Attachment B

Revised Neighborhood Traffic Calming Program

Adopted by Town Council on: Date

Resolution #:

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APPENDIX

1.0 INTRODUCTION

In response to concerns about vehicle speeds and cut through traffic on residential streets, the Town of Castle Rock has developed this Neighborhood Traffic Calming Program. This guide outlines the Program, its objectives and goals, and the process that should be followed when working with a neighborhood on the development of a traffic calming plan. Also included are examples of "tools" that may be used on the streets as part of a traffic calming project.

This program is only for traffic calming issues within existing neighborhoods and on existing streets. Information regarding traffic calming devices that are being installed as part of a new development is included within the Public Works Department's "Transportation Design Criteria Manual".

2.0 PROGRAM MISSION STATEMENT AND OBJECTIVES

The Mission of the Town of Castle Rock Neighborhood Traffic Calming Program is:

To provide a consistent, feasible, and manageable procedure for addressing neighborhood traffic concerns on residential streets where documented speeding problems or other traffic factors exist that may adversely affect the overall residential quality of life.

The objectives of the Neighborhood Traffic Calming Program (NTCP) are to:

- To provide for a "neighborhood driven" process to address concerns about cut through traffic and speeds on residential streets.
- Improve neighborhood livability by reducing the impact of vehicular traffic on residential streets.
- Encourage appropriate driver behavior and reduce the number of vehicles exceeding the posted speed limit on residential streets.

The objectives of this policy are to:

- Ensure a consistent approach to the initiation and approval of a traffic calming study and development of a traffic calming project.
- Define the existing traffic conditions on the street or within the neighborhood that warrant the initiation of a traffic calming study and project.
- Integrate aspects of education, enforcement and engineering in the development of traffic calming projects.
- Encourage citizen involvement in developing solutions to neighborhood traffic concerns.
- Effectively balance the goal of reducing traffic impacts with the needs of the Town's emergency response personnel.
- Efficiently allocate the use of Town funding and resources.

3.0 POLICIES

The following policies provide detail on different aspects of the Neighborhood Traffic Calming Program.

3.1 Compatibility with Existing Policies

Neighborhood traffic projects should be implemented in a manner that is consistent with current Town plans, policies, and practices. Town staff will follow the warrants and placement guidelines contained in the Manual on Uniform Traffic Control Devices (MUTCD) when considering the installation of any new traffic signs and markings. Implementation of measures will also adhere to the American Association of State Highway and Transportation Officials (AASHTO) policy manuals and Town engineering standards.

3.2 Comprehensive Approach

Depending upon the type of problems being addressed and the street configuration within a neighborhood, the traffic calming study may often need to include adjacent streets to the one that is the object of the neighborhood complaint. This must be done to ensure that the solution to the traffic problems on one street isn't simply shifting the problem to an adjacent one.

When reviewing neighborhood traffic issues and developing mitigation plans, a team of Town staff members (Staff Team) led by the Public Works Department will determine where on the street in question the speed and volume data will be collected. The Staff Team will also define the project study area using logical boundaries, such as the roadway system (collectors, arterials, etc.), drainage-ways, or the neighborhood boundaries.

The Staff Team that defines this area will be made up of members from the Fire, Police, Community Relations, Public Works, and Development Services departments. If needed, members of other departments may be asked to join the team. The Staff Team will also identify the streets that are eligible to receive physical street treatments.

The focus of this program is to address concerns that residents have about the cut through volume and speed of traffic on their streets. It is not intended to address access, noise, congestion or other street related issues. The program is also not meant to be used for intersection issues or safety problems. All of these types of concerns and problems will be addressed through the Town's normal operational efforts and its capital improvement program.

3.3 Emergency Response

It is important that any physical device or treatment installed as part of a traffic calming project not interfere with emergency vehicle access or unreasonably reduce response times. To achieve this goal, example devices in the "traffic calming toolbox" that negatively impact emergency response times have been identified. The Town of Castle Rock's Fire and Police Departments will be involved in the design of each project and their input will be considered before any plan is finalized or approved. The local emergency responders (Fire and Police Departments) will be invited to each neighborhood meeting when implementation of any physical devices is being considered so that they may explain to the neighborhood their concerns about possible impacts on emergency response times.

3.4 Eligible Streets

Streets are typically grouped into three classifications:

- arterials
- collectors
- residential streets, also referred to as local streets

These classifications relate to the volume and nature of traffic using the streets and to the function that they have been designed to provide. For example, residential streets serve neighborhoods and have the lowest posted speed limits and the highest number of driveways.

Collector streets are generally used to "collect" traffic from residential streets and take it to nearby arterials. Collectors are also used within commercial areas. Collector streets will generally have more lanes, be wider and have a higher posted speed limit than residential streets.

Arterial streets are designed to move large amounts of traffic at higher speeds. They will

generally be at least four lanes wide, have only a limited number of driveways to adjacent properties and have a higher posted speed limit than other types of streets. They often form the boundaries of neighborhoods, but rarely have any house frontage. Arterial and collector roadways are often further categorized as being either a "minor or major" facility.

The emergency responders generally refer to this classification system when they select their emergency response routes. Physical traffic calming devices that may cause delay to emergency vehicles ("delay inducing" devices) such as traffic circles and speed humps will be limited for use on roadways that have been identified as critical emergency response routes must have the input of the Police and Fire Departments. These streets would still be eligible for other traffic calming elements, such as "neck-downs", radar feedback signs, and the educational programs. As a clarification, while the roundabouts that have been installed throughout town are similar to traffic circles, they have been installed to control traffic, just as a traffic signal or stop sign does. They have not been installed to control speeding.

This traffic calming program is intended to address excessive speeding and cut through traffic on local residential streets, and speeding on collector streets within residential areas. For purposes of this program, Appendix C contains maps of the eligible collectors. This map may be administratively updated by the Town Manager, or designee. Arterial streets are not eligible for traffic calming treatments as they serve as critical emergency response and snow removal routes and typically do not have residential frontage. The Staff Team that defines the project area will also identify the streets that are not eligible to receive physical street treatments.

In order to be eligible for the NTCP, the traffic studies conducted by the Town must show that the following "thresholds" are met or exceeded:

- The 85th percentile speed must be 30 miles per hour (mph) or greater, or, in the case of streets with posted speeds higher that 25 mph, the 85th percentile speed must be at least 5 mph over the posted speed limit . And a local residential street must have a traffic volume greater than 500 vehicles per day (vpd), or, at least 20% of the traffic on the street must be determined to be "cut through traffic" by the Staff Team.

- A collector street within a residential area should have a traffic volume greater than 1,500 vpd.

3.5 Keeping Traffic on Appropriate Facilities

The traffic calming program is also intended to discourage traffic from "cutting through" a neighborhood on a residential street rather than using the arterial and collector street system. Collector or arterial roadways are the most desirable facilities for through traffic, but traffic will sometimes use residential streets to bypass congested intersections or to take a shorter route. Traffic calming treatments may be used to discourage traffic that, in the opinion of the Town's Traffic Engineer should be using adjacent arterial and collector streets instead of neighborhood residential streets.

3.6 System of Devices vs. a Single Device

Traffic calming treatments are more effective when they are installed as part of a "system" rather than individually. Spot reductions in speed have been shown to lead to increased speeding at other points on a street.. A traffic calming plan should be designed so as to calm traffic along an entire street, and not simply at the location where the study was taken. Generally physical treatments should be spaced
approximately 400 to 600 feet apart to keep traffic speeds fairly consistent along the length

of the street.

3.7 Landscaping and Aesthetics

Landscaping and other aesthetic treatments are critical components in the effectiveness of certain neighborhood traffic calming tools and in providing neighborhood enhancements.

A number of the devices, such as raised medians, traffic circles, and curb extensions are more effective when landscaping or other elements have been installed so as to change the appearance of the street and break up a driver's "view". By having these vertical, aesthetic treatments, the devices are more effective in changing drivers' perceptions and their behavior. Landscaping and other treatments will be included in designs whenever possible.

Landscaping materials used in the designs must comply with the current Town policies regarding water demands. Maintenance of landscaping will be performed by the either the property owner adjacent to the traffic calming devices, the neighborhood homeowners association (HOA) or by a civic association (CA), under a maintenance and licensing agreement with the Town. If an agreement cannot be reached, only non-irrigated vertical features will be installed. The Town will not be responsible for watering the landscaping elements installed as part of the project.

3.8 Permanent vs. Temporary Installations

Temporary installations are generally not as attractive or effective as permanent installations, making it difficult to test their effectiveness or public acceptance; therefore temporary installations will not be permitted. However, the temporary installation of radar speed feedback signs will be permitted during phase 1 of the program.

3.9 Drainage Considerations

When designing a traffic calming feature, it is important that storm drainage within the area be carefully considered and accommodated. Physical treatments must not impede storm drainage within the street or create drainage problems for adjacent property owners. In some cases, the potential for drainage problems or changes in drainage patterns may limit or restrict the use of certain physical treatments.

3.10 Neighborhood Involvement

As stated in Sec. 2.0, "Program Mission Statement and Objectives", the NTCP is a neighborhood "driven" process that allows residents living along the street and in the study area to help identify and solve issues along their street(s). One of the most critical issues when developing an effective traffic calming plan is the involvement of residents in the Study Area. Residents of the area must be able to provide input on the extent of the traffic problem and to help in identifying appropriate solutions. Each neighborhood will have its own set of concerns, with some being more apparent than others. It becomes much clearer as to how complex many traffic issues are when neighbors meet and share their various perspectives and experiences.

The Town's staff will facilitate a series of meetings that will allow residents to participate in the creation of the traffic calming plan for their neighborhood. The person bringing the issue to the Town will be the "point of contact" (POC) responsible for circulating a petition; this is the initial step that must be taken before the process is started. The POC will also assist Town staff in organizing meetings and notifying the affected homeowners.

