FINAL REPORT -

ARTERIAL TRAFFIC CALMING PROGRAM

September 1993
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ARTERIAL TRAFFIC CALMING PROGRAM
CITIZENS ADVISORY COMMITTEE
REPORT AND RECOMMENDATIONS

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September 1993
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INTRODUCTION

During the recent Arterial Streets Classification Policy update (now called the Transportation Element of the City of Portland Comprehensive Plan), citizens and neighborhood associations throughout the City expressed concerns about the negative impacts of excessive traffic volumes and speeds on Neighborhood Collector Streets. They also expressed frustration that, unlike their neighbors on Local Service Streets, they did not have access to a program to deal with the traffic and livability issues. Hence, the Transportation Element recommended that a "Collector Recovery Program" be developed. On February 26, 1992, City Council adopted Ordinance No. 165132 establishing the "Collector Recovery Program" in the Bureau of Traffic Management (BTM). The Ordinance authorized funding for the program development, including two full-time staff positions.

Neighborhood Collector Streets are very different from Local Service Streets in that they are part of the City's arterial street system. They are intended to serve as distributors of traffic between Major City Traffic Streets or District Collector Streets and Local Service Streets. In other words, they are the streets that are commonly called "through" streets. They serve as fire response routes, many are transit streets, and most are designated bike routes. A few are designated truck routes. On the other hand, like Local Service Streets, most Neighborhood Collectors are also residential in nature. As residential streets, it is important that livability is maintained and enhanced to ensure the long-term viability of Portland’s neighborhoods.

The inherent conflict between the need to move traffic efficiently and the need to keep the neighborhood livable presented a unique challenge for the citizens and staff developing the "Collector Recovery Program." It was obvious that the developed program needed to balance the many different needs, interests, and uses of Neighborhood Collector Streets to be successful. This report outlines the recommended program resulting from the work of three committees made up of citizens from each District Coalition area, staff, and other agency representatives. The committees also recommended that the program name be changed to the Arterial Traffic Calming Program (ATCP) to better describe the program and its purpose.

The purpose of the program is to enhance livability for residents along Neighborhood Collectors by confronting traffic problems through the use of education, enforcement, and engineering tools. This is an innovative and progressive program; staff research

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1 Streets within the City of Portland are designated through the Transportation Element of the City of Portland Comprehensive Plan. This document provides policy direction for the City and is intended to direct future development of Portland’s transportation system. A copy of the Classification Descriptions from the Transportation Element is included in the Appendix A section of this report.
found no similar programs in the United States addressing these types of traffic issues on arterial streets. The development of this program reflects the ongoing commitment of the City of Portland and the Office of Transportation to the safety and livability of residential neighborhoods. Further, the program complements the "Reclaiming Our Streets" and Neighborhood Traffic Management Program efforts to protect neighborhoods from the negative impacts of traffic, and puts into practice the goals and policies contained in the Transportation Element.

To solicit broad citizen review and comment, a draft report was written and sent to all of the District Neighborhood Offices, District Coalition Boards, Neighborhood Association contact persons and a list of interested people who have asked to receive the draft report. In addition, two public Open Houses were held during the last week of April 1993. The Open Houses offered the general public an opportunity to learn about the proposed program and make comments in a comfortable, informal setting. Comments, written or oral, were received by ATCP staff until May 24, 1993.

Following the comment period, the Program Development and Citizens Advisory Committees reviewed the comments for incorporation into the final report to City Council. The committees' written response to the comments was written and sent to all of the District Neighborhood Offices, District Coalition Boards, Neighborhood Association contact persons, persons and organizations that submitted written comments, and the list of people interested in the program. The final report Executive Summary was also sent to the above parties.

This final report to City Council reflects the revisions to the draft report approved by the committees. City Council will consider adoption of this program at its meeting on September 22, 1993 beginning at 9:30 am. Public testimony will be taken by City Council at that time.

REPORT FORMAT

This report is segmented into two sections. The first section titled "Summary - Arterial Traffic Calming Program," describes the program. This section is designed to give the reader pertinent information about the program in a concise manner. The second section titled "Major Discussion Points During Development - Arterial Traffic Calming Program," repeats the program as described in the first section and adds the major points that were considered by the committees during their decision-making process. The discussion detail portions of the report are highlighted for the readers convenience.
SUMMARY -

ARTERIAL TRAFFIC CALMING PROGRAM
OBJECTIVES AND POLICIES

The goal of the Arterial Traffic Calming Program (ATCP) is to enhance neighborhood livability for residents of Neighborhood Collector Streets by addressing traffic problems using education, enforcement, and engineering tools. While maintaining neighborhood livability is important to the vitality of the City and the primary goal of the program, it must be recognized that Neighborhood Collectors are part of the City-wide arterial street system and must accommodate efficient movement of all modes of transportation, including automobiles. The inherent conflict of needs unique to Neighborhood Collectors must be acknowledged, considered, and balanced throughout all aspects of the Arterial Traffic Calming Program. To that end, the program is guided by the following objectives and policies.

OBJECTIVES

1. Improve neighborhood livability by mitigating the impact of vehicular traffic on residential neighborhoods.

2. Promote safe and pleasant conditions for all modes of transportation, including motorists, bicyclists, pedestrians, transit riders, and emergency vehicles on Neighborhood Collector Streets.

3. Promote and support the use of transportation alternatives to the single occupant vehicle.

4. Ensure opportunities for citizen involvement in all phases of Arterial Traffic Calming Program activities.

5. Make efficient use of City resources by prioritizing traffic management projects.

POLICIES

1. Application of the Arterial Traffic Calming Program should be limited to Neighborhood Collector Streets (as designated in the Transportation Element of the City of Portland Comprehensive Plan) that are primarily residential. Where appropriate, an ATCP project should coordinate with the Neighborhood Traffic Management Program (NTMP), which addresses problems on designated Local Service Streets.

2. To achieve the ATCP’s objectives, education, enforcement, and engineering methods should be employed, and alternative transportation should be encouraged. Traffic management devices should be planned and designed in keeping with sound engineering and planning practices.
3. Emergency vehicle access should be preserved within the existing Fire Bureau response standards. If current emergency vehicle access does not meet the existing response standard, an ATCP project should not further degrade the response time.

4. ATCP projects should not significantly impact transit service access, safety, and scheduling.

5. Pedestrian and bicycle movement should be given equal consideration with vehicle movement in the design and implementation of ATCP projects. ATCP projects should be coordinated with the Bicycle and Pedestrian programs where appropriate so they do not conflict with or preclude each other.

6. Parking removal should be considered on a project-by-project basis. Parking needs of residents should be balanced with the equally important functions of traffic, emergency vehicle access, transit, bicycle, and pedestrian movement.

7. Through traffic should be encouraged to use higher-classification arterials, as designated in the Transportation Element.

8. The amount of traffic increase acceptable on a Local Service Street should be defined on a project-by-project basis to a maximum of 150 vehicles per day.\(^2\) Under no circumstances should an ATCP project divert traffic through the use of traffic diversion devices.

9. To implement the ATCP, certain procedures should be followed by the Office of Transportation in processing traffic management proposals in accordance with applicable codes and related policies and within the limits of available resources. At a minimum, the procedures should provide for project selection and evaluation; citizen participation in plan development and evaluation; communication of any test results and specific findings to area residents and affected neighborhood organizations; and appropriate City Council review.

10. At the beginning of each project, the City (ATCP staff) and project traffic committee should enter into a nonbinding contract to define the roles and responsibilities of the City, traffic committee, and project area residents.

\(^2\)The maximum traffic increase acceptable on a Local Service Street due to an ATCP project is derived from the NTMP Impact Threshold Curve. NTMP projects utilize this curve to define the range of acceptable traffic increases to Local Service Streets. The Impact Threshold Curve has a baseline increase of at least 150 vehicles per day and a ceiling of no more than 400 vehicles per day. In other words, an increase of up to 150 vehicles per day as a result of an NTMP project is acceptable on any Local Service Street.
PROJECT SELECTION PROCESS AND CRITERIA

PROJECT INITIATION

Arterial Traffic Calming Program projects will be initiated by the Bureau of Traffic Management (ATCP staff) by applying the selection criteria to the approximately 275 designated Neighborhood Collector Streets, by segments, to determine project priorities. The project ranking process will be performed at three-year intervals.

Although the Arterial Traffic Calming Program is designed to be a non-complaint-driven program, citizen involvement and participation is very important to the ATCP program and staff. At the start of the project selection cycle, and throughout the process, staff will disseminate information to citizens City-wide regarding the Arterial Traffic Calming Program—how projects are selected and prioritized, and whom to contact to ask questions, obtain more information, make suggestions, and/or express interests or concerns.

PROCESS FOR PROJECT RANKING AND SELECTION

On a three-year cycle, staff will perform an initial survey of all Neighborhood Collectors by segment. A street segment is defined as that portion of a Neighborhood Collector that is between two arterials. The purpose of the initial survey is to determine which segments are primarily residential. To be considered primarily residential, at least 75 percent of the properties with frontage on the segment must be in residential zoning. Those segments that are not primarily residential will be eliminated from further consideration. Also eliminated from further consideration are street segments that have been treated by an ATCP project within the last two project ranking cycles. The remaining segments will be assigned points and ranked using the criteria shown in the following table on the next page to develop a list of segments for potential projects.

To identify potential projects, the top ranking segments will be reviewed by BTM and ATCP staff for the size/complexity of the potential projects, compatibility with other PDOT projects, and the budget availability/limitations to establish program priorities. In addition to the identified high ranking segments, projects may also include additional segments or portions of additional segments to assure that street system continuity is maintained. Normally, two or three projects will be undertaken each year.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points</th>
<th>Basis for Point Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>0 to 30</td>
<td>Average daily speed during nonpeak hours.</td>
</tr>
<tr>
<td>Volume</td>
<td>0 to 25</td>
<td>Average daily traffic.</td>
</tr>
<tr>
<td>Density</td>
<td>0 to 20</td>
<td>Residential density along segment, based on zoning.</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>0 or 9</td>
<td>Absence of continuous sidewalk on both sides of street segment.</td>
</tr>
<tr>
<td>Elem. School Crossing</td>
<td>0 or 7</td>
<td>Points assigned if children must cross segment to get to elementary school.</td>
</tr>
<tr>
<td>Pedestrian Generators</td>
<td>0 or 5</td>
<td>Points assigned if other pedestrian generators are along segment or within 1000 feet of the street.</td>
</tr>
<tr>
<td>Street Width</td>
<td>0 or 4</td>
<td>Points assigned for segments over 40 feet wide.</td>
</tr>
<tr>
<td><strong>Total Points Possible</strong></td>
<td><strong>100</strong></td>
<td><strong>Ranking: Highest total points to lowest total points.</strong></td>
</tr>
</tbody>
</table>

Potential projects will also be examined to see if it would cause a "cumulative impact" situation. Cumulative impact has been defined by the Portland Fire Bureau (PFB) and BTM\ATCP staff as follows:

A cumulative impact is defined as potential negative impacts on the Portland Fire Bureau’s response time and route patterns by consideration of ATCP and/or Neighborhood Traffic Management Program (NTMP) projects on two or more adjacent parallel fire response routes, as identified on the Fire Bureau’s "Fire Response Map." The expansion of existing projects will also trigger this definition.

When a cumulative impact situation is identified, staff will initiate a meeting with PFB to identify, as specifically as possible, the potential negative impacts related to the proposed project. If the project is undertaken, the information generated at this meeting will be included in discussions with the traffic committee and in decision making by staff. Identification of cumulative impact will not preclude ATCP from proceeding with project development.

For efficiency reasons, a priority may be given to potential projects which can be jointly undertaken and funded by ATCP and other appropriate programs (e.g., Bicycle, Pedestrian, Neighborhood Traffic Management). The Arterial Traffic Calming Program will attempt to undertake one joint project each year.
PROJECT PROCEDURES

After the top two or three potential projects are identified, ATCP staff need to determine if the residents on those potential project segments want a project to be undertaken. To do this, for each proposed project segment, staff will send the residents a "survey to proceed," which is described in Step 1 below. If the residents support proceeding with the proposed project, staff will initiate the project by holding a public meeting as described in Step 2. If the residents do not want to proceed with the proposed project, the project will not be initiated.

The project procedures that will be used for ATCP projects are described in detail below and summarized in the flowchart on the next page.

STEP 1: SURVEY TO PROCEED

ATCP staff will mail a survey to all households, businesses, and nonresident property owners that have frontage on the project street segment (the "survey area"). The purpose of the survey is to establish the level of support among residents to proceed with a project. Staff will prepare the survey and describe the problem and the procedures to be followed if a project is undertaken. The survey will ask for a yes/no response as to whether the project should proceed. It will also ask the recipients to identify their major concerns and priorities concerning street improvements. This information can be used by the traffic committee in determining project goals and objectives in Step 4.

Each household, business, and nonresident property owner is entitled to one survey. A majority of the surveys that are returned must give a yes response for the project to proceed. If there is a low initial response to the survey, the staff will send a second notice to remind the recipients to return their surveys.³

If approval to proceed is not obtained, the project does not proceed to Step 2. However, the segment or segments that make up the project will still be included in the next three-year project ranking and selection cycle.

STEP 2: NOTIFICATION OF PROPOSED PROJECT

ATCP staff holds a public meeting to:

- Provide an overview of the ATCP.
- Give the results of the survey.

³The second notice to remind recipients to return their survey will include a second survey form for the recipient's convenience. Only one survey from each household, business, and nonresident property owner will be tabulated to determine response within the survey area.
Project Process

1) SURVEY TO PROCEED
   Survey
   NO
   Project Dropped
   YES
   2) NOTIFICATION OF PROPOSED PROJECT
      3) FORMATION OF PROJECT TRAFFIC COMMITTEE
      Project Dropped

4) PROJECT DEVELOPMENT
   Demo Project
   NO
   YES
   5) DEMONSTRATION BALLOT
      Demo Project Ballot
      NO
      Project Dropped
      YES

5A) CITY COUNCIL (IF NECESSARY)
5B) EVALUATE DEMONSTRATION PROJECT
   Evaluation
   NO
   Project Dropped
   YES

6) BALLOT FOR PERMANENT PROJECT
   Ballot
   NO
   Project Dropped
   YES

7) CITY COUNCIL APPROVAL
8) DESIGN & CONSTRUCTION IMPLEMENTATION
9) EVALUATION OF PERMANENT PROJECT
   Mitigation
   NO
   YES
   Mitigation Plan Development & Implementation

10) MONITORING
• Obtain feedback about issues and concerns.
• Recruit members for the project traffic committee.

