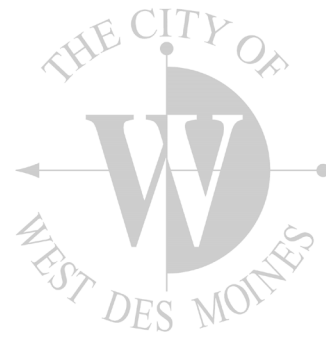


Memorandum



To: Brian Hemesath, P.E., City Engineer

From: Eric Petersen, P.E., Principal Traffic Engineer

Date: August 30, 2024

Re: Study of 4-to-3 Lane Conversion on Ashworth Road from 1st Street to 19th Street

In October 2023, Ashworth Road was converted from a 4-lane roadway to a 3-lane roadway between 1st Street and 19th Street as a “trial phase” of the larger Ashworth Road Improvements Project. City staff has collected data on the street’s performance before and after the 4-to-3 lane conversion, and the purpose of this memo is to summarize the results and provide recommendations going forward.

BACKGROUND

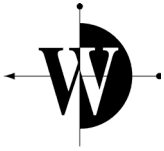
Ashworth Road is classified as a minor arterial street and travels across the entire City from 1st Street (State Highway 28, or 63rd Street in Des Moines) to 98th Street (or SE Waco Place in Waukee). It is used by residents of multiple communities and is West Des Moines’ only street that travels directly east/west through the entire City. Due to it being a parallel facility to Interstate 235/80, it is also used by drivers who prefer to avoid the interstate and as a detour route when there are incidents or maintenance activities occurring on the interstate system.

At City Council workshops that were held on November 7, 2022, and January 3, 2023, City staff presented on a proposed reconfiguration of Ashworth Road from 1st Street to 50th Street. This multi-phase, multi-year project is planned to improve pavement conditions, traffic flow, reliability, comfort, and safety for all roadway users. One component of the project is to reconfigure the majority of the roadway from 4 narrow lanes (2 through lanes in each direction) to 3 slightly-wider lanes (1 through lane in each direction and 1 center left-turn lane). While this component is the primary focus of this memo, there are other future improvements that are important as well. Other goals of the project include:

- Reconstructing deteriorating portions of pavement;
- Improving turn radii for vehicles turning onto and off of Ashworth Road at major intersections, and;
- Improving the existing traffic signals, railroad crossing, and sidewalks along the corridor.

It should be noted that the City’s long-range trail master plan shows a separated sidepath trail on the north side of the street. Although this was originally recommended, direction was given at the City Council workshops to not include this component into the currently proposed project.

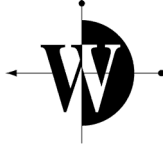
After those workshops and in subsequent discussions, the City Council suggested that a section of Ashworth Road be restriped to 3-lanes as a “trial phase” to observe performance for a period of time. City staff presented recommendations for this “trial phase” at the February 20, 2023, City Council meeting, with the City Council approving the recommendations to restripe Ashworth Road between 1st Street and 19th Street and directing staff to study the performance over a period of at least 9 months.



Funding for the design and roadway modifications was later approved by the City Council, with Shive-Hattery as the City's consultant and Quality Striping, Inc., as the contractor for the project. In addition to the restriping, there were temporary modifications to traffic signals, signs, and pavement markings to transition drivers from the 4-lane configuration to the 3-lane configuration. The conversion to a 3-lane roadway was completed on October 16, 2023.

Before & After – Looking East from 19th Street during PM Peak Hour





APPROACH

From Spring to Fall of 2023, City staff compiled “before” data on the performance of Ashworth Road as a 4-lane roadway. After the 4-to-3 lane conversion was complete, City staff collected the same data at the same locations so that it could be compared with the “before” data. Data was collected for a period of more than 9 months from October 17, 2023, to July 31, 2024.

Performance measures included:

- Crash data
- Speed data
- Traffic flow observations, including from video footage from traffic signal cameras (on multiple days/times during the summer months and during the school year)
- Levels of service (measure of capacity/congestion)
- Feedback from road users, including residents, West Des Moines Community School District, Des Moines Area Regional Transit Authority (DART), and emergency responders from West Des Moines Police, Fire, and EMS.

FINDINGS

The following sections provide an overview of the analysis and compare the roadway’s performance before and after the 4-to-3 lane conversion.

Impact on crashes

Reported crashes from January 2014 through July 2024 were analyzed using the Iowa Department of Transportation’s *Iowa Crash Analysis Tool* and police reports from the City of West Des Moines Police Department.

