ENVIRONMENTAL QUALITY CONDITIONS IN FAIRBANKS, ALASKA, 1972

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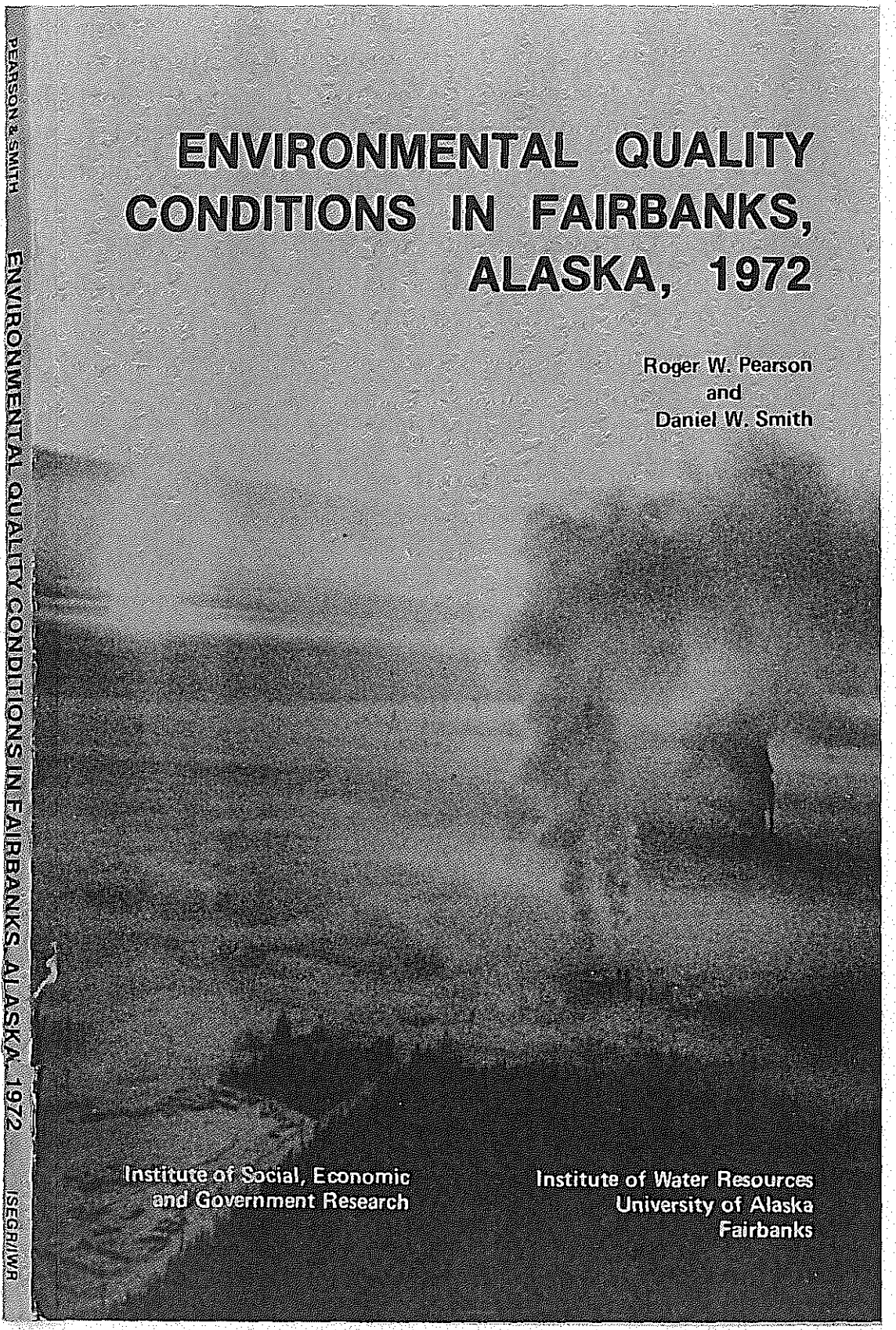

Institute of Social, Economic and Government Research

Institute of Water Resources
University of Alaska
Fairbanks

PEARSON & SMITH ENVIRONMENTAL QUALITY CONDITIONS IN FAIRBANKS, ALASKA, 1972 ISEGR/IWR

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CHAPTER 1
INTRODUCTION

This study represents a starting point for investigating the nature and interconnectivity of environmental quality problems in Fairbanks in the 1970's. Since the Fairbanks flood of 1967, no detailed survey of environmental quality conditions has been conducted despite the impact of the flood, the considerable expansion of the city limits, and the population expansion (anticipated and actual) associated with the oil pipeline.

The study focuses on selective aspects of environmental quality of continuing and increasing concern to Fairbanks area residents and also to the city and borough governments. Specifically, the issues analyzed are (1) the environmental setting of the area, (2) structures, especially housing conditions, (3) premise conditions, and (4) waste control.

