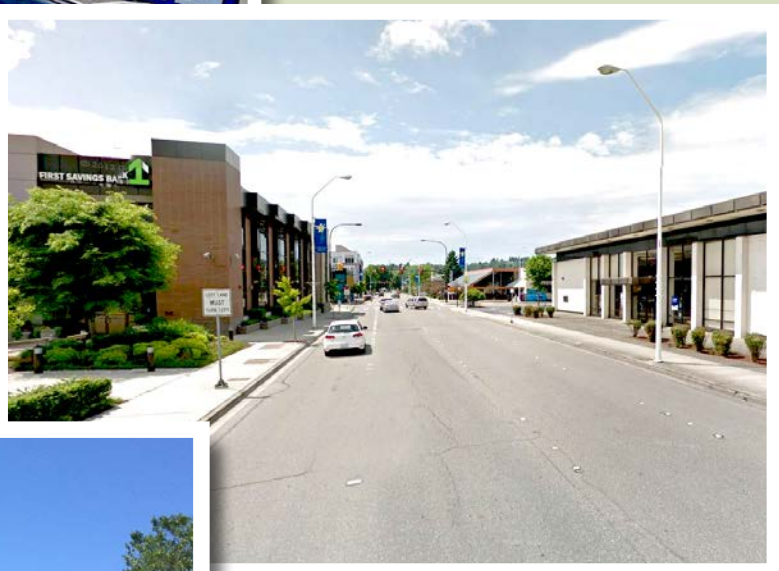


Downtown Circulation Traffic Analysis

Prepared for: City of Renton



Prepared by:

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Interdisciplinary Design
753 9th Avenue North
Seattle, WA 98109

July 2016

Downtown Circulation Traffic Analysis

Prepared for

City of Renton
1055 S Grady Way
Renton, Washington 98057



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Prepared under the direction of a Professional Engineer, registered in the State of Washington, whose seal and signature appear below:



A handwritten signature in black ink, appearing to read "Sessyle A. Asato".

Sessyle A. Asato, PE

7/07/16

Date

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Introduction

As part of its vision to revitalize the downtown, the City of Renton has identified changing the one-way streets to two-way operations. The current one-way operation of S 2nd Street and S 3rd Street encourages regional traffic to cut-through downtown. Two-way operations will improve downtown traffic circulation, maximize access to businesses, and create a safer and more comfortable pedestrian environment.

The City of Renton Comprehensive Plan (2015) and City Center Community Plan (2011) recommend two-way operations for S 2nd Street and S 3rd Street as well as the north-south one-way couplet of Williams Avenue S and Wells Avenue S. The City is working with WSDOT to remove the State Route 900 designation from S 2nd Street and S 3rd Street.

Study Objectives

The primary objectives for the study include the following.

- Evaluate the near-term and long-term operational feasibility of changing S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S to two-way operations with a single travel lane in each direction.
- Identify potential capacity improvements to enhance traffic operations with the two-way conversion.
- Perform a preliminary evaluation of how turn lanes on S 2nd Street and S 3rd Street would reduce on-street parking and impact right-of-way.
- Provide direction for the future design of the downtown streets.

Summary of Findings

This study analyzes downtown traffic operations with the current one-way streets and with the change to two-way operations for the 2025 and 2035 horizon years. Key findings from this analysis include the following.

- Two-way operations on S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S can accommodate the future 2035 volumes with one travel lane in each direction and additional turn lanes at key intersections.
- This study does not recommend two-way operations for the segment of Houser Way from Main Avenue S to Bronson Way N due to negative impacts to traffic operations, limited space for street widening, and few developments along this segment of Houser Way to that could take advantage of the improved two-way circulation.
- The conversion of the downtown streets to two-way operations will not require additional lanes on Rainier Avenue S, Airport Way or S Grady Way.
- Changing the downtown street to two-way operations will provide new opportunities to add on-street parking.

Main Avenue S Improvements

An earlier phase of this project analyzed the two-way conversion of the one-way segment of Main Avenue S from S 2nd Street to S 3rd Street, and the adjacent segment of Bronson Way N from Mill Avenue S to Main Avenue S. The change to two-way operation was recommended to improve circulation, access to businesses, and the pedestrian environment. The redesign of Main Avenue S will add on-street parking, street trees, new plazas for outside dining, and other streetscape improvements that will create a gateway entrance to downtown. These improvements will be constructed in 2016. To further promote the revitalization of downtown Renton, similar improvements would be included as part of the two-way conversions of S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S.

Study Area

S 2nd Street and S 3rd Street form an east-west, one-way couplet between Rainier Avenue S and Main Avenue S. S 3rd Street becomes Houser Way at Mill Avenue S, and continues as an eastbound one-way street to its intersection with Bronson Way. Williams Avenue S and Wells Avenue S are north-south, one-way streets connecting from Grady Way S, through downtown, and to the residential areas north of the Cedar River. As shown in **Figure 1**, the study area includes the one-way segments of these streets.

While the study area encompasses a larger region, the focus of the analysis is the downtown intersections along S 2nd Street and S 3rd Street between Rainier Avenue S and Mill Avenue S. **Figure 2** shows the 21 primary study intersections and the downtown street system.

Study Years

The traffic analysis was done for three study years:

- **2015** represents existing conditions for the traffic analysis.
- **2025** represents the near-term future and includes projects in the City of Renton's Six-Year 2015-2020 Transportation Improvement Program (TIP).
- **2035** represents the longer-term future and adds the planned improvements identified for WSDOT's I-405 Renton to Bellevue Project.

Scenarios Evaluated

Three network configurations were evaluated for S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S.

- **One-Way Operations (Baseline)**. This represents the existing one-way operations on S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S.
- **Two-Way Operations with 2-Lane Configuration (Scenario 1)**. Two-way operations with 1-lane in each direction and limited turn lanes in order to prioritize on-street parking. No turn lanes are included on S 2nd Street and S 3rd Street, east Shattuck Avenue S.
- **Two-Way Operations with Select Turn Lanes (Scenario 2)**. Two-way traffic with 1-lane in each direction and turn lanes at high volume locations to improve traffic operations.

