

Part IV
ISLANDS

A.—GENERAL CONSIDERATIONS

Section 4A-1 Functions of Islands

A traffic-control island is a defined area between traffic lanes for control of vehicle movements or for pedestrian refuge. Within an intersection area, a median or an outer separation is considered to be an island. An island may be designated by paint, raised bars, mushroom buttons, curbs, guideposts, pavement edge, or other devices. For the purposes of this Manual, an island includes not only the designated area but also all end protection and approach-end treatments.

It should be realized that islands constitute an integral part of the geometric design of streets and highways and should be included in overall projects for construction. At times, however, an island may have to be installed at an existing intersection to improve or correct an outdated design. This Manual primarily treats the traffic-control characteristics of islands rather than their design features; however, certain minimum standards are suggested. The treatment of islands herein applies largely to urban and suburban installations which are usually located in relatively restricted roadway or intersection areas. For guides to street and highway design, including the design of islands, reference should be made to *A Policy on Geometric Design of Rural Highways*, 1954, and *A Policy on Arterial Highways in Urban Areas*, 1957, both of which have been adopted and published by the American Association of State Highway Officials.²⁸

4A-2 Classification

Islands may be classed functionally and physically as follows:

1. Pedestrian refuge islands (secs. 4B-1 to 7). Loading islands are considered to be a special form of refuge islands (sec. 4B-7).
2. Traffic divisional islands (secs. 4C-1 to 6).
3. Traffic channelizing islands (secs. 4D-1 to 6).

²⁸ Available from the American Association of State Highway Officials, 917 National Press Building, Washington 4, D.C.

Illustrations of refuge, divisional, and channelizing islands are shown in figures 4-1 to 4-3.

Pedestrian islands are provided to serve as safety zones for the aid and protection of persons on foot. The right of a pedestrian to occupy a pedestrian island in safety is commonly sustained by law. A safety zone is defined as an area within a roadway, officially set aside for the exclusive use of pedestrians. The Uniform Vehicle Code, (sec. 11-1304), prohibits a motor vehicle from entering a safety zone at any time.



Figure 4-1. Pedestrian refuge island with walk-through crosswalk. Approach-end treatment consists of pavement markings and a reflectorized sign.



Figure 4-2. Turf median outlined by a mountable curb in a suburban area. Approach-end treatment consists of painted lines on the pavement, painted curb, and a reflectorized sign.

Traffic islands include all areas created for separating and directing vehicular traffic. They may be either channelizing or divisional. Divisional islands serve to divide opposing or same-direction traffic streams that are usually through movements. Channelizing islands are designed to control and direct traffic movement, usually turning movements.



Figure 4-3. Channelizing islands at a signalized Y-intersection. Concrete curbs delineate the island edges. Mushroom buttons separate a left-turn lane from the through lanes.

Most islands serve two or all of these functions. Divisional islands at intersections, for instance, nearly always serve as pedestrian refuge islands. Refuge islands located on an otherwise undivided street also function as divisional islands. Except for features and criteria that apply to all islands, each function is discussed separately in this Manual.

4A-3 General Design Elements

The necessity for an island should be determined only by careful study, since it is placed in an area that would otherwise be available for vehicular traffic. The island design should be carefully planned so that the shape of the island will conform to natural vehicular paths and so that a raised island will not constitute a hazard in the roadway. A judiciously placed island at

an intersection on a wide street may eliminate the need for traffic signal control by channelizing traffic into orderly movements.

The island should be clearly visible at all times and sufficiently in advance so that the motorist will not be surprised by its presence. The island should occupy the minimum of roadway space needed for its purpose and yet be of sufficient size to be noticeable so that motorists will not be likely to run over it. As governed by the design and traffic conditions, the delineation, illumination, reflectorization, signing, and marking for each island should be as recommended in this Manual.

Size and shape.—Islands are generally either narrow and elongated or triangular in shape, are normally situated in areas of the roadway outside the planned vehicle paths, and are shaped and dimensioned as component parts of the street or intersection layout. The actual size differs as governed by site conditions, but the following minimum size requirements should be met to insure that the island will be large enough to command attention. For rural conditions any island should preferably be at least 75 square feet in area, or at least 50 square feet for very restricted conditions. For urban conditions where speeds are low, corresponding values are 50 and 35 square feet. The latter corresponds to a triangular island of about 6-foot dimension between rounded ends on each leg. An elongated island with a minimum width of 4 feet should preferably be at least 20 feet long, and in no case less than 12 feet.

