



COUNCIL STAFF REPORT

Blue Line Extension

FROM: John Sutter, Community Development Director

TO: Anne Norris, City Manager (for February 10 work session)

DATE: February 3, 2022

SUBJECT: Review updated Blue Line Extension concept plans and traffic information

On Feb. 2 staff received new materials which Metro Transit and Hennepin County (“the project”) will present for an interactive discussion with the City Council at the Feb. 10 work session. City staff has not had time to go through these new materials in detail and the project may also provide additional new materials at the work session. Other materials have been seen by the Council at previous work sessions.

The project clearly wants to reduce the roadway from 6 lanes to 4, with LRT at-grade in the widened median, and an interchange at Bass Lake Road to bridge Bottineau Blvd traffic over the intersection. Based on previous work sessions, the City Council is not unified in its opinion about either the lane reduction or interchange.

The goal of the Feb. 10 work session will be for the project to present their materials in an informal setting, address Councilmember questions and concerns about the project’s preferred option, and listen to Councilmember suggestions for alternatives and mitigation.

The following materials are attached:

1. City staff questions from Dec. 15 (black) and project response from Feb. 2 (blue)
2. Traffic Counts and Forecasts (previously provided Dec. 21)
3. Travel time comparison, Hwy 100 - I-94 (previously provided Sep. 23)
4. Travel time comparison, Wilshire - 63rd (previously provided Dec. 21)
5. Traffic level of service comparison, Hwy 100 - I-94 (previously provided Sep. 23)
6. Traffic level of service comparison, 4-6-4 vs interchange at Bass Lake Road
7. 4-6-4 option (previously provided Dec. 21, some images updated)
8. Interchange option (previously provided Dec. 21, some images updated)
9. Right of way comparison (previously Dec. 21)

February 2, 2022

Blue Line LRT Extension Project responses to:
 Questions/comments from the City of Crystal dated 12/15/2021:

Note: The Blue Line LRT Extension Project responses are bulleted in blue text below each question/comment.

TRAFFIC

1. Looks like 2021 counts are roughly the same as 2015 and lower than 2019.
 - o Yes, very similar.
2. Need detail tables to go along with updated VISSIM models (4-6-4 vs interchange).
 - o Provided in an attached document.
3. Need explanation for divergence in BLR vs 63rd segments of Bottineau on count/forecast table.
 - o 2040 traffic forecasts were developed independently of 2030 forecasts as part of the recent comprehensive planning process. The regional travel demand model developed by Met Council was used as a base model from which the County further refined traffic analysis zones (TAZs) to include additional roadway segments and updated population and employment forecasts. The resulting 2040 traffic forecasts were a direct result of the roadway system and surrounding land use trips being distributed between origins and destinations.
4. Proposed lane reduction from Wilshire-100 is a different issue than BLR-Wilshire 4-6-4 vs interchange question:
 - a. Previous county documents show 6 lanes are needed (see attached 2002 guidelines and 2020 map).
 - o Below is a summary of existing 6-lane County roadways. No additional 6-lane roadways are planned and some may be reprioritized in the future to accommodate HOV, transit, etc.

Existing 6 Lane Roadways	ft	mi
CR 81	22,130	4.191
CR 34	1,900	0.360
CR 17	10,824	2.050
CR 1	5,440	1.030
CR 152	3,540	0.670
CR 109	1,730	0.328
CR 14	3,000	0.568
	48,564	9.198

- b. Some Councilmembers want 6 lanes maintained - don't take anything away to build LRT.
 - o The County is preparing a letter summarizing its position on CR 81 related to the BLRT project and changing County policies related to their recently published Climate Action Plan.
- c. Metro Transit and Hennepin County need to make a point-by point case for why it will work.
 - o The Project is preparing a bulleted point by point summary of how a four lane CR 81 can accommodate the BLRT along with existing and planned future traffic volume.
- d. Interchange may solve overall Bottineau through traffic travel time problem, but city is also concerned about delays for cross streets and local access across/onto Bottineau at Wilshire, Corvallis and 47th.
 - o While some cross streets movements will experience increases in delays with the addition of LRT, the overall increase is anticipated to be minor. By comparing the results of the No-Build and Build scenarios

for side street movements at Wilshire, Corvallis, and 47th; most delay increases are shown to be 10 seconds or less.

- e. Has the (traffic) world really permanently changed because of work from home, etc? Need to do another full set of comparable counts in fall 2022 before seeking municipal consent.
 - o No one knows for sure. There are industry indicators forecasting that peak hour travel will likely never return to the equivalent post Covid highs (due to full and partial work-from-home and more flexible work hour arrangements) and that daily traffic numbers may show decreases as well (due to work-from-home changes).
 - o The County will continue to conduct traffic counts to aid in planning efforts moving forward.

