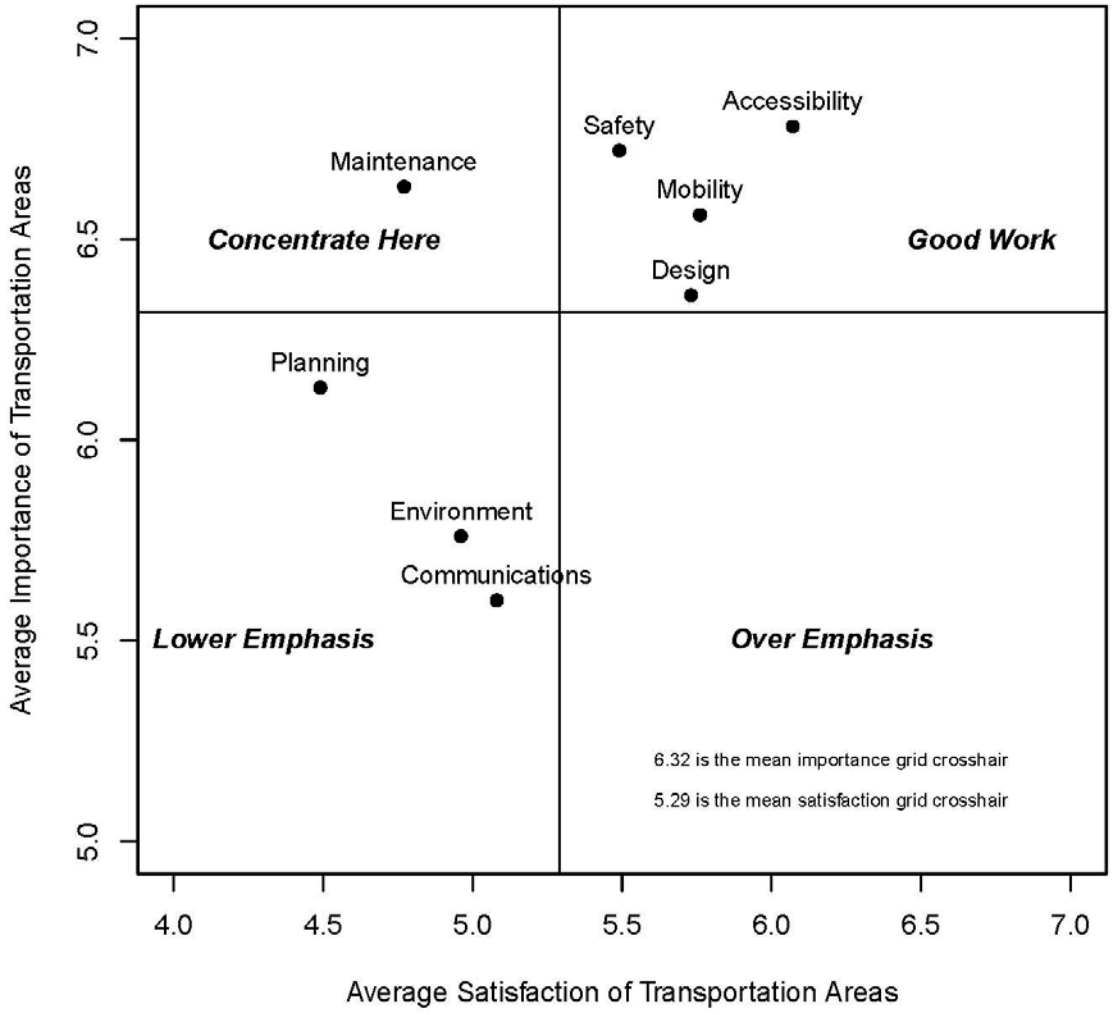

Figure 4.14: Importance and performance analysis for transportation areas in metro Minnesota, 2011.

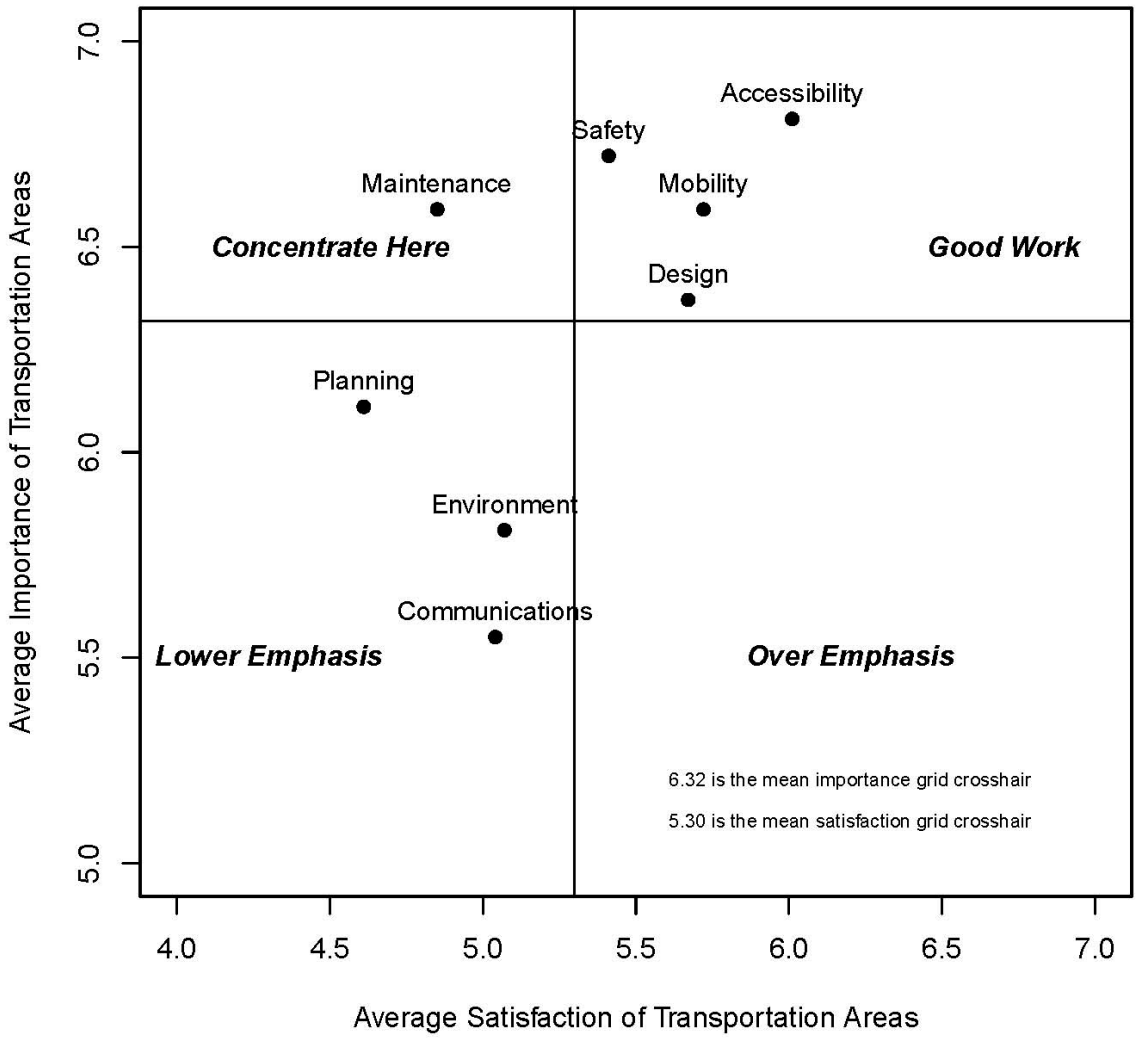

Figure 4.15: Importance and performance analysis for transportation areas in central Minnesota, 2011.

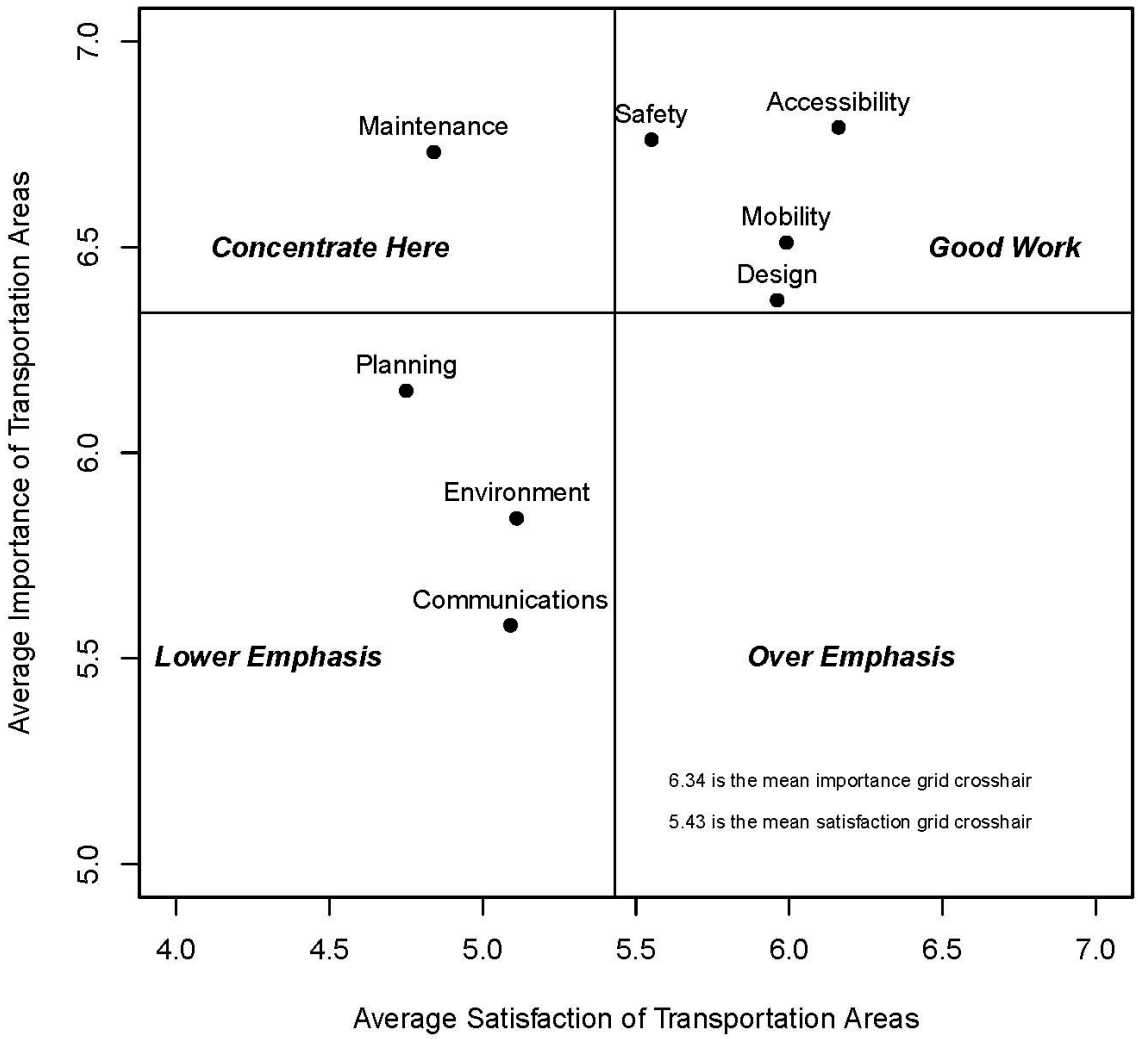

Figure 4.16: Importance and performance analysis for transportation areas in northeast Minnesota, 2011.

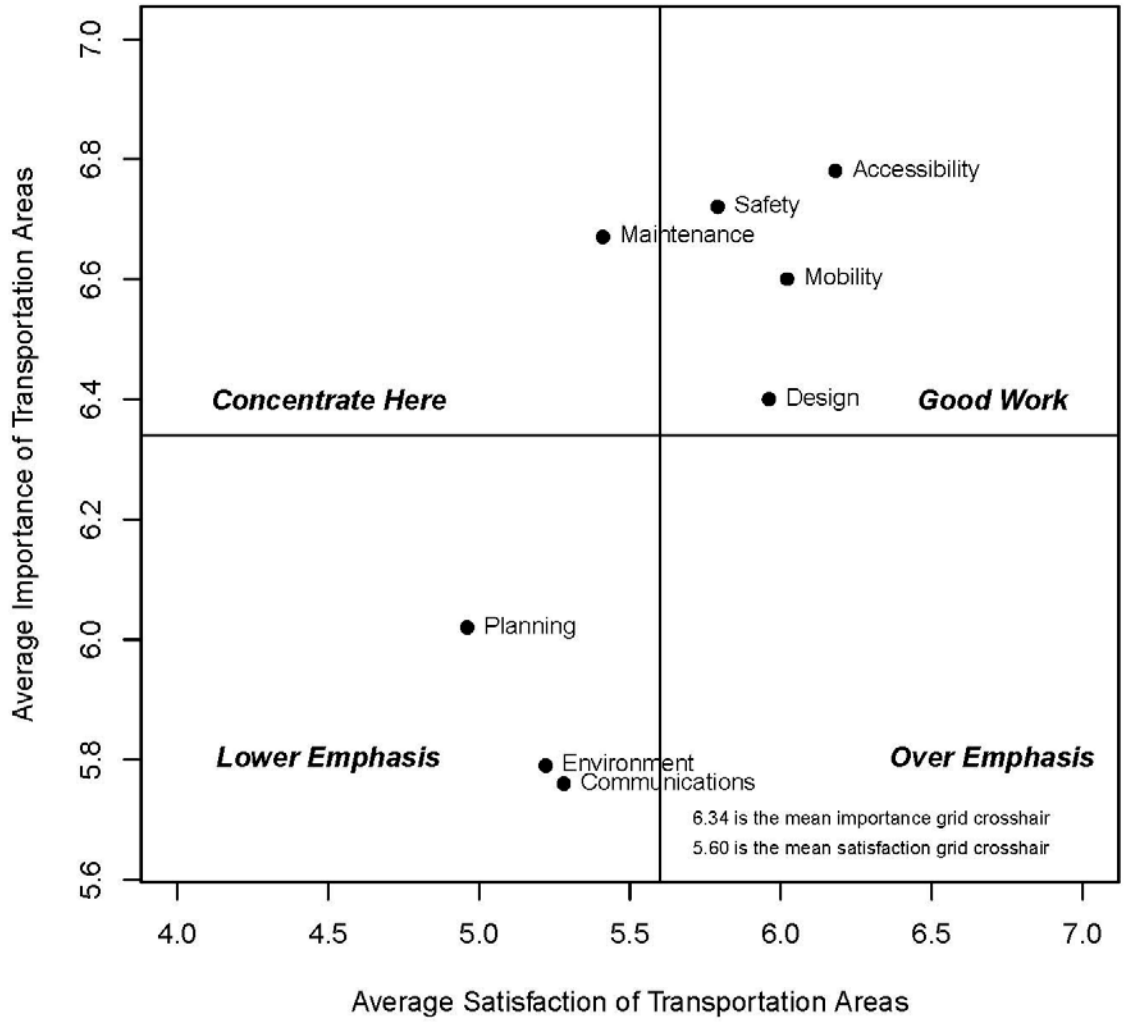

Figure 4.17: Importance and performance analysis for transportation areas in northwest Minnesota, 2011.

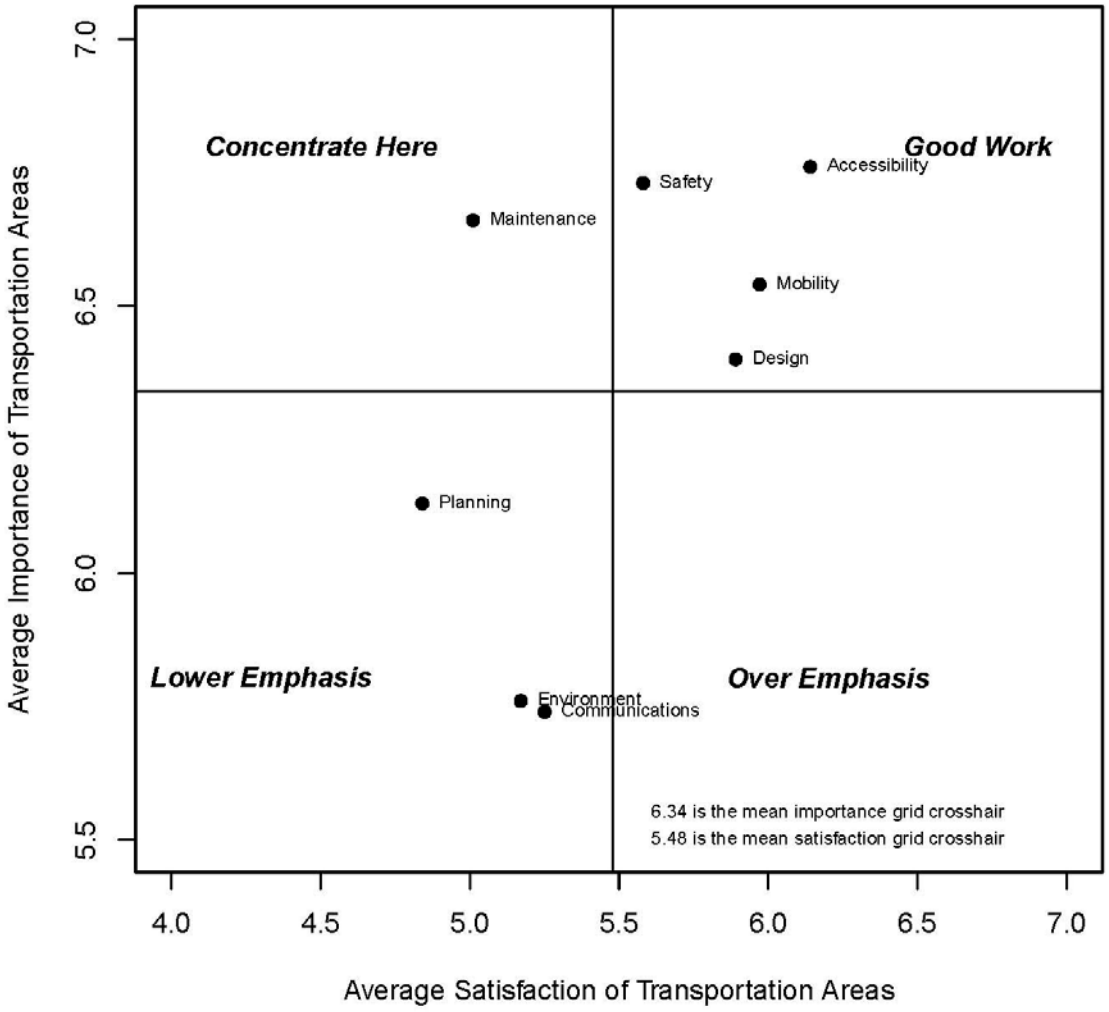

Figure 4.18: Importance and performance analysis for transportation areas in southern Minnesota, 2011.

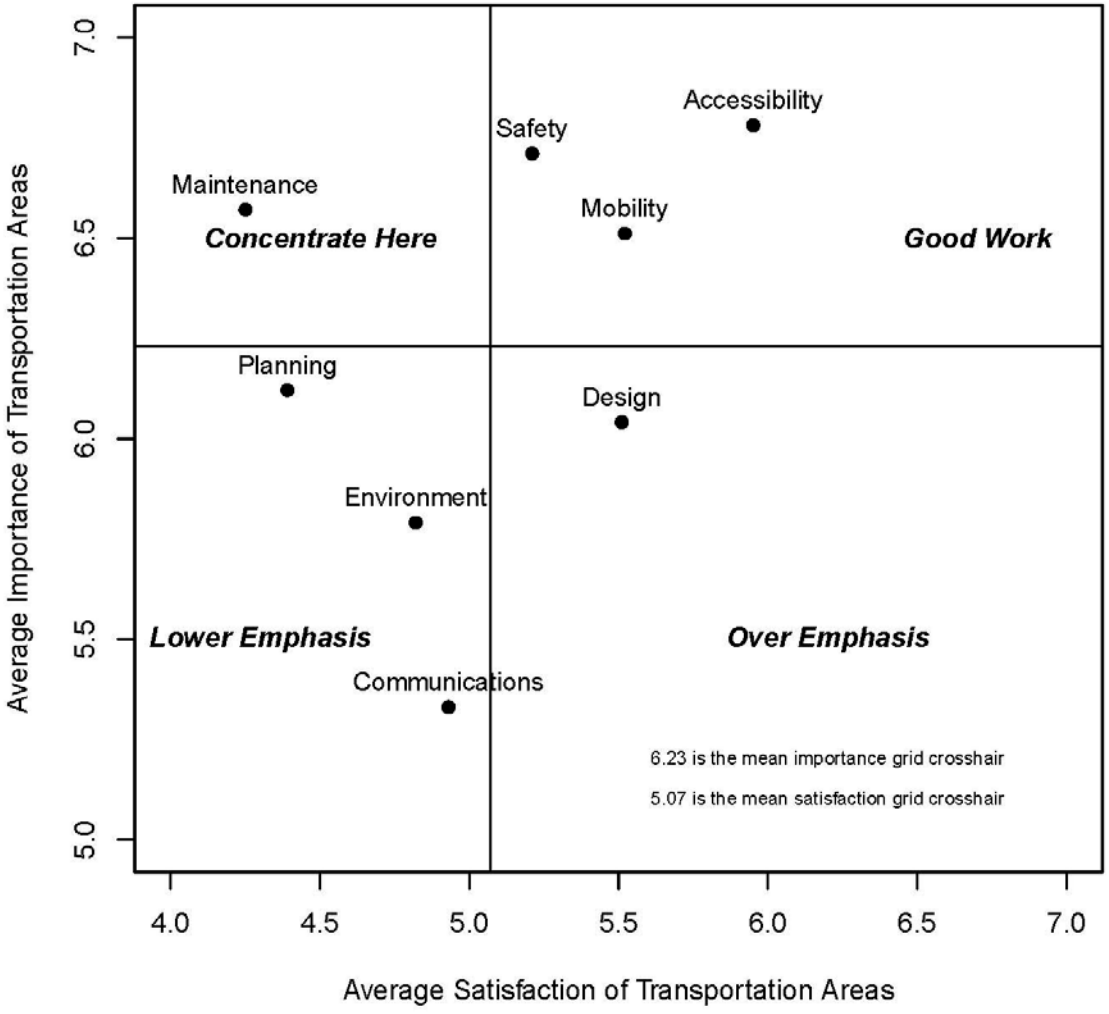

Figure 4.19: Importance and performance analysis for transportation areas for younger group in Minnesota, 2011.

