Status Update and Preliminary Findings

I-35/Bayfront Area Traffic Modeling and Special Event Traffic Control Plan

TAC and MIC
April 16/17, 2019

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Image source: Google Earth

Study Area
Duluth
Lake Superior Circle Tour
W Superior St
E Superior St
W Michigan St
W Railroad St
E Water St
W 1st St
W 2nd St
W 3rd St
W 4th St
W 5th St
W 6th St
W 10th St
E 1st St
E 2nd St
E 3rd St
E 5th St
E 8th St
E 9th St
E 10th St
E Skyline Pkwy
W Skyline Pkwy
N Central Entrance
Mesaba Ave
Piedmont Ave
Waller St
Mondale Dr
Courtland St
Garfield Ave
Port of Duluth-Superior
Port Terminal Dr
S Lake Ave
S 21st Ave E
W Kent Rd
University D
Jefferson S
MINNESOTA
WISCONSIN
St Louis Bay

Plan Goals

To address issues with traffic, parking and wayfinding at special events year-round (beginning Summer 2019)

Partners

- The DECC, Duluth Seaway Port Authority, MnDOT – funded the project
- The MIC is coordinating the project
- Alliant Engineering is the project consultant

Major Tasks

- Documented the existing event information
- Developed a short-term traffic control plan for a pilot test during the 2018 holiday season
- Conducted an event parking, traffic and wayfinding analysis
- Summarized the key findings and developed recommendations for immediate and long-term strategies/improvements

Observed Issues During High-Volume Events

Traffic congestion due to circulation and processing time at parking entrances

Coordination difficulty among independent parking operations

Lack of advanced and real-time parking information

Lack of information about alternative transportation options and wayfinding (pedestrian, bicycle, transit)

Key Strategies to manage event traffic and parking

Strategy Group 1: Outreach and Minimal Traffic Management

- *Marketing; pedestrian improvements; wayfinding signage*

Strategy Group 2: Parking and Traffic Circulation Management

- *Integrated management; multiple entrances; downtown and assigned parking*

Strategy Group 3: Traffic Operation Improvement

- *Signal timing; separate NB/EB traffic on 5th Avenue ramp*

Strategy Group 4: Circulation Improvement

- *Change Harbor Drive to 1-way; create Lake Ave/Canal Park Drive 1-way pair*

Strategy Group 5: Roadway or Network Improvement

- *Reconstruct 5th Ave W. roadway/sidewalk; add roadway capacity to Railroad St*

Strategy Group 6: Transit/Railway Improvement

- *Add dedicated bus lane via 5th Ave W/Harbor Dr; add P&R shuttle option*

Strategy Group 7: System or Capacity Improvement

- *Construct a parking ramp near the power plant; utilize apps for traffic & parking info*

Key Strategies Matrix – evaluates degree of traffic improvement combined with financial feasibility and implementation viability

