A study of

A RAILROAD TERMINAL for SEATTLE

Suggested scheme for unification of railroad facilities, with recommendations for city planning considerations in relation to and in the vicinity of the station.

Submitted as partial fulfillment of the requirements for the Degree of MASTER IN ARCHITECTURE

To: William Wilson Wurster, Dean
School of Architecture and Planning
Massachusetts Institute of Technology
September 20, 1946

By: Arnold Gordon Gangnes
B. Arch., University of Washington 1942

Cambridge, Massachusetts

September 9, 1946

William Wilson Wurster, Dean
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dean Wurster:

I wish to submit for your consideration, this Thesis, as partial fulfillment of the requirements for the Degree of Master of Architecture.
The Thesis consists of a comprehensive study of the existing civic problems with relation to a proposed railroad terminal, and the problem of the terminal itself. I have presented a possible solution to the problems which I hope will meet with your approval.

Respectfully yours,

Arnold G. Gangnes

Arnold G. Gangnes

281133

Acknowledgement:

I am indebted to many persons for their invaluable assistance in the formulation of this report and their able criticism of the design submitted.

1. To J.W.A.Bollong, City traffic Engineer, Seattle, Washington, go my sincere thanks for his tremendous contribution, to the formulation of this report. His enthusiasm in the project was exceeding welcome and served as an effective inspiration to me.

2. I am indebted to Dean W.W.Wurster and Professors Anderson, Beckwith, Brown, Kennedy, MeVoy and Greely of the School of Architecture and Planning for their able criticism and excellent contributions.
Professors Bone and Babcock of the Civil Engineering Department assisted in the Engineering aspect of the problem.

3. There are many thus who contributed, both from Seattle and from Boston. They are listed as Information Sources in Appendix A.

4. I wish to thank my father-in-law, Michael Klepach Sr. and brother-in-law, Michael Klepach Jr. for their patience, understanding and cooperation in securing on the spot data.

5. Lastly, I am grateful for the patience, unfailing confidence and able stenographic assistance contributed by my wife.

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Foreword

On the following pages is a comprehensive study of the railroad terminal situation of city of Seattle, Washington. My study has principally been concerned with the terminal building itself. Repeated reference however, is made to other tributary problems, the solution of which is as vital to the terminal as is the building itself. I have attempted to analyze all problems and to locate or arrange all tributary problems in such fashion as to insure a plausible, workable scheme of public development.

The solution is by no means intended to be final. To properly design such a building, it would require a working committee of all parties concerned. The scheme represents the work of but one individual and is intended to be merely a possible solution.

If this solution serves to provoke the minds of persons who are in a position to affect or propose a change in the existing situation, it is successful.

SEATTLE: RETROSPECTION and REFLECTION

Seattle: Retrospection and Reflection

It has been said that the first half-million population of a growing city is the hardest to obtain; the rest comes more easity. If that is the case, the City of Seattle has just begun to grow. Seattle's pre-war population (1940 census) was recorded at 368,302. This figure grew in the war years to 480,000 in 1943, and was reputed to be over 600,000 at the peak of war production in 1945.

After V-J day, with the closing of many of the war industries; Boeings, Associated Shipyards, Todd-Pacific etc., there was the usual trend toward the de-population of the city, which usually follows boom periods. However, recent reports and trends in the city indicate that large numbers of people who migrated to the city during war years, are staying on to take up peacetime residence, or, if they have left, are returning with their families to take up permanent residence. Added to this startling increase of population, is the increase noted in the outlying districts of the city. These districts must be considered, for Seattle, like all other growing cities, is rapidly approaching the point where all of these communities will have to be considered in the Greater Seattle Area, hence under the influence of Seattle's growth and expansion. Seattle's growth has been partly due to inflated war-time industry , and partly to discovery by people and

industry that the Pacific Northwest holds a wealth of undeveloped possibilites. There is every reason to believe that the existing industry will not return to prewar levels. Contrarily, it is the opinion of experts that industry is merely beginning in the city. Possibilities in the City itself, and in its neighboring communities are unlimited. There are several principal reasons for this belief.

Geographically:

Seattle has a fine inland harbor. She is the key port with regard to future foreign trade with the Orient and Russia. She is literally the gateway to Alaska and the wealth located there. The mild equable climate of Western Washington keeps the waters of Puget Sound navigable the year around, thus facilitating shipping and making continuous industrial activities possible. Plentiful moisture promotes forest growth and encourages agriculture. Lack of extreme temperatures make Seattle attractive to future residents, and the scenic nature of the entire Pacific Northwest makes it an unsurpassed vacation mecca. The mean annual temperature is 51.3 degrees and normal annual rainfall, 33.4 inches.

Natural Resources:

The economy of the entire area is based on the expansive stands of virgin timber. These enable the State of Washington to lead all other states in thenation in the manufacture of plywood, mill products, dressed mill

products, veneers, and pulp. Supplementing the lumber industry are: mining, agriculture, and fishing. Perhaps the most important asset for the future is the unlimited potentialities of hydro-electric power.

Edna Ferber, in her pseudo-saga, "Great Son" wrote, "Seattle could have been the most beautiful city in the world. Perhaps she may someday be." I believe that Edna Ferber meant that if ever a city was endowed with the raw materials for becoming a beartiful city, Seattle was.

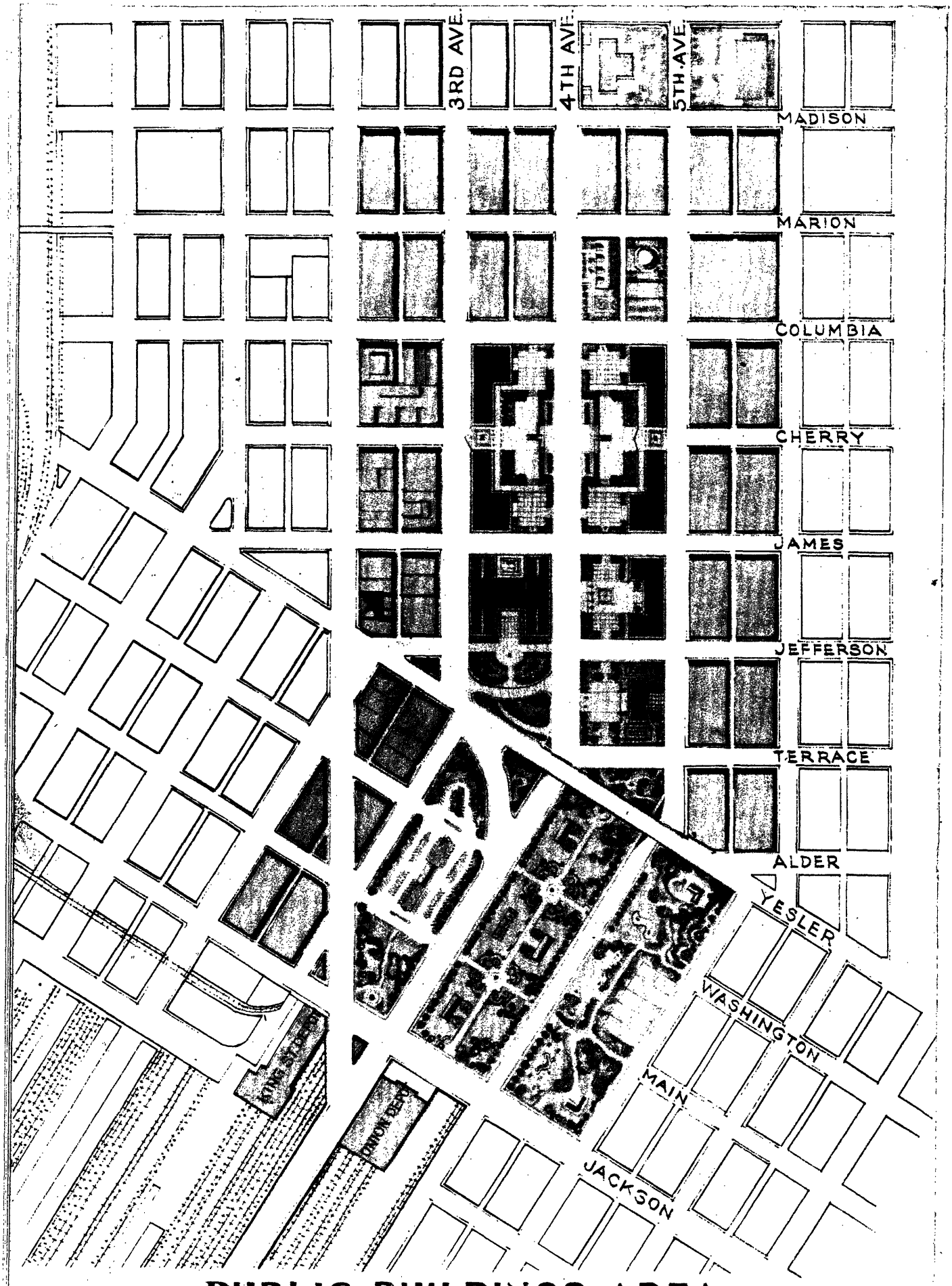
It remains to be seen if the progressive citizenry and City Government will have the courage to meet the challenge.

SEATTLE'S DILEMMA

Seattle's Dilemma:

As a result of Seattle's rapid war growth and in view of her anticipated future expansion, civic officials have and will continue to be concerned with keeping in step with her needs and requirement as a growing Metropolitan area.

In years past, many civic improvement projects have been suggested by visionary citizens. Some of these have been good, others strictly for publicity. Seattle has always been in need of an overall pattern of purpose with regard to civic growth. In 1909 a City plan was formulated by a Mr. Bogue. Mr. Bogue was hired by the city as a city planner, to present a study of the city and to make recommendations as to its future growth and improvement. The Bogue Plan was a sound document in many respects, with a degree of excellence and foresight. This plan was abandoned, virtually, before its start. Certain financial interests in the city have since that time, blocked most proposals for City Planning. As a result, Seattle has grown like a weed, in no fixed direction or pattern and with no definite program. As a result, the City, which has capabilities of being a beautiful, well planned center, has failed to avail itself of its natural beauty and advantages. By way of comparison, cities such as Boston, New York and Chicago are not blessed with the natural scenic panorama, as is Seattle and yet these cities, as old as they are, and despite



PUBLIC BUILDINGS AREA

EXHIBIT A

TENTATIVE DEVELOPMENT

their tremendous growth and expansion, have managed to retain or reclaim certain areas in an effort to beautify their cities. Boston has streets like Commonwealth Avenue, the Fellsway, Veteran's Memorial Drive and others, all major traffic arteries, which are wide, beautifully landscaped, and extremely pleasant to drive on. New York has the Hutchison and Hudson River Parkways, Chicago has Michigan Avenue. All these are main thorofares, are beautiful as well as efficient. Seattle has so far failed dismally in this respect. Her chief arteries, Alaskan Way, Aurora Avenue, Fourth Avenue South and others, are strictly widths of pavement with little attempt made at beautification. In the midst of Boston is the "Common" a large expanse of park which offers a pleasant relief from the turmoil and heat of her business section. Similarly, New York has Central Park. Seattle's closest park is Volunteer Park, many miles removed.

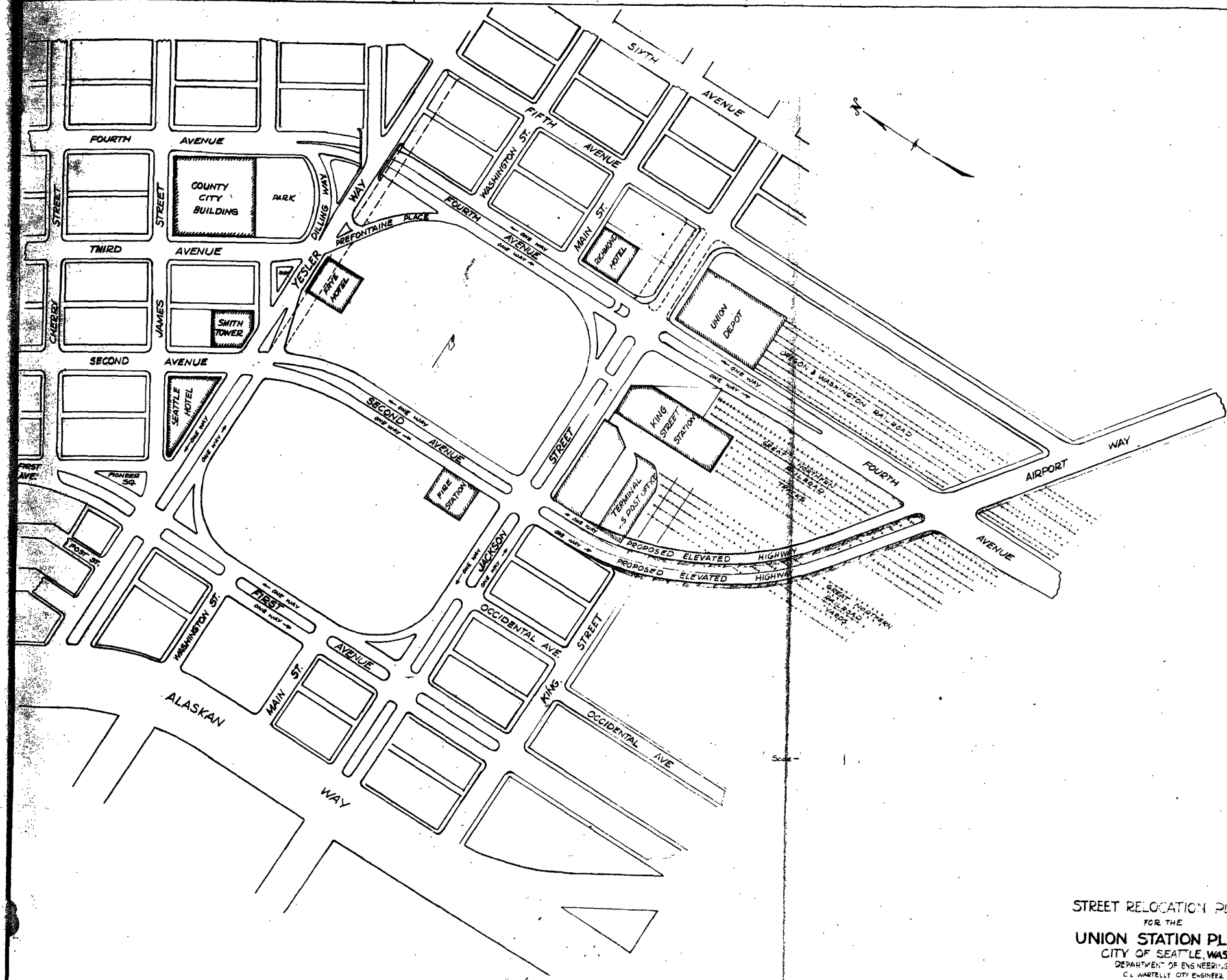
All this further emphasized the need for at least an overall pattern of Civic improvement and beautification. In January 1945, Mayor William F. Devin created a City Planning Commission with the purpose of reporting on a "Proposed Public Buildings Area" for Seattle. Briefly, this report suggests an area for a proposed public buildings area to house all present and future City-County offices. (see opposite page) It also recommends that federal government offices, such as post office, Federal Building, etc. be incorporated

as much as possible with the local city and county offices. The aim is to have all public government facilities in a unified location with easy reach of all concerned and of each other. The Federal government has expressed a willingness to cooperate as much as possible with any civic plan the city will offer. This project constitutes the first real step toward an overall plan the City has undertaken in its modern history. The results of that report, published in May 1945, show that the best possible place for a public buildings area is the track bounded on the east by Fifth Avenue; the south by Jefferson Street; the west by Third Avenue; and the north by Columbia Street. (see Exhibit A) In addition, the Commission made recommendation as to the elimination and beautification of slum areas in the vicinity of the railroad terminals. It is important to note the distinct and definite relation between this proposed area and the railroad terminal area.

In June 1945, Mr. J.W.A.Bollong, City Traffic Engineer, formulated a report regarding modernization of the railroad passenger terminals in the city. A combination of this report with that of the City Planning Commission reveals a definite trend in one direction. Each report supplements the other, and certain points showed amazing agreement of intent despite the disassociation of the reporting groups.

Though I, as an Architect, whose perogative it is to

criticise, do not agree with the overall character of the proposals in sketch form, I am heartily in accord with their intent. I believe the proposals, basically, are tremendously necessary. My chief reaction is to caution the City Officials to whom these reports have been made, not to make the mistakes made by other cities of similar problems. The City Planning Commission indicates its proposed area will reasonably satisfy the needs for a period of 25 years or more. Mr. Bollong's sketches of Union Station modernization (see following pages) show merely an attempt to alleviate the present confusion, with no recommendations for expansion or beautification. Mr. Bollong is not to be criticised for this, he is not an Architect, his problem is traffic. I believe he does and excellent job in his traffic planning and I certainly commend him for being conscious of the architectural shortcomings of the railroad terminals.



STREET RELOCATION PLAN
FOR THE
UNION STATION PLAZA
CITY OF SEATTLE, WASH.
DEPARTMENT OF ENGINEERING
C. L. WARTELLE, CITY ENGINEER
TRAFFIC ENGINEERING DIVISION
J. W. A. BOLLONG, TRAFFIC ENGINEER.

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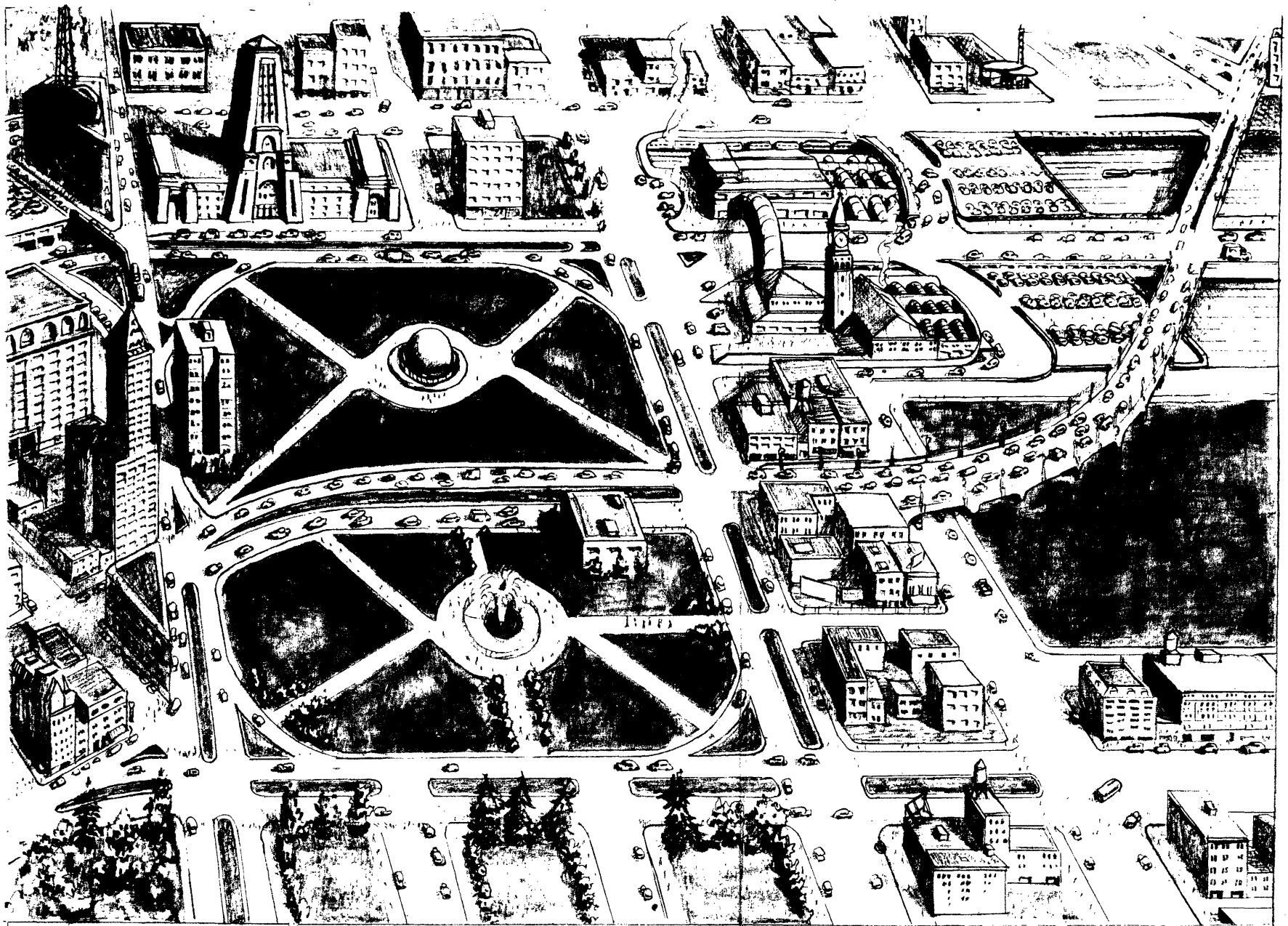


The UNION STATION PLAZA
CITY OF SEATTLE

STREET RELOCATION PLAN

DEPARTMENT OF ENGINEERING

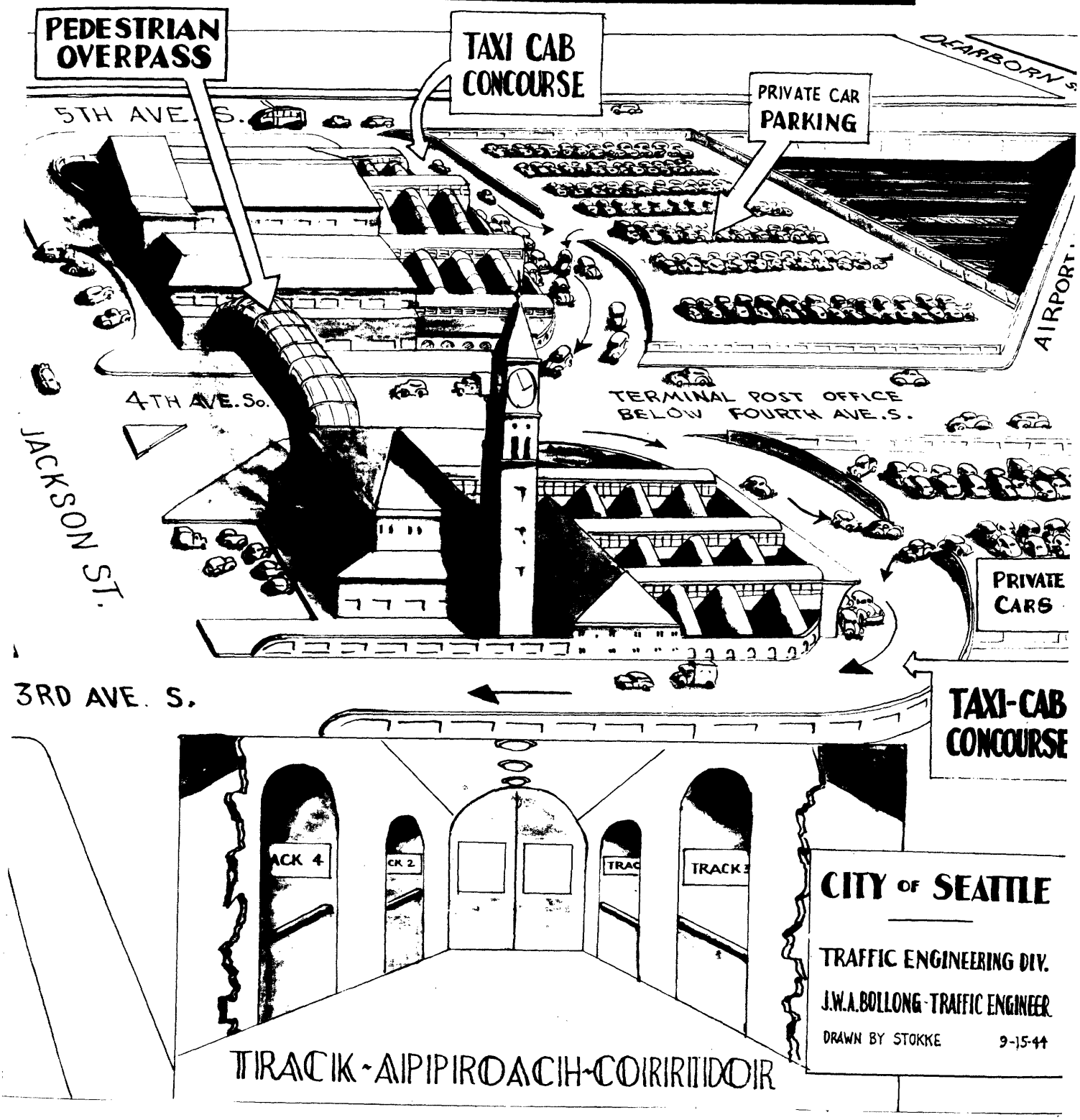
C. L. WARTELLE
CITY ENGINEER

TRAFFIC ENGINEERING DIVISION-DRAWING

TRAFFIC ENGINEER

DRAWN BY STONER-44

RAILROAD STATION MODERNIZATION IN THE CITY OF SEATTLE



CITY OF SEATTLE

TRAFFIC ENGINEERING DIV.