Designation of area.—The form or means of designating an island area varies, depending on its size, location, and function, and also the character of the adjacent area, rural or urban. Generally, islands are delineated by one of the following methods: (1) raised and outlined by curbs and filled with pavement, turf, or other material; (2) formed by pavement markings, buttons, or raised bars on all-paved areas, used in urban districts where speeds are low and space is limited; or (3) unsurfaced, flush with the traveled way, sometimes supplemented by guideposts, stanchions, or other delineators, used for large islands. Island areas of minimum size should be designated by pavement markings, buttons, or raised bars. Small island areas should be designated by vertical curbs when used for pedestrian refuge or for the installation of traffic control devices. Large island areas should be designated by curbs, either mountable or vertical, or by color and texture contrast of vegetative cover, shrubs, mounded earth, guideposts, or signs, or any combination of these (figs. 4-2, 4-3, and 4-4).

Vertical curbs are designed with a face vertical or sloped at

an angle less than 20° to the vertical, ordinarily unmountable by vehicles.

Mountable curbs are designed so that vehicles may cross without a severe jolt; usually with a sloping face at an angle between 20° and 60° from the vertical.

The type of curb used to bound an island is dictated by the needs of the situation, which vary according to vehicle speeds, pedestrian traffic, and island types and width. All curbs in the line of traffic flow should be painted yellow (sec. 2C-4). Islands on major streets in urban areas are usually bounded by 5- to 8-inch vertical curbs for the protection of pedestrians, signal and lighting standards, or other traffic control devices (figs. 4-1, 4-7, and 4-23). Whenever a barrier curb is not essential for traffic control or safety a mountable curb should be used. Curbed refuge and channelizing islands, and divisional islands where feasible, should be designed without curb-and-gutter sections adjacent to the islands so that they remain fully visible and roadway widths are unrestricted during periods of pavement surface drainage.

As noted in section 2A-5, raised bars or buttons are sometimes used to designate an island or part of an island (figs. 4-3, 4-4, and 4-10). They should not be used where they constitute an unexpected hazard. These devices should not project more than 1 to 3 inches above the pavement surface, so that any wheel



Figure 4-4. The transition from a 4-lane undivided roadway to a 4-lane highway with a curbed median is effected through the use of raised concrete bars and pavement markings. Further warning is given by the use of a sign, a hazard marker, and a high-visibility curb.

encroachment within the area will become obvious to the vehicle driver without a resultant loss of control of the vehicle. A major disadvantage of these devices is that the spaces between them are difficult to keep clean. Pavement markings may be used effectively with raised bars or buttons to designate better the island area.

When an island is installed in an existing intersection or roadway, it is often necessary to provide additional roadway space for traffic movement, since some of the original width is usurped by the width of the island. This usually can be accomplished by the simple expedient of prohibiting parking adjacent to and in the immediate vicinity of the island. As a general rule, parking adjacent to an island is undesirable and unsafe, as its effect is to destroy the geometric pattern for which the island is designed.

4A-4 Approach-End Treatment

The approach end of an island shall be carefully designed to provide, for approaching traffic, a maximum degree of warning of the presence of the island and a definite indication of the proper vehicle path or paths to be followed. This applies directly to the approach to all refuge and directional islands and to individual divisional islands, but is not applicable to island ends at median openings on a divided street or highway.

Various methods of approach-end treatment have been used with satisfactory results, but experience does not yet justify complete standardization. Experimentation should be continued. In effective installations to date the motorist is warned of the island and guided around it by one or by some combination of the following devices:

1. Pavement markings (secs. 2B-15, 17, 18).
2. Object markings (secs. 2C-2 to 4).
3. Signs (secs. 1B-25, 1C-34).
4. Reflecting devices (sec. 2D-2).
5. Flashing yellow beacons (sec. 3G-2, 3).
6. Contrasting pavement colors or textures.
7. Raised bars, buttons, and median blocks (sec. 2A-5).
8. Illumination devices.

Although there is no standardization as to the type of approach-end treatment used, there are standards that should be applied for particular types. The standards of application are discussed in the sections mentioned above and in sections 4A-3 and 4A-4.

The ends of islands first approached by traffic should be preceded by a gradually widening marking or a conspicuously roughened strip on the roadway surface and designed so as to lead the vehicles into natural paths of travel in the desired direc-

tions along the island edge. The use of raised bars is often a preferable treatment in advance of curbed island noses. These devices should be combined to the extent practicable with other high-visibility indicators, such as reflectorized curbs, suitably reflectorized or illuminated signs located near the approach end, or reflectors mounted above the island (fig. 4-4).

At the beginning of a divisional or pedestrian refuge island which separates opposing traffic movements the island nose should be offset to the left, as faced by approaching traffic, the right curb of the island forming a diverging taper to deflect traffic toward the right. Where a channelizing or divisional island is introduced between two lanes of traffic moving in the same direction similar offsets should be used, to the extent that space permits, on each side of the nose to direct traffic into the separate roadways.