Table 21 Strategies and Their Favorability

Strategy Group	Strategy ID	Detailed Strategy	Evaluations		
			Traffic Improvement	Financial Feasibility	Implementation Viability
#1 Outreach & Minimal Traffic Management*	1a	Dynamic Message Sign wayfinding messages	Minimum	High	High
	1b	Marketing outreach for downtown parking options & alternative transportation			
	1c	Southbound left-turn lane on Railroad St at Bentleyville parking entrance			
	1d**	Move the train stop further south near the existing Cross City Trail crossing			
	1e**	Pedestrian control at Bentleyville entrance on Harbor Dr			
#2 Integrated Parking & Traffic Circulation Management	2a	Reduce processing time at parking entrances	Minimum	Moderate	High
	2b	Assign parking to reduce entrance queuing			
	2c	Utilize multiple parking facility (e.g. DECC) entrances			
	2d	Coordinate parking management and share facility occupancy during overlapping events			
	2e	Static freeway & local streets signs for downtown and Canal Park parking			
	2f	Traffic signs to split Bayfront Park and DECC traffic, utilize Harbor Dr, alternative parking entrance, and slip ramp			
#3 Traffic Operation Improvement	3a	Separate traffic exiting the NB/EB I-35/5th Avenue ramp to mitigate right turn congestion	Minimum	High	High
	3b	Add permanent/temporary pedestrian wayfinding signs along 5th Avenue, Harbor Dr and the pedestrian skyway			
	3c**	Improve signal timing of I-35 ramp terminal intersections at 5th Ave and Lake Ave			
#4 Circulation Improvement	4a	Change Harbor Dr to one-way flow	Minimum	High	Moderate
	4b	Change Canal Park Dr and Lake Ave to a one-way pair			
#5 Roadway or Network Improvement	5a**	Reconstruct roadway and sidewalk of 5th Ave, potentially add bike lane	Moderate	Low	Low
	5b	Connect Courtland St with Railroad St by a new Courtland St for event access			
	5c	Trailblaze event traffic via 27th Ave, Superior St, Garfield Ave and Railroad St			
	5d	Reconfigure northbound/eastbound 5th Ave exit off I-35			
	5e**	Improve pedestrian and bicycle access in the area			
	5f	Add additional access to frontage road to improve traffic flow at I-35 and 5th Ave W Ramp			
	5g	Add roadway capacity (thru lane and/or left/right turn lanes) to Railroad St south of Harbor Dr			
	5h	Dedicated lane from I-35 with direct access to DECC parking ramp			
#6 Transit/Railroad Improvement	6a	Add dedicated bus lane via 5th Ave and Harbor Dr	Moderate	Moderate	Low
	6b	Add P&R shuttle option			
	6c**	Use one vehicle lane on 5th Ave for pedestrian ingress			
#7 System or Capacity Improvement	7a	Construct a parking ramp near the power plant off Railroad St and connect it with shuttle service	Significant	Low	Low
	7b	Preferential or prepaid parking strategy			
	7c	Utilize apps to share information on events, traffic condition and parking availability			

* Package #1 was implemented for 11/30 and 12/1 events as short-term improvement

** Pedestrian-related strategies

Key Findings

The various strategies were modeled – key findings include:

Roadway capacity for large events is generally sufficient

- Periodic bottlenecks occur at I-35 ramps at 5th Avenue West and at Lake Avenue, Garfield Ave/Railroad Street intersection, and at the Bayfront lot entrance on Railroad Street

Capital-intensive strategies to improve traffic are not recommended in the short term

- Intersection and overpass improvements could be included in future I-35 reconstruction project(s)

Strategies to manage parking and wayfinding for all modes (vehicular, pedestrian, transit and bicycle) are necessary to complement traffic strategies

Ranked List of Strategies

Traffic Improvement + Financial Feasibility + Implementation Viability

Table 3 Ranked Original Strategies

Strategy ID	Detailed Strategy	Recommended	Priority (1)
1c	Southbound left-turn lane on Railroad St at Bayfront Park parking entrance	In-place	0
1d	Move the train stop further south near the existing Cross City Trail crossing	In-place	0
1b	Marketing outreach for downtown parking options & alternative transportation	Yes	1
1e	Pedestrian control at Bayfront Park entrance on Harbor Dr	Yes	1
2d	Establish Bayfront Area event parking management committee for planning, operation and system coordination	Yes	1
2a	Reduce processing time at parking entrances by using multiple entrance lanes and payment points	Yes	2
2c/f	Traffic signs to split Bayfront Park and DECC traffic, utilize Harbor Dr, alternative/multiple parking entrance, and slip ramp	Yes	2
3c	Improve signal timing/operations of I-35 ramp terminal intersections at 5th Ave and Lake Ave	Yes	3
6c	Use one vehicle lane on 5th Ave for pedestrian ingress	Yes	3
7c	Utilize apps to share information on events, traffic condition and parking availability; upgrade parking systems and coordinate parking management and share facility occupancy during overlapping events; collaborate with Park Duluth app	Yes	4
1a	Dynamic Message Sign (DMS) wayfinding messages and operation plans	Yes	5
2e	Static freeway & local streets signs for downtown and Canal Park parking	Yes	5
3a	Separate traffic exiting the NB/EB I-35/5th Avenue ramp to mitigate right turn congestion, by installing dynamic lane assignment sign for the right lane to be either shared through/right or right-turn only	Yes	5
3b	Add permanent/temporary pedestrian wayfinding signs along 5th Avenue, Harbor Dr and the pedestrian skyway	Yes	5
2b	Assign parking at DECC parking to reduce entrance queuing	Yes	6
5e	Improve pedestrian and bicycle access in the area, including a potential pedestrian amenity upgrade on the portion of the Cross City Trail that connect Bayfront Park (near Railroad St) and downtown Duluth (near Michigan St).	Yes	6
6a/b	Add dedicated bus lane via 5th Ave and Harbor Dr; Implement TSP; Add P&R shuttle option	Yes/Hold	7
7b	Preferential or prepaid parking strategy	Yes/Hold	7
5a	Reconstruct roadway and sidewalk of 5th Ave, potentially add bike lane, including a potential covered pedestrian walkway along 5th Ave	Yes/Hold	8
5d	Reconfigure northbound/eastbound 5th Ave exit off I-35 to add an additional right turn lane	Yes/Hold	8
5c	Trailblaze event traffic via 27th Ave, Michigan St, Superior St, Garfield Ave and Railroad St	No	9
4a	Change Harbor Dr to one-way flow	No	10
4b	Change Canal Park Dr and Lake Ave to a one-way pair	No	11
5f	Add additional access to frontage road to improve traffic flow at I-35 and 5th Ave W	No	11
5g	Add roadway capacity (thru lane and/or left/right turn lanes) to Railroad St south of Harbor Dr	No	12
7a	Construct a parking ramp near the power plant off Railroad St and connect it with shuttle service	No	13
5b	Connect Courtland St with Railroad St by a new Courtland St for event access	No	14
5h	Dedicated lane from I-35 with direct access to DECC parking ramp	No	15