J.W.A. BOLLONG - TRAFFIC ENGINEER

DRAWN BY STOKKE 9-15-44

A passenger terminal project should be so located and designed as to coordinate as far as reasonably practicable with other civic activities. Frequently it is found desirable to make general civic improvements at the same time the terminal is being constructed. Modification of street approaches is almost always involved. The costs should be assumed by the parties benefited. Close cooperation between the terminal committee, the Planning Board of the City, executive officers of the city, and perhaps other civic groups, is necessary in order that such new legislation as may be necessary shall be fair and equitable to all parties at interest.

I believe it would be a mistake to rehabilitate slum areas, creating parks and green areas without modernizing the terminals. It would be like planting trees at a garbage dump; the smell lingers on. The creation of a public buildings area and the modernization of railroad terminals brings up the ever important problem of parking space. If Seattle is to avoid the mistake of certain cities, i. e. Boston, Mass.she will plan to be able to accomodate the parking of the tremendous number of vehicles which will appear to congest the areas. The appearance of the rehabilitated slum areas and the resultant green areas, offers a wonderful opportunity for an underground parking area such as at Union Square in San Francisco. Boston is now realizing her mistake

in failing to develop similar areas under the "Common" as proposed 20 years ago, and is now negotiating to construct the underground parking lot.

If Seattle plans to rehabilitate the areas in question it is my opinion that consideration should be given immediately to the development of underground parking in that area.

As further argument against the proposed modernization of the railroad terminals, as suggested by the Traffic Engineer, I would like to point out that the proposal of an overhead link of Airport Way and Second Avenue would greatly jeopardize any future program for the expansion and modernization of railroad facilities.

In the succeeding section of this report, a complete analysis of the situation is made, showing definite reasons for the suggested improvement.

The immediate public reaction is, of course, going to be, "Who is to pay for this?" The financing of this project would involve considerable money but the problem of finance is not too serious after it is analized.

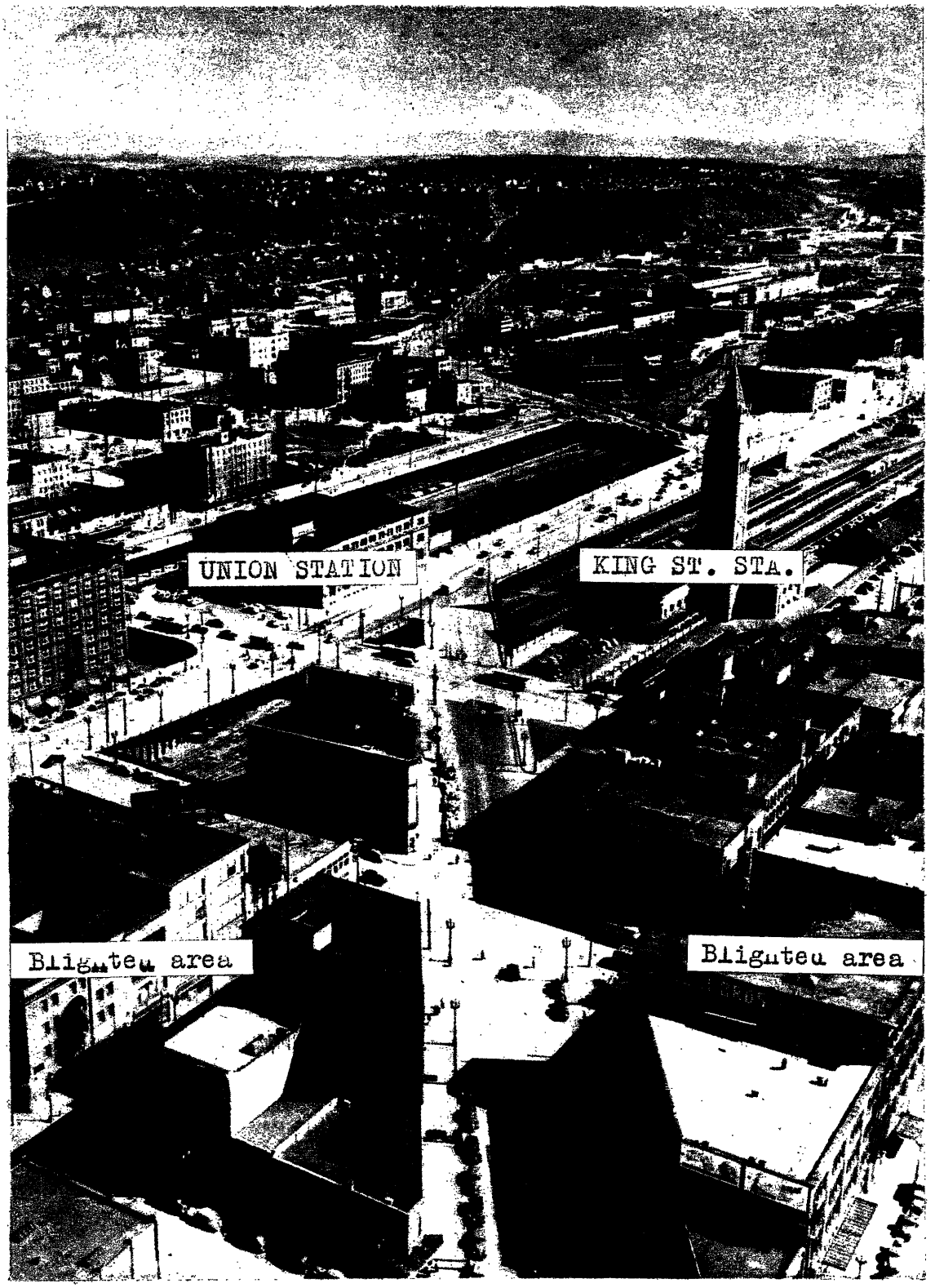
The creation of a park area alone would do many things. First, it would clean out a section which is a financial liability because of its filth, fire hazard and its accumulation of illegal activities. Secondly, its creation would have a tremendous impact on land values in the immediate vicinity.

As an example, Park Avenue in New York City was once an open railroad yard. The resultant covering over, and

creation of this beautiful street, sent land values adjoining it, soaring to the point where today it is the richest land in the would. This is true with respect to properties adjoining the Boston Common. Mr. A.J. McVoy, Professor of City Planning at M.I.T. and former member of the City Planning Board of Portland, Oregon, states that when similar problems were advanced in the City of Portland, the City Tax Assessor revealed that tax increases alone would go far toward lowering the amortization time of any loans incurred. In addition, there is the revenue that would concur to the city from the parking lot. It would be possible to obtain parking area for from 2500 to 5000 automobiles. The railroad companies would also benefit. The improvement of facilites would definitely serve to aid in the increase of traffic volume. The creation of order where confusion now reigns, would enable greater efficiency in operation, increased schedules. Cleanliness and efficiency would greatly increase the service it can offer to the passenger. In these days of bus and air competition, this factor becomes quite important. Modernization could serve to create on property now owned by the railroad companies, facilities for their offices and officers, thereby enabling them to eliminate costly rents paid elsewhere in the city. Sufficient planning will enable a definite increase in concession and rentable office space which

will result in increased revenue. It will be necessary, however, to achieve cooperation from all companies, factions and industries involved. The resultant benefit however, and value to the city, greatly overshadows any obstacle.

EXISTING RAILROAD TERMINAL FACILITIES



VIEW A

Existing Terminals:

There are two railway terminals in Seattle. One is owned and operated by the Union Pacific Railroad Company and is known as the Union Passenger Station. The other is the King Street Passenger Station; it is owned and operated by the Great Northern and Northern Pacific Railroad Companies. At present, operating in and out of Seattle are four major railway companies: Union Pacific, Great Northern, Northern Pacific, and Chicago, Milwaukee, St. Paul and Pacific. In addition there are the Oregon-Washington Railroad and Navigation Company and the Pacific Coast Railroad.

Union Station handles all Union Pacific and Chicago, Milwaukee St. Paul and Pacific trains. King Street Station handles Great Northern and Northern Pacific.

The majority of trains in and out of Seattle are to and from Oregon and California to the South, and Chicago to the East. A few trains operate North to British Columbia.

Complete figures on arrivals and departures could not be obtained at this time. The Northern Pacific Railway Company advises me that approximately 400 cars arrive daily and 200 depart for that company alone. They estimate that their company handles approximately 1000 passengers a day.

The four major companies handle comparable loads, so it is reasonable safe to place the total volume per day in the vicinity of 4000 passengers.

At present, Northern Pacific is building six new passenger trains, diesel electric streamliners, with a total of

about 60 cars. Chicago, Milwaukee, St.Paul and Pacific also reports a dozen new diesel electric streamliners soon to be in operation between Chicago, Minneapolis, St. Paul and Seattle.

This schedule of departures is incomplete, but it gives an indication of the traffic and its destination

June 1, 1946

King Street Station

Time of Departure	Destination	Average No. of Passengers Out
7:00 A.M.	Grays Harbor	25
7:15 A.M.	Vancouver B.C.	15
8:00 A.M.	Spokane and East	100
8:15 A.M.	Vancouver B.C.	100
8:20 A.M.	Portland	150
8:30 A.M.	Spokane	100
12:01 P.M.	Portland-California	250
5:00 P.M.	Vancouver B.C.	75
6:10 P.M.	Spokane and East	75
9:15 P.M.	Chicago N.P.	200
9:30 P.M.	Chicago G.N.	275
10:00 P.M.	St. Paul G.N.	15

King Street Station has eight loading tracks.

Union Station

Departure	Destination	Passengers
4:30 P.M.	Portland and South	317 in 184 out
9:30 P.M.	Chicago Milw.	281 out
11:30 P.M.	Portland and South	154 out

Union Station has four loading tracks, but only two are used.

ELLIOT BAY
KING ST. STA.
UNION STATION
SMITH TOWER
COUNTY-CITY BUILDING
CITY CENTER
4th. Ave. So.

VIEW B

The railway terminal situation in Seattle today is, by comparison with modern terminals, as obsolete and outmoded as the Chic Sale outhouse is compared with the modern bathroom, but even in this comparison, the Chic Sale remains as a decidedly functional building where the Seattle railroad terminals do not.

There are many problems which directly or indirectly influence railroad terminal operation, and conversely, there are many activities directly influenced by the railroad terminal.

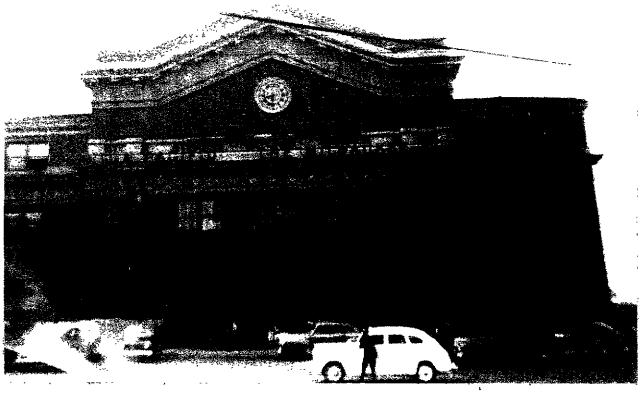
I have endeavored to study the existing situation, to analize it and present the facts. I am greatly indebted to J.W.A.Bollong, City Traffic Engineer for his enthusiastic cooperation and invaluable aid. The following is an analysis and report on existing facilities.

Terminals in General:

The two terminals are both antiquated and obsolete. They were built over 25 years ago in the age of the early steam trains and though they no doubt were useful in their day, they are hopelessly outmoded. The terminals are aesthetically, relics of bygone days, old, dirty and unattractive. They present a dismal outlook and a depressing impression on the traveler. (see accompanying photos)

Terminal Area:

In the immediate vicinity of the terminals is Seattle's slum area. This consists of a area of many city blocks which is known as the "Skidroad". It is comprised of

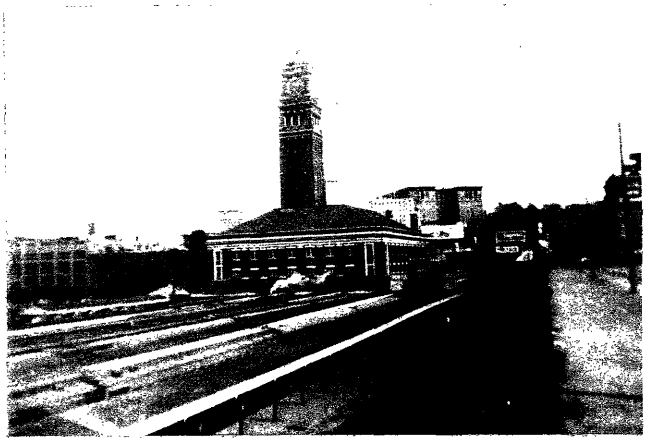


VIEW D

VIEW G

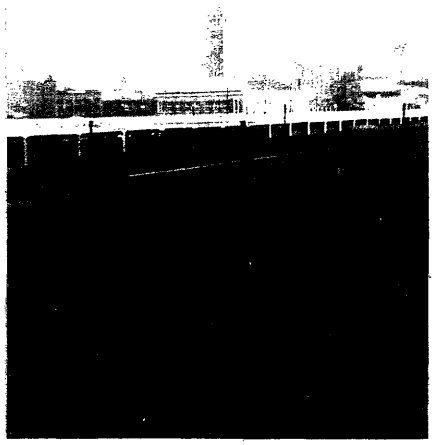
VIEW E

VIEW F

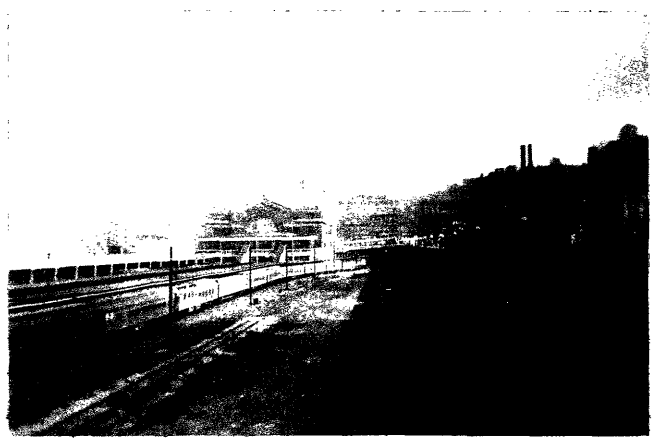


VIEW H

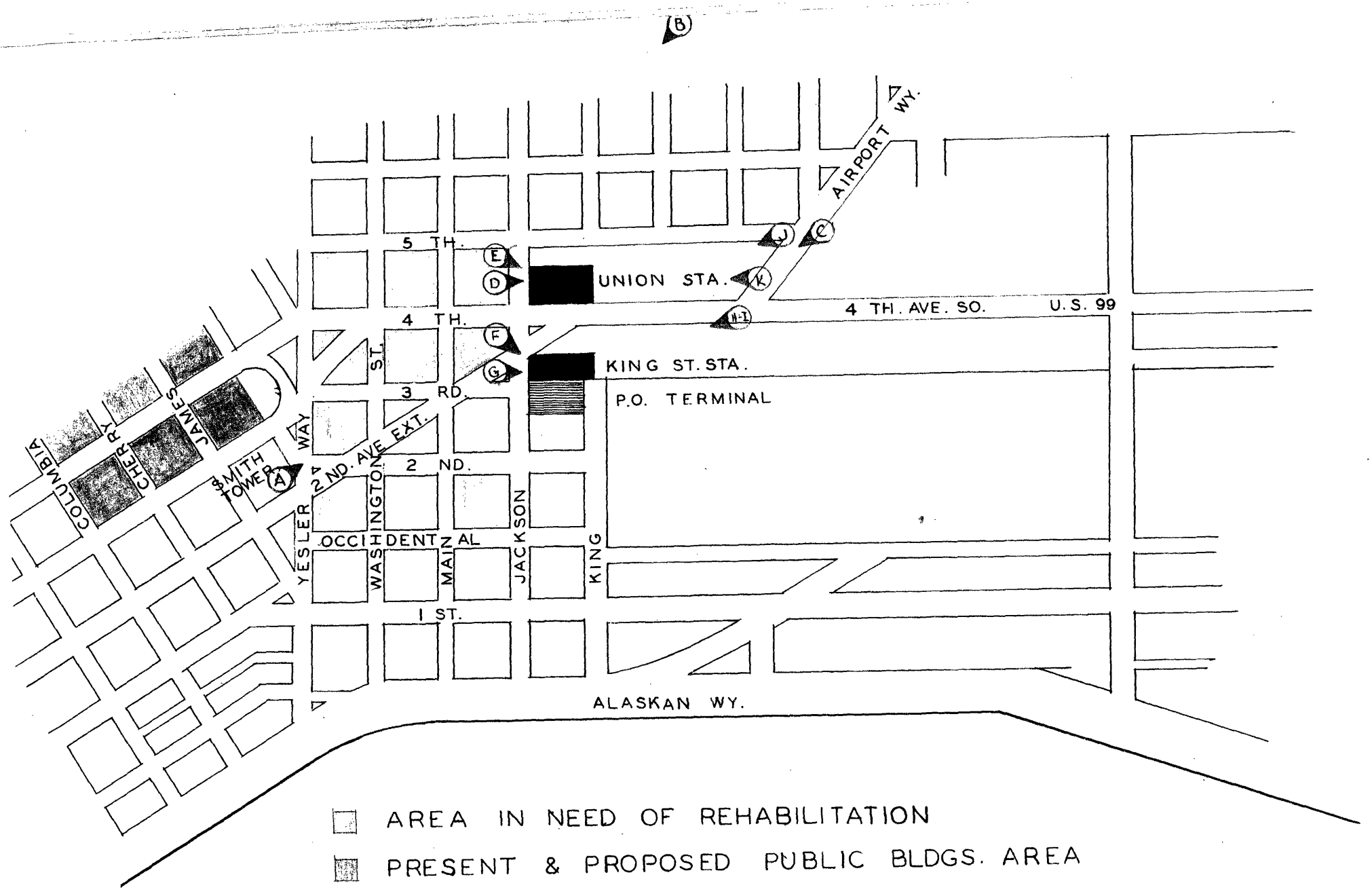
VIEW K



VIEW I



VIEW J


B
AIRPORT WY.
5 TH.
E
D
UNION STA.
J
C
K
4 TH. AVE. SO.
U.S. 99
4 TH.
F
G
KING ST. STA.
P.O. TERMINAL
3 RD.
ST.
2 ND. AVE EXT.
2 ND.
COLUMBIA
CHERRY
JAMES
SMITH TOWER
A
YESLER WAY
WASHINGTON
MAIN
JACKSON
KING
OCCIDENTAL
1 ST.
ALASKAN WY.
AREA IN NEED OF REHABILITATION
PRESENT & PROPOSED PUBLIC BLDGS. AREA

cheap rooming houses, cafes, beer taverns, gambling dens, houses of prostitution and all the accumulated filth that accompanies such activities. It is the hangout of bums, cheap gamblers, prostitutes and so forth.