3.11 Minimum Threshold Determination

Documented traffic conditions, that either meet, or exceed, defined minimum traffic volume and speed thresholds, must be present in order for a street to be eligible for the traffic calming program. Studies will be conducted by Town staff to measure vehicle speeds and daily traffic volumes to determine if a traffic calming project may be initiated.

The minimum thresholds within this program are not intended to imply the number of vehicles (volume) that a street can handle (capacity). It is not the intention of this program to reduce the volume of traffic on a particular street to the thresholds established.

3.12 Approval of a Neighborhood Traffic Calming Plan

The traffic calming plan, developed to address the traffic issues on local residential streets, or for other local residential streets within the Study Area, must be approved by at least 50% of the property owners along the streets where the traffic calming features will be installed. If the plan is not approved then the project will be closed, and become eligible for the program in one year.

For eligible collector roadways, Town Council must approve the plan.

3.13 Commitment of Funding

Although no commitment can be made, the Town of Castle Rock may include funding in each year's budget for the implementation of traffic calming projects. Traffic calming studies will be initiated once an approved neighborhood petition has been received, and while the projects may move on to the design stage, the commitment of funding for the construction of any physical treatments will be based upon the order in which final designs have been approved by the homeowners along the street(s) where the traffic calming measures will be installed. Projects that have been designed and approved, but for which funding is not available, will have the highest priority for any future Town funding.

3.14 Use of Private Funding

If a residential street does not meet minimum thresholds, private funding for a developed plan is permitted.

The following conditions must be met in order for a privately funded project to be implemented:

- All plan development and approval procedures by the Town and the neighborhood must be adhered to
- The Town and the funding entity will enter into a contract that will specify all of the conditions and responsibilities of each party for completion of the project. The contract will also specify the responsibilities and funding for any necessary maintenance activities.
- All agreements must be approved by Town Council.
- It will be the responsibility of the neighborhood to raise the funds needed to complete the project.
- The neighborhood must design and construct the project, Town staff will work with the group on the design, review, permitting and construction process that must be followed.

3.15 Device Removal

This section refers only to the removal of traffic calming devices that have been installed through this program and cannot be used to remove traffic calming devices that were installed as part of a new development.

If after a minimum period of one (1) year, the property owners along the street(s) where the traffic calming devices were installed desire that the traffic calming devices be removed, the Town will require that a vote be taken. The area that will be included in the voting process will be the same as that participating in the initial vote approving the installation of the devices.

More than 50% of the properties returning a ballot must vote in favor of the removal. As with the vote to install the devices, the ballots must be signed by property owners. If the vote passes, devices will be scheduled for removal when funding is available. If devices were paid for with private funds, and constructed under this program, then private funding shall be raised to remove these devices.

All of the traffic calming devices that were installed as part of the project must be removed. Devices, installed as part of a system, will not be removed individually. If after at least one year following completion of the removal, the property owners along the street(s) where the traffic calming devices were installed should then decide if they want the Town to re-install the devices, and studies show the minimum thresholds for installation are still met, the entire cost of the design and installation will be paid by the property owners along the street where the devices had been removed per the conditions outlined in Sec. 3.14.

The Town will always have the authority to revise, remove or maintain a traffic calming device if it believes such actions are needed in the interest of public safety.

3.16 Device Modification

If an individual, neighborhood group, or homeowner association (point of contact) want to modify the existing traffic calming plan then the point of contact needs to reach out to the homeowners who previously voted on the plan, or live on the street with the traffic calming measures to determine if other homeowners share the same concerns. This will be accomplished through a petition. More than 50% of homeowners who live on the street with the traffic calming measures will need to sign the petition seeking a modification to the traffic calming plan. Town staff will provide the petition.

Upon receipt of the petition staff will verify names on the petition and then work with the point of contact and homeowners in the study area to facilitate new meetings to discuss possible modifications of the plan.

A new working group will be selected from homeowners in the study area. A preferred plan will be created and voted upon by the homeowners that live along the street where the modifications are proposed to be made. More than 50% of the homeowners on the street where the traffic calming is to be installed/modified must return the ballot and vote to approve the plan. If less than 50% of the homeowners vote in favor of the plan then the current plan will remain.

Staff will develop costs of modifications and budget based on availability of program funds if modifications are approved. If devices were paid for with private funds, and constructed under this program, then private funding shall be raised to remove these devices.

3.17 Toolbox of Physical Features that May be Used

A “toolbox” of devices that may be used for neighborhood traffic calming projects in the Town of Castle Rock is included as Appendix B of this guide. The toolbox includes a variety of treatments that, depending upon the specific traffic issues (speeding, or cut-through traffic) needing to be addressed, may be considered. Since some of the devices are intended to address very specific types of traffic conditions they may not all be suitable for every project. The toolbox contains a brief discussion of the pros and cons for each device, their possible impacts to emergency response and their estimated costs. Additional traffic calming techniques not included in the “toolbox” may also be added by the Staff Team as part of the plan.

3.18 Physical Features that may Not be Used

Some devices have been intentionally excluded from the Toolbox and shall not be considered for use within the Town of Castle Rock. The devices, as well as reasoning for their exclusion, are as follows:

Speed “Dips”
Speed “dips” are basically drainage cross pans that are being installed for speed control instead of for drainage purposes. “Dips” can cause undue delays and damage to fire department equipment. They can actually lead to new speeding issues since many newer automobiles are more comfortable when crossing the “dips” at higher speeds.

Speed “Bumps”
A speed “bump” is a parking-lot style treatment designed for very slow traffic speeds. Speed bumps are very damaging to fire equipment and don’t allow for streets to be plowed following snow falls. They can also be very dangerous to bicyclists. A speed bump shouldn’t be confused with a “speed hump”, which has been approved for use on town streets. A “speed hump” has a much wider base and doesn’t pose any of the safety issues that a “bump” does.

Rumble Strips
Rumble strips are not suitable for residential use due to the noise that they produce.

Stop Signs
Stop signs are traffic control devices, not speed control devices. They are used to assign “right-of-way” at an intersection according to the requirements of the Manual of Uniform Traffic Control Devices, the Federal manual that regulates signing, signalization and markings on a public street. Studies have shown that when stop signs have been installed to control speeds, there is an increase in number of intentional violations at the intersections, creating a very dangerous condition. Drivers tend to know when a stop sign has been installed for speed control, and they become frustrated by the unnecessary stop. They may even speed up when pulling away from the intersection to “make up for lost time”. This behavior is just the opposite of that desired. Improper use of stop signs can create pedestrian safety issues, increased vehicular accidents, increased speeds between intersections, increased noise and air pollution, and can breed disrespect for all traffic control devices. Additionally, unwarranted stop signs create an enforcement problem and penalize all motorists, even the ones who travel within the posted speed limit.

4.0 ESTABLISHING A NEIGHBORHOOD TRAFFIC CONTROL PROGRAM

This section explains how a traffic calming project may be requested and the steps that should be followed in its implementation. Generally the process is divided into 3 steps:

- Project initiation, studies, and public outreach
- The implementation of a neighborhood education program, increased police enforcement, and other passive treatments
- The design and construction of physical treatments

These steps will include a number of tasks that will need to be completed and are more fully described as follows:

4.1 Project Initiation and Studies

This section describes how a project is approved for study and the speed and volume thresholds must be met in order for traffic calming techniques to be warranted.

4.1.1 Project Initiation

Traffic calming projects may be requested by individuals, neighborhood groups, homeowners associations, or anyone who feels that a problem exists on a residential, or eligible collector street. When a request has been made of the Town to reduce speeding and cut through traffic on a street, staff will begin the process of determining the conditions that exist and the degree of concern that exists among residents along the street.

The first step that staff will take is to discuss the traffic situation and concerns with the person(s) making the request in order to better understand their concerns and the reasons they feel that a problem exists. This person will be the neighborhood "point of contact" (POC) during the process and help Town staff organize meetings and distribute information. At the request of the original POC another resident may be asked to be the POC later in the process. The POC's role is simply to help Town staff in the process. A packet of informational material concerning the Town's traffic calming program will be given to the person. This packet will include a guide to the NTCP, some brochures about the program that can be given to other residents of the neighborhood, and a petition form.

Undertaking a traffic calming project requires a significant expenditure of staff time and, in some cases, town funds. The Town wants to know that at least five (5) other homeowners along the street of concern believe that a traffic problem exists before traffic speed and volume studies are scheduled. In the case of an eligible collector street, a minimum of 20 homeowners, or 25% of the influence area, whichever is lower must concur that a traffic problem exists. Town staff will define the influence area for eligible collector streets. A petition will be given to the POC, and it must be returned to the Town with the signatures of at least 5 other homeowners (one signature per property) living along the street in addition to that of the POC. For eligible collectors the petition must have a minimum of 20 homeowner signatures, or 25% of homeowners residing within the influence area, whichever is lower. When giving the POC the blank petition, staff will discuss with the POC the boundary in which the petition is to be circulated.

While circulating the petition, we encourage residents to discuss their observations and concerns with each other to see if there is a desire to undertake a project. As can be seen from this guide, a significant amount of time may be required of the neighborhood during the process.

The POC shall notify the president of the homeowner's association, or the association's management company of their intention to circulate the petition and explain the issues that the POC is hoping to resolve. The POC will be asked to verify on the petition that this has been done. This step is not required if no HOA exists.

Once a petition has been submitted to the Town, staff will discuss with the POC the next steps that will be taken in evaluating the request.

4.1.2 Data Collection.

Once a petition has been received and approved, the Town's Traffic Engineering Division will collect traffic volume and speed data to determine the conditions that presently exist on the street. The study data will be collected on weekdays so as to determine the normal traffic loads. If a school is located within the area, and the Staff Team believes that it would have an impact on the traffic conditions present on the street, the study will be conducted when the school is in session. If a commercial center, a recreation center, park or other significant traffic generator creates an impact within the study area, traffic counts on Saturday and Sunday may be conducted as well. Staff will attempt to schedule the study during a time when there are no special events being planned along the street.

