

DESIGN OF URBAN HIGHWAY LANDSCAPING

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There are three purposes of landscaping an urban highway which, properly correlated, create a facility that is an integral part of the whole landscape, providing the best of utility, economy and appearance.

1. Landscaping should complement the primary function of the road by preserving natural features and enhancing appearance (Fig. 1).



Figure 1.

2. It should improve the adjacent land by providing a "green belt" to screen the road from nearby residences (Fig. 2), and, possibly, to include the development of amenities such as parks, playgrounds and similar facilities (Fig. 3).

3. It should facilitate maintenance not only by erosion control but by reducing maintenance work, particularly the expensive operations of mowing, pickup of litter, and snow and ice control (Fig. 4).

LOCATION STUDIES

The more intensive development of land, the higher cost of right-of-way and construction, and the fewer natural landscape features usually encountered in urban highway location, compel a most thorough early study of possible routes. It is at



Figure 2.

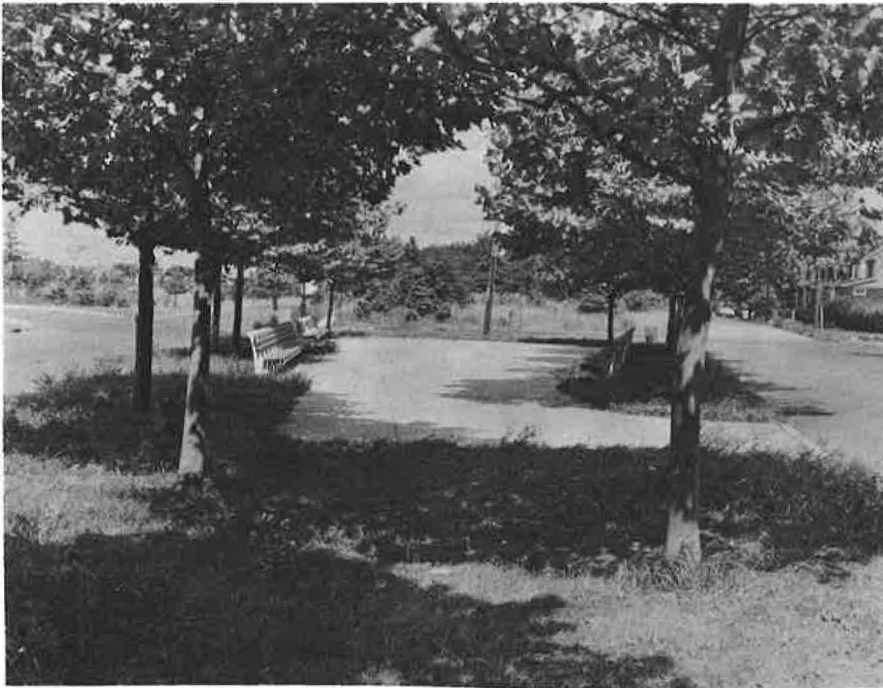


Figure 3.

this early stage that consideration of cross-section design as related to drainage, planting and maintenance requirements can be most valuable. Minimum right-of-way determined at this time, on the basis of existing features only, can produce problems which must be lived with painfully for the life of the road (Fig. 5).

The landscape architect should aid in an appraisal of the possible designs of the alternate routes available, based on a realistic valuation of roadside develop-

