SouthWest Transit Park-and-Ride
Bike and Pedestrian Facilities

Prepared by
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A capstone project completed in partial fulfillment of the requirements for the
Master of Landscape Architecture Degree
College of Design

Prepared on Behalf of
SouthWest Transit

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MOMENTUM
MOMENTUM

PROJECT GOALS
1. Embrace New Modes of Transportation: BIKING & WALKING
2. Increase Bicycle and Pedestrian Access to Southwest Transit Stations
3. Create Public Space Centralized at Station Plazas & Event Spaces
4. Redefine Experiences of Biking and Walking in the Suburbs

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Bicycle and pedestrian improvements are critical to the success and resilience of suburban communities. If there are options in place for communities to engage in multimodal transportation systems, they can increase health, access, equity, and lower costs of living.

Small changes in thinking about transportation can make a huge impact in the future.

SARAH LIPKIN SULARZ
CAPSTONE 2016
MOMENTUM

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THE 1956 FEDERAL HIGHWAY ACT ENSURED PROGRESS AND AUTOMOBILE FRIENDLY ROADWAY DEVELOPMENT FOR THE FOLLOWING 60 YEARS.
THE AMERICAN SUBURB WAS DESIGNED TO GIVE EACH FAMILY DWELLING WITHIN THEIR OWN MINIATURE ESTATE—A SEPARATE HOUSE WITH ITS OWN YARD, GARDEN AND DRIVEWAY FOR A CAR.
A SHIFT IN DEMOGRAPHICS CREATES NEW TYPES OF DEMANDS.

Millenials range from 19-36. ~75.7 million people
Millenials have the largest estimated purchasing power in the US.
Average income of $60k
Expect to keep homes for only 4.7 years
1/5 millenials own homes.
25% never marry

This bar graph shows the change in priority of baby boomer generations to millenials.
Whole ‘Hoods in which more people walk or cycle, rather than drive, are safer, nicer, places to live.

CONVENIENCE IS KEY! Convenient facilities such as access to water, seating, and safety elements can increase usership.

People who live in neighborhoods with sidewalks are 47% more likely to be active at least 30 mins a day.

Health studies show that for every $1 spent on trails, there are $3 in savings in direct medical costs.

Using MultiModal transportation systems, including bicycles and commuter buses can reduce roadway emissions up to 22% annually.

11 different routes departing from 7 different P&R stations, serving 45+ miles.

People who live in neighborhoods with sidewalks are 47% more likely to be active at least 30 mins a day.


SHIFTS IN THE SUBURBS
SHIFTS IN THE SUBURBS

SOUTHWEST VILLAGE STATION
11 BUS lines serve commuters and students through Carver and Hennepin Counties. For only $3.00 each way this commute includes:

- WiFi
- Quiet work zones
- “Rider Rewards” - 700+ Users
- SW Prime Service

RIDER STATS

SWT serves 7 stations throughout Chaska, Chanhassen and Eden Prairie as well as Downtown MPLS, The University of Minnesota, Normandale College, and Target North Campus in Brooklyn Park.

Total of 1,032,889 rides provided in 2013.

Ridership up 2% from 2014-2015

Increase of 6.4% in State Fair service (almost 90,000 rides), Increase of 53.3% in our Vikings game service
Take a look at what currently exists as far as bike paths, trails, and sidewalks all the way from Ramsey County to Carver County. It is clear that a difference in trail connectivity and type is established when you cross county lines, from urban to suburban.

This book will address analysis and design strategies for those bike paths and walkable areas.
Carver County's total population increased by 36% from 2000-2015.

**TOTAL POPULATION 2000:**

70,205

The population density was 197 people per square mile

**TOTAL POPULATION 2010:**

91,042

The population density was 242 people per square mile

**TOTAL POPULATION 2015:**

est. 98,741

The population density is 257 people per square mile

Carver County

MN
A multimodal enhancement project in Chanhassen is a great way to start addressing the shifting needs and wants of new suburban residents. These new residents, predominantly from the Millennial generation have drastically different perceptions of suburban living and make different life style choices than those of the Baby Boomer generation. The area in Carver County being examined in this project is known as Chanhassen. This area is already growing at a high rate with young families. With access to amenities and community spaces and better transit options being a highlight for new residents.