- f. Where else on the county system are there current and projected volumes like this? (Examples.)
 - o Volumes like those in the vicinity of Bass Lake Road, typically occur near freeways and interstates. Below are examples from across our system:
 - CSAH 81 (Bottineau Blvd) just south of I-94/694 to HWY 169
 - CSAH 152 (Brooklyn Blvd) north and south of I-94/694
 - CSAH 12 (Noble Pkwy) just north of HWY 610
 - CSAH 14 (Zane Ave) just north of HWY 610
 - CSAH 61 (Hemlock Ln) north and south of I-94/694
 - CSAH 61 (Flying Cloud Dr) south of I-494
 - CSAH 10 (Bass Lake Rd) just west of I-494
 - CSAH 109 (Weaver Lake Rd) just east of I-94
 - CSAH 62 (62nd Street) just west of I-494
 - CSAH 34 (Normandale Ave) just south of I-494
 - CSAH 17 (France Ave) just north of I-494
 - CSAH 32 (Penn Ave) just south of I-494
 - CSAH 1 (98th Street) near I-35W

- g. Has the county changed how it will design other suburban arterials? (Examples.)
 - o Yes. In 2021 the County endorsed MNDOT "setting a preliminary goal of a 20% reduction in Vehicle Miles Traveled (VMT) statewide by 2050". One way that MnDOT specifically has identified accomplishing this is by "prioritizing transit and high-occupancy vehicles (HOV) on MnDOT-owned right of way". The County is developing similar policies.

4-6-4 OPTION

- a. What design speed assumptions are being used?
 - o The current concept layout was not engineered to a specific design speed however, is more companionable with the 45 mph posted speed south of the intersection than the higher posted speed to the north.

- b. Why aren't 6 lanes shown through Wilshire, with the transition to 4 lanes between Wilshire and the CP bridge? That was the condition before the 2015 restriping which extended the 6 lane segment all the way to 47th. The 2015 configuration worked OK from Bass Lake Road through Wilshire; it was the Wilshire-100 segment, still striped for 4 lanes, that didn't work well. Need to re-do the layout to mimic the 2015 condition and re-run the traffic simulation based on 6 lanes through the Wilshire intersection.
 - o The current concept layout was prepared with the additional through lanes for the Bass Lake Road intersection beginning and ending at Wilshire, as opposed to carrying through the intersection. We will continue to evaluate design options and refinements if this option moves forward for further study.

INTERCHANGE OPTION

- a. What design speed assumptions are being used?

- The current concept layout was not engineered to a specific design speed, however is more companionable with the 45 mph posted speed south of the intersection than the higher posted speed to the north.
- b. Still very concerned about short distance from southbound ramp merge and Wilshire intersection, and the lack of a merge lane. This will look, feel and operate like a freeway interchange - would any highway department design an interchange with no merge lane? What about weaving from the ramp to the left turn bay at Wilshire? Has this configuration been recently designed/built anywhere? (Examples.)
 - The overall design is truly a concept layout and this area (and others) require more detailed design attention to progress toward an engineered layout.
- c. ROW taking is more negatively impactful for interchange option than for 4-6-4:
 - Crystal already has a shortage of living wage jobs compared to other cities.
 - 5500 Lakeland (Crystal Business Commons) is one of the few places where living wage jobs can be found in Crystal.
 - Taking would eliminate not only parking but also vehicular access and circulation to northwesterly half of building front.
 - Even if not a total taking, the partial taking will make this building functionally obsolete.
 - Need to explore shifting the Wilshire-BLR segment west to minimize impacts on east side.
 - We will continue to evaluate design options and refinements if this option moves forward for further study.
- d. Benefit to the city would be no ownership & maintenance responsibility for a ped bridge - we presume Metro Transit would own & maintain the trail from the park & ride to the Crystal Lake Regional Trail on the east side of Bottineau, including plowing.
 - It is likely that Metro Transit would maintain the portion of the trail within the station/platform area.
- e. What is the anticipated span length of the bridges?
 - The main span (directly over Bass Lake Road) is the longest. We have not designed that span but using engineering judgement came up with a working length of around 150' to develop the renderings. This span length would be refined through the design process.
- f. Under-bridge areas - examples look nice but don't fit this context:
 - There's no river or other natural amenity directly adjacent.
 - There are no complimentary uses adjacent or nearby.
 - Duplicates existing 12 acre Becker Park.
 - Who would own and maintain these amenities? City struggles to maintain what we already have.
 - The area under the CR 81 bridges would be County right-of-way. The potential treatment and programming of that space is yet to be determined. The prepared renderings represented one possible vision of how that space could be designed using similar recent projects completed by MnDOT (Hastings, Winona) as inspiration.

CR 81 Traffic Volumes

Annual average daily traffic (AADT) is the estimated average daily traffic volume experienced in both directions of a roadway segment considering the seasonal variation in traffic in a one-year period.

