

Memorandum

Date: December 17, 2021

To: Councilwoman Amanda Sawyer and Staff
Dana Hoffman, DOTI

From: Nikki Silva and Charlie Alexander

Subject: 8th Avenue Traffic Calming Study Recommendations

DN20-0675

Introduction

The Cranmer Park-Hilltop Civic Association, in collaboration with Denver City Council District 5 Councilwoman Amanda Sawyer and the Department of Transportation and Infrastructure, hired Fehr & Peers to study traffic concerns on 8th Avenue.

Study Limits and Purpose

The study limits are 8th Avenue from Colorado Boulevard to Quebec Street. The aim of the study was to understand community traffic concerns on 8th Avenue, collect data to better understand issues, and to develop conceptual designs for low-cost recommendations that the city can build as DOTI work orders.

Study Process

Fehr & Peers has completed the study in three steps. At each step, Fehr & Peers summarized findings in a presentation and presented it to Working Group members and community members for feedback. An attachment to this memorandum includes the presentations summarizing the survey and data collection.

1. In winter/spring 2021, Fehr & Peers prepared a community survey. Registered Neighborhood Organizations, Facebook, flyers, and newsletter articles distributed the survey. Over 250 people responded to the survey which asked questions pertaining to crossing locations, speeding, sight distance, and other potential concerns.
2. On Tuesday, August 31, 2021, Fehr & Peers collected traffic counts at key segments and study intersections. Fehr & Peers also completed field observations on Tuesday,



September 28, 2021. Fehr & Peers also completed a 5 AM parking inventory on Thursday, March 25, 2021. Lastly, Fehr & Peers used crash data from March 14, 2017, to March 16, 2021 (the three years prior to the COVID-19 pandemic) to complete a crash analysis.

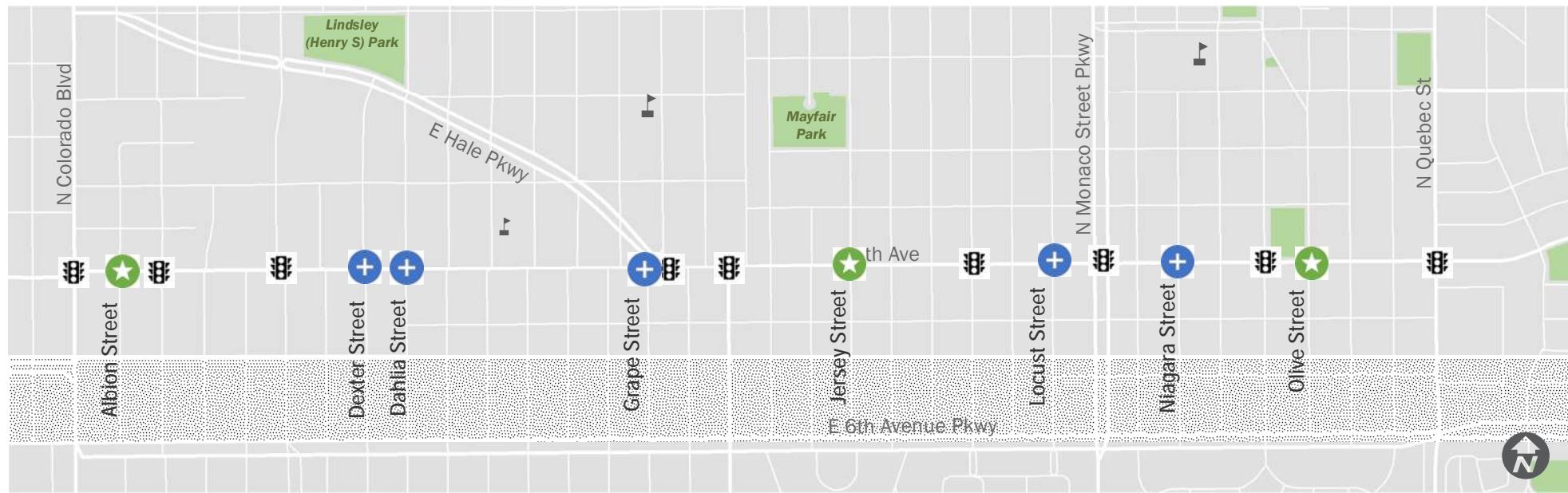
3. Following our presentation of data to Working Group member and community members, Fehr & Peers is preparing conceptual designs and cost estimates for low-cost improvements to address concerns. Fehr & Peers is also making recommendations for higher-cost improvements that the city may investigate in the future.

