



STEPHEN HOVANCSEK & ASSOCIATES, INC.
Consulting Engineers & Planners
TWO MERIT DRIVE • RICHMOND HEIGHTS, OHIO 44143
(216) 731-6255 FAX No: (216) 731-4483

February 28, 2011

City of South Euclid
1349 South Green Road
South Euclid, Ohio 44121
Attention: Mr. Paul Kowalczyk, Building Commissioner

Re: **OAKWOOD COMMONS REZONING APPLICATION
TRAFFIC IMPACT ON SURROUNDING NEIGHBORHOODS**

Dear Mr. Kowalczyk,

In response to the concerns raised by the Planning Commission at their meeting of February 19th, the City Engineer and staff met with the developer's engineers on February 22, 2011 to discuss the potential impact of cut-through traffic that might be generated by the subject development, and what traffic calming measures might be implemented to reduce such impact. Present at the meeting were the following individuals: Paul Kowalczyk, Building Commissioner; Robert Abele, Traffic Commissioner; Jim Anderson, Assist. Service Director; John Cieszkowski, McKenna Associates; Chris A. Goodrich, P.E., First Interstate Development; Michael Schweickart, P.E., TMS Engineers; and the undersigned. The following is a summary of our discussions

Identifying Traffic Impact

The traffic study prepared by TMS Engineers for the developer indicates that the main traffic impact from the proposed development will occur on Warrensville Center Road. The existing peak hour traffic volumes on the streets facing the site on east side of Warrensville Center were quite small; a somewhat higher volume was measured in the E. Antisdale intersection heading west. A comparison of the "build-no build" volumes can be seen in Fig. 9, 10, 11 and 12 of the study. In the build condition the increase of traffic on these side streets is not great.

There is, however, anecdotal evidence of that drivers are already using the side streets as a cut through in both easterly and westerly travel patterns to avoid the traffic signals on the arterial routes of Mayfield and Cedar Roads. The development of University Square and Cedar Center South in recent years has already generated new trips to the vicinity of the project, some of which are probably using the residential side streets as a cut through. Many of these "existing" trips may also choose to shop at the proposed development, with no net increase in cut-through traffic. It was the opinion of some that drivers will stay on the main routes to avoid stop signs and low speed limits. In fact there are a multitude of possible avenues for cut through; the one chosen will depend on the origin and the destination of the trip. Mr. Schweickart stated that cut-through travel is more likely to occur as the result of a frequently made trip, such as the daily commute to work, and that drivers making less frequent trips such as those generated by retail shopping are less likely to seek out a "short cut" and will stick to the arterial streets.

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It was agreed that implementing traffic calming measures “willy-nilly” may result in unintended consequences that make things better for one set of residents and worse for others. The best solutions are those that result in the least impact on the majority of residents.

Traffic Calming Process

It is the opinion of the City Engineer that a process should be established implementing for traffic calming projects. This process would be applicable to any neighborhood and not just those affected by the subject project. Fortunately other communities have already been down this path and the one developed by the City of Kent appears to be a good starting point. A copy of their *Neighborhood Traffic Calming Policy* is attached for the information of the Commission, however it does not have to be formally adopted before we can derive some benefit from it.

The following is an outline of the process for developing a traffic calming solution:

1. Initiation. Typically a group of residents may raise concerns about an existing problem. In the present case we are being proactive by evaluating a potential problem and planning for it. The problems are excess vehicle speed, excess travel volume, or both.
2. Identify Problem Streets. Four streets on the east side of Warrensville Center Road are the likely avenues for cut-through traffic: Verona, Bayard, and Bexley because they offer easy east-west access to Belvoir Boulevard, and Stonehaven Road because it is directly across from the proposed main entrance to the development. In addition, East Antisdale is another well known cut-through route. It is the west leg of the Verona-Warrensville signalized intersection and connects the neighborhoods of Cleveland Heights to the “West Five” neighborhood.
3. Data Collection. Traffic data is collected to measure the traffic volume, times of peak volume, and travel speeds in both the existing and post-construction conditions.
4. Evaluation. The post-construction data is evaluated and compared to established criteria, or factors, that provide a rational basis for further action. These factors are:
 - a. Total Average Daily Traffic (ADT) exceeds 1,000 vpd (vehicles per day);
 - b. ADT in the post-construction condition has increased by 100 vpd;
 - c. 55% of ADT travel at speeds in excess of the posted speed limit;
 - d. The 85th percentile speed is more than 5 mph above the posted speed limit, i.e. 15% of the drivers are speeding 5 mph or more in excess of the posted limit.
5. Identify a Toolbox of Measures. Once it is determined that there exists a problem, there are a number of traffic calming measures that can be implemented in a graduated process, moving from the non-structural, less-

EXISTING DATA

POST-CONSTRUCTION

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- costly, and temporary to the permanent, more expensive, structural changes:
- a. Lower Cost Measures
 - i. Signage: "no through street", "no left turns", stop signs
 - ii. Enforcement: Speed indicator displays to police presence;
 - b. Structural Volume Control Measures (see the Appendix):
 - i. Diverters;
 - ii. Median Closures
 - iii. Road Chicanes
 - iv. Road Closure
6. Implementation. Careful selection of measures to be used at specific locations
- a. Temporary for Initial Evaluation
 - i. Does it work as intended? Are there unintended consequences?
 - ii. Can be done for low cost, easily removed
 - b. Permanent
 - i. If found to be "safe and effective", then permanent structural measures are built.
 - c. Public Education and Involvement
 - i. Hold public meetings, solicit feedback, acceptance of proposed measures.

Specific Solutions for Oakwood Commons

During our meeting Mr. Goodrich of First Interstate Development agreed that the developer would have a pre-construction traffic survey done on the target streets to identify existing traffic volume and speeds, and then to repeat the survey for the post-construction condition. Our discussions considered several areas of concern:

Stonehaven Road. The conceptual plan of development for Oakwood Commons shows the proposed main entrance in direct alignment with Stonehaven Road. In order to discourage cut-through traffic on this road several options were discussed. One was to offset the main entrance on Warrensville Center to the south, midway between Stonehaven and Wilmington Roads. The double left turn lanes into Oakwood Commons have been sized to meet the projected future traffic, and their design length is such that the lanes begin just outside of the Wilmington-Warrensville and Bayard-Warrensville intersections. Shifting the main entrance location north or south will cause these turn lanes to be in conflict with movements into and out of the side streets.

A shift to the south would move the northbound left turn lanes across the Wilmington intersection, creating a potential conflict for drivers wanting to turn left from Warrensville into Wilmington, and tempt drivers on Wilmington to jump into, or move through, the left turn queue going into Oakwood. Therefore, left turns and through movements from Warrensville heading east would be prohibited and vice-versa; and only right turns into, or out of Stonehaven and Wilmington would be permitted.

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To avoid these conflicting movements it was agreed that it would be better to leave the entrance as currently designed, and instead to modify the Stonehaven intersection to prevent left turns and through movements across Warrensville Center. One way to do this would be to install a diverter island on Stonehaven at Warrensville, as shown in the attached Figure 1.0. Only right turns into and out of Stonehaven would be permitted. Some degree of traffic enforcement might be needed to discourage drivers going around the ends of the island.

E. Antisdale Road. Traffic Commissioner Abele stated that the amount of traffic cutting through the West Five neighborhood has greatly decreased since the old Cedar Center Shopping Center was demolished, but would likely increase with the construction of the new Cedar Center North redevelopment. As mentioned this road still has a degree of cut-through traffic heading east, and which is also likely to increase with the development of Oakwood Commons.

Several ideas for this street were discussed. One would be the installation of a traffic diverter at Fenwick. This would discourage through movements to Warrensville, but not inhibit traffic going to Cedar Center North.

A more radical idea would be to acquire and demolish the last house on the south side of E. Antisdale and the last house on the north side Grosvenor, and build a connection between the two streets as a continuation of Halsey, and cutting off the connections to Cleveland Heights.

Other Areas of Concern. Traffic heading west on Cedar Road towards the site must move through seven signalized intersections on Cedar and Warrensville. A right turn onto Belvoir and then a left through the median to Verona avoids these and provides an easy to access cut-through. One obvious solution would be to close the median on Belvoir. However closing this median cut would also greatly inconvenience the residents living between Belvoir and Warrensville Center who have a legitimate right to this access. This would have to be studied further.

Another problem area that exists at present is the limited stacking volume for the left turn on Mayfield Road, turning south onto Warrensville Center Road. It already causes some delay, but is difficult to lengthen without hindering access to Brookline Road. An increased demand for left turns will likely cause more delay, which lowers the efficiency of the intersection, and could promote cut-through traffic down Genesee, Sherbrook, Holmden or Felton Roads.

First Interstate Development Responsibility

The developer has indicated that he is willing to conduct the necessary additional studies and place \$50,000 in escrow for the construction of the traffic diverter solution discussed above on Stonehaven Road should the post-construction study find that it is warranted.

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In addition, the developer is also pledging to contribute up to \$50,000 for whatever solution the City deems best for the West Five neighborhood. With the completion of Cedar Center North there may be a shared responsibility to make traffic calming improvements for this neighborhood.

Appendices

Attached please find some reference material that will be of interest:

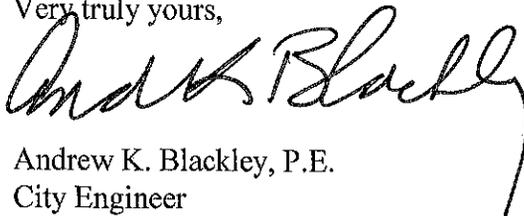
- A. City of Kent "Neighborhood Traffic Calming Policy"
- B. Examples of Traffic Calming Solutions
 - a. TrafficCalming.org
 - b. McKenna and Associates
 - c. *U.S. Traffic Calming Manual*, Ewing and Brown, APA Planners Press, 2009
- C. Fig 1.0, Stonehaven Road

Conclusion

Traffic engineers can make reasonable estimates of the impact of a new development on the existing highway system using measured data and accepted parameters. An engineered solution to mitigate the impact is then possible. However, when it comes to possible cut-through traffic on dozens of available routes the evaluation may simply devolve into best-guesses based on opinion and hearsay. Therefore, we are of the opinion that a rational approach to the issue is to study the affected neighborhoods and determine best-fit solutions once the magnitude and location of the problems are known. To this end the developer, First Interstate, has shown a ready willingness to contribute to the solution with both engineering analysis and substantial financial contributions. It is our recommendation that the issue of traffic impact should not be an impediment to the rezoning of the subject parcel.

If you have any questions please feel free to call.

Very truly yours,



Andrew K. Blackley, P.E.
City Engineer

AKB/ab
Enclosures

Cc: Mayor Georgine Welo
Ed Gallagher, Economic Development

**South Euclid
Oakwood Commons Traffic Impact Report**

APPENDICES

**South Euclid
Oakwood Commons Traffic Impact Report**

Appendix A

City of Kent

“Neighborhood Traffic Calming Policy”

NEIGHBORHOOD TRAFFIC CALMING POLICY

I. PURPOSE

The City of Kent continually strives to strengthen and protect its neighborhoods by improving the quality of life in residential areas. Traffic conditions on residential streets can greatly affect neighborhood livability. Speeding traffic and unnecessary through-traffic in neighborhoods create safety hazards on residential streets. When traffic problems become a daily occurrence, our sense of community and personal well-being are threatened.

The City of Kent's *Neighborhood Traffic Calming Policy* was developed to guide city staff and inform residents about the processes and procedures for implementing traffic calming on residential streets. Under this policy, the Community Development Department will work with residents to identify traffic problems in their neighborhoods and seek appropriate solutions.

Citizen participation is an important part of all traffic calming projects. Experience in other cities has shown that traffic calming projects that are implemented without involving the neighborhood are frequently unsuccessful, often resulting in the future removal of traffic calming measures. The City's goal is to give the people who live and work in the project area the opportunity to become actively involved in the planning and decision-making process

What Streets will be addressed under this Policy?

