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SUMMARY REPORT ON

HEALTH SCIENCES PARKING RAMP AND RELATED CONNECTOR ROADS

UNIVERSITY OF MINNESOTA, MINNEAPOLIS

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## PURPOSE

The purpose of this report is to summarize the work to date on the proposed Health Sciences 3,000-Car Parking Ramp and related roads. Unit "A" of the Health Sciences complex will be completed in September 1973 and it is necessary to complete the parking ramp by this date in order to serve the new medical and other University facilities.

The parking structure will be served from the south by the Dartmouth Avenue interchange with Interstate Highway 94 and from the north by the major traffic arteries of University Avenue and Washington Avenue. Connector roads linking these traffic generators must be directly related to the new parking structure.

These connector roads will provide access to the Health Science medical complex, the new parking ramp, and future University parking facilities north of University Avenue. It will also serve the industrial community adjacent to the railroad tracks to the east of the University, possible future housing to the north and east, and miscellaneous thru traffic.

## DESIGN CRITERIA FOR CONNECTOR ROADS

In order to evaluate the alternative locations for the connector roads, criteria for their location and design were established. Proposed solutions must be tested against the criteria in order to obtain a workable plan for present and future needs of the University and the City of Minneapolis.

- a) Direct access to University medical facilities, especially for patient delivery to inpatient, outpatient and emergency facilities.
- b) Direct access to Health Sciences Parking Ramp with stacking space for peak hour loads.
- c) Service to other University facilities.
- d) Service to nearby industrial and residential areas.
- e) Flexibility required for different destination and movement patterns while incorporating the adequate safety standards for good highway design.
- f) Minimum land acquisition costs and highway construction costs.
- g) Minimum disruption of existing residential community, i.e., dwelling unit loss, increased traffic on local streets, etc.
- h) Good vehicular and pedestrian access to remaining parcels of land for future residential and/or institutional uses.

## TRAFFIC CIRCULATION REQUIREMENTS

### 1. Basic assumptions:

- a. Circulation to parking ramp must function using local streets in the first phase since it is unlikely the connector roads will be built before the new Health Sciences Parking Ramp.
- b. River Flats parking lot (1150 spaces) will be phased out within the foreseeable future.
- c. Present University parking capacities:

6,700 - total University inventory in 1967  
1,700 - River Road Parking Ramp  
3,000 - proposed Health Sciences Parking Ramp  
11,400 - total spaces

2. Traffic capacity: Past characteristics indicate that it would be reasonable to assume that 45% of University parking would seek to approach via the Dartmouth Avenue Interchange and 60% of that traffic would arrive in the peak hour. This would result in approximately 3,100 vehicles per hour desiring to use that interchange to reach University destinations only.

However, the design capacity of the interchange is estimated at between 2,000 to 2,500 vehicles per hour. Thus the above figures indicate that present patterns at future levels due to the University demand alone could exceed the capabilities of the interchange.

If it is assumed that traffic facilities were modified and/or traffic patterns changed so that only 30% of the vehicles bound for the University were supplied by the interchange, and only 50% of the total arrives at the peak hour, the traffic flow allows for limited non-University oriented peak hour traffic users. Existing industrial and future housing development adjacent to the railyards will probably raise the demand on the interchange above design capacity.

### 3. Traffic allocations:

From I-94, two access roads serve the University with an approximated design capacity of 1,250 vehicles per hour equalling 2,500 vehicles per hour. Possible demand for that capacity would be distributed as follows:

1,100 cars - new Health Sciences Parking Ramp  
510 cars - west River Road parking ramp  
240 cars - River Flats parking lot  
650 cars - other destinations  
2,500 cars - total

## SITE CONSIDERATIONS:

In 1967 the Board of Regents of the University delineated areas of long range expansion which included all the available land east of Oak Street and south of Washington Avenue to the railroad tracks, minus land required for city-proposed connector roads between the Dartmouth Avenue Interchange and Washington and University Avenues. Since this time, the new Health Sciences Parking Ramp has been proposed for this area and additional medical facilities relating to the new University hospital have been discussed. In May of this year a Long Range Master Planning Density Study was prepared based on site area, floor area ratios, and projected medical and parking requirements. Final location of the parking ramp and connector roads should take these future development projections into account.

## PARKING RAMP LOCATIONS:

Two sites are presently being considered for the new parking ramp:

Site A: boundaries are Delaware, Oak, Essex and Erie Streets. Access to the parking ramp from the interchange would be accomplished before the connector roads were built by extending Huron Avenue north along the railroad tracks to Delaware Street.

