TECHNICAL MEMORANDUM

STUDY OF THE

KING-BERETANIA CORRIDOR ALIGNMENT

Honolulu Area Rapid Transit System
Environmental Impact Statement & Refine Engineering Phase

DMJM

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by

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A. INTRODUCTION

Between downtown Honolulu and University Avenue in the Moiliili area, there are two primary travel corridors - the King-Beretania corridor and the Kapiolani corridor. These two corridors were considered in the PEEP I planning study and evaluated relative to planning goals and objectives[1/] which cited Waikiki District, Ala Moana Shopping Center and Neal Blaisdell Center as major activity centers to be served by the transit system.

Also considered in the evaluation of these two corridors was the defining of the long-range regional transit plan[2/] which called for a "single line" configuration to serve existing major activity centers with a "second" line to serve as a relief line in the future as well as to serve future population concentration in urban Honolulu. Based on the above described considerations, the Kapiolani corridor was selected to best serve Waikiki and Ala Moana areas with King-Beretania corridor considered for the future "second" line if needed. The primary emphasis of serving existing major activity centers was determined to best meet the intermediate - and long-range travel demands of urban Honolulu.

Since the King-Beretania corridor has been and is still considered to be a viable location for a transit line, a detailed evaluation of this corridor and the proposed route alignment and station location as an alternative is presented.

B. DESCRIPTION OF THE CORRIDOR

The King-Beretania corridor is generally defined as being between the H-1 Freeway on the north to approximately half the distance between King Street and Kapiolani Boulevard as the southerly line. The existing land use can be generally described as low-density commercial activity along both King Street and Beretania Street with public facilities intermingled therein. Adjacent to the freeway, high density apartment developments exist mostly on the west end of the corridor, with low to medium density residential-apartment developments existing on the east end. South of King Street, residential-apartment developments exist between Pensacola Street and Sheridan Street, in the Holiday Mart area, and between Punahou Street and University Avenue.

The corridor can be basically described as containing older developments of both commercial and residential uses with newer developments occuring along the freeway on the west end and in the Holiday Mart area. These newer developments are inherently high density apartments with occasional high-rise commercial buildings dotting the corridor. At this time there is no evidence of any major commercial/office complex emerging in the corridor.

Currently the Interim Zoning Control Ordinance is used to guide development in the corridor while the new development plans are being formulated. At this time, there is no indication of whether any significant changes would be reflected in the new development plans.

C. TRANSIT PLANNING CONSIDERATIONS

As previously described, there is no single dominant land-use development, existing or planned, which would dictate the selection of any one route over the other in this corridor. However, King Street is more centrally located to serve, within walking distance, an area from the freeway to generally half the distance between King Street and Kapiolani Boulevard which was previously described as the bounds of the corridor. Thus King Street was selected to be the preferred transit route over Beretania Street.

Relative to station locations, a minimum spacing of 1/2 mile to a maximum of 3/4 mile would provide excellent coverage to this area. Based on major north-south streets providing convenient access for pedestrians and vehicles destined to the stations, including feeder buses, Ward Avenue, Piikoi Street, and McCully Street were found to be logical locations for stations. With these locations, station spacing would average to about 0.7 miles which makes most of the corridor within easy walking distance of the stations. These station locations also provide direct access from areas north of the freeway as well as from the south, which includes Kakaako, Ala Moana, and Waikiki areas.