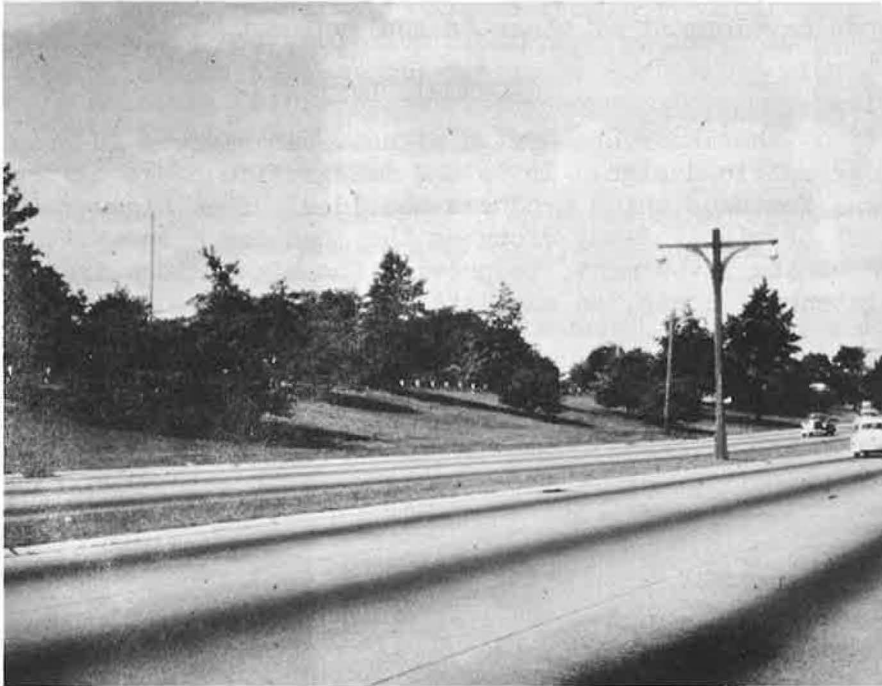


Figure 4.



Figure 5.

ment, maintenance, and land use. He should be most conscious of the value of existing natural features in order to determine their merits and to assure the preservation and proper development of those of real value.

GEOMETRIC DESIGN

The quality of the landscape design of an urban highway is proportional to the quality of its geometric design. It is the integration of good structures with land forms and natural features which produces the ideal urban highway (Fig. 6). The high initial cost of right-of-way dictates the need for economy. However, to preserve the value of the investment, to provide for high future traffic volume, and to minimize maintenance costs, an adequate width of right-of-way is essential.



Figure 6.

A narrow median may require less taking, but the maintenance of grass or vines in such an area, especially when a guardrail is a part of that median, is costly and hazardous to traffic and personnel (Fig. 6). Such areas should be paved, particularly where the narrow width requires hand-operated mowers.

Similarly, narrow areas between the curb and sidewalk of marginal streets should be paved to eliminate costly maintenance.

Planting of a narrow median to control headlight glare is an admission of inadequate geometrical design. It is at best a poor substitute, a hazard to traffic and maintenance personnel, and a costly maintenance item.

Adequate shoulders for emergency stops are essential. Emergency parking areas where no shoulders are provided are not satisfactory for the vehicles of today (Fig. 2).

Slopes can be steep to conserve right-of-way, but how shall they be treated?

Grass? In urban areas mowing probably will have to be frequent and labor costs will be relatively high. Vines? Higher first cost. Pickup of papers more costly. Occasional mowing or cutting required. Shrubs (Fig. 2)? Still more costly and pickup a problem. Pruning required to maintain appearance. In general, except for steep cuts and fills, slopes flat enough for equipment mowing with a cover of turf are the easiest to maintain (Fig. 4). Adequate rounding of tops and toes of slopes is essential for ease in construction and in mowing, for facility in establishing and maintaining vegetation, and for appearance.

Control of traffic noise for abutting properties is effectively achieved by walls or cribbing combined with planting (Fig. 5). Steep fill slopes do not lend themselves to planted noise barriers.

Grading plans, with contour lines, are an essential part of the contract documents for the adequate study and satisfactory construction of an urban project. Only through this medium can the desired transitions between cuts and fills, the free flowing ground forms, and adequate rounding of slope intersections be provided. These plans also serve as the base plans for drainage and planting studies.

AMENITIES

One of the purposes of landscaping urban highways given above—improvement of the adjacent land—may be served by the development of sitting areas, play areas, small parks, and other facilities. Small remnants of land which would not be of value for private use may be acquired with the right-of-way, at little or no extra cost, to provide a bit of green, shade, and benches in residential areas (Fig. 3). In areas of dense population, additional property may be acquired for playgrounds, tennis courts, Little League diamonds and the like. Marinas and small boat mooring facilities, where the road adjoins navigable water, have been successfully developed and publicly acclaimed (Fig. 7).



Figure 7.

Walks, bicycle paths and bridle trails on projects where adequate space was available have been popular facilities.

Rest areas on the highway are not desirable in urban areas. The character of traffic does not require them; there are frequent interchanges or exits to serve the tired driver and such areas would be monopolized by local residents.

The inclusion of amenities such as those mentioned must recognize the responsibility of a public agency for continuing maintenance; in some instances they might be taken over by the neighboring communities. Without maintenance they can become liabilities rather than assets—and in areas where vandalism is apt to be a factor that can happen very quickly.