Site B: boundaries are Delaware, Oak, Fulton, and Ontario Streets. Access to the parking ramp from the interchange would be via Huron and Essex Streets before the connector roads are built.

## CONNECTOR ROAD LOCATIONS:

Three routes for the connector roads are being considered:

Scheme 3: Original city-proposed route which was suggested before the plan for the Health Sciences complex and parking ramp were released by the University. This scheme would use Site B for the parking ramp.

Scheme 4: Diagonal route over the railroad tracks which would bring traffic from the interchange to the intersection with University Avenue at 26th Street in front of the Electrical Machinery Manufacturing Company. This scheme would use Site A for the parking ramp.

Scheme 5: Split one-way pair connectors which would use Erie, Delaware and Ontario Streets for northbound traffic and Oak, Fulton and Essex and Huron Streets for southbound traffic. This scheme would use Site A for the parking ramp with the one-way connectors on either side of the structure.

## LAND USE AND BUILDING SURVEY

In May of 1970 a building survey was made of the area being considered for the parking ramp and connector roads. The results of this survey appear below:

Scheme 3: Original city-proposed route for connectors, Site "B" for parking ramp.

	Housing	Industry	Institution
Parking	59 dwelling units	0	1 church
Connectors	211 dwelling units	0	0
Total	270 dwelling units	0	1 church

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Scheme 4: Diagonal route over railroad tracks, Site "A" for parking ramp

	Housing	Industry	Institution
Parking	72 dwelling units	0	1 church
Connectors	95 dwelling units	2 businesses	0
Total	177 dwelling units	2 businesses	1 church

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Scheme 5: Split connectors -- one-way pair -- Site "A" for parking ramp

	Housing	Industry	Institution
Parking	72 dwelling units	0	1 church
Connectors	14 dwelling units	1 business	0
Total	86 dwelling units	1 business	1 church

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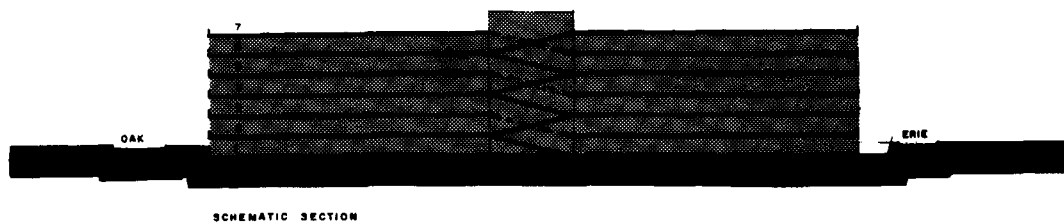
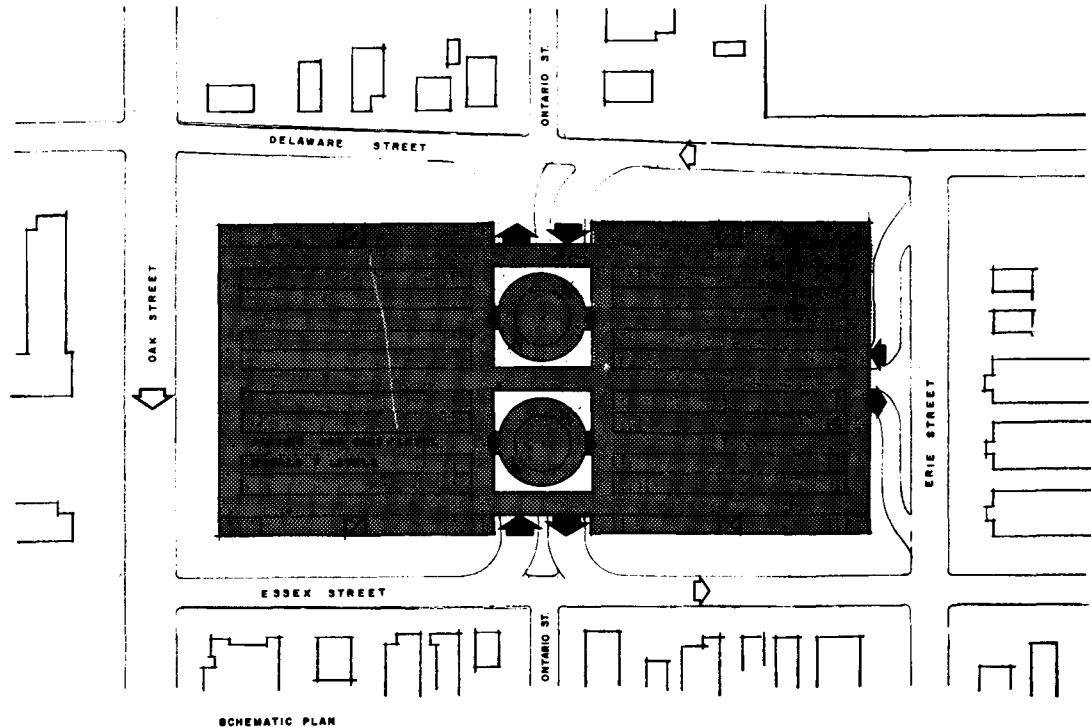
## PARKING RAMP DESIGN

