

Transportation System Corridors

E. WILSON CAMPBELL, Director, Chicago Area Transportation Study

•THE IDEA of mass transit and private vehicles sharing the same right-of-way is not new or unique. Many can remember riding down the middle of a street in a streetcar. An associate at CATS recalls that over 50 years ago trolley cars ran down Woodward Avenue in Detroit on their own grass median. The Hollywood Freeway had rapid transit in its median strip. Figure 1 shows it as it appeared in 1947. Ten years later, however, rapid transit had given way to the motor vehicle (Fig. 2).

The first indication of transportation corridor planning in Chicago came in a 1939 report titled "Comprehensive Plan for the Extension of the Subway System of the City of Chicago."

There have been many different proposals for this type of development in the Chicago area. They are in various stages of planning and development and represent several different concepts in corridor treatment. First, there is the Eisenhower corridor (formerly called Congress Street) which has been in operation since 1957. This has a fixed rail rapid transit system in the median strip of an expressway. Another concept involves a corridor with rail rapid transit (i.e., Chicago Transit Authority) sharing the right-of-way of a suburban railroad for several miles. A third represents a proposal for a median strip or separate lane operation for buses in a proposed expressway. Finally, there is a proposal for an expressway to be built over the air rights of an existing railroad.

This paper discusses planning considerations, legal framework, construction, operation and financing aspects of joint use of right-of-way for various modes of transportation.

GENERAL PLANNING CONSIDERATIONS

The idea of transportation corridors which can handle great multitudes of people in various modes of transit has a very popular appeal. It is often looked upon as an economical method of providing needed right-of-way and conserving urban land. It is important, however, that the decision as to the joint use of right-of-way be based on long-run needs of the community rather than availability of right-of-way.

Studies of trip desire and modal choice coupled with future estimates of travel demand should provide the basis for route locations. The future trip estimates should consider future increases and distribution of population and use of land as well as estimates of other economic and social factors which bear on trip demand and mode choice.

A corridor including multiple modes should be developed only after all planning criteria are met, and further, there should be assurance that the planned route is in the best possible location to serve the community needs.

EISENHOWER CORRIDOR (CONGRESS STREET)

Planning

As indicated earlier, the recommendation for the Congress transportation corridor was made in a 1939 report. The following excerpt explains the proposal:



Figure 1. Hollywood Freeway, 1947.



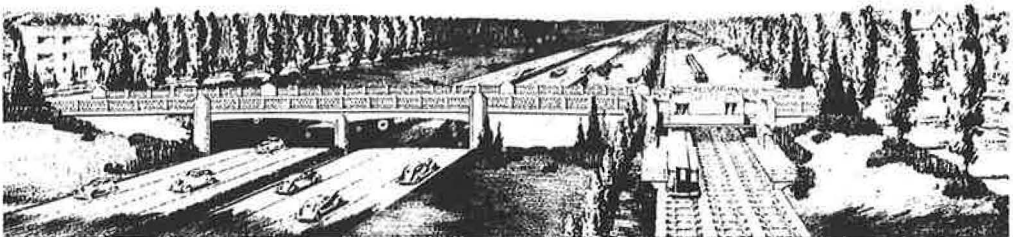
Figure 2. Hollywood Freeway, 1957.

An alternate plan has been prepared for the Congress Street subway extension and the West Side Superhighway, broader in scope and more costly, but with a number of advantages as compared with the plan described.... The alternate scheme differs from the original mainly in the extension of the subway westward in an open cut, parallel to the express roadways of the West Side Superhighway so as to extend the west side subway service from Halsted Street to Kedzie Avenue.

Figure 3 shows artist's conception of this transportation corridor.

The report dealt with the general development of Chicago and the distribution and growth of population, industry and commerce. It also considered the relationship of the proposed "superhighways" to the extension of the local common carrier transit facilities, and the coordination of the extended rapid transit system with a modernized and unified city-wide surface transit system. This proposal was part of a comprehensive transportation plan for Chicago.