This Policy addresses residential minor arterial, principal collector, minor collector, local and local service streets. As the City of Kent does not currently have a comprehensive document, which classifies its existing minor arterial, principal collector, minor collector and local service streets, this Policy contains the following general descriptions that will help identify appropriate streets.

Minor Arterials interconnect with principal arterial roadways and includes all arterials not classified as principal. *This system places more emphasis on land access than the higher system does and offers lower traffic mobility.* The main role of a minor arterial is to provide intra-city mobility. In many cases, bus routes are located on minor arterials. *Ideally, minor arterials do not penetrate identifiable neighborhoods.*

Collector streets are somewhat more difficult to define. Collector streets are typically streets that provide access between local streets or from local streets to arterial thoroughfares. Collector streets often carry some amounts of through-traffic. To be considered under this Policy, a collector street must be primarily residential. In order to allow flexibility for land uses like parks and schools, no exact standard will be set. However, as a general guideline, "primarily residential" means that at least 75% of the properties with frontage on the street are in residential zoning or have existing land use that is residential.

Principal Collector streets can be found in residential, commercial and industrial area, *providing land access and traffic circulation.* Typically, major collectors have greater right-of-way and paving widths and wider traffic lanes than minor collectors. Principal collectors frequently have left turn lanes.

Minor Collector streets are found only in residential neighborhoods and provide a high degree of access to individual properties. As a rule, both right-of-way and paving widths are narrower than principal collectors and designated left turn lanes are infrequent.

Local streets provide direct and full access to private property and are laid out so that their use by through-traffic is discouraged. Local street systems usually do not contain bus routes.

Local Service streets are intended to provide secondary and in some cases primary access to private property. They are generally located within a commercial or high-density zoning area and are commonly known as “alleys”. Available right-of-way is limited on local service streets.

Residential local streets make up the majority of Kent’s street system. These streets serve local circulation needs for motor vehicle, bicycle, and pedestrian traffic and provide access to residences and some businesses on occasion. Local streets are not intended to carry significant volumes of through-traffic.

II. STREET EVALUATION AND PRIORITIZATION

Initiation

All streets will be evaluated by street segment. A segment is that portion of the street that lies between two thoroughfares or collector streets, or other logical feature that may separate portions of a street, such as changes in land use, major driveway entrances, particular road conditions, or historic boundaries. A street segment can be added to the list of streets to be studied for potential traffic calming in a number of ways:

- A citizen or group of citizens contacts the Community Development Department directly to express their concerns about speeding traffic or excessive volumes of traffic on their street. The Community Development Department sends a questionnaire to the resident or residents that asks for additional information about the problem areas and allows multiple residents to sign on to the request. Once Community Development staff receives this questionnaire, the street segment will be added to the list of streets to be studied. *This information will be forwarded to the Traffic Safety and Engineering Committee for review.*
- A recommendation to study is made by City Council, the Planning and Zoning Commission, or the Traffic Safety & Engineering Committee. This recommendation may follow a request to one of these public bodies from a citizen or group of citizens; or the concern may surface during the regular business of these public bodies;
- The Kent Police Department recommends the addition of a street to the list based on their enforcement efforts and/or citizen concerns;

Preliminary Evaluation

The Community Development Department *with the Public Service Department* will visually inspect the street, review the city ordinance to determine the established speed limit, and collect traffic volume and speed data. The data collection will normally be done using electronic automatic traffic recorders over a period of days. The following data will typically be collected:

- Speed data to determine the 85th percentile speed as well as the median speed and average speed. The 85th percentile speed is the speed exceeded by the fastest 15% of vehicles.
- The volume of traffic for a typical day. Preferably, both weekdays and weekends will be included to provide a complete depiction of traffic conditions.
- The speed and volume data will typically be in a form that enables specific times of day to be evaluated in order to determine peak hour traffic volume and to identify any specific times of day when traffic speeds are higher.
- Determination if the street is a main emergency response route. No application can result in an increase of emergency response times greater than 4 minutes from the primary response station.

- The application chosen will need to provide for efficient snowplowing and other maintenance operations.
- Occasionally, vehicle classification data (cars, trucks, buses, motorcycles, etc.) will be collected if deemed necessary by the Community Development Department.

The first step in the preliminary evaluation will be to determine whether the posted speed is appropriate. Under the current ordinance, unless specifically identified in the ordinance, all residential streets have an established speed limit of 35 mph, regardless of the type of use, volume of traffic, or physical and geometric features.

The *Traffic Safety & Engineering Committee* will determine the appropriate speed for streets being evaluated under this policy by conducting an engineering study that considers the following factors:

- the speed data collected;
- geometric features of the roadway including but not limited to horizontal and vertical alignment, sight distance, lane width, shoulder width, and the presence of sidewalks;
- the type of roadside development;
- the proximity of houses and other development to the street;
- pedestrian and bicyclist activity;
- The density of driveways that intersect the roadway.

Typically, speed limits on residential local streets will be set at 25 mph, while speed limits on residential collector streets will be set at 30 mph. These speed limits may be set lower based upon the above factors.

The primary purpose of the preliminary evaluation is to determine whether the speeding or traffic volume problem is significant enough to warrant further study and prioritization. For streets to be considered for prioritization the measured 85th percentile speed must be more than 5 mph higher than the posted speed limit or the total traffic volume on the street must be greater than 1000 vehicles per day. In the event that a street does not meet these criteria, the City of Kent recognizes that a traffic problem may still exist on the street. However, relative to other streets in the city, the extent of the problem does not warrant the use of the city's limited resources to resolve by this program.

At times, the City may receive more requests than can be evaluated immediately due to staffing limitations. When this happens, using knowledge of the City's streets and neighborhoods, and engineering judgment the *Traffic Safety & Engineering Committee* will choose to first study the streets which are likely to exhibit the worst traffic problems.

Prioritization

Street segments that meet the above qualifications will advance to selection scoring and prioritization. At this time, a more detailed field review and study of the street will be completed. The detailed evaluation will typically include the following:

- The traffic speed and volume data collected under the preliminary evaluation;
- Additional speed and volume studies as needed for more detail or to get updated data;
- An evaluation of the roadway geometry to determine the *location* of sidewalks, to identify sight distance problems, and to identify any other conditions of concern for traffic safety;
- A review of auto accident history for the prior three years to determine the total number of collisions and to identify any significant auto accident trends (i.e. type of collisions, locations, time of day, days of the week).

This detailed evaluation will generate information about several rating criteria to be used in prioritizing streets. These criteria will be given varying weights in the rating chart based on the following descriptions:

- Speed is given the most importance, since high speed usually affects safety and livability the most. It is also the condition that can be improved the most using traffic calming measures.
- Traffic volume is also considered because it contributes to the general traffic conditions on the street.
- Cut through-traffic can negatively impact neighborhood street by increasing traffic volume.
- Auto accident history gives an indication of existing safety problems with the street. A high level of auto accidents can be an indicator of limitations of the street design that may be difficult to quantify. In addition, reducing traffic speed and volumes has been shown to reduce auto accidents on residential streets.
- Roadway geometry is an important factor in traffic safety in neighborhoods. Roadway geometry features can restrict visibility; creating hazards for motorists and pedestrians. *Also many residents must back out of narrow driveways into the street.*
- Residential density also affects traffic conditions; higher densities typically generate more pedestrians and vehicle turning movements. In addition, projects on high-density streets benefit more people than projects on low-density streets.
- Other criteria such as the presence of sidewalks and pedestrian generators like schools, parks, and bus routes are important because they relate to pedestrian safety. Vehicle travel speeds and volumes directly affect the potential for pedestrian injuries and fatalities.

Rating Chart

Criteria	Points	Basis for point assignment
Speed	0 to 35	4 points assigned for every mph greater than 5 mph above the posted speed limit (using the full day 85 th percentile speed)

Volume	0 to 20	1 point for every 200 vehicles per day.
Cut through-traffic	0 to 10	1/2 point for each 1% the percentage of cut-through-traffic exceeds 20%.
Auto accident history	0 to 10	1 point assigned for each 0.3 recorded auto accidents per year per mile of roadway (based on the past three years)
Pedestrian generators	0 to 10	4 points for each elementary or middle school within 500 feet of the project area. 2 points for each other school, bus route, park, or community center within 500 feet of the project area. 2 points should be given if any (not for each) retail, commercial, or other institutional (including churches) uses exist within 500 feet of the project area.
Roadway Geometry	0 to 8	Each street segment will be rated on a scale of 0 to 8 for potentially hazardous roadway geometry and other factors. Factors to be considered include horizontal and vertical curvature, street width, proximity of homes to the street, stopping sight distance, intersection sight distance, and driveway sight distance and geometry.
Sidewalks	0 or 7	5 points assigned if there is no continuous sidewalk on at least one side of the street.
Total Points Possible	100	

III. PRELIMINARY USES OF THE PRIORITIZED LIST

The prioritized list will be used in several ways by different departments in the city. The primary purpose of the list is to identify streets and areas for traffic calming projects. However, due to limited resources, some areas may not be identified and funded for a project for significant periods of time. In addition, developing a traffic-calming project can take months, adding to the delay experienced by residents. Therefore, interim strategies may be used to provide citizens with some improvement of their traffic problems.

Police Enforcement

The prioritized list and the speed and volume data will help the Kent Police Department enforce speeding laws more efficiently. The data tells officers which streets have the most significant speeding problems. In addition, specific information about the speed profiles for the street can help officers focus their efforts on the most serious offenders.

Traffic Speed Display Signs

The City of Kent may utilize speed display signs that use radar technology to show drivers the speed they are travelling. The Police Department and the Public Service Department may place these signs on streets where speeding problems have been identified. The prioritized list with information about the level of speeding on various streets will help these departments place these signs more effectively. Some of these types of signs also have the ability to record traffic counts and traffic speed information. While these signs do not force scofflaw drivers to slow down, many drivers speed in neighborhoods without realizing how fast they are travelling. Reminding these drivers that they are exceeding the speed limit on a street can encourage them to drive more slowly.

Low-Cost Traffic Control Device Strategies

Under some circumstances, placement or removal of various traffic control devices such as signs and markings can improve the traffic problem on a residential street. If the City's *Traffic Safety & Engineering Committee* determines that a low-cost strategy may be beneficial, the strategy may be implemented as soon as personnel resources are available. Some examples of possible strategies are:

- Removing on-street parking restrictions can reduce speeds. For low-volume residential streets, parking on one side of streets will normally be allowed on streets with curb to curb widths of at least 20 feet, and parking on both sides of the street can normally be allowed on streets with widths of at least 24 feet. Any changes that will allow parked cars to effectively narrow the street must be approved by the Kent Fire Department. On streets with volumes over 1500 vehicles per day, a queuing analysis that considers traffic volume and the density of on-street parking may be necessary before allowing parking that would narrow the street down to one lane.
- On streets with parking allowed on only one side of the street, parking can be alternated from side to side along the length of the street to break up the visual continuity of long, straight streets. No parking zones must be overlapped to avoid potential barriers to emergency response vehicles.

IV. TRAFFIC CALMING PROJECTS

Traffic Calming Measures

As described below under Project Development, residents will be given a "toolbox" of traffic calming measures that can be used to reduce traffic problems on residential streets. This policy does not include a list of traffic calming measures and definitions, or the criteria or limitations for installation. Community Development staff feels that specifically listing traffic calming measures for use on City streets might limit the potential solutions to traffic problems, as new or modified ideas for calming traffic are constantly being developed. In addition, including all the necessary information about traffic calming measures would make this document quite cumbersome. Several excellent publications and web sites provide definitions, descriptions, benefits, consequences, costs, and design guidelines for traffic calming measures.