Similar designs for the 3,000 car parking ramp were evolved which oriented the parking bays parallel with the long dimension of the structure and located two drums at the center. Access to the parking ramp would be accomplished adjacent to these drums with a third access at one end of the structure. One or more levels could be placed below grade depending upon costs required for excavation and mechanical ventilation.

## PARKING RAMP DESIGN (cont'd.)

Vehicular access to the parking ramp in Site A would be from Delaware, Essex and Erie Streets and in Site B from Oak, Fulton and Ontario Streets. Street widenings would be required on all streets except Oak Street in order to provide adequate room for stacking space and through traffic circulation. Pedestrian access would be provided on all sides but with main elevator cores located on Delaware Street where an underground walkway is proposed to link the parking ramp and the Health Sciences medical complex.

The drawings below show the parking ramp for Site A but the same scheme is also feasible on Site B by making the long dimension of the building parallel to Oak Street.



## PARKING RAMP DESIGN

## PARKING RAMP SITE ALTERNATIVES

Since it is likely that the parking ramp will be completed before the connector roads are built, vehicular circulation to Site A and Site B must be considered independent of the several proposed connector routes.

Site A (bounded by Delaware, Oak, Essex, and Erie Streets)

### Advantages

1. By extending Huron Avenue to Delaware Street excellent access is provided to parking ramp and Health Sciences complex from Dartmouth Avenue interchange. (no building acquisition is required.)
2. Parking ramp and vehicular access leaves major portion of existing residential community undisturbed.

### Disadvantages

1. Parking ramp would block construction of connector roads in Scheme 3.
2. Greater number of housing units would be acquired (72 units.)

Site B (bounded by Delaware, Oak, Fulton, and Ontario Streets)

### Advantages

1. Parking ramp would not block construction of any of the proposed connector routes.
2. Smaller number of housing units would be acquired (59 units).

### Disadvantages

1. Less direct vehicular access to Health Sciences complex and parking ramp.
2. More traffic would penetrate and disrupt existing residential community.

## CONNECTOR ROUTE ALTERNATIVES

The connector roads must distribute traffic to the Health Sciences medical complex, the new parking ramp and other University facilities north of Washington Avenue as well as serve present and future industrial and residential development to the east of the campus.

Scheme 3: Original city-proposed route with Site B for parking ramp

### Advantages

1. Brings traffic from Dartmouth Avenue interchange directly to Washington and University Avenues.
2. Provides direct access from interchange to future University development north of the stadium

### Disadvantages

1. Route cuts diagonally across residential area resulting in large number of housing units required for acquisition (211 units).
2. Weaving distance and vertical roadway alignment difficult for traffic bound for Health Sciences medical complex and parking ramp.





Scheme 4: Diagonal route over railroad tracks to University Avenue with Site A for parking ramp.

Advantages

1. Directs traffic not related to University away from campus.
2. Connectors would serve industrial area and new housing (Harris proposal) southeast of railyards.

Disadvantages

1. Weaving distance and vertical roadway alignment difficulties make this scheme highly questionable from engineering standpoint.
2. Connectors would not relate to proposed parking ramp and other development north of stadium.
3. Requires removal of relatively large number of housing units (95 units) as well as recent addition to General Paper Company building.