The Congress branch was to replace, at least in part, an existing elevated rail transit line (Garfield Park branch) serving Chicago's West Side (Fig. 4). Thus, it would represent an improvement in service by providing a grade-separated right-of-way for the transit line. The planning decision was not difficult, since it did not represent the addition of a new transit facility, but merely replaced an existing rapid transit line. The suggestion of the corridor treatment possibly was the result of a happy coincidence. Nevertheless, it was the first instance in this country in which a



· CITY · OF · CHICAGO · · · DEPARTMENT · OF · SUBWAYS · AND · TRACTION ·
 · A · SUGGESTION · FOR · THE · DEVELOPMENT · OF · A · WEST · SIDE · SUPERHIGHWAY ·
 · ALTERNATE · PLAN ·
 · PERSPECTIVE · NEAR · RAPID · TRANSIT · STATION ·

Figure 3. Artist's conception of West Side highway and transit (from 1939 comprehensive plan).

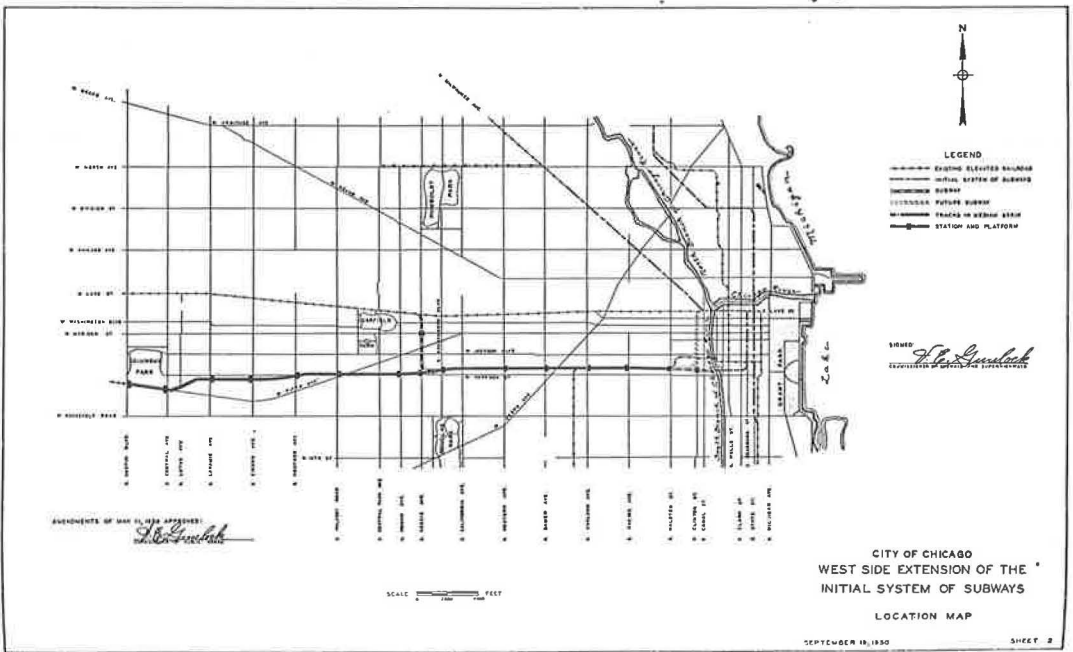


Figure 4. Map showing location of Congress rapid transit.

rail transit line and an expressway were constructed at the same time and in the same right-of-way. An interesting aside is that the cost of building this facility 20 years later was over $3\frac{1}{2}$ times the amount estimated in 1939.

Legal Authority

Several legal hurdles had to be cleared to permit rapid transit use of the median strip. First, the highway agencies had to agree to purchase the necessary right-of-way to permit rail transit operation. The median strip varies from 79 to 150 ft in width. Section 123 of Title 23 of the Federal Highway Act provides guidelines for the use of right-of-way as follows:

(a) Interest to be acquired. The State shall acquire rights-of-way of such nature and extent as are adequate for the construction, operation and maintenance of a project.

(b) Use for highway purposes. Except as provided under paragraph (c) of this section, all real property, including air space, within the right-of-way boundaries of a project shall be devoted exclusively to public highway purposes. No project shall be accepted as complete until this requirement has been satisfied. The State highway departments shall be responsible for preserving such right-of-way free of all public and private installations, facilities or encroachments, except (1) those approved under paragraph (c) of this section; (2) those which the Administrator approves as constituting a part of a highway or as necessary for its operation, use or maintenance for public highway purposes and (3) informational sites established and maintained in accordance with Section 1.35 of the regulations in this part.