	Segment	2005 AADT ¹ (vehicles/day)	2015 AADT ² (vehicles/day)	2019 AADT ³ (vehicles/day)	2021 AADT ⁴ (vehicles/day)	2030 Forecast ⁵ (vehicles/day)	2040 Forecast ⁶ (vehicles/day)
A	CR 81, 63 rd Ave to Bass Lake Rd	23,900	26,500	28,500	26,500	35,000	34,000
B	CR 81, Bass Lake Rd to Wilshire Blvd	23,900	27,000	31,000	26,700	36,000	32,000
C	CR 81, Wilshire Blvd to Corvallis Ave				28,100		
D	CR 81, Corvallis Ave to 47 th Ave				29,900		
E	CR 81, 47 th Ave to TH 100 ramps	28,500	32,500	38,000	33,100		39,000



- Existing volumes during the design phase for the CR 81 reconstruction.
- Volumes after the CR 81 reconstruction but before the restriping to 6 lanes between 47th Ave and Wilshire Blvd.
- Volumes after the CR 81 restriping to 6 lanes between 47th Ave and Wilshire Blvd.
- Volumes collected in October 2021.
- Forecasts used in the design phase for the CR 81 reconstruction.
- Forecasts in the current Hennepin County Transportation Plan.

Travel Time Comparison

CR 81 Corridor – TH 100 Interchange to I-94 Interchange
(approx. 3 miles)

***"Build" is with
interchange at
Bass Lake Road***

Northbound

Peak Hour	No-Build	Build	Overall Change
AM	4 min 53 sec	4 min 48 sec	- 5 sec
PM	4 min 55 sec	5 min 28 sec	+ 33 sec

Southbound

Peak Hour	No-Build	Build	% Change
AM	5 min 23 sec	5 min 21 sec	- 2 sec
PM	5 min 42 sec	5 min 17 sec	- 25 sec



Travel Time Comparison

*CR 81 Corridor – Wilshire Boulevard to 63rd Avenue N
(approx. 1.4 miles)*

Northbound

Peak Hour	4-6-4	Grade-Separated	Difference
AM	2 min 36 sec	2 min 5 sec	- 31 sec
PM	2 min 50 sec	2 min 18 sec	- 32 sec

Southbound

Peak Hour	4-6-4	Grade-Separated	Difference
AM	2 min 46 sec	1 min 59 sec	- 47 sec
PM	2 min 32 sec	1 min 54 sec	- 38 sec



**No-Build - AM Peak Hour
CR 81 - Crystal**

**Build - AM Peak Hour
CR 81 - Crystal**

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ 63rd Ave N	Eastbound	Left	43.7	D	87
		Through	40.7	D	134
		Right	7.1	A	128
	Westbound	Left	42.7	D	196
		Through	40.0	D	221
		Right	8.2	A	118
	Northbound	Left	53.5	D	46
		Through	23.5	C	710
		Right	3.1	A	57
	Southbound	Left	47.2	D	106
		Through	21.2	C	1325
		Right	1.1	A	28
Intersection			25.6	C	3156
CSAH 81 (Bottineau Blvd)/CSAH 10 (Bass Lake Rd)	Eastbound	Left	56.7	E	138
		Through	45.7	D	247
		Right	12.2	B	187
	Westbound	Left	51.3	D	71
		Through	46.2	D	277
		Right	6.3	A	98
	Northbound	Left	52.8	D	233
		Through	19.8	B	699
		Right	1.4	A	15
	Southbound	Left	59.4	E	62
		Through	29.9	C	1355
		Right	6.2	A	233
Intersection			30.5	C	3617
CSAH 81 (Bottineau Blvd)/Wilshire Blvd	Eastbound	Left	46.9	D	9
		Through	36.9	D	6
		Right	7.7	A	10
	Westbound	Left	72.9	E	297
		Through	80.9	F	23
		Right	24.9	C	80
	Northbound	Left	62.5	E	20
		Through	6.3	A	864
		Right	2.0	A	108
	Southbound	Left	44.2	D	62
		Through	10.4	B	1535
		Right	13.0	B	12
Intersection			17.2	B	3024

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ 63rd Ave N	Eastbound	Left	53.6	D	87
		Through	51.4	D	135
		Right	20.3	C	128
	Westbound	Left	48.0	D	197
		Through	43.0	D	223
		Right	9.2	A	118
	Northbound	Left	45.3	D	46
		Through	27.1	C	707
		Right	2.2	A	57
	Southbound	Left	54.6	D	106
		Through	24.1	C	1313
		Right	2.4	A	28
Intersection			29.6	C	3157
CSAH 81 (Bottineau Blvd) NB Ramps/CSAH 10 (Bass Lake Rd) - East Intersection	Eastbound	Left	0.7	A	136
		Through	0.1	A	313
	Westbound	Through	42.6	D	368
		Right	34.7	C	98
	Northbound	Left	62.1	E	233
		Right	9.0	A	14
Intersection			29.1	C	1162
CSAH 81 (Bottineau Blvd) SB Ramps/CSAH 10 (Bass Lake Rd) - West Intersection	Eastbound	Through	40.2	D	387
		Right	2.2	A	205
	Westbound	Left	1.3	A	89
		Through	0.2	A	510
	Southbound	Left	57.7	E	62
		Right	6.8	A	232
Intersection			14.4	B	1485
CSAH 81 (Bottineau Blvd)/Wilshire Blvd	Eastbound	Left	42.5	D	9
		Through	34.4	C	6
		Right	8.7	A	10
	Westbound	Left	47.3	D	299
		Through	48.1	D	23
		Right	12.3	B	80
	Northbound	Left	58.3	E	29
		Through	10.5	B	865
		Right	3.2	A	109
	Southbound	Left	41.3	D	51
		Through	18.4	B	1538
		Right	16.2	B	56
Intersection			19.3	B	3087