Figure 1. Study Area

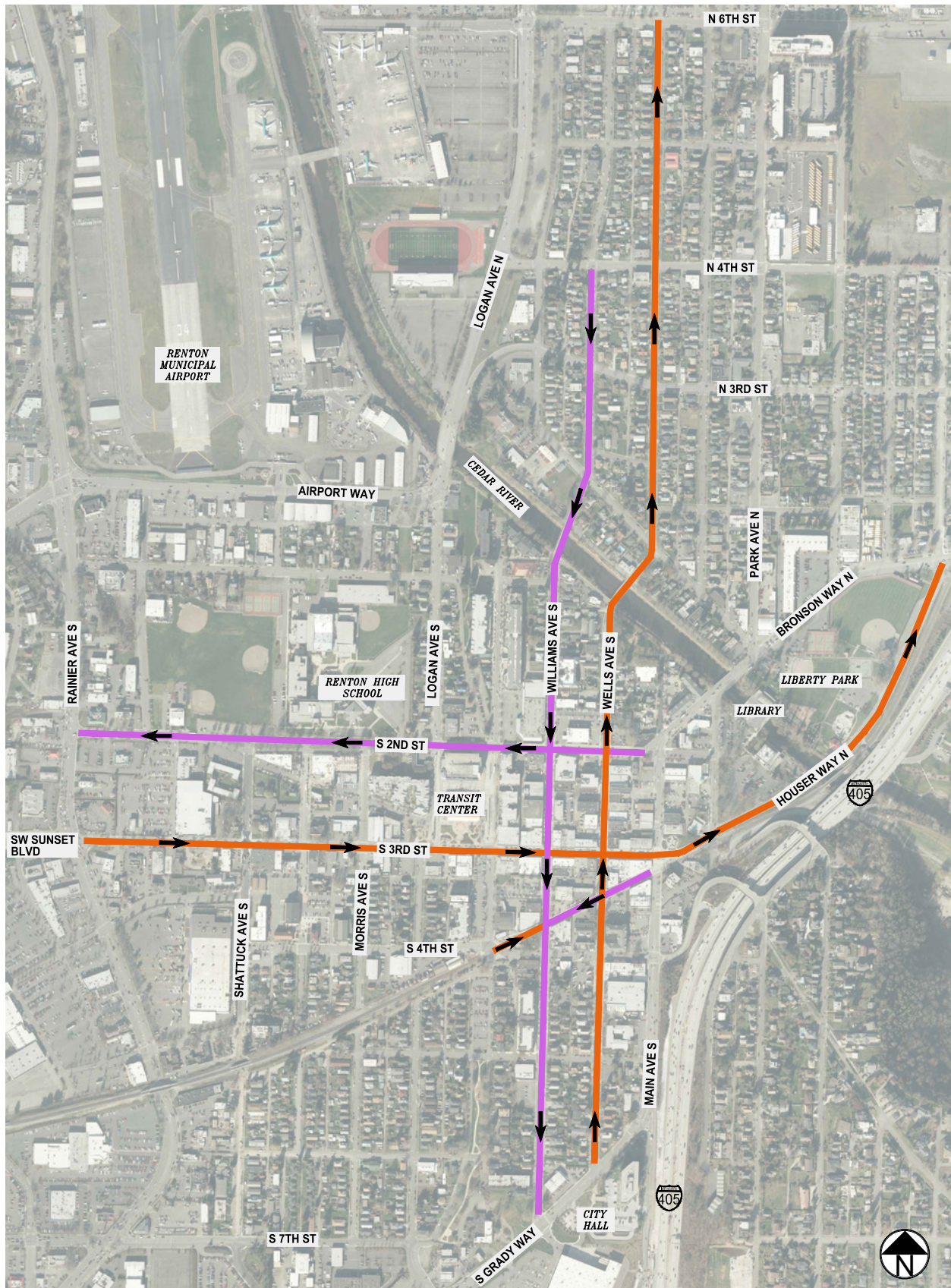


Figure 2. Downtown Study Intersections



x Study Intersections

Existing Conditions

The analysis uses 2015 to represent the existing conditions in the study area. This section describes the existing roadways, non-motorized and transit facilities within the downtown, and evaluates traffic operations.

Downtown Renton is centered along S 2nd Street and S 3rd Street between Rainier Avenue S and Mill Avenue S. Business activity is denser in the east end of downtown, where there is a mix of retail, restaurant and commercial activity. The west end of the downtown features a shopping area along Rainier Avenue S.

Roadway Facilities

S 2nd Street is generally 44 feet wide and provides 3 to 4 westbound travel lanes with one block of on-street parking between Williams Avenue S and Burnett Avenue S. Although traffic volumes are about the same as S 3rd Street, at approximately 10,000 vehicles per day, S 2nd Street experiences less congestion because of the 4-lanes of capacity. Between Logan Avenue S and Shattuck Avenue S, there is a landscape median that splits the 4-lanes into two 2-lane westbound sections. Renton High School is located on the north side of this section of S 2nd Street. Adjacent land uses are generally auto-oriented with off-street parking, and building entrances oriented away from the street. Key corridor destinations include the City Center Parking Garage and Renton Transit Center.

S 3rd Street serves the core of Renton's downtown with two eastbound travel lanes. The street width is 44 feet west of Burnett Avenue S, and 40 feet east of Burnett Avenue S. On-street parking is generally provided on both sides of the street. For the one block from Logan Avenue S to Burnett Avenue S, parking on the south side of the street is not allowed and an eastbound right-turn lane is provided. East of Mill Avenue S, S 3rd Street becomes Houser Way N.

Houser Way N provides a one-way eastbound connection from downtown Renton to SR 169 and Sunset Boulevard N. Houser Way N is 2-lanes from Mill Avenue S to just east of the bridge over the Cedar River. A limited amount of on-street parking is allowed just east of Mill Avenue S. The roadway widens to 4-lanes approaching the intersection with Bronson Way.

S 2nd Street, 3rd Street and Houser Way N have posted speed limits of 25 miles per hour and traffic signals at all major intersections.

Williams Avenue S and **Wells Avenue S** serve as a north-south, one-way couplet providing access to the downtown and residential areas to north and south of downtown. Williams Avenue S has a paved width of approximately 40 feet and has two southbound lanes with on-street parking on both sides. Williams Avenue S typically has traffic signals at major intersections. The segment of Wells Avenue S, south of the Cedar River is approximately 40 feet wide with two northbound lanes and parking on both sides of the street. North of the Cedar River, Wells Avenue N narrows to approximately 30 feet wide with a single travel lane and on-street parking on both sides of the street.

Rainier Avenue S is a north-south principal arterial that forms the west end of the downtown. The segment of Rainier Avenue S between S Grady Way and S 3rd Street was recently improved to include two general purpose lanes and one business access and transit (BAT) lane in each direction. From just north of S 3rd Street to Airport Way, there are three general purpose lanes in each direction.

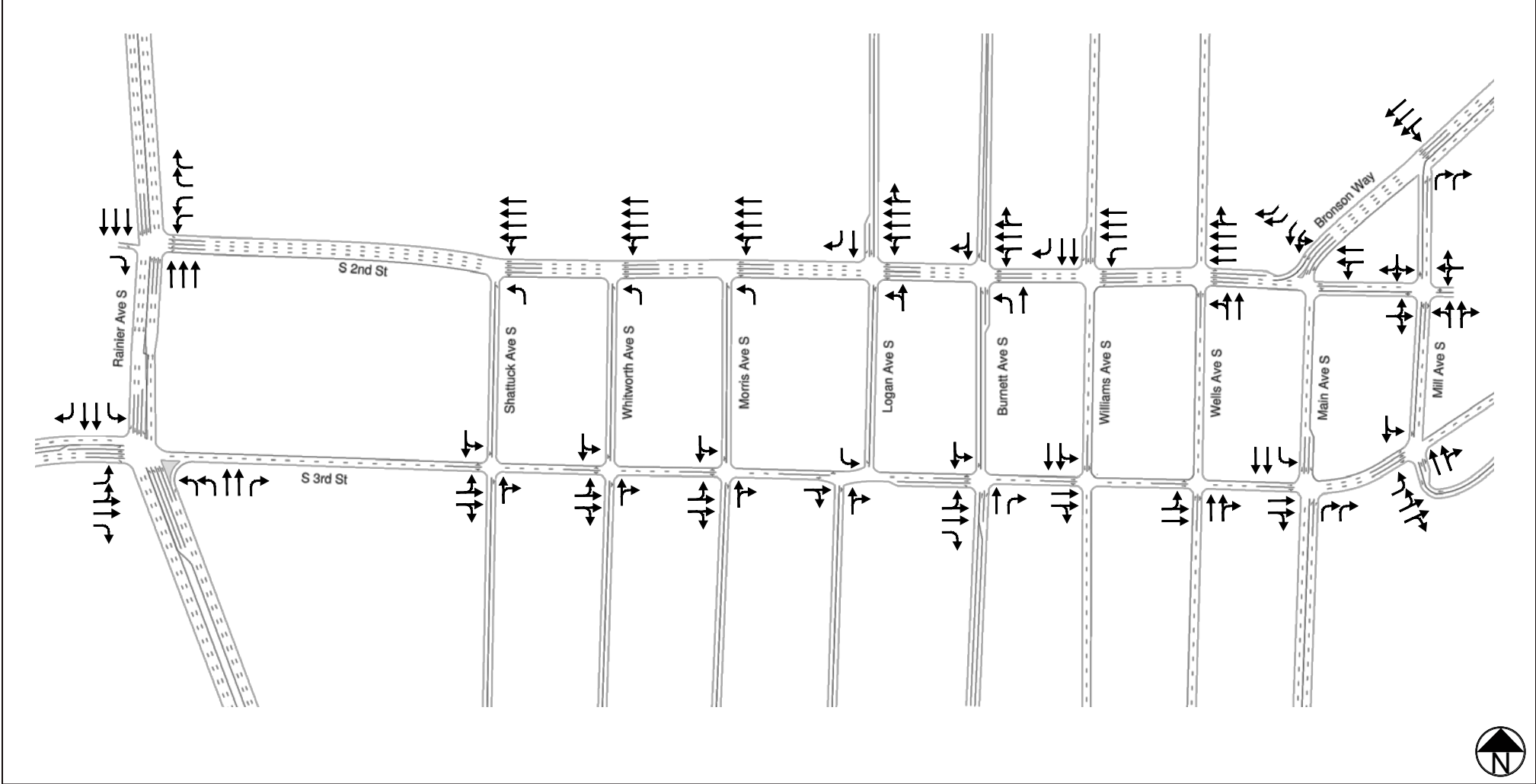
Logan Avenue S serves north-south traffic in downtown with one travel lane in each direction. North of Airport Way, Logan Avenue N becomes a high volume arterial connecting to the Boeing plant, The Landing development, and the NE Park Drive interchange with I-405.

Main Avenue S is a north-south arterial that connects Bronson Way N to S Grady Way. From S 2nd Street to S 3rd Street, its current configuration is a one-way street with two southbound travel lanes and a southbound left turn lane approaching S 3rd Street. South of S 3rd Street, Main Avenue S has two-way operations with two travel lanes in each direction and added turn lanes at intersections.

Bronson Way S connects downtown Renton to SR 169 and Sunset Boulevard N. Between Mill Avenue S and Houser Way N, Bronson Way has two travel lanes in each direction and a center lane for left turn movements. From Mill Avenue S to Main Avenue S, Bronson Way N becomes one-way with four westbound lanes.