Street Approaches and Traffic:

The two stations are located across the street from one another. (see adjoining map) This street (Fourth Ave. So) between the two stations is perhaps the most important thoroughfare in the city traffic scheme. It is a major entry to the city from the South, and is the Seattle portion of U.S. 99, the chief north-south highway on the Pacific Coast. It handles a large portion of the city traffic and is indispensable in the traffic scheme. It is fed by another important southern artery, Airport Way, at a point 1000 feet before its intersection with Jackson Street on which the two terminals are located. This intersection of Fourth Avenue South and Jackson Street produces a heavily conjested area not only because of those two streets but also because of the problem of vehicular traffic usually encountered at a railway terminal.

In years past, the railroads have had vacated, several roads into the city from the south. The City Traffic Engineer informs me that there are remaining, only four highways from the South where there should be eight or ten. It therefore ensues that elimination of Fourth Avenue South to ease traffic at the terminal area, is impracticable and inadvisable. The problem is to plan around this street and

attempt to make it clear for through traffic, with perhaps relief of its overload by various future highway extensions, elevated highways, and express ways.

The terminals themselves have virtually no facilities to accomodate the vehicular traffic of present day railway terminals. They provide virtually no parking space at the terminals or in the immediate vicinity. There is a co-mingling of taxicabs, private cars and trucks, with the ever present stream of through traffic.

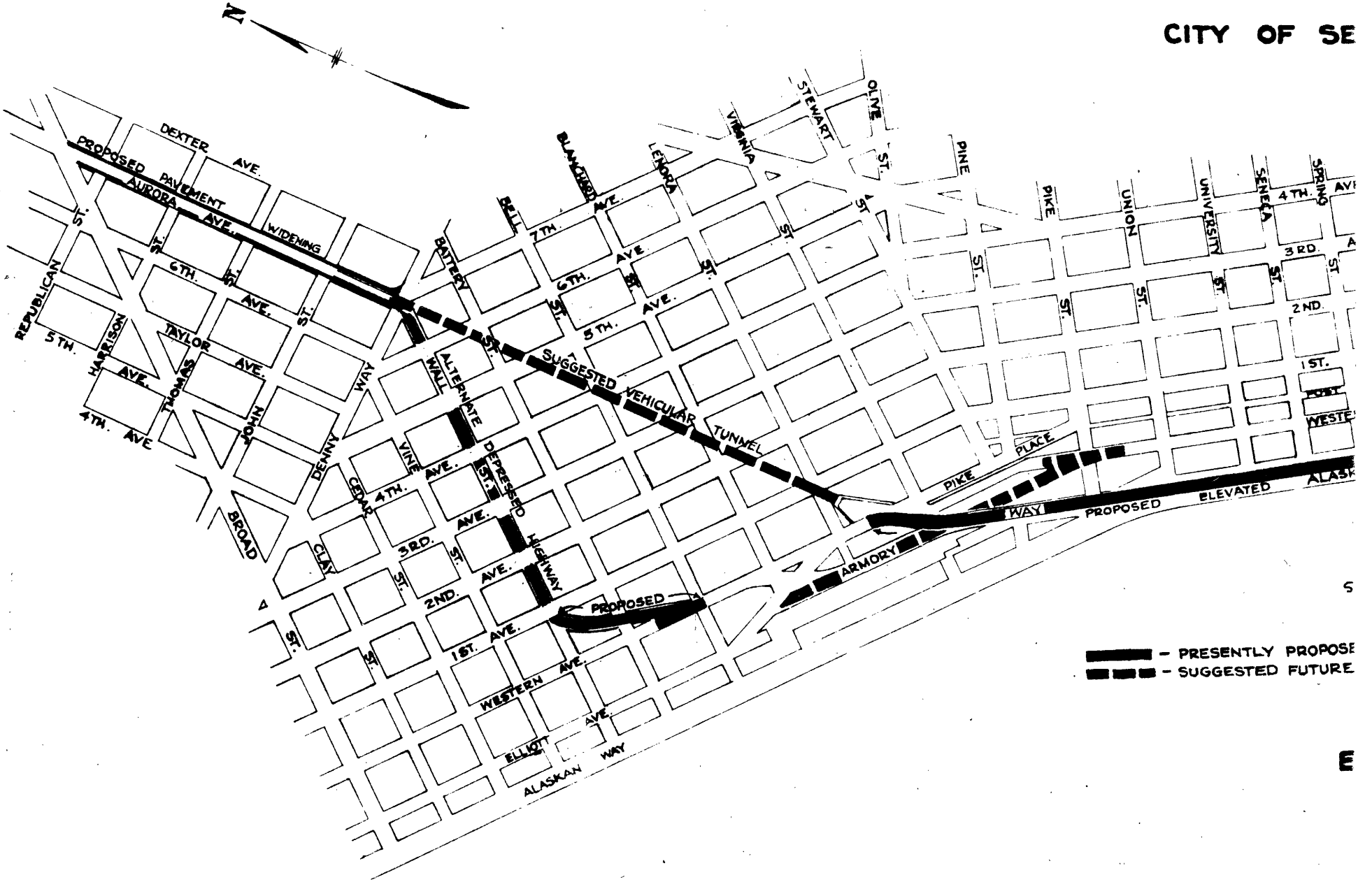
The entire system from almost every viewpoint is antiquated. Functionally, aesthetically and economically the situation is in need of improvement.

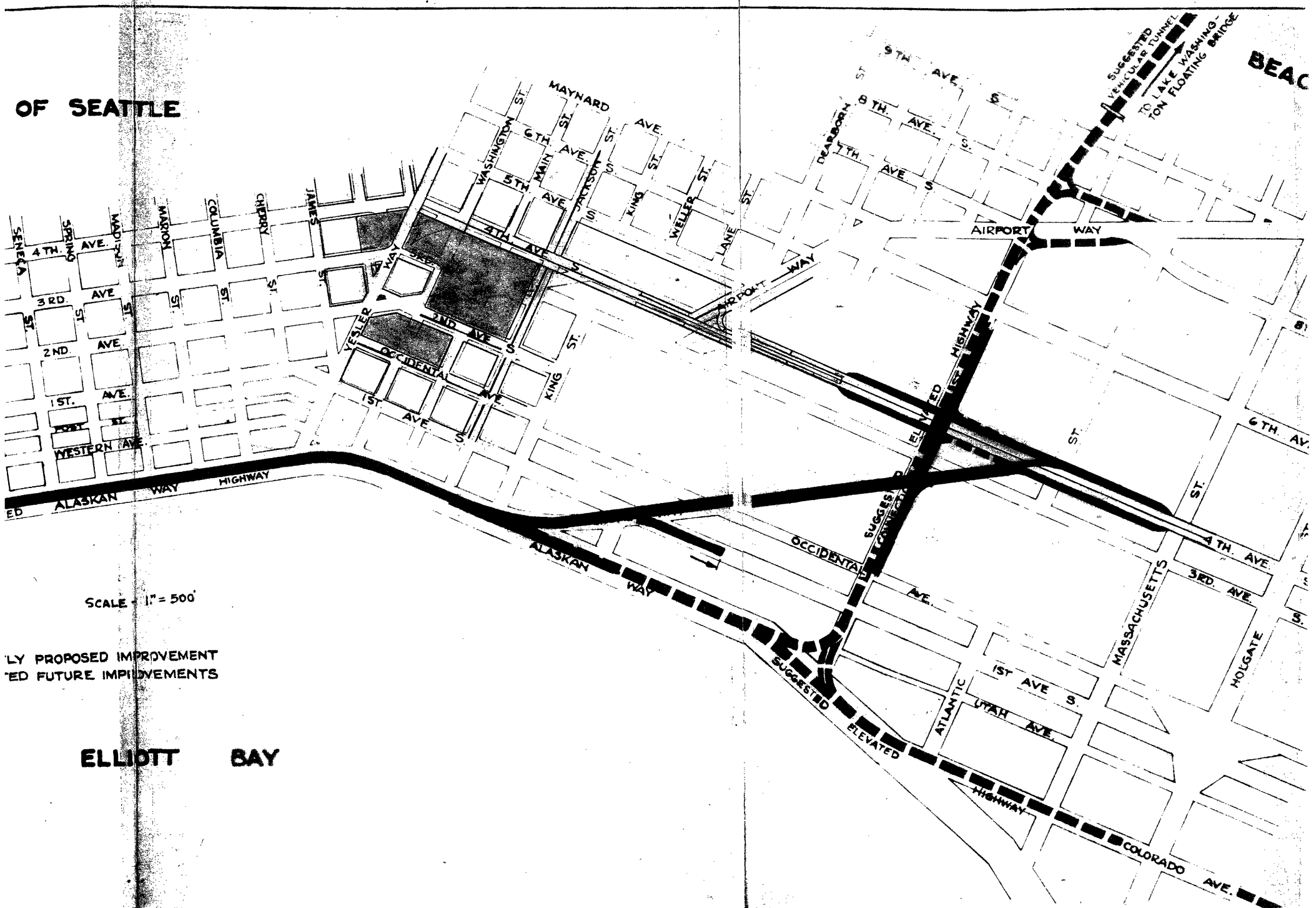
Incoming and Outgoing Passengers:

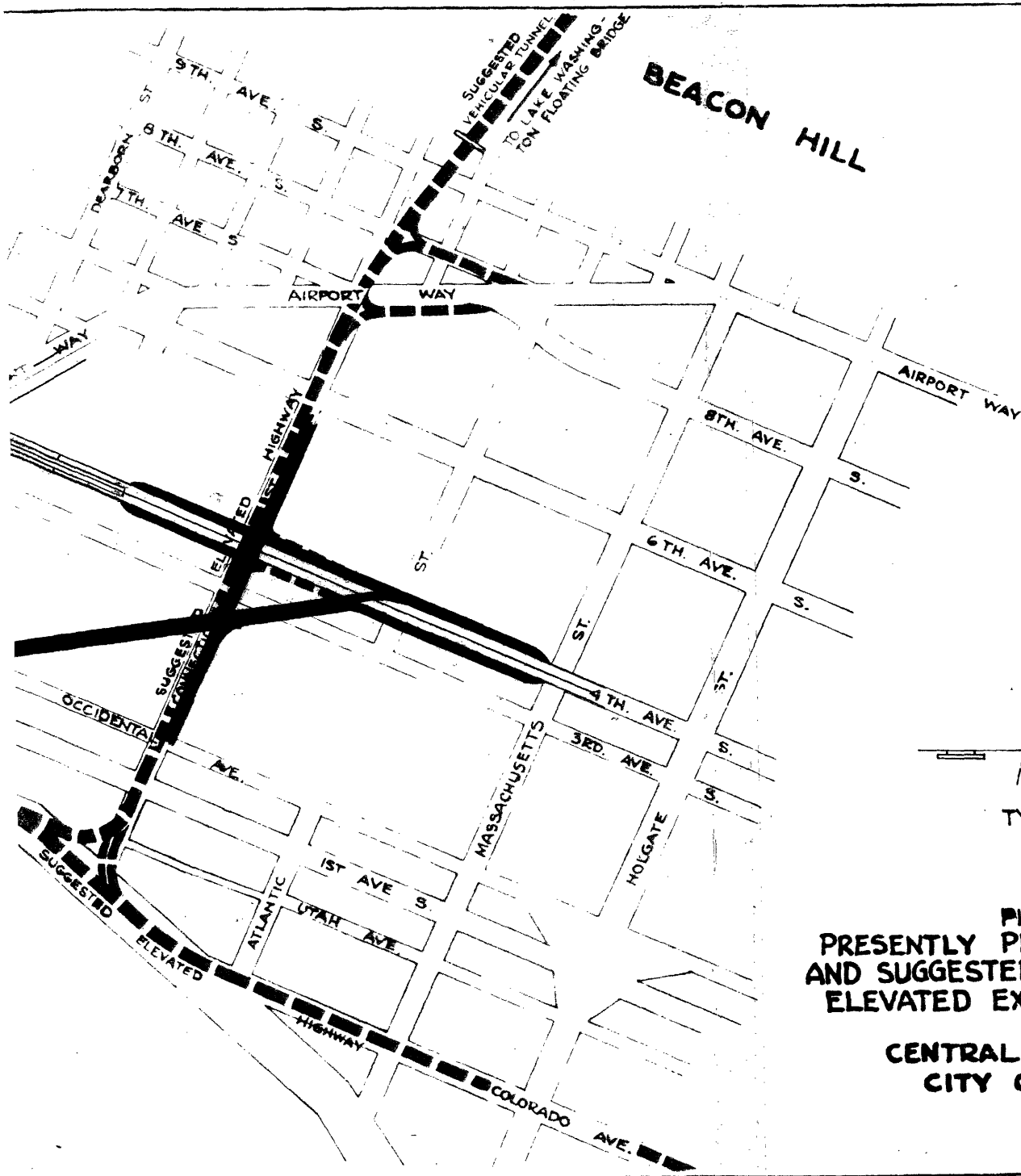
The incoming passenger is confronted with chaos from the moment he arrives. He enters the track concourse by the same doors as are used by outgoing passengers. Frequently he has to cross tracks to get there. Baggage facilities are far from adequate, poorly planned and inconvenient to the passenger. The passenger, if in King Street Station, must climb many stairs to arrive at street level. On arrival at street level he frequently has to walk long distances to reach transportaion facilities, there being very little parking area for taxicabs, autos or buses at the station. The outgoing passengers have similar problems plus the uncertainty of which station they are to depart from and the resultant confusion of transfer in case of mistake.

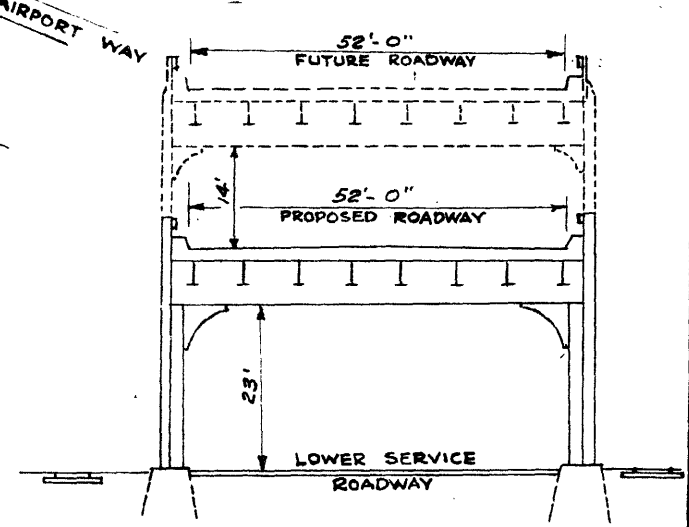
The City Traffic Engineer, Mr. J.W.A.Bollong, has made an exhaustive study of the traffic situation and has presented his recommendations for its solution. Although I am in accord with most of his recommendations, those which affect the railroad terminal area have been revised to suit the situation as I see it. My solution to the terminal problem involves the overall traffic picture; and my suggested solution of the major traffic scheme is present along with the recommendations as set forth by Mr. Bollong.

CITY OF SE


N
DEXTER AVE.
PROPOSED PAVEMENT WIDENING
AURORA AVE.
REPUBLICAN ST.
5TH. AVE
HARRISON ST.
TAYLOR AVE.
THOMAS ST.
JOHN ST.
4TH. AVE
6TH. AVE.
BROAD ST.
DENNY WAY
CLAY ST.
BELL ST.
BATTERY ST.
WALL ST.
ALTERNATE
7TH. AVE.
BLANCHARD
LENORA ST.
VIRGINIA ST.
STEWART ST.
OLIVE ST.
PINE ST.
PIKE ST.
UNION ST.
UNIVERSITY ST.
SENECA ST.
SPRING
4TH. AVE
3RD. AVE
2ND. AVE
1ST. AVE
SUGGESTED VEHICULAR TUNNEL
5TH. AVE.
VINE ST.
CEDAR ST.
4TH. AVE.
DEPRESSED ST.
3RD. AVE.
2ND. AVE.
1ST. AVE.
HIGHWAY
PROPOSED
WESTERN AVE.
ELLIOTT AVE.
ALASKAN WAY
PIKE PLACE
PROPOSED ELEVATED
ALASKAN WAY
ARMORY
PROPOSED
- PRESENTLY PROPOSE
- SUGGESTED FUTURE


OF SEATTLE
BEAC
SUGGESTED VEHICULAR TUNNEL
TO LAKE WASHINGTON FLOATING BRIDGE
MAYNARD AVE.
WASHINGTON ST.
MAIN ST.
JACKSON ST.
KING ST.
WELLER ST.
LANE ST.
DEARBORN ST.
9TH AVE. S.
8TH AVE. S.
7TH AVE. S.
6TH AVE. S.
5TH AVE. S.
4TH AVE. S.
3RD AVE. S.
2ND AVE. S.
1ST AVE. S.
AIRPORT WAY
SENECA ST.
SPRING ST.
MADISON ST.
MARION ST.
COLUMBIA ST.
CHERRY ST.
JAMES ST.
4TH AVE.
3RD AVE.
2ND AVE.
1ST AVE.
POST ST.
WESTERN AVE.
YESLER WAY
OCCIDENTAL AVE.
ALASKAN WAY HIGHWAY
ALASKAN WAY
SUGGESTED ELEVATED HIGHWAY
OCCIDENTAL AVE.
ATLANTIC
UTAH AVE.
1ST AVE S.
MASSACHUSETTS ST.
HOLGATE ST.
6TH AV.
4TH AVE.
3RD AVE.
COLORADO AVE.
SCALE - 1" = 500'
LY PROPOSED IMPROVEMENT
ED FUTURE IMPROVEMENTS
ELLIOTT BAY





TYPICAL SECTION ON ALASKAN WAY

PLAN SHOWING
PRESENTLY PROPOSED IMPROVEMENT
AND SUGGESTED FUTURE EXTENSIONS FOR
ELEVATED EXPRESS HIGHWAY SYSTEM
— AROUND —
CENTRAL BUSINESS DISTRICT
CITY OF SEATTLE, WASH.
1945