B.—REFUGE ISLANDS

Section 4B-1 Legal Authority

Refuge islands, being in the roadway, may be established only on the authority of the local or State highway officials having jurisdiction.

A model of legal authority for the establishment of refuge islands, or safety zones, is presented in the Model Traffic Ordinance (sec. 4-12) and authority for the exclusion of vehicular traffic from such islands is provided in the Uniform Vehicle Code (sec. 11-1304).

4B-2 Functions

The main function of a refuge island is to provide a place of safety for pedestrians who cannot cross the entire roadway width at one time in safety because of changing traffic signals or oncoming traffic. In congested areas they also expedite vehicular traffic by permitting some vehicles to proceed without waiting for pedestrians to cross the entire roadway.

4B-3 Design Elements

Refuge islands should be used in urban areas on exceptionally wide roadways or in large or irregularly shaped intersections where there is a considerable amount of pedestrian traffic and where heavy volumes of vehicular traffic make it difficult and dangerous for pedestrians to cross. No refuge island should be placed where it will leave less than two through lanes available for traffic between it and the adjacent curb or another island. However, a turning lane separated from the through

lanes by an island may be designed for a single traffic lane (sec. 4D-3 and fig. 4-5). Normally a refuge island should be centered on the median line of the roadway (fig. 4-1).



Figure 4-5. Walk-through pedestrian refuge island that also serves to separate a median lane from the through lanes. Approach-end treatment consists of pavement markings and high-visibility painted curb.

Refuge islands should not be located so as to create a hazard for motor vehicles (sec. 4A-3). In areas with fast-moving vehicular traffic, islands not on the roadway centerline should be avoided. Streets with reverse-flow lanes require special consideration in determining island placement. Whenever heavy pedestrian traffic occurs on a street with vehicular traffic moving at relatively high speed, consideration should be given to some additional form of pedestrian protection, such as a pedestrian-actuated traffic signal or a pedestrian grade separation.

In urban areas with slow-moving traffic and many pedestrians, a refuge island should desirably be provided at an intersection with a one-way or two-way roadway six or more lanes in width. At signalized intersections refuge islands are used to expedite vehicular movements by provision of safety zones between different traffic streams. Refuge islands may be required at each intersection along a street. In such case consideration should be given to providing a continuous median divider strip between intersections, as discussed in section 4C-3.

Sections 4A-3 and 4A-4 should be used as guides in the design of refuge islands. It is preferable that part of the island be a raised platform, outlined by barrier curbs, to afford pedestrians a greater sense of security. Part of the area at the crosswalk desirably should be kept at pavement level to facilitate use by

baby carriages, wheel chairs, and crippled or infirm persons. Although it is better to have part of the raised platform project beyond the crosswalk on the side towards the intersection (figs. 4-1, 4-5), it is permissible to stop the platform at or within the crosswalk area. Where this is done, a mushroom button or more substantial curb protection should be provided at any corner which otherwise might be encroached upon by turning vehicles. There should be a raised part immediately available for pedestrians to step upon (fig. 4-6).



Figure 4-6. Pedestrian refuge island with raised platform ending at crosswalk line. Approach-end treatment consists of pavement markings, reflectorized sign, and hazard marker.

Buffers of concrete block or other massive structure placed on the approach end of a pedestrian refuge island intensify the possibility of physical harm to the occupants of a colliding vehicle while providing a questionable increase in pedestrian safety over more yielding types of barriers. For this reason, massive buffers are no longer being built and posts or guardrail are being used instead (fig. 4-7). In general, there is little current construction of buffers on pedestrian islands. Such barriers should be used only in areas with relatively high vehicle speed, and they should be highly visible at all times. Special illumination or reflectorization may be needed if the barrier is not obvious without it.

Refuge islands should preferably be at least 6 feet and in any case at least 4 feet wide. The usable length along the roadway,

including any section at pavement level at the crosswalk, shall not be less than 12 feet or the width of crosswalk, whichever is greater.

4B-4 Illumination and Reflectorization

Refuge islands shall not be installed unless they can be adequately reflectorized and illuminated. Illumination of refuge islands including their approach-end treatment, should be sufficient to show the general layout of the island and immediate vehicular travel paths, with the greatest concentration of illumination at points of possible danger to pedestrians or vehicles, as at barrier curbs, buffers, or other structures. Reflectorization is needed to warn of the presence of the island on nights when illumination may not be in operation.



Figure 4-7. Pedestrian refuge island protected by a barrier of steel posts. The reflectorized sign and the reflectors on the posts give advance warning of the island.