In the nearly 10-year period before Ashworth Road was converted, there were 67 reported collisions (about 7 per year) in the sections that were converted from 4-lanes to 3-lanes. This does not include crashes where a police report was never filed, and it doesn’t include crashes resulting from snow/ice, deer, alcohol/impairment, or other abnormal situations. It also doesn’t include crashes at the intersections of 1st Street or 8th Street, where there were already left-turn lanes on Ashworth Road.

Out of the 67 total crashes, the narrow lanes and lack of a left-turn lane contributed to at least 27 of the collisions (about 40%). The remaining crashes were of types that could still occur even after a 4-to-3 lane conversion, such as a rear-end collision in the outside thru lane.

The 4-to-3 lane conversion has reduced crashes on Ashworth Road. In the 9.5 months after the roadway was restriped, there has been only 1 reported crash. This crash involved a driver turning right onto Ashworth Road and not yielding to oncoming traffic (the driver believed that the right-turning driver had their turn signal on). The crash was not due to the 3-lane configuration.



Impact on speeds

Speed data was collected before and after the 4-to-3 lane conversion at the same 2 locations along the corridor. This was done to compare the progression speeds, distribution of speeds, and the percentage of drivers traveling over the speed limit. Data was collected using the City's Armadillo Tracker Traffic Collector, mounted to poles on the side of the road. The results are shown below.

Ashworth Road near 6th Street

	Before	After
85th-Percentile Speed	40	38
Average Speed	35	34
% > Speed Limit	51%	36%
% 6+ > Speed Limit	13%	5%
% 11+ > Speed Limit	2%	0.5%
% 16+ > Speed Limit	0.3%	0.1%

Ashworth Road near 16th Street

	Before	After
85th-Percentile Speed	42	40
Average Speed	37	36
% > Speed Limit	71%	64%
% 6+ > Speed Limit	24%	12%
% 11+ > Speed Limit	4%	1%
% 16+ > Speed Limit	0.5%	0.2%

As seen above, **the 4-to-3 lane conversion has reduced speeds on Ashworth Road**. Both the average speeds and 85th-percentile speeds are slightly lower at both locations for the 3-lane configuration. Even more importantly in terms of progression and safety, speeds are closer together and the percentage of drivers traveling at excessive speeds of 10-15+ over the speed limit is lower than it was with a 4-lane configuration.

Traffic flow observations

Traffic flow was observed on multiple days/times before and after the road was converted to 3-lanes. With the former 4-lane configuration, there were many instances of drivers not staying within the narrow lanes. This occasionally caused passing vehicles to have to go over the centerline into the opposing lane in order to pass. In one situation, a fire truck responding to an emergency was forced to use both inside thru lanes as a result of the narrow lanes.

Also, as typically seen with 4-lane streets, there were many instances where the inside thru lanes were blocked temporarily by left-turning drivers.

Examples are shown in the following figures.



Bus and truck not staying in their lane



Fire truck forced to use both inside lanes while in route to emergency



Left-turning traffic blocking thru vehicles



With the 3-lane configuration, no major backups were observed and drivers were better able to stay within their lanes. Only minor delays were noted during times when vehicles were temporarily stopped in the thru lanes (UPS trucks, garbage trucks, buses, etc.).



Vehicle using the center lane to pass a stopped UPS truck

Impact on congestion and levels of service

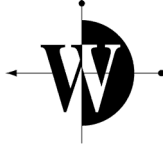
There are currently about 7,000 vehicles per day between 1st Street and 8th Street, and about 9,000 vehicles per day east of 19th Street. These volumes are within the capacity of a 3-lane street, which can generally handle volumes up to about 15,000 vehicles per day on streets like Ashworth Road.

Although the area is mostly developed, traffic volumes may increase slightly over time as properties are redeveloped, as in-fill development occurs, and as drivers avoid more congested roadways such as Interstate 235. Long-range traffic models have forecasted up to 13,000-14,000 vehicles per day in this area, which is still within the capacity of a 3-lane street.