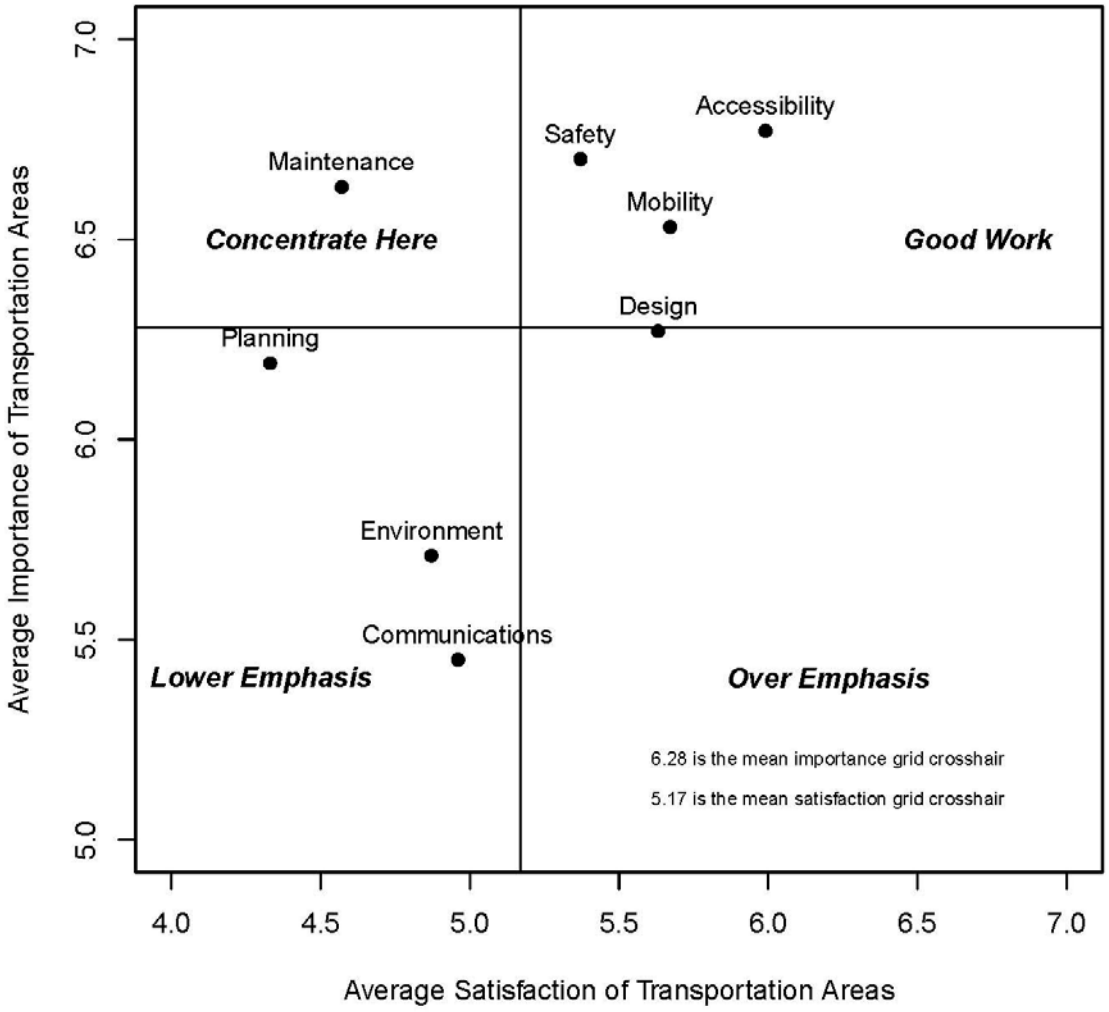

Figure 4.20: Importance and performance analysis for transportation areas for middle-aged group in Minnesota, 2011.

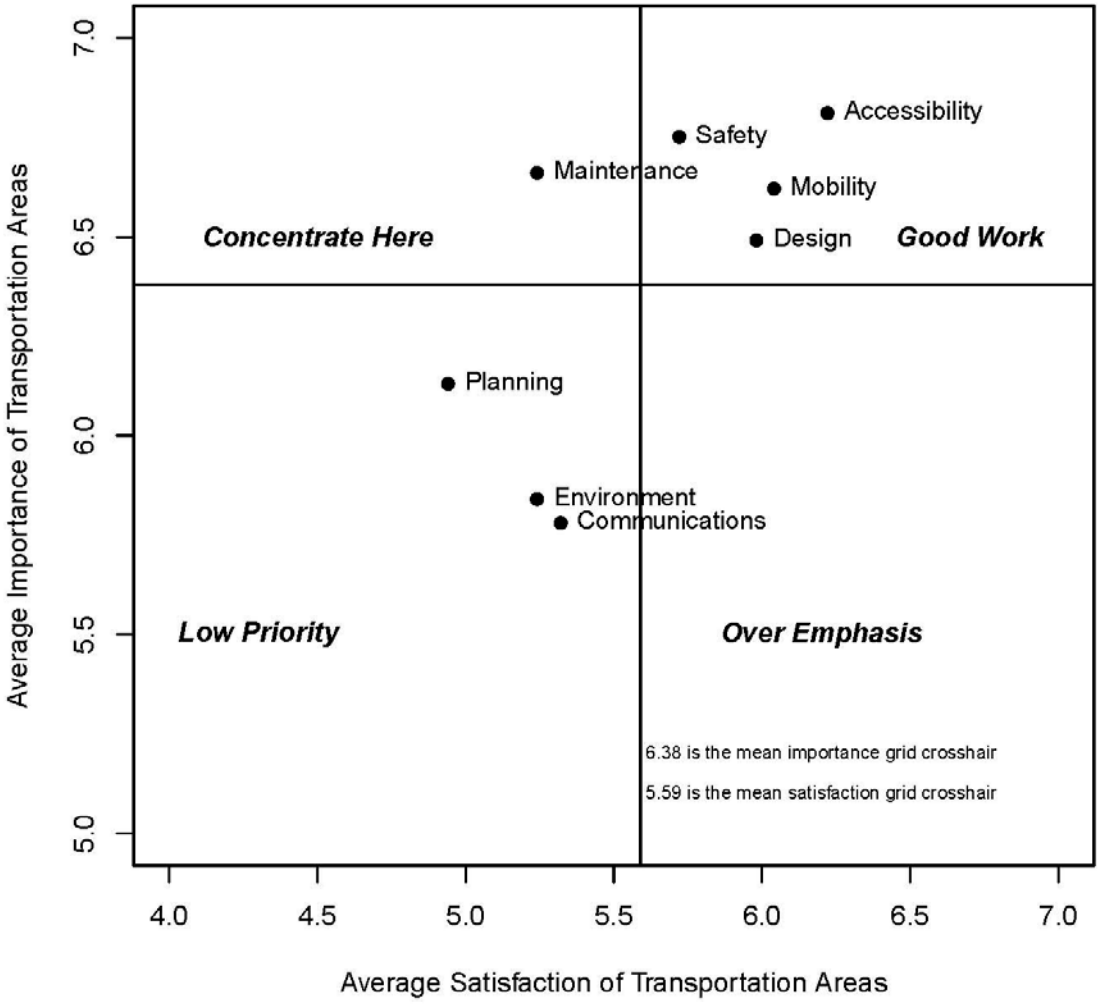

Figure 4.21: Importance and performance analysis for transportation areas among older-aged group in Minnesota, 2011.

4.2.2.6 How Life Areas Related to One Another and Could Be Categorized.

The 11 QOL factors were examined for underlying structure or relationships. Three groups of factors emerged which explained 59% of the variance in QOL. The three groups of life areas are (1) family, friends, and health; (2) education, environment, employment, housing, and transportation; and (3) recreation and local services/amenities (Table 4.19). The item of spirituality, serenity, and faith factored but decreased the factor reliability and therefore was left as a single item.

Table 4.19: Factor analysis of quality of life areas, Minnesota, 2011

Factor 1	Factor 2	Factor 3
Health	Education	Local services/ amenities
Family	Environment	Recreation
Friends	Employment	
	Transportation	
	Housing	

4.2.3 MnDOT Priorities, Short and Long Term

To understand Minnesota residents' transportation priorities over the next three to five years and for the next generation, we asked survey participants to indicate the three most important areas where MnDOT should focus. Respondents listed maintenance, access and safety ideas as the most important areas for both the near term and long term, although their rank changed slightly (Table 4.20).

4.2.4 Demographic Profile and Community Experience

Respondents reported an average age of 59.79, ranging from 17 to 98 years (Table 4.21). More than half of respondents were male (67.0%).The majority of the sample was non-Hispanic (98.8%) and white (94.3%). Respondent income was approximately normally distributed and the most frequently reported income was $50,000 to $74,999 (21.1%). The majority of people were employed full time (52.2%) but 36.1% of respondents were retired.

Respondents lived in Minnesota and in their community for multiple decades and typically year-round (Table 4.19). On average, respondents lived in Minnesota for 49 years and lived in their present community 30 years. Only 10% were seasonal residents (Table 4.22). On average, two people lived in the respondents' household (Figure 4.22), but respondents reported a household range from 1 to 15 (Figure 4.22). Similarly, respondents most frequently indicated they had two working automobiles associated with their household, with a range from 1 to 17 (Figure 4.22). Eleven percent of respondents identified themselves as a person with a disability (Figure 4.23).

When asked about typical trips taken in a week, respondents indicated they drove alone most frequently for work, shopping, and recreational focused trips (Table 4.23). Among all respondents, 26.6% (n=852) reported using public transportation in the last 12 months and 40.6% respondents (n=1284) reported they had biked outdoors.

Just more than half of respondents reported travel to or from work from Monday to Friday and were identified as commuters (55.9%; Figure 4.24). Commuters in the sample travelled an average of 14.44 miles one-way per trip and the majority travelled five days per week (73.8%; Table 4.24, Figure 25).The vast majority of commuters (85.3%) travelled between 6 and 9 am and 6 to 6:30 pm. More than 80% of commuters were satisfied, at some level, with the predictability of their commute: 42% of commuters reported being very satisfied, 32.1% somewhat satisfied, and 9.2% slightly satisfied.

Table 4.20: Percent of open-ended respondents' ideas for short- and long-term MnDOT priorities, 2011.

Theme	Subtheme	MnDOT focus near term	Near term rank	MnDOT focus long term	Long term rank
Maintenance		34.94%	1	21.67%	2
	Roads/general	27.30		16.77	
	Bridges	3.56		2.47	
	Snow/ice removal	3.17		1.67	
	Other	0.57		0.12	
	Efficiency	0.34		0.65	
Access		19.17%	2	25.8%	1
	Public transportation	12.63		17.40	
	General (new routes, new bridges, etc)	3.10		3.95	
	Nonmotorized transportation	2.71		3.07	
	Services (carpool lanes, park & rides, etc.)	0.66		0.93	
	Other	0.07		0.45	
Safety		12.18%	3	15.18%	3
	General	8.51		9.8	
	Speed	1.20		1.47	
	Bikes & pedestrians	0.66		0.50	
	Distracted driving	0.60		1.07	
	Regulation/enforcement	0.57		0.73	
	Education	0.51		1.15	
	Other	0.12		0.40	
Mobility		11.40%	4	8.58%	5
	Traffic flow and congestion	10.33		7.90	
	Construction	0.62		0.22	
	Other	0.28		0.07	
	Commute/travel time	0.18		0.40	
Design		9.02%	5	7.85%	6
	Signage	2.26		1.48	
	Specific features	2.04		2.15	
	Lights	1.88		1.00	
	Quality	1.50		1.82	
	Road material	1.35		1.40	
Communication		8.02%	6	10.52%	4
	Planning	3.08		4.83	
	Finances	2.76		4.55	
	Organization (hiring, urban v. rural, etc.)	1.38		0.28	
	Other	0.43		0.28	
	Communication	0.40		0.57	
Environment		3.73%	7	7.57%	7
	General	2.07		4.22	
	Reduce runoff	0.50		0.48	
	Other	0.48		0.68	
	Air	0.25		0.70	
	Fuel alternative/efficiencies	0.23		0.93	
	Reduce car use	0.19		0.55	
Other	Other	1.53%		2.83%	

Table 4.21: Demographics of respondents to transportation and quality of life questionnaire in Minnesota, 2011

	State	Metro	Central	Northeast	Northwest	South
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Gender						
Male	67.0 (2191)	64.8 (1120)	73.1 (207)	64.3 (173)	69.2 (209)	70.1 (470)
Female	31.9 (1043)	34.1 (590)	26.1 (74)	33.5 (90)	29.5 (89)	29.4 (197)
Prefer not to respond	1.1 (36)	1.1 (19)	0.7 (2)	2.2 (6)	1.3 (4)	0.4 (3)
Total	100(3270)	100 (1729)	100 (283)	100 (269)	100 (302)	100 (670)
Ethnicity						
Non-Hispanic/ Non-Latino	98.8 (2661)	98.6 (1406)	98.6 (219)	99.2 (236)	98.4 (239)	99.5 (549)
Hispanic/Latino	1.2 (32)	1.4 (20)	1.4 (3)	0.8 (2)	1.6 (4)	0.5 (3)
Total	100 (2693)	100 (1426)	100 (222)	100 (238)	100 (243)	100 (552)
Race						
White	94.3(3120)	92.8 (1624)	95.8 (274)	96.7 (263)	95.4 (290)	96.8 (655)
Asian	1.2 (39)	2.0 (35)	-	-	0.3 (1)	0.4 (3)
American Indian/ Alaskan native	1.0 (33)	0.7 (13)	1.7 (5)	1.8 (5)	2.0 (6)	0.6 (4)
Other	1.0 (32)	1.0 (17)	1.0 (3)	1.1 (3)	2.3 (7)	0.3 (2)
Black/African American	0.8 (27)	1.4 (24)	-	0.7 (2)	-	0.1 (1)
Native Hawaiian/ Pacific Islander	0.1 (3)	0.1 (2)	-	-	-	0.1 (1)
Total	N/A					
Age						
18-30	1.8 (60)	2.2 (37)	1.4 (4)	2.6 (7)	1.7 (5)	1.1 (7)
31-40	8.3 (268)	9.2 (158)	10.3 (29)	5.6 (15)	6.0 (18)	6.9 (46)
41-50	16.7 (543)	18.1 (311)	19.9 (56)	13.0 (35)	12.7 (38)	15.5 (103)
51-60	25.1 (815)	25.7 (441)	26.2 (74)	23.0 (62)	23.1 (69)	24.0 (160)
61-70	23.5 (762)	22.9 (394)	23.4 (66)	24.9 (67)	22.1 (66)	25.1 (167)
71 or older	24.6 (800)	21.9 (376)	18.8 (53)	30.9 (83)	34.4 (103)	27.5 (183)
Total	100 (3248)	100 (1717)	100 (282)	100 (269)	100 (299)	100 (666)
Annual household income (U.S. Dollars)						
Less than $25,000	12.9 (384)	10.0(158)	12.8 (34)	17.7 (44)	21.7 (59)	14.5 (88)
$25,000-34,999	10.6 (318)	8.3 (132)	10.2 (27)	12.5 (31)	13.6 (37)	14.8 (90)
$35,000-49,999	15.2 (454)	14.0 (221)	17.0 (45)	20.2 (50)	19.1 (52)	13.5 (82)
$50,000-74,999	21.1 (631)	19.4 (307)	25.3 (67)	21.0 (52)	21.0 (57)	24.2 (147)
$75,000-99,999	14.6 (437)	15.3 (242)	13.6 (36)	9.7 (24)	11.0 (30)	17.0 (103)
$100,000-124,999	11.2 (334)	12.8 (202)	12.1 (32)	12.9 (32)	5.9 (16)	8.4 (51)
$125,000-149,999	5.0 (149)	6.3 (99)	4.2 (11)	2.8 (7)	2.9 (8)	3.6 (22)
$150,000-174,999	3.2 (95)	4.7 (75)	1.1 (3)	0.4 (1)	1.1 (3)	2.0 (12)
$175,000 or More	6.2 (186)	9.2 (146)	3.8 (10)	2.8 (7)	3.7 (10)	2.0 (12)
Total	100 (2988)	100 (1582)	100 (265)	100 (248)	100 (272)	100 (607)

Highest level of education						
Some high school	2.9 (87)	1.7 (26)	5.0 (13)	3.0 (7)	5.1 (14)	4.4 (27)
Graduated high school /GED	18.4 (547)	13.0 (204)	21.8 (57)	19.8 (47)	27.3 (75)	26.6 (164)
Some votech	2.7 (81)	2.8 (44)	2.7 (7)	3.4 (8)	2.9 (8)	2.3 (14)
Graduated from votech	10.8 (320)	7.7 (121)	16.5 (43)	13.5 (32)	13.5 (37)	13.6 (84)
Completed associate degree	5.3 (156)	6.2 (98)	6.5 (17)	2.1 (5)	3.3 (9)	4.1 (25)
Some college	12.8 (381)	12.9 (203)	10.3 (27)	19.0 (45)	15.6 (43)	9.7 (60)
Graduated from college	24.9 (739)	29.1 (457)	20.7 (54)	16.0 (38)	18.2 (50)	22.5 (139)
Some postgraduate	5.1 (152)	5.5 (86)	3.8 (10)	7.6 (18)	4.0 (11)	4.4 (27)
Postgraduate degree(s)	17.1 (508)	21.0 (330)	12.6 (33)	15.6 (37)	10.2 (28)	12.5 (77)
Total	100 (2971)	100 (1569)	100 (261)	100 (237)	100 (275)	100 (617)
Employment						
Employed full time	52.2 (1683)	55.8 (953)	56.4 (158)	34.8 (93)	43.1 (129)	51.6 (338)
Retired	36.1 (1164)	32.0 (546)	33.9 (95)	49.4(132)	47.2 (141)	37.9 (248)
Employed part time	6.7 (215)	6.1(104)	5.7 (16)	12.0(32)	6.4 (19)	6.6 (43)
Unemployed	2.4 (77)	3.2 (55)	1.8 (5)	0.7 (2)	1.7 (5)	1.4 (9)
Other	1.3 (42)	1.6 (27)	0.7(2)	0.4 (1)	0.7 (2)	0.8 (5)
Self-employed	1.1 (36)	1.0 (17)	1.1 (3)	1.1 (3)	0.7 (2)	1.5 (10)
Student	0.3 (9)	0.4 (6)	0.4 (1)	1.9 (5)	1.0 (3)	0.3 (2)
Total	100 (3226)	100 (1708)	100 (280)	100 (267)	100 (299)	100 (655)

Note Due to possible selection of multiple categorical responses total does not equal 100.

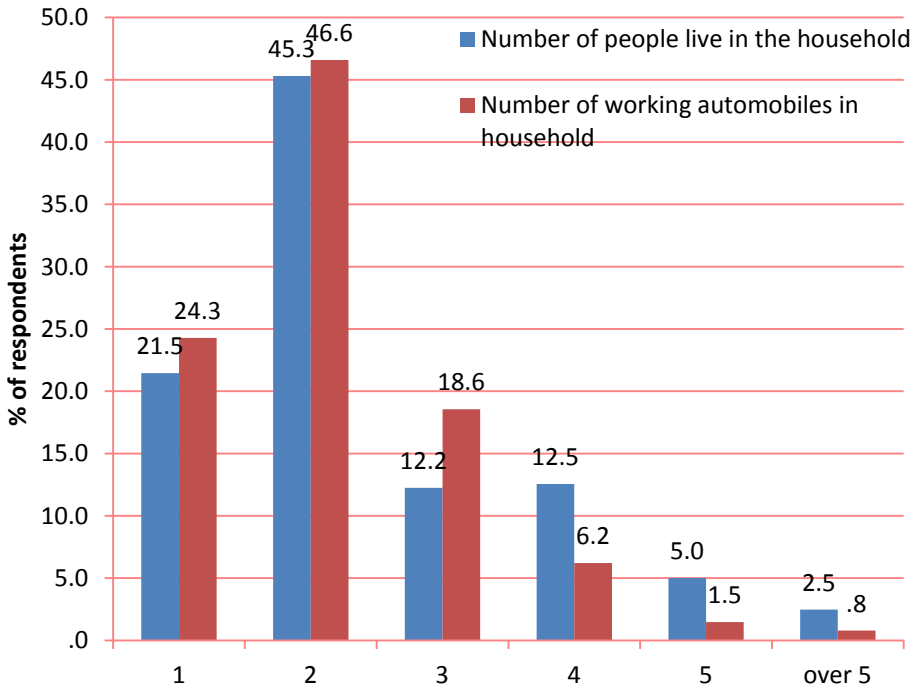

Figure 4.22: Number of people and autos per household in Minnesota, 2011.

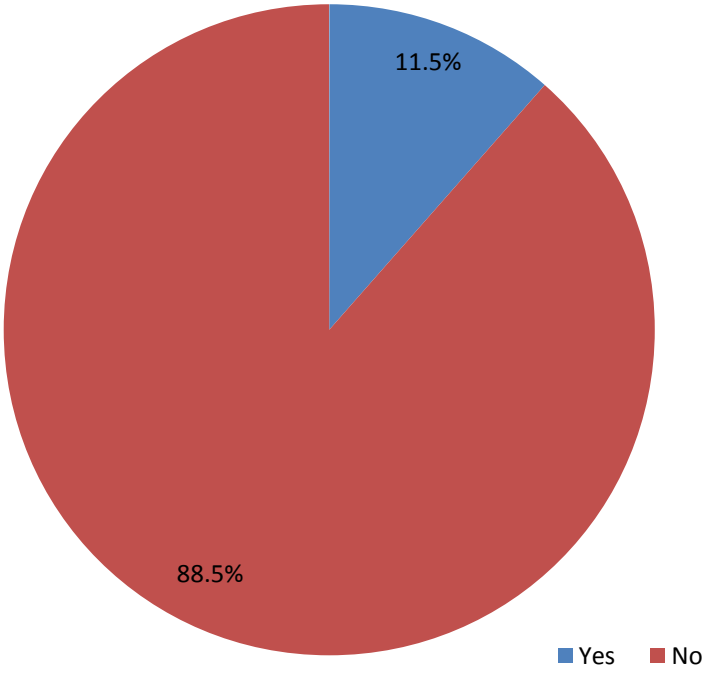

Figure 4.23: Percentage of people reporting a disability.

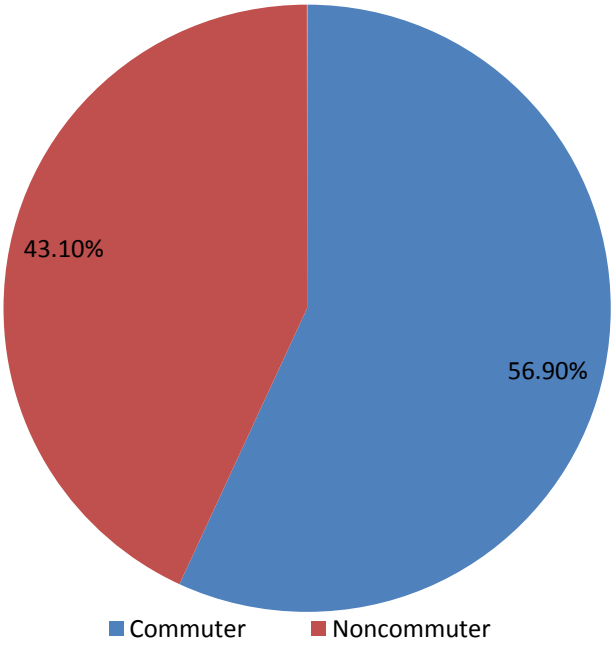

Figure 4.24: Percentage of respondents self-identified as commuters or non-commuters in Minnesota, 2011.