ARCHITECTURE

Characteristic of the urban highway are the many structures which are an integral part of it or are closely associated with it. Bridges are relatively frequent and most conspicuous. Lighting standards, guardrails, signs, and fences which may be of stock pattern or which may be designed especially for a project are prominent architectural features (Figs. 6 and 7). Consideration should be given to adequate fencing to prevent children from playing on the right-of-way and pedestrians from crossing the pavement (Fig. 8). There may be buildings for police, for maintenance, and for public facilities. Design may extend to such detail as benches, paving patterns for pedestrian use and play equipment (Fig. 9). All these must be a part of the complete highway design, not individual items tacked on, if the whole is to be successful.

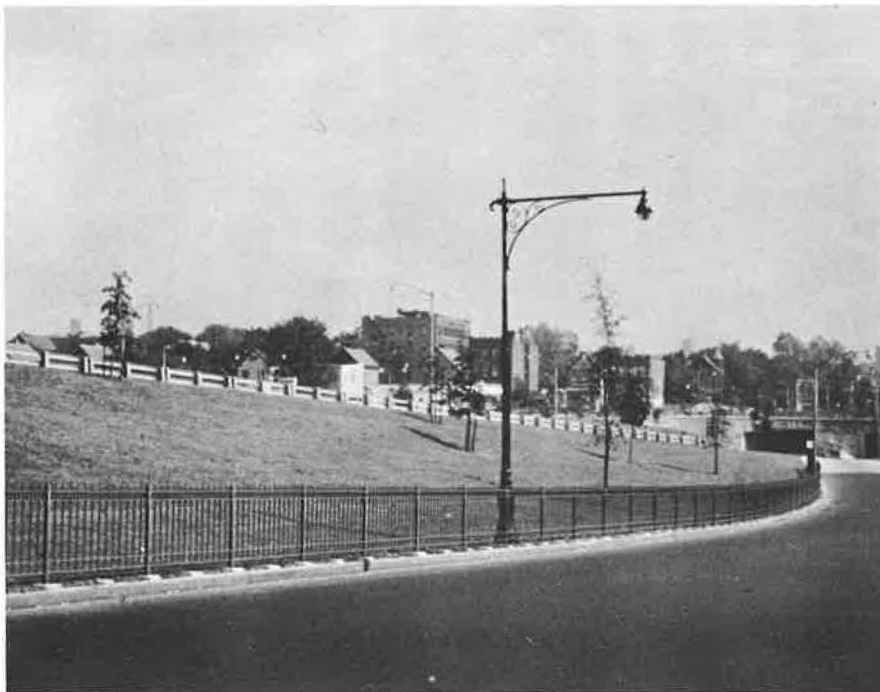


Figure 8.



Figure 9.

TREATMENT OF EXISTING VEGETATION

Except for locations through parks, existing vegetation encountered by urban highway development is most likely to be either "brush" or individual trees. It is a wise and experienced designer who can weigh the value of a tree and the special work necessary for its protection as opposed to the replacement of it. Rationally, it is only the exceptionally valuable tree which justifies special consideration (Fig. 1). In actual practice, emotion and public relations enter the picture all too frequently. Appreciation by the public of the several phases of a development plan, including planting, care during construction for trees which can readily be saved, and quick disposal of trees which must be removed, is important in retaining good will.

Tree wells, should never—well practically never—be used; porous backfill perhaps, but no tree will be happy with more than a shallow fill about it.

Trees located at the intersection of steep cut slopes and the original surface are generally a liability. Their roots are usually cut on one side by grading, they frequently interfere with proper slope rounding operations and interpose an unsightly hump in an otherwise good grading job.

Selective thinning (the removal of dead, weak and undesirable trees), and pruning desirable trees are low cost items which have been found to be of great value. In the New York area, \$300.00 an acre and \$10.00 per tree are average costs.

PLANTING DESIGN

The greater investment in urban highway planting and its more formal character require more study than designs for rural sections.

In general, plants of larger size should be used in urban design in order to give a more immediate effect. However, there are practical limitations. Fifteen years ago 10- to 12-in. caliber trees were commonly used in the New York area. Today the maximum size is generally limited to 5 in. to 6 in. and only a small percentage of that size is used. Experience has shown that under average roadside conditions the smaller sizes will become established quicker and overtake the larger sizes in development.

Nursery grown rather than collected trees are desired. Not only are losses fewer but the nursery grown tree develops faster than the collected plant.

Because of the scarcity of desirable varieties, specifications are frequently written to permit the use of several varieties deemed suitable. The selection of plants for specific locations are frequently made in the field.

Ecological conditions along an urban highway are quite different from those existing in undisturbed areas. Soil conditions are changed by construction. There is generally less moisture, and due to air movement and reflected heat the rate of evaporation is probably higher. There may also be toxic elements in the air harmful to some of the more sensitive species.

