

Neighborhood Traffic Calming: Seattle's Traffic Circle Program

City of Seattle, Seattle Transportation (SEATRAN)

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Program Description

Seattle's Neighborhood Traffic Control Program (NTCP) got its start as an outgrowth of programs to assist and improve deteriorating neighborhoods. Residents of Seattle approved the Forward Thrust Bond Issue in 1968 that included an emphasis on reducing traffic impacts and support for street improvements to re-vitalize deteriorating neighborhoods. Demonstration projects were instituted in 1973 and continued throughout the 1970's, testing a variety of traffic control devices. Temporary barriers were used to test traffic circles, star diverters, diagonal diverters, partial closures, and full closures on a system wide basis. The experiences gained from these demonstration projects were used to establish the annual NTCP in 1978. This program emphasizes citizen participation and includes an element to address spot safety problems at specific locations.

The NTCP has grown into a popular and highly visible program with its most successful device being the traffic circle (Figure 1). Of all the devices used in Seattle, traffic circles have proven to be the most effective at solving neighborhood concerns surrounding speeding and traffic accidents with a minimum of controversy. Since 1973, over 600 traffic circles have been constructed in Seattle and NTCP staff receive about 700 requests for traffic circles each year. The program is currently funded to construct 30 traffic circles per year.



Figure 1. Landscaped Traffic Circle

Selection Process

Potential traffic circle locations are identified through community requests or investigation of high accident intersections. Each request is investigated and an initial assessment is performed to determine if a traffic circle is feasible. Residents' requests are responded to with a letter, which explains the process for installing a circle and the likelihood of the location competing successfully for full city funding. In order to ensure that the City's traffic safety funding is allocated to intersections with the greatest need, a priority point system is used to rank the intersections where traffic circles are requested. Ranking criteria include: the number of accidents that have occurred at the intersection in the last three years; traffic speed (85th percentile); and traffic volume. Residents are required to submit a petition, with signatures representing 60% of the households within a one block radius of the proposed traffic circle, in order to compete for funding. Funding is allocated starting with the intersection with the worst combination of problems and proceeds as far down the list as funding allows. The cost to construct each circle ranges from \$3,000 to \$6,000.

Design

Each traffic circle is individually designed to fit the intersection without having to modify the street width or corner radii. Most of Seattle's local streets are 25 feet wide or less and traffic circles are usually 12 to 16 feet in diameter. A single unit truck having a 45 foot turning radius is used as a design vehicle to ensure that fire trucks can pass by the circle without running over the curbs. All intersections where circles are to be constructed are reviewed by the Fire Department and field tests are conducted where they have a specific concern. While traffic circles are designed to allow fire trucks to pass by them, they are constructed with a two foot wide mountable curb that allows fire trucks or larger vehicles, such as moving vans, to run over the curb without damaging the vehicle or the circle.

Landscaping is included in all the traffic circles currently being constructed. The pavement inside the traffic circle is removed during construction to allow for drainage and accommodate tree roots. The landscaping plays two important roles, making the circle more attractive to the neighborhood residents and changing the character of the street to making it less appealing for high speed driving. The local residents are required to maintain the plantings, which consist of ground cover and one to three trees. Residents are allowed to add their own low growing plants that will not block pedestrian or driver visibility.

Accident Reduction

While landscaping makes traffic circles an attractive addition to a street, accident reduction is their greatest benefit. Between 1991 and 1994 a total of 119 traffic circles were constructed through the NTCP. A comparison of the number of accidents occurring in the calendar year before and after construction at these intersections, reveals a considerable drop in accidents. There were 187 accidents in the year before construction, compared to 11 accidents in the year after (Figure 2). This is a 94% reduction in accidents in a single year. Figure 2 displays the long-term impact of traffic

circles, as the number of accidents has remained at very low levels in the years following construction.