72

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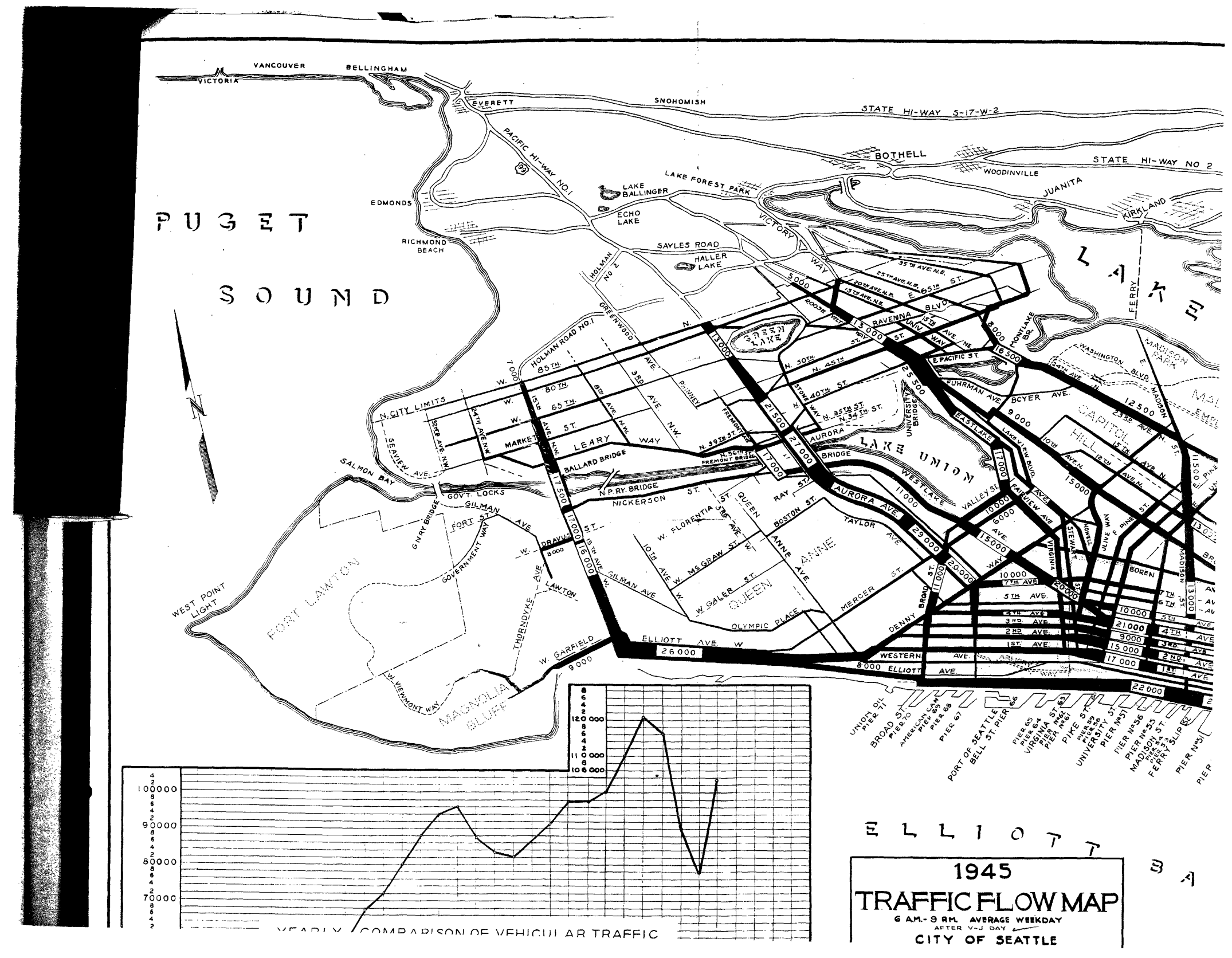
VANCOUVER
VICTORIA
BELLINGHAM
EVERETT
SNOHOMISH
STATE HI-WAY 5-17-W-2
PACIFIC HI-WAY NO.1
99
BOTHELL
STATE HI-WAY NO 2
WOODINVILLE
JUANITA
KIRKLAND
LAKE BALLINGER
LAKE FOREST PARK
EDMONDS
ECHO LAKE
VICTORY WAY
PUGET SOUND
RICHMOND BEACH
SAYLES ROAD
HALLER LAKE
HOLMAN NO 2
HOLMAN ROAD NO.1
GREENWOOD AVE.
N. CITY LIMITS
85TH
80TH
65TH
ROOSE VELT
RAVENNA BLVD
MONTLAKE BR.
FERRY
MADISON PARK
WASHINGTON BLVD
E PACIFIC ST.
EDHRMAN AVE
BOYER AVE.
CAPITOL HILL
LAKE UNION
UNIVERSITY BRIDGE
AURORA BRIDGE
EASTLAKE
LAKEVIEW BLVD
WESTLAKE
VALLEY ST.
FAIRVIEW AVE
AURORA AVE.
BOSTON ST.
TAYLOR AVE
MERCER ST.
DENNY WAY
BROAD ST.
STEWART
HOWELL
VIRGINIA
PINE
BOREN
MADISON
7TH AVE.
5TH AVE.
3RD AVE.
2ND AVE.
1ST AVE.
WESTERN AVE.
ELLIOTT AVE
BALLARD BRIDGE
N.P.RY. BRIDGE
FREMONT BRIDGE
NICKERSON ST.
RAY ST.
QUEEN ANNE
W. FLORENTIA ST.
W. McGRAW ST.
W. GALER ST.
OLYMPIC PLACE
GILMAN AVE
GILMAN BRIDGE
FORT ST.
GOVERNMENT WAY
DRAVUS ST.
LAWTON
THORNDYKE AVE
W. GARFIELD
W. VEEMONT WAY
FORT LAWTON
MAGNOLIA BLUFF
WEST POINT LIGHT
SEAVIEW AVE
SALMON BAY
GOVT. LOCKS
BALLARD
FREMONT
PINNEY
UNION OIL PIER 71
BROAD ST. PIER 70
AMERICAN CAN PIER 69
PIER 68
PIER 67
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PIKE ST. PIER 59
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YEARLY COMPARISON OF VEHICULAR TRAFFIC
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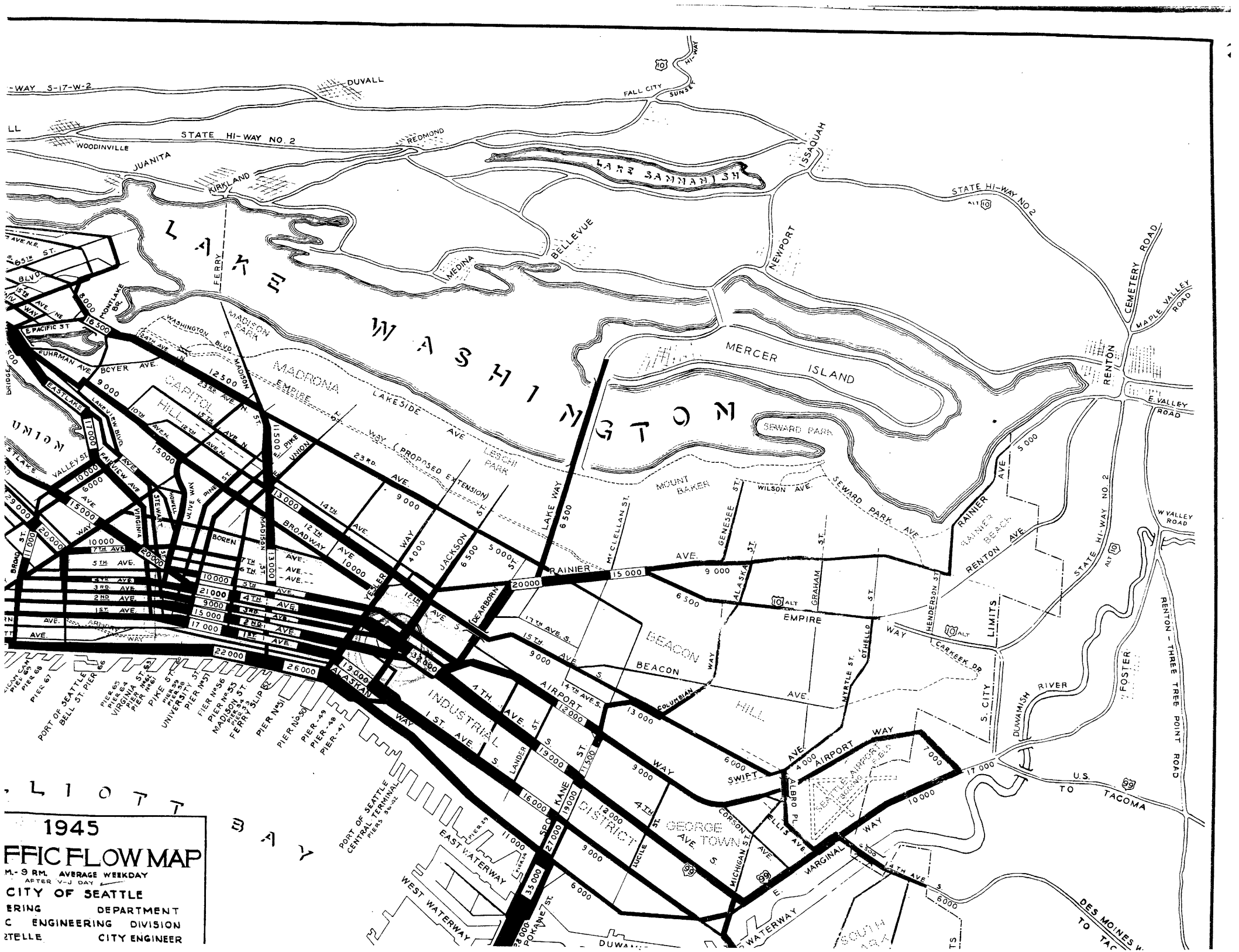
1945
TRAFFIC FLOW MAP
6 A.M.- 9 P.M. AVERAGE WEEKDAY
AFTER V-J DAY
CITY OF SEATTLE


1945
FFIC FLOW MAP
M.- 9 RM. AVERAGE WEEKDAY
AFTER V-J DAY
CITY OF SEATTLE
ERING DEPARTMENT
C ENGINEERING DIVISION
RTELLE CITY ENGINEER
LAKE WASHINGTON
LAKE SAMMAMISH
MERCER ISLAND
SEWARD PARK
MOUNT BAKER
MADRONA
CAPITOL HILL
EMPIRE
LESCHI PARK
BEACON HILL
INDUSTRIAL DISTRICT
GEORGE TOWN
SEATTLE AIRPORT (BOEING FIELD)
RAINIER BEACH
UNION
ELLIOTT BAY
EAST WATERWAY
WEST WATERWAY
PORT OF SEATTLE CENTRAL TERMINAL
PORT OF SEATTLE BELL ST. PIER
STATE HI-WAY NO. 2
DUVALL
WOODINVILLE
JUANITA
KIRKLAND
REDMOND
BELLEVUE
MEDINA
NEWPORT
ISSAQUAH
FALL CITY
SUNSET HI-WAY
RENTON
CEMETERY ROAD
MAPLE VALLEY ROAD
E. VALLEY ROAD
W. VALLEY ROAD
RENTON - THREE TREE POINT ROAD
FOSTER
S. CITY LIMITS
DUWAMISH RIVER
U.S. 99 TO TACOMA
DES MOINES
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RAINIER AVE.
MARGINAL WAY
AIRPORT WAY
SWIFT AVE.
ALASKAN WAY
BEACON AVE.
EMPIRE WAY
BROADWAY
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DEARBORN ST.
MADISON ST.
YESLER WAY
LAKESIDE AVE.
MADISON PARK
WASHINGTON BLVD.
BOYER AVE.
FUHRMAN AVE.
EASTLAKE
LAKEVIEW BLVD.
FAIRVIEW AVE.
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STEWART
VIRGINIA
BOREN
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UNIVERSITY ST.
PIER No. 57
PIER No. 56
MADISON ST.
FERRY SLIP
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PIER 36-42
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E. PACIFIC ST.
65TH ST.
BRIDGE
MCCLELLAN ST.
GENESEE ST.
WILSON AVE.
ALASKA ST.
GRAHAM ST.
MYRTLE ST.
OTHELLO ST.
HENDERSON ST.
CARKEEK DR.
COLUMBIAN WAY
AIRPORT
ALBRO PL.
ELLIS AVE.
CORSON AVE.
MICHIGAN ST.
LUCILLE
KANE
SPOKANE ST.
LANDER ST.
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5TH. AVE.
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15TH. AVE. N.
12TH. AVE. N.
23RD. AVE. N.
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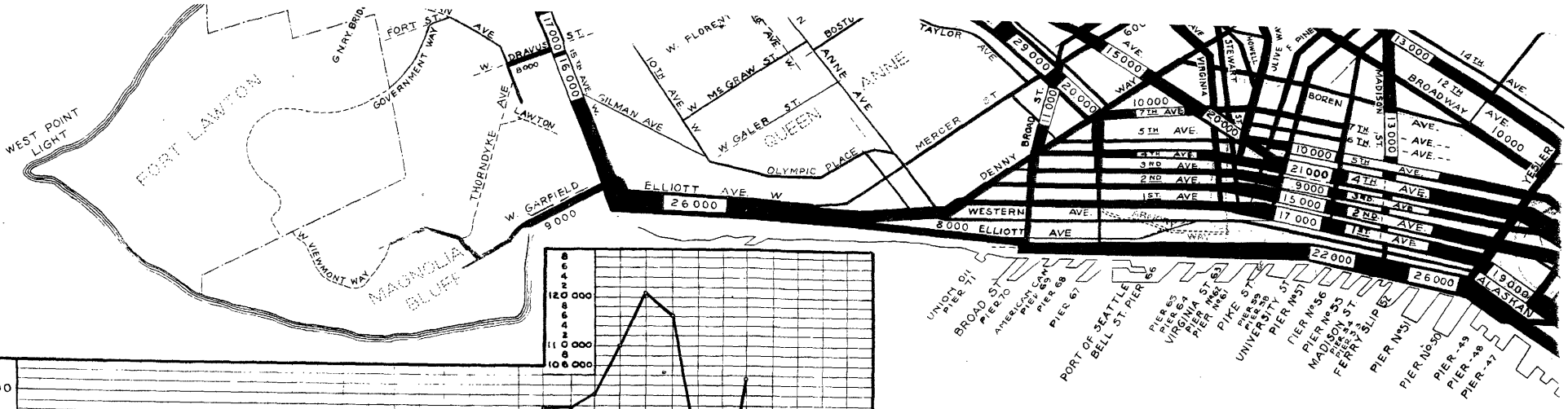

ELLIOTT BAY

PORT OF SEATTLE CENTRAL TERMINAL PIERS

1945
TRAFFIC FLOW MAP

6 A.M.- 9 P.M. AVERAGE WEEKDAY
AFTER V-J DAY

CITY OF SEATTLE

ENGINEERING DEPARTMENT
TRAFFIC ENGINEERING DIVISION
C.L. WARTELLE CITY ENGINEER
J.W.A. BOLLONG TRAFFIC ENGINEER
BY E.E. LEWARCH

TRAFFIC VOLUME SCALE

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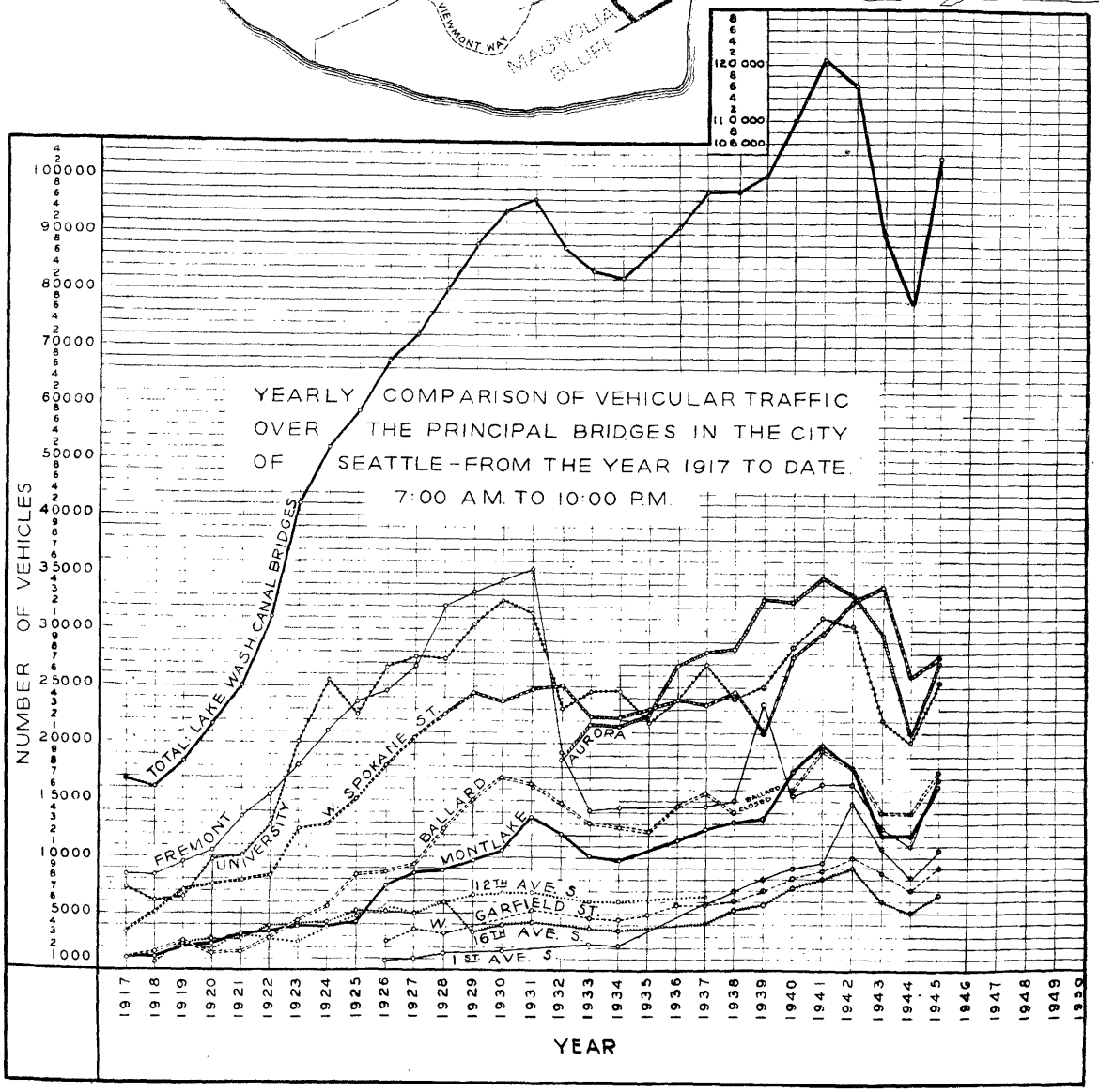
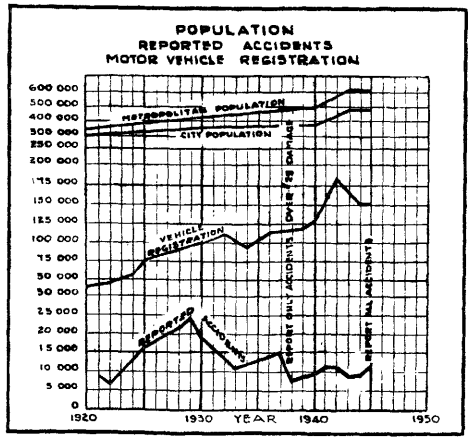
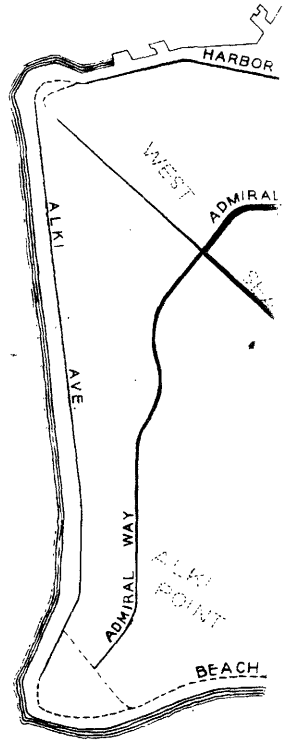
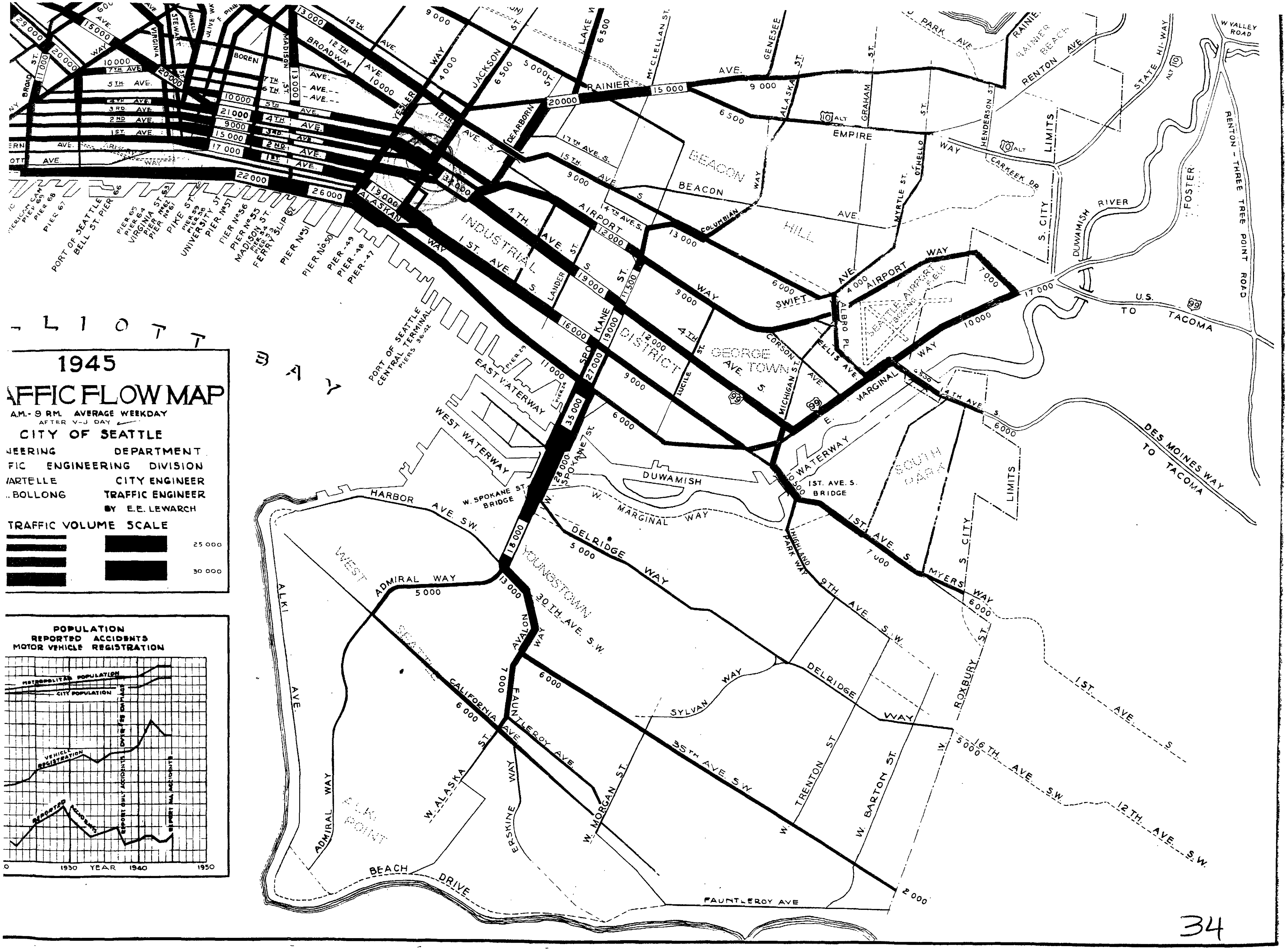
15 000
20 000
25 000
30 000








