

**ANALYSIS OF THE
CONVERSION FROM
ONE-WAY TO TWO-
WAY OPERATION OF
PINE STREET FROM
STATE STREET TO
JEFFERSON STREET**

**CITY OF BURLINGTON
RACINE COUNTY
WISCONSIN**

WP-2
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MEMORANDUM REPORT NUMBER 31

ANALYSIS OF THE CONVERSION FROM ONE-WAY
TO TWO-WAY OPERATION OF PINE STREET
FROM STATE STREET TO JEFFERSON STREET

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ANALYSIS OF THE CONVERSION FROM ONE-WAY
TO TWO-WAY OPERATION OF PINE STREET
FROM STATE STREET TO JEFFERSON STREET

INTRODUCTION

On May 22, 1986, the City of Burlington's City Engineer requested the Commission staff to determine the impacts of converting the segment of Pine Street extending from State Street to Jefferson Street from one-way operation to two-way operation. Pine Street extends from Milwaukee Avenue in the City of Burlington central business district to the southern corporate limits of the City of Burlington. Pine Street operates as a one-way street northbound between Milwaukee Avenue and Chestnut Street in the City of Burlington central business district; then as a one-way street southbound between Chestnut Street and State Street through the City of Burlington central business district; and then as a two-way street between State Street and the City of Burlington southern corporate limits. Pine Street serves as the routing for STH 11 between Milwaukee Avenue and Chestnut Street, for both STH 11 and STH 83 between Chestnut Street and Jefferson Street, and for STH 83 between Jefferson Street and the southern city corporate limits.

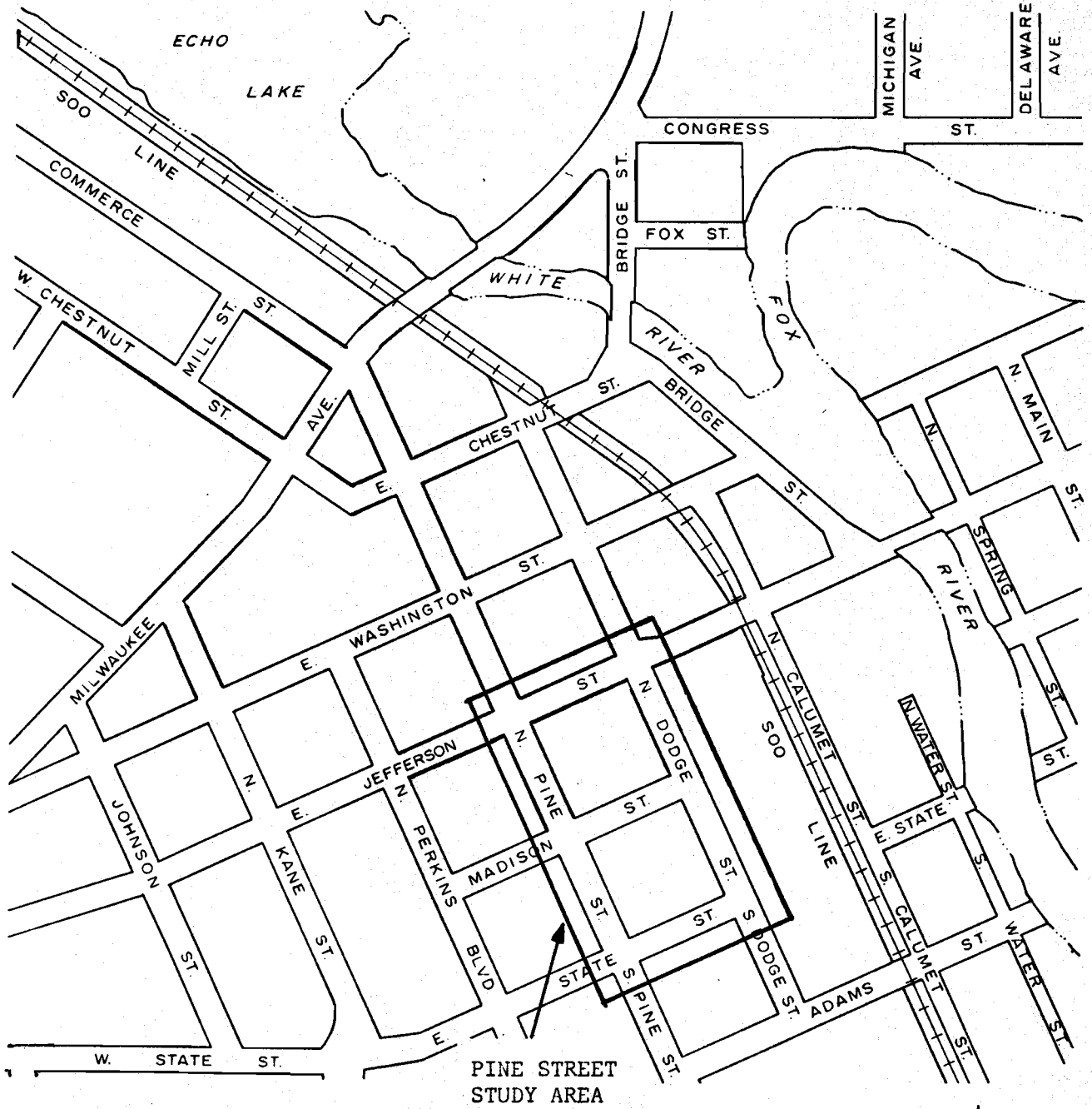
This report presents the findings of the requested analysis of the impacts of converting the segment of Pine Street between Jefferson Street and State Street from its present one-way operation to two-way operation.