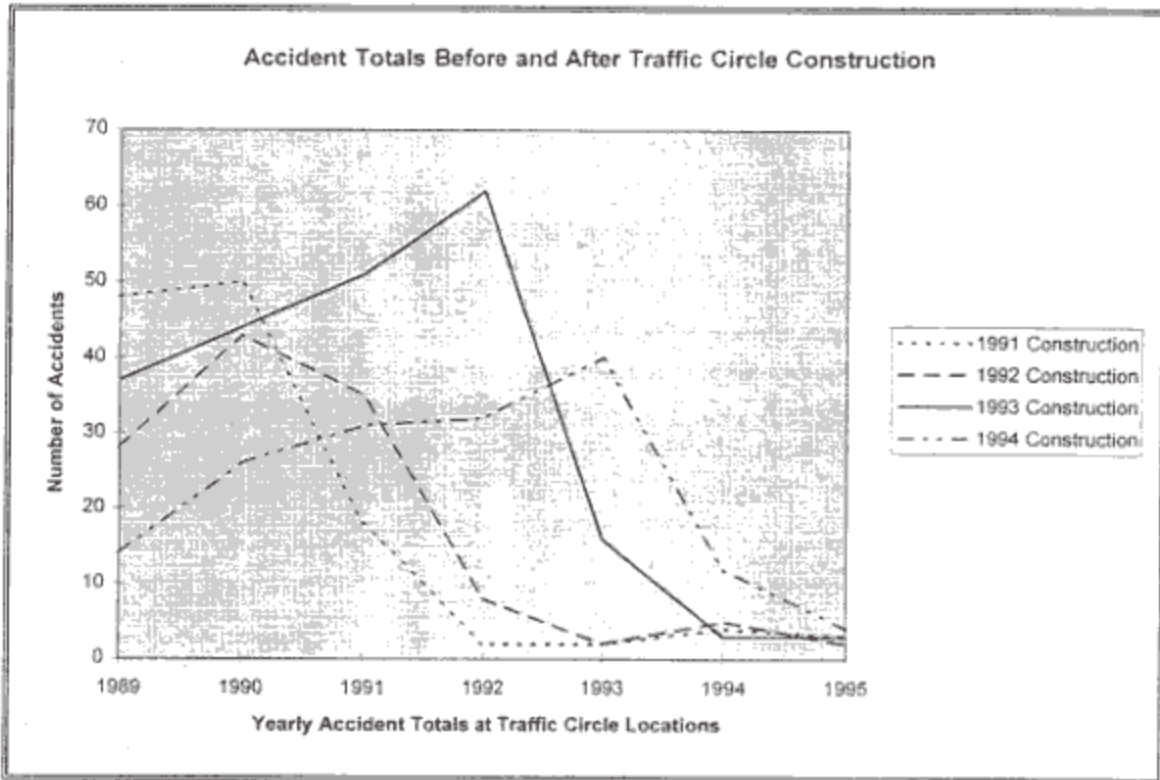


Figure 2. Accident Totals Before and After Traffic Circle Construction

The reduction in injuries was even more dramatic, dropping from 153 injuries in the year before construction to a single injury in the year following construction (Figure 3). The reduction in injuries as well as accidents is even more impressive when examining the trend-line figures, as they show increasing numbers of both injuries and accidents in the years prior to traffic circle installation (Figures 2 and 3).