The meeting notification is:

• Mailed to all households and businesses (including nonresident property owners) within the "project area." The project area is defined as extending to the ends of the project segment, and halfway to the next parallel arterials. The City may also notify other interested parties as appropriate.

• Mailed to neighborhood and business associations that: 1) are recognized by the Office of Neighborhood Associations, 2) include the project segment within their boundaries or area, and 3) are adjacent to the associations that include the project segment.

• Mailed to other appropriate agencies and City bureaus.

• Published as a general public notice.

STEP 3: FORMATION OF PROJECT TRAFFIC COMMITTEE

The project traffic committee is formed. Members include those persons who volunteer at the public meeting (Step 2) or otherwise indicate interest in participating. ATCP staff will also extend invitations to appropriate parties (e.g., major institutions, businesses, Tri-Met, the Police and Fire Bureaus) to encourage a good representation of interests on the committee.

The traffic committee is an autonomous committee rather than a committee of the neighborhood association(s), able to make decisions that differ from the position of the neighborhood association(s). The appropriate role of the neighborhood association(s) is to participate in and support the process.

At the first traffic committee meeting, ATCP staff and the traffic committee enter into a nonbinding contract to define their general roles and responsibilities, such as meeting procedures and decision-making processes. The traffic committee and staff work together to arrive at mutually satisfactory solutions to problems or disagreements that may arise. Reasonable time limits for resolving these issues are mutually established.

STEP 4: PROJECT DEVELOPMENT

Project development involves identifying education, enforcement, and engineering solutions that can achieve the project’s goals and objectives. The nonbinding contract
(established during Step 3) can be expanded to identify activities that traffic committee members can implement while project development is underway.

Project development consists of the following steps:

- Assess problems and needs
- Identify project goals and objectives
- Identify mitigation criteria
- Develop and assess alternative plans/solutions
- Identify and/or implement recommended education and enforcement activities
- Identify recommended engineering solutions
- Decide to conduct or not conduct a demonstration project

The demonstration phase (Step 5) of projects will be optional, at the discretion of the traffic committee. If there is a demonstration phase, the committee can determine its length.

**STEP 5: DEMONSTRATION PROJECT**

ATCP staff will send a ballot to all households, businesses, and nonresident property owners that have frontage on the project street segment (the "ballot area") for approval to construct a demonstration project of proposed engineering devices. This is different from a test in the sense that it is permanent construction of devices such as speed bumps, with the assumption that they will remain permanent unless there is a later ballot to remove them (Step 6). The demonstration project may not necessarily include all of the devices that are planned; some (such as curb extensions) may be deferred until construction (Step 8).

Each household, business, and nonresident property owner is entitled to one ballot. A majority of those ballots that are returned must be in favor of the demonstration project for it to proceed. If there is a low initial response, staff will send a reminder to recipients to return their ballot.\(^4\)

If ballot approval for the demonstration project is not obtained, the project will not proceed any further. However, the segment or segments that make up the project will still be included in the next three-year project ranking and selection cycle.

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\(^4\)The second notice to remind recipients to return their ballot will include a second ballot form for the recipient's convenience. Only one ballot from each household, business, and nonresident property owner will be tabulated to determine response within the ballot area.
Step 5A: City Council Approval

If ballot approval for the demonstration project is obtained, City Council approval will not be required unless: 1) the project costs over $50,000, 2) a contract is let, or 3) the demonstration involves new devices that may be controversial.

Step 5B: Evaluation of Demonstration Project

The demonstration project will remain in place approximately one year (or less, at the discretion of the traffic committee). After this time, staff collects data (e.g., speed and volume counts, diversion to Local Service Streets) to help evaluate project impacts. The project is evaluated on the basis of the objectives and mitigation criteria developed during Step 4. Mitigation measures or revisions that are necessary to address any unacceptable impacts are identified and/or implemented.

The results of the demonstration project are reviewed with the traffic committee and area residents. The demonstration period also gives residents the chance to experience the results of education and enforcement efforts, as well as the engineering devices.

STEP 6: BALLOT FOR PERMANENT PROJECT

ATCP staff sends a ballot to households, businesses, and nonresident property owners that have frontage on the project street segment (the "ballot area"). The purpose of the ballot is to make a recommendation to City Council about the project; ballot approval is not in itself a binding decision.

If there has been a demonstration project, the ballot asks if the project should remain permanent. With this approach, people are asked to react to the overall project (education, enforcement, and engineering measures) based on their perceptions of how it has affected their livability. The results of the Step 5B evaluation are also provided to the ballot recipients.

If there has not been a demonstration project, the ballot asks if a permanent project should be constructed. The results of the evaluation conducted during Step 4 are provided to the ballot recipients.

Each household, business, and nonresident property owner is entitled to one ballot. A majority of those ballots that are returned must be in favor of the project for it to
proceed to City Council action (Step 7). If there is a low initial response, staff will send a reminder to recipients to return their ballot.\textsuperscript{5}

**STEP 7: CITY COUNCIL ACTION**

If ballot approval is obtained in Step 6, ATCP staff prepares a final report and recommendations for City Council action. The report and recommendations address the entire project (i.e., education, enforcement, and engineering measures).

If a permanent construction project does not obtain the required ballot approval, it is not forwarded to City Council. If a demonstration project does not obtain the required ballot approval to become permanent, the devices are removed and the ballot results are reported to City Council.

**STEP 8: DESIGN AND CONSTRUCTION/IMPLEMENTATION**

Final design and construction of permanent engineering devices is administered by the City. Any education and enforcement tools that were identified during project development (Step 4), but have not yet been put in place, are implemented.

**STEP 9: EVALUATION OF PERMANENT PROJECT**

If there has not been a demonstration project, the ATCP staff collects data (e.g., speed and volume counts, diversion to Local Service Streets) to help evaluate project impacts. The project is evaluated on the basis of the objectives and mitigation criteria developed during Step 4. Mitigation measures or revisions that are necessary to address any unacceptable project impacts are implemented.

**STEP 10: MONITORING**

The City conducts ongoing monitoring of the project for two years to determine if the project’s goals and objectives continue to be met.

**PROGRAM TOOLS**

ATCP will use a three-pronged approach to solve traffic problems on Neighborhood Collectors. Targeted enforcement will be used to slow traffic, although it is recognized that the effect is of limited duration. The use of engineering tools (traffic management devices) will permanently slow traffic on the project street. However,

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\textsuperscript{5}The second notice to remind recipients to return their ballot will include a second ballot form for the recipient’s convenience. Only one ballot from each household, business, and nonresident property owner will be tabulated to determine response within the ballot area.
the third prong, education, potentially offers the key to solving neighborhood traffic problems over the long term. Through education, ATCP will promote the use of alternative transportation modes, and an awareness of the negative effects that speeding and excessive vehicle volumes have on the livability of Portland neighborhoods.

The Arterial Traffic Calming Program is new and innovative because it is designed to address traffic problems on streets which are both residential and part of the arterial street system. Staff research found no programs world-wide to use as a model for developing this program. Consequently, the education, enforcement, and engineering tools envisioned by this program are dynamic and will evolve over time. Many of the tools listed below, particularly the education tools, will need to be developed, tested, and evaluated over the next several years. As new tools are identified, they will be tested as part of this program as well.

EDUCATION TOOLS

Education tools will be developed to target three levels of audience: the general public, nonlocal traffic using the project street, and local traffic using the project street. Education tools that target the general public can be incorporated with the BTM Reclaiming Our Streets program education efforts. Education tools aimed at nonlocal and local users of project streets will be developed to include the following topics:

- Reduce speeding
- More appropriate use of streets/routes
- Increase use of alternative transportation
- Increase awareness of multiple use of streets/shared public space

The following ideas are possible education tools. These ideas will require further investigation, development, testing, and evaluation of effectiveness by ATCP staff.

- Work with Tri-Met to promote the use of transit.

- Work with the Pedestrian and Bicycle programs to promote these modes of transportation.

- Develop a simple, standardized ATCP sign (similar to the Neighborwatch signs) for placement on project streets.

- Investigate cost-effective ways to design and install neighborhood "gateway" treatments.
• Develop formats to utilize house meetings, neighborhood coffees, neighborhood picnics, block parties, etc. to deliver ATCP educational messages.

• Investigate the use of testimonials from participants of past projects.

• Encourage carpooling, walking, biking to traffic committee meetings

• Organize carpools within the neighborhood.

• Establish information centers in the neighborhood with information about alternative transportation methods.

• Work with trucking company dispatchers to encourage truck routing to appropriate roadways.

• Provide information to children and their parents through the schools.

• Work with community policing/education efforts.

• Work with radio traffic reporters to make announcements about specific project streets.

Once an ATCP project is undertaken, the traffic committee will be expected to participate in educational activities as part of the project. The nonbinding contract with the project traffic committee will define the committee’s role and identify specific activities (e.g., Speed Watch, promotion of alternative transportation, data collection, or any other appropriate activities). Initial studies may be needed at the beginning of each project to determine the origin and destination of the traffic. Based on this information, appropriate education targets and goals can be identified.

Since only a limited number of projects can be undertaken each year, residents on future project streets should be given the opportunity and encouraged to try "interim" education activities. In this way, they will have some recourse for addressing their problems until a project can be done. ATCP staff will work with the Reclaiming Our Streets program to develop information packets that outline possible "interim" education activities. Some of the activities that might be included are:

• Speed Watch
• Sample articles for neighborhood/community newsletters
• Sample information that local schools can distribute (e.g., educational flyers for students to take home)
• How to form a committee to address the problems
• How to hold events such as meetings or neighborhood parties
Sample graphic materials, flyers, etc. that can be delivered door-to-door

ENFORCEMENT TOOLS

Enforcement is a somewhat limited ATCP tool, but an important tool nonetheless. Despite the limited resources of the Portland Police Bureau, Traffic Division, they have agreed to provide targeted enforcement for project streets. Enforcement causes motorists using the project street to be aware of their speed. When enforcement is used at the beginning of a project, and particularly when it is used in conjunction with Speed Watch, it can provide the traffic committee with a temporary tool to deal with traffic problems while the rest of the project is being designed.

Although photo radar is not yet available, the concept is very appealing and would provide the City with a potentially valuable enforcement tool. In addition, staff will encourage traffic committees to work with the community policing liaison officer in a project area. Community policing officers can issue tickets and may be able to work with the community to address traffic issues.

ENGINEERING TOOLS

A number of traffic management devices have been identified for use as engineering tools in the Arterial Traffic Calming Program. Most of these devices have been tested on either Local Service or Neighborhood Collectors. Several of the devices have not yet been tried in Portland. As new devices are identified, they will be developed, tested, and evaluated for inclusion in the program.

The report, "Traffic Calming Devices" (included in the Appendix B section of this report) details more fully approved and potential devices for use in the ATCP. However, the following is a list of devices described in the report that are available for use in ATCP projects:

- Entry Treatment
- 22' Arterial Speedbumps
- Median Slow Point
- Curb Extensions
- Raised Crosswalk
- Textured Pavement Treatment
- Medians

Staff will continue to investigate new devices for potential ATCP project use. At a minimum, potential new devices should meet the following criteria:

- Devices must minimize conflicts between vehicles and bicycles.
- Devices must be well illuminated and visible.
- Medians must accommodate appropriate markings and signs.
- Devices must allow the traffic stream to maintain an acceptably consistent speed of approximately 30 mph.\(^6\)
- Pavement treatments must not pose a hazard to bicycles or pedestrians, or impede people with disabilities.
- Devices must ensure safety and visibility to pedestrians and other nonvehicular traffic.
- Devices cannot inappropriately restrict buses, emergency vehicles, and trucks from providing normal and necessary services to the neighborhood.

PROJECT FUNDING GUIDELINES

ATCP staff will develop general funding guidelines for the use of engineering tools in projects. These guidelines will estimate the cost per mile of project, based on experience with similar projects. The guidelines will be flexible enough to allow the project traffic committee to consider various options. The traffic committee and staff can then develop project design using these options—putting together a plan that is within the general funding guidelines, but that is selected to fit their particular needs and preferences.

The guidelines do not represent an absolute cap or limit, but rather a target for project development. The traffic committee and staff will work together to come to agreement about a reasonable budget for the project. (Budget development is part of the iterative process the committee goes through, and must be done in conjunction with developing the project goals, objectives, and alternatives.) Information about both costs and types of devices for various situations will be developed as the ATCP evolves. The data base is limited at present, but will expand as more experience is gained. Funding guidelines can become more refined as the data base grows.

The Arterial Traffic Calming Program will have an overall budget each year for education and enforcement; some will be allocated to program-wide efforts, and some will be allocated to specific projects.

\(^6\)The 30 mph speed is based on the City's experience in designing, implementing, and monitoring ATCP test projects on NE 15th Avenue and NW Cornell Road.
RECOMMENDATIONS

The Citizens Advisory and Program Development Committees make the following recommendations to City Council:

- The program should be named the Arterial Traffic Calming Program (ATCP) to better describe the program and its purpose.

- The program detailed in the final report should be adopted.

- New education, enforcement, and engineering tools should be investigated, developed, tested, and evaluated by this program over the next several years for inclusion in the list of available program tools.

- The program should be evaluated by a Citizens Advisory Committee and Technical Advisory Committee in six years, with the committee's recommended program changes forwarded to City Council for adoption.
MAJOR DISCUSSION POINTS
DURING DEVELOPMENT -
ARTERIAL TRAFFIC CALMING PROGRAM
OBJECTIVES AND POLICIES

The goal of the Arterial Traffic Calming Program (ATCP) is to enhance neighborhood livability for residents of Neighborhood Collectors by addressing traffic problems using education, enforcement, and engineering tools. While maintaining neighborhood livability is important to the vitality of the City and the primary goal of the program, it must be recognized that Neighborhood Collectors are part of the City-wide arterial street system and must accommodate efficient movement of all modes of transportation, including automobiles. The inherent conflict of needs unique to Neighborhood Collectors must be acknowledged, considered, and balanced throughout all aspects of the Arterial Traffic Calming Program. To that end, the program is guided by the following objectives and policies.