4.1.3 Minimum Threshold Determination.

In order to qualify for the implementation of the NTCP, the traffic conditions on the street must meet both of the following minimum "thresholds":

1) The street must have an 85th percentile speed (see the definition in Appendix A) of 30 miles per hour or greater, or at least 5 miles per hour above the posted speed limit if the limit is higher than 25 miles per hour. Most residential streets within the Town limits are posted at 25 miles per hour, and

2) The street must have a traffic volume of at least 500 vehicles per day, or at least 20% of the traffic on the street must be found to be "cut through", as determined by Town staff.

For eligible collector streets, the traffic volume should be greater than 1,500 vpd. If eligible collectors do not meet the minimum thresholds, Town Council will still consider the project and be provided with the collected data to assist with making their decision.

For neighborhoods that are not "built out", the Staff Team will consider the specific traffic issues and concerns relative to the rate of development to determine if a project should be immediately pursued or if it should be delayed until the neighborhood is closer to completion.

4.1.4 Determination of the Study Area

If after evaluating the data, Town staff determines that the street is eligible for the traffic calming program, the Staff Team will meet to determine if other streets need to be included within the Study Area. The Staff Team will also determine the study area limits so that residents within the area can be notified of meetings and given an opportunity to participate.

4.1.5 Presentation of the Results to the POC and Identification of the Next Steps

Town staff will meet with the POC to discuss the information that was collected and if it has met the minimum thresholds. If the residential street qualifies for the program, the POC will be asked to help organize a meeting of residents within the Study Area.

If the thresholds are not met for a residential street, the Town will not proceed with the traffic calming project, but Staff will notify the POC and work with the POC and other residents from the Study Area on other possible approaches, such as driver awareness and educational programs. The street may be "re-studied" after one year to determine if the thresholds are then met. If thresholds are not met for an eligible collector street, these will be reported to Town Council to assist with their decision.

If the POC so chooses, an appeal of staff's decision may be made by submitting a written request. This request must be signed by at least 5 of the people who signed the initial petition submitted by the POC. The request must be submitted to the Director of Public Works for an evaluation. Public Works will then present the request to the Public Works Commission for its review and recommendation. This meeting is open to the public and a time will be offered to anyone wanting to speak. Staff will then present the appeal to the Town Council. At this meeting the recommendations of staff and the Commission will be presented. As at the Commission meeting, time is available for the public to present their information and observations.

If Town Council denies the appeal, the process will stop and the street(s) will be eligible for reevaluation after one year. If Council approves the appeal, the project will move forward.

4.1.6 Meeting with the Study Area to Discuss Traffic Study

For residential streets Town staff will meet with POC and residents from the Study Area, if the minimum threshold criterion is met, to discuss the results of the traffic study. At the meeting staff will also discuss what actions may be taken during the Program, and how the process will proceed. The first steps taken to reduce the traffic impacts on the street will focus on Education, Enforcement and Passive Treatments, as described in Sec. 4.2, below.

4.2 Phase 1 – Driver Education, Police Enforcement and Passive Treatments

For residential streets the first action that will be taken is to first initiate driver awareness and educational programs; to work with the police on targeted speed enforcement; and to identify possible changes in street signing and markings (passive treatments). This will be done to see if reductions in vehicle speeds and cut through traffic can be achieved before moving on to the more expensive, physical treatments. These actions will be decided upon by the residents of the Study Area, in cooperation with the Staff Team and may occur either separately or concurrently.

4.2.1 Educational Efforts

Town staff will provide educational, and driver awareness tools to help reduce traffic speeds and volumes. These tools may include:

- Yard signs

- "Traffic treaties" – A petition championed by the POC or assistants who gather pledges from neighborhood residents to drive the speed limit.
- "Traffic" awareness campaign

4.2.2 Passive Treatments Installed

Depending upon the nature of the traffic issues staff may decide to implement passive treatments either on the street, at intersections where the street being studied connects to another, or both. These treatments may include the following:

- Regulatory signage, such as turn restrictions and other operational changes
- Pavement markings (parking lanes, bicycle lanes, or visual narrowing)
- Changes in parking restrictions

4.2.3 Targeted Police Enforcement and Advisory Signing

At the discretion of Town's Police Department, "targeted" police enforcement may be used to control speeding problems. It should be noted that targeted enforcement may be initiated at any time during this process as part of the Department's enforcement procedures.

The Town may also install temporary radar speed feedback signs that provide feedback to the driver about their speeds.

4.2.4 Re-evaluation

Within four months following the initiation of the efforts described above, Town staff will re-evaluate the neighborhood traffic conditions to determine if the traffic problems still exist. Additional data will be collected to see if speeds and traffic volumes have changed and if the thresholds are still met. If the thresholds are still met, the project is eligible to proceed on to implementation of physical treatments.

If the speed and traffic volume thresholds are no longer met, the project will be considered complete and no additional actions will be taken.

The Staff Team will also meet with the POC and residents from the Study Area to present the results of the re-evaluation. If the street is eligible for the NTCP, the residents will be asked if they want to proceed with the development of a traffic calming plan. If they do, the Staff Team will begin the steps outlined in Sec. 4.3 for Phase 2 - Project Development and Implementation.

4.3 Phase 2 - Project Implementation

Eligible Collector Streets

If the minimum support for an eligible collector street is received, Town staff will develop a conceptual plan. Upon completion of this plan development, Town staff will conduct public outreach to receive feedback on this concept. Town staff will utilize judgement to identify the feedback area, and method for determining input. Upon receiving public feedback on the plan, Town staff will schedule the concept to be reviewed and acted on by Town Council.

Residential Streets

If the thresholds are still met after the follow-up study, and the neighborhood chooses to proceed, staff will begin to work with them on the development of a traffic calming plan.

4.3.1 Determination of Project Limits, Possible Restrictions, and Conceptual Plan

Town staff will establish the boundaries of the project area in order to identify the streets that will need some type of traffic calming features. This area may be a single street or may involve a wider area, as discussed in Sec. 3.2. During this meeting, the street classification(s) and the emergency response corridors within the area will be identified. Staff members from the Police Department, the Fire Department, Public Works, Community Relations, and Development Services will be asked to attend this meeting.

Once the project limits have been established, staff will prepare a conceptual plan showing the minimum number and approximate locations of the traffic calming devices that will be needed. This will be done to prevent a problem on one street from simply being shifted to another. This information will provide the basis of the plan that will be developed by the neighborhood working group.

Conditions that exist within the area that may restrict the use of some of the devices in the "toolbox" will also be identified and discussed.

4.3.2 Facilitated Neighborhood Meetings and Plan Development

Staff Team will develop a public outreach plan to facilitate neighborhood meetings with residents and other stakeholders on
the development of a traffic calming plan. It is important that everyone have an opportunity to express their different perspectives of the traffic issues in the study area. .

Public meetings will be held to allow residents an opportunity to share their experiences and to learn about the issues facing their neighbors. Each of the properties within the Study Area will receive either an email, or mailing, about the project meetings. If the Study Area is included within an HOA, the president of the HOA will be notified of any meetings and invited to attend. The schedule for all public meetings will also be posted on the Town's website and on the street of concern to notify all Town residents and people driving on the street(s).

Although a street may seem to be the "property" of the residents living along it, the street is actually "public property" and available for use by everyone. Because of this, people who must use this street, but don't actually live along it, will be notified about the meeting via the Town's website or signs posted along the street(s) of concern. These additional "stakeholders" may include representatives of nearby schools, users of area park and recreation facilities, public organizations, or simply residents living along adjacent streets. The boundary of the study area that could possibly be impacted by the traffic calming plan will be used to determine who is invited to the meetings. Of course, the meetings will be open to anyone, invited or not.

If at all possible the meetings should be held within the study area to make it easier for anyone interested to participate. Town staff will work with the POC to find a suitable location and time for the meeting. Town staff will attend and help facilitate the public meetings.

4.3.3 Development and Approval of a Traffic Calming Plan

The steps for development and approval of the plan will generally be as follows:

Step #1 –Meeting to identify the traffic problems and possible actions

Once the Staff Team has completed their conceptual design, the POC will be contacted to help assist the Town in arranging a meeting of residents within the Study Area. Prior to the meeting Town staff will distribute information to all of the properties within the Study Area, which will include details of the issues being discussed, a map showing the limits of the Study Area, and the results of the traffic study. A copy of the NTCP policy will also be included along with an agenda of items to be discussed at the meeting. This information will be sent to the HOA, and posted on the Town's website announcing the meeting the project.

The first meeting will be held to solicit input from residents and other stakeholders in the study area regarding their observations and concerns with existing traffic patterns on the street(s).

A presentation on the various traffic calming measures contained in the "toolbox" will be made in order to explain the "pros and cons" of each, how they may be used and what changes each are designed to produce. Staff will show the project limits and explain how they were developed.

Town staff will present their conceptual plan with the understanding that it has not been finalized and that it won't be without the input and approval of the residents within the Study Area. The plan showing the Staff's recommendation of approximate number and locations of the devices will be presented, along with an explanation of how the base plan was developed. It is also important to be aware of the Town's budget limitations and how and when their project could be implemented. Town staff will also discuss any other traffic calming projects presently underway and how this could affect implementation of the neighborhood's project.

At this meeting, the attendees will be asked to select a "working group". This group will meet and prepare a traffic calming plan for the Study Area's consideration. The Town feels that this group should be made up of residents from the street of concern and the broader Study Area who:

- Have different opinions about the need for traffic calming
- May have knowledge about traffic calming devices/treatments
- Live in different parts of the Study Area on streets where traffic calming devices may be installed
- Live within the Study Area on streets where no devices are being installed

Town staff will also attend and help facilitate these meetings.

Step #2 – Meeting to refine the preferred traffic calming plan

Once the Working Group has been selected, it will meet to prepare a draft traffic calming plan. This meeting may occur during the meeting discussed in Step #1, or later, depending upon the decision of the group. The working group will present their proposed traffic calming plan and solicit input from those attending the meeting(s). Proposed modifications to the plan will be discussed and the measures to be included in the final plan will be identified and approved by those present. While the plan may differ from the Town's conceptual plan, it should be developed using the traffic calming treatments included in the Toolbox shown in Appendix B and within the parameters for device spacing and emergency response requirements incorporated in the Town's conceptual plan. Treatments not listed in the Toolbox may be considered if approved by the Staff Team.