Community Development Staff will use these documents and other resources to present a "toolbox" of traffic calming measures to residents during the project development process. In addition, staff may make general presentations about traffic calming measures to the public or to specific organizations. Residents who are interested in learning more about traffic calming on their own are encouraged to make use of valuable resources on the Internet. The web site for the Institute of Transportation Engineers (ITE) contains excellent information and several links concerning traffic calming. <http://www.ite.org/traffic/index.htm>

Project Selection

In many cases, several neighboring streets have similar speeding and cut-through-traffic problems. Implementing traffic calming on one street can cause the problem to get worse on other streets, or create traffic problems where there were not significant problems before. Therefore, traffic calming projects will often need to include several streets in the same area. Some flexibility in selecting projects from the prioritized list will be necessary in order to accommodate appropriate grouping of streets. The City's goal is to provide traffic calming in all regions of the

city where the data indicates that it is needed. Additional flexibility in project selection is necessary to allow this goal of regional equity to be realized.

Due to the criteria used, the rating chart will give higher scores for residential collector streets. However, it is important to have traffic calming projects on both residential collector streets and residential local streets. Therefore, to select traffic calming projects, separate lists shall be created for collector streets and local streets. Projects will be alternately selected from each list.

Residents or a homeowners association may elect to pay for 100% of the construction costs via petition to implement a low priority project faster, provided the other high priority projects remain on schedule.

Project Initiation

Once an area has been selected for a traffic calming project, Community Development Staff will contact neighborhood representatives and identify a committee of 4 to 6 neighborhood representatives who will assist in notifying and petitioning other residents. Preferably, the project will be supported by an established neighborhood association. The committee and Community Development staff will work together to identify the petition area. Typically the petition area will include properties on all street segments within the actual project area, on cross streets up to the next parallel street (or up to 300 feet from the project streets), and on any other street that must use the project streets as primary access. Projects on collector streets will generally have a relatively large petition area.

The citizen committee will be given petition forms along with information about the project area and basic information about traffic calming to provide to the residents in the petition area. In order to move on to the next phase of project development, signatures must be gathered from at least 60 percent of the households (owners and renters) within the petition area.

In addition to the petition, in some situations, surveys may be distributed to residents of the petition area, to further measure support for the project and obtain additional comments about traffic from residents who may not be able to attend the project development meetings described below.

Meetings for Project Development

Community Development Staff will work with residents of the petition area to set up a public meeting. All the residents of the petition area will be invited to attend. Facilitators will be used to assist in the process, and depending on the size of the project, consultants may be on hand to help with the project. Representatives of the Police, Fire, Public Service and Community Development Departments will be invited to attend the meeting and participate in the discussion. The following activities will take place at this meeting:

- Preliminary activities and introduction including a map for residents to use pushpins or dots to show where they live or have their business.
- Staff will present the data and analysis for the traffic problems in the project area. This process may include slides of the streets to help illustrate the problems.
- Participants will be offered a “toolbox” of physical traffic calming measures or other solutions for the traffic problems on their streets. This toolbox will be in the form of a verbal presentation accompanied by slides, handouts and/or other visual media.
- Participants will be asked to provide one-sentence descriptions of specific traffic issues within their neighborhood. Ideally, about 20 to 40 issues will be listed and posted on the wall.

- Citizens will have a chance to vote on the issues that are their highest priorities by using the “dot technique.” (Participants are given colored dot labels to stick next to the issues that concern them the most. This process brings out a list of primary issues within the project area.
- Residents will split into groups of 6 to 10 people and work around a map laid out on a table. Using their top issues prioritized in the previous activity and their “toolbox” of possible solutions, residents will discuss specific solutions for the traffic problems on their streets. Creative ideas from the residents that are not included in the toolbox will also be considered. Using the maps provided, participants will create a neighborhood traffic-calming plan with their proposed solutions. Community Development Staff will be available to answer any technical questions and provide guidance.
- Each of the groups will present their maps and give a summary of their discussion. These reports should be videotaped to assist staff in eventual project development.
- A final group discussion to get consensus about differences in the plans will give Staff final guidance.

Conceptual Plan Development

Community Development staff will create a conceptual plan for the neighborhood based upon the recommendations and proposed solutions from the residents. Any necessary field measurements will be taken to ensure that the proposed treatments will fit within the context of the street and to help with design. The proposed solutions will be evaluated for their appropriateness for the project area, and adjustments will be made as necessary. The plan development should include an analysis of whether or not the proposed measures will negatively affect nearby residential streets. The conceptual plan and report by Community Development Staff will be reviewed by Police, Fire and Public Service Department personnel as well as representatives of other departments and divisions as needed. The City’s Community Development Department will prepare a final report and conceptual plan that incorporates any comments from these reviews.

Final Report to Neighborhood

Community Development Staff will present the final report along with the conceptual plan at a public neighborhood meeting where all of the residents of the petition area are invited to participate. A map of the project area and visual aids will be used to summarize the treatments. Approximate project costs and installation information will be presented as well. Meeting participants will be asked to provide comments and help refine the recommended design. Community Development staff will refine the design as necessary to address the concerns and comments from this meeting.

Final Approval Process

With information about the project and petitions provided by the Community Development Department, the citizen committee will petition residents of the petition area to determine the level of support for installation of the proposed traffic calming measures. Both residents and non-resident property owners may be included on the petition. Signatures are required that represent at least 70 percent of the households in the petition area. In addition to the petition, a survey of residents in the area may be conducted to further assess the level of community support. Once the necessary level of support is determined, projects will be funded based upon their prioritization.

Design and Construction

Once the project is approved and funded, *Public Service Department* will complete the detailed design. The final plans will be reviewed by the Police, Fire and *Community Development* Departments, other City departments and divisions as needed, and representatives of the neighborhood. The traffic calming measures will be constructed by City crews or by a contractor. The design and construction phase may take up to 6 to 10 months

In the event that the traffic calming measures are very costly to install, or if the potential effectiveness of the measures is unknown, the *Traffic Safety & Engineering Committee* may elect to install temporary traffic calming measures to determine their effectiveness.

Many traffic-calming measures offer significant opportunities for landscaping. Appropriate City of Kent staff will be invited to participate in the project development process in order to help address landscaping issues. Neighborhood residents will be responsible for installation and maintenance of the landscaping. Landscaping must be installed in accordance with the Tree Ordinance, and as approved by the Tree Commission. Before the project is constructed, an agreement or agreements must be signed between the City and the residents that state that residents are responsible for installation and maintenance landscaping. Preferably, these agreements will be between the City and a neighborhood association or other organization. However, if this is not feasible, an agreement may be made with individuals for specific traffic calming measures.

Project Evaluation

Six months after the project is installed, the *Traffic Safety & Engineering* will complete an evaluation of the effects of the project. Comments will be solicited from residents in the project area by the use of a formal survey or through press releases. Traffic speed and volume data will be collected and any change in traffic volumes and speeds on the treated streets will be documented. In addition, traffic diversion and impact on nearby residential local streets will be measured. If any unacceptable impacts are identified, corrective measures will be taken. In some cases, traffic calming measures might be removed. If temporary traffic calming measures were used initially, the City may opt to install permanent measures at this time.

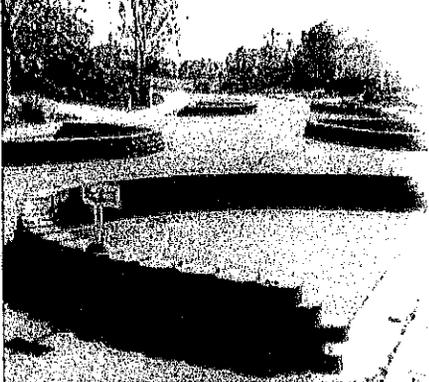
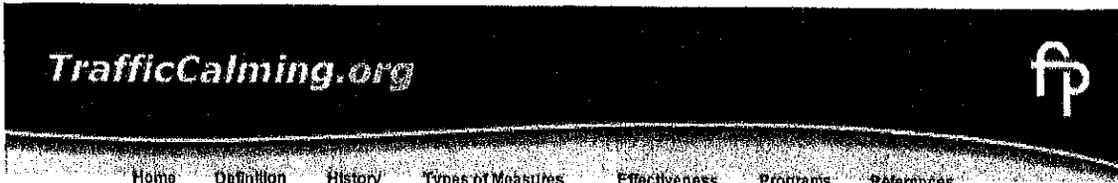
TABLE 1. Summary of the Process Outlined in This Policy

Step #1	<ul style="list-style-type: none"> • Citizen(s) contact staff with concern or a study is initiated by City staff or a City-based public body. • Community Development staff sends questionnaire to resident(s). • Citizens return completed questionnaire to City staff.
Step #2	<p><i>Traffic Safety & Engineering Committee:</i></p> <ul style="list-style-type: none"> • Conducts a preliminary evaluation including a basic speed and volume study; • Recommends reduced speed limits if necessary; and • Determines whether the traffic problem is significant enough to warrant further study and prioritization for traffic calming measures.
Step #3	<ul style="list-style-type: none"> • City staff conducts a more detailed evaluation and study of the street. • The data collected from the evaluation is input into the rating chart in order to create a prioritized list of street segments that have significant traffic problems.
Step #4	<ul style="list-style-type: none"> • City staff uses the prioritized list to help implement some interim strategies to provide citizens with some improvement to their traffic problems. These strategies may include: <ul style="list-style-type: none"> • Police enforcement; • Speed display signs; • Awareness campaigns; and • Low-cost traffic control device changes.
Step #5	<ul style="list-style-type: none"> • Projects are selected based on the prioritized list and the connectivity of streets in specific areas. • A citizen committee of residents who live on or near the project streets is formed. • Staff and the committee identify the petition area for the project, and the citizen committee gathers signatures from residents within the petition area. • At least 60% of the households in the petition area must be represented on the petition in order to move on to the next step.
Step #6	<ul style="list-style-type: none"> • City staff works with neighborhood residents to hold a public meeting to develop the project. • Staff presents the data for the project area and a “toolbox” of traffic calming measures. • Citizens and City staff work together to identify the key problems and recommend solutions for the neighborhood.
Step #7	<ul style="list-style-type: none"> • Community Development staff develops a draft conceptual plan based on the recommendations from the neighborhood meeting. • This plan is reviewed by representatives of other City Departments. • A final plan is developed based on any internal comments.
Step #8	<ul style="list-style-type: none"> • Community Development staff presents the final report and conceptual plan to the neighborhood at another public meeting where meeting participants comment on the conceptual plan. • Community Development staff refines the design as necessary
Step #9	<ul style="list-style-type: none"> • Citizens petition residents of the petition area to determine the level of support. • Signatures must be obtained that represent at least 70% of the households in the petition area.
Step #10	<ul style="list-style-type: none"> • <i>The Public Service Department</i> completes the detailed design. • Agreements are signed between the neighborhood and the City stating that the neighborhood will install and maintain any landscaping. • Traffic calming measures are installed.
Step #11	<ul style="list-style-type: none"> • After six months, <i>Traffic Safety & Engineering Committee</i> evaluates the project. • Additional data is collected. • Comments are solicited from neighborhood residents and other citizens. • Corrective measures will be taken if necessary.

**South Euclid
Oakwood Commons Traffic Impact Report**

Appendix B

Examples of Traffic Calming Solutions



This site serves as a practical guide to traffic calming and neighborhood traffic management, including:

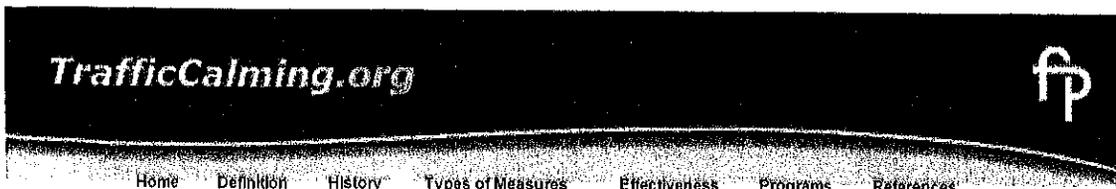
- International and US history
- A toolbox of calming devices
- Measured results from traffic calming
- Current programs around the world

This site is brought to you by Fehr & Peers Transportation Consultants.