D. SELECTION & DESCRIPTION OF ALIGNMENTS

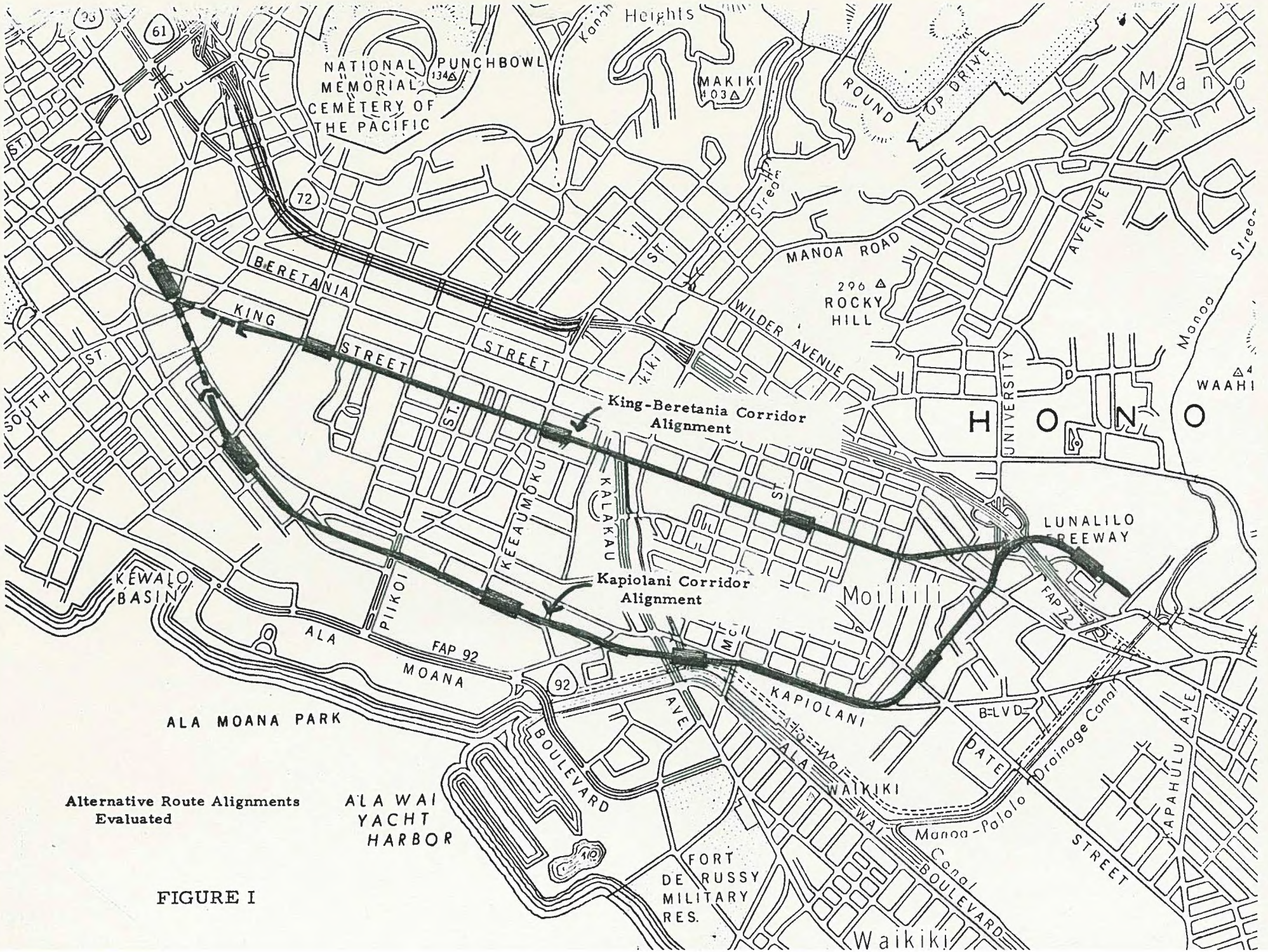
Although King Street was determined to be the preferred transit route in the King-Beretania corridor, alternative alignments were reviewed on Young Street and a possible alignment on some street south of King Street. Young Street is relatively narrow and discontinuous at Thomas Square Park and Moiliili Field Park. There are no continuous streets immediately south of King Street and they are also quite narrow. Therefore it was concluded that King Street with its wide right-of-way (ROW) would be the logical choice for the transit line.

King Street is a wide street with one-way traffic in the east bound direction. It is wide enough to construct an underground (subway) structure requiring little or no underpinning. With King Street being the primary arterial for east-bound traffic, construction should be done by tunneling in lieu of open-cut method in order to minimize traffic impact.

Since any underground construction is quite expensive, an aerial guideway configuration was included for consideration. The width of the ROW should be adequate to minimize visual and noise impacts to the adjacent properties. However the one major problem is the impact on traffic since it is a one-way street. A single row of columns in the center of the roadway would preclude changing of lanes and thus inhibit the full and effective use of this major arterial.

The alternative to the use of the center lane is to use the curb lane but this would place the guideway structure in close proximity to the adjacent buildings. It was determined that the use of the curb lane would be unacceptable due to the magnitude of visual and noise impact on adjacent properties. It was therefore concluded that the most feasible alignment would be in the center of the roadway.