*Momentum* is a project that delves into the best practices of streetscape, community space, and bike trail design so that moving forward there is a shift in how to best plan and design for a new type of suburban resident.
WHERE WE WORK.
In just 10 years, there has been a 6% increase in commuters who leave Carver County for work. That is 25% more than the state’s average. For so many people to be commuting every day by car can have huge environmental and physical impacts on the cities and towns they traverse.

Comparatively fewer workers in MN leave their home county for employment.

"THE GOAL IS BASICALLY ELIMINATING THE CAR FROM THE PICTURE."
and we have a long way to go...

18.1% HENN CO. HOUSEHOLDS DO NOT OWN CARS.
2.5% CARVER COUNTY HOUSEHOLDS DO NOT OWN CARS.
This project delves into social perception of biking and walking as transportation in suburban life. Knowing the changes in demographics of target populations is important when planning new types of transit paths in the suburbs.

In Chanhassen we are seeing a rise in medium and high density housing units. Single family home are no longer the future trajectory for this town.

SOCIAL DEVELOPMENT.

HOUSING PERMITS pulled per year for a 6 year span has changed the suburban fabric. This map and chart to the left show how communities are growing in areas already previously densified. These smaller cities and towns are growing due to reducing suburban sprawl trends and higher density housing styles being in demand.

Kathleen McCormick, 2016

The blue outlines show the 15 fastest growing suburban areas in the United States according to 2016 BusinessInsider.com.

The maroon dots mark the 25 best cities for millennials as outlined in the 2015 time.com magazine.
Bikers: According to a survey by Southwest Transit Authority, bike commuters will ride up to 3 miles for a bike to bus transfer. The diagrams on the following page show how far, using current street layouts in the suburbs, that 3 miles takes riders.

By creating more direct channels for walking and riding trails, ridership can increase and comfortably accommodate more bike and pedestrian to bus commuters.

Pedestrians: People will choose to walk up to 1 mile to get goods and services. In many cities this is easily 8-12 blocks away. In Carver County, the suburban layout means that walking up to 1 mile barely gets you to exit a housing development.

There is standing transit/modal philosophy that people are willing and able to walk up to 1 mile, and bike up to 3 miles to get goods and services, I will be conducting the analysis, design and recommendations at both the 3 mile and 1 mile scales. This will benefit the experiences of riders at the furthest extent of the bikeable area as well as pedestrians and bikers as they arrive into the transit station and public plaza area. By creating more direct channels for walking and riding trails, ridership can increase and comfortably accommodate more bike and pedestrian to bus commuters.
EXPERIENCE IS KEY!

Know what you are getting into and what to expect along the way. It can also be helpful to infill open areas that are undeveloped in the suburban context. This changes one's perception of travel distance and time passed.
It is important to understand the current conditions existing in Chanhassen. There are numerous trails, with more planned, for increasing recreation, and safe and commuter opportunities. These new planned routes will better connect existing trails and paths that lead people from residential areas into commercial, communal, and transit nodes. Southwest Village Station serviced by Southwest Transit Commuter Bus Lines, is a perfect place to engage additional bike and pedestrian users, a new community space all around existing transit and new residential zones.

It is invaluable to have these connections both for biker and pedestrian use. However, what is even more important is the experiential qualities and safety implementations of these routes.
The majority of American communities, developed after 1950, are designed for private automobile rather than public transportation. This sustained emphasis on design, public policy, and investment favoring private auto travel has made it difficult for transit to serve these communities.

CYCLING TO WORK: POTENTIAL.

Over 33,000 people live in a 3 mile / bikeable range to Southwest Village Station. The higher levels of income mean that these users have the means to use automobile transit if they choose. Our challenge is to excite and engage this large population in order to peak interests in commuter cycling.