2009 U.S. Traffic Calming Manual now available...



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Definitions of Traffic Calming...

Definitions of traffic calming vary, but they all share the goal of reducing vehicle speeds, improving safety, and enhancing quality of life. Some include all three "Es," traffic **education**, **enforcement**, and **engineering**. Most definitions focus on engineering measures to change driver behavior. Some focus on engineering measures that compel drivers to slow down, excluding those that use barriers to divert traffic. The following are some example definitions.



INSTITUTE OF TRANSPORTATION ENGINEERS

Traffic calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes.



TRANSPORTATION ASSOCIATION OF CANADA

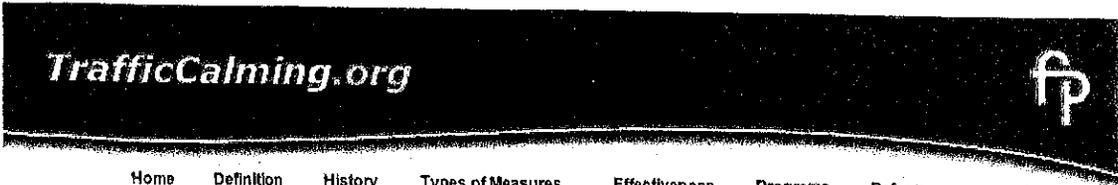
Traffic calming involves altering of motorist behaviour on a street or on a street network. It also includes traffic management, which involves changing traffic routes or flows within a neighbourhood.



MONTGOMERY COUNTY, MARYLAND

Traffic calming consists of operational measures such as enhanced police enforcement, speed displays, and a community speed watch program, as well as such physical measures as edgelines, chokers, chicanes, traffic circles, and (for the past four years) speed humps and raised crosswalks.

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[Home](#)
 [Definition](#)
 [History](#)
 [Types of Measures](#)
 [Effectiveness](#)
 [Programs](#)
 [References](#)

Types of Traffic Calming Measures...

Traffic calming measures can be separated into two groups based on the main impact intended. **Volume control measures** are primarily used to address cut-through traffic problems by blocking certain movements, thereby diverting traffic to streets better able to handle it. **Speed control measures** are primarily used to address speeding problems by changing vertical alignment, changing horizontal alignment, or narrowing the roadway. The distinction between the two types of measures is not as clear as their names suggest, since speed control measures frequently divert traffic to alternate routes, and volume control measures usually slow traffic.

Speed Control Measures

Vertical Deflection	Horizontal Deflection	Horizontal Narrowing	Other Measures
Speed Humps	Traffic Circles	Neckdowns	Examples
Speed Tables	Roundabouts	Center Island Narrowings	
Raised Crosswalks	Chicanes	Chokers	
Raised Intersections	Realigned Intersections		
Textured Pavements			
Speed Lumps *			
Speed Cushion *			
Split Speed Hump *			

Volume Control Measures

Divertive, Restrictive	Other Measures
Full Closures	Examples
Half Closures	
Diagonal Diverters	
Lateral Shift *	
Median Barriers	

Combined Measures

Examples

* - coming soon

TrafficCalming.org



Median Barriers... (median diverters, island diverters)

Median barriers are islands located along the centerline of a street and continuing through an intersection so as to block through movement at a cross street.

They are good for:

- Local street connections to main streets where through traffic along the continuing local street is a problem
- Main streets where left-turns to and/or from the side street are unsafe

Advantages:

- Median Barriers can improve safety at an intersection of a local street and a major street by prohibiting dangerous turning movements
- They can reduce traffic volumes on a cut-through route that crosses a major street

Disadvantages:

- They require available street width on the major street
- They limit turns to and from the side street for local residents and emergency services

Effectiveness:

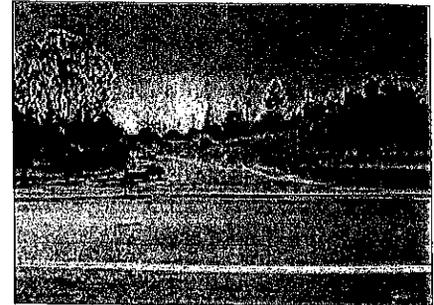
- Average of 31% decrease in traffic volume, or a decrease of 1167 vehicles per day (from a sample of 10 sites; average includes various types of volume control measures)

Similar Measures:

- By placing a barrier across only one stem of the intersection, you have a Full Closure
- By placing a barrier only half-way across a street along only one stem of the intersection, you have a Half Closure
- By placing the barrier diagonally through an intersection, you have a Diagonal Diverter
- By shortening the barrier and placing it at a midblock location only, you have a Center Island Median
- By restricting turning movements using channelization out of the side street itself, you have a Forced Turn Island

Cost Estimate(s):

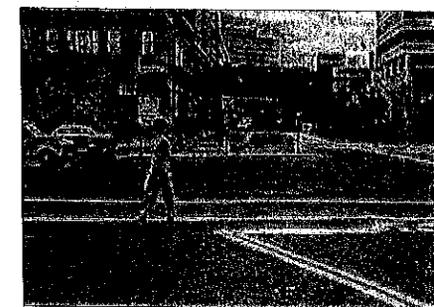
- \$15,000 - 20,000 per 100 feet



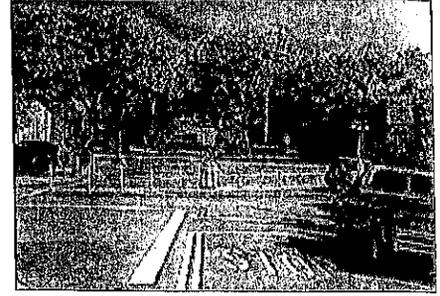
San Diego, CA - This median barrier uses a simple raised curb along the centerline of the major street. The pavement markings on the side street indicating that right-turns only are barely visible from this angle.



Phoenix, AZ - This median barrier allows both right- and left-turns out of the side street but prohibits through movements by explicitly channeling the left-turn movement.



Montgomery County, MD - This median barrier also allows left-turns out of the side street by using a very short barrier.



Berkeley, CA - This median barrier uses temporary materials to test the effects of the restriction.

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Diagonal Diverters... (full diverters, diagonal road closures)

Diagonal diverters are barriers placed diagonally across an intersection, blocking through movements and creating two separate, L-shaped streets. Like half closures, diagonal diverters are often staggered to create circuitous routes through the neighborhood as a whole, discouraging non-local traffic while maintaining access for local residents. They are good for inner-neighborhood locations with non-local traffic volume problems.

Advantages:

- Diagonal Diverters do not require a closure per se, only a redirection of existing streets
- They are able to maintain full pedestrian and bicycle access
- They reduce traffic volumes

Disadvantages:

- They cause circuitous routes for local residents and emergency services
- They may be expensive
- They may require reconstruction of corner curbs

Effectiveness:

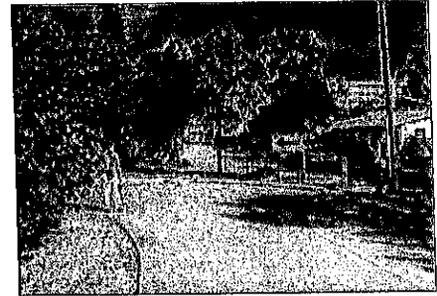
- Average of 35% decrease in traffic volume, or a decrease of 501 vehicles per day (from a sample of 27 sites)

Similar Measures:

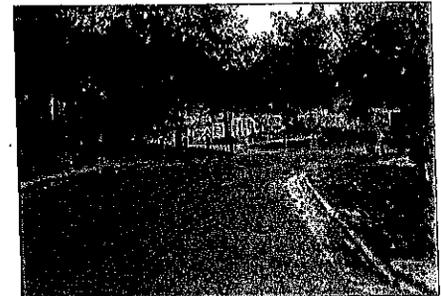
- By placing a barrier across a street along only one stem of the intersection, you have a Full Closure
- By placing a barrier only half-way across a street along only one stem of the intersection, you have a Half Closure
- By placing the barrier length-wise along the roadway centerline across a side street, you have a Median Barrier

Cost Estimate(s):

- \$85,000 (Seattle, WA)



Ft. Lauderdale, FL - This diagonal diverter uses a narrow raised curb and landscaping to prevent through movements. Bicycle and pedestrian access is maintained along two cement-paved connections.



Boulder, CO - This diagonal diverter uses a wide raised, landscaped closure with a raised contour and a paved pedestrian/bicycle walkway connecting the two sides.



Berkeley, CA - This diagonal diverter uses ground cover landscaping in lieu of trees.

Half Closures... (partial closures, one-way closures)

Half closures are barriers that block travel in one direction for a short distance on otherwise two-way streets. They are good for locations with extreme traffic volume problems and non-restrictive measures have been unsuccessful.

Advantages:

- Half Closures are able to maintain two-way bicycle access
- They are effective in reducing traffic volumes

Disadvantages:

- They causes circuitous routes for local residents and emergency services
- They may limit access to businesses
- Depending on the design, drivers may be able to circumvent the barrier

Effectiveness:

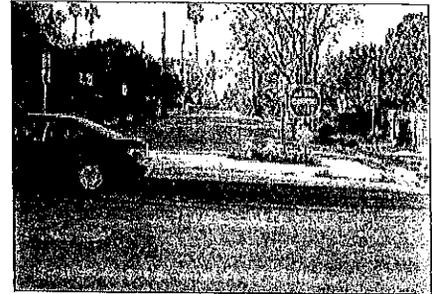
- Average of 42% decrease in traffic volume, or a decrease of 1,611 vehicles per day (from a sample of 53 sites)

Similar Measures:

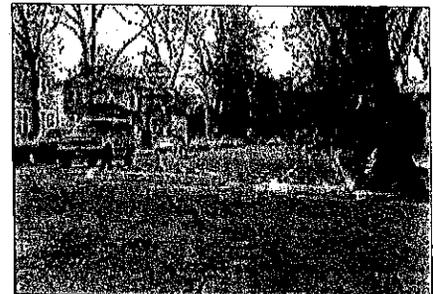
- By closing the street in both directions, you have a Full Closure
- By placing a barrier lengthwise along the center of a street past a side street, you have a Median Barrier
- By placing the barrier diagonally through an intersection, you have a Diagonal Diverter

Cost Estimate(s):

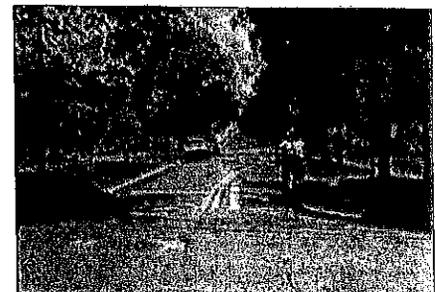
- \$40,000 (Portland, OR), \$35,000 (Seattle, WA)



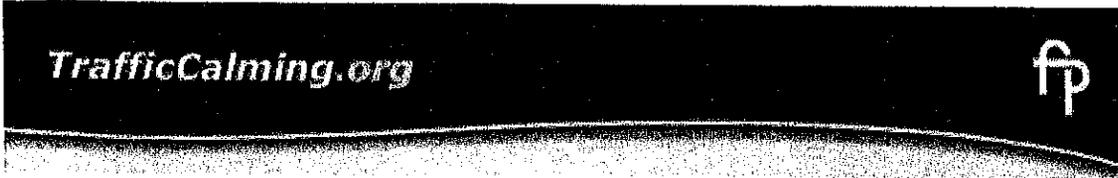
San Jose , CA - This half closure uses a short raised island with "Do Not Enter" signage to prohibit motor vehicle access, while allowing bicycle access through a gap between the island and the right curb.



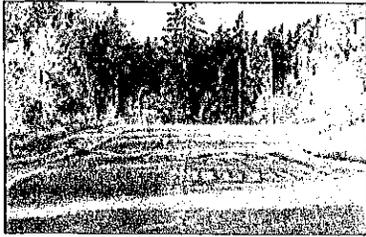
Sacramento, CA - Like the San Jose example, this half closure uses a short raised curb with a gap for bicycles. However, in this case the island is combined with a curb extension island that distinguishes the bicycle lane from the parking lane.