(1) Priority is based on potential benefit, financial feasibility and implementation viability. Smaller numbers indicate higher priority.

Strategies Not Recommended

Traffic Improvement + Financial Feasibility + Implementation

Table 3 Ranked Original Strategies

Strategy ID	Detailed Strategy	Recommended	Priority (1)
1c	Southbound left-turn lane on Railroad St at Bayfront Park parking entrance	In-place	0
1d	Move the train stop further south near the existing Cross City Trail crossing	In-place	0
1b	Marketing outreach for downtown parking options & alternative transportation	Yes	1
1e	Pedestrian control at Bayfront Park entrance on Harbor Dr	Yes	1
2d	Establish Bayfront Area event parking management committee for planning, operation and system coordination	Yes	1
2a	Reduce processing time at parking entrances by using multiple entrance lanes and payment points	Yes	2
2c/f	Traffic signs to split Bayfront Park and DECC traffic, utilize Harbor Dr, alternative/multiple parking entrance, and slip ramp	Yes	2
3c	Improve signal timing/operations of I-35 ramp terminal intersections at 5th Ave and Lake Ave	Yes	3
6c	Use one vehicle lane on 5th Ave for pedestrian ingress	Yes	3
7c	Utilize apps to share information on events, traffic condition and parking availability; upgrade parking systems and coordinate parking management and share facility occupancy during overlapping events; collaborate with Park Duluth app	Yes	4
1a	Dynamic Message Sign (DMS) wayfinding messages and operation plans	Yes	5
2e	Static freeway & local streets signs for downtown and Canal Park parking	Yes	5
3a	Separate traffic exiting the NB/EB I-35/5th Avenue ramp to mitigate right turn congestion, by installing dynamic lane assignment sign for the right lane to be either shared through/right or right-turn only	Yes	5
3b	Add permanent/temporary pedestrian wayfinding signs along 5th Avenue, Harbor Dr and the pedestrian skyway	Yes	5
2b	Assign parking at DECC parking to reduce entrance queuing	Yes	6
5e	Improve pedestrian and bicycle access in the area, including a potential pedestrian amenity upgrade on the portion of the Cross City Trail that connect Bayfront Park (near Railroad St) and downtown Duluth (near Michigan St).	Yes	6
6a/b	Add dedicated bus lane via 5th Ave and Harbor Dr; Implement TSP; Add P&R shuttle option	Yes/Hold	7
7b	Preferential or prepaid parking strategy	Yes/Hold	7
5a	Reconstruct roadway and sidewalk of 5th Ave, potentially add bike lane, including a potential covered pedestrian walkway along 5th Ave	Yes/Hold	8
5d	Reconfigure northbound/eastbound 5th Ave exit off I-35 to add an additional right turn lane	Yes/Hold	8
5c	Trailblaze event traffic via 27th Ave, Michigan St, Superior St, Garfield Ave and Railroad St	No	9
4a	Change Harbor Dr to one-way flow	No	10
4b	Change Canal Park Dr and Lake Ave to a one-way pair	No	11
5f	Add additional access to frontage road to improve traffic flow at I-35 and 5th Ave W	No	11
5g	Add roadway capacity (thru lane and/or left/right turn lanes) to Railroad St south of Harbor Dr	No	12
7a	Construct a parking ramp near the power plant off Railroad St and connect it with shuttle service	No	13
5b	Connect Courtland St with Railroad St by a new Courtland St for event access	No	14
5h	Dedicated lane from I-35 with direct access to DECC parking ramp	No	15