THE 4 TYPES OF TRANSPORTATION CYCLISTS

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>AVERAGE COMMUTE TIME</th>
<th>WORKING AGE 16-65</th>
<th>USE PUBLIC TRANSPORTATION</th>
<th>PERCENT COMMUTER</th>
<th>MEAN IN POVERTY</th>
<th>MEDIAN H.H. INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATION CENSUS BLOCK</td>
<td>1,688</td>
<td>22 MIN</td>
<td>65%</td>
<td>0%</td>
<td>80%</td>
<td>7.83%</td>
</tr>
<tr>
<td>1 MILE RADIUS</td>
<td>7,582</td>
<td>22 MIN</td>
<td>61.5%</td>
<td>2.1%</td>
<td>70-80%</td>
<td>2.75%</td>
</tr>
<tr>
<td>3 MILE RADIUS</td>
<td>33,175</td>
<td>23 MIN</td>
<td>64.1%</td>
<td>3.3%</td>
<td>60-70%</td>
<td>2.30%</td>
</tr>
<tr>
<td>CITY OF CHANHASSEN</td>
<td>22,952</td>
<td>23 MIN</td>
<td>60.0%</td>
<td>2.8%</td>
<td>55%</td>
<td>2.0%</td>
</tr>
<tr>
<td>CARVER COUNTY</td>
<td>91,042</td>
<td>25 MIN</td>
<td>61.7%</td>
<td>1.7%</td>
<td>55%</td>
<td>2.2%</td>
</tr>
<tr>
<td>MINNESOTA STATE</td>
<td>5,454,700</td>
<td>23 MIN</td>
<td>50%</td>
<td>3.4%</td>
<td>47.5%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

1" = approx .5 miles
BIKE STREET TYPES.

RESIDENTIAL TRAFFIC
ON or OFF street bike lanes with low speed limits, 0-999 ADT, paved route.

LOCAL TRAFFIC
ON or OFF street bike lanes with medium speed limits, 1000-5,999 ADT, paved route.

COMMUTER TRAFFIC
ON or OFF street bike lanes with high speed limits, 6000+ ADT, paved route.

SITE
In this section there are 4 typologies that will be discussed within the proposed bike shed of a 3 mile radius / 30 minute commute. By classifying these typologies of path experiences, we can better assess user needs and strategies to plan for the safe and increasing use in the future. Issues with sight lines, access, congestion, crossing lengths, crossing ability, and way finding can all be influential in the user’s desire and ability to bike. First, we will look at safety strategies from the Community Design Group, a Minneapolis based consultation firm. Second, we show how new technologies can increase and excite more people in the millennial generation to use trails. Third, we will run through design interventions and propose changes in experiential qualities for all 4 typologies through a series of sections and perspective renderings.
SAFETY STRATEGIES

These 3 safety measure classifications are based on average daily traffic (ADT) numbers, concurrent with increasing mph speed limits on these roads. According to the Community Design Group (c-d-g.org) of Minneapolis, there are different safety structures needed depending on the route quality. Because this graph typically applies to urbanized areas, we do not always find the need to analyze and re-design the exact same ways. This project for instance chooses to focus on local traffic and commuter traffic streets rather than residential trafficked streets. We also have included two additional typologies of design interventions: “Unique Elements”, such as park trails, and where “Trails Converge”, two distinct types meeting or change.

TOP CRASH CONTRIBUTING FACTORS WITH MOTORISTS

- NO CLEAR FACTOR
- FAILURE TO YIELD @ R.O.W
- DRIVER AT FAULT
- DISREGARDING TRAFFIC CONTROL DEVICE
- VISION OBSTRUCTED
- OTHER HUMAN FACTORS
SOME HAVE CALLED THE SMART CITY TREND THE MOST TRANSFORMATIVE THING TO HAPPEN TO CITIES SINCE THE URBAN RENEWAL MOVEMENT OF THE 1960S. IT’S HAPPENING IN LARGE PART BECAUSE OF DEMOGRAPHIC, ECONOMIC AND FISCAL CHANGES AFFECTING CITIES IN AMERICA AND AROUND THE GLOBE.