(c) Other use or occupancy. Subject to 23 U.S.C. 111, the temporary or permanent occupancy or use of right-of-way, including air space, for non-highway purposes and the reservation of subsurface mineral rights within the boundaries of the rights-of-way of Federal-aid highways, may be approved by the Administrator, if he determines that such occupancy, use or reservation is in the public interest and will not impair the highway or interfere with the free and safe flow of traffic thereon.

Approval of highway authorities for the Congress Expressway Rapid Transit facility was not difficult for the section west to Kedzie Avenue. Since the existing transit line

right-of-way was being taken for the expressway, they simply gave the median strip location in exchange. In other instances it required convincing the highway officials that a wide median would be desirable even if transit were not included.

Authorization by the City of Chicago came in an ordinance passed in December 1946 with subsequent amendments in 1950, 1954, 1956, 1957 and 1963. The amendments approved changes in construction plans, or station location, and in one case, authorized payments of over \$200,000 for right-of-way settlement either from superhighway bonds or motor fuel tax revenues. In general, the ordinance described the route of the subway, pledged that the City would provide for acquisition of the required real and personal property, fixed responsibility with the Commissioner of Public Works for drawing detailed specifications and plans, described the source of funds for financing the project, ordered all public utilities removed from the proposed subway location, and directed the Comptroller to set up separate bookkeeping accounts for the project.

Finally, there was an agreement between the City and the Transit Authority wherein the Authority "gives, grants and conveys to the City a perpetual right and easement" to the then existing transit line for use as part of the right-of-way for the Congress Expressway.

Financing

As indicated, the right-of-way in the median was provided, in part, in exchange for the existing 75-ft two-track right-of-way. Funds for construction of the track, ballast, station platforms, walkways, etc., were provided by the City of Chicago. This was done through a \$25-million voter-approved bond issue in June 1952.

Under the ordinance creating the Chicago Transit Authority, the City of Chicago agreed to construct subways and other facilities to be operated by the Authority. The cost of all such structures, other than track and related facilities, was borne by the City. Fixed transportation equipment such as tracks, signals, communication and power station facilities required for operation of the system were paid for initially by the City, to be reimbursed by the Transit Authority. The City had to furnish about \$24 million and was to have been reimbursed approximately \$12 million for CTA's share of the cost.

There were some interesting exchanges during the planning of this facility. One already mentioned was the exchange of rights-of-way. Another included the City's purchase of a terminal turn-around and storage yard as a trade-off for not having to build a ramp to an existing CTA storage yard. The Authority had maintenance shops and a storage yard at Harrison Street and Laramie Avenue. To reach this yard from the median of the expressway would have required the construction of a very expensive ramp incline. Rather than build the incline, the City provided a terminal turn-around, storage yard and a 450-car parking lot at the terminal in Forest Park.

Construction

Construction was complicated by the fact that the CTA service had to be maintained at all times. Several million dollars were spent to provide temporary rights-of-way for trains during the construction period.

Difficult problems were encountered in strengthening the foundation of the U. S. Post Office building through which the facility runs. The center line of the tube, under the Post Office, was situated in line with some of the sub-piers of the building. The piers had to be shored up at a subbasement level and removed from the tunnel. The full loads then had to be transferred to the tunnel arch. This was primarily a tunneling problem and not one caused by joint use of a transportation corridor. Figure 5 shows the completed facility.

Operation and Maintenance

The expressway is maintained and operated by the Illinois Division of Highways. The transit line is maintained and operated by the Transit Authority. The State maintains the shrubbery, shoulders, fences, guardrail, storm drains, etc. There has



Figure 5. View of Congress rapid transit facility.

been an occasional joint problem when an automobile has negotiated the guardrail and fence and ended its trip on the transit track. This, of course, can be very disruptive to train schedules—not to mention traffic disruption on the expressways caused by gaping motorists.

Legal Problems

One official of the CTA made several suggestions where changes in the law or administrative procedure would enhance the operation of the transit line. The first involved the question of ownership. As it now stands, the City of Chicago owns the line and the CTA is the operator. Apparently there are problems connected with changing or modifying stations, ramps and other facilities due to City ownership. The operator is concerned with having the flexibility to make any physical changes required to enhance operations. The time involved in obtaining approval is apparently a problem.