4B-5 Signs

Standard signs indicating the permitted direction of flow shall be placed at the approach end of every refuge island that is in the line of approaching traffic. When vehicles are required to pass only to the right of the island a regulatory Keep Right sign (sec. 1B-25) shall be used. When passing is permitted on either side, the Double Arrow warning sign (sec. 1C-34) shall be used. Such signs shall be adequately reflectorized or illuminated.

Parking should be excluded along the curb of the sidewalk adjacent to a refuge island for the length of the island and for such distances beyond the ends as are necessary to expedite the flow of traffic (Uniform Vehicle Code, sec. 11-1003). Where necessary, additional parking restriction signs should be installed (sec. 1B-31).

4B-6 Markings

The approach-end treatment of a refuge island in the line of traffic flow shall include pavement markings as provided in sections 2B-15, 17, and 18.

Where an obstruction is used as part of the approach-end treatment, the ends of all islands toward approaching traffic shall be marked in accordance with section 2C-2. Section 2C-4 will apply if the island curb is the only obstruction. Additional curb markings are not required if the use of a contrasting color, reflectorized paint, or other special treatment has been used to indicate clearly the presence of the island. If in the surrounding area markings are used to indicate that parking is prohibited (sec. 2B-27), the markings should be used opposite refuge islands.

4B-7 Loading Islands

Loading islands are considered herein to be a special class of refuge islands, inasmuch as they serve as a pedestrian refuge while loading and unloading passengers from streetcars or buses, and require the same general design treatment as discussed above. The present trend is to mass-transit vehicles that load at the curb, and it is expected that few new loading islands will be constructed. Where a particular situation necessitates the use of a loading island, details of treatment should be as for pedestrian refuge islands (figs. 4-8 and 4-9).



Figure 4-8. Mid-street bus loading platform on a one-way street. The loading area is composed of wood plank deck, and is protected by sheet metal splash plate. Advance warning is given by signs at end facing traffic.



Figure 4-9. Mid-street bus loading platform of concrete. Steel posts and chains provide side protection and discourage mid-block crossings by pedestrians. End protection is provided by heavy steel post and painted curb.

C.—DIVISIONAL ISLANDS

Section 4C-1 Legal Authority

Divisional islands are elements of street and highway design, and accordingly no special authority is required for their instal-

lation, since such authority is vested in the agency responsible for highway design.

4C-2 Functions

Divisional islands are placed longitudinally in roadways to divide the traffic stream into two or more parts. Most commonly they separate opposing traffic movements by serving as a central divider. Where continuous, they are a part of the design cross section and are called medians (figs. 4-10, 4-16). Often divisional islands are introduced in advance of an intersection to separate opposing traffic, to serve as a warning of the intersection, or to provide a turn lane (fig. 4-11). They also may be used to separate traffic in the same direction, as when dividing left-turn traffic in a median lane from the through traffic, as shown in figures 4-10 and 4-13, or separating through traffic lanes from an adjacent pavement provided for local service, as in figure 4-12. Divisional islands are used to guide traffic around an obstruction within the roadway, such as a bridge pier, and also at any point where traffic is regularly stopped for toll or inspection purposes. Divisional islands may be located so as to prevent overtaking and passing at hazardous points, as at sharp curves or narrow underpasses.



Figure 4-10. Concrete median on a major street in a residential area. Median lanes are provided for storage and safety at intersections. Mushroom buttons separate the left-turn lanes from the through lanes.



Figure 4-11. Divisional island of raised bars introduced to provide a left-turn lane. The island at the intersection is delineated by mountable curb and is illuminated. Included in the approach-end treatment are a reflectorized sign and a hazard marker.

4C-3 Specific Design Elements

A divisional island (median) is an important and essential element in the design of major thoroughfares in urban areas, if these major traffic arteries are to meet the minimum standards of safety and capacity. Where right-of-way width permits, medians can be used to advantage on other streets. Although a raised median may bar vehicles from left-turn access to alleys and business facilities and results in some indirection in traffic movement, these restrictions are essential if the desired traffic safety and capacity are to be achieved.

The more important functions of a median are as follows:

1. The median provides an insulating area between opposing streams of moving traffic, reducing the strain on drivers and usually resulting in a reduction in the accident rate.
2. Where width is sufficient a median provides protection and

control of cross and turning traffic. One of the most important benefits of a median is obtained when a median or left-turn storage lane is provided. Left-turning vehicles are separated in a protected lane so as not to impede the flow of the through traffic, thus greatly increasing the efficiency, capacity, and safety of the intersection.

3. A median provides a refuge for pedestrians and decreases the need for installation of traffic signals. It makes possible more efficient signing and signalization in that traffic movements are regulated into orderly channels.