OBJECTIVES

1. Improve neighborhood livability by mitigating the impact of vehicular traffic on residential neighborhoods.

2. Promote safe and pleasant conditions for all modes of transportation, including motorists, bicyclists, pedestrians, transit riders, and emergency vehicles on Neighborhood Collector Streets.

3. Promote and support the use of transportation alternatives to the single occupant vehicle.

4. Ensure opportunities for citizen involvement in all phases of Arterial Traffic Calming Program activities.

5. Make efficient use of City resources by prioritizing traffic management projects.

POLICIES

1. Application of the Arterial Traffic Calming Program should be limited to Neighborhood Collector Streets (as designated in the Transportation Element of the City of Portland Comprehensive Plan) that are primarily residential. Where appropriate, an ATCP project should coordinate with the Neighborhood Traffic Management Program, which addresses problems on designated Local Service Streets.

2. To achieve the ATCP’s objectives, education, enforcement, and engineering methods should be employed, and alternative transportation should be
encouraged. Traffic management devices should be planned and designed in keeping with sound engineering and planning practices.

3. Emergency vehicle access should be preserved within the existing Fire Bureau response standards. If current emergency vehicle access does not meet the existing response standard, an ATCP project should not further degrade the response time.

4. ATCP projects should not significantly impact transit service access, safety, and scheduling.

5. Pedestrian and bicycle movement should be given equal consideration with vehicle movement in the design and implementation of ATCP projects. ATCP projects should be coordinated with the Bicycle and Pedestrian programs where appropriate so they do not conflict with or preclude each other.

6. Parking removal should be considered on a project-by-project basis. Parking needs of residents should be balanced with the equally important functions of traffic, emergency vehicle access, transit, bicycle, and pedestrian movement.

7. Through traffic should be encouraged to use higher-classification arterials, as designated in the Transportation Element.

8. The amount of traffic increase acceptable on a Local Service Street should be defined on a project-by-project basis to a maximum of 150 vehicles per day.\(^7\) Under no circumstances should an ATCP project divert traffic through the use of traffic diversion devices.

9. To implement the ATCP, certain procedures should be followed by the Office of Transportation in processing traffic management proposals in accordance with applicable codes and related policies and within the limits of available resources. At a minimum, the procedures should provide for project selection and evaluation; citizen participation in plan development and evaluation; communication of any test results and specific findings to area residents and affected neighborhood organizations; and appropriate City Council review.

\(^7\)The maximum traffic increase acceptable on a Local Service Street due to an ATCP project is derived from the NTMP Impact Threshold Curve. NTMP projects utilize this curve to define the range of acceptable traffic increases to Local Service Streets. The Impact Threshold Curve has a baseline increase of at least 150 vehicles per day and a ceiling of no more than 400 vehicles per day. In other words, an increase of up to 150 vehicles per day as a result of an NTMP project is acceptable on any Local Service Street.
10. At the beginning of each project, the City (ATCP staff) and project traffic committee should enter into a nonbinding contract to define the roles and responsibilities of the City, traffic committee, and project area residents.

**PROJECT SELECTION PROCESS AND CRITERIA**

**PROJECT INITIATION**

Arterial Traffic Calming Program projects will be initiated by the Bureau of Traffic Management (ATCP staff) by applying the selection criteria to the approximately 275 designated Neighborhood Collector Streets, by segments, to determine project priorities. The project ranking process will be performed at three-year intervals.

Although the Arterial Traffic Calming Program is designed to be a non-complaint-driven program, citizen involvement and participation is very important to the ATCP program and staff. At the start of the project selection cycle, and throughout the process, staff will disseminate information to citizens City-wide regarding the Arterial Traffic Calming Program—how projects are selected and prioritized, and whom to contact to ask questions, obtain more information, make suggestions, and/or express interests or concerns.

**DISCUSSION:**

The committees decided to have ATCP projects initiated by BTM for two primary reasons. First, this approach provides for equity; those neighborhoods without the resources or information to pursue a request process will have an equal chance of selection, based on project need. Second, a manageable amount of data collection is required to rank each street given the relatively small number of Neighborhood Collectors Streets.

**PROCESS FOR PROJECT RANKING AND SELECTION**

On a three-year cycle, staff will perform an initial survey of all Neighborhood Collectors by segment. A street segment is defined as that portion of a Neighborhood Collector that is between two arterials.

A street segment must meet the following two criteria to be qualified for inclusion in the Arterial Traffic Calming Program:

**Transportation Element Classification:** The street must be classified as a Neighborhood Collector.
Primarily Residential: The street segment must be primarily residential. This means that at least 75 percent of the properties with frontage on the segment must be in residential zoning. No distinction is made between single-family and multi-family residential.

There may be situations where a segment ("Segment 1") might not pass the "primarily residential" criterion because it includes a commercial area. However, it might also include a residential area that extends into the adjacent segment ("Segment 2") and that has significant traffic problems. That part of the residential area that is in Segment 1 will be excluded from the program; in other words, it will be penalized for falling into a segment with commercial uses. This issue will be addressed by allowing flexibility in defining project areas. For example, when a project is undertaken in Segment 2, the project area can be extended to include the adjacent residential area in Segment 1.

**DISCUSSION:**

The committees limited the Arterial Traffic Calming Program to Neighborhood Collector Streets that are primarily residential because the intent of the program is to address traffic related livability issues for residents along the street segment. The committees did recognize that Neighborhood Collectors that have primarily commercial uses can also affect the overall livability in a neighborhood. However, due to budget and staffing limitations, it is necessary for this program to focus on Neighborhood Collectors that are primarily residential.

The committees decided to base the definition of primarily residential on zoning rather than current use. This approach is consistent with City policy, placing transportation decisions and priorities within an overall planning context. This is also consistent with the Transportation Element, which directs that changes in streets should be consistent with the designated use.

Those segments that are not primarily residential will be eliminated from further consideration. Also eliminated from further consideration are street segments that have been treated by an ATCP project within the last two project ranking cycles.

The remaining segments will be assigned points and ranked using the criteria detailed below in a two-step process. The first step will apply the speed and volume criteria to generate a ranked list. The top ranked segments on this list will be carried forward to the second step, where the remaining criteria will be applied and the list reranked. The relative rankings among segments may change the following application of the secondary criteria. Enough segments will be carried forward to the second step to account for these possible changes.
DISCUSSION:

The committees decided to rank segments initially using speed and volume for several reasons. First, many of the problems identified on Neighborhood Collectors, such as pedestrian issues, are related to excessive speeds and volumes. In some sense, the measure of speed and volume can be used as a surrogate measure of other problems along the street segment. Second, the speed and volume criteria are weighted number one and two, respectively, for the selection criteria overall. Consequently, by assigning points for speed and volume and ranking the segments, the segments with the worst traffic problems will automatically be included on the list. Third, the BTM Operations section has collected speed and volume information for many streets in the City. The most cost effective and expedient way to rank the segments is to utilize existing data and to collect data only where information does not exist. Finally, having ATCP staff do the necessary research to assign points for the remaining criteria for all Neighborhood Collector segments would be too time-consuming and costly.

Project selection generated much discussion in both the Program Development and Citizens Advisory Committees. Listed under "Eliminated Selection Criteria" are the selection criteria that were considered and discussed by the committees, but eliminated. After a number of meetings, the committees reached consensus on the selection criteria and process to be used to rank and prioritize projects. A more detailed explanation of the criteria is given below.

SELECTION CRITERIA

Speed: Speed will be based on average daily speed during nonpeak hours. Up to 30 points can be assigned (2 points for every mile over 30 mph, up to a maximum of 30 points for 45 mph and over).

Volume: Volume will be based on average daily traffic. Up to 25 points can be assigned (1.667 points per 1,000 ADT, up to a maximum of 25 points for 15,000 ADT).

Residential Density: Residential density will be determined based on zoning. All buildings with frontage on the street segment will be included. Both single-family and multi-family residential will be considered. Up to 20 points can be assigned [4 points per 100 dwelling units per mile (DUPM), up to 500 DUPM].

Lack of Sidewalks: Street segments lacking sidewalks will be given 9 points. The lack of sidewalks is defined as the absence of a continuous sidewalk on both sides of the street segment. Selection of these streets does not necessarily mean that
sidewalks will be built as part of the project; other approaches could be taken (e.g.,
installation of Tri-Met pads) to improve conditions. These streets could also be
targeted as possible joint projects with PDOT's Pedestrian Program.

**Elementary School Crossings:** Street segments will be assigned 7 points if children
have to cross the street to get to an elementary school. This includes marked
crossways.

**Other Pedestrian Generators:** Street segments will be assigned 5 points if any of the
following pedestrian generators occur within the street segment (i.e., from arterial to
arterial) and within 1,000 feet of the street:

- Retail commercial uses
- Institutional uses
- Parks
- Other schools not included in the elementary school crossing criterion (e.g.,
  high schools)

**Street Width:** Street segments over 40 feet wide will be given 4 points.

The above selection criteria are summarized in the following table.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points</th>
<th>Basis for Point Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>0 to 30</td>
<td>Average daily speed during nonpeak hours.</td>
</tr>
<tr>
<td>Volume</td>
<td>0 to 25</td>
<td>Average daily traffic.</td>
</tr>
<tr>
<td>Density</td>
<td>0 to 20</td>
<td>Residential density along segment, based on zoning.</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>0 or 9</td>
<td>Absence of continuous sidewalk on both sides of street segment.</td>
</tr>
<tr>
<td>Elem. School Crossing</td>
<td>0 or 7</td>
<td>Points assigned if children must cross segment to get to elementary school.</td>
</tr>
<tr>
<td>Pedestrian Generators</td>
<td>0 or 5</td>
<td>Points assigned if other pedestrian generators are along segment or within 1000 feet of the street.</td>
</tr>
<tr>
<td>Street Width</td>
<td>0 or 4</td>
<td>Points assigned for segments over 40 feet wide.</td>
</tr>
<tr>
<td><strong>Total Points Possible</strong></td>
<td>100</td>
<td>Ranking: Highest total points to lowest total points.</td>
</tr>
</tbody>
</table>

To identify potential projects, the top ranking segments will be reviewed by BTM and
ATCP staff for the size/complexity of the potential projects, compatibility with other
PDOT projects, and the budget availability/limitations to establish program priorities.
In addition to the identified high ranking segments, projects may also include additional segments or portions of additional segments to assure that street system continuity is maintained. Normally, two or three projects will be undertaken each year.

Potential projects will also be examined to see if it would cause a "cumulative impact" situation. Cumulative impact has been defined by the Portland Fire Bureau (PFB) and BTM\ATCP staff as follows:

A cumulative impact is defined as potential negative impacts on the Portland Fire Bureau’s response time and route patterns by consideration of ATCP and/or Neighborhood Traffic Management Program (NTMP) projects on two or more adjacent parallel fire response routes, as identified on the Fire Bureau's "Fire Response Map." The expansion of existing projects will also trigger this definition.

When a cumulative impact situation is identified, staff will initiate a meeting with PFB to identify, as specifically as possible, the potential negative impacts related to the proposed project. If the project is undertaken, the information generated at this meeting will be included in discussions with the traffic committee and in decision making by staff. Identification of cumulative impact will not preclude ATCP from proceeding with project development.

For efficiency reasons, a priority may be given to potential projects which can be jointly undertaken and funded by ATCP and other appropriate programs (e.g., Bicycle, Pedestrian, Neighborhood Traffic Management). The Arterial Traffic Calming Program will attempt to undertake one joint project each year.

**DISCUSSION:**

The committees discussed at length the issue of ATCP projects causing increased fire response time for both residents along the project segment and for residents beyond the project segment. The committees agreed that it is acceptable for an ATCP project to increase emergency response time as long as Fire Bureau response standards are still met. However, the Fire Bureau expressed concern that there may be a "cumulative impact" on response time when successive ATCP and/or Neighborhood Traffic Management Program projects are installed within a response area.

Through a series of meetings, BTM and the Fire Bureau agreed upon a definition of "cumulative impact" and the process that will be used for ATCP or NTMP projects that trigger this definition. This definition and process is incorporated into the ATCP Process for Project Ranking and Selection.
DISCUSSION:

ELIMINATED SELECTION CRITERIA

The committees considered and eliminated the following proposed selection criteria:

Accidents: Accidents will not be included as a selection criterion for the following reasons:

- The number of accidents on a roadway segment is usually a function of the amount and speed of traffic on the segment. Since speed and volume are primary selection criteria, including accident rates as a criterion is somewhat redundant.

- Specific accident patterns at specific locations (i.e., high turning-accident rate at intersection of A Street and Central Avenue) can usually be addressed outside a process such as the ATCP.

- Accident rates for different Neighborhood Collectors are generally very similar and therefore will not significantly impact selection criteria scores from roadway to roadway.

- The collection, refinement, and evaluation of accident data is a very time-consuming effort.

- Many accidents are unreported. Citizen observation of accidents is unreliable and subjective.

Noise: Noise is too difficult to measure and assess. For example, how is the distinction made between ambient and traffic-generated noise? Also, how would a high ambient noise level from other sources be evaluated (i.e., as a liability because it adds to the traffic noise, or as an existing condition that "cancels" out traffic noise)?

Local vs. Nonlocal Mix: It is too difficult and costly to obtain data on traffic mix. (It requires stopping traffic to ask origin and destination.)
Percent Trucks: It is too difficult to measure traffic mix. Also, some Neighborhood Collectors are designated truck routes, and it is difficult to distinguish between "appropriate" and "inappropriate" truck traffic. The street classification system and other PDOT programs (e.g., the truck route program and educational efforts) are more appropriate ways of addressing truck problems than using truck traffic as a project selection criterion.

Percentage of Single-Occupancy Vehicles: This is too difficult to measure.