Another problem revolves around the use of air rights over the facility. For example, the CTA wanted to build parking garages on air rights for Park 'n' Ride customers. Financing could have been arranged through certain oil companies which would have built a service station in connection with the parking lots. There is, however, an instructional memorandum issued by the Bureau of Public Roads, May 4, 1962, which clearly spells out the requirements of the "use of air space on the Interstate System."

Section 111 of title 23 of the United States Code, as amended by section 104 of the Federal-Aid Highway Act of 1961, approved June 29, 1961, provides as follows:

All agreements between the Secretary and the State highway department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary. Such agreements shall also contain a clause providing that the State will not permit automotive service stations or other commercial establishments for serving motor vehicle users to be constructed or located on the rights-of-way of the Interstate System. Such agreements may, however, authorize a State or political subdivision thereof to use or permit the use of the airspace above and below the established grade line of the highway pavement for such purposes as will not impair the full use and safety of the highway, as will not require or permit vehicular access to such space directly from such established grade line of the highway, or otherwise interfere in any way with the free flow of traffic on the Interstate System.

Apparently the design, as recommended, did not meet the requirements of the highway agencies.

OTHER CORRIDORS

Median strip rail transit is now committed for two other Chicago Expressways—the Kennedy and the Dan Ryan. In addition, there is a proposal being considered by the Chicago Plan Commission to build a 22-mi crosstown expressway over the Belt Railway on Chicago's West Side. A proposal by CATS suggested a rubber-tired rapid transit experiment in the form of buses in a median or a reserved lane for the crosstown expressway. Finally, there is the corridor owned by the Chicago and Northwestern Railway in Oak Park in which the CTA leases two tracks for their local operation.

Kennedy and Dan Ryan Subways

The successful operation of the Congress Rapid Transit Line and the availability of cheap right-of-way prompted the planning of a median strip rail transit operation in the Kennedy Expressway. It was determined that even though the location was selected primarily to serve highway traffic it would provide an excellent rapid transit service to Chicago's Northwest side. The recognition that rail transit typically serves the longer trip, and the availability of good bus feeders, along with the possibility of developing Park 'n' Ride facilities, overcame any objection to using a location not specifically selected for transit.

The decision, however, was not made until after the expressway had been designed. At that time it became apparent that the median as designed would be sufficient to permit two-track transit operation if retaining walls were added at certain points, and bridge abutments were lengthened to accommodate the rails. By agreement, these modifications were made at a cost of \$2.3 million to the City of Chicago. The average median width is 51 ft.

The Kennedy transit line was authorized by a city ordinance passed in March 1956. The ordinance was quite similar to the one passed in 1946 authorizing the Congress Line. Figure 6 shows the Kennedy Expressway with the median strip reserved for transit operation.

The Dan Ryan Expressway was designed to provide for tracks in the median strip. The median varies from 56 ft to 88 ft in width. The additional right-of-way needed for transit cost \$1.02 million—paid for by the City. Additional costs for construction amounted to about \$1.5 million, also paid for by the City.

The U. S. Bureau of Public Roads reduced its matching from 90 percent to 85 percent to account for the cost of the transit median. Figure 7 illustrates a typical section showing the vacant median reserved for rail transit.

It is estimated that the cost of the Kennedy rapid transit will be \$48 million. The Dan Ryan improvement is expected to cost \$27 million. On June 12, 1966 Chicago



Figure 6. View of Kennedy Expressway showing reserved median.

voters approved a \$28-million bond issue designated for rapid transit improvements on the Kennedy and Dan Ryan Expressways. It is anticipated that the remaining funds will come through a grant from the Department of Housing and Urban Development.

Crosstown Corridor

The crosstown corridor offers a slightly different concept in transportation corridors. It involves building an elevated expressway over an existing railroad which presently is used exclusively for freight movement (Fig. 8). This is not a definitely committed location, but is one being currently considered by the Chicago Planning Commission.

There are many problems connected with building a structure of this type. During construction the railroad would necessarily have to remain in operation to provide service to its spurs and sidings along the route. The right-of-way is narrow and would result in "squeezing" the expressway in order to provide the required number of lanes. For example, instead of a median there probably would be a barrier separating the two travel directions. The aesthetic problem of building such an elevated structure has already been publicly debated. Problems of traffic operation could be magnified by heavy commercial vehicles on long ramp grades.