4. A median makes it possible for traffic to move smoothly and safely at higher operating speeds.

Where possible, the width of the divisional island should be sufficient to provide protection for vehicles crossing or turning at intersections. Chapter VIII of *A Policy on Geometric Design of Rural Highways*, 1954, and Chapter D of *A Policy on Arterial Highways in Urban Areas*, 1957,²⁹ should be consulted for an analysis of minimum designs for these conditions. Widths of 20 feet or more are desirable. Although narrow medians do pro-



Figure 4-12. Expressway with a painted-line median and frontage roads. The divisional island or outer separator is sodded and planted, and outlined by vertical curb.

²⁹ Available from the American Association of State Highway Officials, 917 National Press Building, Washington 4, D.C.

vide some separation of opposing traffic and may serve for pedestrian refuge, medians less than 12 feet in width will not accommodate a median left-turn lane and at cross-street openings provide only partial protection for turning and crossing traffic.

The minimum desirable width of a median which will accommodate a median lane is 16 feet. Where right-of-way is severely limited, median widths of 12 feet have been used with a 10-foot turning lane. Whenever the separator of median lane and opposing through traffic is narrower than 4 feet, it should be composed of a mountable separator, mushroom buttons, or lane markings. Where the separator is 4 feet or wider either mountable or barrier curbs should be used, with the type determined by local conditions (figs. 4-13 to 4-15, and 4-17). For further information on median lane design, the design policies of the American Association of State Highway Officials should be consulted.



Figure 4-13. Median lane with mountable concrete curb traffic separators having a scored face for light reflection. Pavement markings and a hazard marker give advance warning of the introduced separator.

Divisional islands should be delineated as discussed in section 4A-3. Vertical curbs are required on medians where it is necessary to prohibit improper turning across the median area. On wide streets with heavy traffic volumes, curbed medians at least 4 feet wide are needed for pedestrian protection, as discussed in section 4B-3. Other narrow medians should be mountable and



Figure 4-14. *Separate left-turn lanes are notched into a relatively wide earth-filled median outlined with vertical curbs. The median lane separator is paved with concrete to serve as a pedestrian island.*

may consist of low rolled curb sections with pavement filler, pavement markings, or a series of raised bars, corrugations, or buttons placed along the centerline. Flush medians of contrasting pavement color are also used. On streets where snow removal is frequent, low rounded or flush median sections are preferable (figs. 4-12, 4-16, and 4-17).

Approach-end treatment should be as described in section 4A-4. A divisional island should not be located so as to begin on a sharp curve or at the top of or just over a hillcrest where its presence in the roadway would introduce a surprise element to drivers.

Generally, divisional islands should not be placed where they will confine any part of the through roadway on either side to less than two through traffic lanes, except when an island is used to separate through traffic from a left-turning median lane. Under extraordinary circumstances it may be advantageous to provide a divisional island with only a single through traffic lane alongside. The width of a through lane will be governed by the volume, type, and speed of traffic and other local conditions and may vary from 10 to 13 feet.

At some locations where indiscriminate pedestrian crossings would be hazardous on streets with fairly high vehicle speeds or where sizable pedestrian volumes in certain hours would disrupt traffic flow, it is advisable to consider erection of a pedestrian



Figure 4-15. *Raised concrete median warped to provide protection and storage for left-turning vehicles at intersections. Painted curbs and hazard markers mark the islands.*

barrier fence down the center of the divisional island. For clearance and maintenance, medians should be about 8 feet or more in width for such installations. The pedestrian barrier usually consists of some form of woven wire or picket fence and should be at least 3 feet high. It should extend the entire length between intersections, or for a distance of several hundred feet on either side beyond the point of pedestrian conflict. Such a pedestrian fence materially increases the visibility of the divisional island to the motorist and makes it a more effective traffic separator.



Figure 4-16. Low divisional island that can be crossed by vehicles but which discourages mid-block left turns.

4C-4 Illumination and Reflectorization

Divisional islands and the proper lanes of travel along them should preferably be made clearly visible at night through the use of adequate and well directed street lighting. If lighting facilities are not available, the island should be outlined as clearly as possible by the use of high-visibility approach-end devices as discussed in section 4A-4.

4C-5 Signs

A divisional island in the line of traffic flow shall be protected at the approach end by an appropriate reflectorized or illuminated sign or marker. An island with a width of 3 or more feet shall be protected with a regulatory **Keep Right** or a **Double Arrow** warning sign (secs. 1B-25, 1C-34). On islands narrower than 3 feet a reflectorized hazard marker (sec. 2D-2) shall be used. Such signs or markers should be set back from the island approach end to reduce the likelihood of being struck by a vehicle.