PROPOSED CHANGE IN PINE STREET OPERATION

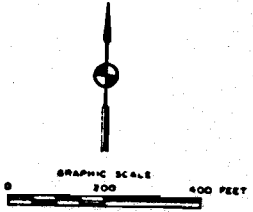
Map 1 shows the study area, which includes the segment of Pine Street proposed for conversion from one-way to two-way operation, and the segments of other streets which would principally be affected by this potential conversion. Map 2 identifies the existing direction of traffic flow on the streets in the study area, and the proposed direction of flow. The proposal to convert Pine Street from one-way to two-way operation between State Street and Jefferson Street would retain the current routing of northbound STH 83 over the one-way eastbound segment of State Street between Pine Street and Dodge Street, and the one-way northbound segment of Dodge Street between State Street and Jefferson Street. Retaining the current routing of northbound STH 83 and the one-way operation of the segments of State Street and Dodge Street is essential to accommodating semi-trailer truck turning movements. Routing northbound STH 83 over the proposed two-way segment of Pine Street would require increasing the curb radius at the southeast corner of the intersection of Pine Street and Jefferson Street from the current five feet to at least 40 feet and acquisition of about 350 square feet of right-of-way. The principal advantage to changing the routing of northbound STH 83 to the proposed two-way segment of Pine Street between State Street and Jefferson Street would be that the segments of State Street between Dodge Street and Pine Street, and of Dodge Street between State Street and Jefferson Street could also be converted from one-way to two-way operation, providing better

Map 1

PINE STREET STUDY AREA



Source: SEWRPC.

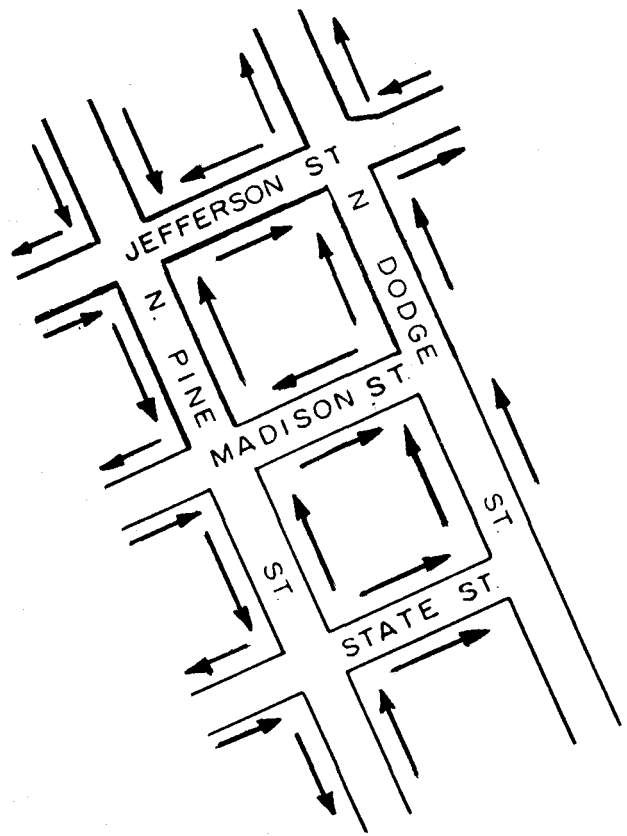
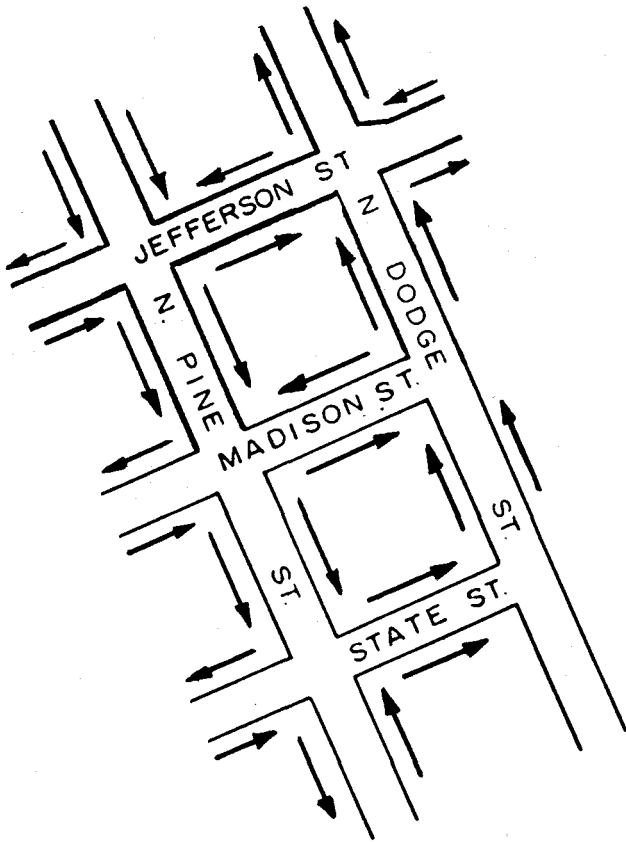