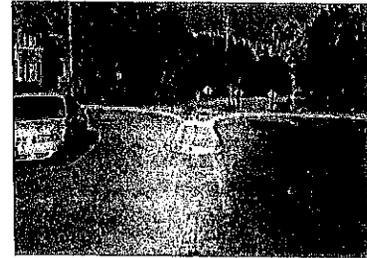
Eugene, OR - This half closure does not include a gap on the right side for bicycles, but rather is truncated to allow bicycles to pass on the left. This also allows enough width for fire and police vehicles to easily enter when responding to an emergency.



Combined Measures...



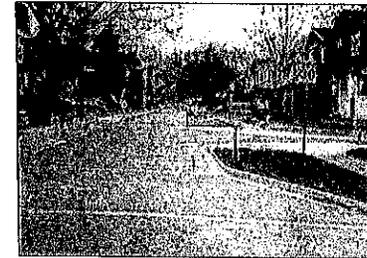
SPEED HUMP with CHOKER
Bellevue, WA



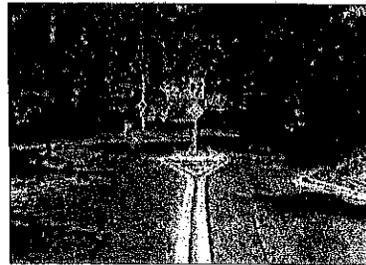
DVERTER - CLOSURE
San Jose, CA



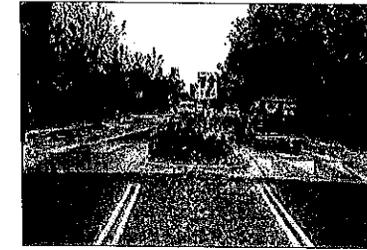
CENTER ISLAND with NECKDOWN
Eugene, OR



RAISED INTERSECTION with NECKDOWN
Toronto, Ontario



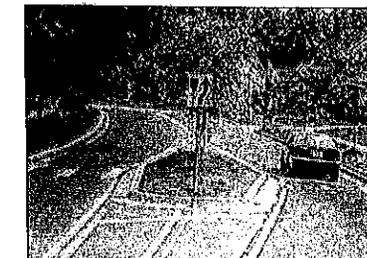
CENTER ISLAND with CHOKERS
Tallahassee, FL



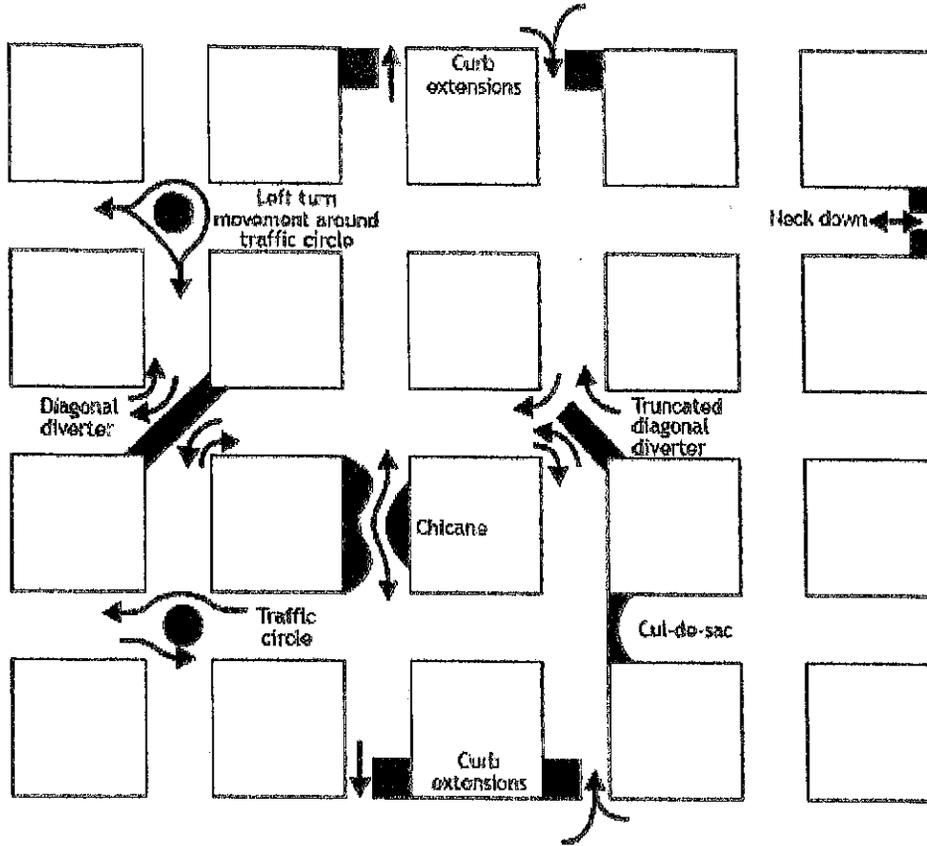
CENTER ISLAND with TABLES
Boulder, CO



RAISED CROSSWALK with CHOKER
West Palm Beach, FL



CENTER ISLAND with HUMPS
Montgomery County, MD





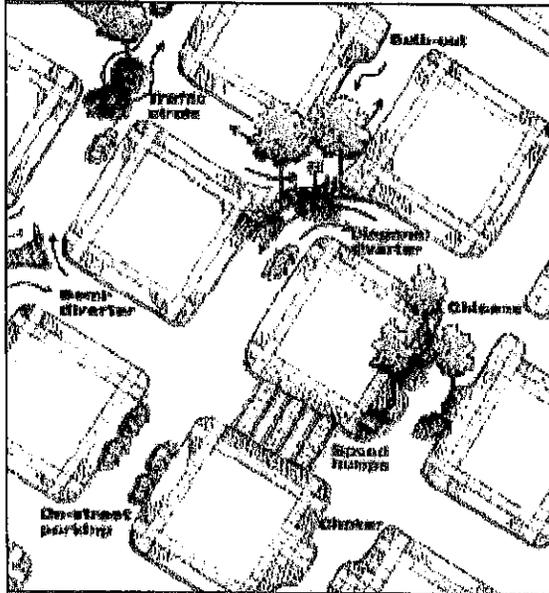
STEPHEN HOVANCSEK & ASSOCIATES, INC.

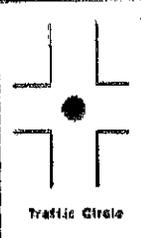
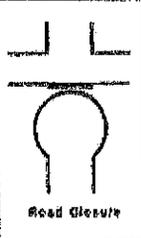
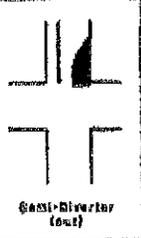
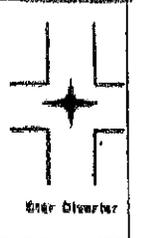
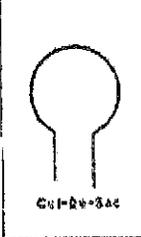
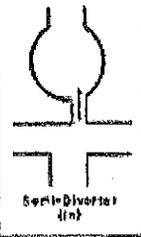
Consulting Engineers & Planners

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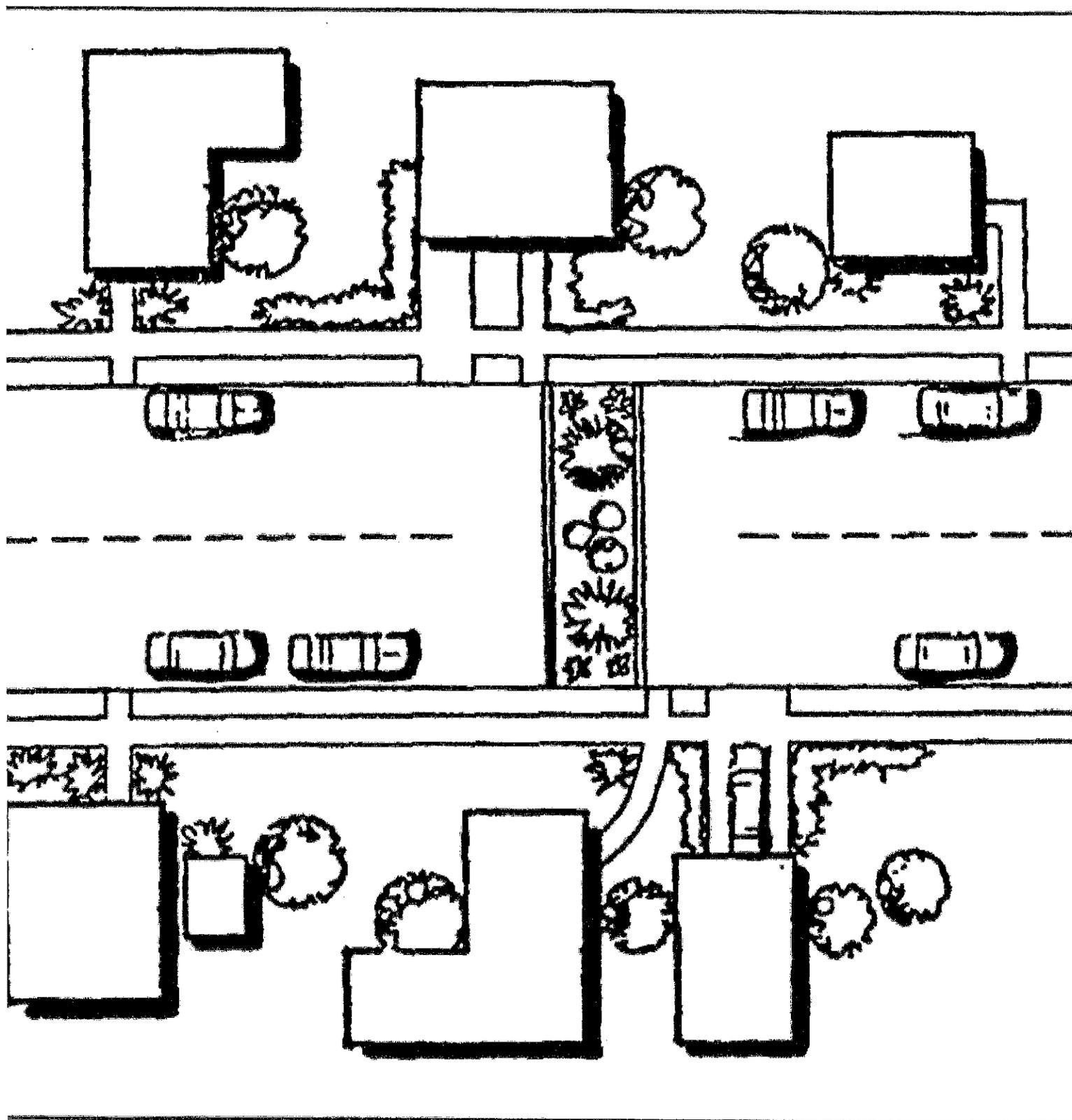
(216) 731-6255