1945
TRAFFIC FLOW MAP
A.M.- 9 P.M. AVERAGE WEEKDAY
AFTER V-J DAY
CITY OF SEATTLE
ENGINEERING DEPARTMENT
TRAFFIC ENGINEERING DIVISION
CITY ENGINEER
TRAFFIC ENGINEER
BY E.E. LEWARCH
TRAFFIC VOLUME SCALE
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POPULATION
REPORTED ACCIDENTS
MOTOR VEHICLE REGISTRATION
METROPOLITAN POPULATION
CITY POPULATION
VEHICLE REGISTRATION
REPORTED ACCIDENTS
1930 YEAR 1940 1950
ELLIOTT BAY
PORT OF SEATTLE BELL ST. PIER 66
PORT OF SEATTLE CENTRAL TERMINAL PIERS 36-42
EAST WATERWAY
WEST WATERWAY
DUWAMISH
INDUSTRIAL DISTRICT
GEORGE TOWN
BEACON HILL
YOUNGSTOWN
WEST SEATTLE
ALKI POINT
SOUTH PARK
SEATTLE AIRPORT BOEING FIELD
RAINIER BEACH
S. CITY LIMITS
RENTON - THREE TREE POINT ROAD
W VALLEY ROAD
STATE HI-WAY
FOSTER
DUWAMISH RIVER
U.S. 99 TO TACOMA
DES MOINES WAY TO TACOMA
W. SPOKANE ST. BRIDGE
1ST. AVE. S. BRIDGE
HARBOR AVE. SW.
ADMIRAL WAY
ALKI AVE.
BEACH DRIVE
FAUNTLEROY AVE
CALIFORNIA AVE
DELRIDGE WAY
35TH AVE. S.W.
1ST. AVE. S.
MYERS WAY
ROXBURY ST.
16TH. AVE. S.W.
12TH. AVE. S.W.
AIRPORT WAY
EAST MARGINAL WAY
W. MARGINAL WAY
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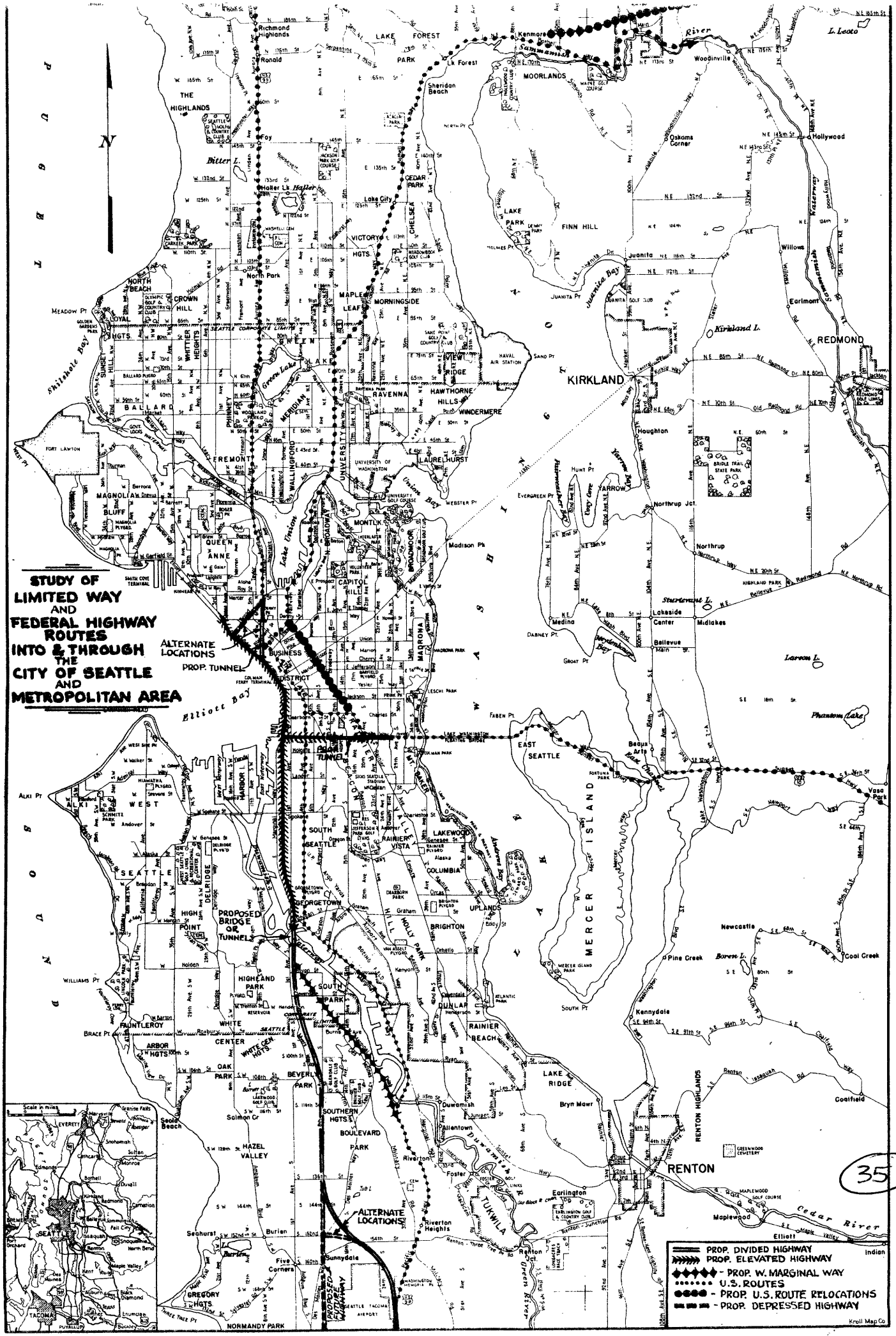
STUDY OF
LIMITED WAY
AND
FEDERAL HIGHWAY
ROUTES
INTO & THROUGH
THE
CITY OF SEATTLE
AND
METROPOLITAN AREA
ALTERNATE LOCATIONS
PROP. TUNNEL
PROPOSED BRIDGE OR TUNNELS
ALTERNATE LOCATIONS
PROPOSED FUTURE FREEWAY
PROP. DIVIDED HIGHWAY
PROP. ELEVATED HIGHWAY
PROP. W. MARGINAL WAY
U.S. ROUTES
PROP. U.S. ROUTE RELOCATIONS
PROP. DEPRESSED HIGHWAY
Kroll Map Co
35
SEATTLE
EVERETT
TACOMA
RENTON
KIRKLAND
REDMOND
BELLEVUE
MERCER ISLAND
LAKE WASHINGTON
LAKE UNION
PUGET SOUND
Elliott Bay
Union Bay
Juanita Bay
Yarrow Bay
Lake Sammamish
Green Lake
Bitter L.
Haller Lk
Kirkland L.
Larson L.
Phantom Lake
Sturtevant L.
Boren L.
L. Leota
Shilshole Bay
Meadow Pt
Alki Pt
Brace Pt
Williams Pt
Hunts Pt
Evergreen Pt
Groat Pt
Dabney Pt
Faben Pt
South Pt
Sand Pt
Three Tree Pt
Seola Beach
Salmon Cr
Coal Creek
Cedar River
Maple Valley
Lake Forest Park
Richmond Highlands
Ronald
Kenmore
Woodinville
Hollywood
Juanita
Willows
Carlmont
Houghton
Northrup Jct.
Northrup
Lakeside
Midlakes
Bellevue
Medina
Newcastle
Kennydale
Renton Highlands
Coalfield
Maplewood
Earlington
Tukwila
Riverton
Foster
Duwamish
Allentown
Bryn Mawr
Lake Ridge
Rainier Beach
Dunlap
Columbia City
Rainier Vista
Lakewood
Uplands
Brighton
Holly Park
Georgetown
South Park
Highland Park
White Center
Arbor Hgts
Fauntleroy
Delridge
High Point
West Seattle
Alki
Harbor Island
Duwamish
Beacon Hill
Mt. Baker
Leschi
Madrona
Capitol Hill
Broadway
Montlake
Broadmoor
Madison Pk
Laurelhurst
University of Washington
Wallingford
Fremont
Phinney
Ravenna
Hawthorne Hills
Windermere
View Ridge
Sand Pt
Haval Air Station
Sheridan Beach
Lk Forest
Moorlands
Oskoma Corner
Finn Hill
Lake Park
Victory Hgts
Cedar Park
Lake City
Maple Leaf
Morningside
North Park
North Beach
Crown Hill
Loyal Hgts
Sunset Hill
Whittier Heights
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Magnolia Bluff
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Baggage:

Baggage arriving at the station is transferred to baggage rooms, often crossing and recrossing public traffic to and from trains. In King Street Station, the baggage room is at track level compelling passengers to carry bags up or down stairs to street level.

Taxicabs, Passenger Cars, Buses, etc.:

In contrast to modern stations which provide adequate safe easy approach, loading, unloading, and exit of taxicabs, autos and buses; easy access to these areas for red caps and porters; and ease of transfer of passenger and luggage to train and waiting space, the Seattle facilities are wholly inadequate.

In the case of King Street Station there is a co-mingling of baggage trucks, private cars, mail trucks, express trucks and other traffic in the area now used by the taxicabs. This area in its present use is entirely inadequate even to serve the taxi trade.

Union Station has only a small space available directly in front of the station which is used by taxicabs. This space is not only inadequate but difficult of access and exit. There is no space available for private car parking. Passengers must walk and carry luggage several blocks.

Railway Express and Post Office Terminal:

Both facilites are hampered by inadequate planning. There is no facility at the station itself for Rail-

way Express. This perhaps is just as well since freight should not mingle with passengers. However, the method of transfer of Express to trains is very slow and difficult.

The postal problem is in need of solution also. There is no direct means of transfer of mail from car to post office building. It is necessary to load mail on trucks at Union Station, transport it via truck to the Post Office Terminal two blocks away then unload and distribute to the various departments. This is a slow, tedious and costly process.

THE PROBLEM

The Problem:

It would, in my opinion, be senseless to attempt a program of remodelling on the terminals. The results of such a plan could hardly hope to achieve an ideal solution, and the cost of such an attempt would be out of proportion to the results achieved.

On preceding pages I have discussed the relation of the railroad terminal to parking areas and the proposed Public Buildings Area. There are, however, several important features of a railroad terminal which have direct relation to several other activities. These activities are, the terminal station, (including baggage problems) Post Office Terminal and Railway Express Company. The handling of mail and express, and the conjunction thereof with the handling of baggage, are essential and integral parts of passenger terminal operation. The necessary facilities should be planned in cooperation with the express and postal officials concerned.

The terminal station itself involves problems of passenger comfort, dining facilities, baggage, parcel service, telephone, telegraph and a host of other things. One common failure of terminals is to overlook the need for adequate office space to service the use of the railroad companies operating in and out of the station. In these days of speed and transfer and use of varied means of transportation,

it is necessary to consider the practicability of a bus terminal in the immediate vicinity, also transfer service to and from airports and steamship piers. With the present use in Los Angeles of helicopters to deliver mail, it is not inconceivable that helicopter service may be inaugurated to transfer passengers from railroad terminals to airports, and vice versa. In addition to the overall parking areas one must take cognizance of the fact the individual parking for employees should be provided.

Summarizing, the problems which have a direct bearing on the Railroad terminal are:

1. Terminal Station
2. Terminal office building
3. Employees parking
4. Public parking
5. Railway Express Company
6. Post Office Terminal
7. Helicopter field

From the engineering standpoint, problems of track arrangement, switching movements, signalling equipment, coach yards, locomotive terminal, etc. Sufficient of these problems need little solving as they operate at present. I will be concerned only with the track arrangement at the station and necessary clearances, rights of way, etc. to permit an economical and functional system.

I have made an exhaustive study of the problem from every important angle. A great deal of contribution to this study has been made by Mr. J.W.A.Bollong, Seattle Traffic Engineer, the City Planning Commission of the City of Seattle, A. J. Bone, Professor of Railroad Engineering, M.I.T. Chas A. Bonner, Superintendent of Railway Mail Service, Boston, Massachusetts; Messrs. Sullivan, Lord, and Flaherty of the New York, New Haven, and Connecticut Railroad; and Mr. Maloney, Superintendentof Railway Express Company of Boston,Mass. The results of my quest for information about the pertinent problems has produced the following considerations, many of which are listed as desirable or necessary, by the American Railway Engineer Association's Manual.

These requirements and suggestions cover terminal stations in general but are reviewed and mentioned here to present all possible considerations.

TERMINAL STATION

Track arrangement:

The track layout should be provided as may be required at any time to accommodate straightforwardly and without interference the contemplated scheduled movement of trains and the tributary switching movements to and from the station , with a proper margin for extra sections or delayed trains, as well as for any predictable increase in volume of traffic.

The track layout should be designed with length of turnouts as required for the proper signal indications, and necessary clearances as required for operation of track circuits so that a system of fixed signals or interlocking may be installed whenever desired without restricting the use of any of the routes of the necessity of additional track changes.

Station tracks should be provided sufficient in number to accommodate at one time the contemplated schedule movement of trains, with a liberal margin for extra sections and off-schedule arrivals or departures, and should be of such clear length and lateral spacing as may be required to fit the station platform layout and to accommodate without congestion the essential functions of the station platform service. While the number of station tracks is largely fixed by the number of trains to be accommodated at periods of maximal density, it also to some extent may depend upon the type and size of the station, the lengths of the station tracks, the design of the throat, the proximity of

the coach yard and locomotive terminal facilities, the character of traffic, and the method of operation. In order to accomodate any predictable increase in the average volume or peak volume of traffic, or both, insofar as practical, extra space should be initially secured and reserved to be occupied by the additional tracks and platforms that would be required therefor.

A sufficient number of station tracks long enough to accommodate the miximum length trains, and so located as to assure flexibility of operation, should be provided. Possibility of future increase in length of trains should be considered.

The through and loop types of station are superior to the stub station from the standpoint of train operation.

Street Approaches:

Street approaches should receive particular attention and care be exercised to see that they are sufficient in number and width; convenient; so located and designed as to lead from or around, and not directing into, lines of traffic congestion; that foot passengers and vehicular traffic have their own independent lines of travel without the necessity for crossing each other at grade; that ample accommodation for vehicles handling baggage, mail and express be provided at points which will not interfere with free movement of taxicabs, motor busses, street cars, private conveyances, or foot passengers.

The desirability of practicability of providing subways

for foot passengers to cross to the opposite sidewalks of adjoining streets should be carefully considered. If provision be not made for this at the outset, pipes, conduits, sewers, etc., may make it difficult, expensive, and perhaps impracticable to do so later.

Ample provision should be made for convenient access to taxi service within or adjacent to the station; also for convenient access to street cars, elevated to underground railways, busses, and other local transportation systems. Within reason, such means of access should be under cover. It is essential that taxicabs be able promptly to reach the point where their passengers for the station should alight, and to leave that point to make way for other arriving taxicabs. It is even more essential that the parking line for empty taxicabs permit the prompt picking up of passengers leaving the station via the usual exit, and at the same time not interfere with other vehicular traffic.

Station Proper:

The station proper is assumed to include all the facilities required for the complete accommodation of passengers and their belongings between the public entrances and the trains; also such facilities as the railway company shall have to provide for the handling of mail and express.

It comprises:

1. The main building, in which is included all the facilities meeting all possible proper demands upon the railway company of passengers prior to their departure or

subsequent to their arrival on trains, including facilities for the receipt and delivery of checked hand baggage if space and convenience economically permit.

2. All thorofares connecting the main building with the station platforms, such as stairways, elevators, ramps, and other passage way and outside concourses, where provided including all housing and shelter thereof.

3. The station tracks and the appurtenant platforms on which passengers, baggage, mail and express are loaded upon or unloaded from the trains on the station tracks, including the elevators, ramps, or other runways having to be provided by the railway company, upon which baggage, express and mail are trucked to or from the station platforms, including all housing and shelter thereof.

4. All other buildings having to be provided by the railway companies to accommodate the assembly and the public receipt and delivery of baggage, express or mail for movement or after arrival on trains at the station.

5. All roadways, platforms and parking spaces having to be provided by the railway company to accommodate taxicabs and other public vehicles and private vehicles, handling people to and from the station, including all housing and shelter thereof not embraced in the main building.

Main Building Areas:

In the ideal arrangement, the principal floor areas will be required for the lobby, the general waiting room or

rooms, and the passenger concourse, the last two being either in separate areas or a common area according to circumstances, the combined function being generally desirable where practicable. An ample corridor should lead from the lobby to the waiting rooms and passenger concourse. The separate men's and women's retiring rooms should preferable open upon such corridor and be connected privately with their respective toilets and lavatories.
All of the essential functions of the main building should be served on a common floor level, or levels so nearly common as to be connected by moderate ramps, and so related if possible to the station track level that no stairways shall be required to reach the station platform level in stub end stations or to reach the thorofares over or under the tracks, as the case may be, in through stations.
The lobby should front upon the principal public entrances and exits, and it, solely or together with the corridor, should be the business area of the station. The principal station facilities, such as information booths, ticket office, baggage check counter, parcel check room, etc., should be located in proper sequence along the line of travel and clearly indicated to avoid confusion and reduce the walking distance of passengers to a minimum.
An adequate and conspicuous bulletin board should be provided.
The general waiting room, if only one is provided separately from the passenger concourse, may well be placed at one side of the line of travel but as convenient as practicable

to the passenger concourse.

If the function of the general waiting room is to be served in common with that of the passenger concourse, provision must be made for all the requirements of a waiting room, with seating facilities so situated as not to intrude upon the maximum areas required for passage of persons to and from the train gates or for those assembling thereat.

Concourse:

Unless its function is combined with that of a waiting room, a separate passenger concourse is essential in a large station. Such a concourse is used effectively in many stations as a passageway which permits arriving passengers to reach the street or departing passengers to enter from the street without passing through the lobby. It should b possible, and is exceeding advantageous in the case of a suburban service, for passengers to proceed directly to and fro between the passenger concouse and the street without passing through waiting room or blocking its exits.

The elimination of conflicting lines of travel is very desirable and should receive careful study in the design of the station, particularly as regards the segregation of inbound from outbound passengers, and of commuters from through passengers.

The required clear width of passenger concourse depends upon the character and amount of traffic and the number of its entrances and exits. The concourse should be large

enough to permit the gathering of a full trainload at a gate without a blockade, but should be so arranged that it will not be a convenient thorofare for people who are not passengers.

A train concourse is advantageous, as it permits serving of one station platform by several gates, or conversely, the serving of several platforms from one train gate.

A clear width of 40 feet for a train concourse is adequate if it is not used extensively for trucking.

Ticket Offices:

Ticket offices should be located adjacent to the direct line of travel, so arranged that passengers waiting to secure tickets will not interfere with the general flow of traffic.

Window openings directly on to the passenger concourse for the sale of local tickets are desirable.

Where a large number of commutation tickets are issued during the last two or three days of the month, portable booths located in the passenger concourse may be desirable.

Parcel Check:

The parcel check rooms should be easily accessible for both inbound and outbound passengers, and should have facilities for handling parcels quickly. Where the amount of business justifies, separate counters should be provided for receiving and delivering parcels.

Toilets:

The practice of installing pay toilets is increasing. They are favorably considered where installed, and are the

source of a substantial revenue. However, there should be an adequate number of free toilts and washing facilities.

Concessions:

Concessions of proper character have proved profitable in most stations and are desirable, not only from a revenue producing standpoint, but as a facility which adds to the comfort and convenience of the passenger.

The number and character of these concessions can be greatly expanded in terminals located in cities of large size, with benefit and profit to all concerned.

Concessions, to be successful, must be so located as to be conspicuous and easy of access. They must be neat and attractive in appearance and well lighted, and concessionaires should be experienced, responsible and progressive. Booths opening directly on to the corridor, where service is rapid, appeal more to the commuter, while stores appeal to the through traveler and particularly to the transfer passenger who has time to spare.

Taxicabs:

The extent of cab facilities depends on the size of the city, character of cab service, and other means of local transportation. In cities where good taxicab service is provided at a reasonable rate, an ever-increasing percentage of passengers is using that service as a means of reaching and leaving the station.

Station Platforms:

In planning a passenger terminal layout, it is of first and exceeding importance to devise such relations between the track arrangement and the station proper as will conform to that station platform arrangement which, at reasonable cost will insure the maximum convenience, expedition and economy in rendering all the platform services.

Particularly at heavy duty stations, it is extremely desirable that baggage, mail and express trucks shall not ordinarily have to traverse or occupy platform space being used for the accommodation of passengers, with the exception of baggage normally handled by porters and red caps.

Determination of the type of platform best suited to a particular situation is dependent upon the character and volume of the various kinds of traffic handled, the type of station (stub, through or loop) the location and type of approaches to the platforms for the various kinds of traffic, the relation of the various approaches to each other, the relative lengths of platforms and trains, space available for station track and platform development, and the method of operation.

For heavy duty stations, the ideal arrangements are:

1. For a through station, with track level below or above the station floor level (preferably the latter); combined platforms should be installed; passengers to reach or leave

The platforms via escalators, ramps or stairways at the middle thereof; trucks to reach or leave the platform by elevators or ramps, at or near the outer ends thereof, connecting with subway runways and assembly areas; provided that the platforms are of sufficient length to eliminate the necessity of spotting passenger carrying cars at the end zone of the platforms when that zone is being used for trucking. If platforms cannot be built to such length or if two trains are regularly berthed on the same track simultaneously, interference between trucking and passengers will result, and installation of separate trucking and passenger platforms may be justified.

2. In all cases where truck elevators or ramps are provided, truck runways at grade across all tracks should also be provided to meet emergency demands. In the case of combined platforms on which the loading and unloading of baggage, mail and express is confined to the end sections thereof, and tracking through the areas devoted to the loading and unloading of passengers is not permitted, platform widths may be the same as for exclusive passenger platforms.

Combined passenger and trucking platforms at heavy duty stations should be at least 20 feet in width, assuming a row of columns located in the center of the platform.

In terminal stations, or in stations where a large number of passengers must be handled quickly, the desirable height of platforms used by the passengers is that of the car

floor, as the hazard and inconvenience resulting from the use of car steps are eliminated, and the handling of passengers is expedited. However, high platforms interfere to some extent with the switching for inspection of equipment.

In large metropolitan areas, the character and volume of arriving mail may justify its handling by belt conveyors. While belts are adaptable to either combined or separate platforms, their use in connection with combined platforms is particularly advantageous, as one belt between adjoining tracks can very satisfactorily be used to serve those tracks, while mail not adapted to handling on the belt can be unloaded on to trucks on the platform while other mail is being thrown onto the belt.

Elevators and Moving Stairways:

Baggage elevators are desirable at both ends of combined passenger and trucking platforms in large passenger stations where trains operate in both directions through the station, to reduce interference between trucking operations and passengers.

For heights less than 25 feet under normal conditions, passenger elevators are not recommended as approaches to individual passenger platforms. They may be desirable as a supplement to stairs for the uses of the ages and infirm.

Passenger Ramps:

Ramps furnish ideal means of handling passengers as an

approach to passenger platforms if they can be so installed as not to increase materially the distance traveled by passengers, and do not materially decrease the space of the station platform available for the accommodation of trains. Good results can be accomplished in many cases by the use of both stairs and ramps in the approach to the platform.

The gradient for passenger ramps preferably should not exceed 10 percent.

Trucking Ramps:

Ramps are a very desirable means of providing vertical transportation for trucking operations, if the design of the station is such as to permit their installation with a minimum sacrifice in space. A gradient of 7 percent is the steepest yet used to any extent for trucking ramps. This gradient should not be exceeded, ~~that~~ though it is possible that trucking ramps may be operated successfully with with maximum gradients of 8 percent.

The minimum clear width which should be considered for trucking ramps designed to accommodate one line of traffic is 6 feet, and for two lines of traffic is 10 feet.

TERMINAL OFFICE BUILDING

Recent years have seen the revival of the old practice of providing office space at the terminal station, for the various offices a railway companies. In the past, however, too little attention has been given this problem, and little thought toward expansion. As a result, railway companies have had to procure large floor areas

in other buildings often remote from the scene of their operations and at high rental rates. The ideal arrangement is to provide adequate space for present demands plus a reasonable area for expansion. This present surplus area readily becomes rentable office space and a further means of adding to the terminal income.