Vandalism in urban areas cannot be ignored or considered solely a police problem. Plants with edible fruit should not be used and showy flowers are certainly an invitation for trouble.

Experience in some New York areas indicates that the planting of small evergreens may be a temptation to local collectors (Fig. 10). The boy in search of a hill for sledding is no respecter of small plants partly snow covered (unless they are thorny).



Figure 10.

The selection of suitable species is of major importance and should be based on experience in similar situations, or, lacking that, on a thorough study of plants which have been proven satisfactory on similar projects.

Ever present in the planting designer's consciousness should be the maintenance problems of the roadside. Ideally, the designer should share those maintenance burdens. Some of our artistic confreres would then, perforce, develop a new style.

Mowing should be facilitated by arranging plantings in beds or clumps of plants or by spacing trees so that equipment can operate without slowing—certainly without stopping (Fig. 4).

Grass has been found easier to maintain than shrubs or vines in areas subject to littering. Mowing, even by hand-operated machines, is less troublesome than pickup.

The designer who appreciates the value of herbicides as a maintenance tool will arrange planting so that this operation will be facilitated.

It is probable that many maintenance organizations find it difficult to keep pace with the additional responsibilities imposed by new road construction. One agency has for some years successfully transferred one burden by requiring the landscape contractors to assume responsibility for the maintenance of plantings, including watering, weeding and replacement of dead or weak plants for a period of two years. This requirement has not appreciably increased the bid prices. One reason for this is that it has become generally known that inspection practices are so rigid that losses are less than 5 percent.

The planting design should be functional. The broad scale of today's new highways, together with the speed and volume of traffic in urban areas which require the constant attention of drivers, and travel which is not intended primarily for enjoyment of the local scene, are factors which dictate plantings composed of major and minor trees with turf as the basic background. Large masses and breadth of scale are most effective along these highways (Figs. 4 and 11). For the pedestrian using sitting areas, small parks, or other facilities along the service road, more detail can be justified.

Planting should also aid in traffic guidance. Highway Research Board Special Report 23, "Planning and Management of Roadside Vegetation," is an excellent reference on this subject.

Planting to screen undesirable views from the road or to screen the road from adjacent properties can be effective, but quite expensive if an immediate effect is required. However, the psychological effect of a good planting, even of small material, has been observed to be more satisfactory than one would imagine. The public, in general, seems to appreciate a sincere motive and is willing to wait for nature to do the rest. Perhaps the problem is one of human relations rather than finances.

If it is decided to use plantings to control headlight glare, the species selected should be limited to those which will not require pruning to prevent encroachment onto the pavement or constitute a mental hazard which would reduce the pavement's effective width. This seems too basic to require comment, however, such ill-advised plantings are used all too frequently.

In localities where drifting snow is a problem, appropriate planting may act as a preventative, but care should be exercised so as not to cause drifting on the pavements.

For the community which can provide the necessary maintenance, planting trees



Figure 11.



Figure 12.

along marginal streets is a very effective measure to relieve the bare appearance of new construction (Fig. 12). There should be at least $3\frac{1}{2}$ -ft clearance separating structures such as curbs, even though in actual practice this is seldom possible. New York is now obtaining a simple form of release from abutting owners which permits planting in back of the sidewalk area. The absence of complex legal phraseology has simplified the problem of obtaining signatures (see Appendix).

CONCLUSION

One of the most important factors in successful urban highway design is the degree of cooperative spirit initially shown by the many agencies and the several professions involved in this necessarily complex endeavor. Cooperative effort is more than additive in effect while, conversely, the lack of it uses a disproportionate part of the energy of each of the units involved.

Appendix
Simplified Legal Form for Consent and Release

PROJECT _____

CONSENT AND RELEASE

KNOW ALL MEN BY THESE PRESENTS

That we _____ and _____
are owners of lands adjacent to and abutting on _____ (Street
or avenue) State Highway number _____ at station _____
_____ in the (town,village,city) of _____ county of
_____ State of New York.

That in consideration of the State of New York providing trees (and
or shrubs) to be planted on our said land pursuant to Chapter 465
of the Laws of 1957, hereby consent that the Superintendent of
Public Works, his employees, representatives or agents may enter
upon our said premises for the purpose of planting trees or shrubs as
indicated on the plans for the above project which are made a part
of this Consent and Release.

That we hereby release the State of New York, the Superintendent
of Public Works, his employees, representatives and agents from
any and all claims for damages caused by or arising out of the
occupancy of said premises for such purpose.

L.S.

L.S.