Effects of physical barrier type devices on emergency service vehicles

Many of the neighborhood traffic control devices detailed in Chapter 3 pose potential problems for emergency and service vehicles by blocking their path or hindering their mobility. Devices of concern include diverters, semi-diverters, cul-de-sacs, circles, forced turn channelization, and median barriers. Primary concerns are for fire, police and ambulance services, and for private vehicles traveling in emergency situations. In addition, routine services such as public transit, school transportation services, delivery vehicles, refuse collection, and street and utilities maintenance operations can be affected. This section examines in detail the effects of traffic management devices on all of these operations. It also examines legal issues in traffic management.

Fire

Concerns for the impact of control devices on firefighting operations center on two elements: dispatching personnel and equipment to the fire (response) and maneuvering equipment at the fire site (extinguishment operations).⁶³
Response Times

Response time — the time between the start of a fire and the beginning of extinguishment — bears an extremely significant relationship to accomplishing lifesaving missions, the seriousness of property damage and the difficulty of extinguishment. Response time has three elements: discovery time, alarm transmission time and apparatus travel time. Very clearly, traffic management plans can affect travel time and travel opportunities of fire apparatus. Neighborhood traffic management plans, particularly ones with barrier devices, may:

- Force apparatus to longer, less direct routings. This can affect insurance ratings as well as increasing response time.
- Confine apparatus to the busier streets, exposing it to increased potential for significant congestion/delay and to increased potential for collisions with other vehicles.
- Lead to an apparatus ending up on the wrong side of a barrier from the fire. This can result from driver error in route choice or from error in initial reporting of the fire location. Significant time is lost in backtracking when this occurs, particularly when an apparatus has already been laying hose.
- Preclude the good practice of routing companies responding from the same station via parallel routes. Multi-route response is normally practiced so that a single traffic incident will not delay all companies responding.
- Lead to an entire area being temporarily inaccessible to fire apparatus. This can occur when barrier devices interrupt several residential streets, one or more episodal incidents (sewer and water hookups, street repair, tree pruning and the like) block other streets normally unimpeded, and traffic from the blocked streets jams the remaining open streets.
- Slow down heavy fire apparatus maneuvering through or around barriers.

Firefighting Operations

At the scene of the fire, barrier devices may:

- Particularly interfere with effective deployment of tillered aerial ladder apparatus;
- Interfere with access to water supply points;
- Complicate diversion of traffic away from the fire scene.

Counter Measures

It is possible that the potentially adverse effects of traffic barriers on response travel time can be offset by other improvements affecting travel time or discovery and alarm transmission. Some possibilities include:

- Signal preemption. Hardware permitting emergency vehicles to preempt traffic signals (thereby clearing the intersection approach of other traffic and quickly stopping cross traffic) is readily available. Its employment at all signalized intersections could cut response time along arterial and collector routes, offsetting increases caused by barriers on other streets.
- Improved detection. Reliable, low-cost combustion detection units are now readily available commercially. These are capable of significantly reducing detection time. A community considering a traffic management plan involving barriers could require installation of such detection units in all structures to offset increases in response travel time.
- Improved alarm transmission. Telephone and modern electronic signaling and retransmitting devices now in use in most urban areas have generally reduced alarm transmission time to the lowest attainable level. But in areas where the 911 universal emergency number call system is not yet operational, improvements are possible.

While the above possibilities hold some promise, the best approach might be to design a neighborhood traffic management system which would minimize its adverse impact on response and firefighting operations. Primary solutions include making barriers traversable, planning the neighborhood traffic management barrier system to minimize blockage of primary fire access routes and operations in the vicinity of potential multiple alarm fire sites, and providing additional fire hydrants where barriers com-
promise accessibility to existing fireplugs.

**Traversable Barriers**

Traversable barriers can be designed in many ways. Methods include open gaps in the barrier, emergency vehicle passageways guarded by mountable curbs, passageways guarded by flexible or breakaway materials, gaps guarded by raised traffic bars or "undercarriage preventer devices" and passageways guarded by automatic or manually operated gate devices.