No-Build - AM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ Corvallis Ave N	Eastbound	Left	33.9	C	70
		Through	46.7	D	10
		Right	11.1	B	151
	Westbound	Left	33.4	C	65
		Through	46.3	D	30
		Right	4.9	A	46
	Northbound	Left	49.8	D	95
		Through	8.0	A	876
		Right	0.6	A	6
	Southbound	Left	59.0	E	5
		Through	16.1	B	1791
		Right	4.9	A	42
	Intersection			15.5	B
CSAH 81 (Bottineau Blvd)/47th Ave	Eastbound	Left	52.3	D	12
		Through	61.2	E	4
		Right	64.9	E	119
	Westbound	Left	39.2	D	60
		Through	43.3	D	14
		Right	10.6	B	24
	Northbound	Left	44.2	D	49
		Through	3.8	A	944
		Right	1.8	A	20
	Southbound	Left	84.5	F	3
		Through	12.6	B	1996
		Right	12.0	B	6
	Intersection			13.2	B
CSAH 81 (Bottineau Blvd)/MN 100 SB Off-Ramp	Eastbound	Left	-	-	-
		Through	-	-	-
		Right	-	-	-
	Westbound	Left	52.6	D	212
		Through	-	-	-
		Right	6.4	A	148
	Northbound	Left	-	-	-
		Through	3.2	A	865
		Right	-	-	-
	Southbound	Left	-	-	-
		Through	6.1	A	931
		Right	0.0	A	1244
	Intersection			9.5	A

Build - AM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ Corvallis Ave N	Eastbound	Left	31.9	C	74
		Through	42.7	D	10
		Right	19.2	B	151
	Westbound	Left	31.3	C	66
		Through	40.1	D	31
		Right	6.5	A	52
	Northbound	Left	48.5	D	94
		Through	13.5	B	877
		Right	0.8	A	6
	Southbound	Left	44.8	D	5
		Through	27.6	C	1784
		Right	10.2	B	42
	Intersection			23.6	C
CSAH 81 (Bottineau Blvd)/47th Ave	Eastbound	Left	56.1	E	12
		Through	55.3	E	4
		Right	62.5	E	119
	Westbound	Left	40.8	D	60
		Through	37.0	D	14
		Right	12.5	B	24
	Northbound	Left	46.3	D	49
		Through	4.3	A	945
		Right	1.5	A	20
	Southbound	Left	60.3	E	3
		Through	15.1	B	1987
		Right	13.4	B	6
	Intersection			14.8	B
CSAH 81 (Bottineau Blvd)/MN 100 SB Off-Ramp	Eastbound	Left	-	-	-
		Through	-	-	-
		Right	-	-	-
	Westbound	Left	68.4	E	212
		Through	-	-	-
		Right	9.0	A	148
	Northbound	Left	-	-	-
		Through	3.1	A	866
		Right	-	-	-
	Southbound	Left	-	-	-
		Through	4.7	A	929
		Right	0.0	A	1237
	Intersection			10.6	B

No-Build - PM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ 63rd Ave N	Eastbound	Left	55.3	E	105
		Through	49.1	D	234
		Right	8.1	A	51
	Westbound	Left	53.0	D	129
		Through	50.0	D	192
		Right	11.8	B	98
	Northbound	Left	60.0	E	126
		Through	32.5	C	1676
		Right	6.8	A	184
	Southbound	Left	47.1	D	120
		Through	19.2	B	683
		Right	0.8	A	58
Intersection			32.1	C	3655
CSAH 81 (Bottineau Blvd)/CSAH 10 (Bass Lake Rd)	Eastbound	Left	57.1	E	373
		Through	45.9	D	386
		Right	9.6	A	214
	Westbound	Left	61.7	E	120
		Through	53.4	D	411
		Right	13.8	B	164
	Northbound	Left	29.6	C	373
		Through	14.4	B	1699
		Right	4.9	A	40
	Southbound	Left	62.3	E	123
		Through	39.5	D	567
		Right	4.6	A	181
Intersection			30.1	C	4663
CSAH 81 (Bottineau Blvd)/Wilshire Blvd	Eastbound	Left	65.2	E	32
		Through	43.7	D	8
		Right	10.4	B	42
	Westbound	Left	55.6	E	121
		Through	65.3	E	4
		Right	9.0	A	88
	Northbound	Left	55.3	E	21
		Through	5.3	A	1958
		Right	3.7	A	107
	Southbound	Left	42.9	D	61
		Through	1.9	A	824
		Right	3.8	A	14
Intersection			8.1	A	3281