Figure 3 shows the existing intersection channelization for the study intersections.

Figure 3. Existing Channelization



Non-Motorized Facilities

Downtown has a network of sidewalks and crosswalks that connect businesses, housing, Transit Center, High School, and adjacent neighborhoods. Most downtown sidewalks vary between 7 and 10 feet in width.

There are no existing bicycle facilities within downtown Renton. The *Renton Trails and Bicycle Master Plan (2009)* recommends S 2nd Street, S 3rd Street, Williams Avenue S, Wells Avenue S, and Burnett Avenue S be designated as signed shared roadways. The plan recommends the creation of a multi-use trail through downtown along the Houser Way N alignment that would connect with the existing Cedar River Trail. The plan also identifies Shattuck Avenue S, Logan Avenue S (north of S 2nd Avenue S) and Main Avenue S (south of 3rd Avenue S) for bicycle lanes. These would link downtown to the Lake Washington Loop Trail.

Transit Service

The Renton Transit Center connects downtown Renton to regional destinations served by King County Metro and Sound Transit. With the one-way couplet configuration, buses travel eastbound on S 3rd Street and westbound on S 2nd Street, accessing the transit center on Logan Avenue S and Burnett Avenue S. In addition to the Transit Center, there are bus stops along S 3rd Street at Shattuck Avenue S and near Rainier Avenue S, and on S 2nd Street east of Lake Avenue S. Additional bus stops are located on Main Avenue S and Mill Avenue S within downtown. Two adjacent parking garages provide a total of 300 spaces for the transit center.

Table 1 shows the 17 bus routes and destinations that serve the transit center.

Table 1. Renton Transit Center Bus Routes and Destinations

Service	Routes and Destinations
RapidRide (Metro)	RapidRide F Line – North Renton to Burien
King County Metro	101, 106 – Downtown Renton to Downtown Seattle 105, 908 – Downtown Renton to Renton Highlands 107 – Downtown Renton to Rainier Beach 110, 143, 907 – Enumclaw to Downtown Seattle 148 – Fairwood to Downtown Seattle 153, 169 – Downtown Renton to Kent 167 – Downtown Renton to University District 240 – Downtown Renton to Bellevue 342 – Downtown Renton to Shoreline
Sound Transit	ST 560 – West Seattle to Bellevue ST 566 – Auburn to Overlake

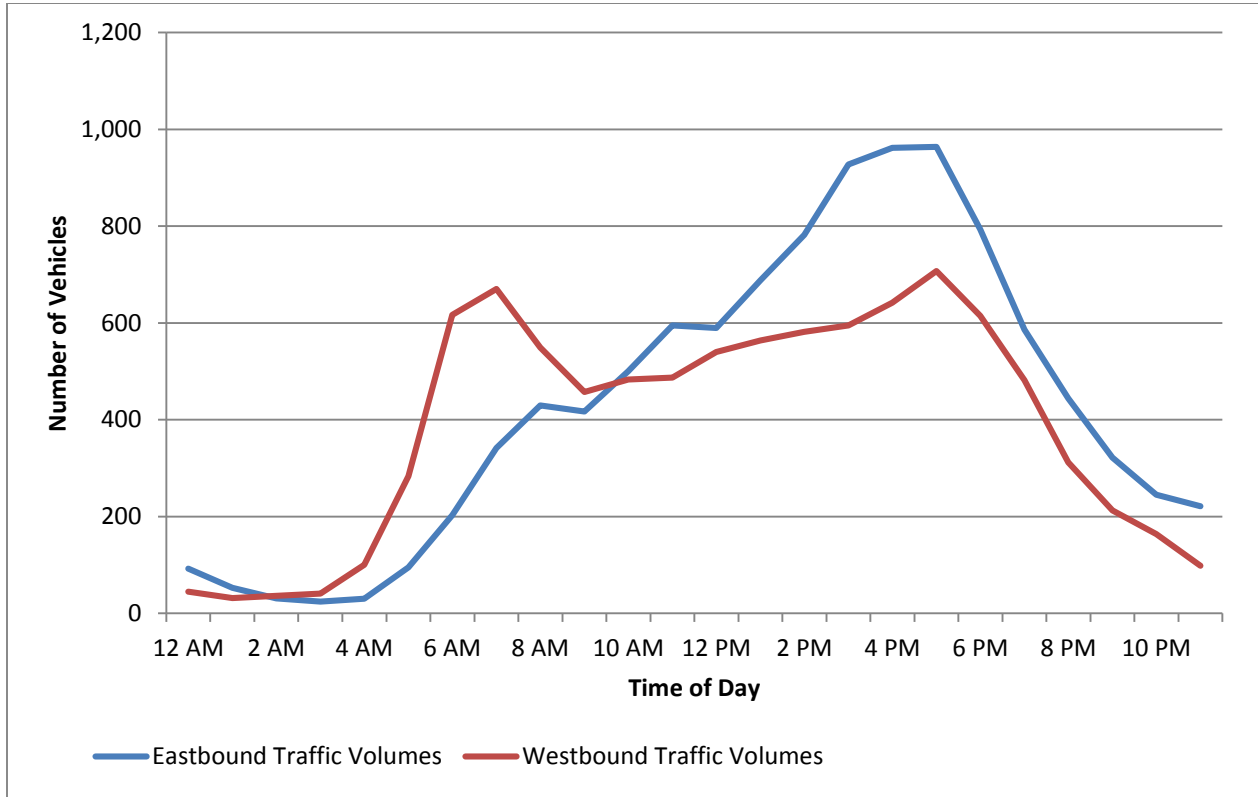
Source: King County Metro as of 11/17/2015

Traffic Volumes

KPG collected new traffic counts during the first week of September 2015. Both westbound S 2nd Street and eastbound S 3rd Street carry approximately 10,000 vehicles per day. **Figure 4** shows the existing weekday hourly traffic volumes on S 2nd Street and S 3rd Street. The traffic

volume show typical directional peaking with higher westbound traffic during the AM peak and heavy eastbound traffic during the PM peak. The peak hour of traffic occurs between 5:00 PM and 6:00 PM when there are 960 eastbound vehicles and 710 westbound vehicles.

Figure 4. Weekday Volumes on S 2nd Street and S 3rd Street, west of Burnett Avenue S



Source: Two day average traffic count: 9/2/2015 – 9/3/2015.

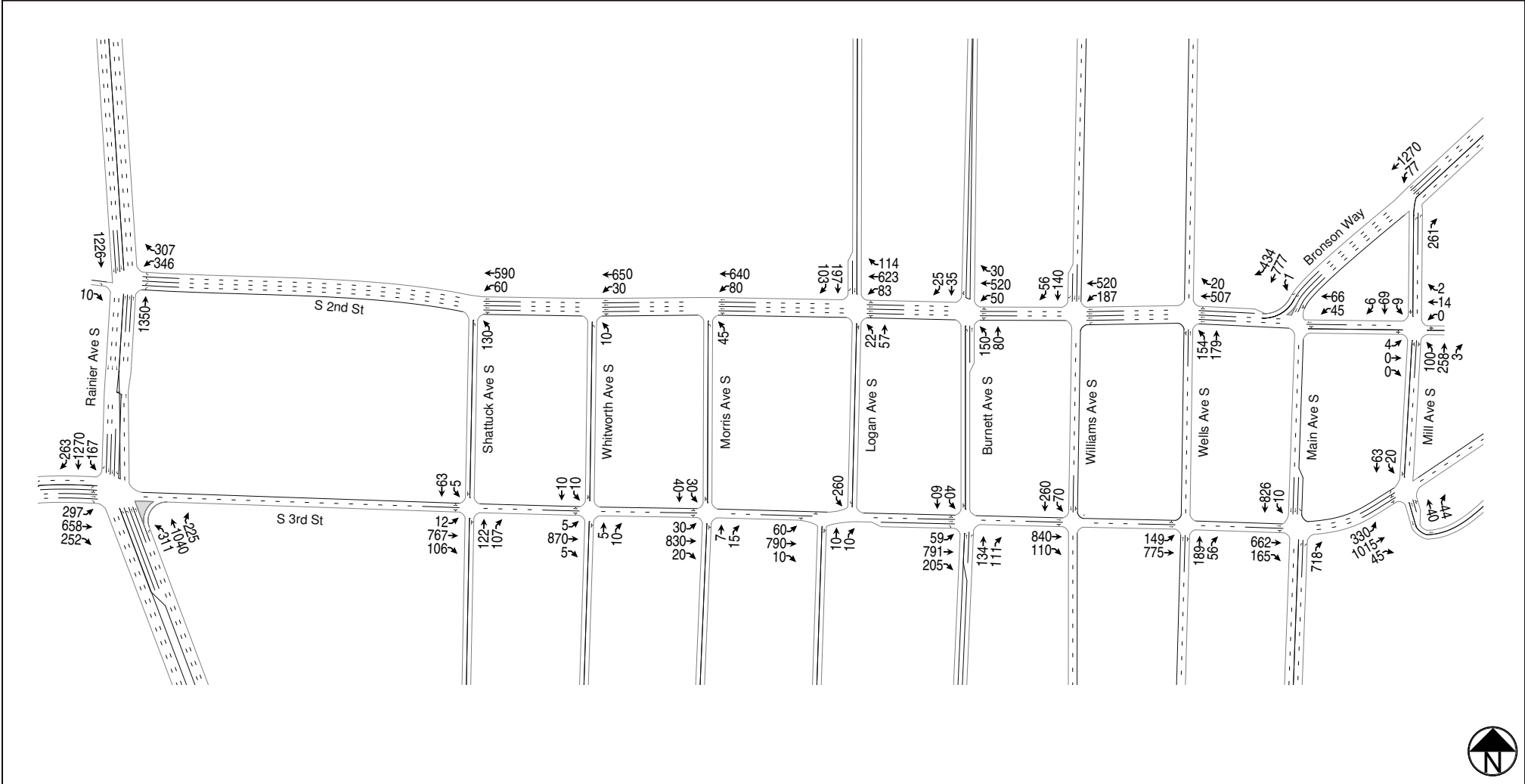
Williams Avenue S and Wells Avenue S have lower daily traffic volumes. Between S 2nd Street and S 3rd Street, Williams Avenue S carries approximately 3,500 vehicles per day and Wells Avenue S carries approximately 2,500 vehicles per day.