Recommendations for Low-cost Improvements

Figure 1 shows the locations of Fehr & Peers' recommendations on the 8th Avenue corridor. At each location, we summarize our recommendations and the justification for those recommendations. An attachment includes conceptual designs of these recommendations. The attachments also include Denver Fire Truck Turning templates at each intersection. Fire trucks templates were run for fire trucks turning within their travel lane and if they were to cross over the yellow centerline. From the turning templates, it was verified that recommendations are feasible; however, designs should be fine tuned in the final design phase. Cost estimates were also completed and displayed in this section. An attachment includes detailed cost estimates for each intersection. Construction management and inspection costs were not included in the cost estimates because it was assumed that installation would be a City Work Order.

Figure 1.

8th Avenue Traffic Calming Infrastructure Summary



★ Pedestrian Refuge Island

⊕ Bulbouts

🚦 Traffic Signal



Albion Street

Fehr & Peers recommends prohibiting the eastbound left-turn and using that space to construct a pedestrian refuge island. The pedestrian refuge island would improve safety for the legal crosswalk at this intersection; however, we do not recommend marking the crosswalk.

We counted 20 people crossing 8th Avenue by walking or biking in the PM peak hour. This satisfies the demand requirement of the Uncontrolled Pedestrian Crossing Guidelines; however, we observed multiple occasions of westbound queuing from Colorado Boulevard extending through the Albion Street intersection. This creates a possibility for "dual threat" crashes where a driver in one westbound lane on 8th Avenue yields but a driver in the second lane does not as well as unpredictable stop-and-go conditions for pedestrians to judge driver yielding. During the AM and PM peak hours, respectively, we counted 7 and 22 vehicles making the eastbound left-turn. Prohibiting the eastbound left-turn would displace these vehicles to the signal at Ash Street. Lastly, our crash analysis revealed five crashes in three years of varying type.

Signal warrants were completed as part of the analysis. Due to the data available, Warrant 2, Four-Hour Warrant and Warrant 3, Peak-Hour Warrant were analyzed. Depending on whether 8th Avenue is treated as a four lane (two lanes in each direction) or two lane (one lane in each direction) street, the warrants may be met. This intersection should continue to be monitored in the future and design iterations may need to be made including restricting westbound left turns and installing a pedestrian refuge island, installing a center median to make the intersection right-in/right-out, or signalization.

Cost Estimate: \$8,000 (in 2021 dollars)

Dexter Street

Fehr & Peers recommends paint and delineator bulbouts on all four corners of this intersection.

Our crash analysis revealed six crashes in three years related to northbound through and northbound left-turning vehicles failing to yield right-of-way to eastbound/westbound traffic. 8th Avenue already has no parking signs at this intersection. Bulbouts will ensure that vehicles do not encroach beyond the no parking signs and will calm 8th Avenue traffic by narrowing 8th Avenue.

Cost Estimate: \$12,000 (in 2021 dollars)

Dahlia Street

Fehr & Peers recommends paint and delineator bulbouts on all four corners of this intersection.



at the lane drop for westbound vehicles. The city should also install no parking signs along with the bulbouts. We also recommend installing diagonal pavement arrow legends to introduce positive guidance for drivers merging.

Our crash analysis revealed nine crashes in three years related to northbound through vehicles failing to yield right-of-way to westbound traffic. Sometime between 2015 and 2019, the city installed a "Right Turn Only 3PM-6PM" sign on the northbound approach. Bulbouts will ensure that vehicles do not encroach beyond the legal no parking area (we recommend formalizing this with signs) and will calm 8th Avenue traffic by narrowing 8th Avenue. Additionally, a hardened edge line at the lane drop for westbound vehicles will physically require drivers to merge into one lane prior to Locust Street.

Cost Estimate: \$25,500 (in 2021 dollars)

Niagara Street

Fehr & Peers recommends paint and delineator bulbouts on all four corners of this intersection. The city should also install no parking signs along with the bulbouts.

Our crash analysis revealed three crashes in three years related to northbound and southbound through vehicles failing to yield right-of-way to eastbound traffic. Bulbouts will ensure that vehicles do not encroach beyond the legal no parking area (we recommend formalizing this with signs) and will calm 8th Avenue traffic by narrowing 8th Avenue.