At the signalized intersection of 8th Street & Ashworth Road, the 4-to-3 lane conversion reduced the number of east/west thru lanes from 2 in each direction to 1 in each direction. However, since Ashworth Road widens as it approaches 8th Street, the loss of the thru lanes allowed for the creation of right-turn lanes for eastbound and westbound approaches. The resulting capacity/delay was analyzed in greater detail using Synchro traffic analysis software. Four different scenarios were analyzed:

- 1) Existing AM rush hour on a typical school day (slightly higher than a summer weekday)
- 2) Capacity on June 11, 2024, when a crash on Interstate 235 during the AM rush hour resulted in additional traffic rerouting to Ashworth Road and 8th Street
- 3) Existing PM rush hour on a school day (slightly higher than a summer weekday)
- 4) Future PM rush hour once the region reaches full build-out

The following table shows the forecasted levels of service (LOS) during these four scenarios. LOS is measured on a scale of LOS A (very little delay) to LOS F (excessive delay). LOS D or better is desired for each intersection per the City of West Des Moines *Transportation Master Plan*.



Intersection Level of Service – 8th & Ashworth

Scenario		4-Lane	3-Lane + RT Lanes
Existing AM Peak Hour (School Day)	Overall	B	B
	Delay (s)	18.6	19.4
AM Peak Hour on 6/11/2024 (I-235 Incident)	Overall	C	C
	Delay (s)	22.4	25.8
Existing PM Peak Hour (School Day)	Overall	C	C
	Delay (s)	20.5	22.0
Future PM Peak Hour (Full-Build)	Overall	D	D
	Delay (s)	37.5	45.0

The capacity analysis determined that the signalized intersection of 8th Street & Ashworth Road has slightly more delay with the 3-lane (plus right-turn lanes) configuration, but the intersection still operates with acceptable levels of service with 1 thru lane eastbound and 1 thru lane westbound– even under future full-build conditions. Even though the City streets are not designed to handle interstate traffic volumes, it performed with acceptable levels of service on June 11, 2024, when a crash during the morning rush hour on Interstate 235 caused additional traffic to divert to this intersection.

Feedback

Since Ashworth Road was converted from a 4-lane to a 3-lane street, the public feedback that has been received has been very positive. Almost all residents and drivers that have expressed their opinions, including bus drivers from DART and the West Des Moines School District, as well as emergency responders from West Des Moines Police, Fire, and EMS, have been pleased with the 3-lane configuration and the slightly wider lanes.

“I was skeptical of the switch to three lanes...and I have to say how much I appreciate that change!” – West Des Moines resident

“[DART drivers] feel it is safe to board and alight passengers with this format...(and) have unanimously agreed that the increased lane widths have helped.” – DART

“It slows traffic and allows more room versus the 4 lanes which does not allow enough room.” – Bus driver for the West Des Moines School District

“[The 3-lane configuration] makes it easier for emergent response to take the center lane with traffic moving off the other two lanes.” – West Des Moines Firefighter

Of the few negative comments that have been received about this section of Ashworth Road, most were about the lack of a sidepath trail for bicycles and pedestrians and not specifically about the performance of the 3-lane configuration.



*“A multi-use trail along the north side of Ashworth Rd would be a great idea!” –
Anonymous comment received during MPO’s Safety Action Plan outreach*

Other negative comments that were received were regarding driver confusion at the temporary transition near 19th Street & Ashworth Road. In order to transition the existing 4-lanes west of the intersection to 3-lanes east of the intersection, the eastbound outside lane approaching 19th Street is temporarily designated as a right-turn only. Signs and pavement markings were installed to designate this lane as a right-turn lane, however some eastbound drivers may not recognize the need to change lanes to the left in order to continue straight. This transition was necessary only to implement the trial phase and is not intended to be the ultimate lane configuration, and the issue is planned to be resolved as Ashworth Road is reconstructed in future phases of the project.

CONCLUSIONS AND RECOMMENDATIONS

The 4-to-3 lane conversion has been successful at improving safety and traffic flow on Ashworth Road. There have been fewer crashes, speeds are lower, and although there is slightly more delay at major cross-streets, the 3-lane configuration still has adequate capacity to handle the traffic volumes without major congestion impacts. Our findings are consistent with the vast majority of national and local research, which has overwhelmingly demonstrated the success of 4-to-3-lane conversion projects similar to Ashworth Road.

The Federal Highway Administration calls 4-to-3 lane conversions a “proven safety countermeasure.” Therefore, these projects are strong candidates for receiving federal and state transportation grants. Over the past two years, City staff has applied for and been awarded a total of about \$4,500,000 of federal Surface Transportation Block Grant (STBG) funds toward the reconstruction and reconfiguration of Ashworth Road.

Based on our analysis and findings, the 4-to-3 lane conversion is still recommended for Ashworth Road. While the corridor is needing other improvements in addition to restriping, the 4-to-3 lane conversion is a vital component of the overall goal to rebuild aging infrastructure and improve transportation for the thousands of residents that use this corridor every day.