The PM peak hour represents the highest volumes in the downtown area and is the focus of this traffic analysis. **Figure 5** shows the 2015 existing PM peak hour intersection volumes for the downtown study intersections.

Traffic Operations

KPG analyzed intersection level of service (LOS) with Synchro 9 and SimTraffic software. LOS is a measurement of the quality of traffic flow and intersection LOS is defined by the seconds of delay experienced by vehicles traveling through the intersection. The intersection LOS grading ranges from A to F, with LOS A assigned when minimal delays are present and LOS F when lengthy delays occur. **Table 2** shows the LOS criteria for signalized and unsignalized intersections.

Figure 5. 2015 Existing PM Peak Hour Volumes



↑ Existing PM Peak Hour Volume

Table 2. Level of Service Criteria for Signalized and Unsignalized Intersections

Level of Service	Signalized Average Delay per Vehicle (seconds)	Unsignalized Average Delay per Vehicle (seconds)
A	0 to 10	0 to 10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	> 80	> 50

Source: 2010 Highway Capacity Manual

Table 3 shows the 2015 existing PM peak hour intersection LOS for the study intersections. With the exception of Rainier Avenue S/S 3rd Street, all downtown intersections operate at LOS C or better during PM peak hour.

Table 3. Existing PM Peak Hour Intersection Level of Service

ID	Study Intersections		Intersection Control	LOS
1	Rainier Ave S	S 2nd Street	Signal	B
2	Shattuck Ave S	S 2nd Street	2-Way Stop/Ped Signal	B
3	Whitworth Ave S	S 2nd Street	2-Way Stop	B
4	Morris Ave S	S 2nd Street	2-Way Stop/Ped Signal	B
5	Logan Ave S	S 2nd Street	Signal	A
6	Burnett Ave S	S 2nd Street	Signal	B
7	Williams Ave S	S 2nd Street	Signal	A
8	Wells Ave S	S 2nd Street	Signal	A
9	Main Ave S	S 2nd Street	Signal	A
10	Mill Ave S	S 2nd Street	2-Way Stop	C
11	Mill Ave S	Bronson Way N	2-Way Stop	A
12	Rainier Ave S	S 3rd Street	Signal	D
13	Shattuck Ave S	S 3rd Street	Signal	B
14	Whitworth Ave S	S 3rd Street	2-Way Stop	B
15	Morris Ave S	S 3rd Street	Signal	A
16	Logan Ave S	S 3rd Street	Signal	B
17	Burnett Ave S	S 3rd Street	Signal	B
18	Williams Ave S	S 3rd Street	Signal	A
19	Wells Ave S	S 3rd Street	Signal	A
20	Main Ave S	S 3rd Street	Signal	B
21	Mill Ave S	S 3rd Street	Signal	A

Note: For 2-way stop-controlled intersections, delay reported for the worst stop-controlled approach.

Houser Way Two-Way Analysis – East of Main Avenue S

A first step in the future year analysis was to determine if the segment of Houser Way from Main Avenue S to Bronson Way N should be converted from one-way to two-way operations. Two-way operations would add new vehicle movements and signal phases to the Houser Way intersections at Bronson Way N, Mill Avenue S and Main Avenue S. The analysis reviewed the traffic operations, roadway widening needs, physical constraints, and potential benefits for property access. Based on this analysis, the study recommends that Houser Way remain in a one-way configuration based on the following factors:

- Overall reduction in vehicle capacity along Houser Way and Bronson Way N.
- Negative impacts to traffic operations at the Bronson Way N/SR 169 interchange with I-405 due to limited space between intersections, new signal phases, increased weaving, and potential queue blockages.
- Lack of intersection capacity at the Houser Way S/Main Avenue S intersection and inability to widen Houser Way S without impacting Veterans Memorial Park or the BNSF rail alignment.
- Narrow two-lane bridge over the Cedar River would require an eastbound lane drop from two lanes to one lane before the bridge.
- Widening for the left turn from westbound Bronson Way N to southbound Houser Way N would impact the roadway alignment and adjacent signal and railroad poles.
- Few developments along this segment of Houser Way that could take advantage of the two-way circulation. The BNSF railroad tracks run along the south side of Houser Way and Liberty Park is located along the north side.

Based on this recommendation, Houser Way is assumed to remain in its existing one-way eastbound configuration for the remainder of the analysis.

Future Traffic Volumes

This section describes the travel demand modeling and the future transportation network that led to the development of future traffic volumes. Future volumes were developed for both baseline conditions with one-way operations and for the change to two-way operations.

Travel Demand Model

KPG used the City of Renton EMME travel demand model to forecast 2025 and 2035 PM peak hour traffic volumes. The travel demand model predicts future traffic volumes and travel patterns based on adopted land use policies and future street network.

Land Use Forecasts

The City of Renton develops existing and future land use forecasts to show where population and employment will be accommodated within the city as part of its Comprehensive Planning process. For this analysis, the City's 2035 land use forecasts represents 20 years of growth, and the 2025 forecasts assume that half of this growth will occur in the next 10 years.

2025 Transportation Network

The 2025 model network assumes the completion of the City of Renton's Six-Year 2015-2020 TIP, which includes the following projects within the study area:

- Logan Avenue N between Cedar River and N 8th Street (TIP #3): road widening and a new traffic signal.
- Rainier Avenue S Phase 4 between S 3rd Street to NW 3rd Place (TIP #7): addition of a southbound Business Access and Transit (BAT) lane to support transit operations.
- Main Avenue S/Downtown Circulation Project (TIP #8): conversion to two-way operation between S 3rd Street and Mill Avenue S.
- S 7th Street between Rainier Avenue S and Talbot Road S (TIP #15): road widening and a new traffic signal.
- S Grady Way between Rainier Avenue S and Talbot Road S (TIP #16): multimodal improvements to the corridor.

2035 Transportation Network

The 2035 model network assumes the completion of the 2015-2020 TIP projects and also WSDOT's I-405 Renton to Bellevue Project, which contains the following improvements:

- One additional lane in each direction on I-405 between SR 169 and Bellevue.
- Operation of I-405 between SR 167 and Bellevue as two general purpose lanes and two express toll lanes in each direction.
- A new I-405 express toll lane direct access interchange at N 8th Street in Renton.

- An express toll lane direct connection ramp from northbound SR 167 to northbound I-405 and another from southbound I-405 to southbound SR 167.

Baseline Conditions Traffic Volumes

The baseline conditions represent the current one-way operations of S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S, and includes the projects from the 2025 and 2035 Transportation Networks listed on the previous page.

Table 4 shows the existing and 2025 and 2035 baseline PM peak hour traffic volumes and growth at select locations within the downtown. The amount of growth varies by location, with an average overall increase of 17 percent by 2025 and 32 percent by 2035.