Map 2

EXISTING AND PROPOSED DIRECTION OF TRAFFIC FLOW IN THE PINE STREET STUDY AREA

EXISTING

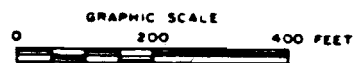
PROPOSED



LEGEND

→ Direction of Traffic Flow

Source: SEWRPC.



accessibility to adjacent land uses, and reducing the need for circuitous travel.

EVALUATION OF PROPOSED CHANGE IN PINE STREET OPERATION

The estimated impacts of the conversion of Pine Street between Jefferson Street and State Street from one-way to two-way operation are presented in Table 1. The estimated impacts presented include traffic impacts including the anticipated change in average weekday traffic volumes on study area streets and at study area street intersections; capital costs; parking spaces lost; and land use impacts.

Traffic Impacts

The expected change in average weekday traffic volumes on streets in the Pine Street study area upon the conversion of Pine Street between Jefferson Street and State Street to two-way operation is shown in Table 1 and on Map 3. The average weekday traffic volume on the segment of Pine Street between State Street and Jefferson Street may be expected to substantially increase from between 5,900 and 7,100 vehicles per average weekday to between 10,600 and 12,200 vehicles per average weekday, which would approach its design capacity of 13,000 vehicles per average weekday. The expected volume of traffic on the proposed two-way street segment would be somewhat less than the 12,700 vehicles per average weekday currently carried on Pine Street south of State Street. Also, the average weekday traffic volume on Jefferson Street between Pine Street and Dodge Street may be expected to increase from 8,000 vehicles per average weekday to 12,200 vehicles per average weekday, which is somewhat more than the 11,000 vehicles per average weekday currently carried on the segment of Jefferson Street between Dodge Street and Calumet Street. Again, the expected level of traffic on the street segment of Jefferson Street between Pine and Dodge Streets would approach its design capacity of about 13,000 vehicles per average weekday. Also, with the conversion of Pine Street between State Street and Jefferson Street to two-way operation, traffic volumes on State Street between Pine Street and Dodge Street would be expected to decrease substantially from 6,000 vehicles per average weekday to approximately 1,700 vehicles per average weekday, and the average weekday traffic volume on Dodge Street between State Street and Jefferson Street may be expected to decrease substantially from approximately 6,000 vehicles per average weekday to 1,800 vehicles per average weekday.

With respect to intersection traffic volumes, the conversion of Pine Street to two-way operation may be expected to result in a substantial increase in the average weekday traffic volumes entering and exiting the intersection of Pine Street and Jefferson Street, as shown in Table 1 and Figure 1. Although traffic operating conditions at the intersection would be expected to decline, the intersection would still operate within its design capacity. Also, although the average weekday traffic volumes using the intersection of Pine Street and State Street and the intersection of Jefferson Street and Dodge Street may not be expected to change, significant shifts may be expected in the amount of traffic on each intersection approach, as shown in Figures 2 and 3. Both intersections would be expected to continue to operate well within their design capacity.

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Table 1

EVALUATION OF TWO-WAY OPERATION OF PINE STREET BETWEEN JEFFERSON STREET AND STATE STREET

	Existing One-Way Operation of Pine Street between Jefferson Street and State Street	Proposed Two-Way Operation of Pine Street between Jefferson Street and State Street
TRAFFIC VOLUME IMPACTS		
<u>Street Segment Average</u>		
<u>Weekday Traffic Volume (1986)</u> (vehicles per average weekday)		
Pine Street Between Jefferson Street and State Street...	5900-7100	10,600-12,200
Jefferson Street Between Pine Street and Dodge Street.....	8000	12,200
State Street Between Pine Street and Dodge Street.....	6000	1700
Dodge Street Between Jefferson Street and State Street...	6000	1800
<u>Intersection Average Weekday</u>		
<u>Entering and Exiting Traffic Volume</u> (vehicles per average weekday)		
Pine Street and Jefferson Street.....	24,400	33,900
Pine Street and State Street.....	29,100	29,100
Dodge Street and Jefferson Street....	31,400	31,400
Dodge Street and State Street.....	12,000	3500
CAPITAL COST (Including signing, pavement striping, and traffic island removal)	--	\$3,000
IMPACTS ON EXISTING PARKING.....	--	Removal of 7 on-street spaces. o Five on eastbound Jefferson Street between Pine and Dodge Streets to provide two traffic lanes at eastbound intersection approach of Dodge Street and Jefferson Street.