Build - PM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ 63rd Ave N	Eastbound	Left	70.3	E	104
		Through	61.9	E	233
		Right	10.3	B	51
	Westbound	Left	59.7	E	129
		Through	56.2	E	191
		Right	15.9	B	97
	Northbound	Left	69.3	E	122
		Through	39.6	D	1674
		Right	16.3	B	186
	Southbound	Left	75.0	E	122
		Through	21.7	C	686
		Right	0.9	A	58
Intersection			39.4	D	3665
CSAH 81 (Bottineau Blvd) NB Ramps/CSAH 10 (Bass Lake Rd) - East Intersection	Eastbound	Left	0.5	A	397
		Through	0.1	A	528
	Westbound	Through	60.3	E	529
		Right	53.3	D	163
	Northbound	Left	62.6	E	378
		Right	14.6	B	56
Intersection			31.9	C	2051
CSAH 81 (Bottineau Blvd) SB Ramps/CSAH 10 (Bass Lake Rd) - West Intersection	Eastbound	Through	43.9	D	803
		Right	4.5	A	195
	Westbound	Left	0.8	A	110
		Through	0.1	A	798
	Southbound	Left	86.3	F	122
		Right	7.5	A	180
Intersection			21.8	C	2208
CSAH 81 (Bottineau Blvd)/Wilshire Blvd	Eastbound	Left	74.6	E	71
		Through	84.4	F	9
		Right	23.1	C	50
	Westbound	Left	54.2	D	119
		Through	59.3	E	4
		Right	22.0	C	89
	Northbound	Left	57.2	E	22
		Through	29.5	C	1952
		Right	21.2	C	107
	Southbound	Left	54.3	D	45
		Through	14.2	B	811
		Right	6.6	A	12
Intersection			27.6	C	3303

No-Build - PM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ Corvallis Ave N	Eastbound	Left	50.2	D	84
		Through	57.5	E	27
		Right	6.0	A	145
	Westbound	Left	50.3	D	25
		Through	60.1	E	20
		Right	8.6	A	26
	Northbound	Left	63.3	E	162
		Through	8.5	A	1989
		Right	2.1	A	10
	Southbound	Left	67.4	E	40
		Through	20.3	C	892
		Right	2.4	A	44
	Intersection			16.6	B
CSAH 81 (Bottineau Blvd)/47th Ave	Eastbound	Left	55.2	E	14
		Through	65.9	E	16
		Right	85.9	F	69
	Westbound	Left	56.4	E	28
		Through	59.2	E	6
		Right	11.9	B	18
	Northbound	Left	43.8	D	131
		Through	2.3	A	2143
		Right	2.9	A	64
	Southbound	Left	89.7	F	7
		Through	9.8	A	1061
		Right	5.5	A	14
	Intersection			9.0	A
CSAH 81 (Bottineau Blvd)/MN 100 SB Off-Ramp	Eastbound	Left	-	-	-
		Through	-	-	-
		Right	-	-	-
	Westbound	Left	55.4	E	217
		Through	-	-	-
		Right	20.1	C	269
	Northbound	Left	-	-	-
		Through	4.1	A	2078
		Right	-	-	-
	Southbound	Left	-	-	-
		Through	0.7	A	624
		Right	0.0	A	534
	Intersection			8.3	A

Build - PM Peak Hour
CR 81 - Crystal

Intersection	Direction	Movement	Average Delay (sec/veh)	LOS	Modeled Volume (vph)
CSAH 81 (Bottineau Blvd)/ Corvallis Ave N	Eastbound	Left	47.9	D	83
		Through	50.3	D	27
		Right	9.1	A	146
	Westbound	Left	43.3	D	25
		Through	54.1	D	19
		Right	16.4	B	26
	Northbound	Left	48.6	D	160
		Through	18.5	B	1978
		Right	13.9	B	10
	Southbound	Left	78.5	E	46
		Through	25.3	C	905
		Right	3.0	A	49
	Intersection			23.0	C
CSAH 81 (Bottineau Blvd)/47th Ave	Eastbound	Left	59.0	E	14
		Through	61.4	E	16
		Right	81.8	F	68
	Westbound	Left	57.3	E	28
		Through	69.4	E	6
		Right	20.7	C	18
	Northbound	Left	45.4	D	131
		Through	7.2	A	2143
		Right	5.9	A	64
	Southbound	Left	70.4	E	7
		Through	10.5	B	1039
		Right	6.4	A	15
	Intersection			12.1	B
CSAH 81 (Bottineau Blvd)/MN 100 SB Off-Ramp	Eastbound	Left	-	-	-
		Through	-	-	-
		Right	-	-	-
	Westbound	Left	60.7	E	222
		Through	-	-	-
		Right	50.1	D	268
	Northbound	Left	-	-	-
		Through	6.0	A	2068
		Right	-	-	-
	Southbound	Left	-	-	-
		Through	6.2	A	606
		Right	0.0	A	529
	Intersection			13.6	B