There are no apparent legal problems. The Highway Department can legally build over air rights provided the design meets acceptable standards (Interstate in this case). The railroads involved have indicated their willingness to negotiate the cost for use of the air rights. The precedent of cooperation has been set and it appears entirely feasible to develop this kind of transportation corridor.



Figure 7. View of Dan Ryan Expressway showing reserved median.

Lake Street Rapid Transit Corridor

A project completed in 1962 involved the relocation of $2\frac{1}{2}$ mi of an existing transit line operating at ground level to an elevated right-of-way owned by the Chicago and Northwestern Railway. This eliminated 22 grade crossings in Chicago and Oak Park where trains had been operating at street level since 1901.

The cost of this improvement was \$4 million shared as follows: The U. S. Bureau of Public Roads and the State of Illinois (Division of Highways) \$1 million, County of Cook \$1 million, Oak Park \$800,000, the City of Chicago and the CTA \$600,000 each.

OTHER USES

There is no reason to limit transportation corridors to the delivery of persons and goods. These corridors can be (and frequently are) combined with power transmissions, pipe lines, sewer and water, etc. The number and kinds of corridors which can be developed are limited only by our own ingenuity. For example, air space over rivers which could combine water transportation with highway or rail certainly is feasible.

Another example is shown in Figure 9. Here a small vehicle capable of being carried on railroad flatcars within urban complexes is suggested. This would permit the traveler ultimate flexibility and convenience. He would have the advantage of never leaving his seat from home to office, and of being delivered for the "line haul" share of his trip by rapid rail transit. A railroad official when asked about this idea would not volunteer that this was a good idea, but also offered the comment that it was not a bad idea.

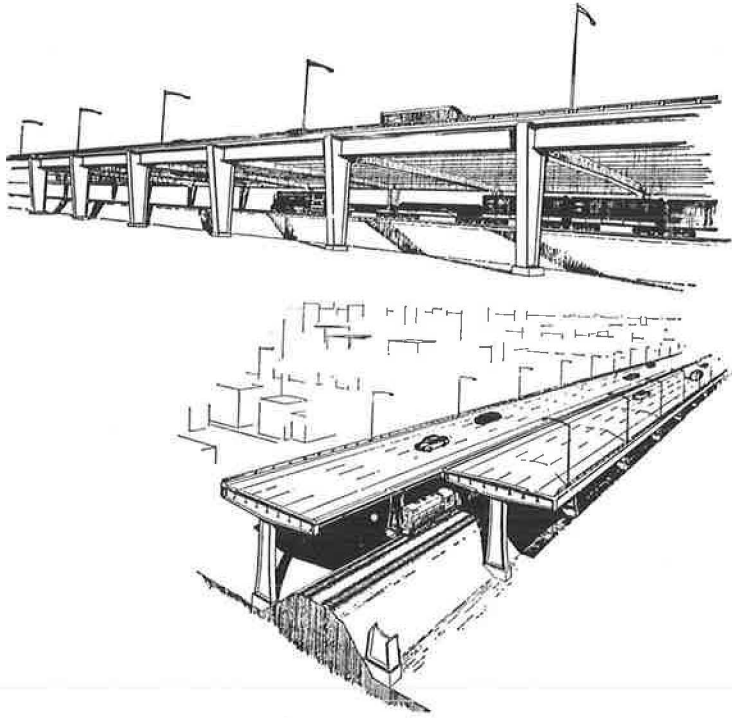
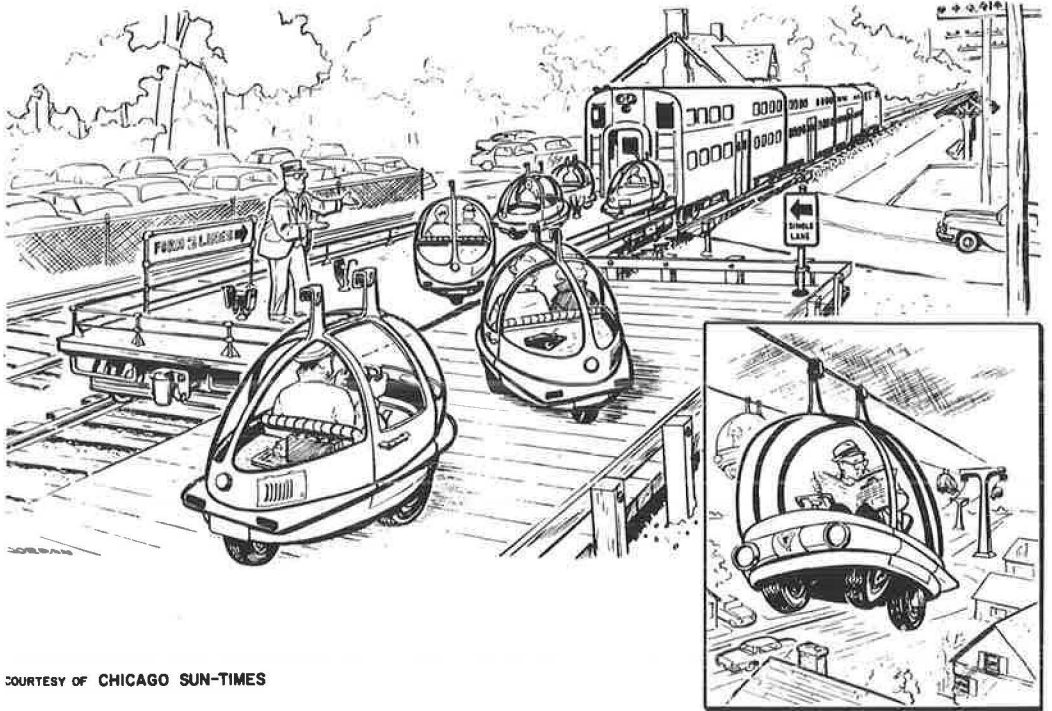