-continued-

Table 1 (continued)

	Existing One-Way Operation of Pine Street between Jefferson Street and State Street	Proposed Two-Way Operation of Pine Street between Jefferson Street and State Street
IMPACTS ON EXISTING PARKING (continued)		o Two on northbound Pine Street at its intersection with Jefferson Street to provide two northbound traffic lanes at intersection.
IMPACTS ON LAND USE AND TRAFFIC CIRCULATION.....	--	o Improves land use access and ease of use of street network by converting one-way street segments to two-way operation. o Eliminates unnecessary circuitous travel attendant to one-way street network.

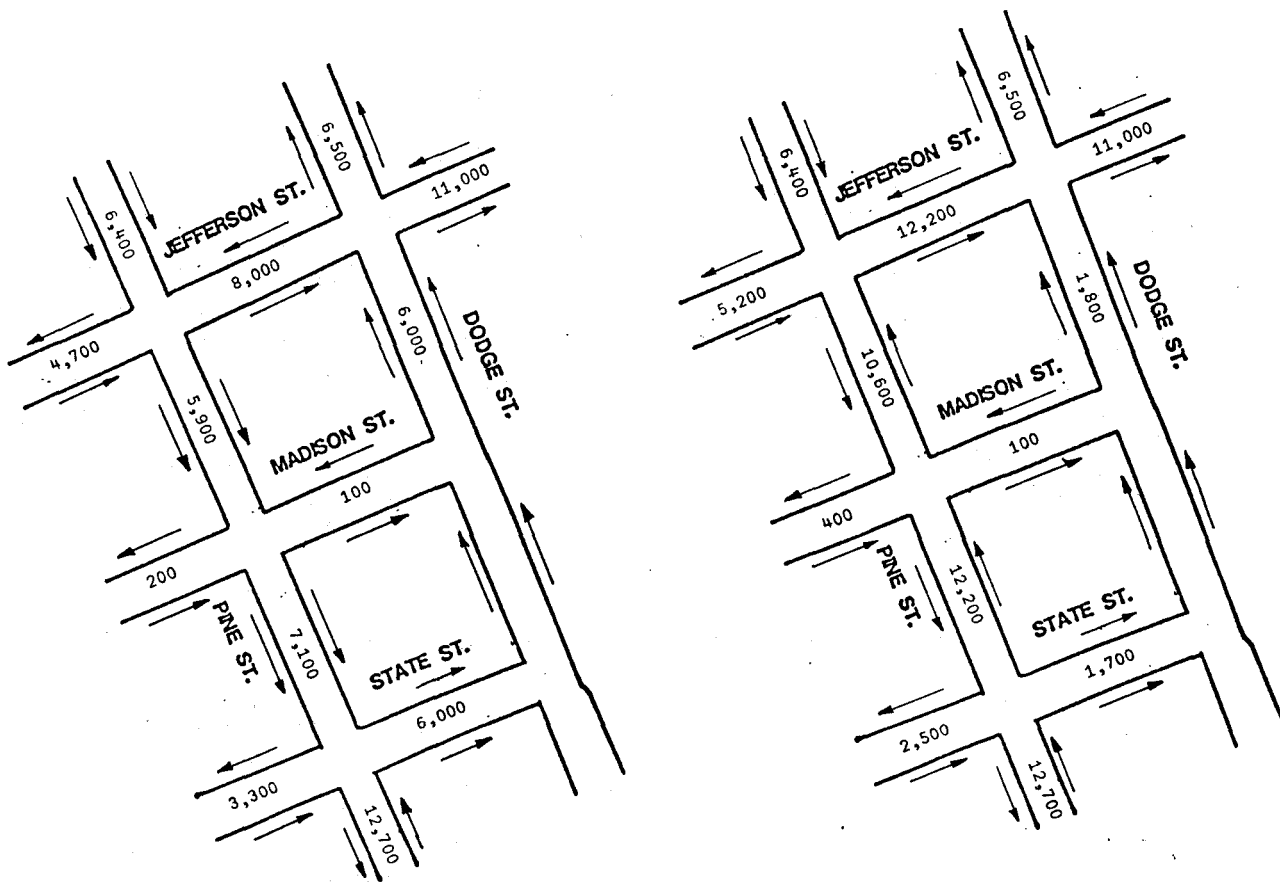
Source: SEWRPC.

Map 3

ESTIMATED AVERAGE WEEKDAY TRAFFIC VOLUME ON STREETS
IN THE PINE STREET STUDY AREA: EXISTING AND PROPOSED

EXISTING

PROPOSED



LEGEND

3,300 Average Weekday Traffic Volume

→ Direction of Traffic Flow

Source: SEWRPC.