UNIQUE ELEMENT: Wayfinding & information in park trails and rest areas through tech apps.
This schematic map shows all 7 stations served by Southwest Transit and interstitial distances. By using Smart City technology users can track progress, and location for an easy and safe ride from home to station.
Lyman Blvd is a commuter traffic route. It has a 5’ Shoulder pathway classified for bikers. A solid white painted line is all there is to designate space from vehicular to bike traffic. Here you see the north facing entrance to Southwest Village Court, just a half block from the north entry of the station.

Here we see a Park Trail and a Local Traffic route, above-grade path converge into one unmarked crosswalk.

On the following pages we see how simple safety and aesthetic enhancements can greatly reduce risk of a crash, and increase use for all types of pedestrian and bike users.
EXISTING TRAILS CONVERGE

REDESIGNED TRAILS CONVERGE

YOU ARE HERE

southwest village
townhomes

4’
private walk

5’
blvd

6’
sidewalk

12’

13’

13’

12’

5’
shoulder

6’
sidewalk

Amelanchier × grandiflora
‘autumn brilliance’

Cornus sericea L.
‘cardinal’

Taxus x. media
‘tauntonii’

Perovskia atriplicifolia
‘russian sage’

Prunus cerasifera
‘mt. saint helens’

Salix nigra
‘black willow’

landscape forms
leo 16’

wayfinding
station

pedestrian
path

tree line

30 MIN BIKE / 3 MILE

median w /
stop zone

bituminous
bike trail

planting
+ seating

1-5’

10’

8’

12’

12’

11’

tree lined
blvd

8’

5’

4’

townhomes

private walk

blvd + seat

sidewalk
1. REDESIGNED TRAILS CONVERGE

LYMAN BLVD

30 MIN BIKE / 3 MILES
2. EXISTING LOCAL TRAFFIC
water street @ great plains blvd.

This street can easily be used as an example of expansive roadways with little care for multimodal movement. No infrastructure or space is considered for enhancing pedestrian or biker experience. On the next page you can see how re-distributing space can change everything about a street.
This is an on-street bike route option for local roadways. The user is protected by elevation and visual cues from vehicular traffic in this scenario. Safety and convenience for users is fundamental to increase use and function in multimodal traffic. The use of protected intersections, illuminated paths, way finding and a bike fix station are appropriate safety measures to implement on the Local Traffic Route, as outlined by the CDG and NACTO bikeguide.
2. EXISTING LOCAL ROUTE
Great Plains Blvd. & Brendemere Park
CONSIDERATIONS OF TRAILS AT STATION APPROACH WITHIN ONE MILE

Pedestrian experience for the 1 mile / 15 minute walk

“All truly great thoughts are conceived while walking.”

Friedrich Nietzsche
**15 MINUTE WALK / 1 MILE**

**POTENTIAL REACH @ 1 MILE.**

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Average Commute Time</th>
<th>Working Age 16-65</th>
<th>Use Public Transportation</th>
<th>Percent Commuter</th>
<th>Mean in Poverty</th>
<th>Median H.H. Income</th>
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<tr>
<td><strong>Station Census Block</strong></td>
<td>1,688</td>
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<td>$62,394</td>
</tr>
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<td><strong>1 Mile Radius</strong></td>
<td>7,582</td>
<td>22 MIN</td>
<td>61.5%</td>
<td>2.1%</td>
<td>70-80%</td>
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<td>$118,351</td>
</tr>
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<td>3.4%</td>
<td>47.5%</td>
<td>6.0%</td>
<td>$53,482</td>
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</table>
In order to fully explain the need for new development and it is necessary to show the existing conditions of this transit site. Currently, there is a commercial development with limited services across the street to the west. Multiple housing developments surround the transit node. With the amount of people around the station, there is a great chance that rider numbers and site use will rise.

With rising populations, there will soon be greater demand for goods and services nearby areas of transit and housing.
BIKE STREET TYPES. WITHIN STATION CONTEXT

RESIDENTIAL TRAFFIC
ON or OFF street bike lanes with low speed limits, 0-999 ADT, paved route.