If the station building is surmounted by an office building, the entrances to the latter should be independent of the station so that office employees will not be required to pass through the station. Consideration, however, should be given to the design of certain station facilities to the possible patronage by occupants of the office building.

EMPLOYEES PARKING

It is desirable to provide space for the parking of employees automobiles. This space should be independent of the usual public parking areas, so as to avail employees of private parking privileges. This facility may often be located below the grade of the station proper, in space normally vacant or undeveloped. Such space should, if possible, have direct access to, without crossing vehicular circulation, the station, office building and necessary apertinences.

PUBLIC PARKING SPACE

One of the great failures of railroad terminals existing today, is the lack of parking space for private cars.

Friends and relatives often have to walk several blocks to a station from parking space. Solution of this problem can be combined with civic proposals of the same nature, to the mutual benefit of everyone. It should, however, be in the immediate proximity of the station, with direct access to and from the parking to the private car loading areas of the station. Such access should preferable not have to cross traffic flow of any kind. Direct pedestrian access from parking lot to station is desirable.

RAILWAY EXPRESS COMPANY

The Railway Express Company does not require much space in the terminal station proper. The principal function is the handling of express, most of which is brought to the express terminal in Railway Express Company trucks, and which is shipped in special train or cars containing nothing but express. These trains or cars are usually loaded on sidings separate from the functions of the railroad terminal. They are then either dispatch as a load of express, or if individual, are switched onto a train preparing to move. This entire operation can be carried on exclusively at the express terminal. The only requisite is ease of switching and proximity to departing trains. This does not mean that the express terminal can be wholly detached from the terminal however. There are two problems. First, there should be public access, which should be as close to public access to the terminal as

possible. Second, there is the problem of small lots of express which can be loaded in unoccupied spaces in baggage cars. For this latter reason, both unloading and loading, it is necessary that there be a direct passageway from the express company to the load-unload areas. The same rules apply to this traffic as do to baggage. It should not cross any public or vehicular traffic. The sole exception to this might be that it may mingle with baggage operations without conflict, since function and destination are virtually the same.

POST OFFICE TERMINAL

The handling of the mail is indeed a difficult problem at railroad terminals. Due to the necessity of speed, safety, economy and care in handling, the U.S. mail requires special consideration. The Mail problem is somewhat similar to the express problem in the fact that mail is loaded and unloaded from special trains as well as from cars attached to regular passenger runs. Mail trains should be handled directly at the post office terminal however must be readily accessible from switching areas. It too, as in the case of the railway express, must handle mail directly to and from cars which are a part of regular passenger trains. Due to the complexity of types of mail, which in turn require varying amounts of consideration and different handling, the post office requires special routes and devices to expedite service. Postal Authorities insist, if it is feasible, that separate runways, tunnels or access be

provided for the mail. This mandatory for several reasons. The mail needs protection from theft. Rush loads and peak congestion usually occur simultaneously with those of baggage and express. The elimation of any handling operation thereby reduces the chance of damage, loss or theft, and speeds operations as well as increases economy.

HELICOPTER FIELD

In view of present day use of the helicopter as a means of handling mail, it would be wise to consider its use as a taxi to and from airports. Since a very limited space can be acceptable for a landing field, it may usually be provided for with very little additional planning or cost.

THE SITE

THE SITE

The design of a passenger terminal should provide for anticipated demands during at least the first 20 years of its life, and provision should be made for such subsequent expansion as may be reasonable under the circumstances. The designer must realize that a large passenger terminal is subject to vicissitudes of weather, to delays and derailments to trains, to late connections, to power failures, to surges in traffic, to bad-order equipment, to special trains or cars requiring special handling, to excursion travel, and to jubilees, conventions and special functions at irregular periods. The site for the terminal should have a balanced maximum composed of the following characteristics:

1. Accessibility--having due regard to modern methods of transportation, land values, and economic requirements.
2. Sufficient size and suitable shape to provide for a proper number and length of tracks, and to provide for future growth of both.
3. Ease of approach from all the associated rail lines, without excessive curvature or gradient, and without grade crossings.
4. Possibilities of proper highway approach, development without excessive cost.
5. Proper relation, present and prospective, to rapid transit and surface car lines, etc.
6. Room for proper by-pass tracks and for the spread of

ladder tracks, to provide for free movement and to prevent a tie-up of the yard from derailment at the throat.

7. Room for auxiliary facilities conveniently located, such as:

   a. Baggage, mail and express.

   b. Parking space for Pullman sleepers and private cars.

   c. Locomotive terminal

   d. Coach yard.

(American Railway Engineer Association Manual 1942)

The present terminal stations are perhaps not as conveniently located with respect to hotels, residential areas and the city center as they might be. Despite this fact, they are not too remote from these areas as to render them undesirable. In view of the aforementioned desirable characteristics, I believe the existing location is perhaps the best possible in the present city economy. Important consideration should be given to existing yards, rights of way, room for expansion and land ownership. The fact that the Great Northern tunnel under the City from the north terminates at a point two blocks north of the existing sites is further indication that the present site should be used if possible. The individual terminal sites, Union Station and King Street Station are hardly sufficient individually to accommodate an adequate functional station. However, by use of both sites plus the area now occupied by the post office terminal, sufficient space for a long range program can be attained. This, of course, involves legal problems of land ownership and

cooperation on the part of all factions.

This object need not be unsurmountable if the balance of mutual advantage is maintained. The Federal Government now leases the site on which the terminal post office is located, from the Great Northern Railroad Company. Surrender of this area to its owners for terminal expansion requires the relocation of Post office facilities. This may be easily handled in the new area, to the benefit of all parties. The Federal Government has indicated willingness to comply with City Officials in any civic planning. In view of the fact that the Federal Government plans to build a new post office terminal in the next five years or so, it seems logical that the entire program should be considered at one time.

The site to be used is that area bounded by Jackson Street on the North, Second Avenue on the West, Fifth Avenue on the East and the existing railroad yards and Airport Way on the South. This site includes Fourth Avenue South and its traffic problem. In my solution, Fourth Avenue South becomes an elevated roadway over this area to the benefit not only of the railroad terminal but also to the city traffic pattern.

THE PROGRAM

The Program:

Despite the excellent cooperation received from city officials and railway company people, I was unable to get complete facts and figures on total rail movements in and out of the city. However, the comparison of companies together with data received enabled me to arrive at a reasonable estimate of present volume. This, coupled with research information based on studies of cities of comparable size and problems, resulted in the establishment of a program which I feel will adequately fulfill the needs for the coming 20 years. Sufficient thought has been given to an expanding program, and ample provision for such has been made.

A Railroad Terminal for Seattle, Washington

Due to the inadequacy and obsolescence of existing facilities, it is proposed to erect new facilities for a unified cooperative railroad terminal. The site comprises land owned by the railway companies involved and includes the area bounded by Jackson St. on the north, Second Avenue on the west and Fifth Ave. on the East.

The principal problems are as follows:

1. Creation of joint facilities for all railway companies.
2. Study of terminal problem and its solution with

respect to city plan and existing proposals for alterations of same.

3. Elimination of factors which are the principal reasons for failure of present facilities to function successfully, economically and easily.

4. Creation of a railroad terminal which will be modern, functional, attractive and which will meet all present day demands and anticipated future requirements for at least 20 years.

5. Study of terminal problem and its solution with respect to other businesses, i. e. Post Office, Railway Express Company, etc.

The following requirements are listed as minimum, In some cases, areas are more generous than required to allow more freedom of operation and ease of expansion.

Specific Requirements and Provisions:

A. Railroads and Track System

Union Terminal of all operating companies.

Type of station - -	Stub (with Through-Type arrangement)
Number of loading tracks	10
Number of passenger platforms	5
Average length of train 10 cars and locomotive	900 ft.
Track expansion possibilities	6-8

B. Station Proper

1. Passenger facilities

Area for waiting and concourse	20,000 sq. ft.
Seating capacity	350
Area of hand baggage (receiving)	2,000 sq. ft.
Area of hand baggage (delivery)	2,000 sq. ft.
Area of Parcel check room	1,000 " "
Information and Traveler's aid	150 " "
Area of ticket offices	1,500 " "
Number of Ticket windows	8-10
Travel Bureau	1,000 sq. ft.
Restaurant	4,500 " "
Kitchen	2,200 " "
Snack Bar	1,000 " "
Men's Lounge and Restroom	1,200 " "
Barber Shop - 4 chairs	
Women's Lounge and Restroom	1,200 sq. ft.

2. Station facilities

Porter Service - Lockers, lounge restroom and showers	1,000 sq. ft.
Dispatchers room - office space	1,500 " "
Passenger Agent - office space	1,500 " "
Station Master and Offices	1,500 " "
Employees rooms, lockers	1,000 " "
Baggage sorting, storage	10,000 " "
Baggage tailboard space	140 " "
Conductor's visa	200 sq. ft.

Mechanical Equipment Heating, etc.	1,000	sq. ft.
Interlocking Relay Room Yard Control	2,000	" "
Terminal Operating Company Yard Control	1,500	" "
Building Maintenance	1,000	" "
Caretaker	1,000	" "

C. Terminal Office Building

Terminal operating Company (Union Depot Corporation)	10,000	sq. ft.
Great Northern Railway Co. (1 floor)	6,000	" "
Union Pacific Railway Co. (1 floor)	6,000	" "
Northern Pacific Co. (1 floor)	6,000	" "
Chi. Milw. St.Paul & Pac. (1 floor)	6,000	" "
Oregon & Wash. R.R & Nav.	3,000	" "
Pacific Railroad	1,000	" "
Cafeteria and Dining (½ floor)		
Kitchen and Service		
Rentable Office space (3 Floors)	2,000	sq. ft.

? area needed

D. Terminal Parking (Employees)

Total Area

Number of cars

E. U. S. Mail

Necessary tunnel connections, sorting areas and Platform space.

F. Railway Express Company

Necessary tunnel connections, sorting areas and platform space.

Receiving area at terminal station 1,000 sq. ft.

	Storage space	1,000 sq. ft.
	Tailboard length	50 " "

G. Concessions

THE SOLUTION

The problem of modernization of railway terminal facilities for Seattle is one which has interested me since the time when I first became conscious of its inadequacies and obsolescence, from the architectural point of view. I chose it as a Thesis subject for several reasons.

1. Its solution involves many phases of architectural design and its problems are sufficient and complex enough to tax the ingenuity and ability of any architect.

2. It perhaps more than any other civic project is in need of rehabilitation and modernization due to its immedediate association with persons entering or leaving the city.

3. Proper solution of this project will have a great impact on the economy of the city and will involve problems of civic development which are at present of major concern to the progress of the city.

It is impossible for one person to adequately investigate and to attempt to solve all of the problems encountered in the creation of a railroad terminal. The best procedure would be to have a joint committee of all parties concerned, architects, engineers, railroad officials, city planning group and others, to completely formulate all possible problems. In turn, this group would bring forth all desirable and undesirable traits, would be capable of advising for or against each decision, and would ensure complete and

exhaustive research into all problems.

I have attempted to present a possible solution, from an architect's viewpoint. It is possible that certain parts of the scheme are not feasible, due to factors beyond the scope of my research. I am, however, reasonably certain that the major and important functions as planned in the scheme, will operate successfully.

The Solution:

1. Joint facilities.

The problems involved in the creation of a Union Terminal are many. Railroad companies, as do other companies, like to operate individually, and generally are unwilling to share with a competing company. Considering the number of Union Terminals in this country however, that problem pales into insignificanse. The American Railway Engineers Association Manural lists sample legal documents for the creation of joint terminal facilities. In the Seattle case, equitable agreements would have to be reached on problems of land ownership and use, terminal space, track assignments and operating procedure. My scheme involves pooling of land, rights of way and facilities of the various companies, to allow for a reasonable solution of benefit to all.

Operation of the terminal would be assumed by a terminal Operating Company which would become a Depot Corporation. Its function would be to control all operations at the terminal. This includes rail movements in and out of the yard as well as functions of the building itself. This Corporation would maintain its own switching locomotives and handle all such activites within its limits.

2. The Site.

The site has been discussed in a previous section of

this report. To enumerate:

There would be a pooling of the site occupied by the King Street Station with that occupied by the Union Depot. The land now occupied for a Terminal Post Office Building is considered in this area. Provision is made for a Postal Terminal elsewhere on the site. Suitable arrangements will be made to insure equitable return of income to the companies, on the basis of area used jointly and present and future taxable values of land now used individually.

3. Traffic Problem.

The principal traffic problems are:

a. The existence of Fourth Avenue South as a major artery bisecting the site.

b. Jackson Street or Second Avenue becomes the most desirable access streets to the site because of minimum traffic.

My solution recommends that Fourth Avenue South become an elevated route, beginning at Airport Way and continuing at the elevated height until it reaches the normal street grade in the vicinity of Washington St. Fourth Avenue South at present begins to ramp up at 400 feet before its intersection with Airport Way from approximately track level, to 20 feet above that level at Airport Way. It continues at 20 feet above track level to Jackson Street, then begins to rise again as it proceeds uptown past Main and Washington Streets.

My solution proposes that Fourth Avenue South continue to ramp up for 400 feet when it reaches Airport Way, to an elevation of 40 feet above track level. It would continue at this elevation until it reached the normal street grade at a point near Washington Strret. This would have the following effect:

1. It would allow through traffic on Fourth Ave. So. to traverse the congested terminal area, as an overhead freeway with no grade crossings. At Airport Way, a system of underpasses which allowed no cross traffic, would enable transfer of vehicles from Airport Way to Fourth Avenue South and vice versa;

2. Jackson Street would be a through street underneath relieved of congestion at Fourth Avenue South. This would enable access to and from the terminal to move with a minimum of congestion.

3. It enables the pooling of two existing terminal sites, under the Fourth Avenue South raodway.

In addition to this, Second Avenue(from Washington Street to Jackson Street,) is eliminated, as is Washington Street (from Occidental to Fourth), and Main Street (from Second to Fourth). Elimination of these streets follows recommendations of the City Planning Commission and Traffic Engineer, for rehabilitation of slums in that area and creation of a green belt or park as a means of civic beautification. These park areas could serve as sites for underground parking areas to serve vehicles of persons having

business at the terminal or in the proposed adjacent Public Buildings Area.

A general widening of the streets in the vicinity (as far as possible) is affected, and dividing strips placed as a means of directing and separating traffic.

4. The Station:

a. Tracks enter the station from the existing rights-of-way and main lines. In the case of Union Pacific and Milwaukee trains, they would have to enter and use the same rights of way as due Great Northern and Northern Pacific trains at present. Access to coach yards of the former would have to be made unless coach facilities could be arranged in the same areas as are the Great Northern and Northern Pacific. To handle the increased traffic and greater volume of movement at the terminal, suitable modern interlocking relay signalling equipment would be necessary.

The yard develops into 10 loading and unloading tracks. Four of these tracks are terminating stubs, six of them offer means of taking locomotive power from the head and bypassing it to the outgoing side of the yard. The two tracks from the tunnel remain as main line tracks with one used as a bypass spur when necessary. Tracks at station platforms are in pairs. Between each pair is a platform on which all passenger, mail express and baggage is handled. Passengers, however, use essentially the center portions of the platforms,

while mail, express and baggage are confined to the extremities.

b. Private cars enter from a point on Jackson St. near Second Avenue. They leave the area, entering Jackson Street at a point 250 feet from Second Avenue. There are two levels, one for unloading, one for loading. In the access loop is parking space for approximately 60 autos. There is no cross circulation whatsoever.

Taxicabs enter opposite the building from private cars. They enter and leave from Second Avenue, which is elevated to station level. As in the case of Private cars, they have two levels, one for loading and one for unloading. In the access loop is space for taxi waiting areas.

c. Pedestrians arrive at the Jackson Street entrance either on foot or from transit coaches. Transit passengers arrive on three routes. One is the crosstown route on Jackson Street; one is the north-south route via Fourth South overhead. This latter has unloading zones at the point where it crosses Jackson Street. The third is the transit coach which terminates at the station.

d. Trucks and delivery vehicles approach the lower service floors by way of King Street which is below the station level.

e. Arriving by foot, auto or taxicab, the passenger

encounters information, tickets, baggage and parcel receiving rooms and waiting room, in that order. Conveniently located are all necessary concessions, news, traveler's aid, travel bureau, restaurant, snack bar, telegraph, telephone and rest rooms. From the waiting room he can see all track approaches and may sit in the immediate vicinity of the ramp to the platform from which his train leaves.

Arriving by train, the passenger enters the concourse from the ramps or stairs, and may proceed directly to the baggage delivery room and to awaiting auto, taxicab, or bus without interfering with other passengers. He has the option of using all station facilities if he so chooses.

f. There are two hand baggage rooms. One on the top level for receiving, one at the lower for delivery. Below these, at track level, is the sorting and storage area. Baggage travels below tracks, in tunnels to the various platforms where it is elevated to awaiting cars.

Both ramps and elevators are provided when possible to allow expeditious handling of baggage. Truck access is provided at the lower track level.

g. Mail is handled via separate tunnels under tracks, to the Postal Terminal building. The post office terminal is located with good access to the terminaland sufficient room for the handling of indi-

vidual mail trains at the port office terminal.

h. Express tunnels are provided, which join with baggage tunnels. The express tunnel provides access from the express terminal to the station. Provision is made at the terminal for public access by car or truck to an express area at the terminal.

j. Offices are provided in an office building located independently of, but with direct access to the station. This building houses the Terminal Operating Corporation, offices of the various railroad companies and rentable space for other tenants. It is oriented for north light and the most pleasant outlook.

The design itself represents my personal approach to the problem with respect to character, spacial relationship to parts and function.

Contrary to past practices in the design of Railway terminals, I have endeavored to make the building a more informal structure. I do not believe that monumentality or formality is the requisite of good design. I believe the situation should present an attractive appearance from the exterior, be clean, well lighted, easy and direct in operation and completely functional.

I have attempted to eliminate waste space as much as possible. Passengers are foremost in the consideration of elements, and every consideration has been given to their convenience and pleasure. Waiting areas are located to provide pleasant outlook and speedy access

to trains. Wherever possible, planting has been arranged to enhance areas that normally are ugly and dirty. The building in its essential parts is informal and direct. No useless monument or tower has been erected. The only vertical element is the office building and it is justly so. The general character of the station is derived from its forms which are common only to railroad terminals.

The materials used are those common to the State in which the station is located. Wood is used where possible, to recall the great forestry industry. However, wood requires great maintenance as an exterior material, so brick will be used as a facing in most parts. The basic skelelton is of steel with caisson foundations. Reinforced concrete is used as the second main structural medium.

INFORMATION SOURCES

Information Sources:

Perry B. Johanson, Architect
Naramore, Bain, Brady, Johanson
1190 Dexter Horton Building
Seattle, Washington

J.W.A.Bollong, Traffic Engineer
City of Seattle
County City Building
Seattle, Washington

Henry R. Berg, Executive Secretary
City Planning Commission
503 County City Building
Seattle, Washington

H. L. Burnham, Western Traffic Manager
Northern Pacific Railway Company
Seattle, Washington

E. B. Crane, Principal Assistant Engineer
Chicago, Milwaukee, St. Paul and Pacific Railroad Company
Seattle, Washington

Sam Murray, Resident Engineer
Union Pacific Railway Company
Seattle, Washington

H.J. Shannon, General Agent
Railway Express Agency
Seattle, Washington

Frank LaFortune, Foreman
Post Office Garage
Seattle, Washington

Messrs. Sullivan, Lord, Flaherty,
Traffic Research and Development
New York, New Haven and Connecticut Railroad
Boston, Massachusetts

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Railway Mail Service
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Mr. Maloney
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Boston, Massachusetts.

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APPENDIX

DEPARTMENT OF PUBLIC WORKS OF

THE CITY OF SEATTLE

OFFICE OF CITY ENGINEER

C. L. WARTELLE, CITY ENGINEER

IN RE: Railroad Terminal for
Seattle -

May 2, 1946

Mr. Arnold G. Gangnes
19 Westgate
Cambridge 39, Mass.

Dear Mr. Gangnes:

I am very much interested in your proposed thesis contemplating a study for a railroad terminal for Seattle, something which is sorely needed, I am sure.

The railroads have had vacated, (in the early days of approach to the city from the south particularly) so much of the approach streets from the south that there is now remaining only four highways from the south where there should be eight or ten. These four are Airport Way, 4th Avenue South, 1st Avenue South and E. Marginal Way (or Alaskan Way.) There are some 58,000 cars using these four highways daily. 4th Avenue alone carries 32,000 in the vicinity of the depot, which is a combination of 4th Avenue South, Airport Way and Dearborn Street from the east. The traffic flow map enclosed shows pictorially the approach of this traffic.

We now have the Public Roads Administration in conjunction with this department and the State Highway Department carrying on what is known as an Origin & Destination Survey, the purpose of which is to find the route or routes which might be used in place of those now actually being used and to construct along said route or routes "limited ways" or what is popularly known as "freeways"--similar to Merritt Parkway or Aroyo Seco in Los Angeles. The function of such freeways is to carry traffic at fairly high speeds without any intersecting cross-traffic, pedestrian or vehicular. I am enclosing another print showing studies of such freeways into and around the City of Seattle and possible location of such freeways. However, none of these contemplate the abandonment of any of the four approach streets on highways from the south.

I believe it would be a mistake to abandon 4th Avenue South which is now U.S. 99. It might be interesting for you to peruse a study which the writer made with regard to modernization of the stations and their combining into somewhat as one whole. This entailed new construction, methods of approach to trains, taxicab concourse, private car parking, the moving of the terminal post office, the construction of a new highway on 2nd Avenue South, clearance of a plaza in front of the stations and other changes.

I am enclosing a copy of a letter which was written to presidents of each of the railroad companies entering the city, setting out the need for such modernization from a traffic standpoint, an economical standpoint and an aesthetic standpoint.

All of this, of course, would run into considerable financing, but it is something I believe the City of Seattle needs. The stations are not only inadequate, but the area occupied by blighted buildings in front of them from Yesler Way to Jackson Street needs rehabilitation. What a wonderful impression it would be for those coming into Seattle to have a modernized station facing on a plaza such as the writer has outlined!

I would call your attention to similar plazas and civic centers which have been constructed or are being contemplated in St. Louis, Los Angeles, Portland, St. Paul, Kansas City and others which you no doubt have encountered in your travels.