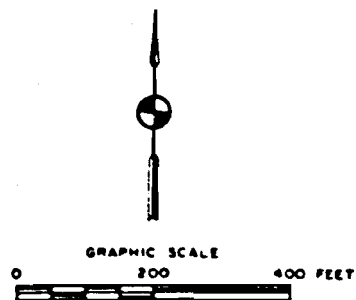
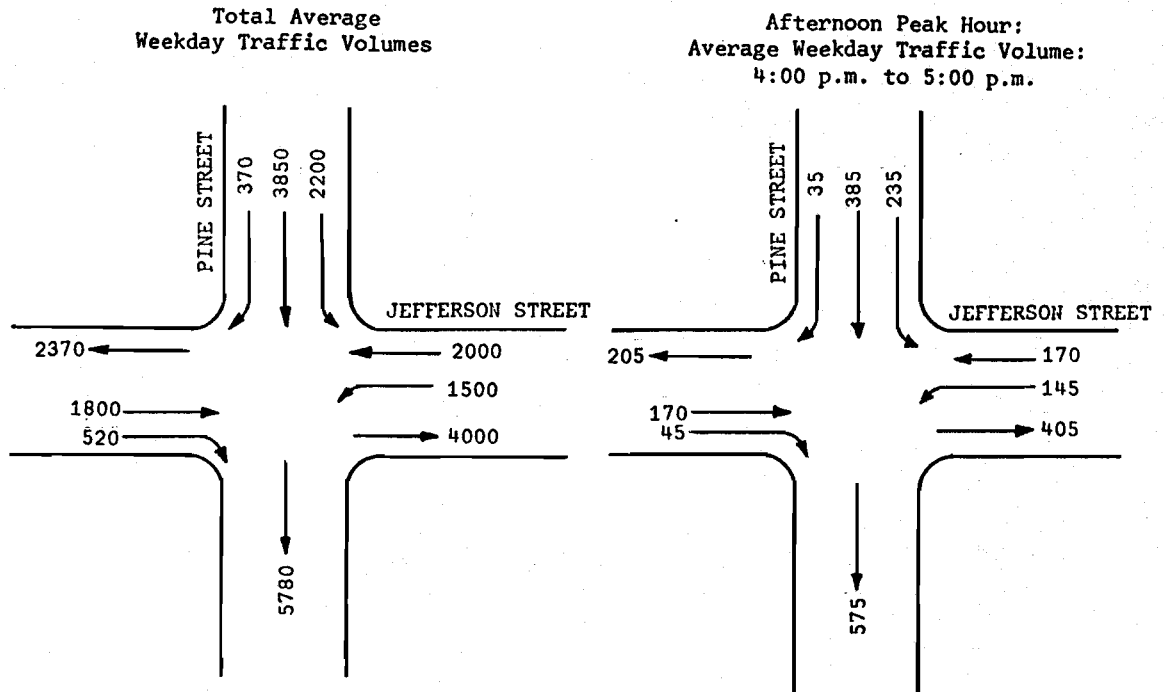