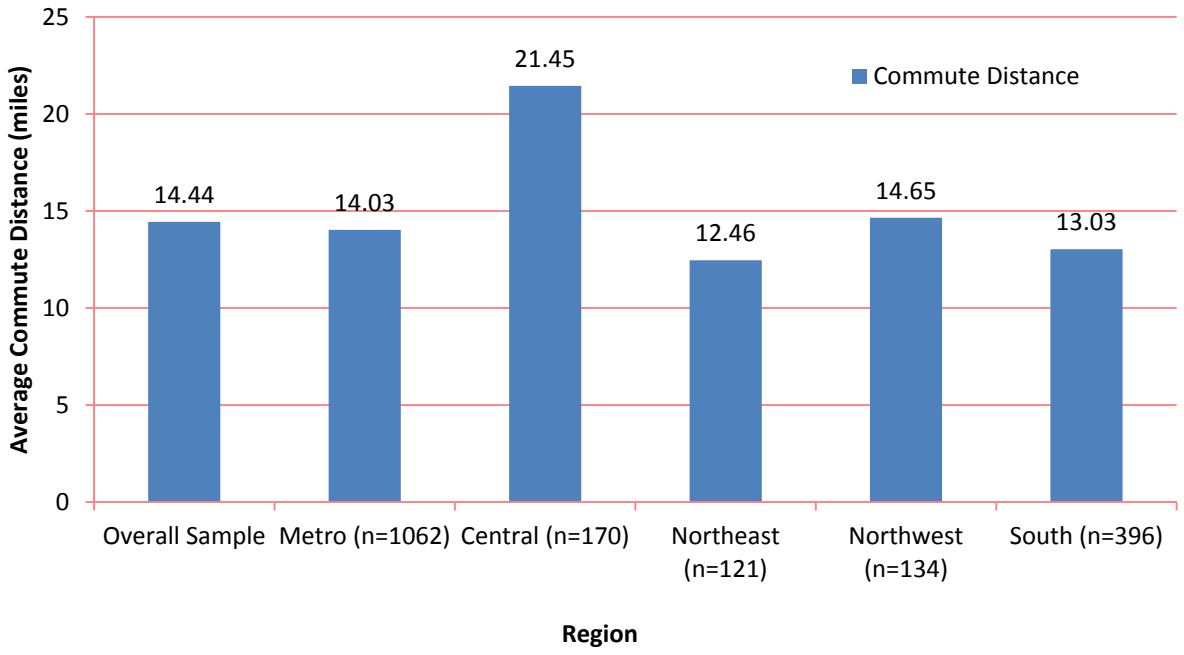

Figure 4.25: Average commute distance in miles by region in Minnesota, 2011.

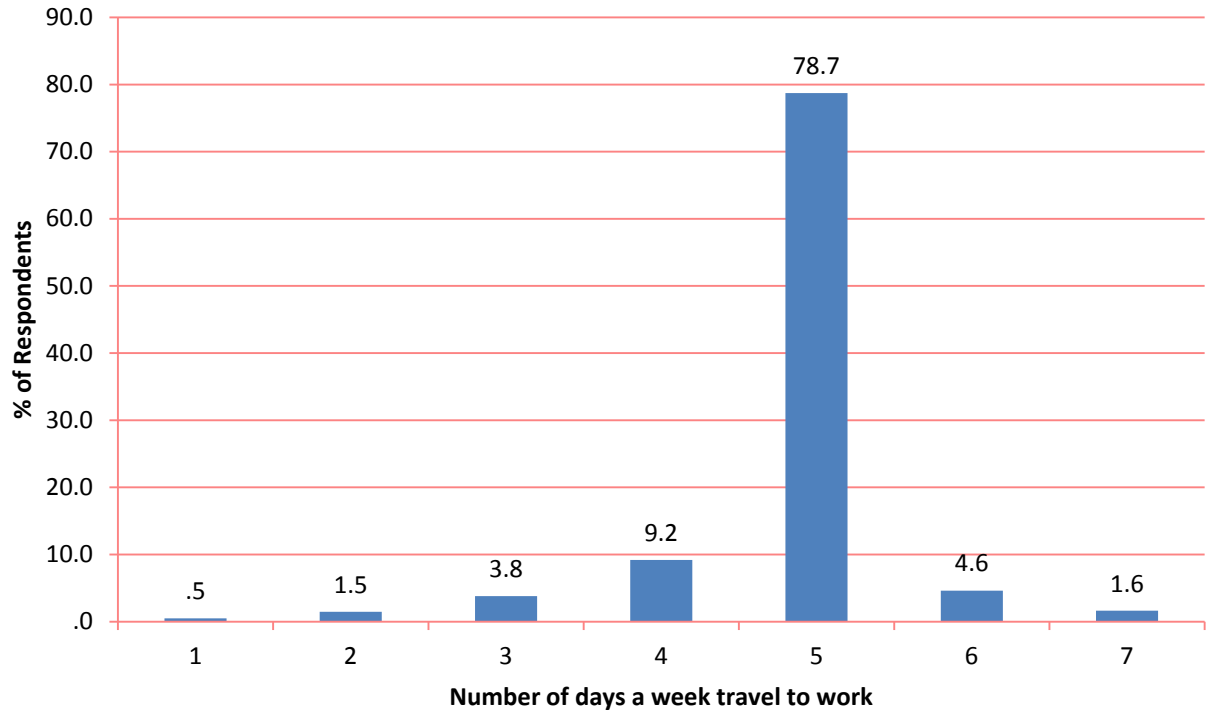

Figure 4.26: Distribution of number of days a week traveling to work in Minnesota, 2011.

Table 4.22: Residential experience among respondents to questionnaire, 2011

	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Years lived in Minnesota	49.12	20.18	47.01	19.96	49.37	18.82	53.03	18.67	51.18	21.43	51.94	20.84
Years lived in this community	29.77	20.17	26.47	18.16	28.59	19.55	33.46	20.09	33.2	22.00	35.69	22.20
Number of months in community	11.7	1.22	11.75	1.08	11.73	1.27	11.57	1.44	11.4	1.84	11.72	1.11

Table 4.23: Frequency of travel modes for various trip purposes in Minnesota, 2011

	Travel Mode							
Trip Purpose	Drive alone %(n)	Car-pool %(n)	Bus (public) %(n)	Metro trains (Light rail or commuter rail) %(n)	Bike %(n)	Walk %(n)	Taxi/ shuttle %(n)	Telecommute (working from a remote location) %(n)
To/from work (n=2031)	91.04(1849)	6.89(140)	4.28(87)	1.03(21)	4.63(94)	4.09(83)	0.39(8)	5.22(102)
To/from school (n=225)	70.22(158)	20.89(47)	8.00(18)	0.44(1)	4.44(10)	8.44(19)	0.44(1)	2.67(6)
Shopping or errands (n=3064)	77.89(2807)	14.75(452)	1.70(52)	0.42(13)	4.54(139)	7.83(240)	0.39(12)	-
Recreation, entertainment or meals (n=2917)	76.65(2236)	31.88(930)	1.78(52)	2.26(66)	8.67(253)	11.79(344)	0.89(26)	-
Other/specify/various (n=175)	64.57(113)	16.57(29)	4.57(8)	9.14(16)	6.29(11)	7.43(13)	5.14(9)	-
Medical (n=59)	72.88(43)	11.86(7)	16.95(10)	5.08(3)	-	3.39(2)	5.08(3)	-
Volunteer (n=25)	100.00(25)	4.00(1)	-	-	4.00(1)	-	-	-
Church (n=83)	74.69 (62)	26.51(22)	1.20(1)	-	1.20(1)	2.41(2)	2.41(2)	-

Table 4.24: Commute travel frequency and length among respondents to questionnaire, 2011

	State		Metro		Central		Northeast		Northwest	South		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
How many days a week do you travel to/from work Monday to Friday	4.84	0.75	4.83	0.71	4.92	0.64	4.62	0.98	5.07	0.68	4.84	0.81
Approximately how many miles is your trip one way	14.44	13.26	14.03	10.25	21.45	17.02	12.46	15.16	14.65	16.68	13.03	15.69

4.3 Discussion and Conclusions

Data from a mail questionnaire among Minnesotans in 2011 reveals:

- QOL is complex and transportation plays an important and consistent role in it across Minnesota;
- transportation is critical to QOL because it connects us to important destinations in aspects that matter most; and
- Minnesotans can readily identify what matters and how the state is performing within the breadth of transportation services.

This rich data set affords a number of analysis and discussion opportunities. However, this project primarily focused on five research questions and, as such, the discussion centers around them:

1. If/how does transportation contribute to satisfaction with QOL among Minnesotans?
2. If/how does satisfaction with transportation areas (access, etc.) contribute to satisfaction with transportation overall?
3. How important is each of the transportation areas (access, etc.)?
4. How satisfied are Minnesota residents with each of the transportation areas (access, etc.)?
5. How does perceived MnDOT performance compare with perceived importance on each of the transportation areas (access, etc.)?

4.3.1 How Does Transportation Contribute to Satisfaction with Quality of Life Among Minnesotans?

Data from a survey of a sample of Minnesota residents found transportation was an important QOL area as indicated by its rating above 5.0 on an importance scale, its inclusion the list of most important areas for QOL, as well as its predictive power in select models explaining QOL. Similar to other research, consistent findings with statistical models of QOL remain elusive. Still, transportation retained its importance across regions and increased in importance with respondent age.

Other research typically focuses on specific components of transportation that might significantly influence QOL (Senlier et al. 2009; Gabriel and Bowling 2004; Feng and Hsieh 2009). However, this research examined transportation holistically and found transportation was a significant predictor of QOL for the state population overall, though the variance explained was quite low. The significance of transportation to QOL is similar to select models found by Michalos and Zumbo (1999) but the explained variance much lower than other models. Different dependent measures are certainly one explanation for the differences in explanatory power as is the relatively low variance within the predictor variables. Regardless, definitive answers about transportation's role in QOL remain absent. Statistically in the Minnesota model, transportation suppressed variance in other variables and made them better predictors of QOL. As such, one can ascertain the statistical contribution of transportation is in its support of other important life areas. The practical contribution of transportation to QOL remains difficult to quantify but certainly the oft-used 'transportation as a means to an end' seems to stand. As noted

in the focus group portion of the study and assessment of transportation areas in the questionnaire, its quality matters.

4.3.2 If/How Does Satisfaction with Transportation Areas (Access, etc.) Contribute to Satisfaction with Transportation Overall?

Predictive analysis revealed that seven of the eight factors examined were significant to understand satisfaction with MnDOT services (in rank order): maintenance, planning, accessibility, design, safety, communication, and mobility. Environmental impacts were not a significant predictor to satisfaction with MnDOT services. These models were similar for commuters. Given this is relatively new analysis, comparisons with other research is obviously difficult. However, this initial analysis clearly prioritizes maintenance for satisfaction with MnDOT services followed quite distantly by the other areas. An advantage to this research is the detail that enables understanding of what contributes to satisfaction with maintenance and the other transportation areas. The rank order of transportation areas contributing to satisfaction with MnDOT services may be somewhat surprising given the amount of attention to access and mobility in transportation literature and rhetoric. This analysis creates an opportunity to reconsider measures of success and if they should be identified through predicting satisfaction, descriptive importance to Minnesotans or some combination thereof. Further, the data presents an opportunity to better understand specific segments such as commuters, those taking public transportation and people with disabilities. Decisions on how to integrate this information into planning and programming are exciting to consider.

4.3.3 Transportation Area Importance, Satisfaction, and Performance

All of the transportation areas studies were deemed important by Minnesota residents, regardless of region, mirroring focus group results where Minnesotans were unable to identify what part of transportation they could do without (Schroeder et al. 2011). The importance of transportation areas did differ by age, however. The importance older residents attributed to mobility matches previous research where it was found to play an important role in QOL (Metz 2000; Gabriel and Bowling 2004; Hjorthol et al. 2010). Older residents also identified design, communications and environmental issues as more important than other age groups. Little information is available to help contextualize these findings, but clearly they deserve additional attention. Supplemental analysis used predictive modeling to determine what measured items contributed most to these transportation areas (Appendix D). Additional analysis with this existing data could compare predictive analysis by age groups to further identify where the differences lie. Certainly the predictive analysis of these areas to satisfaction with MnDOT services provides more detail on their weight in Minnesotans' minds.

Overall, MnDOTs performance should be commended as their performance was viewed as satisfactory by more than 8 of 10 respondents. Two transportation areas, however, fell below the 5.0 mark for satisfaction: maintenance and long-term planning. The importance-performance analysis clearly indicates maintenance is an area that deserves attention, whereas planning, communications and environment were much less of a priority. Because planning was part of the more encompassing area of 'transparency,' details about what contributes to satisfaction with planning remain unknown from this dataset. Information from the ongoing MnDOT planning processes may be informative to ascertain what matters in planning. Planning is part of a larger transparency area which was identified as a low priority area for the current time period, but does

appear to increase as a priority for the future. Notably, at the time of the survey MnDOT was embarking on a 50-year transportation planning process. Certainly residential choice, work patterns and multimodal developments are important factors for future planning processes. Communications and environment were near the 5.0 mark and could be considered for monitoring to improve performance issues. While this research did not detail items to predict satisfaction with communications in detail, focus group research could be re-evaluated to consider possible items.

Attention to maintenance opportunities are very clear when considering its gap analysis between importance and satisfaction, contribution to satisfaction with MnDOT services overall, and priority in both the short- and long-term future.

Although overall regions were more similar than different in their satisfaction ratings, some differences did emerge. Depending on level of assessment, these differences may provide insight for discussion about unique factors associated with those areas as well as ongoing challenges in those areas.

4.3.4 Opportunities

Across Minnesota it is clear that transportation plays an important and consistent role in QOL. However, transportation is one of eleven areas of QOL. As such, connecting and integrating with relevant partners is essential. Certainly MnDOT already has a number of vibrant partnerships in areas most important to Minnesota. Assessing the strength and status of those relationships may be in order, particularly in light of staffing changes due to retirements. Beyond topical areas, multi-jurisdictional partnerships also need to be retained and strengthened toward a seamless and service-oriented transportation system. Investigating and implementing ways to maximize those partnerships toward seamless and comprehensive services can enhance MnDOTs role in QOL as well as Minnesotans' satisfaction with QOL.

Although overall satisfaction with MnDOT was high, opportunities to improve performance were identified in both planning and maintenance as evidenced by their satisfaction scores.

Maintenance, access and safety are priority areas for Minnesotans both now and in the future. Retaining or improving performance can happen by attending to the factors that predict satisfaction in these areas, as noted above. Residents in the Central and Metro regions were less satisfied than other respondents overall, but with maintenance and safety in particular. Exploring this difference, with existing and new data as needed, is recommended.

Given the aged are a large and growing percent of the population, their higher satisfaction with transportation is important to note and retain. Identifying and attending to changing transportation needs through the life-time is a pressing issue in Minnesota and the U.S. as a whole. Similarly, the role transportation plays for non-white residents and new immigrants is important but under-researched. Ensuring diverse voices are incorporated into MnDOT programs and planning can strengthen them now and for the future.

This project focused on five main research questions surrounding transportation and QOL. While the project resulted in a high response rate, the respondents were still older, more educated and less diverse than the state. As such, research with diverse populations is strongly recommended to examine if and how these models and ratings differ across racial and ethnic groups. Still, significant insight is provided by the data.

Chapter 5. Performance Measures Review

Based on the data and existing measures, the purpose of this performance measure review was to (1) identify existing and customer-identified transportation performance measures, and (2) critically evaluate performance measures regarding importance, MnDOT purview, efficiency, and effectiveness.

5.1 Methods

A combination of existing documentation and extensive customer-identified QOL data provided the foundation for the performance measure review. These measures were considered with a collaborative team from the University of Minnesota and MnDOT.

5.1.1 Existing Measures

Existing documentation reviewed included reports and data available from MnDOT. MnDOT annually collects a variety of data points and information for a 'scorecard' (http://www.dot.state.mn.us/measures/pdf/2010%20SCORECARD.pdf) which is shared widely and available online. Major categories for the scorecard include: traveler safety, infrastructure preservation, maintenance, national and global connections, statewide connections, twin cities mobility, greater Minnesota metropolitan and regional mobility, community development and transportation, energy, and the environment. Important to note is that MnDOT reports on the full transportation system, not just those categories under their jurisdiction. This holistic approach to transportation recognizes the blurred lines of responsibility among the public as well as the mutual responsibility of information sharing with partners.

In addition, select results from the annual MnDOT omnibus survey were reviewed. MnDOT annually assesses Minnesota driver's attitudes toward the transportation system, MnDOT services and responses to a variety of other questions. Finally, the strategic plan management scorecard was reviewed which includes areas of innovation, leadership and transparency.

5.1.2 Customer Quality of Life Data

Data analysis included using qualitative and quantitative data from the focus group and questionnaire phases of the project to inform the existence and importance of various transportation areas to the Minnesota public.

5.1.3 Collaborative Team Discussions

A three person team met several times to discuss, differentiate, and determine the relevance of the various data available for performance measures. Following an overview of existing data, additional analysis was provided for all measures comparing the metropolitan area with the other regions, safety item correlations were assessed, and differences in response by self-identified disability were explored. Relationships among the primary indicators were also assessed.

Broad guidelines for the discussion included assessing performance data as follows:

1. Importance of item from customer QOL data
    a. Items within several transportation areas considered important by 10% or more of respondents to 2011 QOL questionnaire;
    b. Items that were significant predictors of satisfaction with select transportation areas;
2. Existing measures or tracking indicators from MnDOT scorecard or omnibus survey;
3. Measures within MnDOT purview; and
4. Measures which are efficient and effective in terms of available data and meaningfulness.

5.1.4 Results

MnDOTs scorecard tracks nine major areas with detail provided in a lengthier performance report. Existing measures appear to broadly capture much of what is important for Minnesotans' transportation-related QOL (Table 5.1).

Table 5.1: Existing performance measures and customer-identified important transportation areas

Category	MnDOT scorecard performance measure	MnDOT indicator	Corresponding or additional area identified as important in questionnaire to Minnesotans & in criteria
Safety	Traveler safety	Minnesota traffic fatalities	Road safety with & without other drivers
			Pedestrian safety
			Railroad crossing safety
			Bike safety considering design
Maintenance/ infrastructure	Infrastructure preservation	Bridge conditions: % poor and % good	
		Pavement: % miles poor state principal arterials & nonprincipal arterials; % miles good state principal arterials & nonprincipal arterials	Smooth road service
	Maintenance	Frequency of achieving bare lane within target hours	Clearing roads of ice & snow
		Bridge safety inspections: % completed on time	
		Customer satisfaction with state highway maintenance	Visual appeal of roadsides
			Rest areas for road trips
			Making road/pavement markings clearly visible
			Making highway signs clearly visible

Category	MnDOT scorecard performance measure	MnDOT indicator	Corresponding or additional area identified as important in questionnaire to Minnesotans
Access/Mobility	National & Global connections	Airline annual available seat miles from MSP	Access to air travel
		Annual tonnage of port shipments to & from MN Great Lakes & rivers	
		Annual tonnage from, to and through Minnesota on railroad	
	Statewide connections	Interregional corridors: % miles +/- 2 mph target speed	Travel time to/from Twin Cities; weekend highway traffic
		Airport access: % population within 20 mi. of an airport with paved & lighted runway	Access to air travel; Access to regional airports
	Twin Cities mobility	% miles below 45 MPH in AM or PM peak	Community travel time; commute time;
		Clearance time for urban freeway incidents	Community travel time; commute time;
		Annual rail & Express bus transit ridership	Access to public transportation
	Greater MN metropolitan & regional mobility	Greater Minnesota bus service hours	Access to public transportation
	Community development and transportation	ADA Accessible pedestrian signals; % of state highway intersections with APS	Access to public transportation
		Bike, walk and transit share of commuter trips: large metro areas	Access to public transportation
			Access to trails
Energy and the environment	Transportation fuel consumption	Billions of gallons sold in Minnesota	Air pollution
			Water pollution
			Noise pollution from traffic
			Drainage problems/flooding

Category	MnDOT scorecard performance measure	MnDOT indicator	Corresponding or additional area identified as important in questionnaire to Minnesotans
Design	Integrated into mobility, access and safety areas	Integrated into mobility, access and safety areas	Highway sign placement
			Stoplight timing
			Rumble strips
			Bridges (See Maintenance)
			Use of flashing yellow lights)
Transparency (communications, finance & planning)	Customer trust & confidence (mgmt scorecard)	Delivering the transportation system: % of Minnesotans agreeing MnDOT can be relied on to deliver MN's transportation system	
		Financial responsibility: % of Minnesotans agreeing MnDOT acts in a financially responsible manner	Acts in financially responsible manner
		Maintaining roads & bridges: % of Minnesotans agreeing MnDOT does a good job of maintaining roads & bridges	
		Providing transportation options; % of Minnesotans agreeing MnDOT does a good job at providing alternative transportation options for the future	
			MnDOT does what is best for Minnesota
	CE/CM	Projects delivered on schedule: % of all MnDOT projects let for construction in the year scheduled	See construction speed

Analysis revealed that of the performance measures important and available, eleven significantly predicted transportation satisfaction and six of these held significant when the regressions were done with a partial sample of all respondents (Table 5.2). When these eleven predictors were factor analyzed, they revealed three factors that explained 56% of the variance in transportation satisfaction (Table 5.3).

Table 5.2: Stepwise regression analysis explaining the variance in satisfaction with transportation Minnesota, 2011

	Full sample [a]		Partial sample [b]
	Beta	t-statistic	
MnDOT does what is best of Minnesota			
Satisfaction with long term transportation planning			
Keeping road surfaces smooth			
Excluding other drivers, roadway safety			
MnDOT acts in a financially responsible manner			
Commute time to and from work			
Clearing roads of snow and ice			
Making highway signs visible			
Visual appeal of the roadsides			
Community safety for pedestrians			
Travel time to within and around community			

Table 5.3: Factor analysis of 11 significant predictors of satisfaction with MnDOT services, Minnesota, 2011.

Factor 1: Maintenance/safety	Factor 2: Mobility	Factor 3: Transparency
Community safety for pedestrians	Commute time to & from work	MnDOT acts in a financially responsible manner
Visual appeal of the roadsides	Travel time within & around community	MnDot does what is best for MN
Safety on road excluding other drivers		Satisfaction with long-term planning
Clearing roads of ice & Snow		
Making highway signs clearly visible		
Keeping road surfaces smooth		

5.1.5 Discussion and Implications

Comparisons of existing measures with items deemed important by a representative sample of Minnesotans revealed MnDOT is measuring many things that matter to Minnesotans, consistency exists among the data when identifying the most important elements to satisfaction with transportation, and 11 items can explain half the variance in satisfaction with transportation. As such, results from the consumer data affirm many existing measures but offer the opportunity to adjust select reporting and performance indicators. Such adjustments, however, must consider the breadth of factors influencing performance and reporting requirements such as budgetary issues and federal reporting requirements.

Considering all of the performance measures MnDOT reported as of 2011, most were identified as important by Minnesotans. Gaps in what appeared important to project respondents and existing publicly reported indicators existed in safety, the environment, and transparency.

In terms of safety, MnDOT typically reports vehicular safety in terms of vehicular fatalities. However, included in the select 11 predictors of satisfaction with transportation services is ‘pedestrian safety’ in the community. Further, when predicting safety, both pedestrian and biking

safety in the community emerged. Therefore, opportunities to include perceptions of pedestrian safety in the omnibus survey may be possible, with subsequent reporting in the scorecard, or consideration of various measures such as pedestrian fatalities may also be in order. Given the increase in alternative transportation and biking, similar monitoring and reporting on bike safety seems prudent.

As of 2011, MnDOT's reported indicator on the environment focuses on billions of gallons of fuel sold. In the questionnaire, respondents indicated the extent of transportation-related noise, air, water pollution and drainage issues that impacted their community. Certainly a number of indicators of specific impacts are available from various state and federal agencies that may be more appropriate or better capture the public's interest than 'billions of gallons of fuel sold.' Alternatively, if gallons of fuel sold is retained as an indicator, more explicitly identifying the connection between the measure and MnDOT performance may be useful for the lay public. For example, Virginia (2009) reported: tons per year of mobile source emissions, tons per year of mobile source greenhouse gas emissions, fuel usage per capita, and acres of wetlands replaced.

