

Many downtowns across the nation have a desire to convert their one-way street system to two-way. Pairs of one-way streets (couplets) were popular in the 1950's and 60's to improve automobile traffic flow and reduce conflicts at intersections. Most one-way street systems at one time were two-way streets, such as in downtown Napa. The most common reasons for converting back to two-way include:

- ▶ One-way streets create a circuitous and confusing circulation pattern, particularly for visitors.
- ▶ Some businesses located on one-way streets have poor access or less exposure to passing motorists.
- ▶ Narrower two-way streets have slower traffic.
- ▶ Two-way streets improve pedestrian and bicycle safety (ostensibly from slowing automobile traffic or by reducing the number of automobiles circulating in the downtown).
- ▶ Two-way streets result in less use of fuel, fewer miles of travel, and less automobile emissions from circulating around downtown.
- ▶ Two-way streets eliminate wrong way travel.

The conversion of one-way streets to two-way is often fraught with controversy. Proponents of one-way streets claim they are safer for pedestrians and result in less automobile congestion. Proponents of two-way streets claim they are safer, and create a more intuitive circulation system. The fact is, there is no single and straightforward answer. Both one-way and two-way street systems have a number of technical advantages and disadvantages. Both systems can be made to work and be safe for all modes of travel. **The decision to convert one-way streets back to two-way is a local decision based on the community's values.**

This fact sheet summarizes some generalized advantages and disadvantages of one-way and two-way street systems.

### Advantages of Two-Way Streets

- ▶ Two-way streets create less confusing circulation pattern which is more intuitive to all users,
- ▶ Eliminates indirect routes, which reduces travel time, fuel consumption, and emissions.
- ▶ Provides more direct routes to downtown destinations.

- ▶ Creates direct emergency vehicle access to and from downtown.
- ▶ Creates slower traffic speeds due to fewer lanes in each direction, parking maneuvers, and an increase in congestion.
- ▶ Improves pedestrian perception of the street as less of a barrier.
- ▶ Increase exposure of adjacent businesses to passing motorists.
- ▶ Increase access to adjacent properties served by driveways.
- ▶ Two-way streets with bike lanes or routes are preferable to bicyclists for wayfinding.
- ▶ Two-way streets are favored by transit users for improved transfers between routes.
- ▶ Favored by Napa transit operator (VINE) by increasing recognition and visibility of routes.

### Disadvantages of Two-Way Streets

- ▶ Generally increase traffic congestion at intersections.
- ▶ May require left turn lanes at intersections which may eliminate on-street parking adjacent to intersection.
- ▶ Two-way streets increases the number of conflict points at intersections, and may increase certain types of crashes (i.e., broadside).
- ▶ Reduces opportunity to increase traffic capacity if ever needed.
- ▶ Narrower two-way streets may be difficult for large vehicles and fire apparatus to negotiate and may require longer red zones and loss of parking at some intersections.
- ▶ With only one lane each direction, traffic control may be required during emergencies.
- ▶ Two way streets that eliminate turning movements at some intersections will divert turning vehicles to other intersections.

### Advantages of One-Way Streets

- ▶ Fewer automobile and pedestrian conflict points at intersections and pedestrian need only watch for traffic in one direction.
- ▶ Some right turn on red movements eliminated, thus eliminating a potential auto/pedestrian conflict.
- ▶ Left turns into the street from driveways have fewer conflicts.
- ▶ One-way streets generally provide more vehicular capacity and long lines of turning vehicles don't block through lanes.
- ▶ One-way streets have more simplified traffic signal operations reducing delay for individual drivers.

- ▶ One-way streets can accommodate more on-street parking since parking doesn't need to be removed to accommodate left turn lanes. Drivers have option to park on both sides of the street.
- ▶ One-way streets can provide better traffic signal synchronization set to the slower speeds expected in downtowns.

### Disadvantages of One-Way Streets

- ▶ One-way street systems without uniform patterns are confusing, especially to visitors.
- ▶ One-way streets can result in higher speeds and be perceived as a barrier to pedestrian crossings.
- ▶ One-way streets can increase certain types of pedestrian accidents.
- ▶ Higher speeds on one-way streets can increase crash severity, and one-way streets have the potential for wrong way, head-on collisions.
- ▶ For downtown circulation, one-way streets have longer travel times (looping) causing inconvenience, use more fuel and create more auto emissions.
- ▶ Undesirable for transit users as they separate and increase the distance between routes.
- ▶ One-way streets can create circuitous emergency response routes, and circuitous truck routes.
- ▶ One-way streets that eliminate turning movements at some intersections will increase them at others.
- ▶ Reduces exposure of businesses to passing motorists.

### Does Converting From One-Way to Two-Way Streets Improve Business?

While there is no definitive answer to this question and no support by scientific studies correlating street direction with business economy, there is ample anecdotal before and after information about the positive results of converting from one-way streets back to two-way. One study<sup>1</sup> surveyed 22 communities that converted their one-way streets back to two-way. The vast majority of the communities reported that the conversion was positive for business development and none of the communities reported tangible negative effects of the conversion. Communities reported improved business, increased investment in the downtown,

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<sup>1</sup> Hyannis Main Street Improvement District. Survey of Communities Converting Downtown Streets from 1-Way to 2-Way Traffic Circulation. December 1999.

more choices for travel in downtown, increased pedestrian friendliness, and a general feeling of improved “livability”, “quaintness”, and “sense of community”.