Appropriate vs. Inappropriate Traffic Volumes: In concept, it makes sense to consider appropriate vs. inappropriate traffic volumes (i.e., traffic generated from within the street's "drainage area," based on size, land use, and residential density, versus traffic coming from outside the drainage area) in scoring street segments. However, to measure this factor is very time and resource intensive and for ranking purposes, the information is of limited value. It is suggested that this issue be considered again when the ATCP is evaluated in six years; viable models for this kind of analysis may exist by that time.

Street Classification: Street classification (e.g., designated transit or bicycle routes) will not be included because the difference among streets will be insignificant. Most Neighborhood Collectors are also designated bicycle and transit routes. There is also the problem of whether to consider the classification as an asset or a liability. (For example, should a designated bicycle route be given points because it presents greater opportunities for achieving the program's objectives, or not be given points because it already has an advantage over streets that are not designated routes?)

Property Values: This is too difficult to measure/evaluate.

Other Criteria to Address Neighborhood Conditions: The Citizens Advisory Committee considered other possible criteria (besides property values) to address the issue of neighborhood conditions. For example, one view is that neighborhoods with poor or declining conditions may not be helped by an ATCP project, while neighborhoods with stable, but on the verge of declining, conditions could be stabilized or improved by a project. The Citizens Advisory Committee considered whether there could be some kind of a "measurable outcome" criteria to help assess the likely results of a project (e.g., how it is likely to improve neighborhood livability) After some discussion, however, they decided that this is not feasible; "measurable outcome" is very subjective and impossible to predict or measure.
Proximity to Site Destination Facility: The term "site destination facility" is very broad and refers to land use like major shopping areas, large institutions and public facilities. Most Neighborhood Collectors are likely to have some kind of site destination facility located nearby, and the difference among segments will be insignificant.

Protected Pedestrian Crossways: Few Neighborhood Collectors have pedestrian activated signal protected crossways between arterials. Also, it would be more logical to subtract points if a street has a crossway than to add points if it doesn't. However, on some streets residents feel that the crossway (as it currently works) is a liability, not an advantage. Pedestrian crossing problems are related to traffic speed and volumes, street width, and pedestrian generators, and will be addressed by those criteria.

Substandard Street: The sidewalks criterion will help address substandard conditions.

Drainage: Drainage is a design issue, not a selection consideration.

PROJECT PROCEDURES

After the top two or three potential projects are identified, ATCP staff need to determine if the residents on those potential project segments want a project to be undertaken. To do this, for each proposed project segment staff will send the residents a "survey to proceed," which is described in Step 1 below. If the residents support proceeding with the proposed project, staff will initiate the project by holding a public meeting as described in Step 2. If the residents do not want to proceed with the proposed project, the project will not be initiated.

The project procedures that will be used for ATCP projects are detailed in detail below and summarized in the flowchart on the next page.

STEP 1: SURVEY TO PROCEED

ATCP staff will mail a survey to all households, businesses, and nonresident property owners that have frontage on the project street segment (the "survey area"). The purpose of the survey is to establish the level of support among residents to proceed with a project. ATCP staff prepare the survey, and describe the problem and the procedures to be followed if a project is undertaken. The survey will ask for a yes/no response as to whether the project should proceed. It will also ask the recipients to identify their major concerns and priorities concerning street improvements. This
information can be used by the traffic committee in determining project goals and objectives in Step 4.

Each household, business, and nonresident property owner is entitled to one survey. A majority of the surveys that are returned must give a yes response for the project to proceed. If there is a low response to the survey, the staff will send a second notice to remind the recipients to return their surveys.\(^8\)

If approval to proceed is not obtained, the project does not proceed to Step 2. However, the segment or segments that make up the project will still be included in the next three-year project ranking and selection cycle.

**DISCUSSION:**

The committees discussed whether interest in proceeding with a project should be determined by having a petition signed by the majority of the households and businesses on the project street. They ultimately rejected this approach for two primary reasons:

- Because ATCP will not be "complaint-driven," there may not be any residents who have previously been involved with traffic issues on the project street. Without a "contact person" on the project street, it may be difficult to recruit volunteers to circulate the petitions.

- Even if enough volunteers were recruited, they may not have sufficient background to discuss the project with residents as they circulate the petition.

It was suggested that the petition could be circulated after a traffic committee was formed and has established project goals and objectives; residents could then be given more specific information about the proposed project. The problem with this approach, however, is that residents' interest in the project is not determined until project planning is already underway.

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\(^8\) The second notice to remind recipients to return their survey will include a second survey form for the recipient's convenience. Only one survey from each household, business, and nonresident property owner will be tabulated to determine response within the survey area.
STEP 2: NOTIFICATION OF PROPOSED PROJECT

ATCP staff holds a public meeting to:

- Provide an overview of the ATCP.
- Give the results of the survey.
- Obtain feedback about issues and concerns.
- Recruit members for the project traffic committee.

The meeting notification is:

- Mailed to all households and businesses (including nonresident property owners) within the "project area." The project area is defined as extending to the ends of the project segment, and halfway to the next parallel arterials. The City may also notify other interested parties as appropriate.

- Mailed to neighborhood and business associations that: 1) are recognized by the Office of Neighborhood Associations, 2) include the project segment within their boundaries or area, and 3) are adjacent to the associations that include the project segment.

- Mailed to other appropriate agencies and City bureaus.

- Published as a general public notice.

STEP 3: FORMATION OF PROJECT TRAFFIC COMMITTEE

The project traffic committee is formed. Members include those persons who volunteer at the public meeting (Step 2) or otherwise indicate interest in participating. ATCP staff will also extend invitations to appropriate parties (e.g., major institutions, businesses, Tri-Met, the Police and Fire Bureaus) to encourage a good representation of interests on the committee.

The traffic committee is an autonomous committee rather than a committee of the neighborhood association(s), able to make decisions that differ from the position of the neighborhood association(s). The appropriate role of the neighborhood association(s) is to participate in and support the process.

At the first traffic committee meeting, ATCP staff and the traffic committee enter into a nonbinding contract to define their general roles and responsibilities, such as meeting procedures and decision-making processes. The traffic committee and staff work together to arrive at mutually satisfactory solutions to problems or disagreements that may arise. Reasonable time limits for resolving these issues are mutually established.
STEP 4: PROJECT DEVELOPMENT

Project development involves identifying education, enforcement, and engineering solutions that can achieve the project's goals and objectives. The nonbinding contract (established during Step 3) can be expanded to identify activities that traffic committee members can implement while project development is underway.

Project development consists of the following steps:

- Assess problems and needs
- Identify project goals and objectives
- Identify mitigation criteria
- Develop and assess alternative plans/solutions
- Identify and/or implement recommended education and enforcement activities
- Identify recommended engineering solution
- Decide to conduct or not conduct a demonstration project.

The demonstration phase (Step 5) of projects will be optional, at the discretion of the traffic committee. If there is a demonstration phase, the committee can determine its length.

**DISCUSSION:**

The terms "goals," "objectives," and "mitigation criteria" used in Step 4 above are defined as follows:

**Goals** are general statements about what the project hopes to achieve. For example: "Reduce excessive speeding on the project street."

**Objectives** are more specific statements that help define how to reach the goals and help guide the project design. They should be realistic statements of what the project will try to attain (for example: "Reduce speed by 10 mph").

However, the project should not be considered a "failure" if the objectives are not strictly achieved (for example, if speed is reduced by only 5 mph).

**Mitigation criteria** define what project results are or are not acceptable. If a project cannot meet a mitigation criterion, it must be mitigated or revised until it can. A project that cannot meet these criteria is unacceptable.
There are two kinds of mitigation criteria:

1) "Programmatic" criteria that apply to all projects and must be met under all circumstances. These would include criteria such as required emergency response times and diversion limits (i.e., a maximum traffic increase of 150 vehicles per day on any Local Service Street).

2) Criteria that are determined by the traffic committee (working with staff) on a project-by-project basis. These criteria basically define how close the project must come to the objectives in order to be acceptable. For example, the objective may be to reduce speed by 10 mph, but the traffic committee may consider a reduction of 5 mph to be acceptable.

This approach allows a project to be designed to achieve realistic objectives, but it can still be considered successful if the objectives are not strictly achieved (as long as the mitigation criteria are met). This enables residents on the project street to evaluate a project in terms of their overall subjective experience of it. For example, speed reduction may be less than the original objective, but residents may still view the project as positive because of a combination of engineering, education, and enforcement measures. This approach will also increase a project’s chances of getting approval for permanent construction (Step 6); residents will know that an attempt has been made to make the project work as well as possible through mitigation and revision.

The committees stressed the need to provide traffic committees with enough information to make informed decisions (e.g., to develop appropriate goals, objectives, and criteria; to assess the need for a demonstration project; etc.) Tools such as videos and testimonials from other projects should be made available for the committees’ use. It may be useful to develop a "briefing book" for traffic committees; this could include procedural information, results of past projects, examples of the nonbinding contract, technical background, identification of available resources (such as the videos), etc. It is also suggested that the traffic committee participate in a "field trip" to other projects to provide them with some direct observation/experience.

The City will provide a list of topic areas that traffic committees may want to consider including in their objectives. Examples of topic areas that may be included are noise, visual aesthetics, air pollution, historic preservation considerations, parking loss, and ability of project to help reinforce zoning and comprehensive plan designations.
As stated above, the demonstration phase (Step 5) of projects will be optional, at the discretion of the traffic committee. If there is a demonstration phase, the committee can determine its length. This approach has the following advantages:

- It allows traffic committees to take a conservative approach in the first years of ATCP. It is not possible to rely on past experience to demonstrate to residents how the ATCP devices will work, because performance of devices such as speed bumps has not yet been adequately established. Residents and others, particularly on adjacent streets, may oppose the project if they anticipate potential negative impacts to their street and have no demonstration/evaluation phase to show otherwise.

   It is likely that traffic committees will decide to bypass the demonstration phase once they can use the experience from prior ATCP projects to demonstrate performance results.

- It enhances the citizen involvement process by giving individual traffic committees the responsibility for making the decision, rather than having to abide by fixed, program-wide rules.

   In order to make its decision, the traffic committee will have to evaluate whether residents are likely to approve a permanent project without first seeing it demonstrated. This requires the committee to keep in touch with residents, assess their information needs, and educate them about the proposed project and its expected results.

**STEP 5: DEMONSTRATION PROJECT**

ATCP staff will send a ballot to all households, businesses, and nonresident property owners that have frontage on the project street segment (the "ballot area") for approval to construct a demonstration project of proposed engineering devices. This is different from a test in the sense that it is permanent construction of devices such as speed bumps, with the assumption that they will remain permanent unless there is a later ballot to remove them (Step 6). The demonstration project may not necessarily include all of the devices that are planned; some (such as curb extensions) may be deferred until construction (Step 8).

Each household, business, and nonresident property owner is entitled to one ballot. A majority of those ballots that are returned must be in favor of the demonstration
project for it to proceed. If there is a low response, ATCP staff will send a reminder to recipients to return their ballot. 

If ballot approval for the demonstration project is not obtained, the project will not proceed any further. However, the segment or segments that make up the project will still be included in the next three-year project ranking and selection cycle.

**Step 5A: City Council Approval**

If ballot approval for the demonstration project is obtained, City Council approval will not be required unless: 1) the project costs over $50,000, 2) a contract is let, or 3) the demonstration involves new devices that may be controversial.

**Step 5B: Evaluation of Demonstration Project**

The demonstration project will remain in place approximately one year (or less, at the discretion of the traffic committee). ATCP staff collects data (e.g., speed and volume counts, diversion to Local Service Streets) to help evaluate project impacts. The project is evaluated on the basis of the objectives and mitigation criteria developed during Step 4. Mitigation measures or revisions that are necessary to address any unacceptable impacts are identified and/or implemented.

The results of the demonstration project are reviewed with the traffic committee and area residents. The demonstration period also gives residents the chance to experience the results of education and enforcement efforts, as well as of the engineering devices.

**DISCUSSION:**

The committees noted that putting speed bumps in as a demonstration and then asking residents if they want to take them out may seem like an unusual approach. It is important to note the two basic assumptions underlying this approach: 1) a demonstration phase will be important for some projects, and 2) most demonstration projects will in fact be approved for permanent construction. The committees noted reasons both for and against conducting a demonstration phase for individual ATCP projects. A traffic committee can weigh these factors in making its decision about conducting a demonstration phase.

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The second notice to remind recipients to return their ballot will include a second ballot for the recipient's convenience. Only one ballot from each household, business, and nonresident property owner will be tabulated to determine response within the ballot area.
Arguments against conducting a demonstration phase include:

- Most projects will use similar engineering devices (primarily speed bumps and slow points). The results of using these devices will be fairly predictable; individual demonstrations for each street are not necessary.

- It is not possible to install speed bumps as temporary devices. Once they are installed, they are essentially permanent devices; it is more appropriate to ask residents to vote for or against them as permanent devices.

  It is likely that most residents will be in favor of speed bumps and will vote for their permanent construction without a demonstration phase.

- The elimination of the demonstration phase will streamline the process, saving time and funding that can be made available for other projects.

Arguments for conducting a demonstration phase include:

- Residents may be unwilling to approve a permanent project if they have not seen the devices demonstrated on their street. There is not yet enough previous experience with these devices to convince people that they will have acceptable results.

- Residents on adjacent Local Service Streets may oppose the project if they perceive negative impacts to their street. The results of the demonstration phase are important to obtain data about the project's impacts.

- A demonstration provides the opportunity to see the impacts of the devices and fine-tune the project if necessary (and possible).

**STEP 6: BALLOT FOR PERMANENT PROJECT**

ATCP staff sends a ballot to households, businesses, and nonresident property owners that have frontage on the project street segment (the "ballot area"). The purpose of the ballot is to make a recommendation to City Council about the project; ballot approval is not in itself a binding decision.

If there has been a demonstration project, the ballot asks if the project should remain permanent. With this approach, people are asked to react to the overall project
(education, enforcement, and engineering measures), based on their perceptions of how it has affected their livability. The results of the Step 5B evaluation are also provided to the ballot recipients.

If there has not been a demonstration project, the ballot asks if a permanent project should be constructed. The results of the evaluation conducted during Step 4 are provided to the ballot recipients.