FAX No: (216) 731-4483



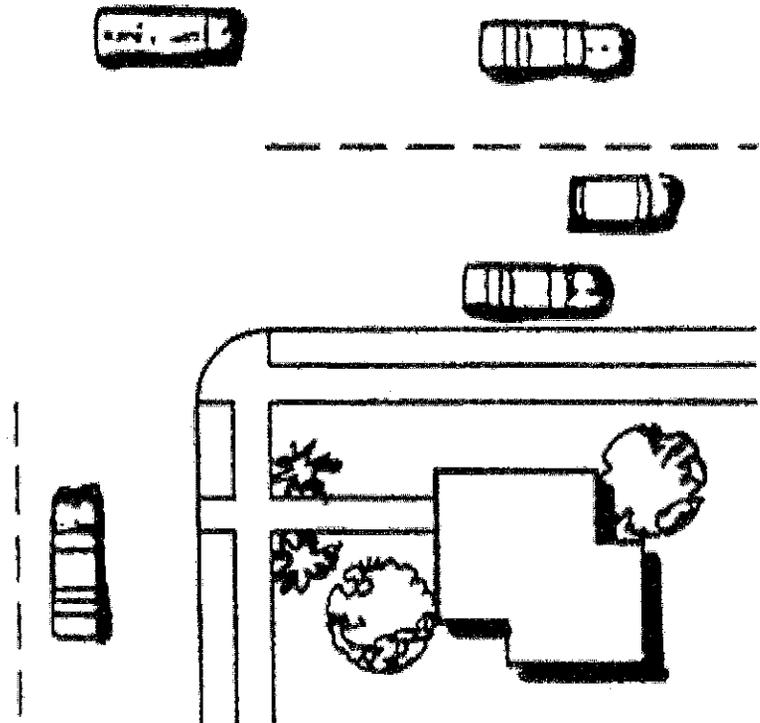
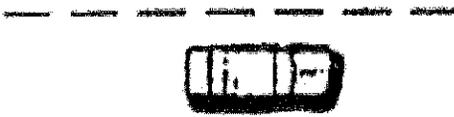
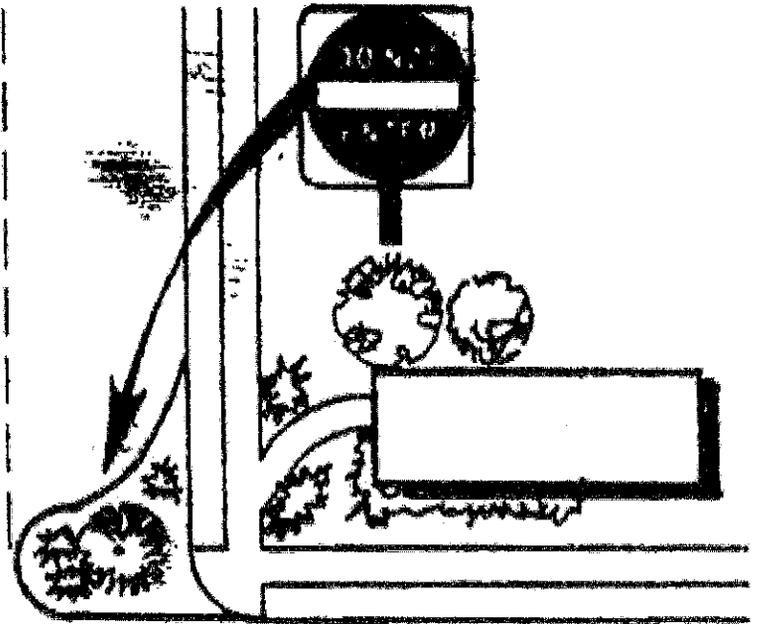
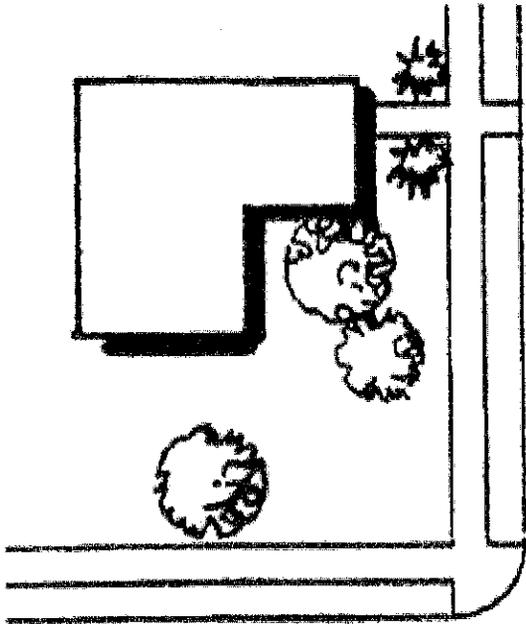
TRAFFIC CONTROL DEVICES			
 Traffic Circle	 Road Closure	 Semi-Diverter (out)	 Star Diverter
 Cut-Through	 Diagonal Diverter	 Semi-Diverter (in)	 Island Diverter
 One-Way	 Checker	 Right Turn Diverter	 Chicanes

FULL CLOSURES (cul-de-sacs, dead ends)

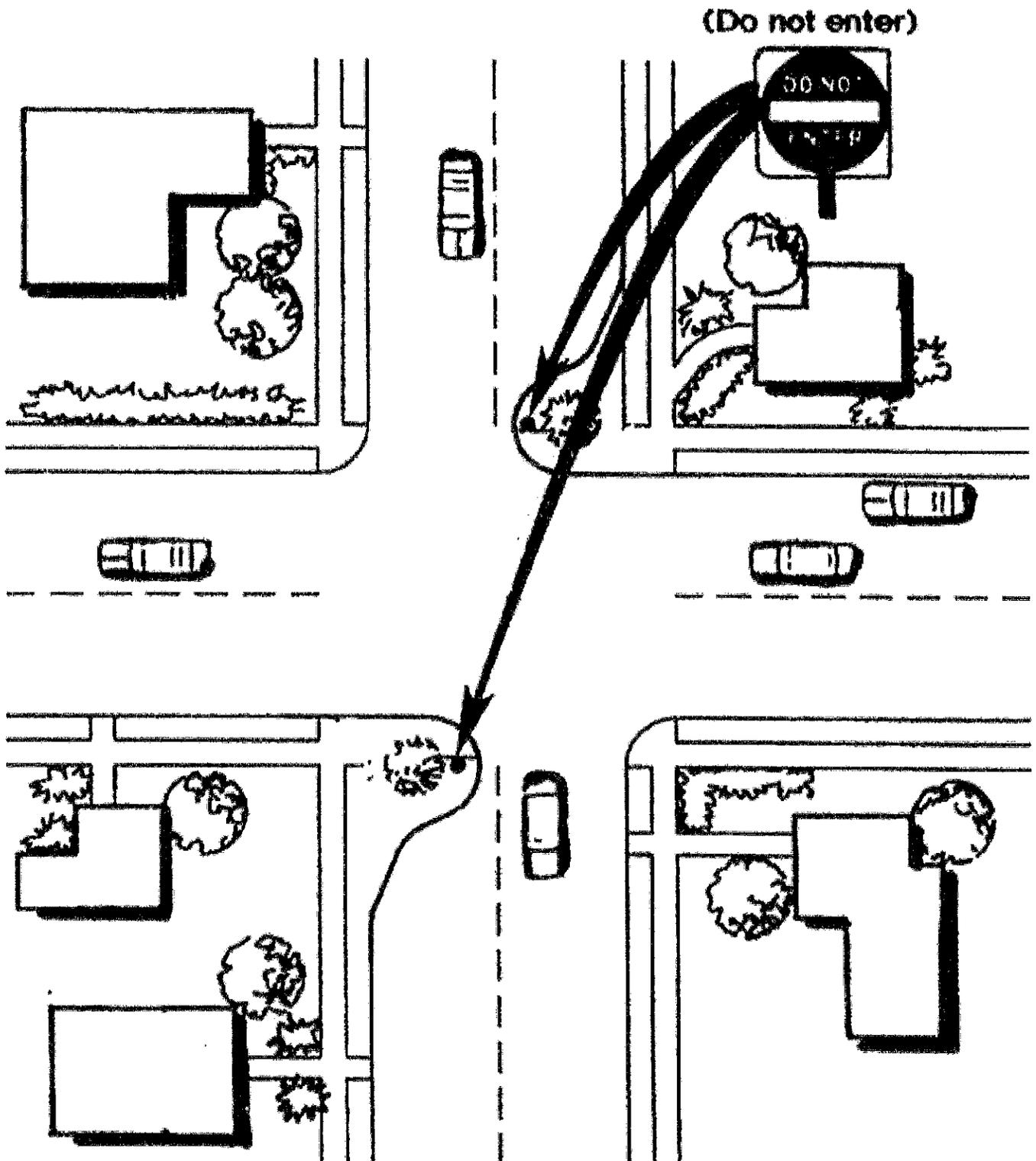


HALF CLOSURES

(partial closures, one-way closures)