**CR 81 - Crystal
Bass Lake Road
Build Conditions**

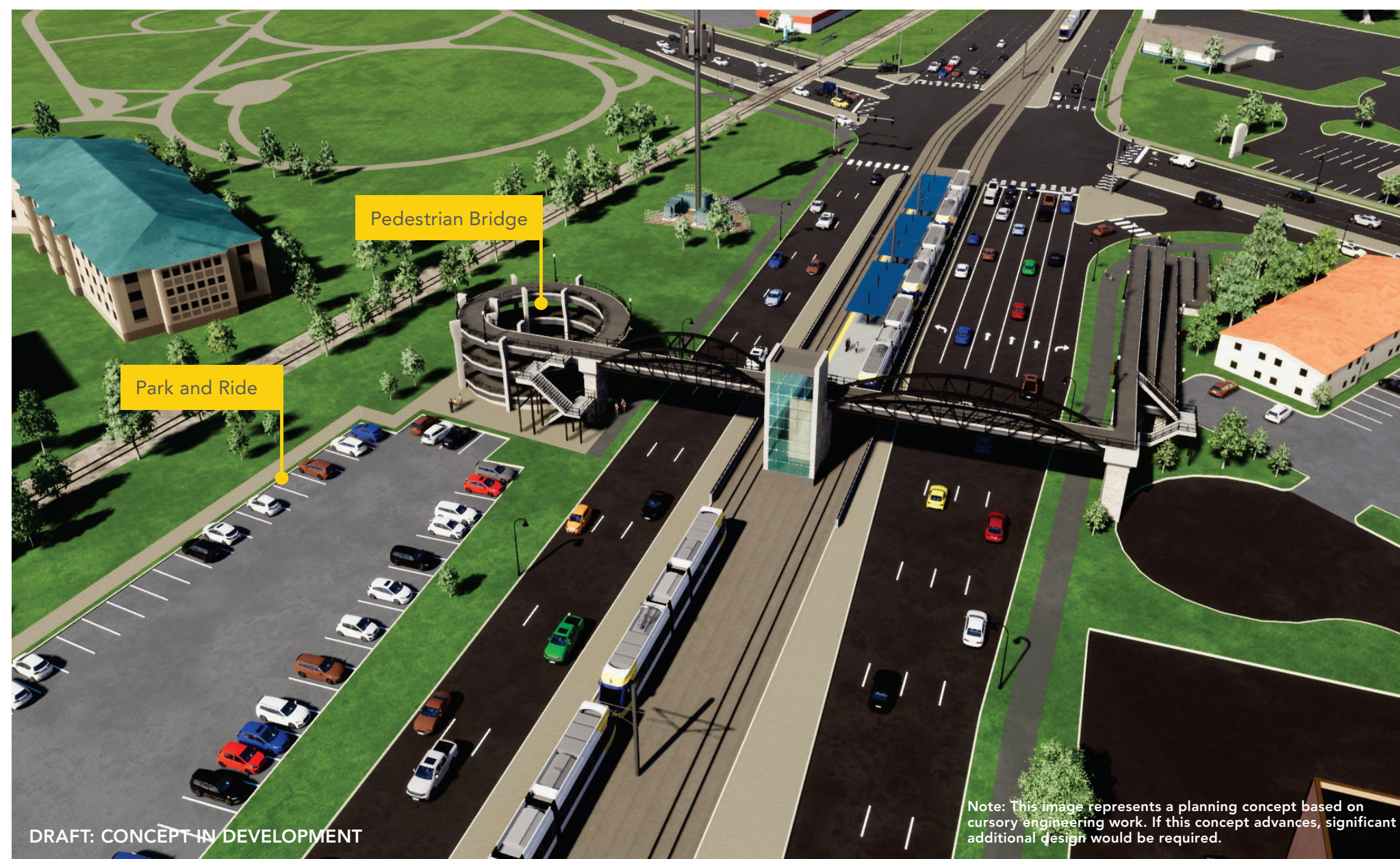
AM PEAK HOUR																		
Intersection	Direction	Movement	4-6-4 Concept						Intersection	Direction	Movement	Grade-Separated Concept						
			Average Delay (sec/veh)	LOS	Average Queue (ft)	Maximum Queue (ft)	Storage Length (ft)	Modeled Volume (vph)				Average Delay (sec/veh)	LOS	Average Queue (ft)	Maximum Queue (ft)	Storage Length (ft)	Modeled Volume (vph)	
CSAH 81 & Bass Lake Rd	Eastbound	Left	58.3	E	35	150	325	135	CSAH 81 NB Ramps & Bass Lake Rd (East Intersection)	Eastbound	Left	0.7	A	0	30	100	136	
		Through	49.9	D	5	100	425	252			Through	0.1	A	0	30	100	313	
		Right	9.6	A	0	50	450	204			Right	42.6	D	55	290	325	368	
	Westbound	Left	57.5	E	55	195	250	90		Westbound	Through	34.7	C	55	290	325	98	
		Through	46.0	D	55	195	400	279			Right	62.1	E	90	445	1150	233	
		Right	5.3	A	55	195	275	98			Right	9.0	A	90	450	300	14	
	Northbound	Left	88.4	F	75	295	400	232		Intersection			29.1	C	-	-	-	1162
		Through	28.9	C	55	340	1300	696			Eastbound	Through	40.2	D	60	295	350	387
		Right	1.5	A	0	10	275	15				Right	2.2	A	0	115	350	205
	Southbound	Left	71.0	E	20	100	475	62	Westbound	Left	1.3	A	0	55	100	89		
		Through	33.4	C	105	435	5700	1341		Through	0.2	A	0	55	100	510		
		Right	7.5	A	20	370	350	231		Left	57.7	E	25	210	350	62		
	Intersection			36.4	D	-	-	-	3648	Southbound	Right	6.8	A	10	185	525	232	
									Intersection				14.4	B	-	-	-	1485
	Denotes a left- or right-turn movement where maximum queue exceeds the storage length.									Denotes a through movement where maximum queue blocks adjacent turn lanes.								