A continuous divisional island, except where very narrow or where defined by an unmountable curb, may also be protected by **Keep Off Median** signs (sec. 1B-37).

4C-6 Markings

The approach end of a divisional island in the line of traffic flow should be designed, signed, and marked to indicate its

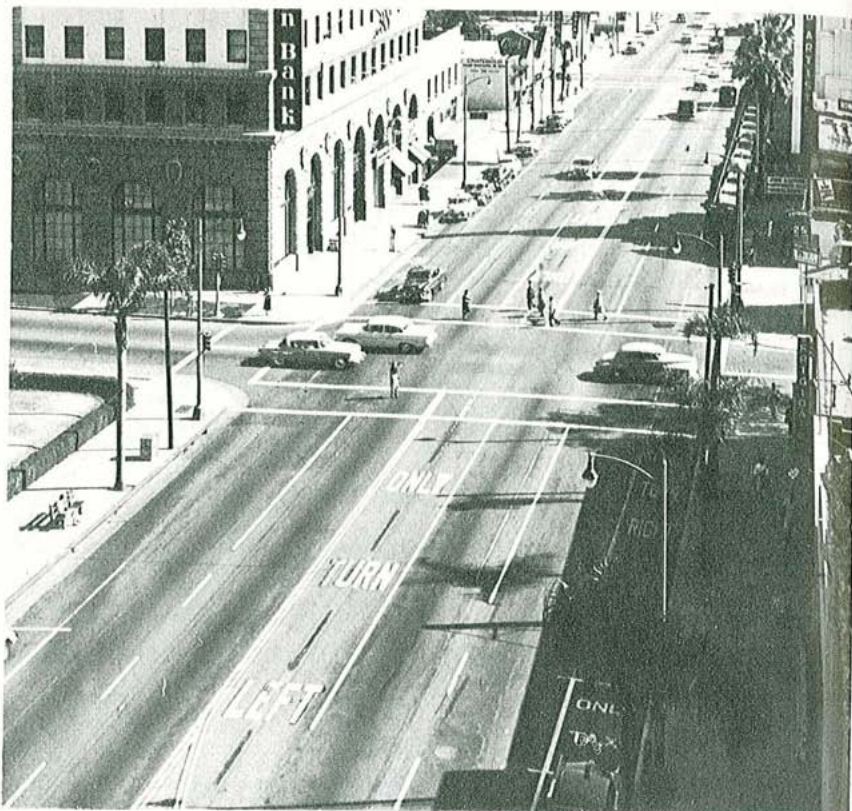


Figure 4-17. Continuous median designated by pavement markings, providing median lanes at every intersection.

presence and also to outline the proper vehicle paths. Where necessary the approaches to such an island shall be marked in the manner provided for refuge islands (secs. 4B-6, 2B-17 and 18, 2C-4).

D.—CHANNELIZING ISLANDS

Section 4D-1 Legal Authority

Channelizing islands are elements of street and highway design, and accordingly no special authority is required for their installation.

4D-2 Functions

The primary function of a channelizing island is to control and direct a motorist into the proper channel for his intended route and thus assure safe and efficient operation of the intersection. Channelizing islands are installed in areas that otherwise would

be broad expanses of pavement, to bring about the desired orderly flow of traffic. As such the channelizing island primarily is a part of intersection layout design, the details of which are covered only in a general manner in this Manual.

4D-3 Specific Design Elements

The design of a channelized intersection can be decided only after special study of the particular area, it being a part of the whole intersection layout. The shape and size of the islands will vary widely according to the intersection conditions. For channelization of existing intersections it is desirable to test the layout by temporarily delineating the island area through the use of sandbags, stanchions, or markings before final construction. Reference should be made to chapter VII of the *Policy on Geometric Design of Rural Highways*³⁰ for design information. The number of channelizing islands used at any intersection should be kept to a minimum. The entire layout should be the simplest design that will accomplish the desired intersection control. Usually a few carefully placed islands of above-minimum size are more effective than a greater number of small islands which create multiple channels and cause confusion (figs. 4-18, 4-19).