Though important to the project respondents, items related to transparency and communications are not consistently reported to the general public, but available through the omnibus survey conducted every fall as of 2012. As such, it appears that more public reporting of the select items from the omnibus survey would provide both the opportunity to be more transparent and have greater monitoring of these areas deemed important by the public. Further, given the relatively high satisfaction with MnDOT, such reporting could encourage further support of their efforts.

Access and mobility are inter-related and both important as determined by their significance in predicting satisfaction with transportation services. Also, access was identified as important for both the short- and long-term futures, as was maintenance and safety. Specific access items were important in the breadth of performance indicators, but did not emerge as significant when all of the potential indicators were used to predict satisfaction with transportation services. One explanation may be in the items used to measures access items. Although the items were reliable (Cronbach alpha of .87), they only explained 18% of the variance in satisfaction with access. As such, other measures may have better predictive capabilities. Mobility items particularly relevant and significant included commute time to and from work and travel time within and around respondent's communities. Given mobility and accessibility are consistently identified as important among the aged (Spinney et al. 2009; Loti and Koohsari 2009; Hjorthol et al. 2010) and Minnesota's population is aging, keen consideration of these areas is suggested.

Efforts to communicate MnDOT's performance are significant. To make them even better, at least a few opportunities are suggested when examining the cumulative results from the project. Specifically with regards to maintenance, consumers typically referred to it as just that: maintenance, rather than the 'infrastructure preservation' category currently used by MnDOT. As such, it may be clearer to the public if maintenance is used for the public scorecard as opposed to 'infrastructure preservation.

References

Arlington County, Transportation Demand Management Research Center (2007). Internet. *How much does transportation affect your life,* 2007. http://www.commuterpage.com/research/uploads/ACCS016/2007%20AC%20Residents%20Satisfaction%20Internet%20STUDY%20FINAL%20REPORT.pdf.

A. Campbell, P. Converse, and W. Rodgers (1976). *The Quality of American Life.* New York, NY: Russell Sage Foundation.

H. Cantril (1965). *The Patterns of Human Concerns*. New Brunswick, NJ: Rutgers University Press.

K. Chamberlain (1985). "Value dimensions, cultural differences, and the prediction of perceived quality of life." *Social Indicators Research,* vol. 17, no. 4: 345-400.

A. Chatterjee, F.J. Wegmann, N.J. Fortey, and J.D. Everett (2001). "Incorporating safety and security issues in urban transportation planning." *Passenger Travel Demand Forecasting, Planning Applications, and Statewide Multimodal Planning - Planning and Administration*, no. 1777: 75-83.

Connecticut Department of Transportation. (2009). Internet. *Connecticut Department of Transportation "On the Move" performance metrics report.* Retrieved from http://www.ct.gov/dot/lib/dot/documents/dperformancemeasures/pmetrics.pdf

R. Cummins, R. (2000). "Objective and subjective quality of life: an interactive model." *Social Indicators Research,* vol. 52, no. 1: 55-72.

R. Cummins, M.P. Mccabe, Y. Romeo, and E. Gullone (1994). "Validity studies the comprehensive quality of life scale: instrument development and psychometric evaluation on college staff and students." *Educational and Psychological Measurement*, vol. 54, 372-382.

D. Das (2008). "Urban quality of life: a case study of Guwahati." *Social Indicators Research,* vol. 88, 297-310.

D.A. Dillman, J.D. Smyth, and L. Christian (2007). *Internet, mail, and mixed-mode surveys: the tailored design method*. Hoboken, NJ: John Wiley & Sons, Inc.

E. Diener, R. Emmons, R. Larsen, and S. Griffin (1985). "The satisfaction with life scale." *Journal of Personality Assessment,* vol. 49, no 1: 71-75.

K. Doi, M. Kii, and H. Nakanishi (2008). "An integrated evaluation method of accessibility, quality of life, and social interaction." *Environment and Planning: Planning and Design,* vol. 35 1098-1116.

J. Endicott, J. Nee, R. Yang, and C. Wohlberg (2006). “Pediatric quality of life enjoyment and satisfaction questionnaire (PQ-LES-Q): reliability and validity.” *Journal of American Academic Children Adolescent Psychiatry*, vol. 45, no. 4: 401-407.

C. Feng, and C. Hsieh (2009). “Implications of transport diversity for quality of life.” *Journal* of Urban Planning and Development, vol. 135, no. 13: 13-18.

C. Ferrans (1996). “Development of a conceptual model of quality of life.” *Scholarly Inquiry for Nursing Practice: An International Journal,* vol. 10, no. 3: 293-304.

D. Forkenbrock (2004). *Transportation Policy Strategies for Iowa to Advance the Quality of Life*. Iowa City, Iowa: Public Policy Center, the University of Iowa. Internet. http://www.iowadot.gov/iowainmotion/files/trans_policy_strategies.pdf

L. Frank, and P.O. Engelke (2001). “The built environment and human activity patterns: exploring the impacts of urban form on public health.” *Journal of Planning Literature*, vol. 16, no. 2: 202-218.

L. Frank, and S. Kavage (2009). “A national plan for physical activity: the enabling role of the built environment.” *Journal of Physical Activity and Health,* vol. 6 (Suppl 2*)*: S186-S195.

L.D. Frank, J.F. Sallis, B.E. Saelens, L. Leary, K. Cain, T.L. Conway, and P.M. Hess (2009). “The development of a walkability index application to the neighborhood quality of life study.” *British Journal of Sports Medicine*, vol. 44, 924-933.

Z. Gabriel, and A. Bowling (2004). “Quality of life from the perspectives of older people.” *Ageing and Society*, vol. 24, 675-691.

C. Gagliardi, F. Marcellini, R. Papa, C. Ciuli, and H. Mollenkopf (2010). “Associations of personal and mobility resources with subjective well-being among older adults in Italy and Germany.” *Archives of Gerontology and Geriatrics*, vol. 50, 42-47.

R. Goldenkoff (2004). “Using focus groups.” In *Handbook of Practical Program Evaluation,* eds. J.S. Wholey, H.P. Hatry, and K.E. Newcomer, 341-363. San Francisco, CA: Jossey-Bass Inc. Publishers.

T. Guo, and I.E. Schneider (2010). *Transportation and quality of life: an annotated bibliography*. Minneapolis, MN: University of Minnesota, Minnesota Department of Transportation.

M. Hagerty, R. Cummins, A. Ferriss, K. Land, A. Michalos, M. Peterson, A. Sharpe, J. Sirgy, and J. Vogel (2001). “Quality of life indexes for national policy: review and agenda for research.” *Social Indicators Research,* vol. 55, no. 1: 1-96.

W.W. Hendricks, I.E. Schneider, and M. Budruk (2004). “Extending Importance-Performance Analysis with Benefit-Based Segmentation.” *Journal of Park & Recreation Administration,* vol. 22, no. 1: 53-74.

R. Hjorthol, L. Levin, and A. Siren (2010). “Mobility in different generations of older persons: The development of daily travel in different cohorts in Denmark, Norway and Sweden.” *Journal of Transport Geography,* vol. 18, 624-633.

C. Hu (2009). “Enhancing quality of life by shifting importance perception among life domains.” *Journal of Happiness Study,* vol. 10, 37-47.

A. Kapteyn, J. Smith, and A. Soest (2009). Comparing life satisfaction. Santa Monica, CA: RAND Corporation. Internet. http://www.rand.org/pubs/working_papers/WR623-1

R.A. Krueger and M.A. Casey (2008). *Focus Groups: A Practical Guide for Applied Research*. Los Angeles, CA: Sage Publications.

M. London, R. Crandall, and G. Seals (1977). “The contribution of job and leisure satisfaction to quality of life.” *Journal of Applied Psychology,* vol. 62, no. 3: 328-334.

S. Lotfi, and M. Koohsari (2009). “Analyzing accessibility dimensions of urban quality of life: where urban designers face duality between subjective and objective reading of place.” *Social Indicator Research,* vol. 94, 417-435.

I. Malkina-Pykh, and Y. Pykh (2008). “Quality of life indicators at different scales: theoretical background.” *Ecological Indicators*, vol. 8, 854-862.

S.K. McMahon (2002). “The development of quality of life indicators – a case study from the City of Bristol, UK.” *Ecological Indicators,* vol. 2, 177-185.

D.H. Metz (2000). “Mobility of older people and their quality of life.” *Transport Policy,* vol. 7, 149-152.

A. Michalos, and B. Zumbo (1999) “Public services and quality of life.” S*ocial Indicators Research,* vol. 8, no. 2: 125-156.

Minnesota State Council on Disability (2011, October, 16). Minnesota disability profile: an analysis of 2000 census data. Internet. http://www.state.mn.us/portal/mn/jsp/content.do?id=-536888335&subchannel=null&sc2=null&sc3=null&contentid=536914015&contenttype=EDITORIAL&programid=536907465&agency=MSCOD.

Minnesota Demographic Center. Projected Minnesota population by county [Data file]. Internet. http://www.demography.state.mn.us/

V. Moller (2001). “Monitoring quality of life in cities: the Durban case.” *Development Southern Africa,* vol. 18, no. 2: 217-238.

P. Moons, W. Budts, and S. Geest (2006). “Critique on the conceptualization of quality of life: a review and evaluation of different conceptual approaches.” *International Journal of Nursing Studies,* vol. 43, 891-901.

D. Parra, L. Gomez, O. Sarmiento, D. Buchner, R. Brownson, T. Schimd, V. Gomez, and F. Lobelo (2010). “Perceived and objective neighborhood environment attributes and health related quality of life among the elderly in Bogota, Colombia.” *Social Science and Medicine,* vol. 70, 1070-1076.

M. Power, M. Bullinger, and A. Harper (1999). “The World Health Organization WHOQOL-100: Tests of the universality of quality of life in 15 different cultural groups worldwide.” *Health Psychology*, vol. 18, no. 5: 495-505. doi: 10.1037/0278-6133.18.5.495

B. Reiff, and G. Brian (2005). *Transportation Planning Performance Measures* (Report No. FHWA-OR-RD-06-08). Internet. Oregon Department of Transportation. http://www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/PlanningPerformanceMeasures.pdf?ga=t

L. Russell, A. Hubley, A. Palepu, and B. Zumbo (2006). “Does weighting capture what’s important? Revisiting subjective importance weighting with a quality of life measure.” *Social Indicators Research*, vol. 75, no. 1: 141-167.

O. Sarmiento, T. Schmid, D. Parra, A. Diaz-del-Castillo, L. Gomez, M. Pratt, E. Jacoby, J. Pinzon, and J. Duperly (2010). “Quality of life, physical activity, and built environment characteristics among Colombian adults.” *Journal of Physical Activity and Health,* vol. 7, Suppl 2: S181-S195.

S.L. Schroeder, K. Gustafson, and I.E. Schneider (2011). *Quality of life: Assessment for transportation performance indicators*. Minneapolis, MN: University of Minnesota, Minnesota Department of Transportation.

N. Senlier, R. Yildiz, and D. Aktas (2009). “A perception survey for the evaluation of urban quality of life in Kocaeli and a comparison of the life satisfaction with the European Cities.” *Social Indicators Research,* vol. 94, 213-226.

C. Shafer, B. Lee, and S. Turner (2000). “A tale of three greenway trails: user perceptions related to quality of life.” *Landscape and Urban Planning*, vol. 49, 163-178.

M. Sirgy, D. Rahtz, M. Cicic, and R. Underwood (2000). “A method for assessing residents’ satisfaction with community-based services: a quality-of-life perspective.” *Social Indicators Research,* vol. 49, no. 3: 279-316.

W. Smith (2009). Virginia’s long-range multimodal transportation plan 2007-2035 final report: vision , goals and performance measures. Internet. http://www.vtrans.org/resources/Vision_goals_and_performance_measures-_final.pdf

J. Spinney, D. Scott, and B. Newbold (2009). “Transport mobility benefits and quality of life: a time-use perspective of elderly Canadians.” *Transport Policy*, vol. 16, 1-11.

B. Tabachnick, and L. Fidell (2006). *Using Multivariate Statistics*. Boston, MA: Allyn & Bacon.

A. Turksever, and G. Atalik (2001). “Possibilities and limitations for the measurement of the quality of life in urban areas.” *Social Indicators Research,* vol. 53, no. 2: 163-187.

U.S. Government Accountability Office. (2010). Statewide transportation planning: opportunities exist to transition to performance-based planning and federal oversight. Internet. http://www.gao.gov/new.items/d1177.pdf

World Health Organization Quality of Life Assessment. (1998). “The World Health Organization quality of life assessment (WHOQL): development and general psychometric properties.” *Social Science Medicine,* vol. 46, no. 12: 1569-1585.

Appendix A: Focus Group Discussion Guide

QUALITY OF LIFE & TRANSPORTATION STUDY

DISCUSSION GUIDE

INTRODUCTION/LOGISTICS (approximately 10 minutes)

Good_____*(morning/afternoon/evening)* and welcome. Thank you very much for taking the time to participate in our discussion today

My name is _____ and this (these) is (are)my colleague(s)_____. We are from the University of Minnesota and will be conducting the focus group today

The purpose of this focus group is to discuss the idea of "quality of life" and the impact of the transportation system on your quality of life. This is one in a series of discussions across the state addressing this topic.

We have allowed up to 2 hours to complete our discussion but we hope to finish before that time

Before we get started with our discussion, there are a few logistics we need to take care of

Is there anyone that can't stay for the full conversation? (note who they are and make sure they sign their receipt and get paid before they leave)

Has everyone signed the attendance register and received your payment?

You will note the audio recorder on the table. The purpose is simply to make sure we capture all of the discussion. This focus group is one of a series of focus groups being held. We will be responsible for writing a final report and reviewing the audio tapes will help us do that. The tapes have no other purpose.

You also note there are several observers in the room. They are interested in the discussion but will not be taking part in the discussion. (*We will introduce them at the end of the discussion, if questioned*)

We have light refreshments available. Please feel free to get them at any time.

Rest rooms are located_____

One final note before we begin: as we stated at the beginning, we are interested in your perceptions of the impact of the transportation system on your quality of life. This is for research purposes only. You are not obligated to participate in this focus group but your responses will help inform decision making. All of your responses are confidential and will be combined with others in the study and your name is not known to the agency or the public (*required Tennessen warning)*

PARTICIPANT INTRODUCTIONS & WARM-UP QUESTION

To help us get a bit better acquainted, we would like to begin with a question for all of you about the area in which you live

Q1. Please introduce yourself and tell us where you live and how long you have lived there *(approximately 10 minutes)*

As you think about your community……

What things were you looking for when you moved into the area? (or, if they have lived in the area all of their lives, what has motivated you to stay in the area?)

What was it, in particular, that drew you to the area?

TRANSITION QUESTIONS

Now, let's shift into the discussion of "quality of life". This is a very broad topic and one that is very subjective. What I might consider important to my quality of life, you may think differently. There are no right or wrong answers. For the purposes of this question, we would like you to think about the quality of your life right now, at this particular time. So, the question is……

Q2. How would you describe the factors that describe and make up your own quality of life? *(approximately 15 minutes)*

The list could be quite varied—it might be positive or negative—there might be several things that influence and define your life. To help us think about this question, we would like you to jot down one or two words or a short sentence on the paper we have provided. We don't expect an autobiography. The things or factors you write down may be quite different from the others because each person deals with different situations and circumstances in life. This will be a "jumping off" point for our discussion.

(repeat the question)

(provide____(2-3)_____minutes for them to complete their lists)

To help us keep your responses in front of us, we are going to jot them down on the easel pad so that we can all refer to them. How did you respond to the question? Who would like to start?

How did you respond to the question?

What else should be added?

Is there anything missing?

(Dot rating exercise - Approximately15 minutes)

Now, we would like to take this one step further. We would like you to think about what you had originally written down on the paper, what others had said about their quality of life and anything else you might want to consider about the things or factors that impact your life and make-up your own "Quality of Life."

Each of you have 10 colored dot stickers ---5 blue and 5 yellow. We would like all of you to come up and place your BLUE dot stickers next to the factors that you consider to **detract from** your quality of life. Place your YELLOW dot stickers next to the factors that **contribute to** your quality of life

If one of the categories that is a major contributor to your Quality of Life or a detractor from your Quality of Life is not shown, write on the list what should be there and add it to the list we have created.

(Give participants____(8-10)_____minutes to complete the task)

What do you notice about your respective lists?

What are the similarities? Differences?

KEY QUESTIONS

Still thinking about your perceptions of "Quality of Life," we're going to narrow the discussion to the transportation system. The question is……

Q3. How does the <u>transportation system</u> influence or impact your quality of life? *(Approximately 15 minutes)*

As you did before, we would like you to write down some words that describe how the transportation system impacts your quality of life. They may be words that describe how it **contributes** to your quality of life or they may be words that describe how the transportation system **detracts** from your quality of life

(Provide___(5)_____minutes to complete the task)

Let's start by listing on the easel pad the items you wrote down. First, let's note what you wrote down about how the transportation system **contributes to** your quality of life.

What else?

Are we missing anything?

What stands out for you about this list?

Tell us a bit more about_____

How about the things that **detracts from** your quality of life

- What else?
- Are we missing anything?
- What stands out for you on this list?
- Tell us a bit more about_____

What part of the transportation could you do without ---what is not as important as other parts?

CONCLUDING QUESTIONS

Think now about the transportation system and the Minnesota Department of Transportation (MnDOT)

Q4. How can the Minnesota Department of Transportation (MnDOT) improve your quality of life? *(Approximately 10 minutes)*

What do you think your needs will be from a transportation system in the near future?

What do you think MnDOT could do to help make certain that those needs are met?

How do you get information about MnDOT? What MnDot is doing?

Have you used MnDOT's website? What do you think of the site?

Thinking about the near future (4-5 years) are there things that MnDot could/should be doing to improve your quality of life?

Think about the next generation (your grandchildren for O/M group; your children for Y group):

Q5. What could MnDOT be doing to contribute to the next generation's Quality of Life? *(Approximately 5 minutes)*

What else?

Q6. Is there anything else that you would like to comment on before we close? *(Approximately 5 minutes)*

Thank you very much for your participation in this focus group. As we mentioned at the beginning, the results of this, and all of the other focus groups, will be used for research purposes to provide a better understanding of customer needs and demands on the transportation system. MnDOT will use the information to assess customer needs. Have a safe journey home and thanks again.

Appendix B: Focus Group Schedule

MnDOT Quality of Life Focus Group Schedule-2010					
Date	Community	Age[1] or diversity of group	Time	Total Participants	MnDOT District (number)
August 31	Minneapolis	Middle	Evening	12	Metro (5)
September 2	Rochester	Older	Afternoon	12	Rochester (6)
September 2	Rochester	Younger	Evening	11	Rochester (6)
September 7	Bloomington	Older	Afternoon	11	Metro (5)
September 8	Mankato	Middle	Afternoon	11	Mankato (7)
September 8	Mankato	Younger	Evening	10	Mankato (7)
September 9	Mankato	Older	Morning	12	Mankato (7)
October 6	St. Cloud	Younger	Evening	8	Baxter/St. Cloud (3)
October 7	St. Cloud	Middle	Morning	8	Baxter/St. Cloud (3)
October 7	Willmar	Middle	Evening	7	Willmar (8)
October 8	Willmar	Older	Morning	7	Willmar (8)
October 13	Duluth	Older	Afternoon	8	Duluth (1)
October 13	Duluth	Younger	Evening	5	Duluth (1)
October 14	Virginia	Middle	Afternoon	7	Duluth (1)
October 20	Bemidji	American Indian	Afternoon	10	Bemidji (2)
October 20	Bemidji	Younger	Evening	8	Bemidji (2)
October 21	Bemidji	Middle	Morning	7	Bemidji (2)
October 22	Brainerd	Older	Morning	7	Baxter/St. Cloud (3)
October 26	Willmar	Hispanic	Afternoon	8	Willmar (8)
October 27	Minneapolis	African American	Morning	10	Metro (5)
October 27	St. Paul	Mixed Asian	Afternoon	8	Metro (5)
October 28	Minneapolis	Younger	Evening	9	Metro (5)
November 3	Detroit Lakes	Older	Afternoon	9	Detroit Lakes (4)
November 10	Alexandria	Middle	Afternoon	10	Detroit Lakes (4)

[1]Note: younger life stage (age 20-34), middle life stage (age 35-59), and older life stage (age 60-75)

Appendix C: Focus Group Telephone Screener

Quality of Life Telephone Screener

NAME (CHECK SPELLING):			
ADDRESS:			
CITY:		ZIP:	
HOME PHONE:			
WORK PHONE:			
E-MAIL:			
COMMUNITY:			AGE GROUP
AGE GROUPS	MINNEAPOLIS	1	(Y)
Younger Life Stage (20-34)	DETROIT LAKES	2	(O)
Middle Life Stage (35-59)	ANOKA	3	(Y)
Older Life Stage (60-75)	ALEXANDRIA	4	(M)
INTERVIEWER	DATE		SUP
Letter sent:	On grid:	Rem #1:	Rem #2:

ASK FOR ADULT IN HOUSEHOLD

INTRO: Hello, I am _____, calling for the U of MN from CJ Olson Market Research. MnDOT (pronounced "mindot" is interested in your perceptions of the impact of the transportation system on your quality of life and this is for research purposes only. You are not obligated to do this survey but your responses will help inform decision making. All your responses will be combined with others in the study and your name is not known to the agency or the public.

Today we are recruiting participants for a discussion group. This group will be about 1 ½ -2 hours in length and those who participate will be paid $75 for their time. I just have a few questions to see if you qualify.

To begin, do you live within the city limits of (THIS COMMUNITY)? (CIRCLE CODE)

YES (CONTINUE)

How far are you from (this community) Estimated # of miles _____

NO (THANK AND TERMINATE)

And, how long have you lived in (THIS COMMUNITY)? (WRITE IN)

RECORD NUMBER OF YEARS _____ (MUST HAVE LIVED IN CURRENT AREA FOR PAST 3 YEARS TO QUALIFY)

How long have you lived in the state of Minnesota? (WRITE IN)

RECORD NUMBER OF YEARS _____ (MUST HAVE LIVED IN MN FOR THE PAST 5 YEARS TO QUALIFY)

D.Do you or does anyone in your family currently work or have worked in any of the following fields? (READ LIST & CIRCLE CODES)

	YES	NO	
An advertising or promotions firm			(IF YES, THANK AND TERM)
A radio or TV station, newspaper or magazine			(IF YES, THANK AND TERM)
A survey or market research firm			(IF YES, THANK AND TERM)
City, County or state government or political arena			(IF YES, THANK AND TERM)

E. In a typical week, how far would you say to drive or travel as a passenger? (READ LIST & CIRCLE CODE)

Less than 5 miles	1 (THANK AND TERMINATE)
5-9	2 (THANK AND TERMINATE)
10-19	3 (THANK AND TERMINATE)
20-29	4
30-39	5
40-49	6
50 or more miles	7
DON'T KNOW/ REFUSED	9 (THANK AND TERMINATE)

F. During the week, do you typically travel in the morning or afternoon?

YES…… NO……

In order to make certain that we interview a good cross-section of the population, we are attempting to include persons from all age groups. Which of the following categories includes your age? Please stop me when I get to the right range. (READ LIST & CIRCLE CODE)

Under 20	1 (THANK AND TERMINATE)
20-24	2
25-34	3
35-44	4
45-54	5
55-59	6
60-69	7
70-75	8
76 and older	9 (THANK AND TERMINATE)
REFUSED	99 (THANK AND TERMINATE)

RECORD GENDER. (DO NOT READ, CIRCLE CODE)

FEMALE	1
MALE	2

Are you Spanish/Hispanic/Latino? (CIRCLE CODE)

YES	1
NO	2
DON'T KNOW/ REFUSED	9

Do you consider yourself to be...? (READ LIST & CIRCLE ALL THAT APPLY)

White	1
Black or African American	2
American Indian or Alaskan Native	3
Asian, Native Hawaiian or other Pacific Islander	4
Some other race	5
DON'T KNOW/ REFUSED	9

FOCUS GROUP INVITATION – (SELECT SESSION TIMES AVAILABLE BASED ON AGE IN Q1.)