Cost Estimate: \$18,500 (in 2021 dollars)

Olive Street

Fehr & Peers recommends a marked crosswalk (Level A markings and signing) on the west leg with pedestrian refuge islands and no parking signs.

We only counted 12 people crossing 8th Avenue by walking or biking in the AM peak hour; however, this location directly serves Kittredge Park. The crossing location is 275-feet from the east crosswalk at Oneida Street, a signalized intersection. The intersections are 340-feet apart from center-to-center. During field observations, we did not observe any vehicle queuing from Oneida Street that affects Olive Street, so we recommend a variance to the 300-feet spacing criteria from the Uncontrolled Pedestrian Crossing Guidelines. A pedestrian refuge island will also calm traffic on 8th Avenue by introducing horizontal deflection.

Cost Estimate: \$28,000 (in 2021 dollars)



Ivy Street

Fehr & Peers recommends no parking signs.

In reviewing our 5 AM parking inventory, we observed that there is a relatively high amount of on-street parking near Ivy Street; however, Ivy Street does not currently have no parking signs.

Implementation Recommendations for Low-cost Improvements

During the final community meeting on November 16, 2021, a poll was conducted to determine the community's top priority locations. The following table shows the project priorities according to community feedback as well as the project priorities according to crash history.

Table 1. Project Prioritization by Crash Data and Community Feedback

Project Prioritization by Crash Data	Project Prioritization by Community Feedback
<ol style="list-style-type: none">1. 8th Avenue & Locust Street2. 8th Avenue & Dahlia Street3. 8th Avenue & Dexter Street4. 8th Avenue & Albion Street5. 8th Avenue & Niagara Street6. 8th Avenue & Jersey Street7. 8th Avenue & Grape Street8. 8th Avenue & Olive Street	<ol style="list-style-type: none">1. 8th Avenue & Albion Street (10/15 votes)2. 8th Avenue & Grape Street (8/15 votes)3. 8th Avenue & Olive Street (6/15 votes)4. 8th Avenue & Locust Street (4/15 votes)5. 8th Avenue & Dexter Street (4/15 votes)6. 8th Avenue & Jersey Street (4/15 votes)7. 8th Avenue & Niagara Street (3/14 votes)8. 8th Avenue & Dahlia Street (1/15 votes)

Recommendations for Higher-cost Improvements

Fehr & Peers community outreach, data collection, and analysis also indicated higher-cost corridor needs:

- Sidewalks on most of 8th Avenue are too narrow and many curb ramps are not ADA compliant. The city should continue efforts to fill sidewalk gaps, widen sidewalks that are too narrow, and upgrade non-ADA compliant curb ramps including on the 8th Avenue corridor.
- Several community members had concerns at the signalized intersection of 8th Avenue & Monaco Parkway. We understand that the city is going to rebuild this traffic signal as part of a separate project. The city should do outreach to community to members to understand concerns so that the city can address them through the signal rebuild project.



- Most of the corridor's traffic signals are span wire and lack pedestrian signals. The city should continue efforts to upgrade span wire traffic signals to pole/mast signals with pedestrian signals including on the 8th Avenue corridor.
- The city should monitor the segment of 8th Avenue near the 9th & Colorado development and Rose Medical Center to continue to address safety, turning movements, and traffic flow. As 9th & Colorado builds out, traffic to/from minor streets and across 8th Avenue is increasing. Some locations may be close to meeting signal warrants (for example, the northbound approach at Albion Street has 169 vehicles per hour with 925 through vehicles on 8th Avenue). Over time, it may become more appropriate to design and operate this segment of 8th Avenue more like other east-west streets with 340-foot block spacing (e.g., Colfax Avenue from Grant Street to Park Avenue, 1st Avenue from University Boulevard to Steele Street). Alternative concept designs for implementation at Albion Street include restricting westbound left turns and installing a pedestrian refuge island, installing a center median to make the intersection right-in/right-out, or signalization.

Attachments

- Conceptual designs of recommendations for low-cost improvements
- Community meeting presentation documenting community survey
- Community meeting presentation documenting data collection and analysis
- 8th Avenue & Albion Street Signal Warrants
- 8th Avenue Count/Speed Data Collection
- Cost Estimates