(1) Priority is based on potential benefit, financial feasibility and implementation viability. Smaller numbers indicate higher priority.

Strategies Not Recommended

Several specific strategies that require significant capital investment are not recommended for further consideration, including:

Strategy Group 5: Roadway or Network Improvement

- New Courtland Street connection to Railroad Street
- Additional access to frontage road to improve traffic flow at I-35/5th Ave W ramp
- Add roadway capacity to Railroad Street
- Dedicated lane from I-35 with direct access to DECC ramp

Strategy Group 7: System or Capacity Improvement

- Construct a parking ramp near the power plant with access to Railroad Street

Strategies Recommended for Implementation

Traffic Improvement + Financial Feasibility + Implementation

Table 3 Ranked Original Strategies

Strategy ID	Detailed Strategy	Recommended	Priority (1)
1c	Southbound left-turn lane on Railroad St at Bayfront Park parking entrance	In-place	0
1d	Move the train stop further south near the existing Cross City Trail crossing	In-place	0
1b	Marketing outreach for downtown parking options & alternative transportation	Yes	1
1e	Pedestrian control at Bayfront Park entrance on Harbor Dr	Yes	1
2d	Establish Bayfront Area event parking management committee for planning, operation and system coordination	Yes	1
2a	Reduce processing time at parking entrances by using multiple entrance lanes and payment points	Yes	2
2c/f	Traffic signs to split Bayfront Park and DECC traffic, utilize Harbor Dr, alternative/multiple parking entrance, and slip ramp	Yes	2
3c	Improve signal timing/operations of I-35 ramp terminal intersections at 5th Ave and Lake Ave	Yes	3
6c	Use one vehicle lane on 5th Ave for pedestrian ingress	Yes	3
7c	Utilize apps to share information on events, traffic condition and parking availability; upgrade parking systems and coordinate parking management and share facility occupancy during overlapping events; collaborate with Park Duluth app	Yes	4
1a	Dynamic Message Sign (DMS) wayfinding messages and operation plans	Yes	5
2e	Static freeway & local streets signs for downtown and Canal Park parking	Yes	5
3a	Separate traffic exiting the NB/EB I-35/5th Avenue ramp to mitigate right turn congestion, by installing dynamic lane assignment sign for the right lane to be either shared through/right or right-turn only	Yes	5
3b	Add permanent/temporary pedestrian wayfinding signs along 5th Avenue, Harbor Dr and the pedestrian skyway	Yes	5
2b	Assign parking at DECC parking to reduce entrance queuing	Yes	6
5e	Improve pedestrian and bicycle access in the area, including a potential pedestrian amenity upgrade on the portion of the Cross City Trail that connect Bayfront Park (near Railroad St) and downtown Duluth (near Michigan St).	Yes	6
6a/b	Add dedicated bus lane via 5th Ave and Harbor Dr; Implement TSP; Add P&R shuttle option	Yes/Hold	7
7b	Preferential or prepaid parking strategy	Yes/Hold	7
5a	Reconstruct roadway and sidewalk of 5th Ave, potentially add bike lane, including a potential covered pedestrian walkway along 5th Ave	Yes/Hold	8
5d	Reconfigure northbound/eastbound 5th Ave exit off I-35 to add an additional right turn lane	Yes/Hold	8
5c	Trailblaze event traffic via 27th Ave, Michigan St, Superior St, Garfield Ave and Railroad St	No	9
4a	Change Harbor Dr to one-way flow	No	10
4b	Change Canal Park Dr and Lake Ave to a one-way pair	No	11
5f	Add additional access to frontage road to improve traffic flow at I-35 and 5th Ave W	No	11
5g	Add roadway capacity (thru lane and/or left/right turn lanes) to Railroad St south of Harbor Dr	No	12
7a	Construct a parking ramp near the power plant off Railroad St and connect it with shuttle service	No	13
5b	Connect Courtland St with Railroad St by a new Courtland St for event access	No	14
5h	Dedicated lane from I-35 with direct access to DECC parking ramp	No	15