Each of these measures has inherent problems. Any emergency vehicle gap must be kept free of obstruction. Instances of parked cars blocking emergency vehicle gaps are not infrequent. Unfortunately, with many of the devices located on the interior streets of residential areas, enforcement actions against such parking violations tend to be lax. Any emergency vehicle finding an expected gap blocked may be delayed more than if the barrier were an absolute one and the vehicle were routed around it initially. Vigorous enforcement of parking regulations at emergency vehicle openings is essential.

Barriers with open gaps (restriction of passage to emergency vehicles done by signs and markings only) are obviously subject to violation by other vehicles. This is treated in the following section on violations. But in terms of performance relative to emergency vehicle needs, open gaps rate highly. Seattle observed occasional problems where gaps were located near the curbline as parked cars complicated maneuvering through the space (though not blocking it). Positioning of emergency vehicle passages in the middle of the barrier appears advisable.

As an alternative to simply providing an open gap, some communities have placed mountable curbing across the emergency vehicle passage to discourage or slow motorists. Unfortunately, any curb which poses a somewhat formidable barrier to normal traffic is also a problem for emergency vehicles. If emergency vehicles attempt to take a raised curb at speed, the shock of crossing can lead to problems with wheel alignment, dislodge equipment and pose safety problems for the crew. It seems advisable where an emergency vehicle passageway is provided through a raised barrier device, that smooth ramps be constructed rather than "mountable
curbs."

Protection of emergency vehicle gaps by means of breakaway or flexible materials appears inadvisable. Breakaway barriers are equally permeable by vandals in private vehicles. And, debris from the breakaway material poses a hazard to firefighters riding on the exterior of the apparatus. Flexible plastic bollards have proven unsuccessful in several cities. Normal vehicles find them no deterrent to passage. And, while they do spring back to shape if subject only to infrequent passage, when subject to frequent violation they tend to become permanently deformed or break off. These materials are also an easy target for vandals. Some communities have placed raised traffic bars in the emergency vehicle openings. However, these did not pose much of a deterrent to drivers determined to violate the barrier. And, when the fire apparatus traverses them at speed, they tend to dislodge equipment and hazardously jolt firefighters, particularly those standing on the tailboard of the apparatus.

A few cities, notably Berkeley and Palo Alto, California, have employed an "undercarriage preventer" device in the emergency vehicle passage. As shown in Figure 8, this is a wooden or concrete block, usually about 3 foot (1 meter) wide, 6 inches (.2 meters) thick, raised about 6 inches (.2 meters) above the surface of the emergency vehicle passage. In theory, emergency vehicles are higher slung than most vehicles in normal public use. By measuring the underbody clearance of all emergency vehicles in use in a community, the projection height for the undercarriage preventer device which will allow emergency vehicle passage but discourage other vehicles can be selected.

In practice there are problems. A projection height which can be cleared adequately on a flat roadway surface can cause the same vehicles to bottom-out when the device is placed on a crowned contour. Because crowns vary substantially and the tolerances of concern are small, projection height must be determined on an individual site basis. Some emergency vehicles, particularly some police and fire chief's cars, differ little in underbody clearance characteristics from the vast majority of automobiles in normal use.* Conversely, virtually any private truck and some common high-slung automobiles can clear almost any undercarriage preventer that fire apparatus can clear. So the undercarriage preventers are not wholly effective. The section on violations presents some data on effectiveness of the undercarriage preventer in deterring normal traffic.

Gates automatically opening for emergency vehicles have proven problematic. In one Berkeley barrier on the immediate egress route of a fire station, a heavy duty parking lot type gate which opened upon radio actuation from all emergency vehicles was employed. Unfortunately, it proved so highly susceptible to vandalism (it needed repair on the average of once to twice per day), that it was removed after a brief period and an undercarriage preventer was substituted. Yet a similar type gate used for a similar purpose on the campus of the University of California at Davis has functioned well for many years. Radio or electronically actuated devices using even heavier duty gates and opening mechanisms — such as an adaptation of railroad grade crossing protection gear — may be more resistant to vandalism, but involve considerably more installation cost than a simple parking lot gate.