Figure 1

AVERAGE WEEKDAY TRAFFIC VOLUME AT THE INTERSECTION OF PINE STREET AND JEFFERSON STREET

Existing Street Operation



Proposed Conversion of Pine Street to Two Way Operation

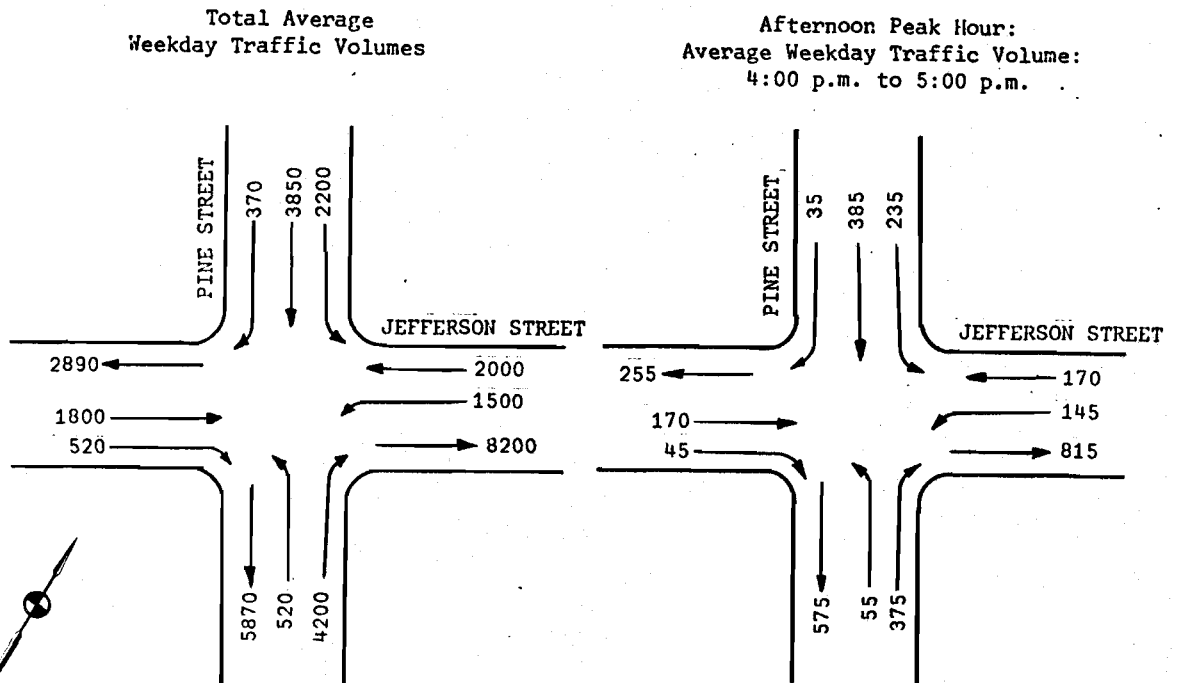


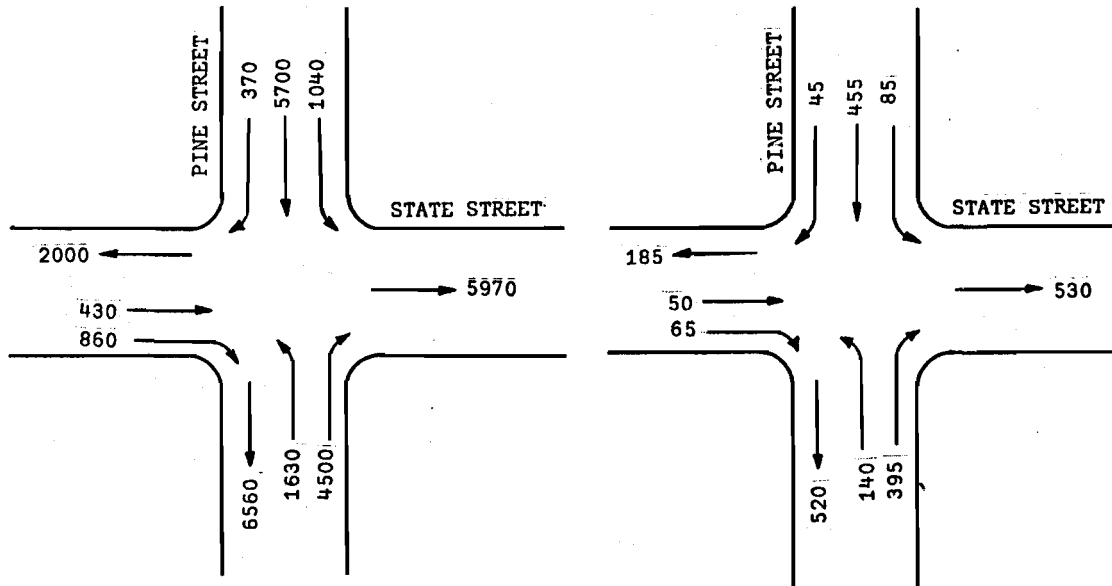
Figure 2

AVERAGE WEEKDAY TRAFFIC VOLUME AT THE INTERSECTION OF PINE STREET AND STATE STREET

Existing Street Operation

Total Average Weekday Traffic Volumes

Afternoon Peak Hour:
Average Weekday Traffic Volume:
4:00 p.m. to 5:00 p.m.



Proposed Conversion of Pine Street to Two Way Operation

Total Average Weekday Traffic Volumes

Afternoon Peak Hour:
Average Weekday Traffic Volume:
4:00 p.m. to 5:00 p.m.