Once the draft plan has been prepared it will be distributed to residents within the Study Area and also posted on the Town's website for the general public.

Step #3 – Neighborhood approval

A ballot will be mailed to each property fronting the street where the devices will be installed. The ballot will ask if the proposed plan should be implemented.

More than 50% of the returned ballots must vote to approve the plan before it can be scheduled for implementation. Ballots must be signed by property owners and may not be completed by renters. There will be a 30 day voting period before the ballots are counted.

Should the ballot measure fail to get more than 50% the project will come to an end without any traffic calming measures being installed. The street will then become eligible for the program again one year from the end of the 30-day voting period.

Step #4 – Study Area notification of the voting results and the "next steps" in the program

Once the ballots have been counted, the Study Area will be notified of the results and the next steps that will be taken. The HOA will also be notified of the results and requested to distribute the information to the remainder of the study area.

4.3.4 Final Design and Implementation.

Once the preferred plan has been approved for implementation, final engineering plans, specifications, and cost estimates will be prepared by Town Staff. If sufficient funding exists in the Town's budget, construction will then be scheduled. The Study Area will be kept informed as to the estimated schedule for completion of the project.

4.3.5 Order of Project Implementation

Although several traffic calming requests may be in the design and approval process at any one time, the commitment of any Town funding for the implementation of any project will not be made until the plan has been approved. Town funding for these projects will be limited to the amount included in the Town's approved budget. It may be possible that only one project per year can be constructed. Any project that has gone through the process and received the required approvals, after the Town has already obligated its available funding, will be given priority for any future Town funding that is made available for the Traffic Calming program. A project may remain on the "waiting for funding list" for a maximum of 3 years before having to be re-evaluated.

Should there not be sufficient Town funding available, the residents will have the option of funding the installation themselves.

4.3.6 Follow-up Study.

In order to gauge the effectiveness of the program, Town staff will conduct a "follow-up" study to determine what traffic changes have occurred since the traffic calming features were installed. The study will not only gather data from the street that was the subject of the program, but other adjacent streets as well to see if any shifts in traffic patterns has occurred. This data will be useful in grading the effectiveness of the project, as well as identifying how best to plan and implement future projects.

The data will be collected within 6-12 months following the completion of the project. If the data shows that the measures have not reduced the 85th percentile speed and/.or cut through traffic volumes to a level below the Program's thresholds, the Town will notify the residents of the Study Area to see if a majority of them want to pursue other measures.

Appendix A: Glossary of Terms

85th Percentile Speed
The 85th percentile speed is the speed at or below which 85 percent of the motorists drive on a given road. This speed indicates the speed that most motorists on the road consider safe and reasonable under ideal conditions. It is often used by traffic engineers as a guideline for the setting speed limit on a roadway.

Arterial Street
Arterial streets are major roadways designed to carry high volumes of traffic at higher speeds. They not only move traffic between the different areas and neighborhoods of Castle Rock, but also connect to the major roadways leading into and out of town. Examples of arterial streets within Castle Rock include Wolfensberger Rd., Meadows Pkwy., Founders Pkwy., and Ridge Rd.

Collector Street
Collector streets are designed to provide a balance between traffic movement and land access within residential, commercial, and industrial areas. Collector streets often do not provide direct residential frontage but do often provide access to schools and parks. Collectors typically link arterial streets with neighborhood (local) streets and fall between the two in the roadway classification hierarchy. They will generally have higher traffic volumes and speeds than local streets but less than arterials. Examples of collector streets are Scott Blvd, Mikelson Blvd, Enderud Blvd. and Gilbert St.

Cut-Through Traffic
Cut-through traffic is defined as traffic using neighborhood streets that has no "origin or destination" on the residential street(s) or in the neighborhood, and is not required to use the street. For example, travel through a neighborhood in order to avoid a congested arterial or intersection. These trips generally are simply passing through the neighborhood and do not have either an origin or a destination within a neighborhood.

Daily Traffic
This is the number of vehicles passing a certain point on a roadway during a 24-hour period. These counts are two-directional and usually obtained from a mechanical traffic counter placed on the roadway for a continuous 48 hour period. The counting period will be conducted between Tuesday and Thursday and may include weekends if the Study Area is near a park, recreation area, or other weekend traffic generator.

Emergency Response Route
Emergency responders, such as Fire, Police, and ambulance, must be able to respond to calls throughout the community. Emergency response routes are those commonly used routes that allow responders to reach residents and businesses in a safe and efficient manner.

Physical Devices
Physical devices refer to traffic calming devices placed within the street. Examples of these are raised medians, traffic circles, curb extensions, speed cushions and speed humps. Nonphysical devices would include such things as signage, roadway striping, etc. that may guide, but not restrict, traffic movement.

Point of Contact (POC)
This refers to the person who made the initial request to the Town that traffic speeds and/or cut through traffic on a residential street are a concern. This person will be asked to circulate a petition along the street in question to determine if other residents have the same concern. The POC will also be asked to assist Town staff in setting up neighborhood meetings and in distributing information. The POC may be changed during the course of the study. The POC has the same rights and influence as other residents within the Study Area.

Residential Streets
Residential streets carry traffic within a neighborhood and provide access to residences along the street. These streets generally are designed for lower volumes and lower speeds. They will usually have on-street parking and direct driveway access.

Study Area
The study area will be defined by the Staff Team for each traffic calming project. It will include the street of concern, but may also include other streets that may be impacted by the installation of traffic calming features, such as traffic diversion that may occur when traffic calming features are installed on another street. It may also include residents that live on other streets but have to use the street(s) that are a concern.

Traffic Treaties
A petition championed by the POC, or assistants who gather pledges from neighborhood residents that pledge to drive the speed limit.

Appendix B: Traffic Mitigation Toolbox

Traffic Calming Toolbox

Toolbox Overview

EDUCATION, ENFORCEMENT, & LOW-COST TOOLS:

- *Neighborhood Education Programs*
- *Speed Limit Signing*
- *Striping / Visual Narrowing*
- *Speed Monitoring Display*
- *Traditional Police Enforcement*

ENGINEERING (PHYSICAL) TOOLS:

- *Entry Islands*
- *Speed Cushions*
- *Raised Pedestrian Crossing*
- *Curb Extensions*
- *Partial Medians*
- *Traffic Circles*

Traffic Calming Toolbox Overview

Traffic Mitigation Tool	Relative Effectiveness		Associated Impacts						
	Speed Reduction	Cut-Through Reduction	Emergency Response	Enforcement Needs	Loss of On-Street Parking	Restricts Access	Maintenance	Noise	Relative Cost
Education, Enforcement, and Low-Cost Tools									
Neighborhood Education Programs	Minimal	Minimal	No change	None	None	None	None	No change	Low (varies)
Speed Limit Signing	Minimal	No	No change	Requires Enforcement	None	None	Minimal	No change	Low ($200 and up)
Striping / Visual Narrowing	Minimal	No	No change	None	Possible	None	Yes	No change	Low-Med ($1K-$5K)
Speed Monitoring Display	Yes	No	No change	None	None	None	Minimal	No change	Med ($2500)
Traditional Police Enforcement	Yes	Minimal	No change	Requires Enforcement	None	None	None	No change	High
Engineering (Physical) Tools									
Entry Islands	Yes	Minimal to Moderate	No change	None (Self-Enforcing)	Possible	None	Yes	No change	Med ($10K-$20K)
Speed Cushion	Yes	Moderate (w/system of devices)	Minimal	None (Self-Enforcing)	Possible	None	Yes	Increases noise	Low-Med ($1K-$5K)
Raised Pedestrian Crossing	Yes	Moderate (w/system of devices)	Increases time	None (Self-Enforcing)	Yes	None	Yes	Increases noise	Med ($10K-$40K)
Curb Extensions	Yes	Minimal (w/system of devices)	No change	None (Self-Enforcing)	Possible	None	Yes	No change	Med ($25K-$40K)
Partial Medians	Yes	Minimal (w/system of devices)	Minimal	None (Self-Enforcing)	Yes	Dependent Upon Application	Yes	No change	Med ($25K-$40K)
Traffic Circles	Yes	Moderate (w/system of devices)	Increases time	None (Self-Enforcing)	None	None	Yes	No change	Med-High ($25K-$60K)

NEIGHBORHOOD EDUCATION PROGRAMS

DESCRIPTION:

PROGRAMS DESIGNED TO INCREASE DRIVER AWARENESS OF NEIGHBORHOOD TRAFFIC SAFETY ISSUES

APPLICATION:

Neighborhoods where speeding or other traffic safety concerns have been identified. Programs may include educational signing and stickers, speed pledges, and other means of increasing driver awareness and commitment to safety when driving in neighborhoods.

Effectiveness:

• Educational programs have been shown to produce some reduction in traffic speeds among residents of the targeted neighborhood. Results vary widely based on the type of program and neighborhood.

Other Advantages:

• Can be implemented often much sooner than physical treatments
• Relatively low cost
• Can often affect a much larger area (entire neighborhood) than a targeted, physical treatment

Delay to Emergency Vehicles:

• None

Other Disadvantages:

• Results may be minimal and may decrease after initial use
• Not self enforcing
• If signs are used, increased visual pollution from signs in the neighborhood

Special Considerations:

• None

Cost:

• Dependent upon programs used

SPEED LIMIT SIGNING

DESCRIPTION:

SIGNS THAT DEFINE THE LEGAL DRIVING SPEED UNDER NORMAL CONDITIONS. SPEED LIMITS ARE SET BASED ON ENGINEERING STUDY AND DETERMINATION OF APPROPRIATE SPEED FOR A GIVEN ROADWAY.

APPLICATION:

Streets where additional notification of the speed limit may assist with awareness.