If I can be of any further assistance to you in this respect, please call on me. I would be glad to receive a copy of your proposed thesis and plan lay-out for checking from a traffic standpoint.

Very sincerely,

J. W. A. Bollong
Traffic Engineer

JWAB-t
Enc.-7

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CITY PLANNING COMMISSION
OF
CITY OF SEATTLE

503 COUNTY-CITY BLDG.
SEATTLE 4, WN.

MEMBERS (EX-OFFICIO)
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PRESIDENT OF PARK BOARD
C. L. WARTELLE
CITY ENGINEER
JOHN B. CAIN
SUPT. OF BUILDINGS

EXECUTIVE SECRETARY
HENRY R. BERG

April 17, 1946

Mr. A. G. Gangnes
19 Westgate
Cambridge 39, Mass.

Dear Mr. Gangnes:

We are in receipt of your letter of April 1st, requesting information and data for your proposed study for "A Railroad Terminal for Seattle". Under separate cover, we sent you a copy of our report, entitled "Report on Proposed Public Buildings Area for Seattle", which is related to the subject you have chosen. I would suggest that you give our report a thorough study as it is definitely related to the railroad passenger terminals.

While we were working on the preparation of the above mentioned report, we contacted the four railroad companies, having depot facilities at 4th Avenue South and Jackson Street, as to their plans for modernization of the King Street and the Union Depots. At that time they replied that the pressure of war transportation had required the full attention of the railroad company officials and therefore it had been necessary to defer studies of this matter.

Your particular attention is called to pages 16 and 17 of our report, under the heading of "Auxiliary Areas to be Considered for Future Improvement in Connection with the Approach to the Public Buildings Area."

Frankly, I believe you have chosen a subject on which it probably will be difficult to get data. Considerable will depend on the cooperation you receive from the railroad companies. I would suggest that you tackle them immediately for information and see what sort of a reaction you get.

There are several limiting factors that must be taken into consideration in endeavoring to solve this problem, some of which are as follows:

(1) Since the Great Northern Railway passes under the Central Business District in a tunnel which ends at 4th Avenue South and Washington Street, the location of depot facilities must be south of this point.

(2) Fourth Avenue South is a part of the State Highway System through the City, being U. S. 99, and the depot structures must not infringe on this important arterial street.

(3) Foundation conditions in the vicinity of the present depots are difficult since it is filled in tide-flat areas with a high water plane and most any kind of a structure will require a heavy pile foundation.

(4) Bus and air travel facilities are highly competitive with rail passenger facilities, and there is considerable difference in opinion on the amount of passenger business that will accrue to the railroads in spite of their improved equipment.

(5) The competitive element between the various railroads works against any sort of joint depot facilities.

Under the Bogue Plan, the railroad terminal was to be located at the south end of Lake Union with tunnels under the city connecting with the lines to the south. The Northern Pacific, Chicago Milwaukee, and Union Pacific all enter the city from the south. The Great Northern is the only line that enters from the north. It is our opinion that any new depot facility would have to be located in the vicinity of the present depots.

Sorry that I do not have any more definite data that I can send you but we have been so busy on other problems that we haven't had a chance to go into this one in any detail.

Yours very truly,

Henry R. Berg

HENRY R. BERG,
Executive Secretary,
City Planning Commission

HRB:jm

C
O
P
Y

June 1, 1945

Re: Modernization of Railroad Passenger Stations in the City of Seattle

Dear Sir:

The writer, as Traffic Engineer of the City of Seattle, has annually or bi-annually visited the cities in the United States and Canada ranging from 50,000 to 1,000,000 in population for the past 18 years in order that he might keep in step with the progress made in other cities and apply the knowledge gained thereby to the city of Seattle.

Closely identified with traffic control, it has been the observation of the writer that there has been a gradual modernization of railroad passenger stations throughout the United States. Various items in this respect are the marked improvement in the means for traffic approach and exit from stations, and the trend toward the provision of safe access and exit to and from the various tracks on which passenger trains are loaded and unloaded, by means of overhead or tunnel passages.

Comparing railroad passenger stations in Seattle with modernized stations, it is always particularly outstanding (in the writer's mind) that the access and exit to and from the railroad passenger stations in Seattle from a traffic standpoint are not only inadequate but chaotic. Let us consider the following:

1. Taxicabs. Modern stations provide adequate and safe facilities for the approach, loading and unloading and exit of taxicabs, providing easy access to these approaches for red caps or porters, and the transfer of passengers and luggage from the passenger train to the taxicab loading space. The approach facilities, storage capacities and means for loading and unloading of passengers and luggage to and from taxicabs in the city of Seattle are entirely inadequate.

In the case of the King Street Station, there is a commingling of baggage trucks, private cars, mail trucks, express trucks and other types of traffic in the area now being used by taxicabs. In the case of the Union Station, only a small inadequate space is available directly in front of the station and this is difficult of both access and exit.

2. Private Cars. A large number of passengers approach and leave the railroad station by means of private cars. At the present time, there are no areas

for the parking of private cars within reasonable distance of these passenger stations, necessitating the carrying of baggage and the transferring of the passengers themselves from a distance of two or three blocks.

3. Station Connections. The proximity of the two Seattle stations — directly across 4th Avenue South — makes possible a connecting of the two for passenger transfer purposes without passing through the heavy traffic on the streets adjacent thereto.

4. Post Office Terminal. Location of the Terminal Post Office on the north side of King Street to the west of 3rd Avenue South entails movement of mail from one station to the other by means of trucks via 2nd Avenue South, Jackson Street, 4th Avenue South to Dearborn, thence returning along the ramp and lower roadway to the Union Station.

5. Train Approach. Train approach for passengers from the stations is on the same level as the tracks. In some cases, passengers are required to cross other tracks in making their approach.

In view of these conditions, the writer suggests that STUDY be made of the following:

1. Taxicabs: That a proper taxicab concourse be constructed by means of paving the area over the railroad tracks to the south of the stations in each case, thus providing easy approach and exit from this concourse, provision to be made for the transfer of baggage from the passenger trains to this concourse by the red caps. This concourse should be of sufficient size to supply taxicab storage space, especially on the arrival of transcontinental trains.

2. Passenger Car Facilities: That sufficient paved area be provided to the south of the taxicab concourse and over the same railroad area for the reasonable storage of private passenger cars approaching or leaving the station with passengers or baggage.

3. Station Connections: That means of passage from station to station be provided without the necessity of combating streams of traffic as at present.

4. Post Office Terminal: That Terminal Post Office facilities be placed between the two stations in the area beneath 4th Avenue South from Jackson St. to Dearborn St.

5. Passenger Train Approach: That glass-enclosed corridors for passenger track approach be extended from the station to the south with stairways leading to the proper tracks — Track No. 1, No. 2, No. 3, and so on, as necessity requires.

It is the further thought of the writer that the Waiting Room in the King Street Station should be moved from the lower or King Street level to the Jackson St. level, releasing this lower level for baggage and other approach.

As a general comment, it would seem that the intense competition in the transportation field that now exists and will exist to a greater extent in the post-war period between air, railroad and motor coach systems would necessitate serious consideration of every facility for the safety, comfort and convenience of the passenger entering the stations.

Further, Seattle has grown very appreciably during the war period and it is the estimate of well-qualified authorities that it will continue to grow, so it would seem that serious thought for the future should be given.

Attached hereto is an artist's sketch of the facilities referred to in this communication.

Yours very truly,

J. W. A. Bollong
Traffic Engineer

JWAB:VL

CC: E. B. Crane, Engineer
Chicago, Milwaukee, St. Paul & Pacific Railway

Robert S. McFarland, Ass't to President
Northern Pacific Railway Co.

J. E. Derrig, Asst. Chief Engineer
Northern Pacific Railway Co.

H. J. Seyton, Asst. Chief Engineer
Great Northern Railway

B. S. Merritt, Western Traffic Manager
Great Northern Railway

F. E. Bisbee, Supt.
King Street Station

Arthur A. Murphy, Asst. to President
Union Pacific Railroad

Sam Murray, Resident Engineer
Union Pacific Railroad - Portland, Ore.

U. S. Post Office Garage,
Seattle 4, Wash. June 8, 1946

Mr. Arnold G. Gangnes,
19 Westgate,
Cambridge 39, Mass.

Dear Mr. Gangnes:

Almost a month since your letter - forgive the delinquent - or am I too late to help in the thesis - but truthfully I did struggle to secure information so as to be of some help to you - it seems that everytime I made a forward stroke I was pushed back to sea again do to the advice of those supposedly in the know.

Your thesis subject, "A Railroad Terminal for Seattle," however, is worth the effort and someday will come to a realization. If the Seattle Chamber of Commerce heard about it they would exclaim "Bravo, and More Power to you." Lord only knows that not only the PostOffice but also the railroads, express, taxi cabs, cars, trucks are all jammed into dead ends fighting each other in an effort to ensnarl our confusion around the depots. The only road to Heaven is prayer, and that is the way the boys around the Terminal P.O. feel about it - ask your father-in-law. We tried everything else and failing have come to the conclusion that we will have to bend our knees a little.

As suggested by you, the sensible thing to do is to join all railroads into Seattle into one grand Union depot, taking in the terminal postoffice, express, and other necessary evils. The postoffice should be in an accessible position so that mail cars may be easily spotted to the lower level of the building for loading or unloading purposes; this would expedite distribution in the building by means of conveyor belts to the upper floors - consideration being given both for local and out-of-town connections.

Some twenty years ago the City of Seattle agreed to the use of the space under Fourth Ave. So., between the two depots, for a mail terminal, but todate - although the space can still be utilized - I am afraid that the baby has outgrown its crib - we would have to kick out the backboard and make use of the now vacant space adjoining the New Richmond Hotel, that is the lot or block on the north side of Jackson St. between 4th & 5th Av. This area was once offered to the P.O.Dept when bids were called for several years ago, by the U.P. R.R., but the G.N. site - the square block between King and Jackson, 2nd to 3rd - was taken under option instead. That option has now expired.

In speaking with George E. Starr, Postmaster, and others, the concensus of option is that no action - appropriation or otherwise - will be taken towards a new terminal for at least five years, as prospects now stand the Government is giving priorities to Veteran hospitals and other emergency measures. We are badly in need of a new and larger building, but we must await our turn - but that turn is sure to come, maybe sooner than we anticipate.

To house the Terminal P.O. would require a structure of eight stories - its lower level to be utilized strictly as loading platforms for trucks - conveyors to upper floors for distribution purposes. The details of a postoffice is something with which you are familiar - as your father-in-law, Mike Klepach, no doubt has unwound its intricacies many a time - to the layman it offers the picture of a labyrinth.

To use the space where we now stand for a new terminal building, action no doubt would be taken towards securing a tunnel under the King St. Passenger Depot and tracks so as to ingress to the Union Depot, as half of the mail must be transferred from the Terminal to the other depot. The tunnel no doubt would be a series of conveyor belts.

I am afraid that I have not offered you very much in your problem, so if you want to rate high just pray hard, yourself, for there is no easy road to Heaven as I stated before. Everyone you contact seems to have a different idea as to the construction of a terminal - and where it should be located - but there are certain basic or fundamental necessitities -

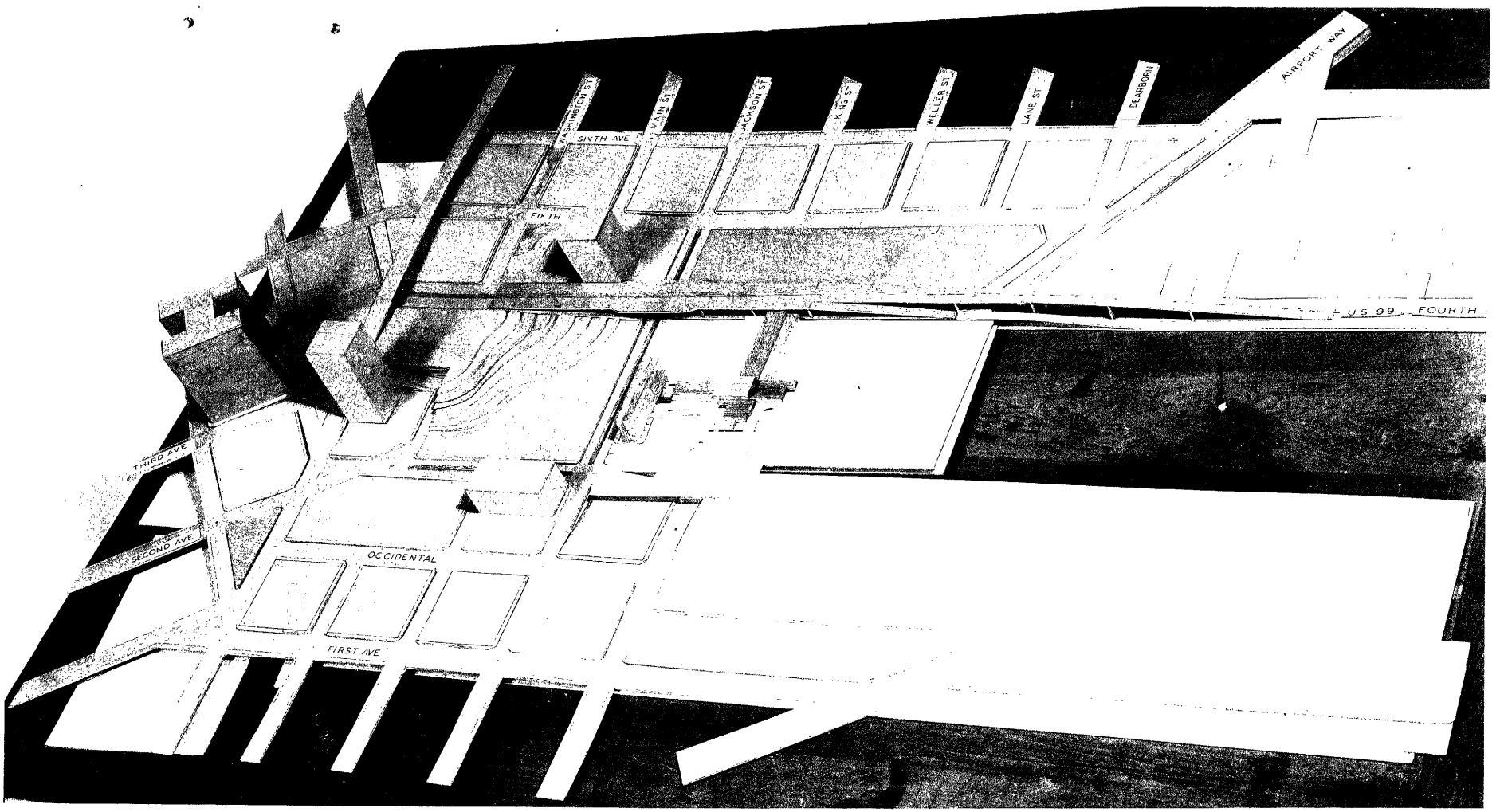
First - it must be accessible to the depots and within hailing distance of the docks, as we move tons of mail every day from Alaska and the trans-Pacific - and with time and growth of trade which is bound to increase considerably - it means considerable short hauls by trucks of heavy tonnage, which is quite a cost item. Piers 50 and 51 for Alaska, foot of King St., and Pier 39 and other Army docks, foot of Atlantic St., are the most used right now, although we travel the entire waterfront from Interbay to the West Waterway.

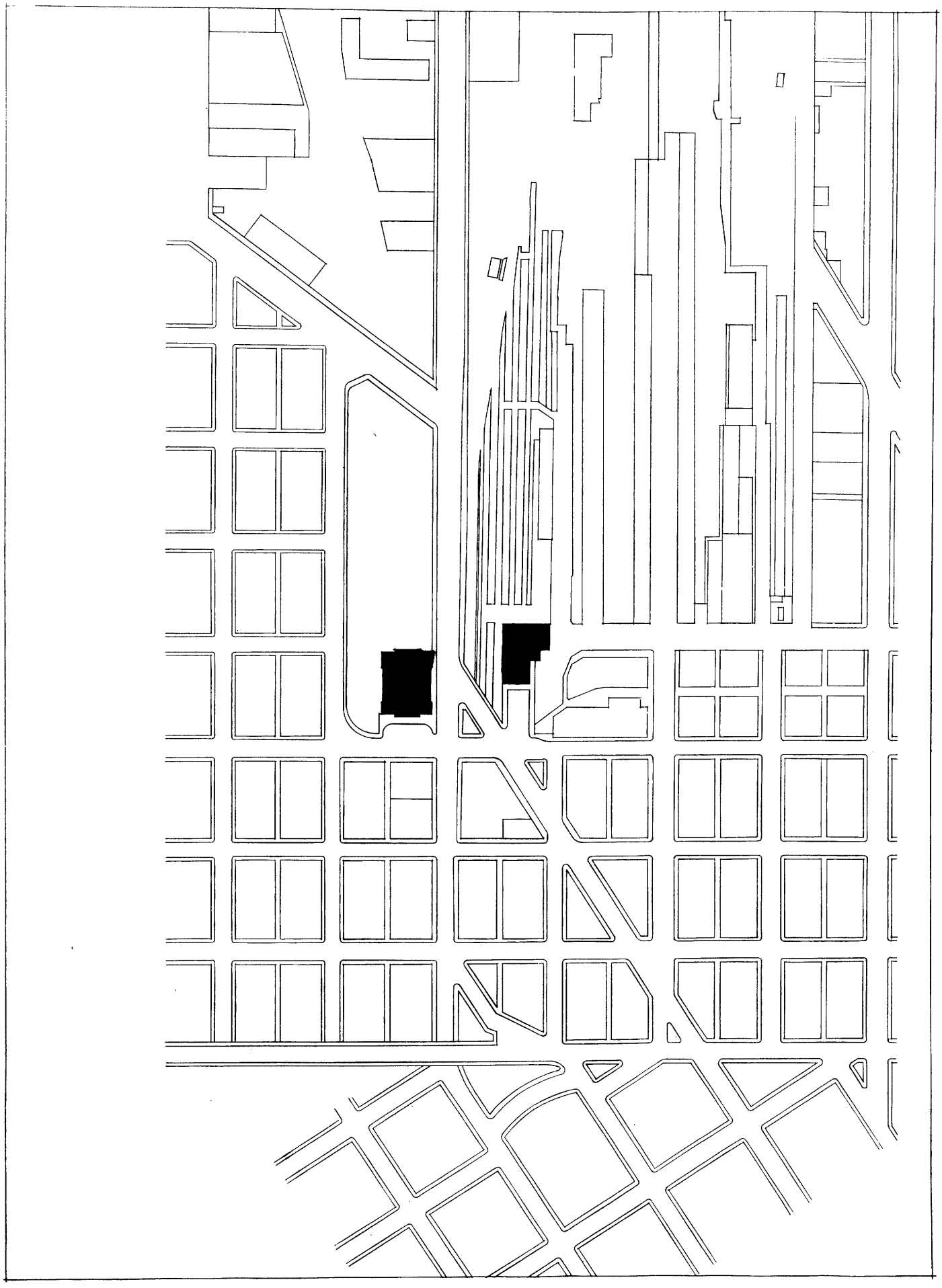
Enclosed is a newspaper clipping which may prove of some service to you. At least you can look at the corner of Fourth Avenue and Jackson St. with recollections and say, "Gee, I wish I was back in Seattle."

I sincerely hope you success in your undertaking, and anyone tackling "A Postoffice Terminal" for a thesis indicates ambition that will carry far in a well chosen career.