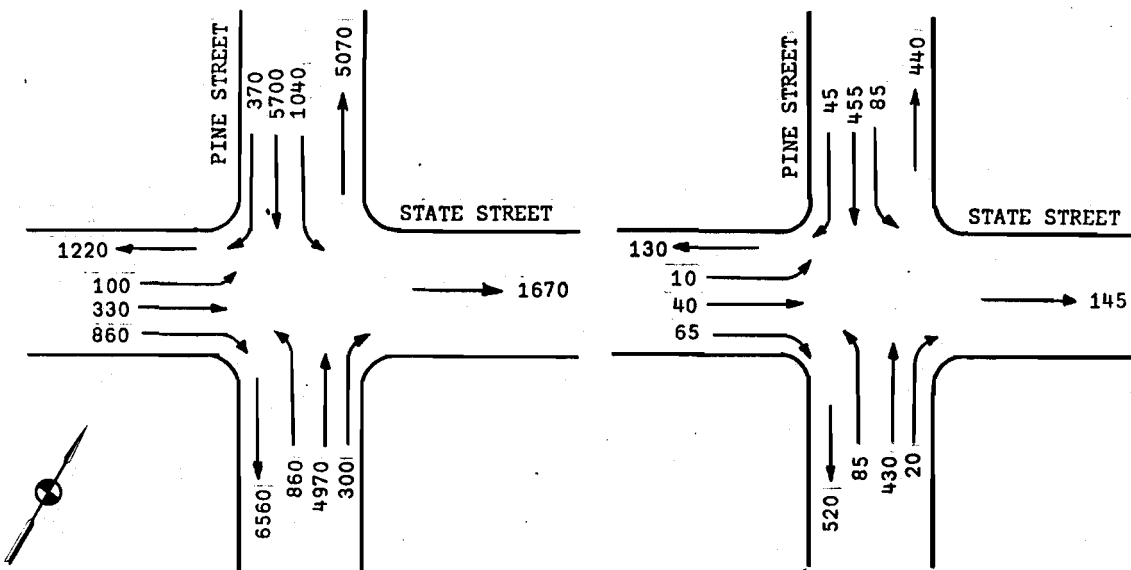
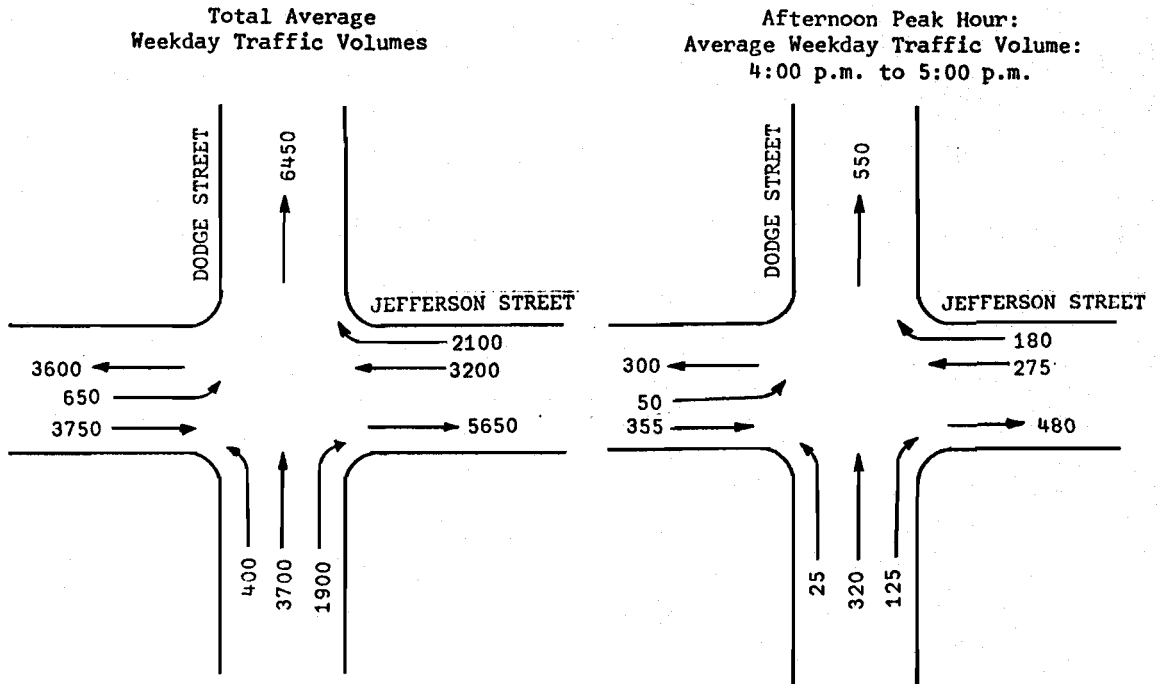