Based on your responses, we would like to invite you to participate in a discussion group for which you will be compensated $75 for your time. The group will consist of about eight people and a facilitator who guides the discussion and reports what the group has to say. I think you will find the discussion to be interesting and enjoyable. You don't have to do anything to prepare. The discussion group will be held on [Day/Date/Time/Location]. The session will last almost two hours, and again you'll be paid $75 in cash as a token of appreciation and for parking.

We are holding our discussion groups on (DATE). Are you available to attend at (TIME) on that day? **(CIRCLE CODE)**

YES	1 SEND LETTER
NO	2 THANK, TERM, TALLY AS QR
DON'T KNOW/ REFUSED	3 THANK, TERM, TALLY AS QR

	Q1	DATE/ TIME
GROUP 1	AGES 20 - 34	
GROUP 2	AGES 35 - 59	
GROUP 3	AGES 60 - 75	

You will receive the cash payment of $75 for participating after the session is completed. We'll be sending you a letter confirming your participation and details on the location. This letter will include a map with directions to the location.

ASK OF ALL PEOPLE WHO AGREE TO PARTICIPATE:

Since you have agreed to take part, I would like to verify your name and get your address to mail you the information.

What is your preferred name? We'll put it on your name card.

RECORD _____

CLOSE BY SAYING: Those are all of my questions. If you wear glasses to read or to watch TV, please bring them with you. One final thing, only you are to attend, if you bring any family or friends, they will not be able to participate. We'll see you on [Day/Date/Time]. We'll be sending you the letter shortly. Thank you for your time and thank you for agreeing to participate in this discussion group.

RECORD ALL INFORMATION ON THE FRONT PAGE. BE SURE TO VERIFY ALL NAMES AND ADDRESSES FOR CORRECT SPELLING.

Appendix D: Focus Group Categories – Definitions, Subthemes, and Examples

Quality of Life Categories: Definitions, subthemes, and examples

Category:	Access				
Definition:	Accessibility refers to access to destinations or people's ability to reach the destinations they must visit in order to meet their needs and desire to visit to satisfy their wants (CTS).				
Subthemes:	Public Transportation	Service Transportation	Air Travel	Nonmotorized Transportation	General access
Examples (Contributors)	Local bus system Free for students Express bus LRT options Amtrak services NorthStar Intercity bus Bus improvements and route & destination expansion Dial-a-ride	Taxi service Medical van service Shuttles to twin cities Specialized service, door to door Dial-a-ride	Regional airports Access to MSP MSP good airport Good connecting flights Multiple carriers	Recreation trails, bike, walk horse, hike, trail connectivity Paved bike, walk trails Can bike anywhere, commuter lanes in town Skyways & subways Expansion of bike/walk routes & destinations	Road access in/out of town Plenty of roads and alternate routes Multiple ways to get around town Compactness of city Proximity to all places in-town and out, "network" is significant
Example: (Detractors)	Lack intercity bus, need bus to Twin Cities Not enough LRT Need more bus routes & destinations Inadequate rail, need more Missing bus connections, long waits	Taxi expensive No dial-a-ride on weekends	Price to fly out of small airports Limited carriers Lack regional airports Expensive Cheaper to drive to MSP than shuttle or fly	Need more bike trails Too many bikes on highway Need more sidewalks Add more bike lanes Extend bike/walk lanes and options	Lack of alternate routes to/from town Limited options to travel to Twin Cities No good way to get to certain areas

Category:	Design			
Definition:	Design describes the physical layout of the transportation system and includes the multiple components that make up the system; roads, signs, and lights are basic design attributes.			
Subthemes:	Quality & Efficiency	Signage	Lights	Costs
Examples (Contributors)	Easy to follow streets Scenic drives Round-a-bouts good when people know how to use	Good highway signs Well marked speed limits, mile markers and signs Alternative routes & detours well marked	Well timed lights	
Example: (Detractors)	Confusing city grid/street names/planning Round-a-bouts confusing & dangerous, need education Poor design combined on/off ramp Dead ends Trouble intersections No shelters at bus stops	Signs/indicators inconsistent, poor design, especially across state lines Stop sign, right of way uncertainty	Too many light Poor timing with LRT on Hiawatha Stoplights slow commute Motorcycles don't trip the turn lights Stop lights timing is off, poor timing Need flashing yellow light to warn upcoming stop light	Cost of HWY 10 Cost to bring rail to Willmar greater than benefit Cost of bridge, maintenance (e.g. 35W $250 million) Takes $ away from others, balance project priority decision Diamond express lanes, very expensive, hardly used

Category:	Environment		
Definition:	Parts of the environment are shaped and influenced by the transportation system. Transportation fuel consumption contributes to air pollution; the transportation system also adds considerable sound and light to the environment.		
Subthemes:	Air pollution	Sound pollution	Light pollution
Examples (Contributors)		Reduced noise in some areas Lack of air traffic, no noise Quiet zone for rail road	
Example: (Detractors)	Car-centric culture negatively impact air quality and health Idle buses increase air pollution Increased carbon emissions with more cars on the road	Sound--wider roads, now more traffic, much louder, need quieter roads, sound pollution Increased noise as road system expands Noise pollution from trains	Light pollution Intersections too bright LED stop lights too bright Light pollution from city street lights

Category:	Maintenance		
Definition:	Maintenance is a broad category that describes road surfaces, paint indicators, general repair, and seasonal upkeep including snow and ice removal		
Subthemes:	Road quality	Snow removal	Efficiency
Examples (Contributors)	Good roads, well maintained, potholes and roads repaired Improved road surfaces Overall good upkeep Compared to other cities/states, roads are better condition	Excellent snow & ice removal Clean roads, effective plowing Roads good in all 4 seasons	Construction efficiency, quality, speed finishing projects
Example: (Detractors)	Lack Paint lines hard to see, need paint improved & maintained, improve lane markings Road surfaces worn down, potholes, rough roads Surfaces hard to see, at night, in the rain, paint indicators worn away, can't see under snow Rough roads, pot holes, damages cars, worse in some rural areas Detour roads torn up from increased use, Alternate routes not same quality of main roads, not well marked	No snow removal after dark Large piles of snow need to be removed after plowing Limited snow removal in some rural areas Cars blocked in by plowing	Need more funding to get the job done Concrete vs asphalt, cost vs endurance

Category:	Mobility		
Definition:	Mobility describes movement, the actual process or experience involved with moving from one point or another and is defined as the movement of people from one place to another in the course of everyday life (Hanson, 2010).		
Subthemes:	Traffic flow & Congestion	Commute time/ travel time	Construction
Examples (Contributors)	Auto movement is good in the city Less congestion, no traffic jams, good flow of traffic Good flow, improved with 4 lanes & bypasses Ease of travel, roads not congested, can drive with restricted vision No rush hour	Short distances/commutes Can get across town fast Speed of travel, quick to get around	New bridge open now, quick construction, safe now
Example: (Detractors)	Main arteries very congested, freeways sometimes slower Congestion, seasonal tourism traffic Need more overpass & bypass bridges - reduce lights & congestion	Commute time increased by construction Heavy weekend traffic on HWY Travel time to cities RR crossing, very long delays Long time to get across town	Seasonal impact, results in more congestion & longer commutes Timing of construction projects, many detours, lasts entire season, long duration of construction projects, poor signage in construction Road construction can't keep up with demand, weather issues, major roads get priority over others, roads deteriorate "trickle down" Construction time frame: 24/7 vs day shift only, night scheduling Construction: Timing - done during rush hour, alt routes for construction also under construction

Category:	Safety			
Definition:	The most basic measure of state traveler safety is Minnesota traffic fatalities resulting from crashes (MnDOT). Multiple safety hazards exist; physical conditions, human behavior, and the interaction among these factors were frequently described as safety concerns.			
Subthemes:	Driver Behavior	Bikes & Pedestrians	Specific Features	Train and Public Transportation
Examples (Contributors)		New road incorporates bike trail and walk access, safe & nice size	Rumble strips LED lights, brighter intersections Signs warn for delays, crashes, weather conditions Emergency white light at intersections Flashing yellow light to prepare for stop signs Law enforcement response	Railroads have safer crossings, need whistle for safety
Example: (Detractors)	Driver behavior - people not following rules, pass on right, Cell phone use / texting while driving Traffic speed vs posted limit, drivers going too fast, speed limits too high	Need more sidewalks and crossing guards Bike accidents, bike transport safety (for worker's commute) bike safety off trails, running lights, too many bikes on the highway, bikers riding against traffic Pedestrian safety for Right turns	Bad intersections & dangerous trouble areas Exit/entrance on ramps on loop intersections Round-a-bouts – dangerous & confusing Deer crossing Fog line and paint indicators hard to see (night, rain) evacuation/safety concerns, limited transit options without private vehicle	Public transit safety concerns, Buses - safety and access for older people, bus safety, intimidating to use. Buses driving too fast Dangerous railroad crossings

Category:	Transparency	
Definition:	In a 2009 Transportation Performance Report, MnDOT measured transparency in terms of getting construction projects out for bid on schedule. The objective of the agency is to deliver construction projects on the schedule announced to communities, contractors and travelers (MnDOT). Respondents indicated transparency included communication, planning and finances.	
Subthemes:	Communications & Planning	Finances
Examples (Contributors)	551 works well	Funding allocated per capita
Example: (Detractors)	Better communication with public Create openness (online) Reduce politics of the Department Change Department mission (service to the system user) Research more innovative strategies (for example concrete versus asphalt)	Transparency in budget Long range funding of MnDOT

Appendix E: Survey Questionnaire

Transportation & Quality of life

First, a few questions about your experience in Minnesota and your travel patterns.

1. How many years have you lived in Minnesota (write in #)?

____ Years (if less than 1, put 0)

2. How many years have you lived in this community?

____ Years (if less than 1, put 0)

3. How many months of the year do you live in this community?

____ Months of the year

Please think about the community you live in – and your travels to and from this community – as you answer this survey.

4. Do you travel "To/From Work" Monday-Friday (check one)?

___Yes ___No **(If no, go to Question 5)**

Approximately how many miles is your trip one way?

_____ Miles one way

How many days a week do you travel to/from work Monday-Friday?

____ Days to work

Typically, are these trips during the hours of 6-9 am and 3-6:30pm?

___ Yes ___No

How satisfied are you with the predictability of your travel to/from work (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied

5. How many times in the last 12 months within Minnesota have you…

taken public transportation (bus, train)? ____ Approx. # times in last 12 months

biked outdoors? ____ Approx. # times in last 12 months

6. Please identify the trips you take in a <u>typical</u> week. Check <u>all</u> the boxes that best represent the ways that you use to get to those places. ***(Please check all the options that make up your typical trip. For example for To/From Work: drive alone to park-n-ride, take bus downtown, bike to office).***

Trips	**Ways to travel**								
	Drive Alone	Car-pool	Bus (Public)	Metro Trains (Light Rail or Commuter Rail)	Bike	Walk	Taxi / Shuttle	Tele-commute (working from a remote location)	Not Ap-plicable
To/from work									
To/from school									
Shopping or run errands									
Recreation, entertainment or meals									
Other: *Specify:* _____									

7. How satisfied are you with transportation in your community (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied

8. Please let us know about your current transportation situation by checking one box in each row below.

	Not at all	A little	Mod-erately	Mostly	Com-pletely
To what extent do you have adequate means of transportation?					
How much do difficulties with transportation options restrict your life?					
To what extent do you have problems with transportation options? *Please explain*: _____					

Now, think about your quality of life. By "quality of life" we mean "the general wellbeing of residents taking into consideration such things as educational opportunities, employment opportunities, the economy, health, housing, recreation and entertainment opportunities, and so forth."

9. How satisfied are you with the quality of your life (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied

10. The following factors relate to quality of life. Please indicate how important each is as a contributor to your quality of life. (check one box per row)

	Very Important	Somewhat Important	Slightly Important	Neither	Slightly Unimportant	Somewhat Unimportant	Very Unimportant
a. Education							
b. Transportation							
c. Environment							
d. Housing							
e. Family, friends & neighbors							
f. Health							
g. Safety & security							
h. Spirituality, faith & serenity							
i. Local services & amenities (library, shopping, community services, etc.)							
j. Recreation & entertainment (parks, music, restaurants, theatre)							
k. Employment/ finances							

Now, looking at the above list, which 3 are the <u>most</u> important factors as contributors to your quality of life?

_____ _____ _____ (write in 3 letters from the list above, a-k)

Part of your life involves transportation. We are interested in learning more about your thoughts related to several areas of transportation. In this section, we ask about your perceptions of these areas and your satisfaction with them. The first section focuses on the physical layout of the transportation system and includes the roads, signs, and lights. Then, we move to the environment and safety areas.

11. How satisfied are you with the following parts of the roadway design? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	Not Applicable
a. Highway sign placement (including alternate route signs, speed limit)								
b. Stoplight timing								
c. Use of flashing yellow lights								
d. Use of Roundabout intersections								
e. Speed of construction projects								
f. Cost of construction projects								
g. Bridges								
h. On road bike lanes								
i. Rumble strips loud road markers on road edge & at intersections)								

Now, looking at the above list, which 2 are the <u>most</u> important parts of roadway design?

_____ _____ (write in 2 letters from the list above, a-i)

12. Please indicate the extent of your agreement that the following transportation and environmental related issues impact your community? (check one box per row)

	Very Strongly Agree	Somewhat Agree	Slightly Agree	Neither	Slightly Disagree	Somewhat Disagree	Very Strongly Disagree	N/A
a. Noise pollution from trains								
b. Noise pollution from traffic								
c. Air pollution								
d. Light pollution from street lights								
e. Water pollution								
f. Drainage problems /flooding								

Now, looking at the above list, which 2 are the <u>most</u> important environmental impacts?

_____ _____ (write in 2 letters from the list above, a-f)

13. Please share your thoughts about the safety of various transportation areas by checking one box in each row below.

	Very Safe	Somewhat Safe	Slightly Safe	Neither	Slightly Unsafe	Somewhat Unsafe	Very Unsafe	N/A
a. How safe do you feel on the road with other drivers?								
b. Excluding other drivers, how safe do you feel using the actual roadways?								
c. How safe is your community for pedestrians?								
d. How safe is your community for bicyclists?								
e. How safe are the railroad crossings in your community?								

Now, looking at the above list, which 2 are the <u>most</u> important safety areas of transportation?

_____ _____ (write in 2 letters from the list above, a-e)

This section focuses on your ability to get places you need and want to go and how easy it is to get there.

14. How satisfied are you with the following parts of the transportation system?

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Some-what Dissatisfied	Very Dissatisfied	N/A
a. Access to taxis & other similar service transportation options								
b. Access to air travel								
c. Access to regional airports								
d. Access to rail transportation between cities								
e. Access to buses between cities								
f. Availability of parking in your community								
g. Access to public transportation (buses, trains)								
h. Travel time within & around your community								
i. Commute time to & from work								
j. Weekend highway traffic								
k. Travel time to/from the Twin Cities								
l. Transportation options to/from the Twin Cities								
m. Travel time through construction zones								
n. Wait time at railroad crossings								
o. Public transportation fees (buses, trains)								
p. Access to sidewalks								
q. Access to trails								

r. Traffic information while traveling to alert motorists of delays, crashes and detours								

Now, looking at the above list, which 3 are the <u>most</u> important parts of the transportation system? _____ _____ _____ (write in 3 letters from the list above, a-r)

15. Please indicate the extent of your agreement with the following statements about biking and walking safety in your neighborhood and community (check one box per row).

	Very Strongly Agree	Some-what Agree	Slightly Agree	Neither	Slightly Disagree	Some-what Dis-agree	Very Strongly Dis-agree
a. There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood							
b. There is so much traffic along nearby streets in my neighborhood that it makes it difficult or unpleasant to bike							
c. Is safe enough so that I would let a 10-year-old child walk around my block							
d. My neighborhood is safe enough for an 80-year-old senior to walk around the block							
e. It is safe to ride a bike considering the roadway design roadway (e.g. shoulder width, edge lines, rumble strips)							
f. It is safe to ride a bike, considering traffic and speeds							
g. Buses drive too fast in my area & make it unsafe for bikers & pedestrians							

Now, looking at the above list, which 2 are the <u>most</u> important statements about biking and walking safety? _____ _____ (write in 2 letters from the list above, a-g)

This section focuses on the maintenance of the transportation system.

16. How satisfied are you with the following roadway maintenance related services of the transportation system? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
a. Clearing roads of snow & ice							
b. Clearing sidewalks of snow & ice							
c. Keeping road surfaces smooth							
d. Eliminating weeds on the roadsides							
e. Making highway signs clearly readable							
f. Making road/pavement markings clearly visible							
g. Removing roadside litter							
h. The visual appeal of the roadsides							
i. Clearing roads of debris (e.g. road kill, large objects)							
j. Rest areas for road trips							

Now, looking at the above list, which 2 are the <u>most</u> important maintenance related services of the transportation system?

_____ _____ (write in 2 letters from the list above, a-j)

17. As you can see from the questions you've been answering, transportation includes a variety of factors. How important are each of these factors that relate to transportation? (check one box per row)

	Very Important	Somewhat Important	Slightly Important	Neither	Slightly Unimportant	Somewhat Unimportant	Very Unimportant
a. Your **ability** to get places you need & want to go							
b. The physical layout of the roadway system (including roads, signs & lights)							
c. The **ease** of getting to places you need & want to go							
d. Overall maintenance of the highway & freeways							
e. Safety of the roadways (- highways & freeways themselves)							
f. General communications from MnDOT							
g. Addresing environmental issues							
h. Long term transportation planning (20 years)							

Now, looking at the above list, which 2 are <u>most</u> important factors for transportation?

_____ _____ (write in 2 letters from the list above, a-h)

18. How satisfied are you with the Minnesota Department of Transportation's performance in these transportation areas? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
a. Your **ability** to get places you need & want to go							
b. The physical layout of the roadway system (including roads, signs & lights)							
c. The **ease** of getting to places you need & want to go							
d. Overall maintenance of the highway and freeways							
e. Safety of the roadways (highways and freeways themselves)							
f. General communications from MnDOT							
g. Addressing environmental issues							
h. Long term transportation planning (20 years)							

19. Considering what you know about the Minnesota Department of Transportation overall, how satisfied are you with the services provided (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied

20. In the next 5-10 years, what are the 3 most important things that the Minnesota Department of Transportation should be working on?

1. _____
2. _____
3. _____

21. As you think about the next generation, what are the 3 most important things that the Minnesota Department of Transportation should be working on?

1. _____
2. _____
3. _____

22. Please indicate the extent of your agreement with the following statements about the Minnesota Department of Transportation. (check one box per row)

MnDOT…	Very Strongly Agree	Some-what Agree	Slightly Agree	Neither	Slightly Dis-agree	Some what Dis-agree	Very Strongly Dis-agree
Does what is best for Minnesota							
Acts in a financially responsible manner							
Considers customer concerns and needs when developing transportation plans							
Provides helpful and relevant information to citizens							

Finally, a few questions about you

23. What year were you born? **19 ____ ____**

24. Are you…? ☐ **Male** ☐ **Female** ☐ **Prefer not to answer**

25. What is the highest level of education you have completed (check one)?

☐ Some high school ☐ Graduated high school/GED ☐ Some vo-tech

☐ Graduated from vo-tech ☐ Completed associate degree ☐ Some college

☐ Graduated from college ☐ Some postgraduate ☐ Postgraduate

26. In what ethnicity and race would you place yourself?

Ethnicity (check one): ☐ Hispanic or Latino ☐ Not Hispanic or Latino

Race (check all that apply):

☐ American Indian or Alaska native

☐ Black or African American

☐ White

☐ Other (Please specify_____)

27. Including you, how many people live in your household?_____ People in household

28. How many working automobiles are in your household? _____ Household autos

29. Do you consider yourself a person with a disability? ☐ Yes ☐ No

30. What is your employment status (check one)?

☐ Employed full time ☐ Employed part time ☐ Retired

☐ Student ☐ Unemployed ☐ Other_____

31. Are you a current or former employee of the Minnesota Department of

☐ ☐ **Transportation?** Yes No

32. What is your annual household income before taxes (check one)?

☐ Less than $25,000	☐ $50,000-74,999	☐ $125,000-149,999
☐ $25,000-34,999	☐ $75,000-99,999	☐ $150,000-174,999
☐ $35,000-49,999	☐ $100,000 -124,999	☐ $175,000 or more

Please mail the completed questionnaire back in the postage-paid envelope provided.

THANK YOU FOR YOUR PARTICIPATION!

Questions? 612 624 2250; quoxx278@umn.edu

115 Green Hall, 1530 Cleveland Avenue North, St. Paul, MN 55108-1027

Appendix F: Postcard Reminder

Greetings!

We recently contacted you concerning your perceptions of Minnesota's transportation system. If you have already completed a questionnaire, accept our sincere thanks! If you've not already done so, please complete the questionnaire and return it by mail. For a replacement, email guoxx278@umn.edu or call 612.624.4280.

Your response will improve your future transportation services and inform transportation management: please reply today. Thank you so much!

Sincerely,

Ingrid E. Schneider, Ph.D.