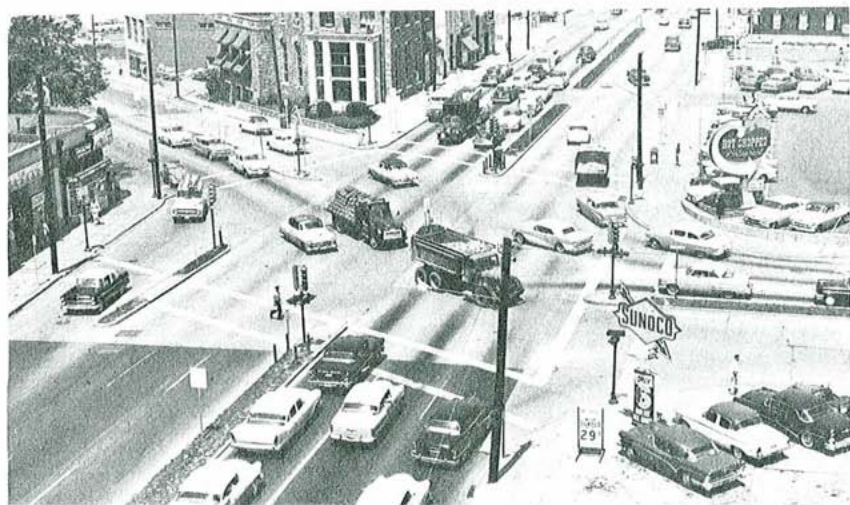


Figure 4-18. Channelized intersection of two major streets. The islands are paved within the crosswalk lines.

³⁰ Available from the American Association of State Highway Officials, 917 National Press Building, Washington 4, D.C.

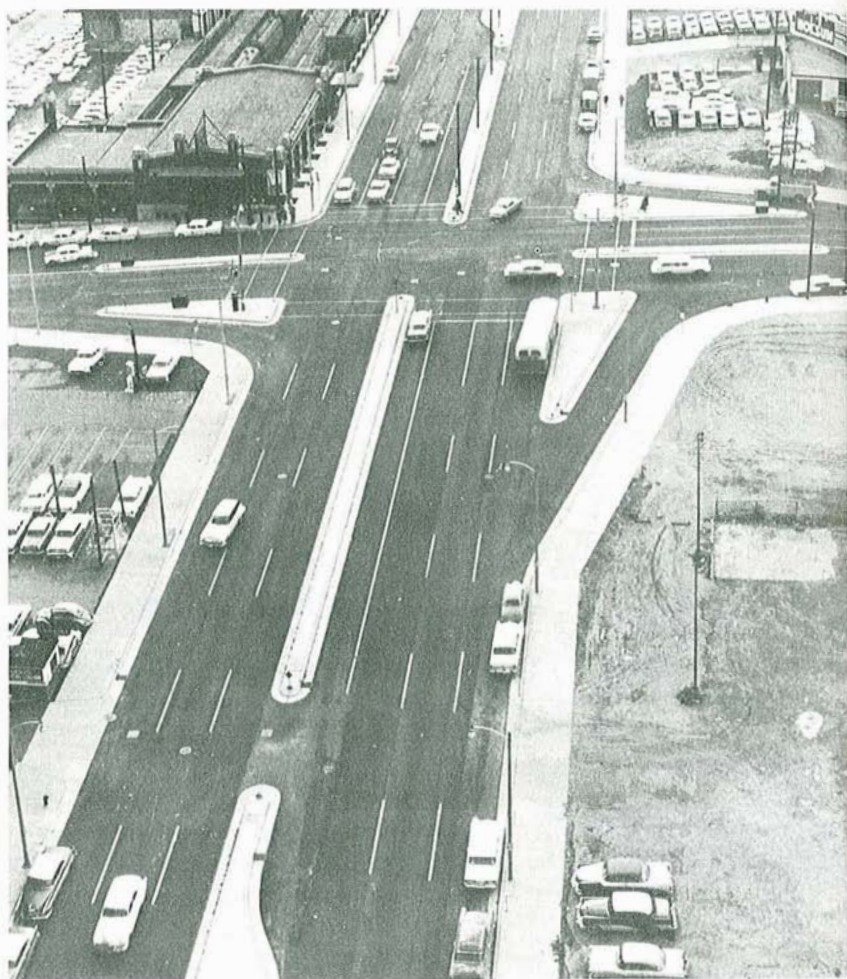


Figure 4-19. Channelizing islands at an intersection. The islands are concrete platforms outlined by curb and gutter. The width of the divisional islands is reduced to provide left-turn lanes at the intersection.

The general design elements discussed in section 4A-3 are applicable in determining the appropriate method for designation of a channelizing island. Curbed islands are most often used in urban areas, but pavement markings, raised bars, mushroom buttons, or other designation methods are often appropriate where encroachment on the island is not dangerous to motorists, pedestrians, or property (figs. 4-20, 4-21).