Respectfully yours,

Frank La Fortune


SIXTH AVE
FIFTH
US 99
FOURTH
THIRD AVE
SECOND AVE
OCCIDENTAL
FIRST AVE
WASHINGTON ST
MAIN ST
JACKSON ST
KING ST
WELLER ST
LANE ST
DEARBORN
AIRPORT WAY



railroad terminal

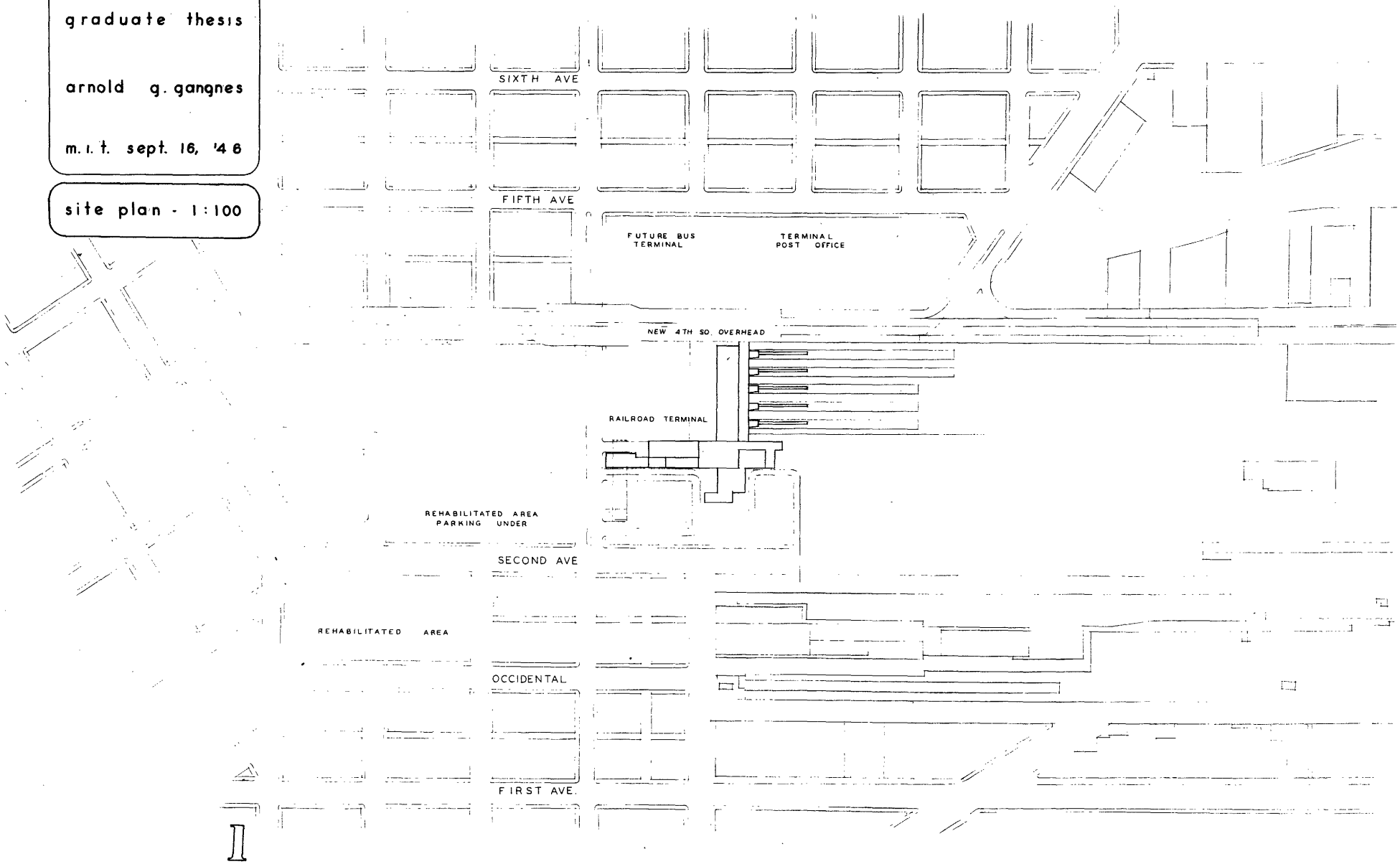
seattle, 4, wash.

graduate thesis

arnold g. gangnes

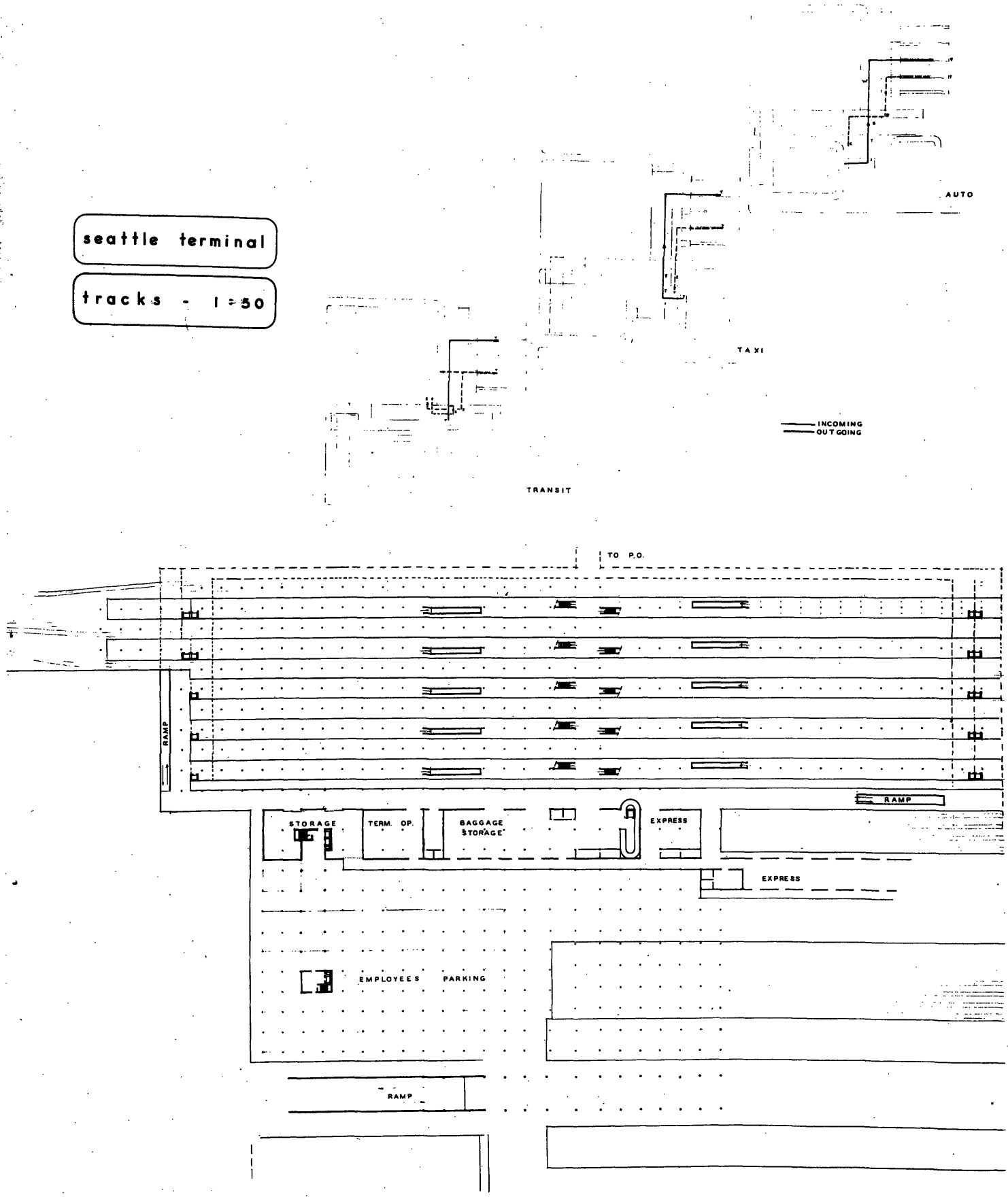
m. i. t. sept. 16, '46

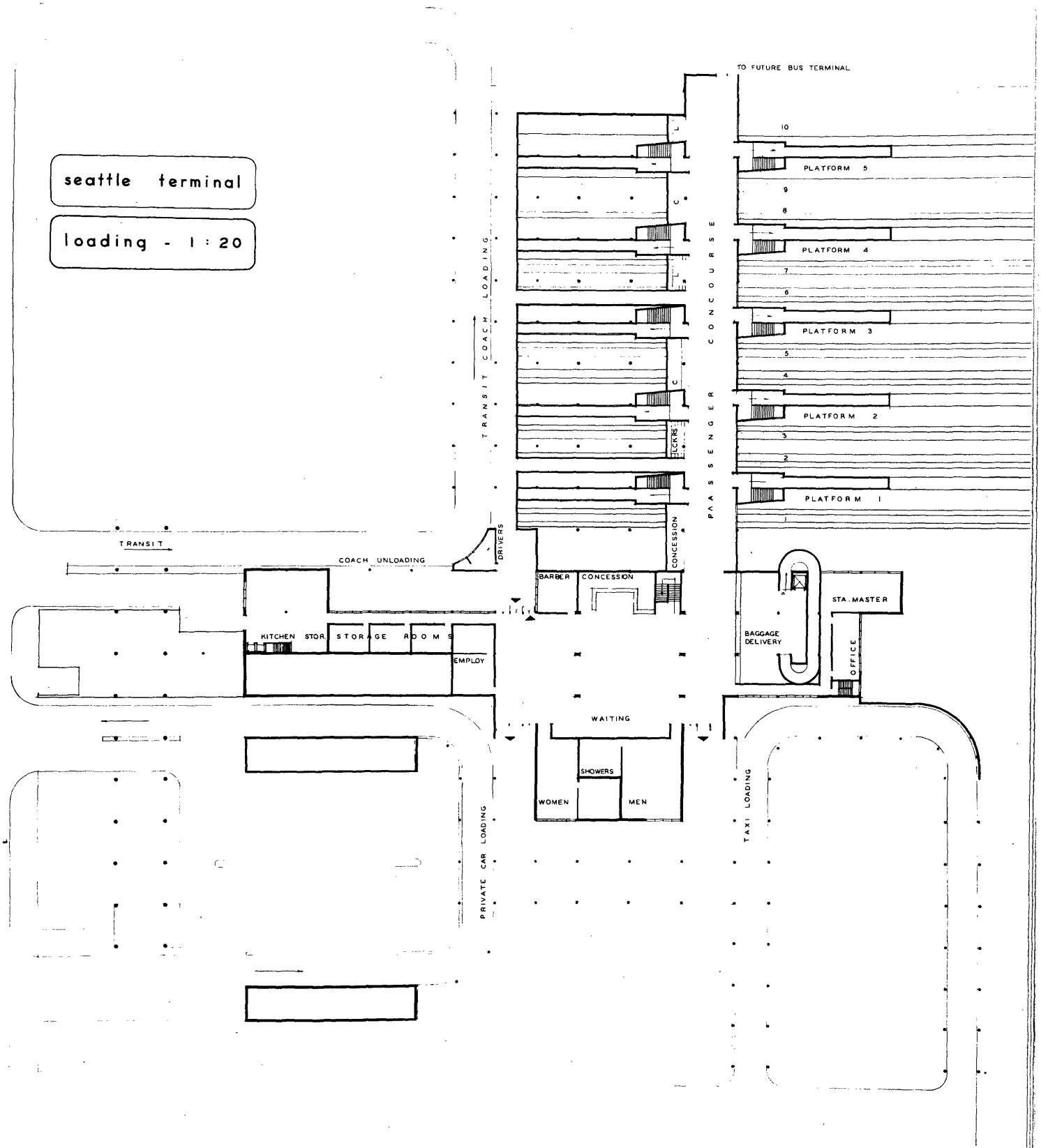
site plan - 1:100

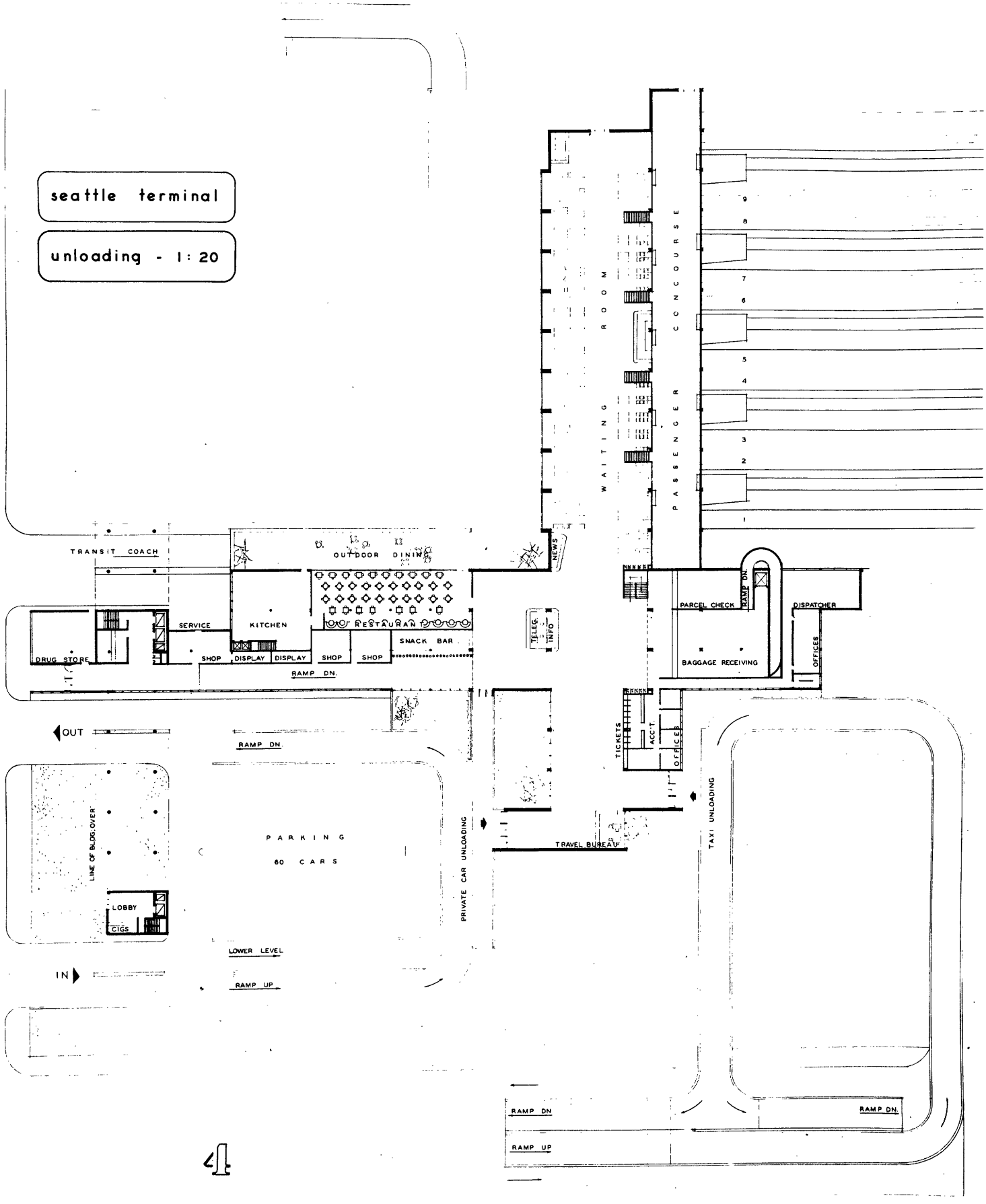


seattle terminal

tracks - 1-50

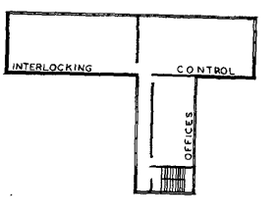


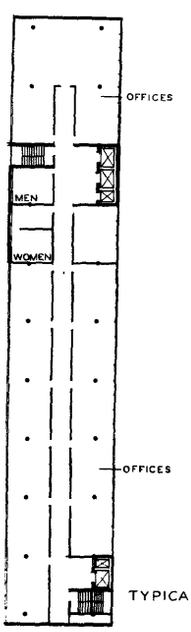

seattle terminal
loading - 1:20
TO FUTURE BUS TERMINAL
TRANSIT COACH LOADING
PASSENGER CONCOURSE
PLATFORM 5
PLATFORM 4
PLATFORM 3
PLATFORM 2
PLATFORM 1
10
9
8
7
6
5
4
3
2
LCKRS
CONCESSION
DRIVERS
TRANSIT
COACH UNLOADING
BARBER
CONCESSION
STA. MASTER
BAGGAGE DELIVERY
OFFICE
KITCHEN STOR.
STORAGE ROOMS
EMPLOY
WAITING
SHOWERS
WOMEN
MEN
PRIVATE CAR LOADING
TAXI LOADING


seattle terminal
unloading - 1:20
TRANSIT COACH
OUTDOOR DINING
NEWS
WAITING ROOM
PASSENGER CONCOURSE
9
8
7
6
5
4
3
2
1
SERVICE
KITCHEN
RESTAURAN
SNACK BAR
DRUG STORE
SHOP
DISPLAY
DISPLAY
SHOP
SHOP
RAMP DN.
TELEG.
INFO.
PARCEL CHECK
RAMP DN.
DISPATCHER
BAGGAGE RECEIVING
OFFICES
OUT
RAMP DN.
TICKETS
ACCT.
offices
LINE OF BLDG. OVER
PARKING
60 CARS
PRIVATE CAR UNLOADING
TRAVEL BUREAU
TAXI UNLOADING
LOBBY
CIGS
LOWER LEVEL
IN
RAMP UP
RAMP DN
RAMP DN.
RAMP UP

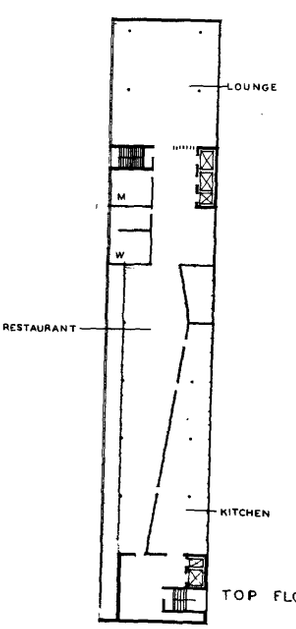
seattle terminal

plans - section

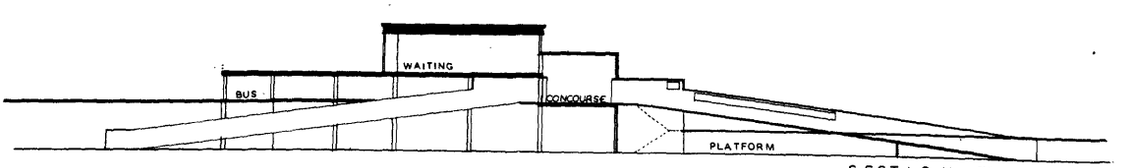




TYPICAL FLOOR



TOP FLOOR

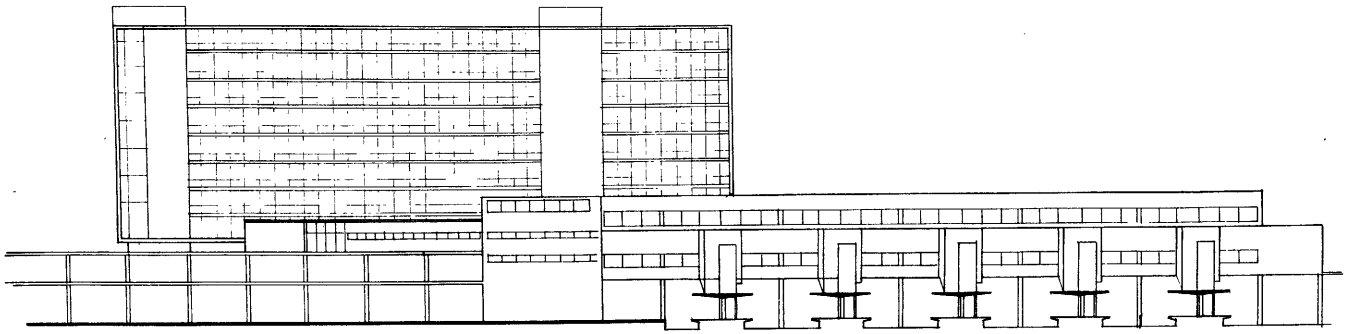


SECTION A

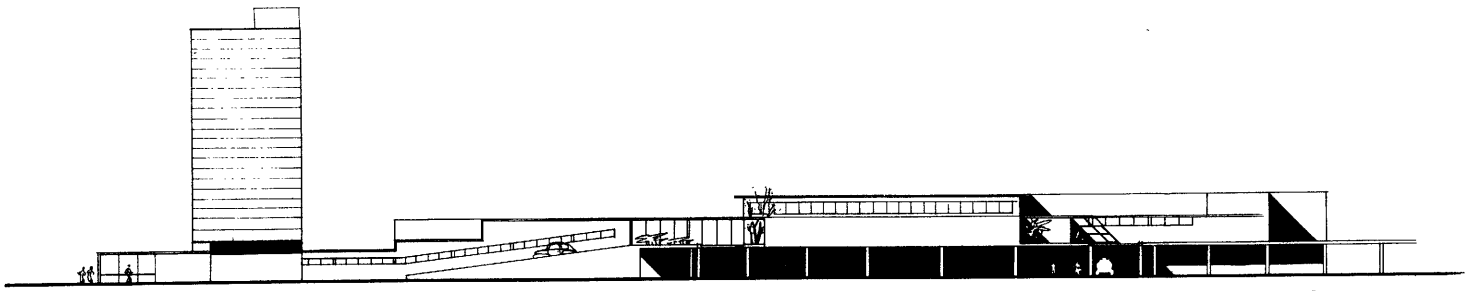
5

seattle terminal

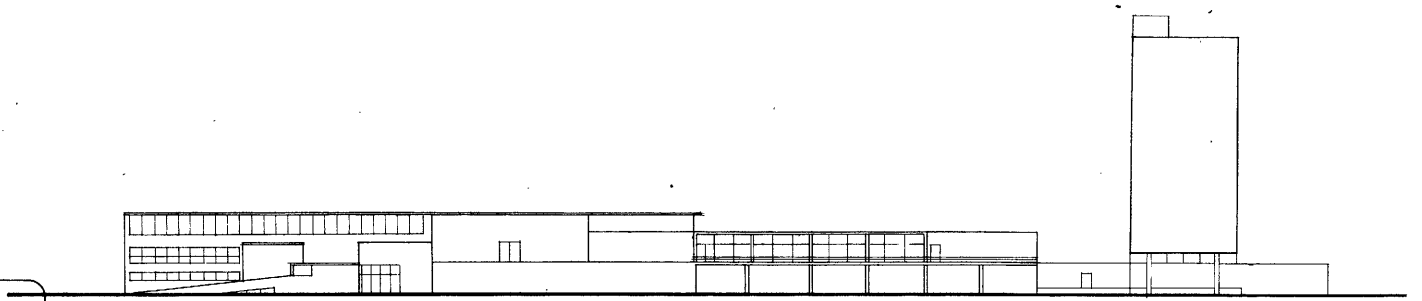
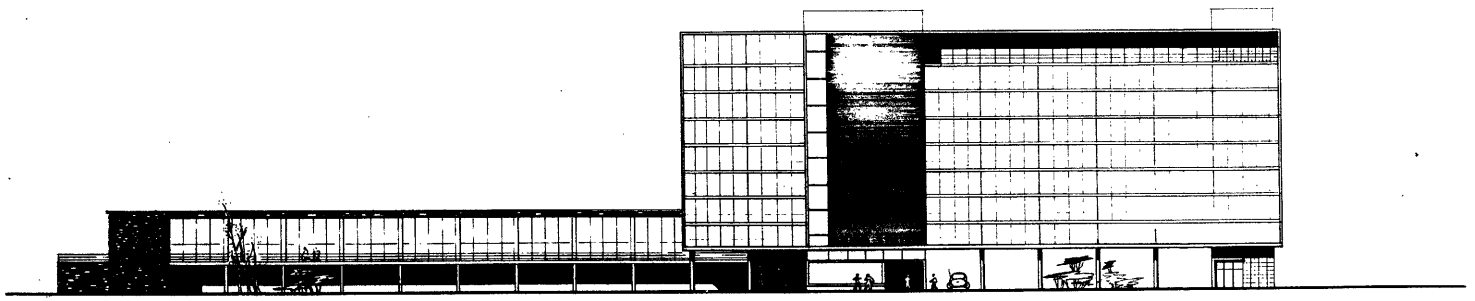
elevations ·s · · w·



SOUTH



WEST

seattle terminal

elevations ·n·e·