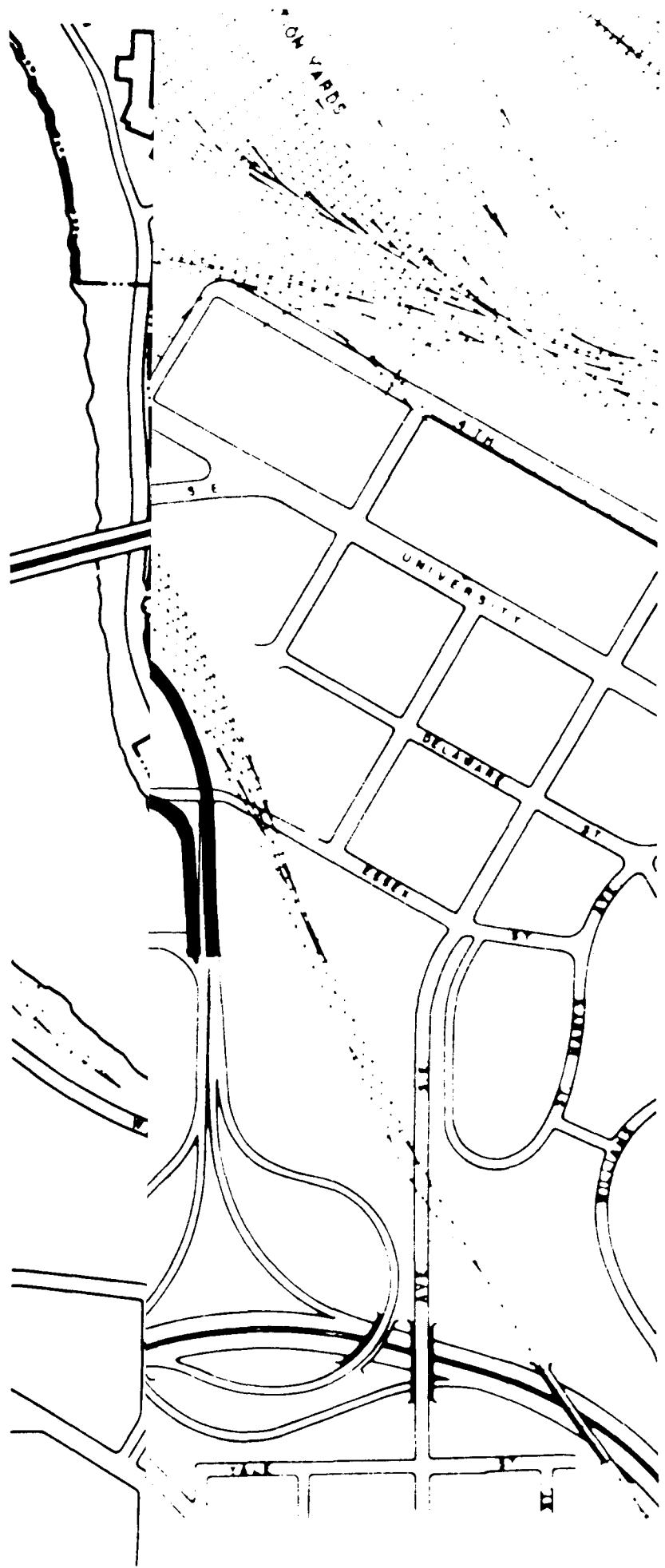
Scheme 5: Split one-way pair connectors with Site A for parking ramp

Advantages

Disadvantages

1. Requires removal of small number of housing units (14 units).
2. Provides direct access to University medical facilities and Health Sciences parking ramp.
3. Provides good access from interchange to future University-related development north of Washington Avenue.
4. Disperses traffic onto two streets thereby minimizing disruption of existing residential community.

1. Circulation difficult for local northbound traffic originating from south of Essex Street.



## RECOMMENDATIONS

Based upon the design criteria and the comparative analysis above, Site A for the parking ramp and Scheme 5 for the connector roads are recommended. This would provide excellent access for the Health Sciences medical and parking facilities as well as future University-related development north of Washington Avenue. Disruption of the existing residential community is minimal since the major land acquisition is for the parking ramp itself with through traffic kept at the perimeter of the community south of Essex Street. The parking ramp can function efficiently with only minor street widenings before the connector roads are built.

Unless the difficulties involved with weaving distance and vertical roadway alignment can be resolved, Scheme 4 should be eliminated from consideration. Even if these problems can be solved, questions on motorist destination and residential and industrial land acquisition still make this scheme the least preferable of the three alternatives.

Although the connector roads in Scheme 3 did not take into consideration the new Health Sciences complex, it seems feasible to consider this scheme as a viable alternative to Scheme 5, even though the weaving distance and vertical alignment of separate access roads to the Health Sciences are difficult. The main objection to Scheme 3, however, is the large amount of residential land acquisition since the road alignment does not follow the existing street pattern.

A difficulty with all the connector road schemes is direct access to the area south of Fulton Street from the Dartmouth Avenue interchange. New large scale development in that area would be severely limited in terms of access since River Road is not designed to take large volumes of traffic.

Our studies indicate that, with the new Health Sciences complex, the major destination at peak hours for autos using the interchange will not be the arterials of Washington and University Avenues, but rather will be the University parking ramps. Thus, the original design for large volume, moderate speed connectors should be reconsidered. There will be an increased demand in the future for direct access to facilities north and east of Washington Avenue and east of Oak Street, but alternate routes other than the Dartmouth Avenue interchange should be developed.