Each household, business, and nonresident property owner is entitled to one ballot. A majority of those ballots that are returned must be in favor of the project for it to proceed to City Council action (Step 7). If there is a low response, staff will send a reminder to recipients to return their ballot.\textsuperscript{10}

\textbf{DISCUSSION:}

The committees discussed at length whether the ballot area should be confined to the project street segment or expanded to a larger project area. They noted that people on other streets may experience impacts from the project, such as increased traffic or increased fire response time. Also, Neighborhood Collectors are for the use of people beyond those living on the project street; these users should perhaps have a voice in approving or disapproving projects.

Both the committees recommend that the ballot area be confined to the project street segment, for the following reasons:

- People in the larger project area will have adequate opportunities to participate in the decision-making process. These include participation on the traffic committee, public meetings, and ongoing information exchange throughout project development.

- People in the larger project area will not be greatly affected by the project. Project designs will not include diversion devices. ATCP policy ensures that traffic increases on other streets will be minimal. Basically, people will just be required to reduce their speed to conform to the speed limit.

- The main issue is livability for people on the project street; these are the people who should be balloted.

\textsuperscript{10}The second notice to remind recipients to return their ballot will include a second ballot for the recipient's convenience. Only one ballot from each household, business, and nonresident property owner will be tabulated to determine response within the ballot area.
The purpose of the ballot is to demonstrate support for the project by people living on the project street. It is not practicable to define boundaries for the ballot that will encompass everyone who may be somewhat impacted; therefore, the intent is to get a response from the people most directly affected.

At the same time, the ATCP process recognizes the policy basis of Neighborhood Collectors (i.e., that they serve a larger area) by providing opportunities for these other users to participate and ensuring that they will not experience unacceptable impacts. This "holistic" approach addresses both the needs of the people on the project street and the concerns of others in the larger area. The ATCP also addresses the needs of the larger area by disallowing some of the approaches that would be allowed if the objective were to fulfill only the wishes of people on the project street (e.g., diversion).

If there is no demonstration phase, it will be important to make sure residents in the ballot area have adequate information about the proposed project so they can make an informed choice about permanent construction (Step 8).

It will also be important to educate people in the larger project area and address their potential concerns. This may be particularly important if there is no demonstration phase; people may oppose the project because they anticipate potential negative impacts (e.g., on nearby Local Service Streets) and have no demonstration to show otherwise. The following points should be conveyed:

- Information about the project's expected performance.

- Assurance that unacceptable impacts from the project (e.g., unacceptable levels of traffic increases on adjacent Local Service Streets) will be mitigated (either during Step 5B for demonstration projects or during Step 9 for permanent projects).

- An explanation that the project's overall goal is livability for residents on the project street; that traffic increases on other streets will be minimal; and that the project's intent is to slow traffic to the speed limit rather than to impede traffic flow on the collector.

It may be desirable for ATCP staff to develop written informational materials that can be disseminated by traffic committees in the project area.
STEP 7: CITY COUNCIL ACTION

If ballot approval is obtained in Step 6, ATCP staff will prepare a final report and recommendations for City Council action. The report and recommendations address the entire project (i.e., engineering, education, and enforcement measures).

If a permanent construction project does not obtain the required ballot approval, it is not forwarded to City Council. If a demonstration project does not obtain the required ballot approval to become permanent, the devices are removed and the ballot results are reported to City Council.

STEP 8: DESIGN AND CONSTRUCTION/IMPLEMENTATION

Final design and construction of permanent engineering devices is administered by the City. Any education and enforcement tools that were identified during project development (Step 4), but have not yet been put in place, are implemented.

STEP 9: EVALUATION OF PERMANENT PROJECT

If there has not been a demonstration project, the ATCP staff collects data (e.g., speed and volume counts, diversion to Local Service Streets) to help evaluate project impacts. The project is evaluated on the basis of the objectives and mitigation criteria developed during Step 4. Mitigation measures or revisions that are necessary to address any unacceptable project impacts are implemented.

STEP 10: MONITORING

The City conducts ongoing monitoring of the project for two years to determine if the project's goals and objectives continue to be met.

PROGRAM TOOLS

ATCP will use a three-pronged approach to solve traffic problems on Neighborhood Collectors. Targeted enforcement will be used to slow traffic, although it is recognized that the effect is of limited duration. The use of engineering tools (traffic management devices) will permanently slow traffic on the project street. The third prong, education, potentially offers the key to solving neighborhood traffic problems over the long term. Through education, ATCP will promote the use of alternative transportation modes, and an awareness of the negative effects that speeding and excessive vehicle volumes have on the livability of Portland neighborhoods.

The Arterial Traffic Calming Program is new and innovative because it is designed to address traffic problems on streets which are both residential and part of the
arterial street system. Staff research found no programs world-wide to use as a model for developing this program. Consequently, the education, enforcement, and engineering tools envisioned by this program are dynamic and will evolve over time. Many of the tools listed below, particularly the education tools, will need to be developed, tested, and evaluated over the next several years. As new tools are identified, they will be tested as part of this program as well.

EDUCATION TOOLS

Education tools will be developed to target three levels of audience: the general public, nonlocal traffic using the project street, and local traffic using the project street. Education tools that target the general public can be incorporated with the BTM Reclaiming Our Streets program education efforts. Education tools aimed at nonlocal and local users of project streets will be developed to include the following topics:

- Reduce speeding
- More appropriate use of streets/routes
- Increase use of alternative transportation
- Increase awareness of multiple use of streets/shared public space

The following ideas were suggested as possible education tools. These ideas will require further investigation, development, testing, and evaluation of effectiveness by ATCP staff.

- Work with Tri-Met to promote the use of transit.
- Work with the Pedestrian and Bicycle programs to promote these modes of transportation.
- Develop a simple, standardized ATCP sign (similar to the Neighborwatch signs) for placement on project streets.
- Investigate cost-effective ways to design and install neighborhood gateway treatments.
- Develop formats to utilize house meetings, neighborhood coffees, neighborhood picnics, block parties, etc. to deliver ATCP educational messages.
- Investigate the use of testimonials from participants of past projects.
- Encourage carpooling, walking, biking to traffic committee meetings
- Organize carpools within the neighborhood.
• Establish information centers in the neighborhood with information about alternative transportation methods.

• Work with trucking company dispatchers to encourage truck routing onto higher classification roadways.

• Provide information to children and their parents through the schools.

• Work with community policing/education efforts.

• Work with radio traffic reporters to make announcements about specific project streets.

Once an ATCP project is undertaken, the traffic committee will be expected to participate in educational activities as part of the project. The nonbinding contract with the project traffic committee will define the committee's role and identify specific activities (for example, Speed Watch, promotion of alternative transportation, data collection, or any other appropriate activities). Initial studies may be needed at the beginning of each project to determine the origin and destination of the traffic. Based on this information, appropriate education targets and goals can be identified.

Since only a limited number of projects can be undertaken each year, residents on future project streets should be given the opportunity and encouraged to try "interim" education activities. In this way, they will have some recourse for addressing their problems until a project can be done. ATCP staff will work with the Reclaiming Our Streets program to develop information packets that outline possible "interim" education activities. Some of the activities that might be included are:

• Speed Watch

• Sample articles for neighborhood/community newsletters

• Sample information that local school can distribute (e.g., educational flyers for students to take home)

• How to form a committee to address the problems

• How to hold events such as meetings or neighborhood parties

• Sample graphic materials, flyers, etc. that can be delivered door-to-door
ENFORCEMENT TOOLS

Enforcement is a somewhat limited ATCP tool, but an important tool nonetheless. Despite the limited resources of the Portland Police Bureau, Traffic Division, they have agreed to provide targeted enforcement for project streets. Enforcement causes motorists using the project street to be aware of their speed. When enforcement is used at the beginning of a project, and particularly when it is used in conjunction with Speed Watch, it can provide the traffic committee with a temporary tool to deal with traffic problems while the rest of the project is being designed.

Although photo radar is not yet available, the concept is very appealing and would provide the City with a potentially valuable enforcement tool. In addition, staff will encourage traffic committees to work with the community policing liaison officer in a project area. Community policing officers can issue tickets and may be able to work with the community to address traffic issues.

DISCUSSION:

Although enforcement is a limited tool, there are things that can be done. While exploring the issue with the Traffic Division of the Portland Police Bureau, the following ideas and suggestions were made:

• ATCP and the Traffic Bureau can work together for their mutual benefit. For example, if an officer has documented complaints from neighbors or data from ATCP regarding the incidence of speeding in a certain area, the officer can use that information to support tickets issued in that area. (The court tends to give more attention to violations with this kind of backup information.) Also the court could be notified that certain areas are being targeted and that police will be writing tickets for 10 mph over the speed limit.

• Courtwatch can be an effective tool; the more grass-roots pressure for courts to enforce traffic violations, the better.

• Education can work; the success of the seatbelt education program is an example. It is important to emphasize that speeders in people's neighborhoods are often their neighbors, not just people coming through from outside the area.
ENGINEERING TOOLS

A number of traffic management devices have been identified for use as engineering tools in the Arterial Traffic Calming Program. Most of these devices have been tested on either Local Service or Neighborhood Collector Streets. Several of the devices have not yet been tried in Portland. As new devices are identified, they will be developed, tested, and evaluated for inclusion in the Arterial Traffic Calming Program.

The report, "Traffic Calming Devices" (included in the Appendix B section of this report) details more fully approved and potential devices for ATCP use. However, the following is a list of devices described in the report that are available for use in ATCP projects:

- Entry Treatment
- 22' Arterial Speedbumps
- Median Slow Point
- Curb Extensions
- Raised Crosswalk
- Textured Pavement Treatment
- Medians

Staff will continue to investigate new devices for potential ATCP project use. At a minimum, potential new devices need to meet the following criteria:

- Devices must minimize conflicts between vehicles and bicycles.
- Devices must be well illuminated and visible.
- Medians must accommodate appropriate markings and signs.
- Devices must allow the traffic stream to maintain an acceptably consistent speed of approximately 30 mph.\(^{11}\)
- Pavement treatments must not pose a hazard to bicycles or pedestrians, or impede people with disabilities.
- Devices must ensure safety and visibility to pedestrians and other nonvehicular traffic.

\(^{11}\)The 30 mph speed is based on the City's experience in designing, implementing, and monitoring ATCP test projects on NE 15th Avenue and NW Cornell Road.
• Devices cannot inappropriately restrict buses, emergency vehicles, and trucks from providing normal and necessary services to the neighborhood.

PROJECT FUNDING GUIDELINES

ATCP staff will develop general funding guidelines for the use of engineering tools in ATCP projects. These guidelines will estimate the cost per mile of project, based on experience with similar kinds of projects. The guidelines will be flexible enough to allow the project traffic committee to consider various options. The traffic committee and ATCP staff can then develop project design using these options—putting together a plan that is within the general funding guidelines, but that is selected to fit their particular needs and preferences.

The guidelines do not represent an absolute cap or limit, but rather a target for project development. The traffic committee and ATCP staff will work together to come to agreement about a reasonable budget for the project. (Budget development is part of the iterative process the committee goes through, and must be done in conjunction with developing the project goals, objectives, and alternatives.)

Information about both costs and types of devices for various situations will be developed as the ATCP evolves. The data base is limited at present, but will expand as more experience is gained. Funding guidelines can become more refined as the data base grows.

The Arterial Traffic Calming Program will have an overall budget each year for education and enforcement; some will be allocated to program-wide efforts and some will be allocated to specific projects.

RECOMMENDATIONS

The Citizens Advisory and Program Development Committees make the following recommendations to City Council:

• The program should be named the Arterial Traffic Calming Program (ATCP) to better describe the program and its purpose.

• The program detailed in the final report should be adopted.

• New education, enforcement, and engineering tools should be investigated, developed, tested, and evaluated by this program over the next several years for inclusion in the list of available program tools.
35183

- The program should be evaluated by a Citizens Advisory Committee and Technical Advisory Committee in six years, with the committee's recommended program changes forwarded to City Council for adoption.
BACKGROUND INFORMATION -
ARTERIAL TRAFFIC CALMING PROGRAM
BACKGROUND

COMMITTEES

Three committees worked to develop the Arterial Traffic Calming Program. The committees are structured as follows:

1) The Program Development Committee (PDC) is a Bureau of Traffic Management (BTM) staff committee. This committee’s charge is to develop and recommend program policies and procedures for the review of the Citizens Advisory Committee, review and consider suggestions and recommendations made by the other committees, and to review both the draft and final report to City Council. The PDC met weekly throughout the initial program development. They met as necessary to review the draft and final report.

2) The Citizens Advisory Committee (CAC) includes representatives from each neighborhood district and other neighborhood residents with an interest and background in transportation issues. The CAC is an advisory committee to BTM. This committee’s function is to review and comment on the PDC’s work, make suggestions and recommendations for the PDC’s consideration, review both the draft and final report, and submit the final report to City Council. The CAC met twice a month throughout initial program development. They met as necessary to review the draft and final report, attend the public Open Houses, and submit the final report to City Council.

3) The Technical Advisory Committee (TAC) includes representatives from the Portland Police Bureau, Portland Fire Bureau, Bureau of Maintenance, Parks Bureau, Bureau of Transportation Engineering, and Tri-Met. This committee met twice to review the proposed program. Staff met and worked with the Portland Fire Bureau and Tri-Met representatives outside of the TAC structure to resolve issues and concerns regarding the program.