Manual devices in which the emergency vehicle operator dismounts to unlock and open a gate or remove a retractable bollard have been in use in vehicle free zones in many areas for numbers of years. Because of their simplicity, they are not particularly subject to mechanical failures and are resistant to vandalism. However, while they work acceptably in a simple situation of providing emergency access to individual blocks, they are less satisfactory in a situation where an emergency vehicle is simply attempting to traverse the block they protect. At each barrier encountered, the vehicle has to come to a full stop while someone dismounts, unlocks and opens the device and reboards. This can be unacceptably time-consuming, particularly if more than one device is encountered on a response route. Such manual "gates" are much more acceptable for

*In the long term, replacement purchases of emergency vehicles with suitable undercarriage clearance can alleviate this problem.
purposes of service access than they are for emergency vehicle accessibility.

**Planning Considerations**

The potential for traffic management plan interference with fire apparatus accessibility and firefighting operations can be minimized through good planning efforts such as:

- Developing traffic management plans which meet neighborhood objectives without placing barrier-type devices on the main egress routes from fire stations.
- Using semi-diverters or one-way street mazes in preference to full barrier treatments where strong traffic control devices are necessary on primary fire station egress routes. So long as the sight distance is good, operation of the fire apparatus the "wrong way" around a semi-diverter or on a one-way street is a generally accepted practice.
- Minimizing the use of full barrier treatments in close proximity to potential multi-alarm fire sites — multi-story apartment buildings, places of public assembly, etc.
- Minimizing problems of accessibility to water supplies by installing new fire plugs on the "dry side" of any barrier device which does not have an emergency vehicle opening. Typical current costs for installation of additional hydrants and laterals is about $2,000 per unit.

**Police**

Concern for the effects of barrier type devices on police functions centers on four topics: (1) Barriers make it more difficult for police to patrol a given area thereby decreasing police surveillance. As a natural reaction, individual patrol officers may tend to avoid regular patrolling of areas which become relatively isolated by barriers. These factors might be expected to load to increase in certain types of residential crime. (2) Barriers tend to hamper patrol car pursuit of motorcycles, mopeds, bicycles, and suspects fleeing on foot. (3) Use of large numbers of barriers in the city as a whole or in one or several adjoining neighborhoods could adversely affect police response to emergency calls. (4) The ability to use streets paralleling arterial and collector routes as an alternate route in cases of blockage due to fires, construction activity or special events traffic is a police concern.

Available information, however, lends minimal support to these concerns. For instance, relative to the patrolling issue, studies in Minneapolis, Minnesota have demonstrated that blocks with lower accessibility (characteristic of situations where diverters and cul-de-sacs are employed) tend to experience less residential crime than blocks with higher accessibility exposed to similar crime-related social variables.

In Berkeley, California nearly 70 cul-de-sacs and diagonal diverters have been deployed along with numerous semi-diverters, circles and other neighborhood traffic control devices. Comparison of residential crime statistics before and after plan implementation lends no support to the hypothesis that neighborhood traffic management would lead to greater crime rates due to inhibited police patrolling.

Experience with their neighborhood traffic management barriers gives slight support to the notion that the barriers would pose significant obstacles to "hot pursuit" situations. There have been incidents where a barrier has been a factor in a pursuit situation, but in over two years of experience in Berkeley there is no instance in which Berkeley police attribute traffic barriers as the cause of failure to capture a suspect. Rather than hot pursuit, police feel the most interference is with "block covers" (where a suspect is believed contained within a residential block), particularly when they attempt to shift the cover from one block to another in response to movements of the suspect. However, no data is available on this phenomenon.