For purposes of comparative evaluation, both underground and aerial guideway configurations were considered, similar to those alternative alignments studied for the Kapiolani Corridor. Figure I shows the route alignment and station location for the two alternatives.



Alternative Route Alignments Evaluated

FIGURE I

E. EVALUATION OF SERVICE QUALITY

One of the primary factors in evaluating alternative transit routes is the service to origins and destinations.[3/] High concentration of population and employment within the 1/4 mile radius area of the stations is considered to be one of the most influential factors in attracting transit usage and making transit cost-effective. Areas that require modes of access other than walking to the station are only influenced by the level of accessibility in terms of significant distance and capacity of the access road. Therefore service areas outside of the walking distance areas are not influenced measurably by the difference in route or station location of only a few blocks.

Based on a detailed analysis of the area of influence around each station, land areas were computed and relative population and employment comparative indices derived by use of appropriate density factors. The following table shows the relative service impact of the alternative routes.

SERVICE COMPARISON

FACTORS	KING STREET CORRIDOR		KAPIOLANI CORRIDOR	
	Land Area (Acres)	Comparative Index	Land Area (Acres)	Comparative Index
RESIDENTIAL SERVICE:[1/]				
High Density Apts.	58.54	58.54	111.83	111.83
Med. Density Apts.	19.35	9.68	-	
Total	77.89	68.22	111.83	111.83
EMPLOYMENT SERVICE:[2/]				
Commercial & Industrial	129.08	25,722	212.37	36,944

1/ For comparison of service to residential areas by the alternative routes, a comparative index was developed based on the fact that the density of a Medium Density Apt. area is approximately 50% of the density in a High Density Apt. area.

2/ For comparison of service to employment areas, by the alternative routes, a comparative index was developed based on the average employment density of each of the census tracts located in the stations' area of influence.

From this comparison it can be readily seen that the Kapiolani corridor would encompass a much larger service area in terms of both population and employment. The primary planning objective for any transit system is to directly serve as much highly concentrated areas of population and employment as possible.

F. EVALUATION OF COMMUNITY IMPACTS

Some of the key factors applicable to this comparative evaluation are related to land use and development of the area, social impact in terms of dislocation, and environmental effects. These factors affect both the local community as well as the entire region, but to varying degrees. For example, the location of the alternative routes of only a few blocks from each other may have a significant local effect but only superficial effect on a regional basis. Conversely, the serving of a major activity center conveniently could have a significant impact on the region through greater overall transit usage but it may have little or no effect locally if the area is already conveniently served by bus transit.

Since the development plan under the new General Plan is currently under formulation with community inputs, little can or should be said relative to impact of transit on community planning and development goals and policies. However, from the island-wide basis, the King-Beretania corridor will not serve Waikiki and Ala Moana areas as well as the Kapiolani corridor. Service to these two major existing activity centers is considered to be of great regional significance in terms of ensuring continued economic viability and environmental preservation. The Kapiolani corridor route would also be highly supportive of the Kakaako redevelopment

which is currently under planning study. In summary, the Kapiolani corridor route would enhance the redevelopment of the Kakaako area, reinforce the existing and future developments in the Ala Moana and Holiday Mart areas, provide good transit access to Waikiki, and is compatible with the continued development of the high density Moiliili area. The King-Beretania corridor would also have some positive influence in the above areas but to a much lesser extent.

One of the most sensitive community impacts is that related to dislocation of businesses and residents. The following table shows the comparison between the two corridors.

RELOCATION COMPARISON

Alternative	Residential	Non-Residential	Total
King St. Corridor	94	87*	181
Kapiolani Corridor	126	62	188

*Does not include new 5-story office building constructed at corner of King and Cooke Streets.

As can be seen from the table, King-Beretania corridor would have more non-residential dislocations but fewer residential dislocations. When the residential and non-residential dislocations are combined, the totals are about equal with King-Beretania corridor having 7 less dislocations.

Relative to environmental effects, the alignment in the Kapiolani corridor is largely located in an area used for industrial purposes and therefore the visual and noise impacts are somewhat less than if placed in more sensitive areas. King Street has many small retail establishments which could be more sensitive to visual intrusion of the guideway structure as well as being more sensitive to the noise emanating from the transit vehicles.