PM PEAK HOUR																		
Intersection	Direction	Movement	4-6-4 Concept						Intersection	Direction	Movement	Grade-Separated Concept						
			Average Delay (sec/veh)	LOS	Average Queue (ft)	Maximum Queue (ft)	Storage Length (ft)	Modeled Volume (vph)				Average Delay (sec/veh)	LOS	Average Queue (ft)	Maximum Queue (ft)	Storage Length (ft)	Modeled Volume (vph)	
CSAH 81 & Bass Lake Rd	Eastbound	Left	78.9	E	120	450	325	390	CSAH 81 NB Ramps & Bass Lake Rd (East Intersection)	Eastbound	Left	0.5	A	0	40	100	397	
		Through	53.6	D	20	270	425	400			Through	0.1	A	0	40	100	528	
		Right	9.1	A	0	50	450	195			Right	60.3	E	130	480	325	529	
	Westbound	Left	92.1	F	135	590	250	110		Westbound	Through	53.3	D	130	480	325	163	
		Through	80.8	F	135	590	400	411			Right	62.6	E	165	690	1150	378	
		Right	14.5	B	135	590	275	163			Right	14.6	B	165	695	300	56	
	Northbound	Left	70.6	E	80	480	400	388		Intersection			31.9	C	-	-	-	2051
		Through	38.3	D	235	1155	1300	1702			Eastbound	Through	43.9	D	155	645	350	803
		Right	9.8	A	0	30	275	57				Right	4.5	A	0	105	350	195
	Southbound	Left	61.8	E	30	120	475	124	Westbound	Left	0.8	A	0	70	100	110		
		Through	38.2	D	50	245	5700	570		Through	0.1	A	0	70	100	798		
		Right	12.6	B	15	210	350	181		Left	86.3	F	70	320	525	122		
	Intersection			47.8	D	-	-	-	4701	Southbound	Right	7.5	A	45	295	350	180	
									Intersection				21.8	C	-	-	-	2208
	Denotes a left- or right-turn movement where maximum queue exceeds the storage length.									Denotes a through movement where maximum queue blocks adjacent turn lanes.								

BASS LAKE ROAD: 4-6-4 OPTION

Design Features:

- Expands County Road 81 between Crystal Airport Road and Wilshire Boulevard, keeping six lanes of traffic (three in each direction) for that section, just over half a mile
- Light rail is at-grade in the center of the roadway
- Park and ride access via Lakeland Avenue North from the Wilshire Boulevard intersection
- Station platform is in the middle of a six-lane road with additional turning lanes at the intersection
- The pedestrian bridge provides a crossing over County Road 81 and a grade-separated access to the south end of the station to the platform from the park and ride and trails