Effectiveness:

• Motorists will generally drive at the speed at which they feel comfortable given the existing roadway conditions, regardless of posted speed

Other Advantages:

• Provides clear definition of legal speed limit
• Provides context for enforcement efforts
• Provides goal for traffic calming efforts

Delay to Emergency Vehicles:

• None

Other Disadvantages:

• Typically not effective in and of themselves
• Not self enforcing
• Requires on-going police enforcement
• Unrealistically low speed limits are difficult to enforce and tend to be disregarded
• More visual pollution from signs in the neighborhood

Special Considerations:

• Speed limits set by an engineering analysis tend to be higher than limits set by political pressures

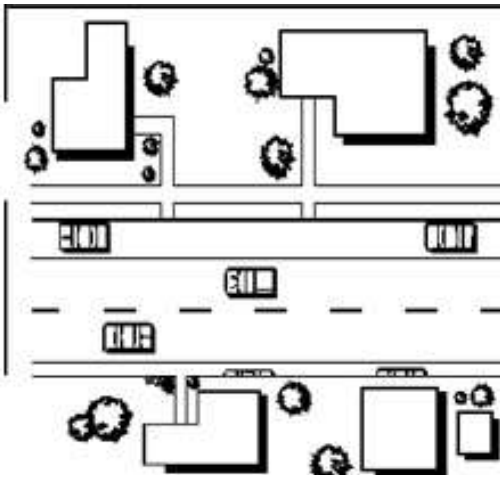
Cost:

• $200 per installation
• Additional cost may be required for study to determine what posted speed should be

STRIPING / VISUAL NARROWING

DESCRIPTION:

UNIQUE STRIPING ADDED TO STREETS TO VISUALLY NARROW THE LANE.



APPLICATION:

- ***Wide streets where physical narrowing is either not feasible or cost-prohibitive***
- ***Can be used in conjunction with on-street bicycle lanes and/or parking lane designation***

Effectiveness:

- Can result in minor reductions to vehicular speed.

Other Advantages:

- Can be used to alert drivers to pedestrians and bicycles
- Does not require removal of on-street parking
- Can be used with other devices
- Easy to install

Delay to Emergency Vehicles:

- None

Other Disadvantages:

- Generally not as effective in reducing speeds as physical narrowing
- May require frequent maintenance/re-striping if lines are ignored by drivers

Variations:

- On-street bicycle lanes
- Parking lane designation

Special Considerations:

- None

Cost:

- $1,000-$5,000 depending upon striping configuration and length of roadway segment

EDUCATION, ENFORCEMENT, & LOW-COST TOOLS

SPEED MONITORING DISPLAY

DESCRIPTION:

PERMANENTLY MOUNTED RADAR DISPLAY THAT INFORMS DRIVERS OF THEIR SPEED COMPARED TO THE SPEED LIMIT.

APPLICATION:

Any street where speeding is a problem

Effectiveness:

- May cause responsible drivers to slow down in the vicinity
- May cause unfamiliar drivers to slow down in the vicinity

Other Advantages:

- Educational tool
- Some drivers may assume it is linked to photo radar

Delay to Emergency Vehicles:

- None

Other Disadvantages:

- Not self enforcing
- Ongoing maintenance needed
- May loose effectiveness on familiar motorists
- Display may detract from neighborhood character

Special Considerations:

- Vandalism may be an issue

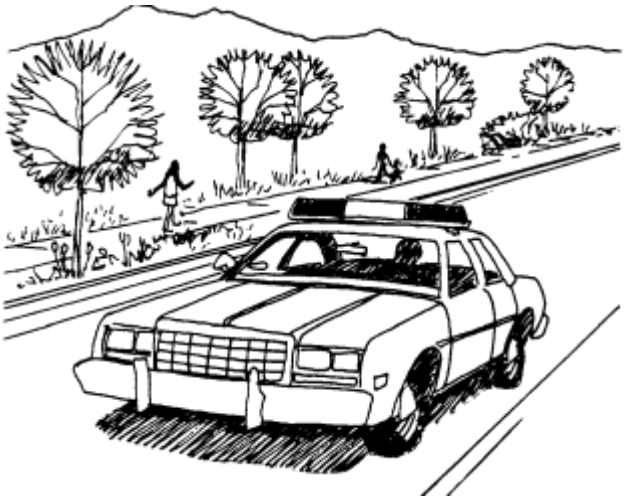
Cost:

- $2,500 per installation

TRADITIONAL SPEED ENFORCEMENT

DESCRIPTION:

POLICE PRESENCE TO MONITOR SPEEDS AND ISSUE CITATIONS.



APPLICATION:

- ***Streets with documented speeding problem and need for quick mitigation***
- ***Locations where restrictions are being violated***

Effectiveness:

- Motorists generally slow down in the areas of active enforcement

Other Advantages:

- Flexible measure that can be implemented in almost any location at short notice

Delay to Emergency Vehicles:

- None

Other Disadvantages:

- Not self enforcing; temporary measure
- Fines do not typically cover cost of enforcement
- Disrupts efficient traffic flow on high volume streets
- Short “memory effect” on motorists when enforcement officers no longer present

Special Considerations:

- Often helpful in school zones
- May be used during “learning period” when new devices or restrictions first implemented

Cost:

- High cost primarily due to the staffing requirements

ENTRY ISLAND

(Also known as: ENTRY MEDIAN or NEIGHBORHOOD IDENTIFICATION ISLAND)

DESCRIPTION:

A RAISED ISLAND IN THE CENTER OF A TWO-WAY STREET ADJACENT TO AN INTERSECTION, TYPICALLY AT THE PERIMETER OF A NEIGHBORHOOD.

APPLICATION:

Placed in a roadway to define the entry to a residential area and/or to narrow each direction of travel and interrupt sight distance along the center of the roadway

Effectiveness:

- Vehicles may slow down as they pass through the narrowed section

Other Advantages:

- Can notify motorists of change in roadway character
- Opportunity for landscaping and/or monumentation for aesthetic improvements
- May discourage cut-through traffic

Delay to Emergency Vehicles:

- 1 to 2 seconds typically

Other Disadvantages:

- Need for maintenance (and irrigation)
- May necessitate removal of on-street parking
- Snow plows must negotiate device

Variations:

- Can incorporate neighborhood identification signing and monumentation

Special Considerations:

- Care should be taken not to restrict pedestrian visibility at adjacent crosswalk

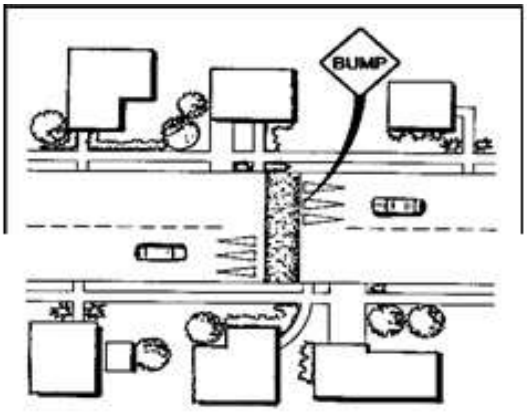
Cost:

- $10,000 to $20,000 depending on landscape type, intensity, irrigation needs, etc.

SPEED HUMP

DESCRIPTION:

SPEED HUMPS ARE AREAS OF PAVEMENT RAISED A MAXIMUM OF 4 INCHES IN HEIGHT OVER A LENGTH OF 12 FEET. THEY WORK BY FORCING MOTORISTS TO SLOW DOWN TO COMFORTABLY PASS OVER THEM. THEY ARE MARKED WITH SIGNS AND PAVEMENT MARKINGS.



APPLICATION:

Local or collector streets where speed control is desired

Effectiveness:

• Demonstrated reduction in average speed of 2-8 mph

Other Advantages:

• Self Enforcing
• Requires minimum maintenance; pavement markings must be maintained

Delay to Emergency Vehicles:

• 3 to 6 seconds per hump

Other Disadvantages:

• May damage emergency response vehicles if not carefully designed
• May increase traffic noise in vicinity of hump
• Snow plows must negotiate device

Special Considerations:

• Should not be used on critical emergency response routes
• Longer designs can minimize impact on long wheelbase vehicles

Cost:

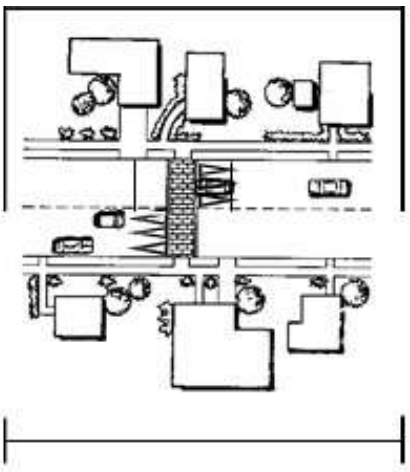
$1,000-$5,000

RAISED PEDESTRIAN CROSSING

(Also known as: RAISED CROSSWALK)

DESCRIPTION:

FLAT-TOPPED SPEED TABLE BUILT AS A PEDESTRIAN CROSSING. COMMONLY INCLUDES A MEDIAN REFUGE ISLAND, OR CURB EXTENSIONS, OR BOTH TO SHORTEN CROSSING AND IMPROVE SAFETY.