Berkeley patrol officers are convinced that traffic barriers interfere with their ability to respond quickly to emergency calls. But before and after data compiled by the police department indicates that the presence of barriers and other traffic control devices placed in the neighborhood traffic plan did not have any significant impact on overall police response time. Difficulties in using barred streets as detour routes have been experienced in Berkeley. One difficulty in such situations has been the failure of community service officers to take advantage of
design features enabling quick disassembly of the barriers for passage of emergency detoured traffic.

**Ambulance services and private emergency travel**

Strategies in dealing with ambulance services in neighborhood traffic management plans are similar to those for fire apparatus. The placement of barriers on the immediate egress routes of ambulance operating bases and on the immediate access routes to hospital emergency rooms and emergency clinics should either be avoided, or the barriers should have emergency vehicle passageways suitable for ambulances. These provisions plus providing good public information on the location of any barriers not physically traversable by private automobiles and signing of unobstructed hospital access routes are the primary measures which can be taken to facilitate emergency travel in private vehicles.

**Refuse collection and deliveries**

Regularly routed vehicles for milk deliveries, postal service, refuse collection and the like can have their routes adjusted to operate in an efficient and continuous pattern within the constraints imposed by a system of barriers. Only cul-de-sacs significantly decrease efficiency by forcing vehicles to back-track over previously covered ground. For non-regular unrouted deliveries (such as delivery of a large household appliance), the barrier scheme poses more of a problem by presenting a confusing street pattern to drivers unfamiliar with the arrangement in each neighborhood. A remedy for this situation is for the city or possibly the Chamber of Commerce to distribute maps detailing the barrier pattern to all businesses making frequent deliveries in the city and to provide warning signs in advance of those blocks on which barriers are deployed.

Since public transit service normally operates on arterial and collector streets unobstructed by barriers, minimal interference to these operations is generally inherent. Where signs and other control devices restrict vehicular movements, transit vehicles may be excepted by sign notice. Barrier systems may pose more of a problem to paratransit vehicles, dial-a-ride operations and school bus operations which tend to travel to some extent on the residential street system. Careful design of the barrier system with respect to school bus operations tends to minimize interference although some relocation of pick-up points may be necessary. Dial-a-ride, and other paratransit uses can adjust their operations in much the same manner as regular deliveries and are likely to be minimally impacted by barriers.

**Maintenance**

Barrier devices' interference with normal maintenance operations is typically minor. Northern cities have reported that diverters, cul-de-sacs and speed bumps complicate removal operations in heavy snow conditions. In Berkeley, where sewage system manholes are typically located in the center of intersections, diagonal diverter barriers must periodically be temporarily disassembled to allow for normal operation of sewage system flushing equipment. Diverse examples of similar kinds of problems have been reported; none are of a particularly serious nature. The essential point is that potential impacts on maintenance be considered in the planning stage so that appropriate adjustments can be designed, or cost impacts of operational changes can be assessed.

**Violations of traffic barrier devices**

Barrier devices by their very nature frustrate motorists and create a considerable level of driver resentment. Drivers find their favorite neighborhood shortcuts closed off and are forced to use less direct and perhaps congested arterial/collector routes. When they attempt to visit friends in the protected neighborhoods,
they may become confused and disoriented by
the barriers. They may naturally feel that the
residents of the protected neighborhood have
created an elitist situation for themselves at the
driver's expense. Occasionally residents of the
protected neighborhoods, who are personally
insensitive to traffic problems and find their
accessibility less convenient, react to the bar-
riers from a driver's rather than from a resi-
dent's viewpoint.

Naturally, some drivers respond to barriers
with behavior that reflects their resentment. A
few resort to vandalism, but more prevalent be-
behavior is violation of the device itself. While
there is an inherent tendency for some drivers to
violate barriers, the actual extent to which this
occurs is dependent on how physically easy it is
to violate the barrier, the amount of advantage
the driver gains by this versus exercising other
options, and general expectations regarding en-
forcement and the consequences of being
caught in violation.

These factors all interact with one another so
that it is difficult to generalize likely percent-
ages of violation for various forms of devices.
However, a few noteworthy points can be made.
Barriers with open paved gaps, such as semi-
diversers, or diagonal diversers and cul-de-sacs
with unprotected emergency vehicle passages
are obvious targets for violation.