Aerial View of Station Area Looking North



BASS LAKE ROAD: 4-6-4 OPTION STATION AREA VIEWS



Aerial View of Station Area Looking East



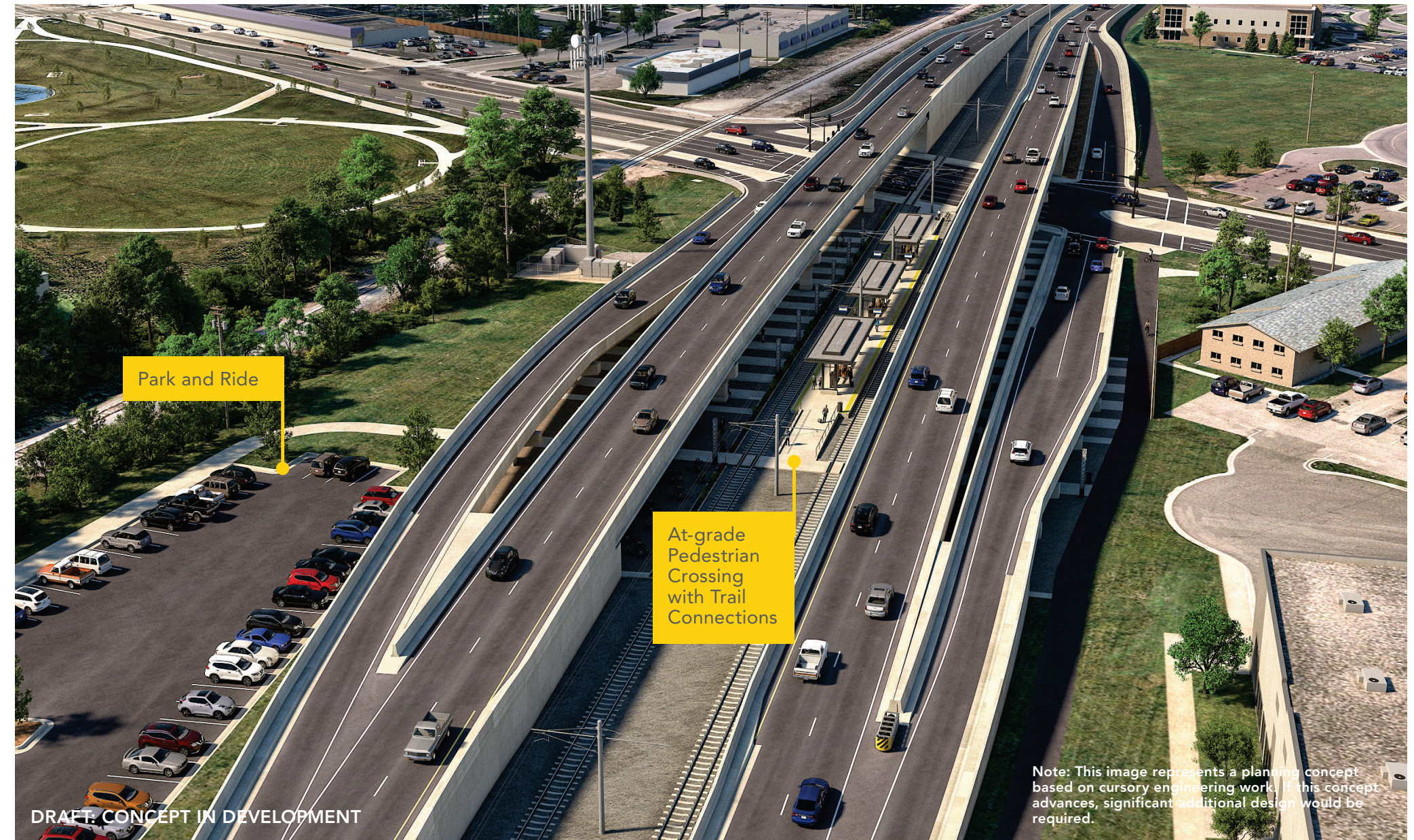
Ground View of Station Area- Pedestrian Crossing



BASS LAKE ROAD: INTERCHANGE OPTION

Design Features:

- County Road 81 two lanes in each direction on a grade-separated overpass at Bass Lake Road with ramps for access from Bass Lake Road
- The intersection maintains full access for Bass Lake Road
- Light rail is at-grade centered between overpass bridges
- Park and ride access via Lakeland Avenue North from the Wilshire Boulevard intersection
- Station platform is at-grade framed by adjacent interchange bridges
- The south at-grade crossing provides grade-separation from County Road 81 and provides access to trails on either side of County Road 81 and to the park and ride



Note: This image represents a planning concept based on cursory engineering work. If this concept advances, significant additional design would be required.

Aerial View of Station Area Looking North



METRO BLUE LINE EXTENSION



BASS LAKE ROAD: INTERCHANGE OPTION STATION AREA VIEWS



Ground View of Station Area Looking South



Ground View of Station Area Looking East



Ground View of Station Area Looking East from Park and Ride



BASS LAKE ROAD: INTERCHANGE OPTION STATION AREA LIGHTING STUDY



Ground area view at the north end of the station looking southwest at night



Ground view of the entrance at the south end of the station looking east from the Park and Ride at night





Right of Way