SUMMARY OF PROGRAM DEVELOPMENT COMMITTEE MEETINGS

<table>
<thead>
<tr>
<th>Meeting Date</th>
<th>Meeting Topic</th>
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<tbody>
<tr>
<td>May 28, 1992</td>
<td>• Objectives and policies</td>
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<td>June 4, 1992</td>
<td>• Objectives and policies</td>
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| June 11, 1992  | • Objectives and policies                          
|                | • Engineering tools/performance criteria           |
| June 18, 1992  | • Education tools                                  |
June 25, 1992  • Objectives and policies  • Enforcement tools
July 9, 1992  • Education tools
July 16, 1992  • Engineering tools  • Project selection criteria
July 23, 1992  • Project selection criteria
August 13, 1992  • Project selection criteria
August 20, 1992  • Project selection criteria
August 27, 1992  • Project selection criteria
September 3, 1992  • Project selection criteria
September 9, 1992  • Project selection criteria
September 17, 1992  • Project procedures
September 24, 1992  • Project procedures
October 1, 1992  • Project procedures
October 8, 1992  • Project procedures
October 15, 1992  • Project procedures  • Project funding
October 22, 1992  • Project funding/LID process
November 12, 1992  • Project funding/LID process
March 18, 1993  • Review preliminary draft report
June 4, 1993  • Review comments received
SUMMARY OF CITIZENS ADVISORY COMMITTEE MEETINGS

June 2, 1992  • Committee roles and responsibilities
              • Transportation system history/overview
              • Transportation Element overview

June 16, 1992 • Objectives and policies

June 30, 1992 • Engineering tools

July 14, 1992  • Education tools

July 18, 1992  • Engineering tools
              • Project selection criteria

August 11, 1992 • Enforcement tools

August 25, 1992 • Project selection criteria

September 8, 1992 • Project selection criteria

September 22, 1992 • Project selection criteria

October 6, 1992 • Project procedures

October 20, 1992 • Project procedures

November 10, 1992 • Project funding

November 17, 1992 • Project funding
              • Loose ends

March 23, 1993  • Review preliminary draft report

April 26, 1993  • Open House

April 28, 1993  • Open House

June 8, 1993   • Review comments received
SUMMARY OF TECHNICAL ADVISORY COMMITTEE MEETINGS

January 14, 1993  •  Review program
February 11, 1993  •  Review program
APPENDICES
APPENDIX A
CLASSIFICATION DESCRIPTIONS

The Arterial Streets Classifications and Policies classify the City’s streets based on their optimal traffic and transit functions, grouping them according to those basic uses. These classifications dictate what types of automobile, truck, transit, bicycle, and pedestrian use should be emphasized on each street, and how future street improvements and public and private development relate to those uses.

Bicycle and pedestrian classifications dictate what types of bicycle and pedestrian use should be accommodated and where monies for bicycle and pedestrian improvements should be directed when they become available. All streets are intended for use by pedestrians and bicyclists, except for limited access facilities. However, special pedestrian designations are given to streets which require improvements for pedestrian use. The Pedestrian Program for Arterial Streets is intended to develop pedestrian corridors connecting the various districts in the City.

All streets in the City have at least both a traffic and a transit classification. This is intended to provide for all means of travel on all streets. For example, SE Powell Boulevard is classified as a Major City Traffic Street, thus stressing improvements for the movement of city-wide traffic over improvements for regional through trips or service to local land uses. It is also designated as a Minor Transit Street, thus stressing improvements for local bus service over improvements for express or limited transit service. Improvements on Powell Boulevard would then respond to its designation both as a Major City Traffic Street and as a Minor Transit Street.

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<tr>
<th>TRAFFIC STREETS</th>
<th>BIKEWAYS</th>
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<tr>
<td>1. Regional Trafficways</td>
<td>1. Bicycle Routes</td>
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<td>2. Major City Traffic Streets</td>
<td>2. Local Service Streets</td>
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<td>3. District Collector Streets</td>
<td>3. Bicycle Paths</td>
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<td>4. Neighborhood Collector Streets</td>
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<td>5. Local Service Streets</td>
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<tr>
<th>TRANSIT STREETS</th>
<th>PEDESTRIANWAYS</th>
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<tr>
<td>1. Regional Transitways</td>
<td>1. Pedestrian Districts</td>
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<td>2. Major City Transit Streets</td>
<td>2. Pedestrian Crossings</td>
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<td>4. Local Service Streets</td>
<td>4. Recreational Paths</td>
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<th>TRUCK ROUTES</th>
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<tr>
<td>1. Truck Districts</td>
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<td>2. Regional Truck Routes</td>
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<td>3. Major Truck Routes</td>
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For each classification, Traffic, Transit, Bicycle, Pedestrian, and Truck, a matrix has been included stating functional purpose (primarily the types of trips to be served by each category of street), design and general aspects, and descriptions of the types of land use and development to be encouraged along the various types of streets. Intersection treatments on traffic streets and transit transfer points and stops are also covered in the matrix.

The Downtown streets are classified as part of the Downtown Parking and Circulation Policy. This policy is undergoing review as part of the Central City Transportation Management Plan project.

In reviewing land use cases, the street classifications provide information about the optimal functioning of a street for automobiles, trucks, transit, bicycles and pedestrians. The classification descriptions are aspirational as they relate to the optimal functioning of the street. Changes in land use classifications shall not be approved unless consistent with the street classifications.