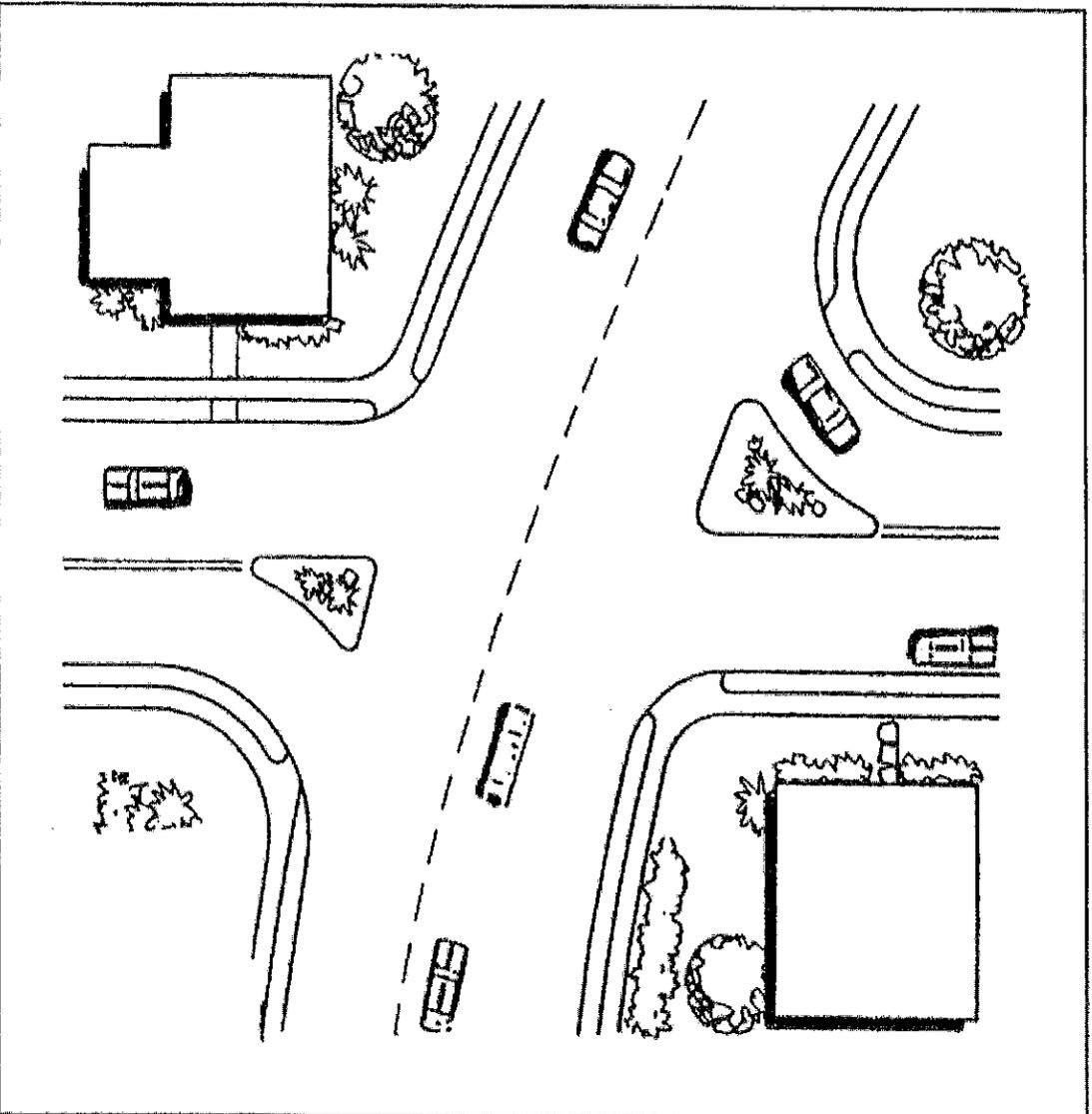


SEMI-DIVERTERS



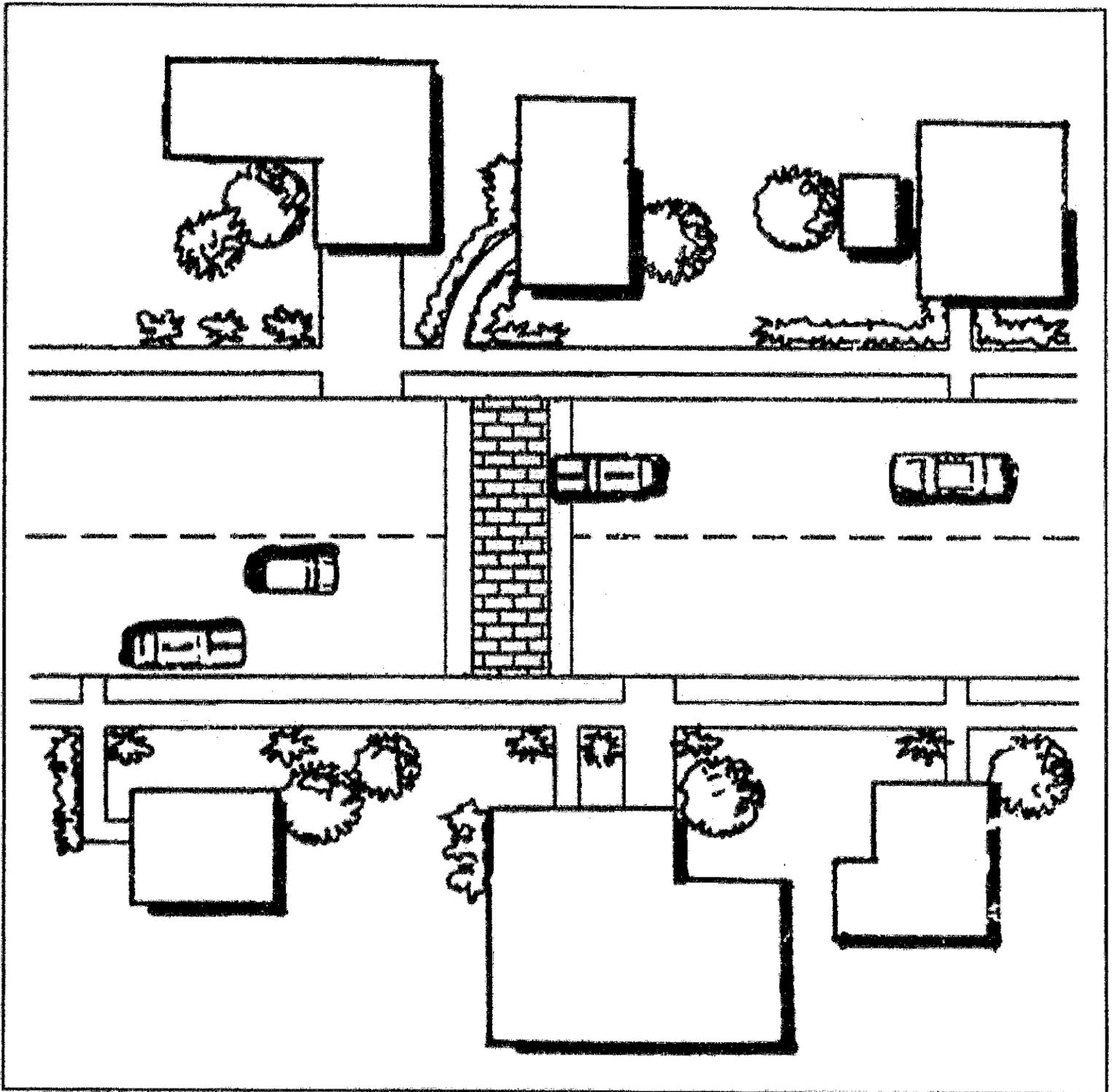
FORCED TURN ISLANDS

(forced turn channelizations, pork chops, right turn islands)

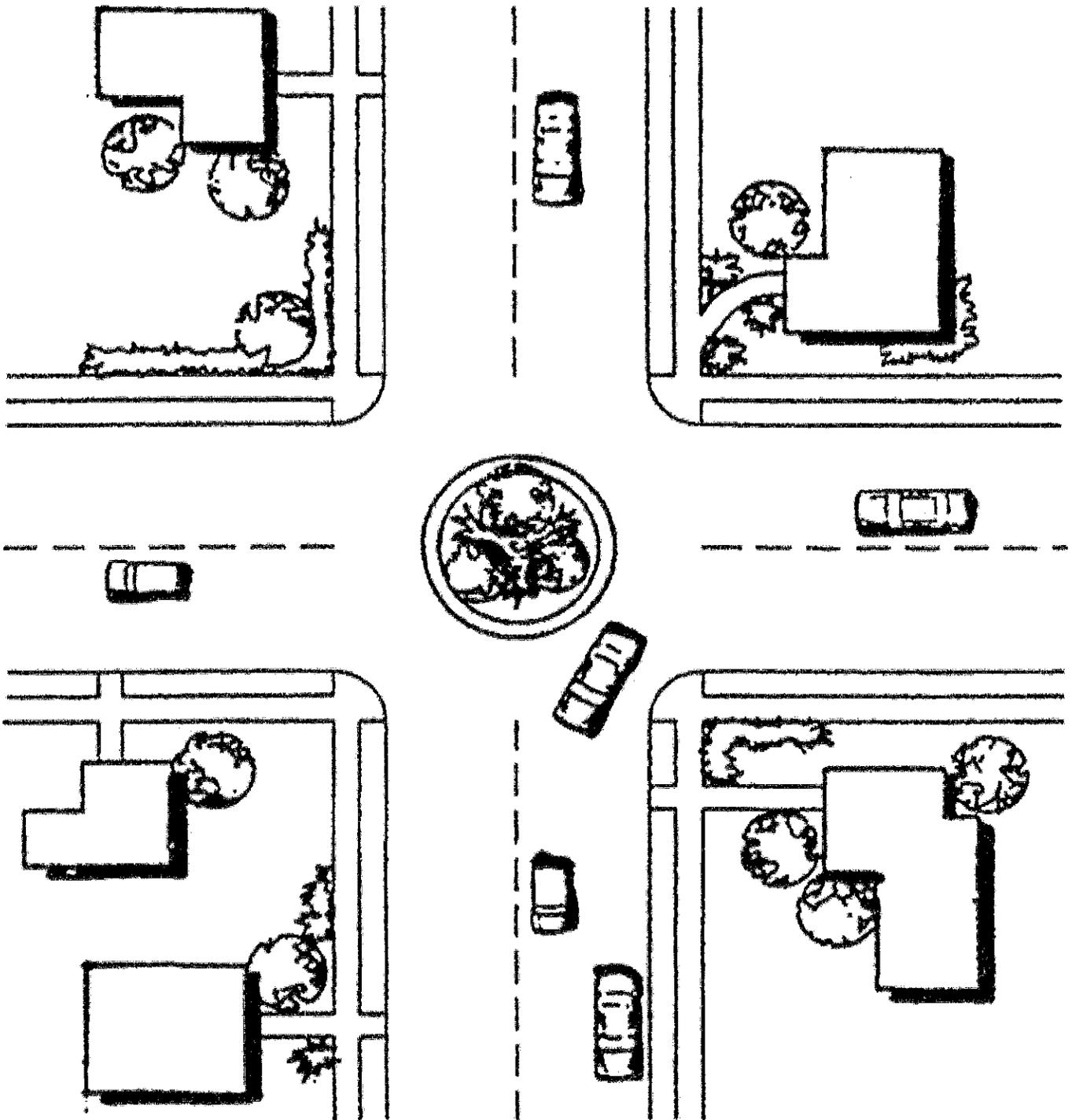


SPEED TABLES

(trapezoidal humps, speed platforms)