But in Berkeley, California where some 70 di-
verters and cul-de-sacs have been deployed as
part of the city's areawide neighborhood traffic
management plan, barriers with open emer-
gency vehicle passages experienced violation
levels on the order of five to seven percent of the
traffic formerly using the street.²¹ This level of
violation is a source of irritation to residents and
to the majority of motorists who do obey the de-
VICES; but it is clear that even with an emergency
vehicle gap easily traversed by normal vehicles,
the barrier is highly effective in reducing
through traffic volume on the streets where it is
employed.

Counts of violations of emergency vehicle pas-
sages protected by undercarriage preventers in
Berkeley showed no significant differences in
the rates of violation than that experienced at
barriers with open emergency vehicle pas-
sages.²¹ However, this observation is somewhat
misleading, since the city employed the under-carriage device only at locations where open gaps were initially observed to have high rates of violation. Unfortunately, no recorded data is available to contrast violation experience at individual sites before and after installation of the undercarriage device.

The same violation rate is probably typical for barriers with paved passages guarded by mountable curbs. Where diverters and cul-de-sacs have no paved passage ways but traversal is not physically precluded by strong deterrents (bollards, guard rails, sturdy plant growth, berms and other landscaping details), violation rates tend to be below quantifiable levels. Though infrequent, they still occur often enough to be a concern, particularly because of damage done to landscaping. Occasional violators will even traverse sidewalks and private lawns to avoid a barrier. Metal or wooden bollards should be positioned to preclude these incursions.

Devices or combinations of devices which tend to entrap motorists inside neighborhoods are ones most likely to be violated, particularly by persons encountering them for the first time. For this reason there may be a tendency toward higher violation rates for cul-de-sacs and mid-block closures unless they are designed to be violation proof. For similar reasons, semi-diverters which prohibit exits from a block rather than entries to it are to be avoided. High violation rates can also be expected at sites where the alternative route involves significant out-of-direction travel or passage through heavily congested streets and intersections. Violations of barriers on interior neighborhood streets is more likely than for those on the periphery. At interior locations, drivers have already committed themselves to a neighborhood shortcut and will have to back-track to comply with the barrier device. Furthermore, at interior locations there is a lessened expectation of police surveillance and enforcement. On the other hand, drivers tend to expect a higher probability of surveillance and enforcement and usually can continue their journey on arterial and collector routes without backtracking if the device is at the periphery of the neighborhood. The best way to avoid violation problems is to landscape the device so well that the roadway on the other side is hardly visible and looks as if there never had been any connection between the two street segments separated by the barrier device.

Legal considerations

The basic justification for neighborhood traffic management stems from the fundamental justification for all traffic laws, ordinances and controls — that streets and highways should provide expeditious and reasonably safe service to all legitimate users and uses and that users and uses should not be killed, injured or frustrated by improper behavior of others. Since local residential streets are intended to serve a broader range of users and uses than other functional classes of streets, it is natural that more specialized controls may be needed to ensure satisfactory performance. More specific legal justification for neighborhood traffic management has been provided by the U.S. Supreme Court (County Board of Arlington County, Va., Et Al. v. Rudolph A. Richards, Et Al, No. 76-1418, Oct. 11, 1977) in a case involving an Arlington County, Virginia resident-preferential parking program. Beyond specifically upholding resident-preferential parking in the Arlington County case, the court added the broad finding that communities “may decide that restrictions on the flow of outside traffic into particular residential areas would enhance the quality of life thereby reducing noise, traffic hazards and litter.” While the Supreme Court ruling appears to affirm basic legal grounds for neighborhood traffic management, a remaining legal issue of concern is that of conformance with the Manual on Uniform Traffic Control Devices and the several parallel control and design manuals issued by individual states. The following considerations are relevant to this concern:

- Many of the devices used for neighborhood traffic restraint purposes are standard traffic devices well recognized in the manuals and applied in quite standard ways. Included among these are one-way streets, turn prohibition signs, DO NOT ENTER signs, mandatory turn signs and markings, median barriers and channelization. There are no unusual legal problems with these devices.
There have been legal challenges to diverters, semi-diverters and retrofit cul-de-sacs on the grounds that they are not recognized traffic control devices. In simple fact, measures loosely called "control devices" in this report are actually not traffic control devices in the strict sense. Some, like circles, semi-diverters, forced-turn islands and median barriers are forms of channelization, a recognized and commonly practiced traffic engineering treatment to guide or prevent specific vehicular movements. Others, like diagonal diverters and cul-de-sacs, are geometric features of the road. They are retrofitted to be sure, but in this they are not unlike a change in a highway alignment made to take it over a new bridge or different from features which would be routinely accepted in the design of a new residential subdivision. These "geometric features" place certain areas outside the traveled-way and are marked and delineated by standard traffic control devices and traveled-way edge treatment. This is obvious in the case of permanent physical treatments delimited by raised curbs. When physical "devices" are constructed of temporary materials like bollards, planter boxes and the like, this point is less obvious. The area in which they are placed must be clearly marked with the appropriate pavement markings (as well as by appropriate signs, delineators and object markers) for proper driver guidance. The bollards, posts or other materials should be clearly outside the traveled way and placed there to discourage or prevent vehicles from traversing that area — not to delineate the traveled way themselves.

Some traffic engineers feel restricted from using any traffic control device not explicitly approved in the Manual on Uniform Traffic Control Devices or in parallel "approved" listings of state jurisdictions. Some feel that these manuals define the totality of good traffic engineering practice and anything not in the manuals is de facto, not good practice. Others, while not necessarily believers in the rigid position above, are concerned about exposure to a liability burden if a unique or non-listed device becomes the subject of litigation following an accident to which the device was in some way related. These are misconceptions. The MUTCD and parallel state manuals are intended as standards to ensure nationwide consistency in good traffic engineering practice, not as substitutes for sound engineering analysis and judgment nor as shields behind which officials wishing to avoid problems may hide. Both the way in which the MUTCD is officially managed and evolved and the actual day-to-day practice of traffic engineering belie the rigid application argument. The MUTCD itself and the Federal Highway Administration (FHWA) which oversees it recognize that the manual is not an all-encompassing document. Advances in understanding and/or technology lead to new methods of control, new devices and techniques must be added to cover areas not adequately treated or not addressed in the past (controls related to bicycle facilities are a good example of this) and rather unique situations may require special treatment or some deviation from normal practice. For these reasons, the Manual sets forth procedures by which changes in it can be brought about or through which interpretations and approvals for use of devices as an alternative to manual-specified devices or approvals for experimentation may be granted. States, local jurisdictions and even individuals may petition the Federal Highway Administrator. FHWA attempts to be responsive to petitions and has minimal formal application requirements. Requests for using new devices or methods should indicate why a device

*Bollards, planters and other landscape materials in the devices under discussion are not intended as or in physical performance similar to guardrails and barriers used as safety devices. That is to say, they are not meant to deflect or constrain cut of control vehicles from crossing medians or colliding with roadside obstructions. Rather, they are employed to discourage willful traversal of the area outside the traveled way. This parallels the use of fencing and some guardrail on limited access highways to prevent independent-minded drivers from creating their own access at points where interchanges are not provided. Considering that these features outside the traveled way are not intended as and may not perform like safety guardrails, it is imperative that roadway geometrics at these locations be adequately delineated and marked by appropriate centerline, edge and advance warning treatments.
or procedure from MUTCD should not be used, advantages of the proposed procedure or device, any data showing why the proposed device is considered the solution and procedures to be used in any field experiments with the proposed device. Traffic engineers are urged to make application to FHWA or, as appropriate, through similar channels for the various state manuals. This brings experiences and new solutions to the attention of others and thereby broadens, changes and improves the practice of traffic engineering as a whole.