Figure 8. Artist's sketch of proposed Crosstown Expressway.



COURTESY OF CHICAGO SUN-TIMES

Figure 9. "CATSmobile."

The growing competition for space in our urban complexes certainly adds an urgent motive for making the best combined use of our transportation facilities—present and planned.

SUMMARY

This paper has presented some considerations incident to planning transportation corridors and has recounted various experiences and problems encountered in actually constructing and operating several corridors. It was pointed out that corridors involving several transport modes should not be developed simply because cheap rights-of-way are available. An important planning consideration is the future travel demand as determined by a careful study of future distribution and increase of population, employment, use of land and other socioeconomic factors which influence travel.

At present, there seems to be an adequate legal enabling framework for the development of transportation corridors. In the case of rights-of-way for highways, the law provides the highway administrator with some discretionary power. That is, he may permit other joint uses if he is satisfied that they are in the public interest and that they will not interfere in any way with the free and safe use of the highway. The key issue does not involve the question of whether or not joint use should be permitted, but rather how right-of-way cost can be charged fairly to each mode.

The development of transportation corridors in Chicago has been a model of inter-governmental cooperation, flexibility in interpreting the law, and extreme patience on the part of responsible officials. Stanley Forsythe (General Superintendent of Engineering for the Chicago Transit Authority and currently with the Bay Area Rapid Transit District in San Francisco), who played a key role in development of the Congress Corridor, said, "The single most important factor in getting the job completed was the superb cooperation of all levels of government from federal to local, and the cooperative administrative interpretation of laws for the public good."

Properly planned and developed, transportation corridors have enormous potential in our crowded urban areas; the limitations are those of our own ingenuity and creative ability.

ACKNOWLEDGMENTS

The author wishes to acknowledge the valuable assistance given by George DeMent, Chairman of the Board of the Chicago Transit Authority (and Commissioner of Public Works during construction of the Congress Corridor); George Krambles, Director of Planning for the CTA; Stanley Forsythe, Bay Area Rapid Transit District; Edward Carozza, Bureau of Engineering, City of Chicago; Henry Yamanaka, Illinois Division of Highways; William McConochie, Vice President of DeLeuw, Cather and Company; Fred Farrell, Regional Engineer, and Tad Comstock, Planning Engineer of the Bureau of Public Roads, Region No. 4. These gentlemen provided the author with copies of legal agreements, cost figures, and in general made the report possible.