### Feasibility for Downtown Napa – Issues Related to Conversion

Recently, a study prepared by DMJM Harris evaluated the conversion of 1st Street from Main to Jefferson<sup>2</sup>. This study found the conversion to be feasible both physically and operationally. Key concerns identified as part of this study will be similar to studying the conversion for 1st Street from Jefferson to California, 2<sup>nd</sup> Street from California to Main Street, and the one-way segments of 3<sup>rd</sup>, 4<sup>th</sup>, Franklin and Clay. These issues are:

- ▶ Ability to accommodate appropriate number of lanes within existing curb to curb width, including turning lanes where necessary.
- ▶ Potential loss of parking particularly at intersections where left turn lanes will be needed, or narrowing of sidewalks to accommodate new lanes where there is no parking currently.
- ▶ The ability of large delivery vehicles, buses, and fire apparatus to make turns without encroaching into opposing travel lanes, or the need to identify alternative large vehicle routes.
- ▶ Potential adverse effect on emergency response times.
- ▶ Potential operational impacts on traffic congestion, queuing, delays, and ability to implement traffic signal synchronization and emergency vehicle pre-emption devices.
- ▶ Determination if the conversion would create an imbalance in traffic between 1<sup>st</sup> and 2<sup>nd</sup> Streets.
- ▶ Potential for conversion to divert traffic to parallel streets and whether diversion impacts adjacent land uses.
- ▶ Ability to accommodate planned and proposed bicycle facilities on converted streets.
- ▶ Cost of required physical and operational improvements.

### Conversion Options for Downtown Napa

Over the years several conversion options have been considered. These are summarized below

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<sup>2</sup> DMJM Harris. First Street Reconfiguration Study. February, 2008.

along with potential issues that may need to be addressed.

**Option 1: Convert Downtown One-Way Streets to Two-Way between Main and Jefferson.** This option converts 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> from one-way to two-way. 1<sup>st</sup> and 2<sup>nd</sup> would be converted between Main to Jefferson, retaining the one-way couplet between Jefferson and Highway 29. No significant implementation issues have been identified with this option other than those summarized in the DMJM Harris study.

**Option 2: Convert Downtown One-Way Streets to Two-Way between Main and Highway 29.** As in Option 1, this option converts 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> from one-way to two-way. 1<sup>st</sup> and 2<sup>nd</sup> would be converted to two-way their entire length to Highway 29. Issues related to this option include:

- ▶ Some reconstruction of the Highway 29/California intersection to align approaches and provide two-way access to 1<sup>st</sup> Street.
- ▶ Expectation that 1<sup>st</sup> Street would attract the majority of traffic since it would provide direct connection to Highway 29, Soscol Avenue and Silverado Trail.

**Option 3: Convert Downtown One-Way Streets to Two-Way between Main and Jefferson and Reverse Direction of 1<sup>st</sup> and 2<sup>nd</sup> Streets.** This option would convert the central business district one-way streets to two-way (between Main and Jefferson) including 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and Franklin, retain 1<sup>st</sup> and 2<sup>nd</sup> between Jefferson and Highway 29 as a one-way couplet but reverse directions. In this option, 1<sup>st</sup> Street would be one-way eastbound and 2<sup>nd</sup> Street one-way westbound. The advantage of this reversal is a more direct route to downtown from Highway 29. Furthermore, this option may reduce the number of conflicts at the intersection of 1<sup>st</sup> and Jefferson and 1<sup>st</sup> and California. Implementation issues include:

- ▶ Reconstruction of the Highway 29/California intersection to align approaches and provide multi-lane access to 1<sup>st</sup> Street, and higher capacity for northbound left turns from California to 1<sup>st</sup> Street.
- ▶ Reconstruction of medians/left turn lanes on Jefferson to accommodate reversal of directions.

### **Order of Magnitude Cost of Conversion**

The DMJM Harris study estimated the cost of converting 1<sup>st</sup> Street from Main to Jefferson at

\$785,000 for a 0.46 mile segment of street. This estimate includes the cost of:

- ▶ Installing traffic signal equipment, which may include preemptive devices for emergency vehicles;
- ▶ Installing street lighting;
- ▶ Roadway signing and striping;
- ▶ Roadway demolition where needed; and
- ▶ Roadway/intersection reconstruction where needed.

Using the DMJM Harris estimate as an approximation of the cost to convert from one-way to two-way, a representative “cost per mile” can be used to estimate the cost of other conversions. The cost per mile then is roughly \$1,700,000. This cost is adjusted for streets that have fewer traffic signals. In addition, those options which would require reconstruction of the 1<sup>st</sup>/California intersection include an additional cost. Below is a summary of the order of magnitude costs for each option:

▶ Option 1:	\$1,706,500
▶ Option 2:	\$2,633,100
▶ Option 3:	\$2,833,100

In any of the options, there is the potential that an eastbound left turn lane is necessary at the intersection of 1<sup>st</sup> Street and Main Street. Because the curb to curb width is inadequate to provide this third lane, the sidewalks on each side of the street would need to be narrowed to accommodate the left turn lane. The estimated cost of this modification, not included in the above estimates, is about \$310,000, including demolition of curb and sidewalk, new curb and pavement, new landscaping, and relocation of utilities (traffic signals, lighting, and drainage).