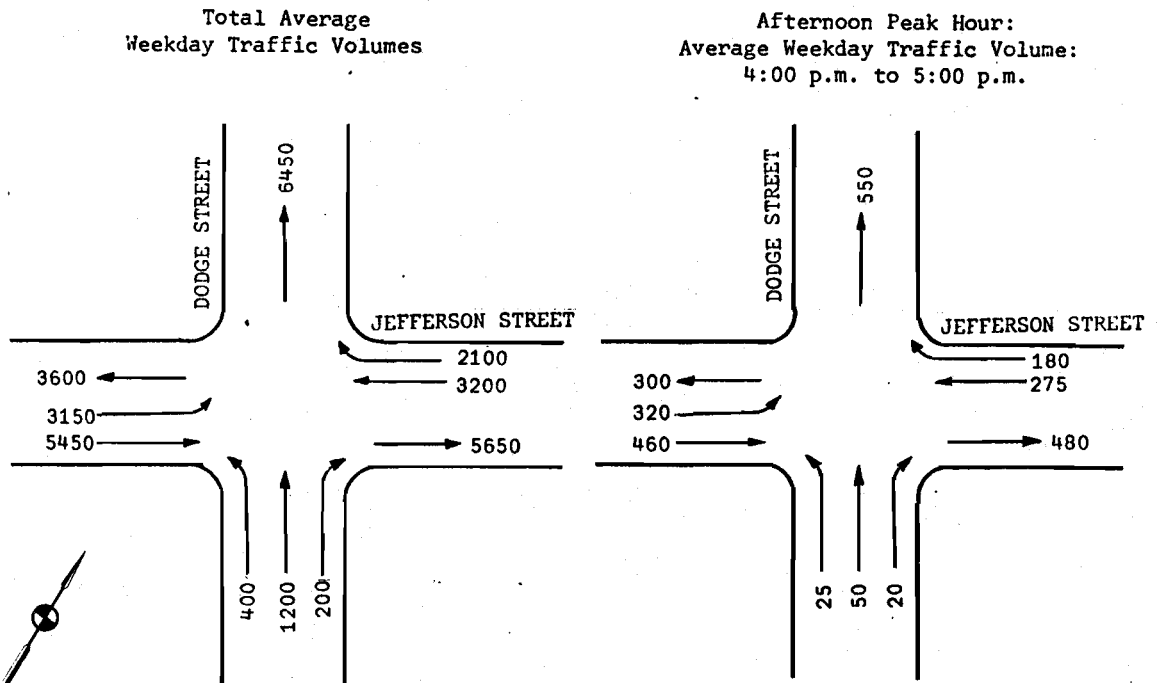
Figure 3

AVERAGE WEEKDAY TRAFFIC VOLUME AT THE INTERSECTION OF DODGE STREET AND JEFFERSON STREET

Existing Street Operation



Proposed Conversion of Pine Street to Two Way Operation



Capital Costs

The proposed conversion of Pine Street between Jefferson and State Streets to two-way operation may be expected to have an estimated capital cost of about \$3,000, including the necessary signing, pavement striping, and removal of a traffic island at the intersection of Pine Street and State Street.

Impacts on Existing On-Street Parking

The proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation may be expected to require the removal of seven existing on-street curb parking spaces, including five parking spaces on eastbound Jefferson Street between Pine Street and Dodge Street. This removal of parking is necessary to provide two traffic lanes at the eastbound intersection of Jefferson Street and Dodge Street. Also, two parking spaces would have to be removed on northbound Pine Street at its intersection with Jefferson Street to provide two northbound traffic lanes--one for left turns and one for right turns.

Land Use and Circulation Impacts

The proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation may be expected to improve land use access and ease of use of the street network in the City of Burlington by converting a one-way street segment to two-way operation.

SUMMARY

At the request of the City of Burlington City Engineer, the Southeastern Wisconsin Regional Planning Commission has analyzed the potential impacts of converting a segment of Pine Street in the City of Burlington from State Street to Jefferson Street from one-way to two-way operation. This segment of Pine Street currently serves as the routing for southbound STH 83. This report presents the findings of the requested analysis. The proposed conversion of this segment of Pine Street to two-way operation does not propose the re-routing of northbound STH 83 over the new two-way segment of Pine Street, but proposes to retain the existing routing over the one-way eastbound segment of State Street between Dodge Street and Pine Street, and the one-way northbound segment of Dodge Street between State Street and Jefferson Street in order to accommodate semi-trailer truck turning movements without street improvements and attendant right-of-way acquisition.

The proposed conversion of Pine Street between Jefferson Street and State Street from one-way to two-way operation may be expected to have potential impacts on traffic volume, capital costs, parking, land use, and traffic circulation. The proposed conversion of Pine Street between State Street and Jefferson Street to two-way operation may be expected to result in a substantial increase in average weekday traffic volumes on Pine Street between State Street and Jefferson Street from between 5,900 to 7,100 vehicles per average weekday to between 10,600 and 12,200 vehicles per average weekday. This expected volume of traffic on the proposed two-way street segment would be somewhat less than the 12,700 vehicles per average weekday currently carried on Pine Street south of State Street, but would approach its design capacity of 13,000 vehicles per average weekday. Also, the average weekday traffic volume on Jefferson Street between Pine Street and Dodge Street may be expected to increase from 8,000 vehicles per average weekday to 12,200

vehicles per average weekday. This expected level of traffic would be somewhat more than the 11,000 vehicles per average weekday currently carried on the segment of Jefferson Street between Dodge Street and Calumet Street, but would again approach its design capacity of about 13,000 vehicles per average weekday. With respect to intersection traffic volumes, the conversion of Pine Street to two-way operation may only be expected to result in substantial increase in average weekday traffic volumes entering and exiting the intersection of Pine Street and Jefferson Street. Although traffic operations at the intersection would be expected to decline, the intersection would still operate within its design capacity.

The proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation was determined to have an estimated capital cost of about \$3,000, including necessary signing, pavement striping, and removal of a traffic island at the intersection of Pine Street and State Street.

The proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation was determined to be expected to require the removal of seven existing on-street parking spaces, including five parking spaces on eastbound Jefferson Street between Pine Street and Dodge Street, and two parking spaces on northbound Pine Street at its intersection with Jefferson Street.

With respect to land use and circulation impacts, the proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation would be expected to improve land use access and ease of use of the street network in the City of Burlington and reduce potential circuitous travel which results from one-way street segments.

In summary, the proposed conversion of Pine Street between Jefferson Street and State Street to two-way operation would have the benefits of improving land use access and the ease of use of the central business district street network, and eliminating the need for unnecessary circuitous travel. The conversion may be expected to have a modest capital cost and relatively minimal impacts on on-street curb parking. While the conversion may be expected to increase average weekday traffic volumes on Pine Street between Jefferson Street and State Street, and on Jefferson Street between Pine Street and Dodge Street, the anticipated volumes of traffic should not exceed the design capacities of the street segments concerned and, therefore, should not result in traffic congestion. However, with growth in the City of Burlington in the future, it may be anticipated that traffic volumes on these street segments will begin to exceed design capacity and a need may exist to consider measures to improve traffic flow such as peak period parking prohibitions, a return to the one-way street system, or a new highway bypass.