In terms of development type and appearance, streets which are traffic-oriented are usually wider than average, with buildings set back from the road and parking lots between the curb and the building. Transit-oriented streets are generally narrower, carry less traffic, and have buildings set close to a wider and more active sidewalk.
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<thead>
<tr>
<th>TRAFFIC STREETS</th>
<th>FUNCTIONAL PURPOSE</th>
<th>INTERCHANGES/INTERSECTIONS</th>
<th>LAND USE AND DEVELOPMENT</th>
<th>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</th>
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<tr>
<td><strong>REGIONAL TRAFFICWAY</strong></td>
<td>Regional Trafficways serve inter-regional district movement with only one trip end in transportation district or bypass a district completely.</td>
<td>Regional Trafficways should connect with other Regional Trafficways, Major City Traffic Streets and District Collectors.</td>
<td>Encourage private and public development of regional significance to locate adjacent to Regional Trafficway interchanges.</td>
<td>Regional Trafficways should be grade-separated, and have limited access where traffic demands, topography, and adjoining development allow.</td>
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<td>Regional Trafficways should not connect to Neighborhood Collectors or Local Service Streets.</td>
<td>Regional Trafficways should not provide access to areas where development is discouraged by the Comprehensive Plan.</td>
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<td>Regional Trafficways are designed and operated to serve through movement and prohibit access to Local Service Streets and private property.</td>
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<td>Regional Trafficways should support desired development patterns as defined by Comprehensive Plan, adopted plans and policies.</td>
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<td>Buffer adjacent neighborhoods from Regional Trafficways.</td>
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<td><strong>MAJOR CITY TRAFFIC STREET</strong></td>
<td>Major City Traffic Streets serve as the principle route for traffic and emergency vehicle movements which have at least one trip end within a Transportation District.</td>
<td>Intersections with Major City Traffic Streets and streets with similar or higher classifications should be designed to facilitate the movement of traffic and to allow all turning movements.</td>
<td>Auto-oriented land uses should be encouraged to locate adjacent to Major City Traffic Streets, according to the Comprehensive Plan and Zoning Code.</td>
<td>A Major City Traffic Street is intended to provide concentrated traffic access for those living or doing business within the district.</td>
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<td>Major City Traffic Streets should provide connections to Regional Trafficways and serve major activity centers within each Transportation District.</td>
<td>Intersections with District and Neighborhood Collectors and Major City Traffic Streets should provide for all desired turning movements without requiring use of a Local Service Street.</td>
<td>Major development centers which attract trips from throughout or beyond the transportation district should locate along Major City Traffic Streets.</td>
<td>On-street parking on Major City Traffic Streets can be removed and additional right-of-way be purchased to provide adequate traffic access.</td>
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<td>Traffic with no trip ends within a Transportation District should be encouraged to use Regional Trafficways and discouraged from using Major City Traffic Streets.</td>
<td>Local Service Street intersections should yield right of way to or be denied access to Major City Traffic Streets.</td>
<td>The provision of off-street parking on Major City Traffic Streets should be encouraged, as provided in the Comprehensive Plan and Zoning Code.</td>
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<tr>
<td>MAJOR CITY TRAFFIC STREET (continued)</td>
<td>FUNCTIONAL PURPOSE</td>
<td>INTERCHANGES/INTERSECTIONS</td>
<td>LAND USE AND DEVELOPMENT</td>
<td>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</td>
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<td>Improvements on Major City Traffic Streets should support appropriate land uses abutting the street.</td>
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<td>Before improvements are made or parking removed on Major City Traffic Streets, alternatives and their impacts on adjacent land uses should be studied.</td>
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<td>Where feasible, buffer residential developments adjacent to Major City Traffic Streets.</td>
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<td>When removing parking along Major City Traffic Streets, special consideration should be given to insuring a safe pedestrian environment.</td>
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<td>Do not prohibit pedestrian/bicycle crossings along Major City Traffic Streets for distances greater than approximately 1,000 feet.</td>
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<td>Provide protected crossing opportunities, where needed, on Major City Traffic Streets.</td>
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<td>DISTRICT COLLECTOR</td>
<td>FUNCTIONAL PURPOSE</td>
<td>INTERCHANGES/INTERSECTIONS</td>
<td>LAND USE AND DEVELOPMENT</td>
<td>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</td>
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<td>District Collectors provide concentrated access to district activity centers and to serve trips which both start and end in a district.</td>
<td>Intersections with District Collectors and streets of similar or higher classification should be designed to facilitate the safe movement of traffic along each street, as well as turning movements between such streets.</td>
<td>New land uses in conformance with the Comprehensive Plan which attract trips from the surrounding neighborhoods or from throughout the district are encouraged to locate on District Collector Streets. Regional land uses are discouraged from locating on District Collectors except where the collector is near and directly connected to a Regional Trafficway.</td>
<td>Parking removal or additional right-of-way purchase on District Collectors should be undertaken only at specific problem locations or under special circumstances to accommodate the equally important functions of traffic movement and access to abutting properties. Provide protected crossing opportunities on District Collectors every quarter mile on streets with insufficient gaps to allow safe crossing without protection.</td>
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<td>District Collectors should serve as a distributor of traffic and emergency vehicles from a Major City Traffic Street to streets of similar or lower classifications. Discourage regional trips from using District Collector streets.</td>
<td>Design District Collector intersections to allow turning movements into neighborhood streets without requiring the use of Local Service Streets. Intersections with District Collectors and Neighborhood Collectors should be appropriately controlled and designed to allow turning movements into the neighborhoods without the use of a Local Service Street. Intersections with District Collectors and Local Service Streets should be designed so that the Local Service Street yields right of way to or is denied access to the District Collector.</td>
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<tr>
<td>NEIGHBORHOOD COLLECTOR</td>
<td>FUNCTIONAL PURPOSE</td>
<td>INTERCHANGES/INTERSECTIONS</td>
<td>LAND USE AND DEVELOPMENT</td>
<td>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</td>
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<td>Neighborhood Collector Streets are intended to serve as a distributor of traffic from a Major City Traffic Street or District Collector Street to the Local Service Streets, and to serve trips which both start and end within an area bounded by Major City Traffic Streets, and District Collector Streets.</td>
<td>Intersections with Neighborhood Collectors and streets of similar or higher classification should be designed to facilitate the safe movement of traffic along each street as well as turning movements between such streets.</td>
<td>New land uses and major expansions of existing land uses which attract a significant volume of traffic trips from outside the neighborhood area should be discouraged on Neighborhood Collectors, as provided by the Comprehensive Plan and Zoning Code.</td>
<td>Parking removal or additional right-of-way purchase should not be undertaken on Neighborhood Collectors except at specific problem locations or special circumstances to accommodate the equally important functions of traffic movement and access to abutting properties.</td>
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<tr>
<td>Neighborhood Collectors should also provide access for emergency vehicles to and from adjacent Transportation Districts, within the District and to individual neighborhoods.</td>
<td>Intersections with Neighborhood Collectors and Major City Traffic Streets should be controlled to allow all desired turning movements into the neighborhood, without requiring the use of Local Service Streets.</td>
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<td>Preference should be given to the distribution of traffic to the neighborhoods on Neighborhood Collectors.</td>
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<tr>
<td>Inter-district, non-local traffic should be discouraged from using Neighborhood Collector Streets.</td>
<td>Intersections with a Neighborhood Collector Street and a Local Service Street should be treated such that a Local Service Street yields right-of-way to, or is denied access to, the Neighborhood Collector Street.</td>
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<td>Non-local inter-district trips should be discouraged on Neighborhood Collectors.</td>
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<td>Provide protected crossing opportunities on Neighborhood Collectors every quarter mile on streets with insufficient gaps to allow safe crossing without protection.</td>
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<tr>
<td>LOCAL SERVICE STREET</td>
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<td>Local Service Streets are intended to provide the following: distribute local traffic and emergency vehicles access; access to local residences or commercial uses; visual setting or entry way to land uses; pedestrian circulation system; meeting place for residences; and play area for children in locations where a woonerf street treatment has been implemented.</td>
<td>Intersections between Local Service Streets which experience safety, speed, or non-local traffic problems may be treated in such a way as to control access or deny traffic movements.</td>
<td>Auto-oriented land use should be discouraged from using Local Service Streets as their primary access. The design of Local Service Streets should correspond directly to the land use it serves.</td>
<td>Local Service Streets give preference to access to individual properties, and also to the special needs of residents and property owners along the street. Access for motor vehicles may be selectively restricted on Local Service Streets to allow for non-traffic uses or improved safety, using the established city process. Local Service Streets are intended to provide on-street parking and access to local residences or commercial uses. The use of Local Service Streets for one-way couplets is not generally appropriate.</td>
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<td>REGIONAL TRANSITWAY</td>
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<td>Regional Transitways are intended to provide for inter-regional and inter-district transit trips. Regional Transitways are intended to provide for frequent high-speed, high capacity, express and limited transit service.</td>
<td>Stations and stops on Regional Transitways should be located in such a way as to provide direct service to regional and neighborhood commercial centers and major trip generators along the transitway. Stations and stops on Regional Transitways should provide a safe and convenient covered waiting area and means of transfer to other transit services. Transit information and access for pedestrians and bicyclists should also be provided. On Regional Transitways, minimum distance between stations and/or stops should be approximately one-half mile. In high density areas in the Central City, closer station spacing may be appropriate. On Regional Transitways, locate stations and stops to provide convenient access to neighborhoods and commercial centers. Stations located within 25 minutes travel time of downtown should primarily be served by feeder bus connections. Those beyond 25 minutes travel time, should be served by either park and ride or feeder bus service.</td>
<td>Regional Transitways should provide connectors between downtown and all regional activity centers. Regional Transitways should not provide direct access to areas in which urban growth is to be discouraged, as defined by the Comprehensive Plan. Private and public developments of regional significance (for example, shopping centers, stadiums, arenas, etc.) should be encouraged to locate adjacent to Regional Transitways to reduce traffic impact on adjoining areas and streets. On Regional Transitways, land uses surrounding transit stations should be planned and designed to support transit-oriented development and provide a high level of multi-modal access to the station site within one-half mile. Density should peak at the station center and decrease proportionately based on distance from the station.</td>
<td>A Regional Transitway should be an exclusive transit facility where the level of service demands and the topography and adjoining development allow. Where feasible, neighborhoods in a developed area should be buffered from the direct impact of Regional Transitways. Design treatment of a Regional Transitway should consider auto, transit, bicycle and pedestrian circulation at the station area.</td>
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<tr>
<td>MAJOR CITY TRANSIT STREET</td>
<td>FUNCTIONAL PURPOSE</td>
<td>STATIONS, TRANSFERS &amp; STOPS</td>
<td>LAND USE AND DEVELOPMENT</td>
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<tr>
<td>Major City Transit Streets are intended to provide transit service for all person trip ends having none, one or both of its trip ends within a Transportation District.</td>
<td>Facilities at transfer points on Major City Transit Streets should provide a safe and convenient covered waiting area and a means of transfer between transit routes. Transit route information and access for pedestrians and bicyclists should be provided.</td>
<td>Transit oriented land uses should be encouraged to locate along Major City Transit Streets. Auto-oriented land uses should be discouraged from locating along Major City Transit Streets, except where the street is also classified as Major City Traffic Street.</td>
<td>Major City Transit Street are intended to provide service for living and doing business within the transportation district. Where neighborhood commercial uses occur along Major City Transit Streets, pedestrian and bicycle improvements and on-street parking should be encouraged. On Major City Transit Streets, employ preferential transit service, including transit priority treatment (such as signal pre-emption or exclusive lanes), which may involve removing on-street parking or acquiring additional right-of-way. Adequate pedestrian and bicycle crossings should be provided along a Major City Transit Street at or near transit stops.</td>
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<tr>
<td>Major City Transit Streets are intended to provide concentrated transit services to connect and reinforce major activity centers and residential areas.</td>
<td>On Major City Transit Streets, locate stations and stops to provide convenient access to neighborhoods and commercial centers. Stations located within 25 minutes travel time of downtown should primarily be served by feeder bus connections. Those areas beyond 25 minutes travel time, should be served by either park and ride or feeder bus service.</td>
<td>Encourage land use densities along Major City Transit Streets to vary directly with the planned capacity of transit service and in conformance with the Comprehensive Plan.</td>
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<td>Major City Transit Streets are intended to provide for local, limited and express transit operations.</td>
<td>On a Major City Transit Street, stops should be 400 to 750 feet apart in high to medium density areas and 600 to 1000 feet apart in low density areas.</td>
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<td>Limited transit service should stop at transfer points and activity centers along Major City Transit Streets.</td>
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<td>MINOR TRANSIT STREET</td>
<td>FUNCTIONAL PURPOSE</td>
<td>STATIONS, TRANSFERS &amp; STOPS</td>
<td>LAND USE AND DEVELOPMENT</td>
<td>DESIGN TREATMENT &amp; OPERATING CHARACTERISTICS</td>
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<tr>
<td>Minor Transit Streets are intended to provide for district transit service.</td>
<td>On Minor Transit Streets, stops should be located between 400 and 600 feet apart in medium density commercial areas and between 500 to 1000 feet apart in other areas. Facilities at transfer points on Minor Transit Streets should provide an adequate covered waiting area. Transit information and direct and convenient pedestrian and bicycle access should be provided between transfer points.</td>
<td>Encourage direct and convenient pedestrian and bicycle access between transit stops and land uses along Minor Transit Streets. The density of development along Minor Transit Streets should be encouraged to vary directly with the planned capacity of transit service and in conformance with the Comprehensive Plan.</td>
<td>Transit movement is not the primary function of Minor Transit Streets. Parking removal, or purchase of additional right-of-way for transit purposes on Minor Transit Streets should not be undertaken except at specific locations, in order to provide for transit stops and intersection improvements. The size and type of vehicle used on Minor Transit Streets should be appropriate to the needs of the land uses being served along the entire route.</td>
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<th>LOCAL SERVICE STREET</th>
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<th>LAND USE AND DEVELOPMENT</th>
<th>DESIGN TREATMENT &amp; OPERATING CHARACTERISTICS</th>
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<tr>
<td>Local Service Streets are intended to provide service to local residents and commercial areas and para-transit service. Where no alternatives are available, they may be used as route end loops for regularly scheduled routes.</td>
<td>On Local Service Streets, the location of stops should be based upon Tri-Met Service Standards.</td>
<td>The design of Local Service Streets should correspond directly to the land uses served.</td>
<td>Design treatment and transit operations on Local Service Streets should give preference for access to individual properties and to the specific needs of property owners and residents along the street.</td>
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<td><strong>BIKEWAYS</strong></td>
<td><strong>FUNCTIONAL PURPOSE</strong></td>
<td><strong>DESIGN TREATMENT</strong></td>
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<tr>
<td><strong>BIKE ROUTES</strong></td>
<td>Bicycle Routes are designed to establish adequate and convenient routes for bicycling, and to provide access to public transit. Bicycle Routes may be shifted to a parallel street where the street can be designed to accommodate bicycles through a capital improvement project.</td>
<td>While all streets should be designed for bicycle passage, special provisions for bicycle use should be considered on streets classified as Bicycle Routes. Intersections of Bicycle Routes and all other rights-of-way should be designed to minimize conflicts and provide adequate bicycle crossings. Bicycle lanes should be considered on Bicycle Routes which are also classified as Regional Trafficways, Major City Traffic Streets, District Collectors or Neighborhood Collectors and on Major and Minor Transit Streets. Design treatment and traffic operations on Bicycle Routes also classified as Local Service Streets should minimize conflicts between bicycles and other modes of traffic. Treatment to and operations of Bicycle Routes designated on Local Service Streets should not, as a side effect, create, accommodate, or encourage additional through automobile traffic. Parking may be removed on Bicycle Routes to provide separate bicycle lanes, except where it is deemed essential to serve adjacent land uses. All Bicycle Routes, with or without bicycle lanes, should be signed.</td>
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<tr>
<td><strong>LOCAL SERVICE STREETS</strong></td>
<td>Local Service Streets are intended to serve local circulation and access for bicycle and pedestrian movements.</td>
<td>Local Service Streets may not be signed, except if deemed necessary. Intersections of Bicycle Paths and all other rights-of-way should be designed to minimize conflicts and provide adequate bicycle crossings. Bicycle Paths shared with pedestrians should emphasize design features and adequate path markings that allow for the safety of all users. Landscape and trail design for Bicycle Paths should conform to Zoning Code specifications for the Greenway Trail.</td>
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<td><strong>BIKE PATHS</strong></td>
<td>Bicycle Paths are off-street facilities designed to establish adequate and convenient routes for bicycling and may be shared with pedestrians.</td>
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<td>PEDESTRIAN DISTRICT</td>
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<td>PEDESTRIAN DISTRICT</td>
<td>Pedestrian Districts are intended to provide for the ease of pedestrian movement and the use of the right-of-way for pedestrian activities in areas of frequent pedestrian use, such as neighborhood commercial centers. Pedestrian Districts include both sides of the street(s) along its boundaries. In those Pedestrian Districts zoned for auto-oriented uses, there is a need for enhanced pedestrian awareness and design treatments.</td>
<td>Pedestrian Districts are areas characterized by dense, mixed-use development retail, service-oriented commercial use; concentration of pedestrian generating activities; and commercial or institutional center of neighborhood or district-wide importance.</td>
<td>Arterial streets within Pedestrian Districts should be designed to buffer pedestrians from traffic. In Pedestrian Districts, design treatments such as wide planting strips, street trees, and on-street parking should be considered. Where two arterial streets cross within Pedestrian Districts, design treatment such as curb extensions, marked crosswalks and traffic signals should be considered to minimize the crossing distance, directing pedestrians across the safest route, and provide safe gaps. Pedestrian Districts should include convenient access to transit stops and parking lots.</td>
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<p>| PEDESTRIAN PATH WITH CROSSINGS | Pedestrian Paths with Crossings are intended to provide adequate and convenient pedestrian access to activities along streets shared with other modes of travel and adequate and convenient movement of pedestrians across such streets and rights-of-way shared with other modes of travel. | Pedestrian Paths with Crossings are usually located along streets which include: important transit transfer points on Major City Traffic and Transit Streets; by major pedestrian generating activity centers; and places where pedestrian paths cross rights-of-ways shared other modes of travel. | Pedestrian Paths with Crossings are designed to buffer pedestrians from traffic. Design treatments such as landscape strips, street trees and on-street parking should be considered, consistent with the street's traffic classification. Pedestrian Paths with Crossings should have signalized crossings and pedestrian refuges, where needed. Where two Pedestrian Paths cross, and there is a legal crosswalk, design treatments such as curb extensions, marked crosswalks and traffic signals should be considered to minimize the crossing distance and direct pedestrians across the safest route, and provide safe gaps. |</p>
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<th>LAND USE CRITERIA</th>
<th>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</th>
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<tr>
<td>Pedestrian Paths are intended to provide adequate and convenient pedestrian access to activities along streets which are shared with other modes of travel.</td>
<td>Pedestrian Paths are usually located in residential areas; neighborhood commercial, industrial and institutional centers; and along the appropriate traffic/transit streets to provide for intra- and inter-district travel.</td>
<td>Pedestrian Paths are designed to buffer pedestrians from traffic. Pedestrian Paths should have design treatments such as landscape strips, street trees, and on-street parking should be considered.</td>
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<td>Recreational Paths are intended to serve as recreational trails and to connect neighborhood activity centers with recreation areas.</td>
<td>Recreational Paths are usually located along river corridors; through park and forest areas; and other scenic or undeveloped corridors.</td>
<td>Railings, barriers, and wide sidewalks should be provided on both sides of bridges on Recreational Paths. Landscaping and trail design for Recreational Paths should conform with the Zoning Code specifications for the Greenway Trail.</td>
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<td>TRUCK DISTRICT</td>
<td>FUNCTIONAL PURPOSE</td>
<td>LAND USE CRITERIA</td>
<td>DESIGN TREATMENT &amp; TRAFFIC OPERATIONS</td>
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<td>Truck Districts are intended to provide for convenient truck movement in areas serving large numbers of truck trip ends.</td>
<td>Encourage large industrial centers with high truck use to locate within Truck Districts.</td>
<td>Street improvements in Truck Districts should be designed to serve industrial areas.</td>
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<td>Truck Districts should include truck terminals and industrial sanctuaries.</td>
<td>Encourage national and international shippers to locate near multi-modal facilities within Truck Districts.</td>
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<td>All streets should be available for use by trucks in Truck Districts.</td>
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<tr>
<td>REGIONAL TRUCK ROUTE</td>
<td>Regional Truck Routes are intended to serve truck trips with one or no trip ends in a transportation district and usually located on Regional Trafficways.</td>
<td>Encourage high truck use activities to locate near interchanges with Regional Trafficways.</td>
<td>Regional Truck Routes should be limited access facilities with design standards to accommodate trucks.</td>
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<tr>
<td>Regional Truck Routes serve as access to Truck Districts.</td>
<td>Provide interchanges with Regional Truck Routes to directly serve Truck Districts.</td>
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<tr>
<td>MAJOR TRUCK ROUTE</td>
<td>Major Truck Routes are intended to serve truck trips with one or both trip ends in a transportation district.</td>
<td>Encourage land uses which attract large numbers of truck trips from inside and outside transportation districts to locate along Major Truck Routes.</td>
<td>In new or reconstructed Major Truck Routes, residential uses adjacent to these routes should be buffered from noise impacts where warranted.</td>
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<td>Major Truck Routes should distribute truck traffic from Regional Truck Routes to Minor Truck Routes</td>
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APPENDIX B
TRAFFIC CALMING DEVICES

FOR HIGHER VOLUME RESIDENTIAL STREETS
AS PART OF THE ARTERIAL TRAFFIC CALMING PROGRAM

PRELIMINARY DESIGN AND GUIDELINES

April 13, 1993 DRAFT

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EXECUTIVE SUMMARY

For the past ten years the City of Portland has been actively developing and applying traffic management techniques to City roadways in order to enhance livability for adjacent residents. The enhancement of neighborhood livability has been achieved in large part by the reduction of traffic speed. During this period the City has developed and implemented the Neighborhood Traffic Management Program (NTMP) to address traffic related issues on residential street classified as Local Service Streets according to the Comprehensive Plan. The City is now in the process of developing the Arterial Traffic Calming Program (ATCP) to address similar traffic related issue on residential streets classified as Neighborhood Collectors.

The fundamental difference between the programs, both of which address residential traffic issues, is based primarily on the policy distinction between streets classified as Local Service Streets and Neighborhood Collector Streets according to the Transportation element of the Comprehensive Plan. This is an important distinction in that many of the roadways found in both of these classifications have similar character and look, including volume, width, speed, and adjacent land-use. According to policy, however, Neighborhood Collector roadways are to function as low level arterials (carrying through trips), while Local Service Streets are to serve adjacent land-use only. Thus, these two street classifications require fundamentally different approaches to traffic calming.

This distinction played a significant role in helping to identify primary goals for the ATCP. Because of this arterial policy distinction the ATCP is being developed with two primary goals:

1) The first primary goal of the ATCP is the enhancements of residential livability along the roadway. This specifically includes livability enhancement for pedestrians, residents, bicyclists, transit user, school children, etc..

2) The second primary goal of the ATCP is to maintain, to the extent possible, the arterial integrity of the roadway. The viability of the roadway to carry local through traffic should not be so degraded as to create significant traffic volume shifts.