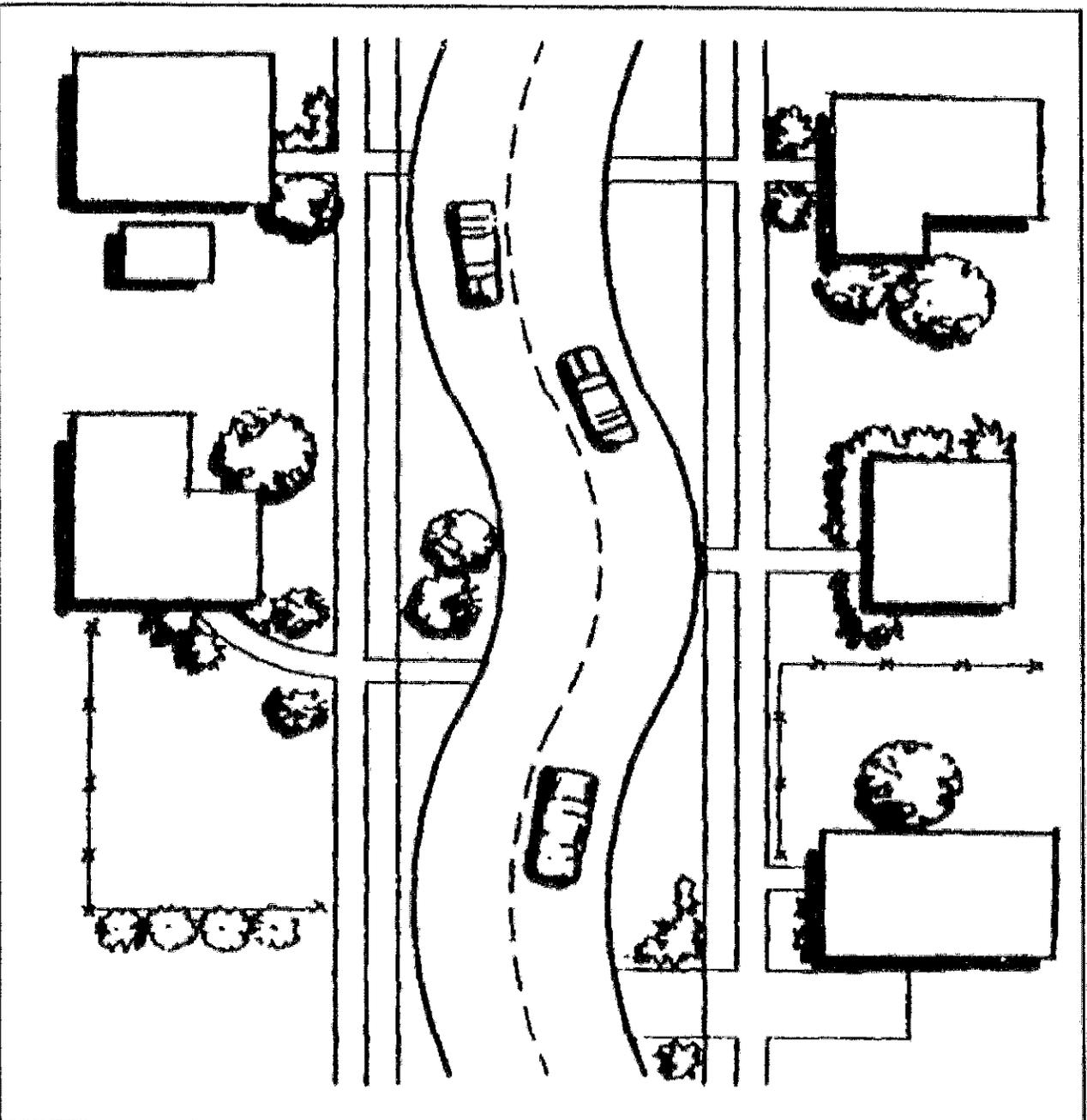


NEIGHBORHOOD TRAFFIC CIRCLES *(intersection islands)*



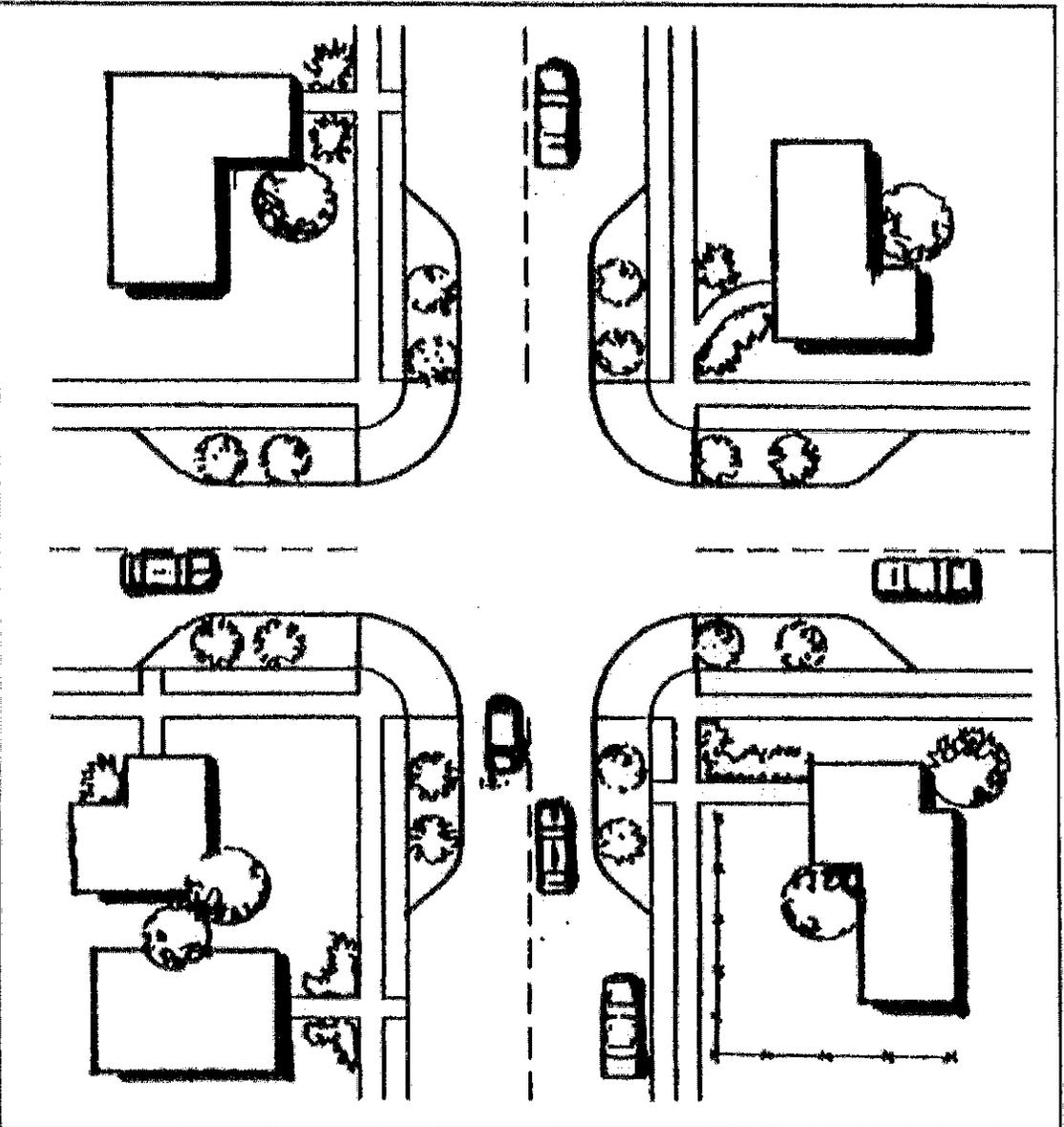
CHICANES

(deviations, serpentine, reversing curves, twists)



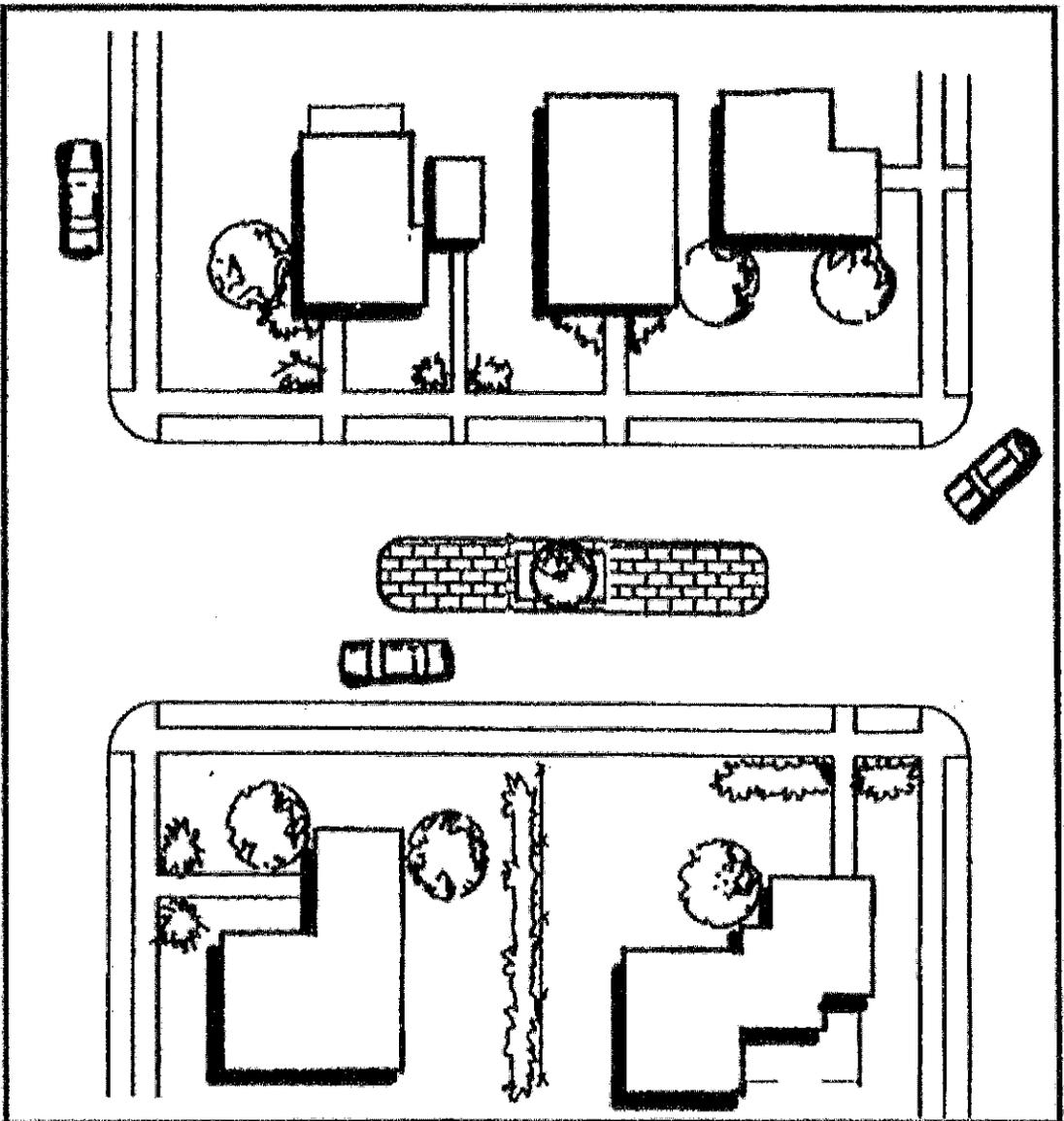
NECKDOWNS

lbouts, knuckles, intersection narrowings, corner bulges, safe



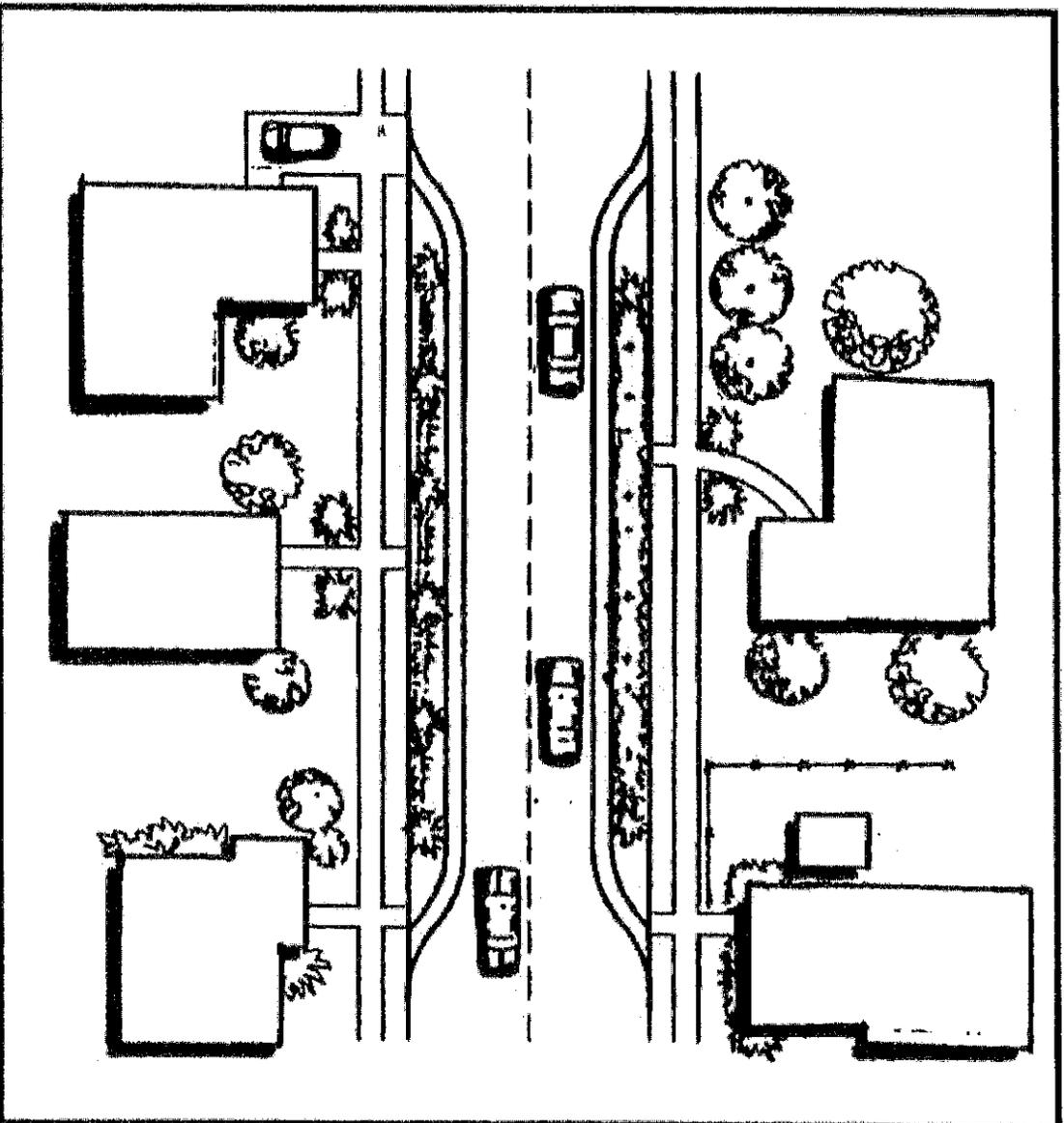
CENTER ISLAND NARROWINGS

(midblock medians, median slowpoints, median chokers)



CHOKERS

points, midblock narrowings, midblock yield points, constrict



**South Euclid
Oakwood Commons Traffic Impact Report**

Appendix C

Stonehaven Road

Traffic Diverters