Table 4. 2015 Existing Volumes and 2025 and 2035 Baseline Forecasts - PM Peak Hour

Street	Location	2015 Existing Volume	2025 Baseline Forecast	2035 Baseline Forecast	% Growth (2015-2025)	% Growth (2015-2035)
S 2nd Street	East of Logan Avenue S	820	900	1,040	10%	27%
S 3rd Street	East of Logan Avenue S	1,050	1,220	1,400	16%	33%
Williams Ave S	South of S 2nd Street	330	480	670	45%	103%
Wells Ave S	South of S 2nd Street	340	540	750	59%	120%

Source: Renton Travel Demand Model, 2015

Two-Way 2025 Traffic Volumes

The conversion of the one-way streets to two-way traffic represents a significant change to the traffic patterns within downtown. KPG developed 2025 PM peak hour traffic volumes that reflect the change to two-way operations within downtown. With two-way operation, vehicle shifts occur with approximately 250 westbound vehicles shifting from S 2nd Street to S 3rd Street and 330 eastbound vehicles shifting from S 3rd Street to S 2nd Street. Similarly, approximately 130 southbound vehicles would shift from Williams Avenue S to Wells Avenue S and 220 northbound trips would shift from Wells Avenue S to Williams Avenue S.

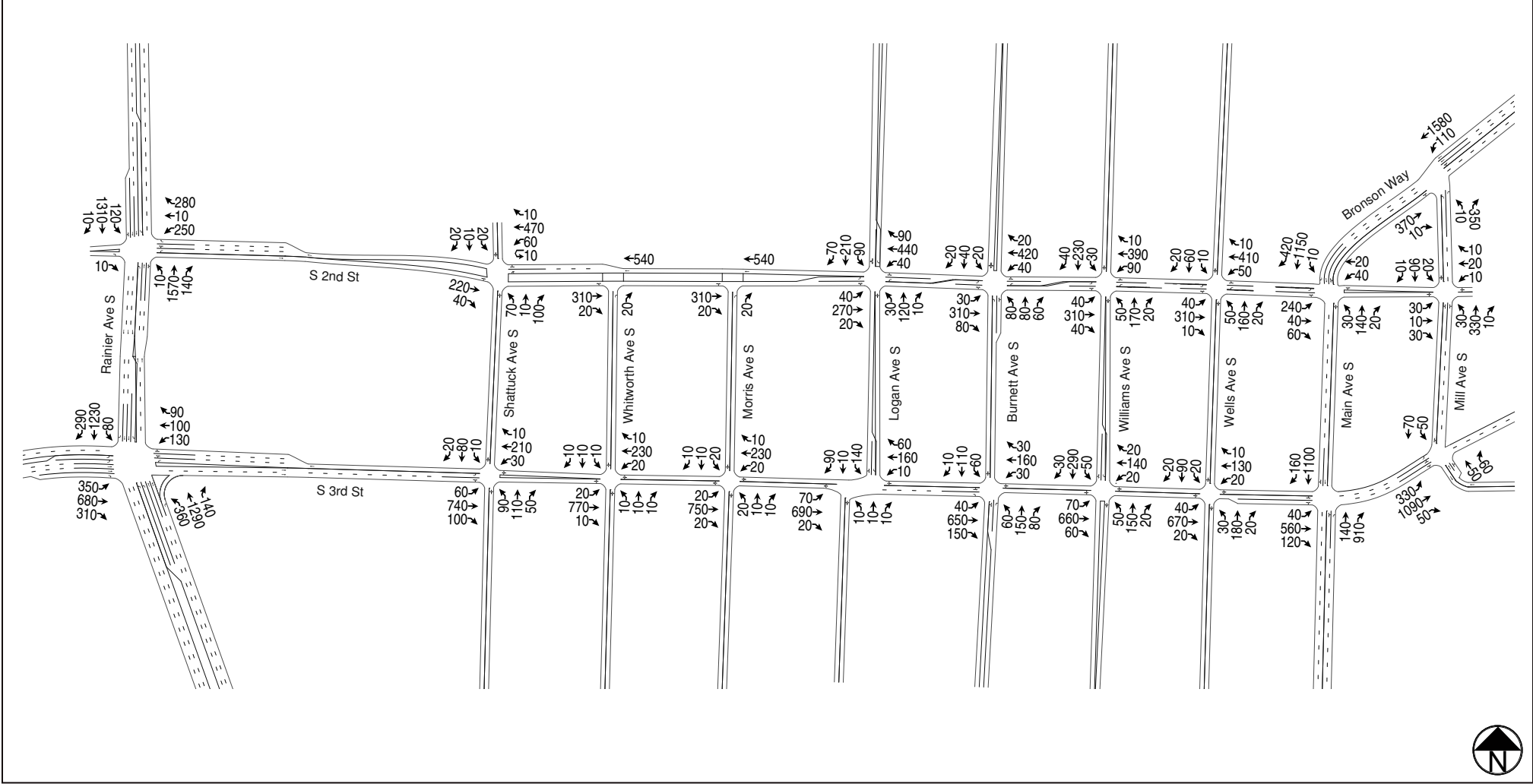
Figure 6 shows the 2025 traffic volumes in the downtown core with two-way operations.

2035 Two-Way Traffic Volumes

The analysis developed 2035 PM peak hour volumes that show two-way operations within the downtown. With two-way operation, approximately 370 westbound vehicles would shift from S 2nd Street to S 3rd Street and 470 eastbound vehicles would shift from S 3rd Street to S 2nd Street. Similarly, approximately 190 southbound vehicles would shift from Williams Avenue S to Wells Avenue S and 370 northbound trips would shift from Wells Avenue S to Williams Avenue S.

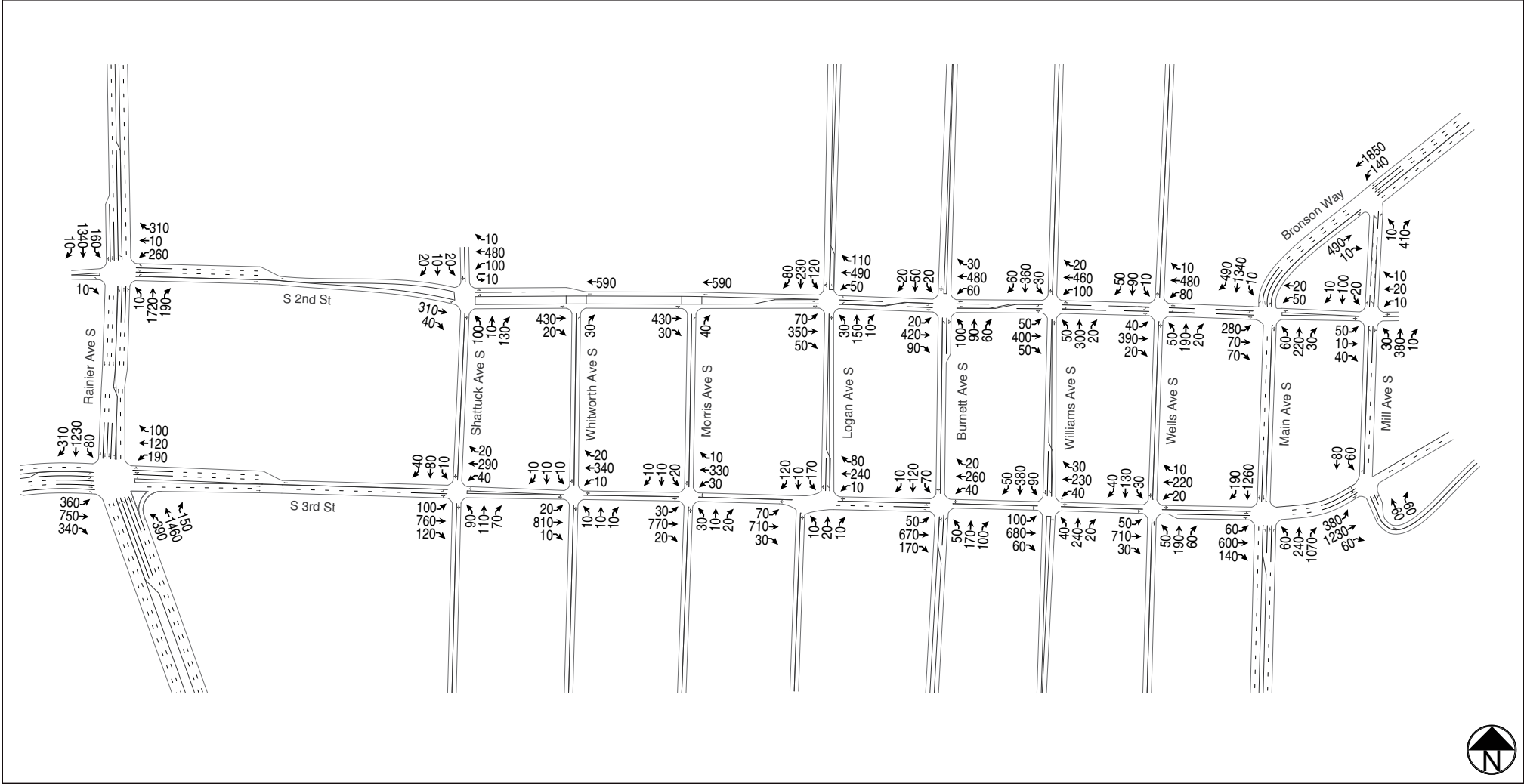
Figure 7 shows the 2035 traffic volumes in the downtown core with two-way operations.