The devices identified in this report were evaluated for their ability to meet the two primary goals of the ATCP. Devices were evaluated in terms of speed reduction, residential enhancement, pedestrian enhancement, impact on transit, impact on emergency services, impact on adjacent access, and impact on general vehicle operation including safety and delay. The report categorizes the devices according to their current status for appropriateness for use on collector roadways. These categories include:
Approved Devices

Devices in this category are devices that are currently approved for use on Neighborhood Collector roadways. These devices include, curb extensions, medians, and arterial speed bumps.

Devices Under Test or Demonstration

These are devices that are highly promising and currently under test or being considered for test or demonstration. These devices include: entry treatments, median slow points, raised crosswalks, and textured pavement treatments.

Potential Devices

Only the serpentine has been identified as a device in this category. It is thought that the device has promise for meeting the goals of the ATCP, however concerns regarding traffic safety and parking removal make testing the device difficult.

Other Devices

These are devices that are considered inappropriate for Neighborhood Collector roadways. It is thought that these devices will significantly degrade the integrity of the roadway as a minor arterial. These devices include: road closures, diverters, traffic circles, single lane devices, chicane, and local street speed bumps.

This report should be considered only an early assessment of these tools. There remains many unanswered issues with regard to many of the devices. With experience many of these devices will likely be re-categorized as approved devices.
INTRODUCTION

This report has been produced as part of the development of the Arterial Traffic Calming Program, ATCP (formally the Collector Recovery Program). This comparative discussion of traffic calming devices was prepared as a way of identifying both approved and potential devices for use as part of this program. The report categorizes the devices according to their current status for appropriateness for use on collector roadways. These categories include:

- Approved Devices
- Devices Under Test or Demonstration
- Potential Devices
- Other Devices

Each device has been evaluated in the report under the following standard format:

**Objectives**
The broad-based primary and secondary objectives for each device.

**Application**
The general circumstances under which use of the device can be considered both in by itself or as part of a street scheme or plan.

**Limitations**
The limitations on the use of the device, i.e., where the device is appropriate or inappropriate.

**Advantages**
The main advantages or "strong points" in favor of use of the device.

**Disadvantages**
The main disadvantage or "strong points" against use of the device.

**Unresolved Issues**
Unresolved issues with potential for developing into either advantages or disadvantages. Issues are unresolved due to lack of field experience with device. With continued testing and demonstrations these issues will become resolved.

The report is intended to be a preliminary guideline only. The guidelines included in this report require additional engineering expertise and judgment in the development of specific solutions for specific identified site problems.
APPROVED DEVICES

Approved devices are those devices which are currently available for use as a part of the Arterial Traffic calming Program without further testing or demonstrating. These devices include:

- Curb Extensions
- Medians
- Arterial Speed Bumps
CURB EXTENSIONS

**Objective**

- Enhance pedestrian crossing point.
- Create visual screen or break along line of roadway.

**Application**

- Curb extensions are applicable on roadways with vehicular traffic perceived as being incompatible with the adjacent residential land use.
- Curb extensions can be installed either at intersections or mid-block.
- Curb extensions may be used in conjunction with other traffic calming devices.

**Limitations**

- Curb extensions are limited only to the degree that they extend into the travel way. (Curb extensions cannot impede or restrict the two-way operation of the roadway)
- Curb extension can be used on all roadway classifications according to the Transportation Element of the City of Portland Comprehensive Plan with the exception of "Regional Trafficways".

**Advantages**

- Reduces pedestrian crossing distance and time.
- Provides visual enhancement of pedestrian crossing point.
- Prevents passing of turning vehicles.
- Requires no deviation from straight line vehicle path.
- Facilitates transit loading and unloading.

**Disadvantages**

- Some parking removal required.
- High installation cost
- Effective-curb extension design precludes bicycle accommodation

**Unresolved Issues**

- Cost/benefit
- Maintenance Costs
- Bicycle accommodation.
MEDIANS

Objective

- Provide visual cue of change in roadway environment.

Application

- Medians are applicable on roadways with vehicular traffic perceived as being incompatible with the adjacent residential land use.
- Medians may be used in conjunction with other traffic calming devices.

Limitations

- Medians have no general limitations.
- Medians can be used on all roadway classifications according to the Transportation Element of the City of Portland Comprehensive Plan with the exception of "Regional Trafficways".

Advantages

- Provides visual enhancement of roadway environment (particularly if landscaped).
- Prevents passing.
- Separates opposing vehicle travel lanes.

Disadvantages

- Major parking removal required.
- Expensive (particularly if landscaping included).
- Prohibits and/or limits access and movement.

Unresolved Issues

- Bicycle issues
- Cost/benefit
ARTERIAL SPEED BUMPS

Objective

- Reduce vehicular speed.

Application

- Arterial speed bumps are applicable on roadways with vehicular speeds perceived as being incompatible with the adjacent residential land use.
- Arterial speed bumps may be used in conjunction with other traffic calming devices.

Limitations

- Arterial speed bumps are limited for use as per the City of Portland Traffic Manual.
- Arterial speed bumps are limited for use on streets classified as either "local service streets" or "neighborhood collector streets" according to the Transportation Element.
- Arterial speed bumps are limited for use on two lane residential streets with 85th percentile speeds of between 30 and 45 mph.
- Speed reduction over entire length of street requires installation of devices in a series along the length of the street.

Advantages

- Effectively reduces vehicle speeds to 25-30 mph near the location of the device.
- When used in series, effectively reduces speeds of vehicles over the entire length of a roadway section.
- Relatively inexpensive ($1,500 to $2,000 per bump)
- Requires no parking removal.
- Requires no deviation from vehicle straight line path.
- Does not impact intersection operations.
- Poses no restrictions for bicycles

Disadvantages

- Possible increase in traffic noise due to braking and acceleration of trucks.
- Limited for use on roadways with 85th percentile speeds less than 45 mph.

Unresolved Issues

- Device Maintenance
Traffic Calming Devices for Collector Streets

Speed Bump (typical)

Section A–A

Section B–B
DEVICES UNDER TEST OR DEMONSTRATION

There are a number of the devices currently under test or demonstration that are highly promising for use on higher volume residential streets and as part of the Arterial Traffic Calming Program. These device include:

- Entry Treatment
- Median Slow Point
- Raised Crosswalk
- Textured Pavement Treatment
ENTRY TREATMENT

Objective

- Provide visual and tactile cue to drivers of entry into specific area or environment.

Application

- Entry treatments are applicable on roadways at transition points between two different land use environments or two different street classifications.
- Entry treatments may be used in conjunction with other traffic calming devices such as raised thresholds, curb extensions and/or pavement treatments.

Limitations

- The effectiveness of an entry treatment to influence motorist behavior is limited unless included as part of an overall traffic calming plan for a street.
- Entry treatments are limited for use on two lane or less residential streets classified as either "local service streets" or "neighborhood collector streets" according to the Transportation Element of the City of Portland Comprehensive Plan.

Advantages

- Provides strong indication of changing environment and/or driving conditions.
- Enhances pedestrian crossing area.
- Aesthetically appealing (improves appearance of intersection).
- Poses no access restrictions for roadway users.

Disadvantages

- Pavement treatment or brick work is very expensive.

Unresolved Issues

- Cost
- Cost/Benefit
- Device maintenance issues.
ENTRY TREATMENT

ARTERIAL STREET

NEIGHBORHOOD STREET
MEDIAN SLOW POINT

Objective

■ Reduce vehicle speeds
■ Enhance pedestrian crossing point.
■ Create visual break or screen along line of roadway.

Application

■ Median slow points are applicable on roadways with vehicular speeds perceived as being incompatible with the adjacent residential land use.
■ Median slow points can be installed either at intersections or mid-block.
■ Median slow points may be used in conjunction with other traffic calming devices.

Limitations

■ Median slow points are limited for use on two lane or less residential streets classified as either "local service streets" or "neighborhood collector streets" according to the Transportation Element of the City of Portland Comprehensive Plan.
■ Median slow points are limited by AASHTO standards for transition taper length.
■ Median slow points are sometimes limited by parking removal issues.

Advantages

■ Reduces vehicle speeds near the location of the device.
■ Provides visual enhancement of pedestrian crossing point.
■ Prevents passing of turning vehicles.
■ Requires only minor deviation from straight line vehicle path.
■ Accommodates bicycles

Disadvantages

■ Some parking removal required.

Unresolved Issues

■ Cost of device
■ Maintenance Costs
Traffic Calming Devices for Collector Streets

MEDIAN SLOW POINT

MID-BLOCK

SECTION A-A

INTERSECTION
RAISED CROSSWALK

Objective

- Reduce vehicular speed.
- Enhance pedestrian crossing point.

Application

- Raised crosswalks are applicable on roadways with vehicular speeds perceived as being incompatible with the adjacent residential land use.
- Raised crosswalks are applicable at locations with significant pedestrian crossings.
- Raised crosswalks may be used in conjunction with other traffic calming devices particularly entry treatments.

Limitations

- Raised crosswalks are limited for use on two lane or less residential streets classified as either "local service streets" or "neighborhood collector streets" according to the Transportation Element of the City of Portland Comprehensive Plan.
- Raised crosswalks, like arterial speed bumps, are limited for use on roadways with 85th percentile speeds less than 45 mph.
- Raised crosswalks, like arterial bumps are limited for use according to the City of Portland Traffic Manual for speed bump use.

Advantages

- Effectively reduces vehicle speeds near the location of the device.
- Creates visual enhancement of pedestrian crossing point.
- If constructed curb-to-curb, provides smooth transition and pedestrian crossing at same grade as adjacent sidewalks.
- Poses no access restrictions for roadway users.
- Requires no deviation from vehicle straight line path.
- Does not impact intersection operations.

Disadvantages

- Possible increase in traffic noise due to braking and acceleration of vehicles.
- If not constructed curb-to-curb, grade change can create difficulty in crossing for visually impaired.
Unresolved Issues

- Access issues for emergency services and transit vehicles.
- Device maintenance issues.
- Cost
- Device design
- Device Markings
COLORED & TEXTURED PAVEMENT TREATMENTS

Objective

- Reduce vehicle speed.
- Provide visual and tactile cue to drivers of entry into specific area or environment.

Application

- Colored & textured pavement treatments are applicable on roadways with vehicular speeds perceived as being incompatible with the adjacent residential land use.
- May be used in conjunction with other traffic calming devices such as raised thresholds, curb extensions and/or pavement treatments.

Limitations

- Colored & Textured pavement treatments are limited for use on two lane or less residential streets classified as "local service streets" or "neighborhood collector streets" according to the Transportation Element of the City of Portland Comprehensive Plan.
- The effectiveness of colored & textured pavement treatment is limited unless included as part of an overall traffic management plan for a street.
- Textured pavement treatments are limited by the degree of treatment roughness (roughness impacts noise and bicycle/motorcycle safety).

Advantages

- Provides strong indication of changing environment and/or driving conditions.
- If tactile enough, speed reduction possible.
- Potentially aesthetically appealing (if brick or block is used)
- Poses no access restrictions for roadway users.
- Requires no parking removal

Disadvantages

- The more tactile, the more noisy.
- Possibly creates hazard for bicyclists
- If not tactile enough, limited traffic calming value.
Unresolved Issues

- Design
- Cost
- Effectiveness
- Bicycle issues
TEXTURED PAVEMENT TREATMENTS

Brick
Cobble Stone
Ceramic Buttons
Pavement Modifications
Etc.
POTENTIAL DEVICES

Potential devices are devices which have potential for use on higher volume residential streets and/or the Arterial Traffic Calming Program, but due to design constraints cannot be tested or demonstrated on the two existing test projects. It is recommended that devices identified in this category be tested or demonstrated, when appropriate, as part of future projects.

Only the serpentine/offset device currently falls into this category.
SERPENTINE OR OFFSET TYPE TREATMENTS

Objective

- Reduce vehicle speeds
- Create visual break or screen along line of roadway.

Application

- Offsets/serpentines are applicable on roadways with vehicular speeds perceived as being incompatible with the adjacent residential land use.
- Offsets/serpentines are located at mid-block locations.
- Offsets/serpentines may be used in conjunction with other traffic calming devices.

Limitations

- Offsets/serpentines are currently not approved for use in Portland. However, if approved, would be limited for use on two lane or less residential streets classified as "local service streets" and possibly "neighborhood collector streets" according to the Transportation Element of the City of Portland Comprehensive Plan.
- Device limited by AASHTO standards for transition taper lengths.
- Device will require significant parking removal and is therefore limited to locations where parking removal not an issue.

Advantages

- Reduces vehicle speeds near the location of the device.
- Prevents passing of turning vehicles.

Disadvantages

- Significant parking removal required.
- Requires major deviation from straight line path.
- Straight line deviation provides head-on & fixed object collision potential.

Unresolved Issues

- Cost of device
- Bicycle Provision
- Cost/benefit
- Maintenance Costs
- Effectiveness of device
SERPENTINE/OFFSET

Variable Distance

New Curb Line
OTHER DEVICES

This report has so far listed devices that are, or may be, appropriate for higher volume two lane roadways as part of the Arterial Traffic Calming Program. The Arterial Traffic Calming Program treats residential livability issues on street classified as "neighborhood collectors" according to the transportation element of City of Portland Comprehensive Plan. Neighborhood collectors are arterial roadways, and as such are designated to serve as a higher traffic volume streets.

The Arterial Traffic Calming Program goals and objective recognize that while livability issues must be addressed, that the integrity of neighborhood collector streets to function as arterials must also be maintained. Therefore, devices which degrade the arterial integrity of these roadways, in terms of diverting significant amounts of traffic, are identified in this section, as unsuitable for use in the Arterial Traffic Calming Program.

The following is a list of devices that are deemed unsuitable for arterial roadways but may be appropriate roadways where maintaining arterial integrity is not relevant:

- Road Closure
- Diagonal Diverter
- Single Lane Entry or Threshold
- Traffic Circle
- Local Speed Bumps
- Single Lane Slow Point
- Single Lane Offset
- Chicane
<table>
<thead>
<tr>
<th>DEVICE</th>
<th>SPEED REDUCTION</th>
<th>SAFETY</th>
<th>NOISE</th>
<th>COST</th>
<th>BICYCLES</th>
<th>TRANSIT</th>
<th>EMERGENCY SERVICES</th>
<th>PEDESTRIANS</th>
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**TRAFFIC CALMING DEVICES**