However, in actual practice traffic engineers often find “official” review too time consuming, remote, perhaps even intimidating, and usually out of scale — making a mountain out of a molehill — in relation to the immediate situation they are addressing. In these circumstances many, even some who on other occasions will cite the MUTCD as reason for not taking action on neighborhood traffic problems, will rely upon their own analyses, judgment, ingenuity and application of fundamental traffic engineering principles to develop solutions and will implement them routinely without seeking “official” review.

When traffic engineers deviate from recognized practices or implement new types of controls without seeking official sanction, they should themselves take the steps outlined below which in fact parallel what would be done more formally in making a request for an official request for change, experimentation or interpretation.

1. Carefully measure and document existing conditions and identify a valid traffic control need.

2. Demonstrate the fact that “approved” control devices were considered first and demonstrate substantive rationale for finding the “approved” devices non-responsive to the problem (or that a “novel device is significantly more responsive).

3. Documents a process in which sensible engineering and design methodology and principles were used to arrive at a reasonable “solution” (i.e., the non-listed or unique device) to the problem.

The words “sensible methodology and principles” and “reasonable solution” are important here. Obviously a solution which directly conflicts with the fundamental principle set out in the control and design manuals and other documents of good engineering practice is neither sensible nor reasonable. On the other hand, a device or measure which is in substantive conformity with the control manuals and design guidelines, though perhaps not explicitly presented in them, a device which builds upon and extends fundamental engineering principles usually is sensible, reasonable and good traffic engineering.

As an aside to the foregoing, the history of numerous and widespread public complaints of neighborhood traffic problems and demands for action and traffic engineers’ frequent inability to provide satisfactory responses are prima facie evidence that the MUTCD and parallel traffic control and design manuals can possibly evolve to define further measures addressing local residential street issues. It is hoped that this “State-of-the-Art Report” will be a step in gaining “official” recognition of devices and measures and in standardization of practices for neighborhood traffic control. Devices like diverters, semi-diverters and retro-fit cul-de-sacs are now pervasive enough that they should be given treatment in traffic control and highway design manuals* whether considered “controls” or “geometric features.” The fact is that these and many other devices are now being widely used for neighborhood traffic control. Some devices which appear to be inherently useful, occasionally do not perform properly because traffic engineers, in the absence of authoritative guidance, sometimes use inappropriate materials in their construction, inadequately sign and mark them, make poor geometric design decisions or follow inadequate installation criteria. In other cases, due to the absence of proper guidance, officials have re-

*The 9th edition of Fundamentals of Traffic Engineering, for one, does treat this subject matter.
sorted to clearly inappropriate and ineffective controls. Traffic engineers are increasingly finding it appropriate if not being forced to control and limit residential street traffic. It is time that good practices and appropriate devices for this purpose be given explicit recognition in fundamental traffic engineering manuals and guides.

There are other legal issues of concern other than those related to the MUTCD. In most states, rigid conditions for abandonment of public right-of-way and procedures for doing so are specified by statute. In Berkeley, where the unfortunate term “closure” was used to describe cul-de-sacs, a court suit contended that the cul-de-sacs were an illegal abandonment of public right of way. The City’s counter argument is that cul-de-sac streets are not closed or abandoned — anyone can walk on them, ride bicycles on them and drive motor vehicles on them; every property on the cul-de-sac streets is directly accessible by motor vehicle; the streets are in use; they simply are not useful to thru traffic. While this argument seems persuasive, particularly in light of the fact that streets initially built as cul-de-sacs are not considered closed, abandoned or non-public; the case is still under adjudication. Another contention in this Berkeley case is that the City’s employment of diverters, semi-diverters, cul-de-sacs and other devices to reduce traffic on some streets while forcing it onto others constitutes a capricious abuse of the City’s authority. While the U.S. Supreme Court decision referenced above appears to clearly uphold the authority of local jurisdictions to undertake neighborhood traffic management, this Berkeley suit reinforces the need that traffic management plans be developed, justified and have their impacts assessed in a well-reasoned planning process.