Figure 6. 2025 Two-Way PM Peak Hour Volumes



↑ 2025 PM Peak Hour Volume

Figure 7. 2035 Two-Way PM Peak Hour Volumes



↑ 2035 PM Peak Hour Volume

Two-Way Conversion Scenarios

The section evaluates two scenarios with two-way operations on S 2nd Street, S 3rd Street, William Avenue S and Wells Avenue S. Both scenarios assume two-way travel with a single travel lane each direction. Scenario 1 limits turn lanes to a few intersections, while Scenario 2 includes additional turn lanes at high volume locations. Turn lane improvements for Scenarios 1 and 2 are the same for the analysis of 2025 and 2035 conditions.

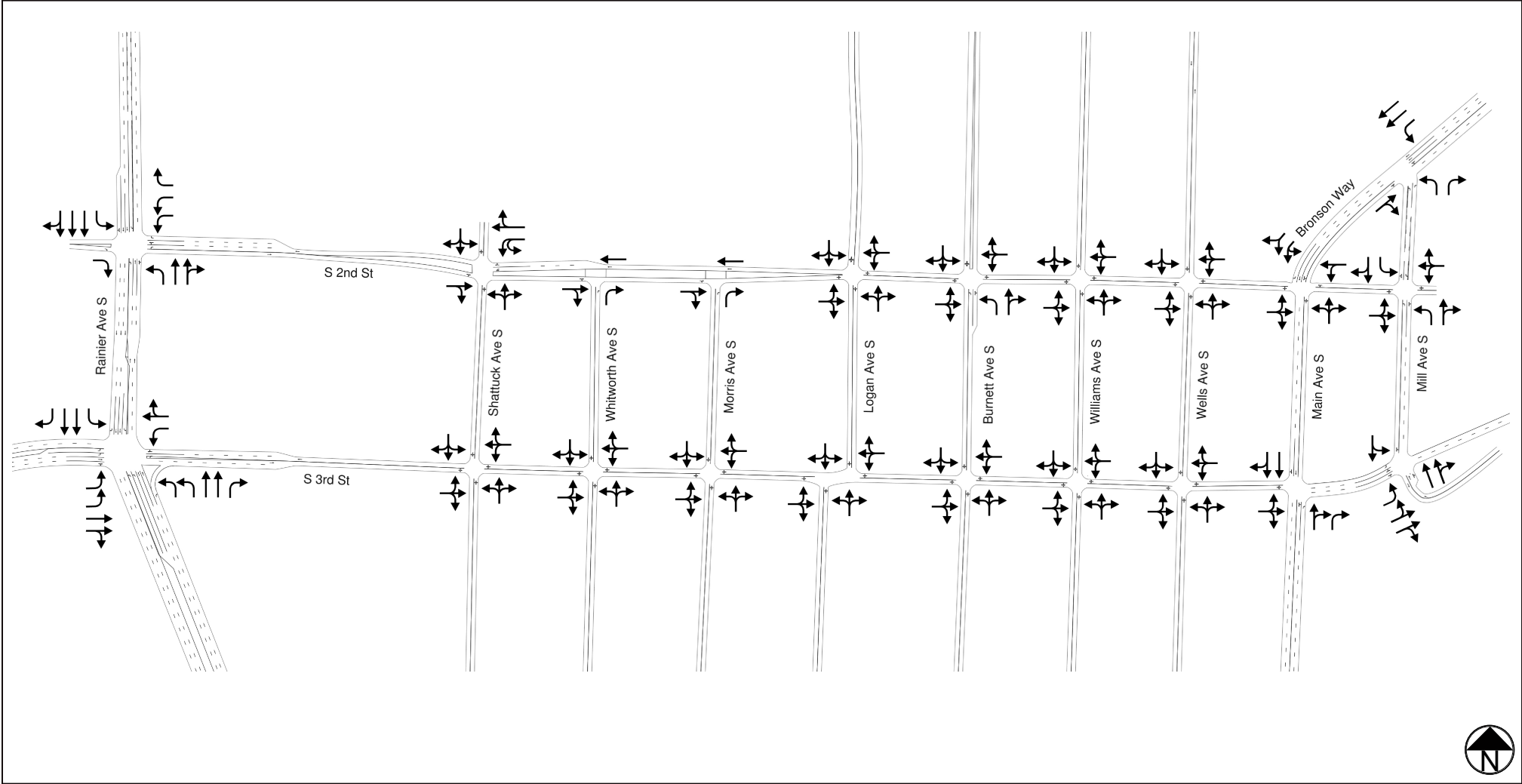
The section also reviews the potential effects of two-way operations on transit and parking, evaluates PM peak hour signal warrants, and provides an initial look at the west segment of Houser Way S between Burnett Avenue S and Main Avenue S.

Scenario 1: Two-Lane Configuration

Scenario 1 provides a single lane in each direction with limited turn lanes in order to prioritize on-street parking and reduce project costs and impacts to right-of-way. No turn lanes are included on S 2nd Street and S 3rd Street, east Shattuck Avenue S. Scenario 1 also reduces southbound Bronson Way approaching S 2nd Street to two lanes in order to reduce the pedestrian crossing distance and provide a larger plaza in the northwest corner of the intersection. **Figure 8** shows the intersection channelization for Scenario 1. The intersection locations with turn lanes are described below:

- Rainier Avenue S/S 2nd Street – Channelize westbound approach to two left turn lanes and a right turn lane, and add a southbound left turn lane.
- Rainier Avenue S/S 3rd Street – Reconfigure eastbound approach to two left turn lanes, a through lane, and a shared through/right turn lane. Reconfigure westbound approach to a left turn lane and a shared through/right turn lane.
- Shattuck Avenue S/S 2nd Street – Create westbound left/U-turn lane and add a full signal at this intersection.
- Burnett Avenue S/S 2nd Street – Retain the existing northbound left turn lane for transit operations.
- Williams Avenue S/S Grady Street – Reconfigure southbound approach to a shared left/through lane and a right turn lane. Add eastbound left turn lane.
- Wells Avenue S/S Grady Way – Add southbound right turn lane and restrict southbound left turn movement.

Figure 8. Scenario 1 Channelization



Scenario 2: Two-Lane with Select Turn Lanes

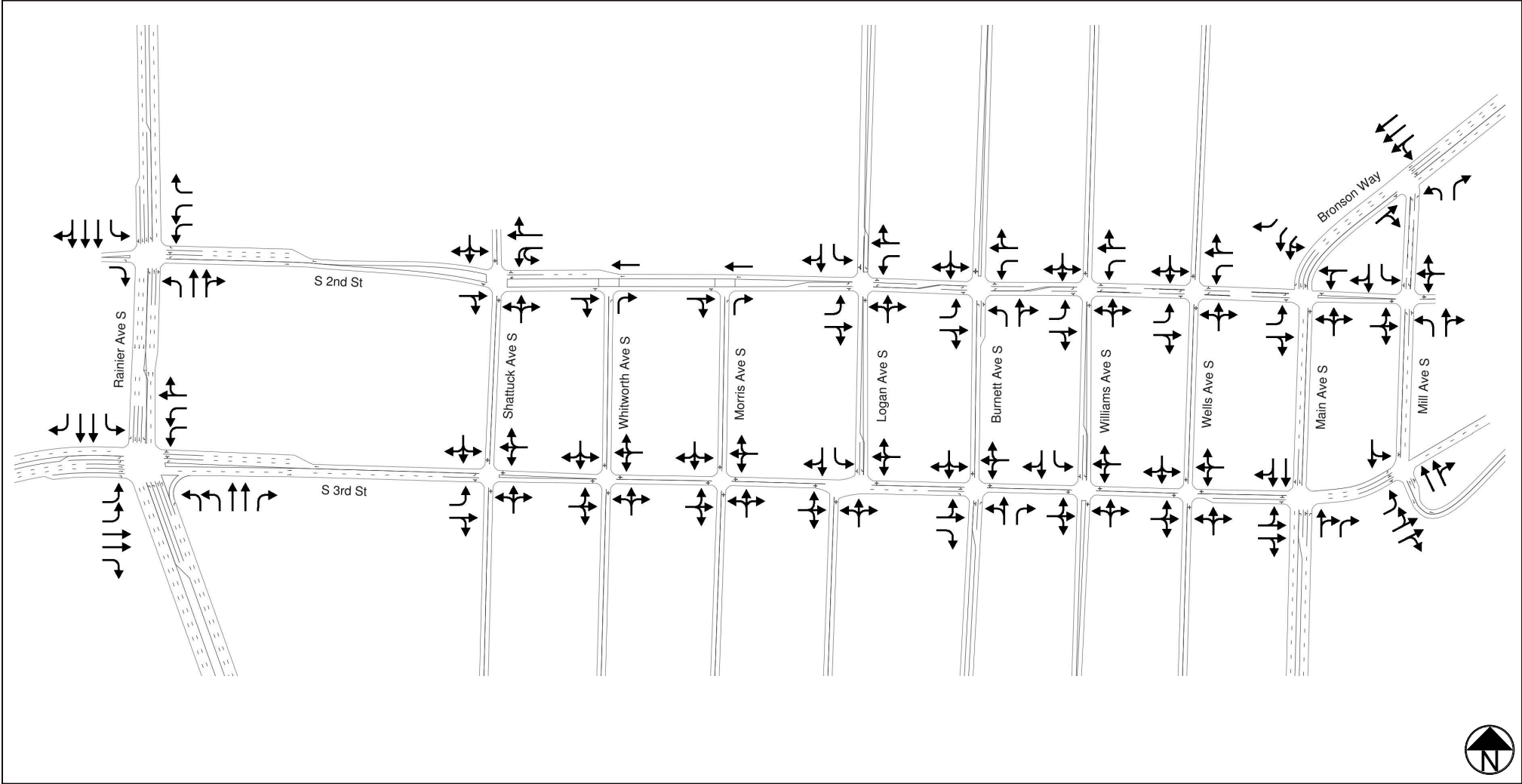
Scenario 2 includes the turn lanes in Scenario 1 and provides additional turn lanes at location with high turning movements in order to reduce intersection delay. The provision of turn lanes improves traffic flows but on-street parking is usually removed on one side of the street. Since retaining on-street parking is important for downtown businesses, turn lanes are only included at select locations. Scenario 2 has three southbound lanes on Bronson Way approaching S 2nd Street.