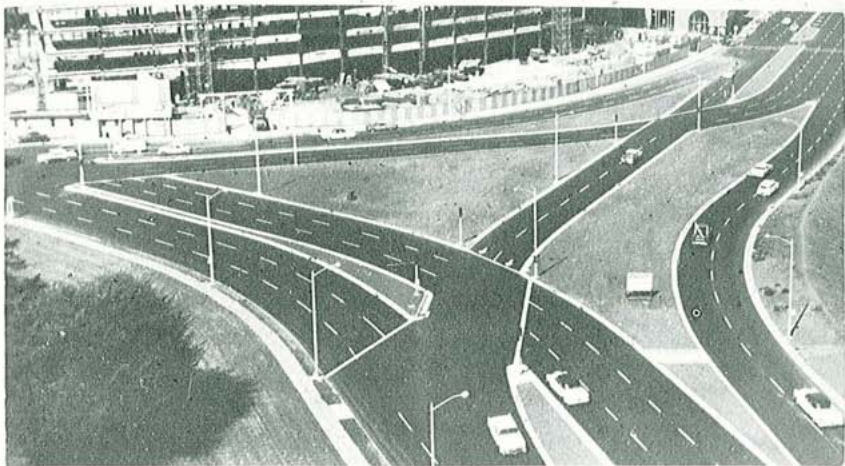


Figure 4-20. Channelized intersection with grass-covered islands outlined by high-visibility concrete curb and gutter. The design is supplemented by signalization, signs, pavement markings, and illumination.



Figure 4-21. Channelization is accomplished through use of both concrete and painted islands in this intersection. The entire area is well illuminated.

Channelizing islands should be constructed with a color and texture of surface area contrasting with that of the adjacent pavement, and should be designed and located so that the proper travel paths are obvious, easy to follow, and unquestionably continuous (figs. 4-22, 4-23). Approach-end treatment should be as discussed in section 4A-4.

The lane widths provided through a channelized area should be in conformance with the pavement widths for separate turning lanes recommended in *A Policy on Geometric Design of Rural Highways*, as shown in table 8.

Table 8.—Design width of pavements for turning roadways¹

	Case I: One-lane one-way operation, no provision for passing			Case II: One-lane one-way operation, with provision for passing a stalled vehicle			Case III: Two-lane operation, either one-way or two-way		
PAVEMENT WIDTH FOR DESIGN TRAFFIC CONDITION ²									
	A	B	C	A	B	C	A	B	C
Radius on inner edge of pavement:	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>
50 feet.....	16	17	20	21	24	27	30	33	37
75 feet.....	15	16	18	20	22	25	28	31	34
100 feet.....	14	16	17	19	21	24	27	30	33
150 feet.....	13	15	16	18	20	23	26	29	31
200 feet.....	13	15	16	18	20	22	26	28	29
300 feet.....	12	15	15	17	19	21	25	27	28
400 feet.....	12	14	15	17	19	21	25	27	28
500 feet.....	12	14	15	17	19	21	25	27	27
Tangent.....	12	14	14	16	18	20	22	24	24

WIDTH MODIFICATION ACCORDING TO TREATMENT OF EDGE OF PAVEMENT

No stabilized shoulder.....	None.....	None.....	None.
Mountable curb.....	None.....	None.....	None.
Barrier curb:			
One side.....	Add 1 foot.....	None.....	Add 1 foot.
Two sides.....	Add 2 feet.....	Add 1 foot.....	Add 2 feet.
Stabilized shoulder, one or both sides	None.....	Deduct shoulder width; minimum pavement width as under Case I.	Deduct 2 feet where shoulder is 4 feet or wider.

¹ Source: American Association of State Highway Officials, *A Policy on Geometric Design of Rural Highways*, 1954, table VII-7, p. 273.

² Traffic conditions: A.—Predominantly passenger vehicles but some consideration for single-unit trucks. B.—Sufficient single-unit vehicles to govern design, but some consideration for semitrailer vehicles. C.—Sufficient semitrailer vehicles to govern design.

4D-4 Illumination and Reflectorization

Channelizing islands and the proper lanes of travel along them preferably should be made clearly visible at night through the use of adequate and well directed street lighting. If lighting facilities are not available, the island should be outlined as clearly as



Figure 4-22. *The smaller islands of this channelized intersection are of concrete, and the larger are of earth with concrete curb delineation.*



Figure 4-23. *Channelization, signalization, and pavement markings are used to control movement within this intersection. The islands also serve as pedestrian refuge islands.*

possible by the use of high-visibility approach-end devices (sec. 4A-4).

4D-5 Signs

Channelizing islands in the lines of traffic streams shall be protected at the approach ends by appropriate reflectorized or illuminated signs. As conditions require, a regulatory Keep Right sign (sec. 1B-25) or other appropriate signs should be used.

4D-6 Markings

The approach end of channelizing islands in the main streams of traffic flow should be marked to indicate their presence and also to outline the proper vehicle paths. The methods used are discussed in section 4B-6. Markings may not be necessary at secondary islands located within a multiple-island intersection. All markings should be in accordance with sections 2B-15, 17 and 18, and 2C-4.