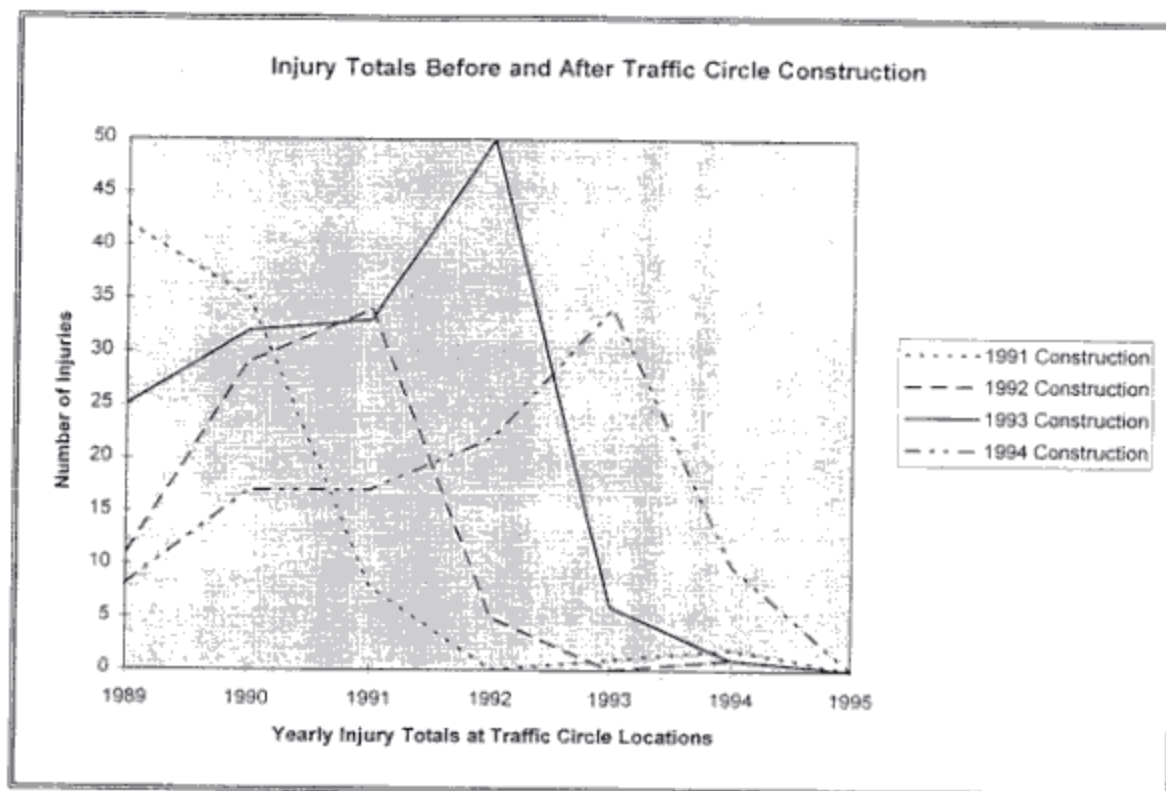


Figure 3. Injury Totals Before and After Traffic Circle Construction

A common question that is asked, relates to the cost effectiveness of traffic circles, because they are much more expensive than installing stop signs. Traffic circles are sometimes viewed as an esthetic improvement and that intersections could be made safer by installing yield or stop signs at considerably less expense. The significant reduction in accidents attributable to traffic circles demonstrates that they pay for themselves many times over in reduced accident costs in just the first year. While most of the non-arterial intersections in Seattle have no right-of-way control, 32 of the 119 locations studied had existing two-way stop or yield signs, which were removed when the traffic circles were installed. These locations, which previously had right-of-way control, experienced accident and injury reduction rates similar to those found at uncontrolled intersections (Tables 1 and 2).

Table 1. Accidents Before and After Traffic Circle Construction at Previously Signed Intersections

	1991 N=10	1992 N=7	1993 N=9	1994 N=6	4 Year Total
Before Construction	11	11	21	6	49
After Construction	1	0	3	1	5
Percent Reduction	90.9%	100%	85.7%	83.3%	89.8%

Table 2. Injuries Before and After Traffic Circle Construction at Previously Signed Intersections

	1991 N=10	1992 N=7	1993 N=9	1994 N=6	4 Year Total
Before Construction	10	5	17	6	38
After Construction	0	0	1	0	1
Percent Reduction	100%	100%	94.1%	100%	97.4%

In addition to reducing accidents, traffic circles have been found to be effective at reducing vehicle speeds, but have not significantly reduced traffic volumes. The effect on speed generally carries over to the middle of the block, however to a lesser extent than near the intersection. The minimal impact on traffic volumes allows circles to be used as a spot safety device without needing to address the impacts of traffic diverting to other residential streets. Traffic circles can change a street's attractiveness as a cut-through route by their reduction in traffic speeds and reducing the wide open appearance of a street. The cumulative effect of several circles, along a street, may have a significant effect on traffic volumes, but this is dependent on the availability of alternative routes.

Neighborhood Acceptance

The success of any neighborhood traffic control device must also be measured by its acceptance among residents living near them. Sentiment about traffic circles in Seattle seems to diverge to the extremes. In other words, residents that like circles "love" them, and residents that don't like circles "hate" them. By far, the majority of residents fall in the former category. This has been demonstrated in a number of ways:

- Nearly 700 requests for traffic circles are received each year. The number of requests is seemingly limited only by the knowledge that funding is limited and only intersections with the greatest traffic problems will be constructed.
- Approximately 3,000 signatures are received on petitions each year.
- Only two circles have been removed out of more than 600 constructed and none have been removed in the last twelve years. Residents are guaranteed that the City will remove a traffic circle if, after construction, 60% of the households within a one block radius have signed a removal petition.
- Responses on surveys mailed to residents following construction of traffic circles indicate that 80% to 90% of residents feel the circles have been effective and want to keep them permanently.

The level of community support for traffic circles in Seattle, can be further demonstrated through two programs that allow residents to choose how their tax dollars are spent. One program is the Neighborhood Matching Fund where residents must provide half of the cost in cash or labor and the City provides the other half. The second program is the Neighborhood Street Fund, which allows residents to set their own priorities for funding improvements within the street right-of-way. Traffic circles are one of the more popular projects selected in both of these programs. Since both programs are based on neighborhood priorities and are not limited by the NTCP ranking system, they provide a positive avenue for residents to pursue funding for traffic circles that are not able to compete successfully for full City funding.

Conclusion

After nearly twenty-five years of experience installing traffic circles, Seattle has found them to be an effective device for controlling neighborhood traffic and improving the safety of residential streets. Additionally, residents feel traffic circles have successfully addressed their safety concerns and make their neighborhood a better place to live.