APPLICATION:

- ***Local or collector streets where speed control and pedestrian crossing designation are desired***

Effectiveness:

- Demonstrated reduction in average speed of 2-8 mph

Other Advantages:

- Increases pedestrian visibility in the crosswalk
- Clearly designates the crosswalks
- Opportunity for landscaping in median
- Requires minimum maintenance; pavement markings must be maintained

Delay to Emergency Vehicles:

- 4 to 6 seconds per raised crossing

Other Disadvantages:

- May damage emergency response vehicles if not carefully designed
- May increase traffic noise in vicinity of crosswalk
- May create drainage issues where raised crossing extends from curb to curb
- May necessitate the reduction of on-street parking in certain configurations
- Snow plows must negotiate device

Variations:

- Specialty pavement treatments
- With median refuge island
- With curb extensions
- With median island and curb extensions

Special Considerations:

- Appropriate near schools and recreation facilities

Cost:

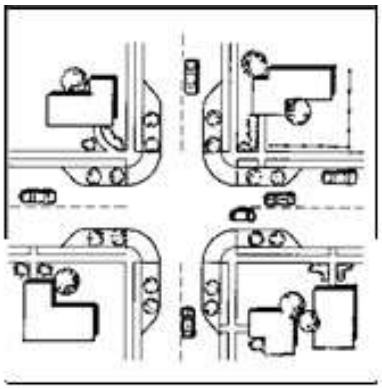
- $10,000 to $40,000 depending on median, curb extensions, pavement type, and irrigation needs

CURB EXTENSION

(Also known as: NECKDOWN)

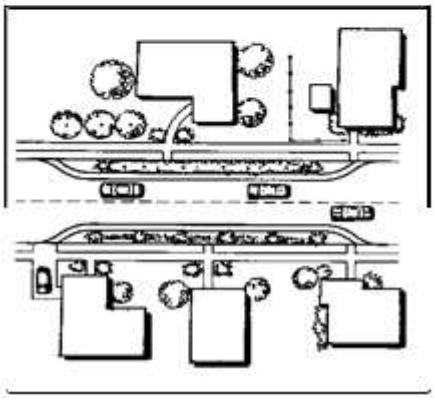
DESCRIPTION:

SEGMENTS OF ROADWAY NARROWING WHERE ROADWAY EDGES OR CURBS ARE EXTENDED TOWARD THE CENTER OF THE ROADWAY. VEHICLES MAY SLOW AS THEY PASS THROUGH THE NARROWED SECTION.



APPLICATION:

- ***Typically used adjacent to intersections where parking is restricted***
- ***Can be used to narrow roadway and shorten pedestrian crossings***
- ***Can be used mid-block***



Effectiveness:

- May slow traffic by changing the character of a wide street to a narrow street

Other Advantages:

- Pedestrian visibility increased and crossing distance reduced
- Can “reclaim” pavement for pedestrian and streetscape amenities or landscaping

Delay to Emergency Vehicles:

- Estimated to be less than 2 seconds

Other Disadvantages:

- Creates drainage issues where curb and gutter exist
- May result in the loss of on-street parking
- Snow plows must negotiate device

Variations:

- Mid-block curb extensions often used in conjunction with pedestrian crossing treatments
- Can be designed with a curb chase to maintain existing flowline

Special Considerations:

- Curb extensions should not extend into bicycle lanes where present

Cost:

- $25,000 and up depending on landscaping, pavement treatments and storm drainage considerations (need for new inlets)

ENGINEERING (PHYSICAL) TOOLS

PARTIAL MEDIANS

DESCRIPTION:

RAISED ISLAND IN THE CENTER OF THE ROADWAY WITH ONE-WAY TRAFFIC ON EACH SIDE.

APPLICATION:

Used on wide streets to narrow each direction of travel and to interrupt sight distances down the center of the roadway

Effectiveness:

- Narrowed travel lanes provide “friction” and can slow vehicle speeds

Other Advantages:

- Changes the character of the roadway to a place where slower speeds are appropriate
- Significant opportunity for landscaping and visual enhancement of the neighborhood
- Can utilize space which otherwise would be “unused” pavement
- Can be used to control traffic access to adjacent properties if desired

Delay to Emergency Vehicles:

- Estimated 1 to 2 seconds or more depending on length of median, narrowness, parking etc.

Other Disadvantages:

- Long medians may impact emergency access potential and reduce staging area
- May interrupt driveway access and result in U-turns
- May necessitate removal of on-street parking
- Snow plows must negotiate device

Variations:

- Medians of various lengths can be constructed
- Can be constructed mid-block only to allow all turning movements at intersection
- Can be extended through intersections to preclude left turning access, or side street through movement if desired

Special Considerations:

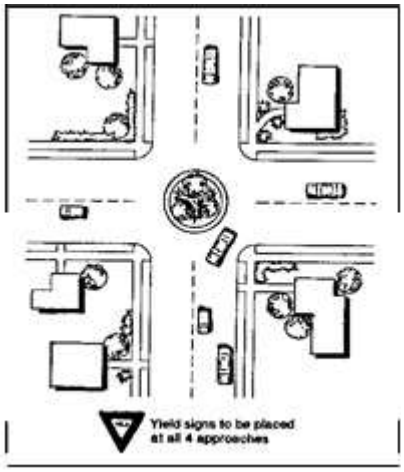
- Vegetation should be carefully designed not to obscure visibility between motorists, bicyclists and pedestrians at intersection and pedestrian crossing areas
- Maintain 18 foot wide space on each side where parking exists, or 11’ wide space without parking

Cost:

- $25,000 for short (30’ +/-) landscaped median
- Cost increases with length, landscaping, etc.

DESCRIPTION:

TRAFFIC CIRCLES ARE RAISED CIRCULAR MEDIANS IN AN INTERSECTION WITH COUNTERCLOCKWISE TRAFFIC FLOW. VEHICLES MUST CHANGE THEIR TRAVEL PATH TO MANEUVER AROUND THE CIRCLE AND ARE TYPICALLY CONTROLLED BY "YIELD ON ENTRY" ON ALL APPROACHES.



APPLICATION:

- ***Streets where speed control is desired***
- ***Intersections where improved side street access is desired***

Effectiveness:

- 2 to 13 mph reduction in average automobile speed one block from the circle
- Vehicles slowed to 15 or 20 mph through the circle

Other Advantages:

- Provides increased access to street from side street
- Breaks up sight-lines on straight streets
- Opportunity for landscaping in the intersection

Delay to Emergency Vehicles:

- 2 to 10 seconds per circle depending on the design

Other Disadvantages:

- Definition of right-of-way is contrary to the "yield to the vehicle on the right" rule
- Relatively expensive if curb extensions are required
- May impede left turns by large vehicles
- On streets with bicycle facilities, bikes must merge with traffic around circle
- Snow plows must negotiate device

Variations:

- With or without curb extensions on the corners
- With or without diverter islands
- Different sizes and dimensions affect magnitude of speed reduction
- Island with barrier curb and gutter face or tapered/mountable face

Special Considerations:

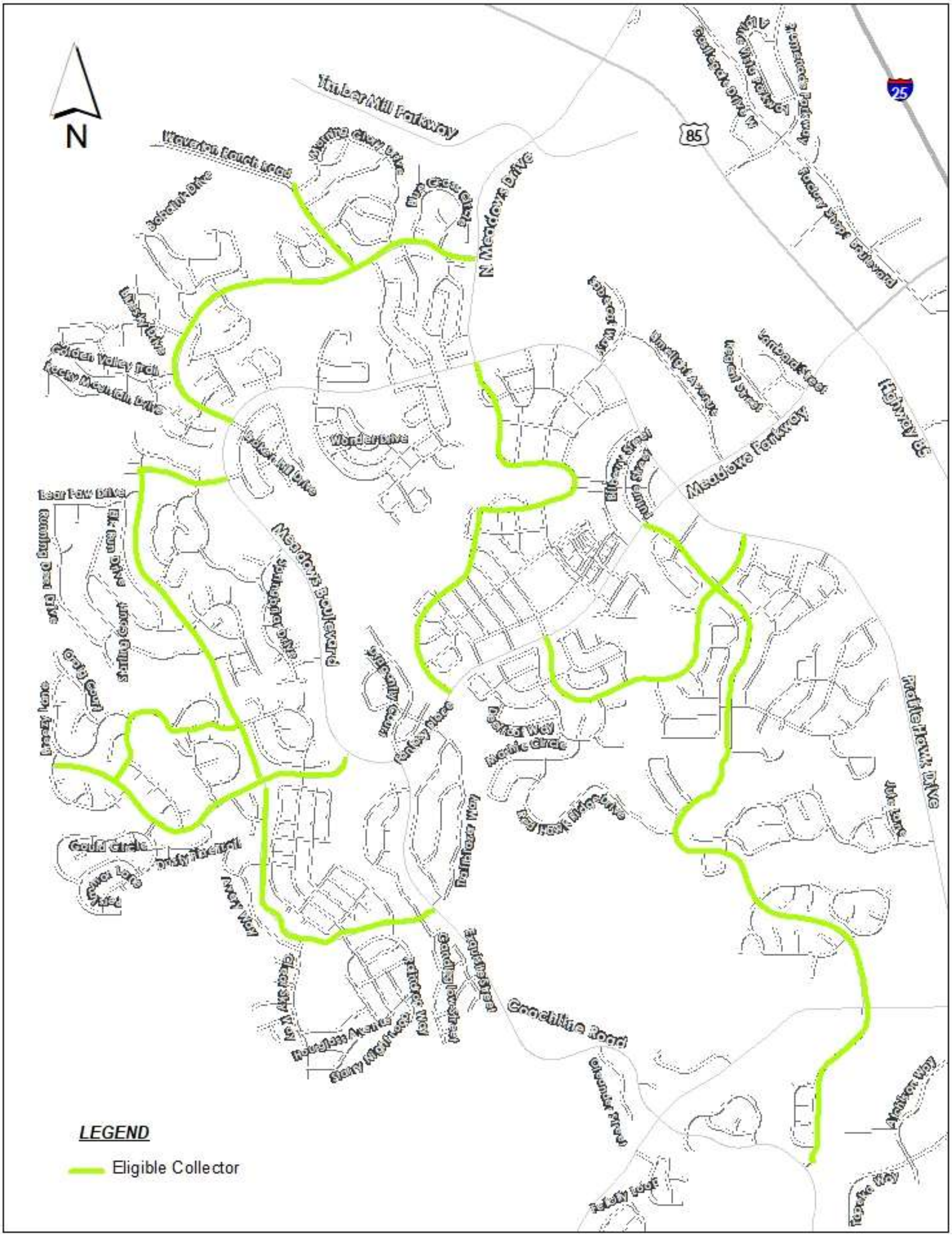
- Requires extensive signing
- Maintenance concerns associated with plowing, sweeping and asphalt maintenance around circle
- Minimum 20 clearance is required around circle
- May require educational campaign and learning period