G. COMPARATIVE COST ANALYSIS

The King Street aerial alignment for the King-Beretania corridor and the Waimanu Street, Kona Street, Kapiolani Boulevard and University Avenue alignment for the Kapiolani Corridor both begin from a common location at the Civic Center station to the University Station, also common to both alignments. Since the Civic Center station is planned to be a subway station, each alignment will start as an underground section and continue for approximately 1000 feet to a portal for transition to an aerial structure configuration. The King Street alignment is a more direct route between the two common stations and has a total length of 2.65 miles as compared to 3.35 miles for the Kapiolani route.

In addition to the difference in the route length, the Kapiolani route has 4 stations between the Civic Center and University stations as compared to the 3 stations for the King Street route. Although the subsurface and surface conditions are quite comparable, the difference is the length and the one extra station results in the cost of the Kapiolani route to be higher by approximately 15% in construction cost. The total cost is $79 million for the King Street alignment and $91 million for the Kapiolani Boulevard alignment or a difference of $12 million.

H. SUMMARY OF COMPARATIVE EVALUATION

The three major factors considered in the comparative evaluation were service, community impacts and cost. The Kapiolani alignment was found to provide superior service and have less negative community impacts but would cost more than the King Street alignment. The greater cost for the Kapiolani alignment is attributed to its greater length and additional station. This additional station provides direct service to the lower Moiliili apartment district which would not be served directly with the King Street alignment.

If one assumes that the superior service of the Kapiolani alignment is attributed to its greater number of stations, then the added cost of this one additional station and the necessary longer guideway length is justified, i.e. the benefits from serving more people would off-set the added cost. Although the community impact factors may favor the Kapiolani alignment, the choice between these two alternatives involves the basic issue of whether transit should serve existing activity centers or located to stimulate the redevelopment of an area.

The use of transit to stimulate redevelopment of an area is certainly a worthy approach but the type of redevelopment may have a major bearing on the use of the system. The rapid transit system as

currently planned should be viewed as a regional system in that with its orientation to serve major employment and activity centers, its utility is increased to all geographical areas of the island. However if transit service is oriented more towards population concentrations over employment centers, then the transit utility is more limited to the areas served. In short, people living in outlying areas are mostly destined to either employment or activity centers and not population centers in urban Honolulu.

If the King-Beretania corridor were to be developed into a linear high density commercial/ office complex, similar to Wilshire Boulevard in Los Angeles, or with one or 2 major activity centers similar to Ala Moana Shopping Center, then the King Street alignment would be highly attractive to people living in both urban core and in outlying areas. However if the corridor were to maintain its current development characteristics of low-density, linear commercial activity and with more high density apartment developments, then the usefulness of the transit system to the island would be less. Unless there is a clear cut policy of developing the King-Beretania corridor into a high-density commercial/office complex, the Kapiolani alignment would provide a more useful service to the island.

The results of the comparative evaluation of the alternatives are summarized below. Although costing slightly more due to the greater route length and the one additional station, the Kapiolani alternative provides better service quality by approximately 50% relative to residents and jobs located in the area. This alternative would result in less adverse impact to the community relative to visual intrusion, noise, and traffic disruption. Furthermore, the station area development potential is much greater for the Kapiolani alternative due to generally large land ownerships existing around stations. It is therefore concluded that the Kapiolani alternative is the preferred route due to greater potential benefits that would accrue to the community as well as the entire island together with lesser adverse impacts resulting from the system.

COMPARISON MATRIX

	KING STREET ALIGNMENT	KAPIOLANI BLVD. ALIGNMENT
PHYSICAL DESCRIPTION		
Route Length	2.65 mi.	3.35 mi.
No. Station	3	4
CAPITAL COST (1977$)	$79 million	$91 million
SERVICE QUALITY		
Residential	68 equiv. ac.	112 equiv. ac.
Employment	25,700 jobs	36,900 jobs
COMMUNITY IMPACT		
Visual	More sensitive	Less sensitive
Noise	More sensitive	Less sensitive
Traffic	More impact	Less impact
STATION AREA DVLPMT.		
Property Characteristics	Small, indiv. owners	Large land ownerships
Dvlpmt. Potential	Fair	Good

REFERENCES

1. Goals & Objectives - Interim Report, October 1971

2. Long Range Regional Transit Plan
   Interim Report, March 1972

3. Route Planning Study - Volume 1
   Interim Report, March 1972

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