Appendix G: Survey Supplemental Tables and Figures

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List of Figures

Table G.1. Importance of various areas of quality of life by age group among Minnesotans, 2011

	Younger 18-34 (n=149)		Middle 35-59 (n=1460)		Older 60+ (n=1639)		F statistic
	Mean	SD	Mean	SD	Mean	SD	
Quality of life	6.14	1.15	6.05[a]	1.31	6.23[a]	1.26	7.27***
Family, friends & neighbors	6.78	0.52	6.70	0.70	6.71	0.75	.76
Health	6.75	0.56	6.84	0.52	6.85	0.62	1.95
Employment/ finances	6.71[a]	0.58	6.68[b]	0.73	6.09[a b]	1.38	112.11***
Safety & security	6.65	0.71	6.71	0.68	6.72	0.77	0.71
Housing	6.56	0.56	6.51	0.88	6.55	0.97	0.92
Education	6.49[a]	0.87	6.35[b]	1.11	6.08[ab]	1.45	20.28***
Environment	6.41	0.86	6.44	0.93	6.40	1.09	.61
Recreation & entertainment	6.14	0.81	6.02	1.04	6.10	1.09	2.26
Local services & amenities	5.97[a]	0.91	6.04[b]	0.98	6.33[ab]	0.98	36.87***
Transportation	5.92[a]	1.06	6.12[b]	1.13	6.22[ab]	1.24	6.07**
Spirituality, faith & serenity	5.70[a]	1.49	5.92[b]	1.44	6.29[ab]	1.25	33.8***

Note. Means with same superscripts are significantly different Importance of various areas to quality of life measured with 7 point scale: 1= Very unimportant; 2= Somewhat unimportant; 3= Slightly unimportant; 4=Neither; 5= Slightly important; 6= Somewhat important; 7= Very important.
* p< .05 ** p< .01, ***p<.001

Table G.2. Importance of various domains of quality of life between commuters and noncommuters among Minnesotans, 2011

	Commuter (n=1460)		Noncommuter (n=1639)		t statistic
	Mean	SD	Mean	SD	
Quality of life	6.11	1.25	6.18	1.34	-1.38
Health	6.84	0.54	6.84	0.62	0.30
Family, friends & neighbors	6.71	0.71	6.71	0.73	0.04
Safety & security	6.71	0.68	6.71	0.78	-0.18
Employment/ finances	6.70	0.66	5.96	1.44	17.09***
Housing	6.53	0.85	6.53	1.00	-0.10
Environment	6.43	0.94	6.39	1.09	1.08
Education	6.38	1.10	6.02	1.46	7.69***
Transportation	6.16	1.09	6.16	1.30	-1.01
Local services & amenities	6.07	0.96	6.33	0.99	-7.68***
Recreation & entertainment	6.04	1.01	6.09	1.12	-1.26
Spirituality, faith & serenity	5.99	1.39	6.22	1.32	17.09***

Note. Importance of various areas to quality of life measured with 7 point scale: 1= Very unimportant; 2= Somewhat unimportant; 3= Slightly unimportant; 4=Neither; 5= Slightly important; 6= Somewhat important; 7= Very important.
* p< .05 ** p< .01, ***p<.001

Table G.3. Satisfaction with transportation design among Minnesota residents by region, 2011

Transportation Design Items	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Highway sign placement	5.92	1.22	5.87	1.25	5.86	1.22	5.91	1.25	6.06	1.17	6.03	1.11
Use of flashing yellow lights	5.42	1.37	5.26	1.37	5.40	1.41	5.57	1.37	5.77	1.30	5.66	1.29
Rumble strips	5.28	1.55	5.19	1.48	5.38	1.52	5.09	1.77	5.60	1.49	5.40	1.61
Stoplight timing	5.03	1.72	4.84	1.77	4.67	1.80	5.38	1.56	5.51	1.55	5.37	1.56
Bridges	4.80	1.65	4.64	1.65	4.97	1.51	5.00	1.67	4.90	1.76	4.99	1.59
Speed of construction projects	4.51	1.82	4.30	1.84	4.51	1.77	4.86	1.73	4.94	1.70	4.75	1.77
Use of roundabout intersections	4.50	1.92	4.54	1.95	4.47	1.87	4.50	1.81	4.57	1.73	4.42	1.95
On road bike lanes	4.14	1.76	4.13	1.74	4.01	1.77	4.22	1.70	4.27	1.79	4.15	1.81
Cost of construction projects	3.78	1.73	3.73	1.69	3.67	1.70	3.94	1.83	3.89	1.74	3.88	1.75
Cronbach α = .83												

Notes. Satisfaction with transportation design measured with 7 point scale: 1= Very dissatisfied; 2= Somewhat dissatisfied; 3= Slightly dissatisfied; 4=Neither; 5= Slightly satisfied; 6= Somewhat satisfied; 7= Very satisfied

Table G.4. Perceived transportation-related environmental impacts among Minnesota residents by region, 2011

Environmental impact items	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Light pollution from street lights	3.78	1.63	3.77	1.68	3.72	1.51	3.72	1.61	3.76	1.51	3.83	1.62
Noise pollution from trains	3.51	1.71	3.73	1.75	3.23	1.66	3.35	1.57	3.24	1.57	3.19	1.63
Noise pollution from traffic	3.05	1.54	2.92	1.55	3.12	1.52	3.17	1.51	3.27	1.44	3.21	1.55
Drainage problems /flooding	2.98	1.66	3.13	1.69	3.08	1.59	3.06	1.70	2.66	1.57	2.67	1.55
Air pollution related to transportation	2.92	1.63	2.78	1.63	2.95	1.57	3.03	1.71	3.21	1.59	3.11	1.61
Water pollution related to transportation design/ maintenance	2.75	1.68	2.74	1.68	2.69	1.65	2.71	1.75	2.84	1.65	2.79	1.64
Cronbach $\alpha = .85$												

Notes Perceived transportation-related environmental impact measured with question "Please indicate the extent of your agreement that the following transportation and environmental related issues impact you community " with 7 point scale: 1= Very strongly agree; 2= Somewhat agree; 3= Slightly agree; 4=Neither; 5= Slightly disagree; 6= Somewhat disagree; 7= Very strongly disagree.

Table G.5. Perceived transportation safety among Minnesota residents, 2011

Safety Items	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Excluding other drivers, how safe do you feel using the actual highways as a traveler?[1]	6.23	1.02	6.23	1.04	6.25	0.92	6.16	1.03	6.32	0.99	6.23	1.01
How safe are the railroad crossings in your community?[1]	5.79	1.29	5.77	1.28	5.97	1.19	5.66	1.37	5.87	1.33	5.79	1.27
How safe is your community for pedestrians?[1]	5.50	1.49	5.42	1.53	5.41	1.51	5.43	1.49	5.64	1.51	5.71	1.35
My neighborhood is safe enough for an 80-year-old senior to walk around the block[2]	5.26	1.77	5.25	1.78	4.85	1.84	5.19	1.80	5.28	1.78	5.46	1.69
How safe is your community for bicyclists?[1]	5.11	1.59	5.02	1.60	5.02	1.62	5.05	1.57	5.27	1.60	5.33	1.52
There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk [3]	5.03	1.89	5.12	1.88	4.73	1.87	4.87	2.05	4.86	1.84	5.09	1.89
How safe do you feel on the road with other drivers?[1]	4.99	1.60	4.85	1.64	4.99	1.55	5.13	1.51	5.28	1.52	5.19	1.52
It is safe enough so that I would let a 10-year-old child walk around the block[2]	4.73	1.93	4.68	1.97	4.41	1.86	4.67	1.91	4.82	1.88	5.01	1.87
It is safe to ride a bike, considering traffic and speeds[2]	4.71	1.78	4.69	1.77	4.39	1.84	4.49	1.88	4.89	1.71	4.90	1.73
Buses drive too fast in my area & make it unsafe for bikers & pedestrians[3]	4.67	1.59	4.67	1.61	4.77	1.48	4.68	1.61	4.66	1.50	4.66	1.61
It is safe to ride a bike considering the design of the roadway (e.g. shoulder width, edge lines, rumble strips) [2]	4.63	1.79	4.64	1.78	4.34	1.86	4.42	1.88	4.68	1.72	4.77	1.77
There is so much traffic along nearby streets that it makes it difficult or unpleasant to bike[3]	4.62	1.90	4.55	1.90	4.39	1.90	4.65	1.97	4.73	1.80	4.84	1.86
Cronbach α = .84												

Notes. [1]Measured with question "Please share your thoughts about the safety of various transportation elements" with 7 point scale: 1= Very unsafe; 2= Somewhat unsafe; 3= Slightly unsafe; 4=Neither; 5= Slightly safe; 6= Somewhat safe; 7= Very strongly safe.

[2]Measured with question "Please indicate the extent of your agreement with the following statement about biking and walking safety in your neighborhood and community" with 7 point scale: 1= Very strongly disagree; 2= Somewhat disagree; 3= Slightly disagree; 4=Neither; 5= Slightly agree; 6= Somewhat agree; 7= Very strongly agree.

[3]Measured with question "Please indicate the extent of your agreement with the following statement about biking and walking safety in your neighborhood and community" with 7 point scale: 7= Very strongly disagree; 6= Somewhat disagree; 5= Slightly disagree; 4=Neither; 3= Slightly agree; 2= Somewhat agree; 1= Very strongly agree.

Table G.6. Satisfaction with accessibility among Minnesota residents, 2011

Accessibility	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Availability of parking (general)	5.67	1.47	5.69	1.49	5.69	1.28	5.51	1.53	5.80	1.28	5.64	1.52
Access to trails	5.44	1.51	5.57	1.48	5.18	1.50	5.46	1.44	5.18	1.69	5.35	1.49
Access to regional airports	5.39	1.56	5.65	1.42	4.59	1.71	5.25	1.69	5.24	1.61	5.18	1.60
Access to air travel	5.38	1.63	5.79	1.42	4.41	1.74	4.92	1.83	5.05	1.65	4.97	1.65
Access to sidewalks	5.21	1.61	5.15	1.67	5.08	1.51	4.96	1.66	5.33	1.56	5.48	1.45
Traffic information while traveling to alert motorists of delays, crashes & detours	5.07	1.51	5.23	1.50	4.77	1.50	4.90	1.53	4.82	1.59	4.95	1.47
Access to taxis & other similar service transportation	4.86	1.66	5.03	1.62	4.47	1.67	4.68	1.65	4.37	1.73	4.80	1.68
Public transportation fees	4.65	1.43	4.73	1.46	4.53	1.31	4.56	1.47	4.48	1.39	4.61	1.35
Access to public transportation	4.58	1.81	4.87	1.78	4.42	1.74	3.84	1.87	4.22	1.72	4.26	1.78
Access to buses between cities	4.30	1.73	4.53	1.73	4.05	1.68	3.78	1.75	4.09	1.71	4.06	1.65
Access to rail transportation between cities	3.92	1.81	4.09	1.82	4.10	1.83	3.13	1.71	3.86	1.73	3.64	1.73
Cronbach α =.87												

Notes. Satisfaction with accessibility measured with 7 point scale: 1= Very dissatisfied; 2= Somewhat dissatisfied; 3= Slightly dissatisfied; 4=Neither; 5= Slightly satisfied; 6= Somewhat satisfied; 7= Very satisfied.

Table G.7. Satisfaction with mobility among Minnesota residents, 2011

Mobility Items	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Travel time within & around your community	5.67	1.43	5.54	1.52	5.46	1.50	5.76	1.32	5.85	1.31	5.98	1.20
Commute time to & from work	5.43	1.64	5.28	1.71	5.07	1.77	5.74	1.39	5.67	1.43	5.76	1.45
Travel time to/from the Twin Cities	5.07	1.62	5.14	1.55	4.41	1.76	5.03	1.76	5.00	1.70	5.24	1.56
Weekend highway traffic	5.06	1.65	5.11	1.60	4.41	1.77	4.56	1.92	5.09	1.67	5.39	1.45
Wait time at railroad crossings	4.92	1.56	4.98	1.47	4.96	1.36	4.86	1.61	4.67	1.91	4.89	1.65
Transportation options to/from the Twin Cities	4.51	1.81	4.80	1.72	4.03	1.81	3.80	1.97	4.36	1.77	4.29	1.84
Travel time through construction zones	4.33	1.70	4.12	1.72	4.28	1.68	4.50	1.70	4.66	1.61	4.68	1.60
Cronbach α = .83												

*Notes.*Satisfaction with mobility measured with 7 point scale: 1= Very dissatisfied; 2= Somewhat dissatisfied; 3= Slightly dissatisfied; 4=Neither; 5= Slightly satisfied; 6= Somewhat satisfied; 7= Very satisfied.

Table G.8. Perceived satisfaction with transportation-related maintenance among Minnesota residents, 2011

Maintenance Items	State		Metro		Central		Northeast		Northwest		South	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Making highway signs clearly readable	5.78	1.23	5.77	1.24	5.74	1.23	5.78	1.10	5.84	1.25	5.82	1.23
Clearing roads of snow & ice	5.49	1.73	5.53	1.73	5.41	1.65	5.36	1.83	5.47	1.74	5.51	1.70
Making road/pavement markings clearly visible	5.36	1.49	5.32	1.51	5.35	1.43	5.33	1.53	5.52	1.41	5.45	1.48
Rest areas for road trips	5.36	1.45	5.38	1.44	5.32	1.35	5.18	1.62	5.33	1.50	5.42	1.43
The visual appeal of the roadsides	5.04	1.50	4.95	1.53	5.00	1.43	5.00	1.58	5.19	1.48	5.25	1.44
Clearing roads of debris	5.03	1.60	5.16	1.53	4.90	1.59	4.78	1.73	5.00	1.71	4.89	1.66
Removing roadside litter	4.86	1.66	4.77	1.68	4.71	1.62	4.88	1.68	4.94	1.67	5.10	1.58
Clearing sidewalks of snow & ice	4.73	1.65	4.72	1.70	4.70	1.45	4.36	1.73	4.78	1.55	4.89	1.57
Eliminating weeds on the roadsides	4.67	1.57	4.55	1.59	4.78	1.45	4.57	1.52	4.81	1.60	4.93	1.53
Keeping road surfaces smooth	3.95	1.95	3.79	1.96	3.91	1.84	3.77	2.01	4.45	1.86	4.20	1.91
Cronbach $\alpha = .87$												

Notes. Satisfaction with transportation-related maintenance measured with 7 point scale: 1= Very dissatisfied; 2= Somewhat dissatisfied; 3= Slightly dissatisfied; 4=Neither; 5= Slightly satisfied; 6= Somewhat satisfied; 7= Very satisfied.

Table G.9. Perception of Minnesota Department of Transportation among Minnesota residents, 2011

	State		Metro		Central		Northeast		Northwest		South	
Transparency Items	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Does what is best for Minnesota	5.4	1.32	5.39	1.32	5.40	1.37	5.39	1.24	5.51	1.25	5.44	1.28
Provides helpful and relevant information to citizens	5.17	1.42	5.16	1.40	5.10	1.44	5.09	1.39	5.20	1.51	5.26	1.40
Considers customer concerns and needs when developing transportation plans	4.99	1.54	4.98	1.55	4.90	1.59	4.94	1.52	5.16	1.49	5.03	1.48
Acts in a financially responsible manner	4.87	1.55	4.87	1.55	4.76	1.61	4.90	1.53	4.93	1.54	4.92	1.52
Cronbach $\alpha = .90$												

Notes. Measured with question "Please indicate the extent of your agreement that the following statements about the Minnesota Department of Transportation " with 7 point scale: 1= Very strongly agree; 2= Somewhat agree; 3= Slightly agree; 4=Neither; 5= Slightly disagree; 6= Somewhat disagree; 7= Very strongly disagree.

Table G.10. ***Stepwise regression analysis explaining the variance in satisfaction with transportation design in Minnesota, in 2011***

	Model	
Transportation Design Aspect	Beta	t-statistic
Highway sign placement	.267	12.27***
Stoplight timing	.138	5.99***
Speed of construction projects	.120	5.44***
Rumble strips	.084	4.09***
Bridges	.065	3.06**
Use of flashing yellow lights	.065	2.78**

Note. Adjusted R square= .278 (R square = .280), F(2172)=150.73, p<.001. Only variable retained in final models
* p< .05 ** p< .01 ***p<.001

Table G.11. Stepwise regression analysis explaining the variance in satisfaction with transportation-related environmental issues in Minnesota, in 2011

	Model	
Transportation-related environmental issues aspect	Beta	t-statistic
Noise pollution from trains	-.115	-5.31***
Drainage problems/flooding	-.105	-3.93***
Water pollution	.088	3.38**

Note. Adjusted R square= .021(R square = .022), F(2,496)=19.02, p<.001. Only variable retained in final models
* p< .05 ** p< .01 ***p<.001

Table G.12. Stepwise regression analysis explaining the variance in satisfaction with transportation safety in Minnesota, in 2011

		Model
Transportation safety aspect	Beta	t-statistic
Safety of using actual roadways excluding other drivers	.239	11.61
Railroad crossing safety in community	.148	7.70
Safety on road with other drivers	.145	7.07
It is safe to ride a bike considering the roadway design	.073	3.50
Safety for pedestrians in community	.066	3.15
Safety for 10-year-old	.042	2.08

Note. Adjusted R square= .227 (R square =.228), F (2493)=122.99, p<.001. Only variable retained in final models; * p< .05 ** p< .01 ***p<.001

Table G.13.Stepwise regression analysis explaining the variance in satisfaction with transportation maintenance in Minnesota, in 2011

Transportation maintenance aspects	Model	
	Beta	t-statistic
Keeping road surfaces smooth	.480	29.37***
Making road/pavement markings clearly visible	.124	7.12***
The visual appeal of the roadsides	.078	7.12***
Clearing roads of debris	.074	3.85***
Rest areas for road trips	.045	2.80**

Note. Adjusted R square= .441 (R square =.410), F(2907)=405.07, p<.001. Only variable retained in final models; * p< .05 ** p< .01 ***p<.001

Table G.14. Stepwise regression analysis explaining the variance in satisfaction with accessibility in Minnesota, in 2011

Accessibility Aspects	Model	
	Beta	t-statistic
Traffic information to alert motorists of delays, crashes and detours	.149	5.82
Access to taxis and other similar service transportation options	.115	4.64
Availability of parking in your community	.104	4.42
Access to regional airports	.103	4.06
Public transportation fees	.103	4.13
Access to trails	.057	2.20

Note. Adjusted R square=.179 (R square =.182), F(1786)=66.25, p<.001. Only variable retained in final models
* p< .05 ** p< .01 ***p<.001

Table G.15. Stepwise regression analysis explaining the variance in satisfaction with mobility in Minnesota, in 2011

Mobility Aspects	Model	
	Beta	t-statistic
Travel time within and around your community	.228	10.29***
Travel time to/from the Twin Cities	.189	7.74***
Travel time through construction zones	.168	7.35***
Weekend highway traffic	.120	5.09***
Wait time at railroad crossings	.046	2.17*

Note. Adjusted R square= .324(R square =.326), F(1987)=192.00, p<.001. Only variable retained in final models
* p< .05 ** p< .01 ***p<.001

Table G.16. Stepwise regression analysis explaining the variance in satisfaction with MnDOT communications in Minnesota, in 2011

Communications Aspects	Model	
	Beta	t-statistic
Provides helpful and relevant information to citizens	.475	23.78***
Does what is best for Minnesota	.107	4.82***
Acts in a financially responsible manner	.053	2.43*

Note. Adjusted R square= .342 (R square =.343), F(3014)=524.02, p<.001. Only variable retained in final models
* p< .05 ** p< .01 ***p<.001

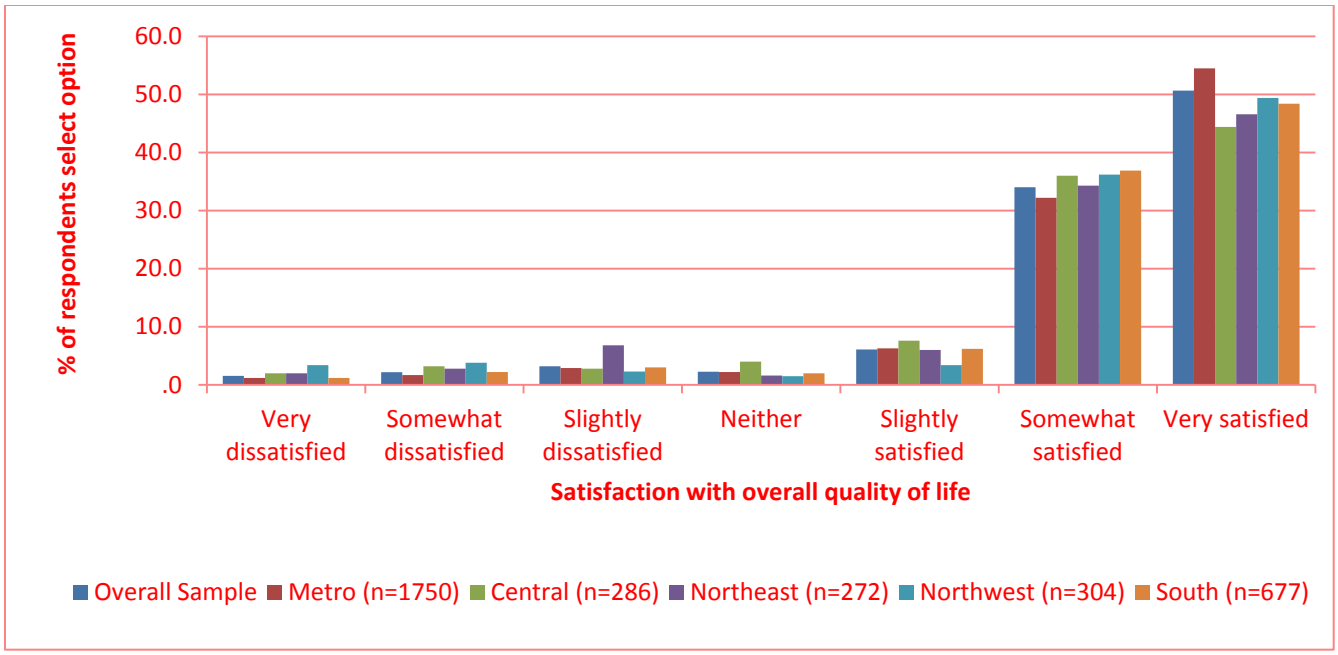


Figure G.1. Satisfaction with overall quality of life among residents in Minnesota, 2011.

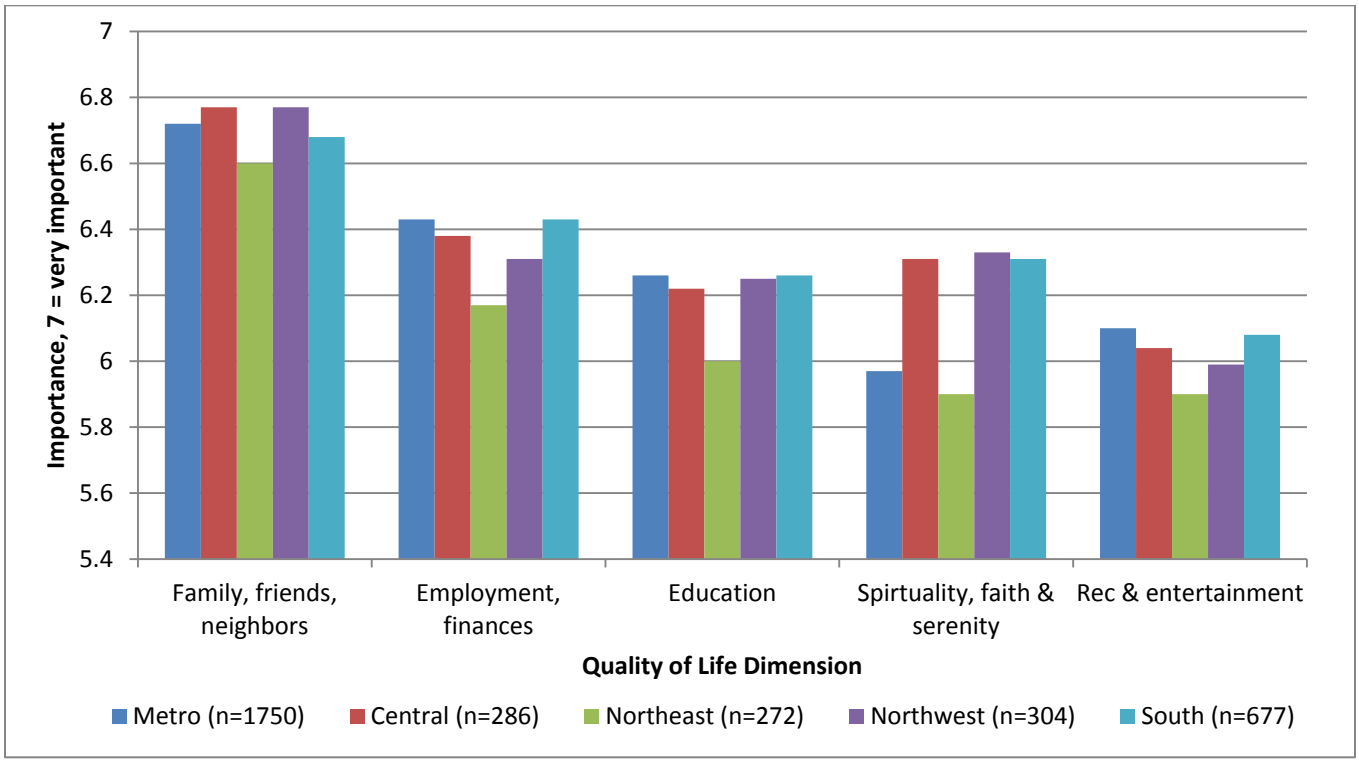


Figure G.2. Significant differences on quality of life areas among Minnesota's regional residents, 2011.