(1) Priority is based on potential benefit, financial feasibility and implementation viability. Smaller numbers indicate higher priority.

Recommended Strategies

Several specific strategies bear substantial merits and should be considered for inclusion in long-term event management plans, including:

- Parking Management
- Wayfinding
- Vehicle Traffic Improvements
- Transit-related Improvements
- Pedestrian-related Improvements
- Bicycle-related Improvements

Recommended Strategies: Parking Management

- Use marketing outreach to advertise downtown parking options
- Establish Bayfront Area event parking management committee for planning, operation and system coordination
- Reduce processing time at parking entrances by using multiple entrance lanes and payment points
- Utilize apps to share information on events and parking availability; collaborate with Park Duluth app
- Assign parking at the DECC to reduce entrance queuing into the ramp
- Implement a preferential or prepaid parking strategy
- Upgrade parking systems and coordinate parking management and share facility occupancy

Recommended Strategies: Wayfinding/Parking Access

- Install traffic signs to split Bayfront Park and DECC traffic, utilize Harbor Dr, alternative/ multiple parking entrance, and slip ramp
- Utilize apps to share information on events and parking availability; collaborate with Park Duluth
- Install Develop Dynamic Message Sign (DMS) on local roadways and develop wayfinding messages and operation plans for events
- Install static freeway & local streets signs for downtown and Canal Park parking

Recommended Strategies:
Vehicle Traffic Improvements

- Improve signal timing and operations of I-35 ramp terminal intersections at 5th Ave and Lake Ave
- Separate traffic exiting the NB/EB I-35/5th Avenue W. ramp to mitigate right turn congestion, by installing dynamic lane assignment sign for the right lane to be either shared through/right or right-turn only.
- Reconfigure northbound/eastbound 5th Ave W. exit off I-35 to add an additional right turn lane.

Recommended Strategies:
Transit Improvements

- Use marketing outreach to advertise alternative transportation options
- Add dedicated bus lane via 5th Ave and Harbor Drive
- Implement Transit Signal Priority (TSP)
- Add Park and Ride (P&R) shuttle options

Recommended Strategies: Bicycle Improvements

- Use marketing outreach to advertise downtown parking & alternative transportation options
- Improve bicycle access in the Bayfront area, including the portion of the Cross City Trail that connects Bayfront Park and downtown Duluth
- Improve bicycle access in the Bayfront area by installing bicycle facilities
- Reconstruct the roadway and sidewalk of 5th Ave, potentially add bike lane

Recommended Strategies: Pedestrian Improvements

- Use marketing outreach to advertise downtown parking & alternative transportation options
- Install pedestrian access control at Bayfront Park entrance on Harbor Dr
- Use one vehicle lane on 5th Ave for pedestrian ingress
- Improve signal timing and operations of I-35 ramp terminal intersections at 5th Ave and Lake Ave to maximize pedestrian green time
- Reconstruct the roadway and sidewalk of 5th Ave, including a potential covered pedestrian walkway along 5th Ave

Implementation Timeline

Relative Benefit/Cost and Approximate Year of Implementation

Figure 6. Relative Benefit/Cost and Approximate Year of Projects Implementation

Next Steps

- **Final Stakeholder Meeting — April 24**
  - Review/input into final recommendations
- **Public Meeting — Wed, May 22, 5:00 pm**
  DECC French River Room
  - Summary of recommended improvements
  - Short term event management plan
  - Long term infrastructure plan
- **Project Implementation**
  - Summer 2019

https://dsmic.org/bayfront

Comments? Questions?

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Image source: Google Earth