Cost:

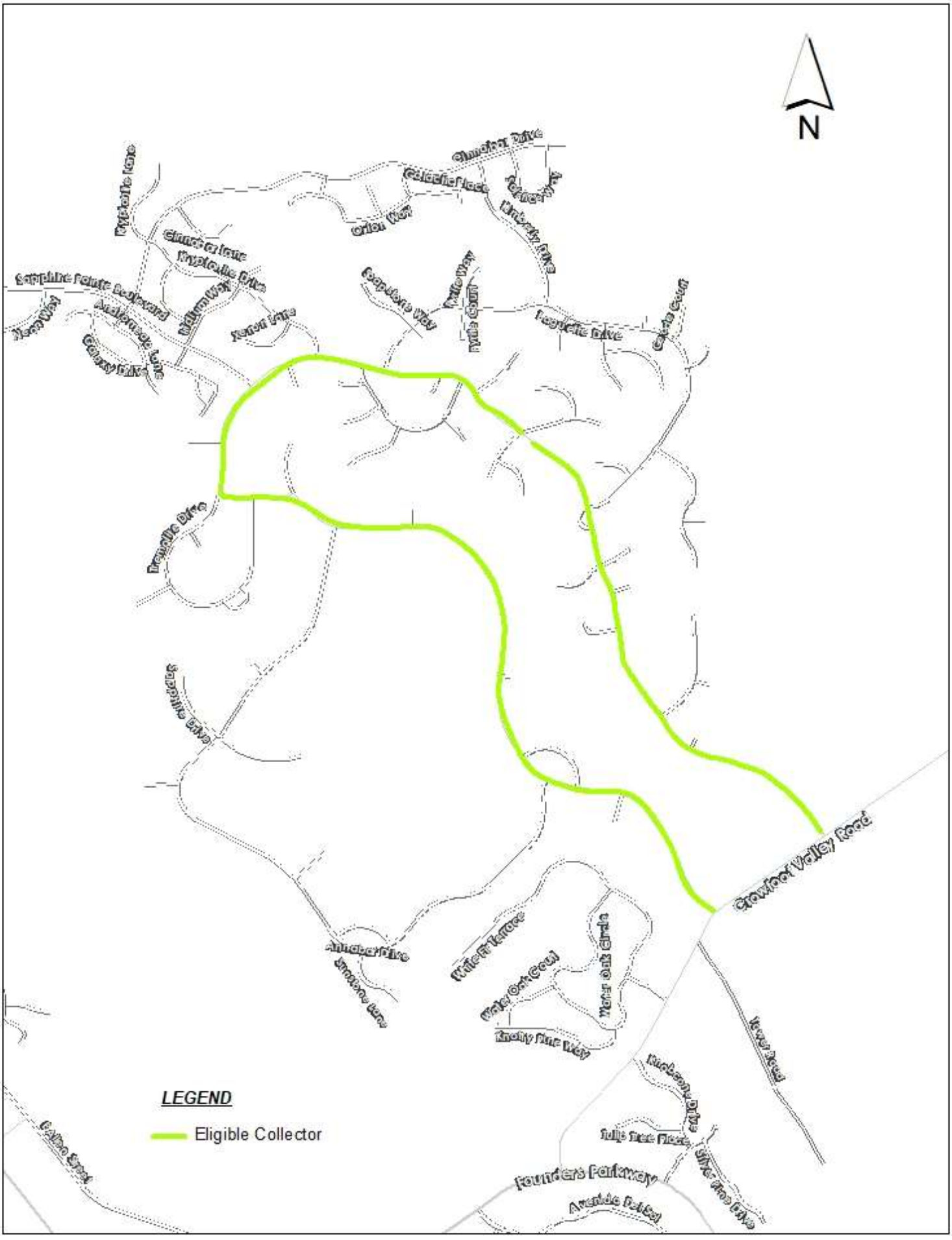
- $10,000 to $40,000

Appendix C: Eligible Collector Streets

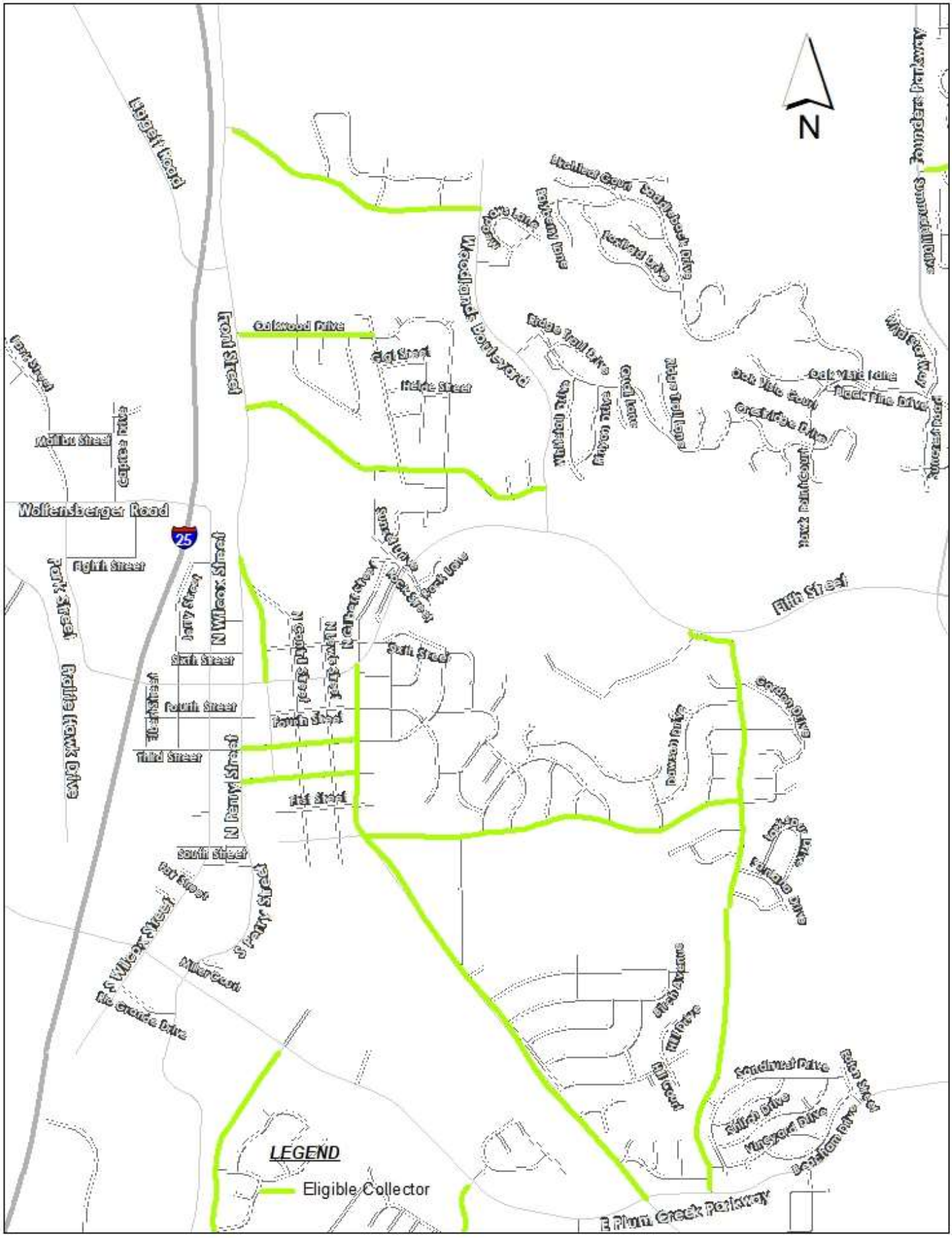
Northwest Area



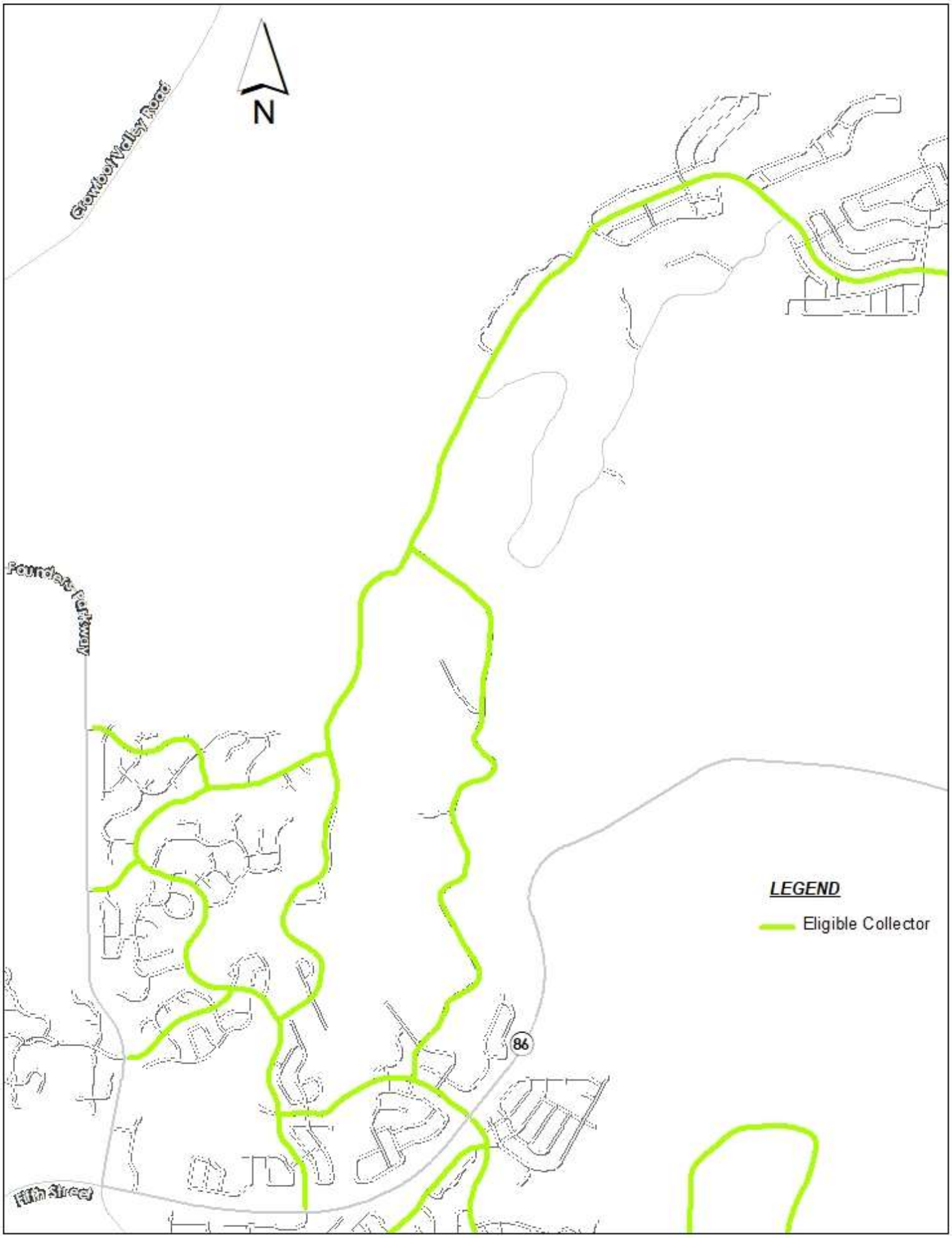
North Area


N
Crowfoot Valley Road
Founders Parkway
LEGEND
Eligible Collector

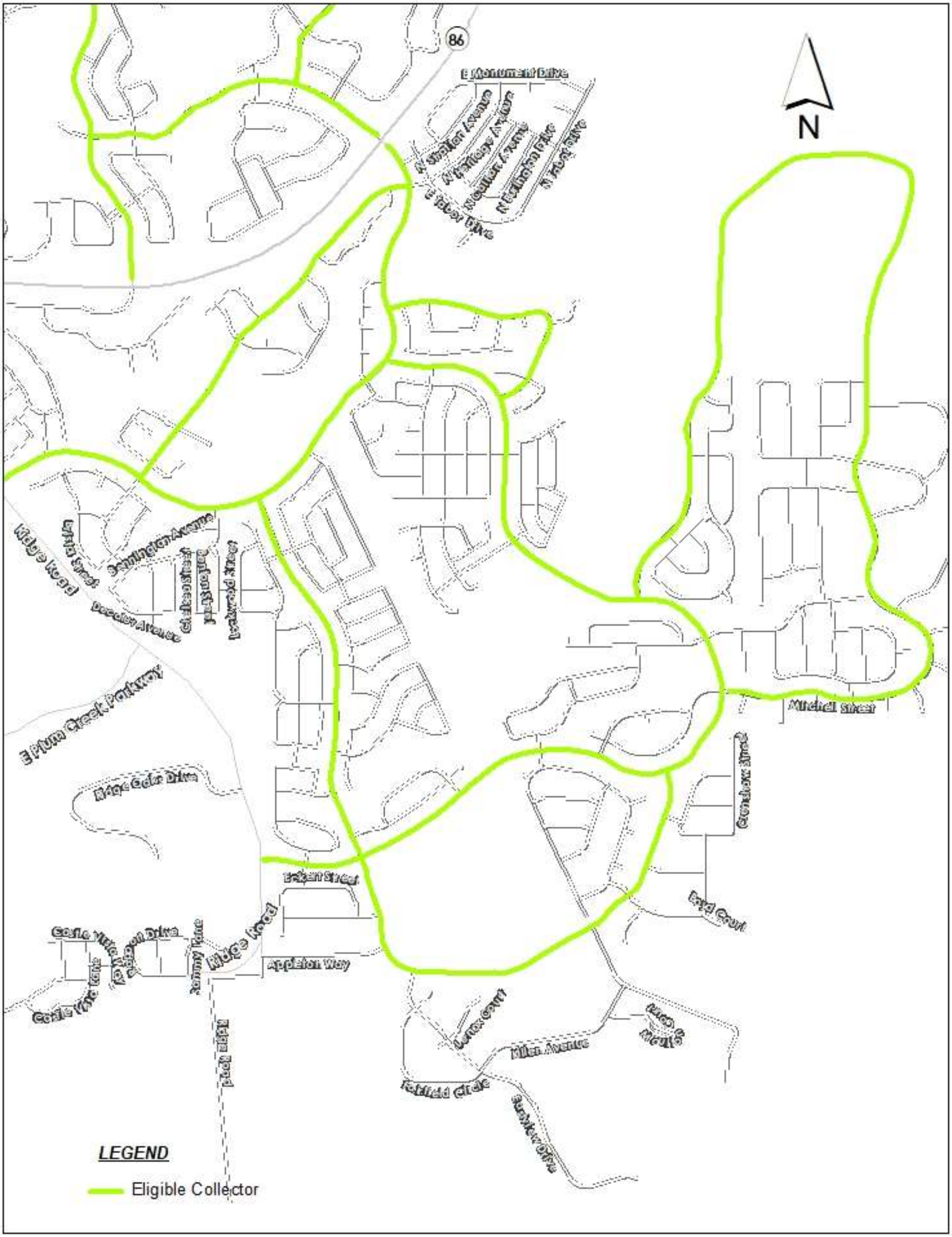
Central Area



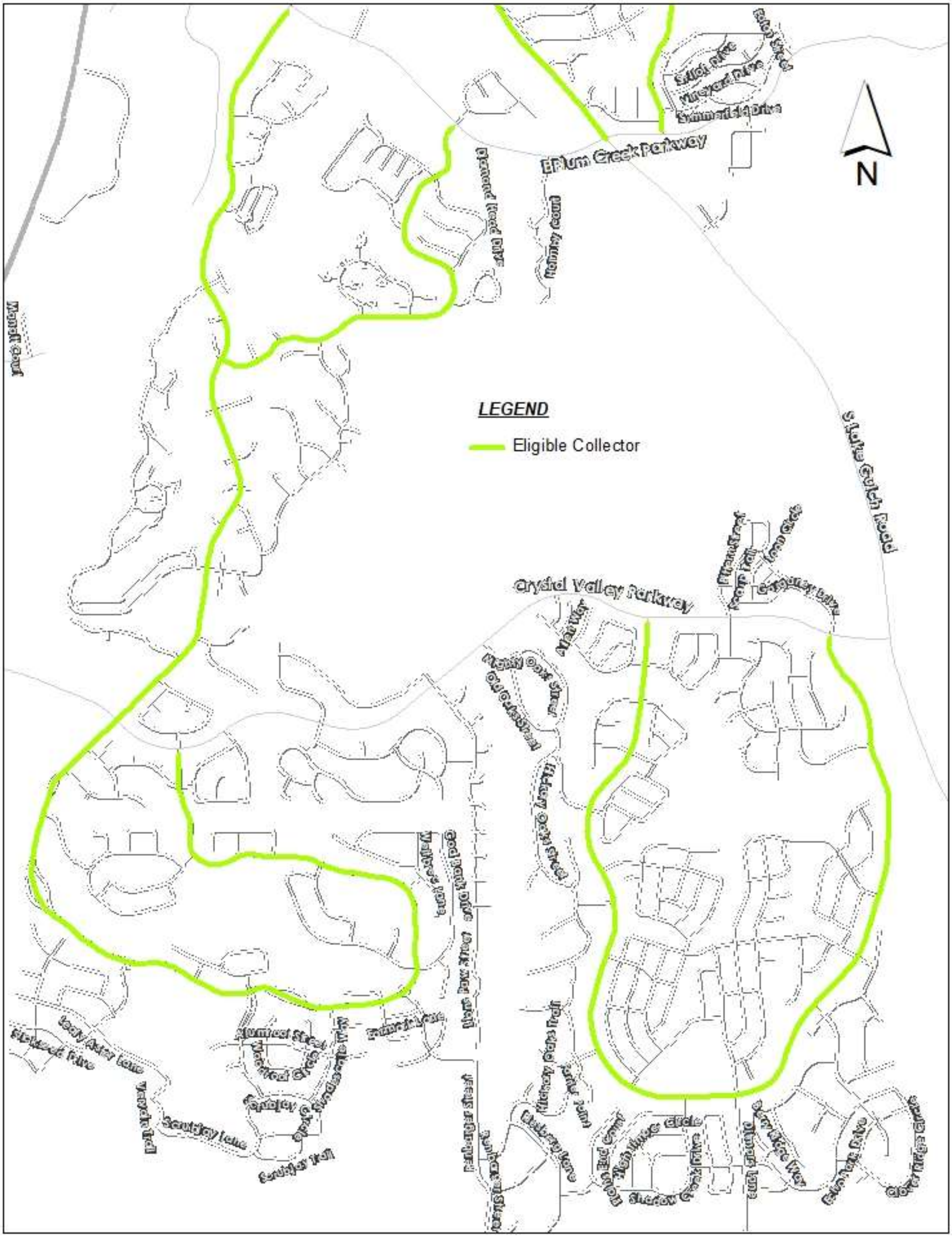
Northeast Area



East Area


86
E Monument Drive
E Tabor Drive
N
Ridge Road
Bennington Avenue
E Plum Creek Parkway
Ridge Oaks Drive
Mitchell Street
Crenshaw Street
Eckert Street
Boyd Court
Appleton Way
Castle Vista Lane
Lenox Court
Allen Avenue
Fairfield Circle
LEGEND
Eligible Collector

South Area


E Plum Creek Parkway
Crystal Valley Parkway
S Lake Gulch Road
Summerfield Drive
Vineyard Drive
LEGEND
Eligible Collector