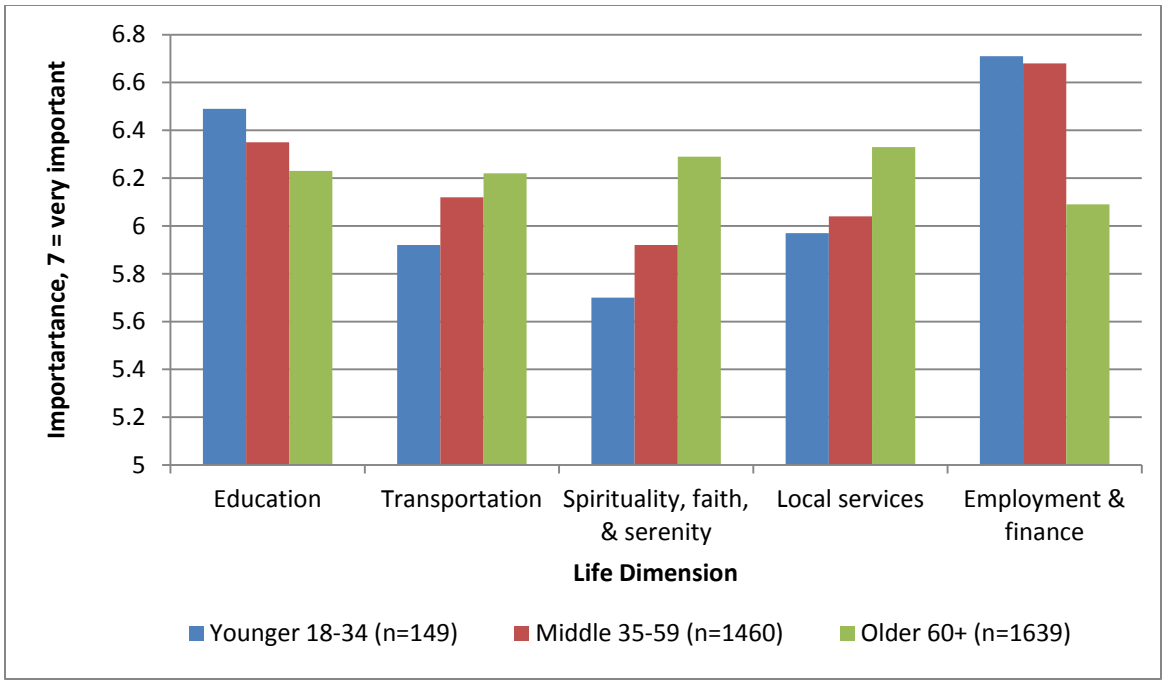


Figure G.3. Significant differences on importance of quality of life areas by age groups among Minnesotans, 2011.

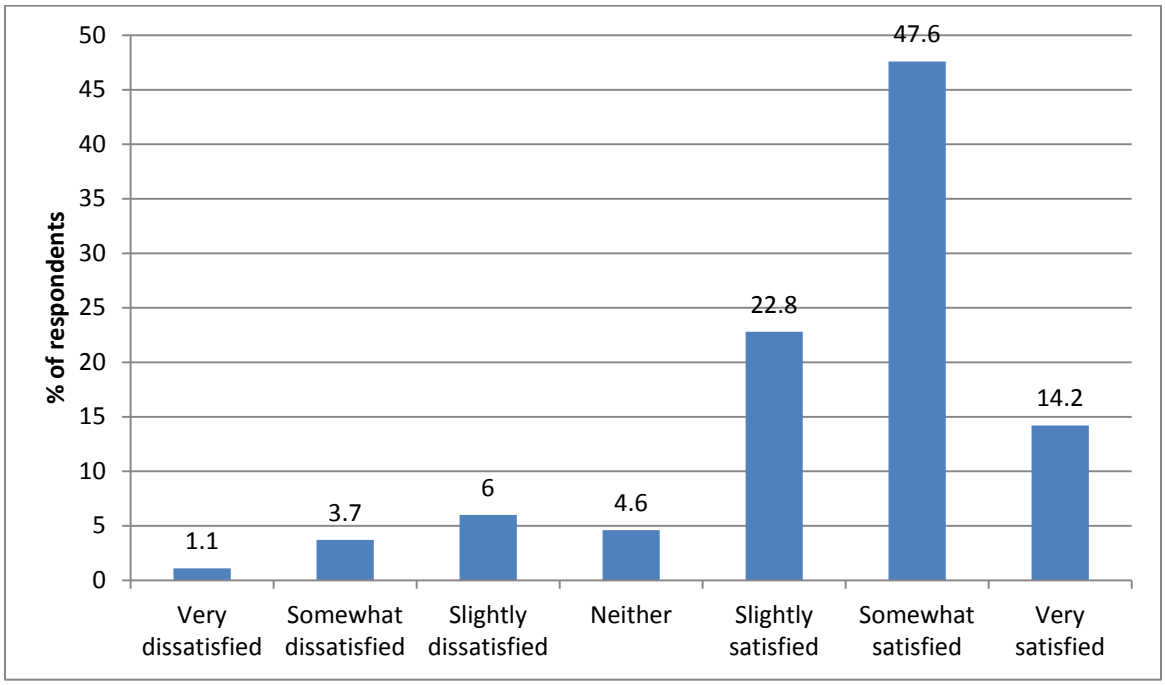


Figure G.4. Satisfaction with MnDOT services among nonemployees in Minnesota, 2011 (n=3215).

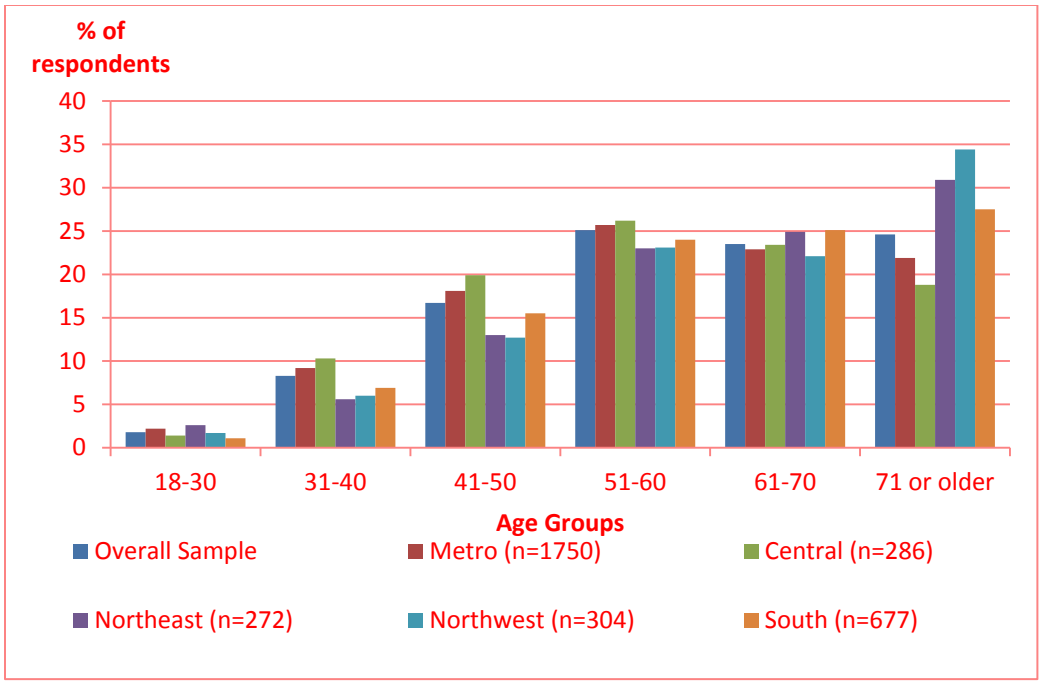


Figure G.5. Age distribution of the sample by regions

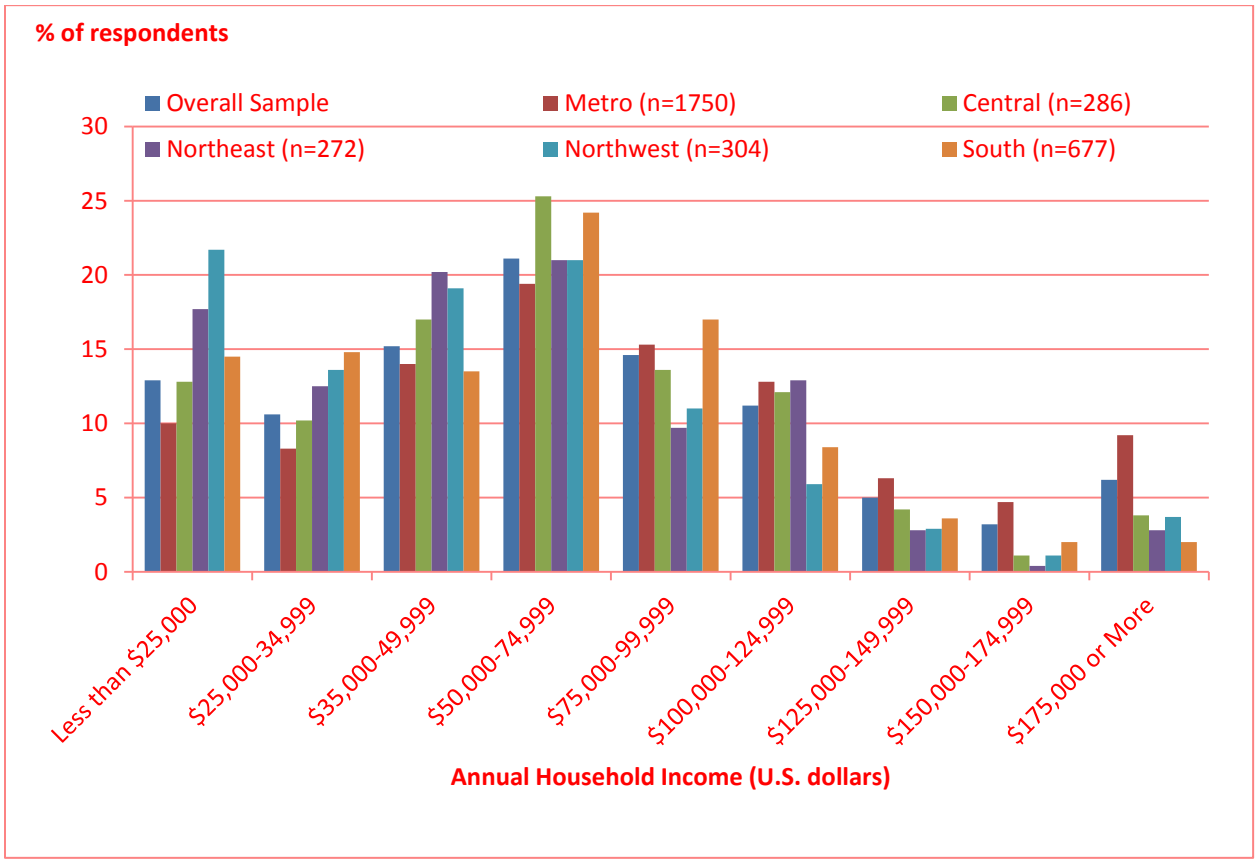
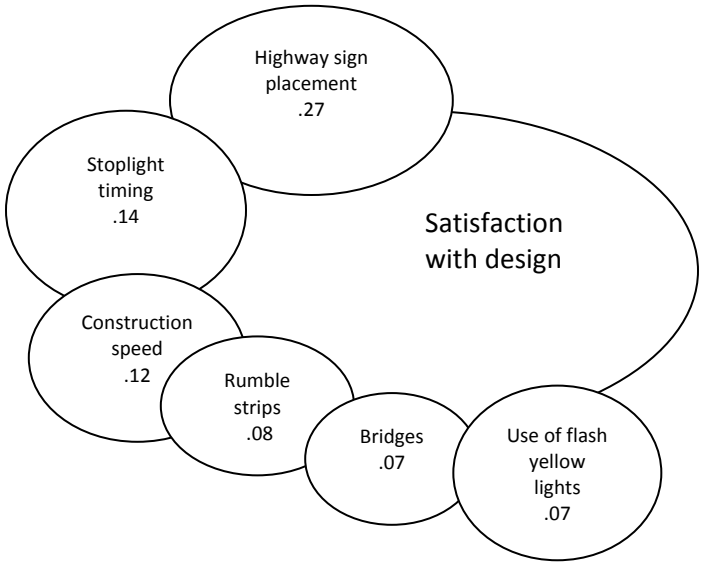
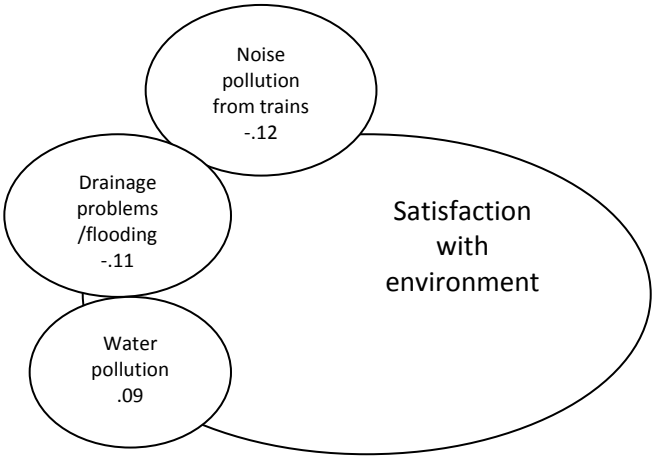


Figure G.6. Annual household income in sample by regions.



Not significant predictor: Use of roundabout intersections, Cost of construction project, On-road bike lanes

Figure G.7. Diagram illustrating relative contribution of various factors to explain satisfaction with transportation design among Minnesotans, 2011. Model Adjusted R^2=.278.

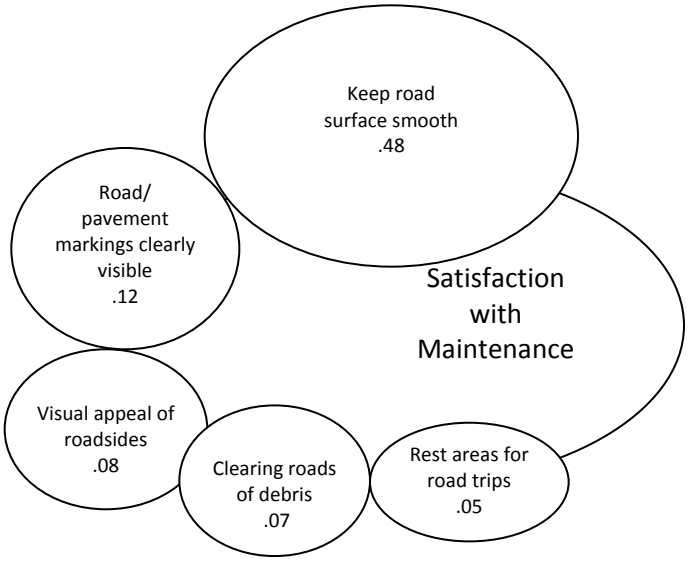


Not significant predictor: Noise pollution from traffic, air pollution, light pollution from street lights

Figure G.8. Diagram illustrating relative contribution of various factors to explain satisfaction with transportation related environmental issues among Minnesotans, 2011. Model Adjusted R^2=.021.

Not significant predictor: Community safety for bicyclists, Too traffic for walk, Too much traffic to bike, safety for 80-year-old, Bike safety considering traffic and speed, Bust driving too fast

Figure G.9. Diagram illustrating relative contribution of various factors to explain satisfaction with transportation safety among Minnesotans, 2011. Model Adjusted R^2=.227.



Not significant predictor: Clearing roads of snow, clearing sidewalks of snow, eliminating weeds, making highway sighs clearly readable, removing litter.

Figure G. 10. Diagram illustrating relative contribution of various factors to explain satisfaction with maintenance among Minnesotans, 2011. Model Adjusted R^2=.441.

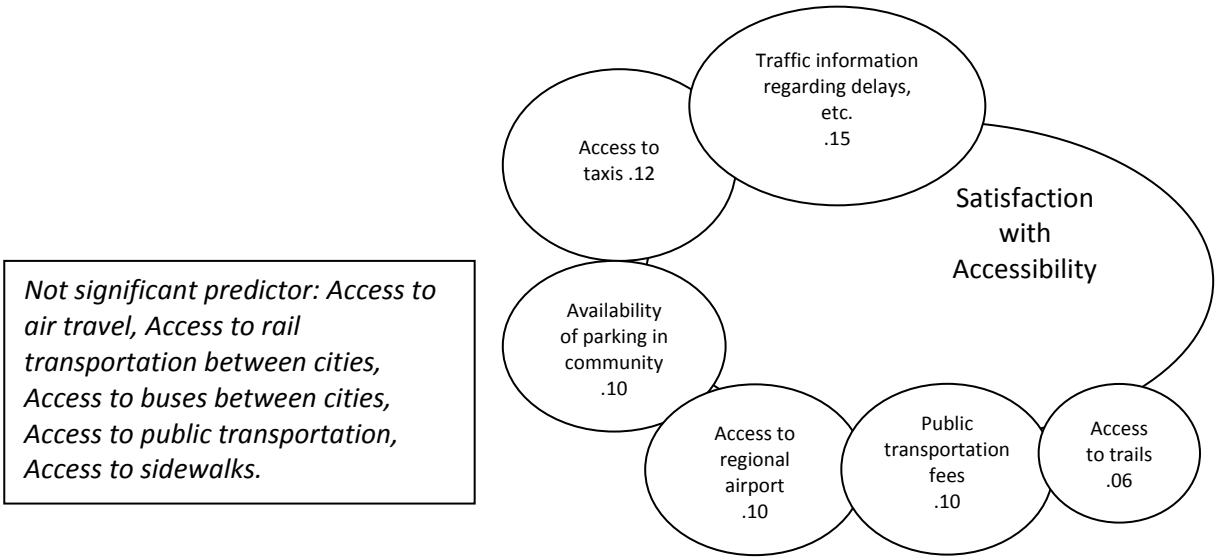


Figure G. 11. Diagram illustrating relative contribution of various factors to explain satisfaction with accessibility among Minnesotans, 2011. Model Adjusted R^2=.179.

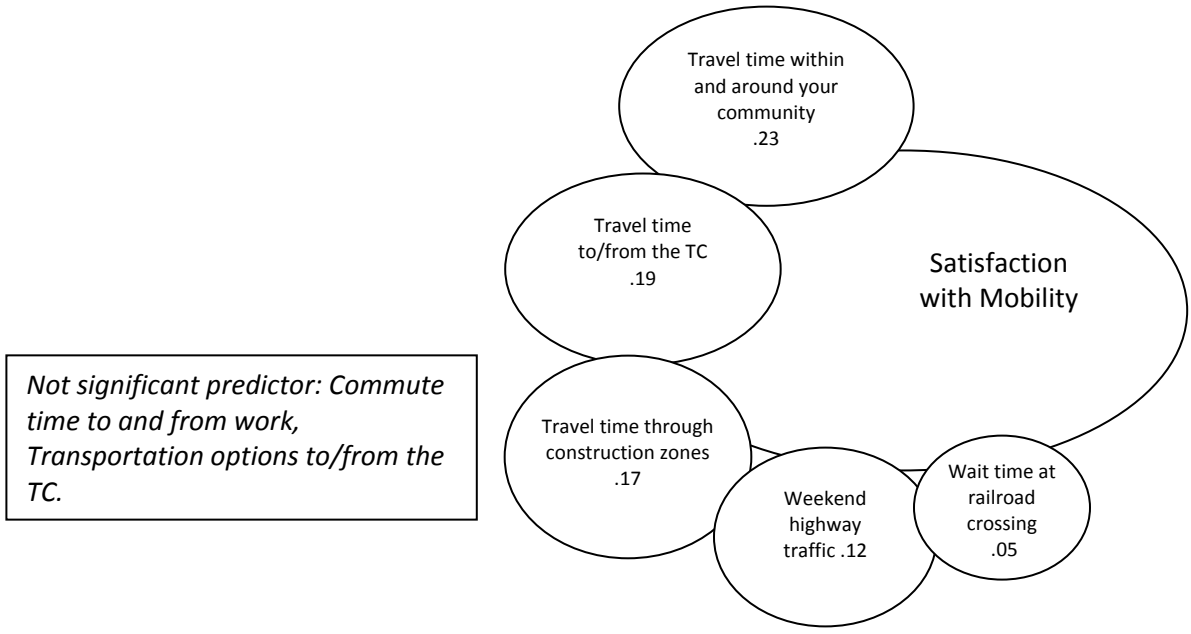


Figure G.12. Diagram illustrating relative contribution of various factors to explain satisfaction with mobility among Minnesotans, 2011. Model Adjusted R^2=.324.

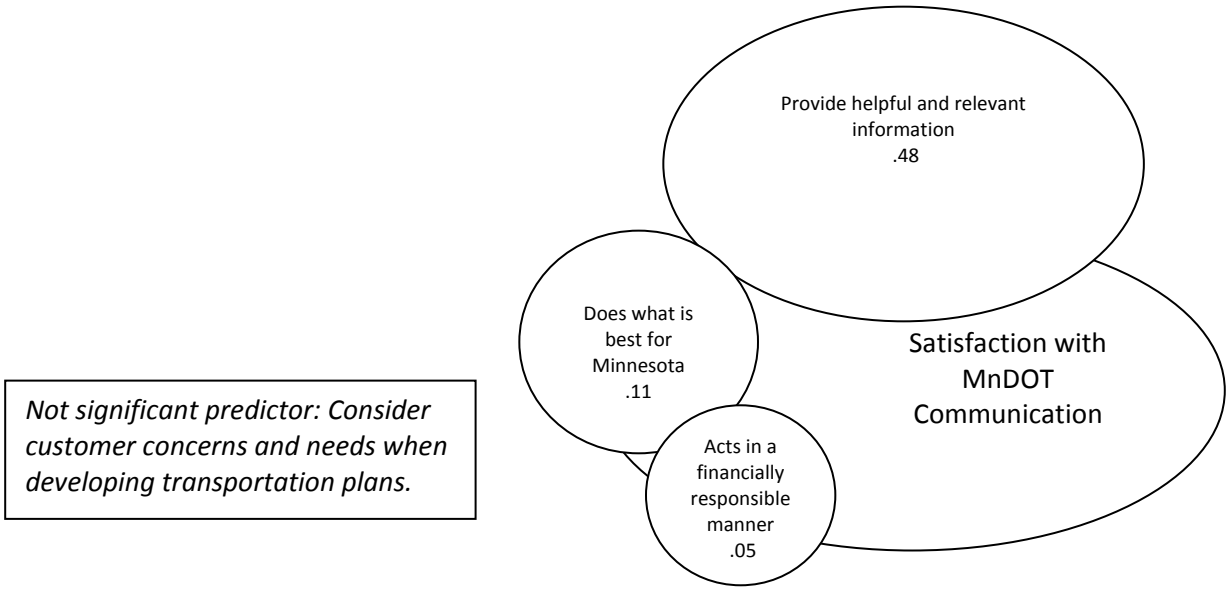


Figure G.13. Diagram illustrating relative contribution of various factors to explain satisfaction with MnDOT communication among Minnesotans, 2011. Model Adjusted R^2=.278.