LOCAL TRAFFIC
ON or OFF street bike lanes with medium speed limits, 1000-5,999 ADT, paved route.

COMMUTER TRAFFIC
ON or OFF street bike lanes with high speed limits, 6000+ ADT, paved route.

SITE
CENTRAL STATION: DEFINED

Inventory:
4.30 acres at station block
regional commercial establishments
hosts 400+ cars; interior and exterior lot
Indoor 5am - 9 pm

By providing a community center gathering area, the transit node can have duel functionality as a place for people and modal transport. Like a town square for the suburban area, it needs to have certain amenities and access. The new area should have respite from built and environmental factors, such as pollution, noise, odors, sun, heat, cold and wind.

This site is perfect for events and gatherings, cyclist routes for tourism and recreation, pre-sporting events which are served already by SWT, and social activity for emerging communities.
ISSUES IDENTIFIED

- discontinuous sidewalks
- entrance points hidden
- parking structure under utilized
- uncontrolled intersections
- crossing excessive roadways
- standing water and runoff on site

HWY 212

GREAT PLAINS BLVD

LYMAN BLVD

1.64 acres

65 acres

9.37 acres
SW VILLAGE
STATION PLAN

Park and ride station at highway 212 between lyman blvd and great plains blvd.

This site has the potential to become the community collaboration space for social engagements, riding bikes on public roadways, shopping, events and meeting neighbors on the way to work.

The newly designed site will host a seasonally adaptable mounded site and plaza, with event rental spaces, food vending site opportunities, and community programming opportunities.
The existing 1,728 sq ft. exterior parking lot could be removed to increase public space and infiltration of the water on site. By shifting use of this exterior parking lot to a plaza with permeable pavers and vegetation, a total of 7,204.8 gallons of runoff water can be reduced.
Public plaza space can add engaged social settings, seating and shade, market and event space, as well as offer year round access for activities and recreation. The existing area is overflow parking and an additional entry point to the parking structure. This is also the ideal location to have storage and bike locker facilities within the parking facility.
MATERIALITY:
MARKET PLAZA

Systems and technologies should be wisely incorporated into new plaza designs to make materials and vegetation last as long as possible. These best management practices can extend tree life with structural soil cells. Pavers like PaveGen can harness kinetic energy and be used to help power lights and facilities on site.
The upper deck of the parking structure has space for more vehicular traffic than is currently necessary. This under utilized capacity area can be used for temporary and/or moveable green roof structures to help mitigate large volumes of runoff water.

- **Scenario 1**: 13,532 GAL
- **Scenario 2**: 27,064 GAL

7. Green Roof Capabilities
T.I.G.E.R. GRANTS

$500 MILLION of FEDERAL MONEY offered
Modal and geographic equity
Rural projects awarded minimum of $1 Million

SELECTION CRITERIA:
• SHOW SAFETY INCENTIVES
• STATE OF GOOD REPAIR
• IMPROVE QUALITY OF LIFE
• ENVIRONMENTAL SUSTAINABILITY

LANDSCAPE ARCH. FOUNDATION

Case studies investigation
No minimum award $ amount

SELECTION CRITERIA:
• LANDSCAPE PERFORMANCE
• UNIQUE PROJECT
• STUDENT / SPONSOR / PARTNERSHIP
• SPECIFIC PERFORMANCE OBJECTIVES

FUNDING

“USDOT will consider the project’s ability to foster a safe, connected, accessible transportation system for the multimodal movement of goods and people”

“The CSI program is highly collaborative with the goal of better integrating the innovative work being done by academia and practice to advance our knowledge of landscape performance.”
PARTNERSHIPS

- Southwest Transit
- Carver County Planning Commission
- University of Minnesota – college of design
- CURA- center for urban and regional studies

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THANK YOU

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Goswami, J. (n.d.). The Economic Impact of the Houston Bikeway Program on Houston. 


Mukhija, Vinit. The Informal American City: Beyond Taco Trucks and Day Labor (Urban and Industrial Environments).