Based on the future traffic volumes and operations analysis, turn lanes are included at the following locations.

- Rainier Avenue S/S 3rd Street – Widen eastbound approach to two left turn lanes, two through lanes and a right turn lane. Widen westbound approach to two left turn lanes and a shared through/right turn lane.
- Shattuck Avenue S/S 3rd Street – Add eastbound left turn lane.
- Logan Avenue S/S 2nd Street – Add southbound left turn lane.
- Logan Avenue S/S 3rd Street – Add southbound left turn lane.
- S 2nd Street between Logan Avenue S and Main Avenue S – Create a 3-lane section with 1-lane in each direction and a center left turn lane.
- Burnett Avenue S/S 3rd Street – Retain existing eastbound right turn lane and northbound right turn lane.
- Williams Avenue S/S 3rd Street – Add southbound left turn lane.
- Main Avenue S/S 3rd Street – Add eastbound left/through lane.

Figure 9 shows the intersection channelization under Scenario 2.

Figure 9. Scenario 2 Channelization



Traffic Operations

This section describes the 2025 and 2035 PM peak hour traffic operations for baseline conditions (one-way traffic), two-way Scenario 1 and two-way Scenario 2 with select turn lanes.

2025 Traffic Operations

KPG analyzed the traffic operations of the downtown intersections for baseline conditions and with two-way operations under Scenarios 1 and 2. **Table 5** compares the PM peak hour intersection level of service for existing, 2025 baseline, and 2025 for the two-way conversion scenarios. Under Scenario 1, the two intersections of Rainier Avenue S/S 3rd Street and Main Avenue S/S 2nd Street would operate at LOS E. Scenario 2 would add turn lanes at both intersections to improve operations. All other downtown intersections are forecast to operate at LOS D or better.

Table 5. 2025 PM Peak Hour Level of Service – Baseline and Two-Way Scenarios

ID	Intersection		2015 Existing	2025 One-Way Baseline	2025 Two-Way Scenario 1	2025 Two-Way Scenario 2: Select Turn Lanes
1	Rainier Ave S	S 2nd Street	B	C	B	B
2	Shattuck Ave S	S 2nd Street	B*	B*	B^	B^
3	Whitworth Ave S	S 2nd Street	B*	B*	B*	B*
4	Morris Ave S	S 2nd Street	B*	B*	B*	B*
5	Logan Ave S	S 2nd Street	A	A	B	B
6	Burnett Ave S	S 2nd Street	A	A	A	A
7	Williams Ave S	S 2nd Street	A	A	B	B
8	Wells Ave S	S 2nd Street	A	B	B	B
9	Main Ave S	S 2nd Street	A	C	E	C
10	Mill Ave S	S 2nd Street	C*	C*	C*	C*
11	Mill Ave S	Bronson Way N	A*	B*	C*	C*
12	Rainier Ave S	S 3rd Street	D	D	E	D
13	Shattuck Ave S	S 3rd Street	B	B	C	B
14	Whitworth Ave S	S 3rd Street	B*	B*	D*	D*
15	Morris Ave S	S 3rd Street	A	A	D*	D*
16	Logan Ave S	S 3rd Street	B	B	C	C
17	Burnett Ave S	S 3rd Street	B	B	C	B
18	Williams Ave S	S 3rd Street	A	B	C	C
19	Wells Ave S	S 3rd Street	A	A	B	B
20	Main Ave S	S 3rd Street	B	C	D	B
21	Mill Ave S	S 3rd Street	A	A	A	A

Note: ^Assumes a new signal. *2-way stop-controlled intersection with delay reported for the worst stop-controlled approach.

2035 Traffic Operations

The analysis evaluated the operations of the downtown intersections for baseline conditions and with two-way operations under Scenarios 1 and 2. **Table 6** compares the PM peak hour intersection level of service for existing, 2035 baseline, and 2035 for the two-way conversion scenarios.

Under Scenario 1, the two intersections of Rainier Avenue S/S 3rd Street and Main Avenue S/S 2nd Street are forecast to operate at LOS F. The addition of select turn lanes in Scenario 2 would improve operations at Rainier Avenue S/S 3rd Avenue S to LOS E, and Main Avenue S/S 2nd Street to LOS C. The remaining intersections are forecast to operate at LOS E or better during the 2035 PM peak hour.

Table 6. 2035 PM Peak Hour Level of Service – Baseline and Two-Way Scenarios

ID	Intersection		2015 Existing	2035 One-Way Baseline	Scenario 1: 2035 Two-Way without Turn Lanes	Scenario 2: 2035 Two-Way with Select Turn Lanes
1	Rainier Ave S	S 2nd Street	B	C	C	C
2	Shattuck Ave S	S 2nd Street	B*	C*	B^	B^
3	Whitworth Ave S	S 2nd Street	B*	B*	B*	B*
4	Morris Ave S	S 2nd Street	B*	B*	B*	B*
5	Logan Ave S	S 2nd Street	A	A	C	C
6	Burnett Ave S	S 2nd Street	A	B	B	B
7	Williams Ave S	S 2nd Street	A	A	C	B
8	Wells Ave S	S 2nd Street	A	B	B	B
9	Main Ave S	S 2nd Street	A	E	F	C
10	Mill Ave S	S 2nd Street	C*	C*	C*	C*
11	Mill Ave S	Bronson Way	A*	B*	E*	E*
12	Rainier Ave S	S 3rd Street	D	E	F	E
13	Shattuck Ave S	S 3rd Street	B	B	C	C
14	Whitworth Ave S	S 3rd Street	B*	C*	D*	D*
15	Morris Ave S	S 3rd Street	A	A	E*	E*
16	Logan Ave S	S 3rd Street	B	C	D	C
17	Burnett Ave S	S 3rd Street	B	C	D	B
18	Williams Ave S	S 3rd Street	A	B	E	C
19	Wells Ave S	S 3rd Street	A	B	D	C
20	Main Ave S	S 3rd Street	B	C	E	B
21	Mill Ave S	S 3rd Street	A	B	A	A

Note: ^Assumes a new signal. *2-way stop-controlled intersection with delay reported for the worst stop-controlled approach.

Additional Two-Way Analysis

The section evaluates the potential effects of two-way operations on transit and parking, evaluates PM peak hour signal warrants, and provides an initial look at the west segment of Houser Way S between Burnett Avenue S and Main Avenue S.

Transit Operations

The conversion of S 2nd Street and S 3rd Street would allow transit routes operate in both directions on a single street, allowing transit stops to be paired along opposite sides of the street instead of one block apart as currently configured. In addition, transit vehicles destined for the Transit Center could be routed to minimize left turns, improving circulation. The City will need to coordinate with King County Metro and Sound Transit to explore potential bus routing option with the conversion to two-way operations on S 2nd Street and S 3rd Street.