Table G.14. Comparison of travel mode frequency for various trip purposes between Twin Cities Metro and Greater Minnesota, 2011

Trip Purpose	Drive alone	Car-pool	Bus (public)	Metro trains	Bike	Walk	Taxi/ shuttle
	%	%	%	%	%	%	%
To/from work							
Metro (n=1126)	91.03%	5.51%	6.93%	1.78%	4.35%	3.02%	0.71%
Greater MN (n=890)	91.01%	8.65%	1.01%	0.11%	4.94%	5.51%	-
To/from school							
Metro (n=126)	65.87%	26.98%	7.94%	0.79%	4.76%	8.73%	0.79%
Greater MN (n=97)	76.29%	13.40%	8.25%	-	3.09%	8.25%	-
Shopping or errands							
Metro (n=1636)	91.38%	16.08%	2.44%	0.79%	5.07%	9.47%	0.43%
Greater MN (n=1412)	92.00%	13.10%	0.85%	-	3.90%	5.95%	0.35%
Recreation, entertainment or meals							
Metro (n=1562)	75.16%	34.51%	2.62%	3.91%	10.12%	13.57%	1.09%
Greater MN (n=1342)	78.69%	28.76%	0.82%	0.37%	6.93%	9.54%	0.67%
Other/specify/various							
Metro (n=95)	62.11%	13.68%	5.26%	15.79%	7.37%	6.32%	7.37%
Greater MN (n=134)	40.30%	11.94%	2.24%	0.75%	2.99%	5.22%	1.49%
Medical							
Metro (n=28)	64.29%	3.57%	32.14%	10.71%	-	3.57%	3.57%
Greater MN (n=31)	80.65%	19.35%	3.23%	-	-	3.23%	6.45%
Volunteer							
Metro (n=17)	100.00%	5.88%	-	-	5.88%	-	-
Greater MN (n=8)	100.00%	-	-	-	-	-	-
Church							
Metro (n=48)	70.83%	29.17%	2.08%	-	2.08%	4.17%	4.17%
Greater MN (n=35)	80.00%	22.86%	-	-	-	-	-

Appendix H: Survey Questionnaire with Means, Standard Deviations and Frequencies

Transportation & Quality of life

First, a few questions about your experience in Minnesota and your travel patterns.

1. How many years have you lived in Minnesota (write in #)?

Mean = 49.1 Years (if less than 1, put 0), *SD = 20.2, n = 3296*

2. How many years have you lived in this community?

Mean = 29.8 Years (if less than 1, put 0), *SD = 20.1, n = 3284*

3. How many months of the year do you live in this community?

Mean = 11.7 Months of the year, *SD = 1.228, n = 3221*

Please think about the community you live in – and your travels to and from this community – as you answer this survey.

4. Do you travel "To/From Work" Monday-Friday (check one)?

56.9% Yes *43.1%* No **(If no, go to Question 5)**, *n = 3248*

Approximately how many miles is your trip one way?

Mean = 14.44 Miles one way, *SD = 13.26, n = 1807*

How many days a week do you travel to/from work Monday-Friday?

Mean = 4.84 Days to work, *SD = 0.75, n = 1838*

Typically, are these trips during the hours of 6-9 am and 3-6:30pm?

88.2% Yes *11.8%* No, *n = 1849*

How satisfied are you with the predictability of your travel to/from work (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
42.4%	*33.5%*	*9.3%*	*5.2%*	*4.6%*	*3.1%*	*2.0%*

Mean = 5.87, SD = 1.45, n = 1794

5. How many times in the last 12 months within Minnesota have you…

taken public transportation (bus, train)? *Mean = 7.4* Approx. # times in last 12 months, *SD = 44.8, n = 3209*

biked outdoors? *Mean = 11.9* Approx. # times in last 12 months, *SD = 42.8, n = 3161*

6. Please identify the trips you take in a typical week. Check all the boxes that best represent the ways that you use to get to those places. ***(Please check all the options that make up your typical trip. For example for To/From Work: drive alone to park-n-ride, take bus downtown, bike to office).***

	Ways to travel							
Trips	Drive Alone	Car-pool	Bus (Public)	Metro Trains (Light Rail or Commuter Rail)	Bike	Walk	Taxi / Shuttle	Tele-commute (working from a remote location)
To/from work *n=2031*	*91.04% (1849)*	*6.89% (140)*	*4.28% (87)*	*1.03% (21)*	*4.63% (94)*	*4.09% (83)*	*0.39% (8)*	*5.22% (102)*
To/from school *n=225*	*70.22% (158)*	*20.89% (47)*	*8.00% (18)*	*0.44% (1)*	*4.44% (10)*	*8.44% (19)*	*0.44% (1)*	*2.67% (6)*
Shopping or run errands *n=3064*	*77.89% (2807)*	*14.75% (452)*	*1.70% (52)*	*0.42% (13)*	*4.54% (139)*	*7.83% (240)*	*0.39% (12)*	
Recreation, entertainment or meals *n=2917*	*76.65% (2236)*	*31.88% (930)*	*1.78% (52)*	*2.26% (66)*	*8.67% (253)*	*11.79% (344)*	*0.89% (26)*	
Other: *Specify:* Various *n=175*	*64.57% (113)*	*16.57% (29)*	*4.57% (8)*	*9.14% (16)*	*6.29% (11)*	*7.43% (13)*	*5.14% (9)*	
Medical *n=59*	*72.88% (43)*	*11.86% (7)*	*16.95% (10)*	*5.08% (3)*	-	*3.39% (2)*	*5.08% (3)*	-
Volunteer *n=25*	*100.00% (25)*	*4.00% (1)*	-	-	*4.00% (1)*	-	-	-
Church *n=83*	*74.69% (62)*	*26.51% (22)*	*1.20% (1)*	-	*1.20% (1)*	*2.41% (2)*	*2.41 % (2)*	-

7. How satisfied are you with transportation in your community (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
27.4%	*31.8%*	*9.7%*	*18.4%*	*5.6%*	*4.1%*	*3.1%*

Mean = 5.32, SD = 1.6, n = 3007

8. Please let us know about your current transportation situation by checking one box in each row below.

	Not at all	A little	Mod-erately	Mostly	Com-pletely
To what extent do you have adequate means of transportation? *Mean = 4.52, SD =0 .98, n = 3189*	*3.9%*	*2.6%*	*4.3%*	*16.0%*	73.3%
How much do difficulties with transportation options restrict your life? *Mean = 4.58, SD =0 .85, n = 3169*	*74.2%*	*15.7%*	*6.1%*	*2.1%*	*1.9%*
To what extent do you have problems with transportation options? *Please explain*: _____ *Mean = 4.59, SD =0.87, n = 2569*	*76.3%*	*13.2%*	*6.0%*	*2.4%*	*2.1*

Now, think about your quality of life. By "quality of life" we mean "the general wellbeing of residents taking into consideration such things as educational opportunities, employment opportunities, the economy, health, housing, recreation and entertainment opportunities, and so forth."

9. How satisfied are you with the quality of your life (check inside one box)?

Mean = 6.14, SD = 1.29, n = 2915

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
50.7%	*34.0%*	*6.1%*	*2.3%*	*3.2%*	*2.2%*	*1.5%*

10. The following factors relate to quality of life. Please indicate how important each is as a contributor to your quality of life. (check one box per row)

	Very Important	Somewhat Important	Slightly Important	Neither	Slightly Unimportant	Somewhat Unimportant	Very Unimportant
a. Education				*Mean = 6.22, SD = 1.29, n = 3208*			
b. Transportation				*Mean = 6.16, SD = 1.18, n = 3213*			
c. Environment				*Mean = 6.41, SD = 1.01, n = 3219*			
d. Housing				*Mean = 6.53, SD = 0.92, n = 3223*			
e. Family, friends & neighbors				*Mean = 6.71, SD = 0.72, n = 3259*			
f. Health				*Mean = 6.84, SD = 0.57, n = 3246*			
g. Safety & security				*Mean = 6.71, SD = 0.73, n = 3251*			
h. Spirituality, faith & serenity				*Mean = 6.10, SD = 1.36, n = 3243*			
i. Local services & amenities (library, shopping, community services, etc.)				*Mean = 6.18, SD = 0.98, n = 3252*			
j. Recreation & entertainment (parks, music, restaurants, theatre)				*Mean = 6.06, SD = 1.06, n = 3252*			
k. Employment/ finances				*Mean = 6.39, SD = 1.13, n = 3113*			

Now, looking at the above list, which 3 are the <u>most</u> important factors as contributors to your quality of life?
Findings reported here are most frequently identified letters in 1 thru 3
<u>f health (54.6%)</u> *<u>e. family and friends (54.6%)</u>* *<u>k employment and finance (34.5%)</u>*

Part of your life involves transportation. We are interested in learning more about your thoughts related to several areas of transportation. In this section, we ask about your perceptions of these areas and your satisfaction with them. The first section focuses on the physical layout of the transportation system and includes the roads, signs, and lights. Then, we move to the environment and safety areas.

11. How satisfied are you with the following parts of the roadway design? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	N/A
a. Highway sign placement (including alternate route signs, speed limit)				*Mean = 5.92, SD = 1.22, n = 3252*				
b. Stoplight timing				*Mean = 5.03, SD = 1.72, n = 3199*				
c. Use of flashing yellow lights				*Mean = 5.42, SD = 1.37, n = 3049*				
d. Use of Roundabout intersections				*Mean = 4.50, SD = 1.92, n = 2769*				
e. Speed of construction projects				*Mean = 4.51, SD = 1.82, n = 3224*				
f. Cost of construction projects				*Mean = 3.78, SD = 1.73, n = 3143*				
g. Bridges				*Mean = 4.80, SD = 1.65, n = 3083*				
h. On road bike lanes				*Mean = 4.14, SD = 1.76, n = 2924*				
i. Rumble strips loud road markers on road edge & at intersections)				*Mean = 5.28, SD = 1.55, n = 3117*				

Now, looking at the above list, which 2 are the <u>most</u> important parts of roadway design?
<u>a high way sign placement (50.03%)</u> *<u>b stoplight timing(32.29%)</u>* **(write in 2 letters from the list above, a-i)**

12. Please indicate the extent of your agreement that the following transportation and environmental related issues impact your community? (check one box per row)

	Very Strongly Agree	Somewhat Agree	Slightly Agree	Neither	Slightly Disagree	Somewhat Disagree	Very Strongly Disagree	N/A
a. Noise pollution from trains				*Mean = 3.51, SD = 1.71, n = 2736*				
b. Noise pollution from traffic				*Mean = 3.05, SD = 1.54, n = 3223*				
c. Air pollution				*Mean = 2.92, SD = 1.63, n = 3220*				
d. Light pollution from street lights				*Mean = 3.78, SD = 1.63, n = 3196*				
e. Water pollution				*Mean = 2.75, SD = 1.68, n = 3214*				
f. Drainage problems /flooding				*Mean = 2.98, SD = 1.66, n = 3219*				

Now, looking at the above list, which 2 are the <u>most</u> important environmental impacts?
_e water pollution53.6%_c air pollution 49.85%___ **(write in 2 letters from the list above)**

13. Please share your thoughts about the safety of various transportation elements by checking one box in each row below.

	Very Safe	So me-wha t Safe	Slig htly Safe	Neither	Slig htly Uns afe	Some -what Unsa fe	Ve ry Un saf e	N/A
a. How safe do you feel on the road with other drivers?				*Mean = 4.99, SD = 1.60, n = 3290*				
b. Excluding other drivers, how safe do you feel using the actual roadways?				*Mean = 6.23, SD = 1.02, n = 3289*				
c. How safe is your community for pedestrians?				*Mean = 5.50, SD = 1.49, n = 3286*				
d. How safe is your community for bicyclists?				*Mean = 5.11, SD = 1.59, n = 3276*				
e. How safe are the railroad crossings in your community?				*Mean = 5.79, SD = 1.29, n = 2847*				

Now, looking at the above list, which 2 are the <u>most</u> important safety elements of transportation?
_a safety on road with other drivers *63.88%___* *_b safty on road excluding other drivers_*(44.59%)_**__**
(write in 2 letters from the list above, a-e)

This section focuses on your ability to get places you need and want to go and how easy it is to get there.

14. How satisfied are you with the following parts of the transportation system?

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Some-what Dissatisfied	Very Dissatisfied	N/A
a. Access to taxis & other similar service transportation options				*Mean = 4.86, SD = 1.66, n = 2632*				
b. Access to air travel				*Mean = 5.38, SD = 1.6, n = 3078*				
c. Access to regional airports				*Mean = 5.39, SD = 1.56, n = 2978*				
d. Access to rail transportation between cities				*Mean = 3.92, SD = 1.81, n = 2673*				
e. Access to buses between cities				*Mean = 4.30, SD = 1.73, n = 2738*				
f. Availability of parking in your community				*Mean = 5.67, SD = 1.47, n = 3207*				
g. Access to public transportation (buses, trains)				*Mean = 4.58, SD = 1.81, n = 2896*				
h. Travel time within & around your community				*Mean = 5.67, SD = 1.43, n = 3245*				
i. Commute time to & from work				*Mean = 5.43, SD = 1.64, n = 2427*				
j. Weekend highway traffic				*Mean = 5.06, SD = 1.65, n = 3192*				
k. Travel time to/from the Twin Cities				*Mean = 5.07, SD = 1.62, n = 3124*				
l. Transportation options to/from the Twin Cities				*Mean = 4.51, SD = 1.81, n = 3016*				
m. Travel time through construction zones				*Mean = 4.33, SD = 1.70, n = 3216*				
n. Wait time at railroad crossings				*Mean = 4.92, SD = 1.56, n = 2880*				
o. Public transportation fees (buses, trains)				*Mean = 4.65, SD = 1.43, n = 2505*				
p. Access to sidewalks				*Mean = 5.21, SD = 1.61, n = 3060*				
q. Access to trails				*Mean = 5.44, SD = 1.51, n = 2967*				

r. Traffic information while traveling to alert motorists of delays, crashes and detours				*Mean = 5.07, SD = 1.51, n = 3073*				

Now, looking at the above list, which 3 are the <u>most</u> important parts of the transportation system?
_h.travel time within and around your community 36.15%____
__i commute time to and from work 31.02%%___
r, traffic information 19.86%____ **(write in 3 letters from the list above, a-r)**

15. Please indicate the extent of your agreement with the following statements about biking and walking safety in your neighborhood and community (check one box per row).

	Very Strongly Agree	Somewhat Agree	Slightly Agree	Neither	Slightly Disagree	Somewhat Disagree	Very Strongly Disagree
a. There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood				*Mean = 5.03, SD = 1.89, n = 3241*			
b. There is so much traffic along nearby streets in my neighborhood that it makes it difficult or unpleasant to bike				*Mean = 4.62, SD = 1.90, n = 3216*			
c. The community is safe enough so that I would let a 10-year-old child walk around my block				*Mean = 4.73, SD = 1.93, n = 3192*			
d. My neighborhood is safe enough for an 80-year-old senior to walk around the block				*Mean = 5.26, SD = 1.77, n = 3234*			
e. It is safe to ride a bike considering the roadway design roadway (e.g. shoulder width, edge lines, rumble strips)				*Mean = 4.63, SD = 1.79, n = 3223*			
f. It is safe to ride a bike, considering traffic and speeds				*Mean = 4.71, SD = 1.78, n = 3220*			
g. Buses drive too fast in my area & make it unsafe for bikers & pedestrians				*Mean = 4.67, SD = 1.59, n = 3149*			

Now, looking at the above list, which 2 are the <u>most</u> important statements about biking and walking safety? *__c safe for child 48.97%____ _d safe for 80 year old senior 41.20%____* **(write in 2 letters from the list above, a-g)**

This section focuses on the maintenance of the transportation system.

16. How satisfied are you with the following roadway maintenance related services of the transportation system? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
a. Clearing roads of snow & ice				*Mean = 5.49, SD = 1.73, n = 3270*			
b. Clearing sidewalks of snow & ice				*Mean = 4.73, SD = 1.65, n = 3188*			
c. Keeping road surfaces smooth				*Mean = 3.95, SD = 1.95, n = 3257*			
d. Eliminating weeds on the roadsides				*Mean = 4.67, SD = 1.57, n = 3261*			
e. Making highway signs clearly readable				*Mean = 5.78, SD = 1.23, n = 3271*			
f. Making road/pavement markings clearly visible				*Mean = 5.36, SD = 1.49, n = 3267*			
g. Removing roadside litter				*Mean = 4.86, SD = 1.66, n = 3257*			
h. The visual appeal of the roadsides				*Mean = 5.04, SD = 1.50, n = 3233*			
i. Clearing roads of debris (e.g. road kill, large objects)				*Mean = 5.03, SD = 1.60, n = 3257*			
j. Rest areas for road trips				*Mean = 5.36, SD = 1.45, n = 3208*			

Now, looking at the above list, which 2 are the <u>most</u> important maintenance related services of the transportation system? **__***a clear roads of snow and ice 75.76%*___ c *keeping road surfaces smooth 53.69%*__**___ (write in 2 letters from the list above, a-j)**

17. As you can see from the questions you've been answering, transportation includes a variety of factors. How important are each of these factors that relate to transportation? (check one box per row)

	Very Important	Somewhat Important	Slightly Important	Neither	Slightly Unimportant	Somewhat Unimportant	Very Unimportant
a. Your **ability** to get places you need & want to go				*Mean = 6.78, SD = 0.61, n = 3280*			
b. The physical layout of the roadway system (including roads, signs & lights)				*Mean = 6.36, SD = 0.89, n = 3263*			
c. The **ease** of getting to places you need & want to go				*Mean = 6.56, SD = 0.72, n = 3274*			
d. Overall maintenance of the highway & freeways				*Mean = 6.63, SD = 0.71, n = 3275*			
e. Safety of the roadways (- highways & freeways themselves)				*Mean = 6.72, SD = 0.67, n = 3274*			
f. General communications from MnDOT				*Mean = 5.60, SD = 1.29, n = 3254*			
g. Addressing environmental issues				*Mean = 5.76, SD = 1.34, n = 3262*			
h. Long-term transportation planning (20 years)				*Mean = 6.13, SD = 1.17, n = 3257*			

Now, looking at the above list, which 2 are <u>most</u> important factors for transportation?

_a. Accessibility55.08% _____ __c.Maintenance 37.15%_____ **(write in 2 letters from the list above, a-h)**

18. How satisfied are you with the Minnesota Department of Transportation's performance in these transportation areas? (check one box per row)

	Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
a. Your **ability** to get places you need & want to go				*Mean = 6.09, SD = 1.10, n = 3235*			
b. The physical layout of the roadway system (including roads, signs & lights)				*Mean = 5.79, SD = 1.23, n = 3233*			
c. The **ease** of getting to places you need & want to go				*Mean = 5.84, SD = 1.23, n = 3231*			
d. Overall maintenance of the highway and freeways				*Mean = 4.89, SD = 1.75, n = 3236*			
e. Safety of the roadways (highways and freeways themselves)				*Mean = 5.54, SD = 1.39, n = 3232*			
f. General communications from MnDOT				*Mean = 5.14, SD = 1.32, n = 3202*			
g. Addressing environmental issues				*Mean = 5.06, SD = 1.34, n = 3203*			
h. Long term transportation planning (20 years)				*Mean = 4.64, SD = 1.62, n = 3195*			

19. Considering what you know about the Minnesota Department of Transportation overall, how satisfied are you with the services provided (check inside one box)?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
14.4%	*47.5%*	22.7%	*4.6%*	*5.9%*	*3.7%*	*1.2%*

Mean = 5.44, SD = 1.29, n = 3068

20. In the next 5-10 years, what are the 3 most important things that the Minnesota Department of Transportation should be working on? (see table below)

4. _____SEE TABLE IN TEXT _____
5. _____
6. _____

21. As you think about the next generation, what are the 3 most important things that the Minnesota Department of Transportation should be working on? (see table below)

4. _____SEE TABLE IN TEXT__
5. _____
6. _____

22. Please indicate the extent of your agreement with the following statements about the Minnesota Department of Transportation. (check one box per row)

MnDOT…	Very Strongly Agree	Somewhat Agree	Slightly Agree	Neither	Slightly Disagree	Somewhat Disagree	Very Strongly Disagree
Does what is best for Minnesota				*Mean = 5.40, SD = 1.32, n = 3185*			
Acts in a financially responsible manner				*Mean = 4.87, SD = 1.55, n = 3161*			
Considers customer concerns and needs when developing transportation plans				*Mean = 4.99, SD = 1.54, n = 3167*			
Provides helpful and relevant information to citizens				*Mean = 5.17, SD = 1.42, n = 3177*			

Finally, a few questions about you.

23. What year were you born?19 ____ *Mean = 59.79, SD = 14.56, n = 3249*

24. Are you…? ☐ **Male** *67.0%* ☐ **Female** *31.9%* ☐ **Prefer not to answer** 1.1% *(n = 3270/3308)*

25. What is the highest level of education you have completed (check one)? *(n=2971/3308)*

☐ Some high school *2.9%* ☐ Graduated high school/GED *18.4%* ☐ Some vo-tech *2.7%*

☐ Graduated from vo-tech *10.8%* ☐ Completed associate degree *5.3%* ☐ Some college *12.8%*

☐ Graduated from college *24.9%* ☐ Some postgraduate *5.1%* ☐ Postgraduate *17.1%*

26. In what ethnicity and race would you place yourself? *(n=2693/3308)*

Ethnicity (check one): ☐ Hispanic or Latino *1.2%* ☐ Not Hispanic or Latino *98.8%*

Race (check all that apply):

☐ American Indian or Alaska native *1.0%* ☐ Asian *1.2%*
☐ Black or African American *0.8%* ☐ Native Hawaiian/Pacific Islander *0.1%*
☐ White *94.3%* ☐ Other (Please specify_____) *1.0%*

27. Including you, how many people live in your household? *Mean = 2.4, SD = 1.3, n = 3267*

People in household

28. How many working automobiles are in your household? *Mean = 2.1, SD = 1.0, n = 3271*

Household autos

29. Do you consider yourself a person with a disability? ☐ Yes *11.5%* ☐ No *88.5%*

(n = 3255/3308)

30. What is your employment status (check one)?

☐ Employed full time *52.2%* ☐ Employed part time *6.7%* ☐ Retired *36.1%*
☐ Student *0.3%* ☐ Unemployed *2.4%* ☐ Other *1.3%*

self employment 1.1%

31. Are you a current or former employee of the Minnesota Department of Transportation?

☐ Yes *1.1%* ☐ No *98.9%* *(n = 3250/3308)*

32. What is your annual household income before taxes (check one)?

☐ Less than $25,000 *12.9* ☐ $50,000-74,999 *21.1%* ☐ $125,000-149,999 *5.0%*

☐ $25,000-34,999 *10.6%* ☐ $75,000-99,999 *14.6%* ☐ $150,000-174,999 *3.2%*

☐ $35,000-49,999 *15.2%* ☐ $100,000 -124,999 *11.2%* ☐ $175,000 or more *6.2%*

Please mail the completed questionnaire back in the postage-paid envelope provided.

THANK YOU FOR YOUR PARTICIPATION!

Questions? 612 624 2250; quoxx278@umn.edu