On-Street Parking

On street parking is important for the success of businesses in the downtown. On-street parking is provided on both sides of S 3rd Street, Williams Avenue S and Wells Avenue S for the majority of blocks in the downtown. S 2nd Street offers more opportunities to add on-street parking as it is only provided for the one block between Williams Avenue S and Burnett Avenue S.

Scenario 1 would maximize on-street parking in the downtown, while Scenario 2 requires a trade-off between parking spaces and added turn lanes. **Table 7** shows the potential change in on-street parking spaces along S 2nd Street and S 3rd Street for the two-way scenarios. This analysis represents a preliminary estimate and the actual number of spaces will be determined as part of the design process.

There are currently 118 on-street parking spaces along S 2nd Street and 3rd Street between Rainier Avenue S and Mill Avenue S. Scenario 1 would provide approximately 66 more parking spaces than today. Most of these spaces would be located along the S 2nd Street where the majority of the current land uses have been developed with off-street parking lots. Scenario 2 would provide 25 more spaces than existing, but would provide 31 fewer spaces than Scenario 1 due to the addition of turn lanes.

Table 7. On-Street Parking Spaces along S 2nd Street and S 3rd Street for Scenarios

Street	Location	Existing Conditions	Two-Way Scenario 1	Two-Way Scenario 2 with Select Turn Lanes
S 2nd Street	West of Logan Ave S	0	+42	+36
S 2nd Street	East of Logan Ave S	5	+43	+20
S 3rd Street	West of Logan Ave S	69	-19	-24
S 3rd Street	East of Logan Ave S	44	0	-7
Total		118	+66	+25

Source: KPG 2015

Signal Warrant Analysis

KPG conducted a PM peak hour signal warrant analysis for study intersections to determine if new signals would be justified and if existing signals might be candidates for removal. The warrant analysis follows the 2009 Manual of Uniform Traffic Control Devices (MUTCD) and only evaluates one (Warrant 3, Peak Hour) of the eight possible warrants. **Table 8** summarizes the results of the PM peak hour signal warrant analysis.

Results of the peak hour signal warrant analysis found that an additional signal would be warranted at Shattuck Avenue S/S 2nd Street by 2035. The signal at Morris Avenue S/S 3rd Street does not meet the PM peak hour warrant under 2025 and 2035 conditions. Further consideration and additional analysis of warrants should be conducted prior to a final determination at these locations.

Table 8. PM Peak Hour Signal Warrant Analysis

Intersection		Existing Control	2025	2035	Preliminary Recommendation
Shattuck Ave S	S 2nd Street	Ped Signal		Yes	Add full signal for peds, safety & circulation
Whitworth Ave S	S 2nd Street	Stop			Stop – consider ped crossing
Morris Ave S	S 2nd Street	Ped Signal			Ped signal for school crossing
Logan Ave S	S 2nd Street	Signal	Yes	Yes	Signal
Burnett Ave S	S 2nd Street	Signal		Yes	Signal for peds & buses
Williams Ave S	S 2nd Street	Signal	Yes	Yes	Signal
Wells Ave S	S 2nd Street	Signal		Yes	Signal for peds & circulation
Mill Ave S	S 2nd Street	Stop			Stop control
Mill Ave S	Bronson Way	Stop			Stop control – consider additional warrant analyses
Shattuck Ave S	S 3rd Street	Signal	Yes	Yes	Signal
Whitworth Ave S	S 3rd Street	Stop			Stop control
Morris Ave S	S 3rd Street	Signal			*Potential to remove signal
Logan Ave S	S 3rd Street	Signal	Yes	Yes	Signal
Burnett Ave S	S 3rd Street	Signal	Yes	Yes	Signal
Williams Ave S	S 3rd Street	Signal	Yes	Yes	Signal
Wells Ave S	S 3rd Street	Signal		Yes	Signal for peds & circulation
Burnett Ave S	S 4th Street	Signal		Yes	Signal
Williams Ave S	S 4th Street	Stop		Yes	Stop control/future signal
Wells Ave S	S 4th Street	Stop			Stop control
Williams Ave S	S Grady Way	Signal	Yes	Yes	Signal
Wells Ave S	S Grady Way	None			Stop control – restrict SB left

* Complete full warrant analysis & context relative to pedestrian crossings.

Houser Way Circulation Analysis – West of Main Avenue S

The analysis also reviewed the potential impacts of closing the segment of Houser Way between Burnett Avenue S and Main Avenue S to create a multi-use trail through downtown along the Houser Way alignment connecting with the Cedar River Trail.

The roadway is shared with the BNSF tracks which are incorporated into the paved roadway width. West of Burnett Avenue S, the BNSF tracks return to a dedicated alignment. The existing configuration of this segment of Houser Way is a single lane with one-way operation in the southwest direction to Williams Avenue S and one-way in the northeast direction from Burnett Avenue S to Williams Avenue S. There is typically parallel parking on both sides of street, truck loading zones, and a number of access points to parking areas, business garages, alleyways, and the front doors to two businesses. Traffic volumes are very light and therefore closure of the street would have little impact to area-wide traffic operations. However, the loss of 30 parking spaces, truck loading zones and access to property would be difficult to accommodate elsewhere.

Based on our review of the street and field work, we recommend keeping Houser Way open as a local access street. Bicycles could be accommodated by marking the street as a bicycle-priority street that allows local vehicle one-way access and bicyclists two-way access.

Recommendations

This section describes the recommendations from the downtown traffic circulation analysis. The analysis recommends changing S 2nd Street, S 3rd Street, Williams Avenue S and Wells Avenue S to two-way operations to improve traffic circulation, access to businesses, and the pedestrian environment. This study does not recommend two-way operations for the east segment of Houser Way from Main Avenue S to Bronson Way N due to negative impacts to traffic operations and limited space for street widening.

The results of the traffic analysis show that two-way operations can accommodate the future volumes with one travel lane in each direction with the addition of recommended turn lanes and improvements at select locations. To guide the design of the downtown streets, the recommended improvements are divided into three tiers based on importance to traffic operations.

Tier 1 Improvements

The highest priority improvements needed to maintain traffic operations and accommodate future volumes in the downtown. These improvements should be included in the design of the two-way streets.

- Main Avenue S/S 2nd Street – Add eastbound left turn lane. This improvement is included with the current design of the Main Avenue S/Downtown Circulation Project that will be constructed in 2016.
- Main Avenue S/S 3rd Street – Add eastbound shared left/through lane. Eastbound curb lane may be able to be used for on-street parking outside the weekday afternoon peak period.
- Rainier Avenue S/S 2nd Street – Channelize westbound approach to two left turn lanes and a right turn lane and add a southbound left turn lane.
- Rainier Avenue S/S 3rd Street – Widen eastbound approach to two left turn lanes, two through lanes and a right turn lane. Widen westbound approach to two left turn lanes and a shared through/right turn lane.
- Williams Avenue S/S Grady Street – Reconfigure southbound approach to a shared left/through lane and a right turn lane. Add eastbound left turn lane.
- Wells Avenue S/S Grady Way – Add southbound right turn lane and restrict southbound left turn movement.

Tier 2 Improvements

These turn lanes support traffic circulation within the downtown, but not as important as Tier 1 projects to maintain overall traffic operations. The addition of these improvements needs to be balanced with the reduction of on-street parking, impacts to right-of-way, and project costs.

- Shattuck Avenue S/S 2nd Street – Create westbound left/U-turn lane and add a full signal at this intersection. This will allow westbound vehicles to turn south onto Shattuck Avenue S.
- Shattuck Avenue S/S 3rd Street – Add eastbound left turn lane that extends back to Rainier Avenue S to better enable vehicles to travel from eastbound S 3rd Street to eastbound S 2nd Street without traveling on northbound Rainier Avenue S.
- Morris Avenue S/S 3rd Street – Evaluate additional signal warrants to remove the existing traffic signal.
- Burnett Avenue S/S 2nd Street – Retain the existing northbound left turn lane for transit operations.
- Logan Avenue S/S 2nd Street – Add southbound left turn lane.
- S 2nd Street between Logan Avenue S and Wells Avenue S – Create a 3-lane section with one lane in each direction and a center left turn lane.
- Williams Avenue S/S 3rd Street – Add southbound left turn lane.

Long-Term Improvements

These improvements benefit traffic operations and circulation, but require significant investment due to impacts to private property. These improvements may occur with the redevelopment of adjacent properties.

- Main Avenue S/S 2nd Street intersection – Add northbound left turn lane. Improvement would require widening Main Avenue S and would impact properties on the east side of the street.
- Main Avenue S/S 3rd Street intersection – Add northbound left turn lane. Improvement would require widening Main Avenue S and would impact adjacent properties and railroad tracks.
- Intersections of Logan Avenue S/S 3rd Street and Smithers Avenue S/S 3rd Street – Realign the streets to form one intersection in order to simplify signal phasing and north-south traffic flow. Improvement would impact adjacent properties.