Much of the data was derived from a program called NEEDS, an acronym for Neighborhood Environmental Evaluation and Decision System. NEEDS was developed by the Bureau of Community Environmental Management of the Department of Health, Education, and Welfare for rapid gathering of environmental, health, and social information in urban areas.[1] The NEEDS survey design consists of two separate stages. Stage I is concerned with collecting general environmental quality information to determine geographically where the most pronounced environmental health problems exist in a given urban area. Stage II consists of detailed interviews with residents of the identified "problem areas" to

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[1] "NEEDS: A New Source of Urban Indicators," *Planning*, 37, 1971: Roy Spillenkothen, "NEEDS for Improvement," *Health Services World*, 7 (1972), 24-26.

determine the exact nature of existing health and environmental problems, e.g., housing, health, availability of services, and attitudes regarding existing government (local, state, and federal) programs. With this information, local officials could begin to reorganize existing programs and/or develop new programs to solve some of the interrelated environmental quality problems in the disadvantaged sections of their cities.

NEEDS studies are not conducted solely by the Bureau of Community Environmental Management. Instead, the program must be requested by local officials. While technical supervision and computer analyses are done by BCEM, local governments must supply the survey teams and pay both their salaries and the miscellaneous survey costs. However, local funding for the projects in the past have usually been arranged through various federal grants. In Fairbanks, the study was funded through a Title IV-A grant from the Department of Health, Education, and Welfare.

By 1971, NEEDS surveys were underway in 22 cities and towns in the United States. Nearly all of these centers were in the eastern or southwestern part of the country. In 1972, Fairbanks, Alaska, was selected as the twenty-third city to be included in the NEEDS program. Environmentally, it was significantly different from the other 22 NEEDS centers in the U.S. Unfortunately, because of the withdrawal of Title IV-A funds by the Nixon Administration in late 1972, the NEEDS survey was limited to only the first stage of analysis. Also, the lack of funding has delayed the publication of the findings until this time. Yet, since the summer of 1972, Fairbanks has undergone some dramatic environmental changes, including population expansion, new housing, expanded sewer and water systems. Nevertheless, the writers feel the report is still of value since: (1) it provides an analysis of selected environmental conditions at a recent time period (such information would not otherwise be available), and (2) it provides a method for *continuously* updating current environmental conditions and analyzing problem areas. Thus, local officials will have a basis for making future environmental quality policy decisions.

Method of Study

The Fairbanks NEEDS Survey was conducted in the summer of 1972. Data was collected on two standarized forms, one focusing on city blocks, and the other focusing on exterior building and premise

conditions (Appendix I). The major categories of information collected as shown in Table I-1.

Delimitation of the survey area was based on three major considerations:

1. The survey should concentrate on areal units with main structures, especially residential structures. The NEEDS format focuses particularly on combined housing and premise conditions.

2. The survey area should not be limited within the city boundaries. Areas immediately adjacent to the city, e.g., the community of College, form an integral part of the Fairbanks environment and therefore should be included. Alternatively, not all areas of the city need be included, especially if they contain large areas of vacant land.

3. The survey boundaries should exclude, if possible, areas not covered by the 1970 census block analysis of the Fairbanks region. The census block data provides useful supplementary information for the study, while the census tract provides a geographic basis for data groupings.

As shown in Figure I-1, the final survey area included all of the city except for portions of central and South Fairbanks, which consisted mainly of vacant land. By 1974, however, much of south Fairbanks was being converted to industrial use. Alaskaland (in Census Tract 9503) has been excluded because it is an amusement center.

Outside of the city, most of the community of College was encompassed in the survey area. That portion of College lying north of College Road was excluded because it was not covered in the 1970 census block analysis. Certain portions of Census tracts 9503 and 9505 were not included in the survey area because of their large size and peripheral location to the other developed portions of the study area.

Sampling Procedures

Because of time and monetary limitations, a decision was made to conduct a sample survey of the study area, rather than to collect data on each individual land parcel. The area was divided into 560 blocks, most of which were blocks in the actual sense, encompassed

Table I-1
NEEDS DATA CATEGORIES

1. Crowding of structures — A determination is made of the percentage of the land covered by structures. Note is made of the types of construction and the land usage. The occurrence of "for sale" signs is also recorded to indicate the relative stability of a neighborhood.

2. Crowding of population — An index of population crowding is determined by dividing the total amount of residential floor area within a block by the total number of people residing in that block. This index is then compared to nationally established standards dealing with population crowding.

3. Premise conditions — Premise conditions are measured by the occurrence of abandoned automobiles, discarded appliances, accumulations of rubbish, generally improper storage of refuse, presence of livestock, poultry, rodents or mosquitoes on premises, unacceptable fences or retaining walls, or abandoned or neglected landscaping.

4. Structural conditions of housing — The quality of the main structure is determined by the condition of the roof, cornices, chimneys, foundation, outside walls, doors, paint, windows, stairs, and porches. The surveyor also notes the presence of pit privies.

5. Auxiliary structures — Number and condition of auxiliary structures are observed.

6. Environmental stresses — Environmental stresses such as noise, vibration, glare, odor, air pollution or safety hazards are evaluated.

7. Natural deficiencies — Observation is made of the topography of the block, the presence of swamps or marshes, and the danger of flooding.

8. Public transportation — The availability and frequency of public transportation is determined.

Source: Department of Metropolitan Development. *NEEDS Urban Environmental Survey, Stage I.* Indianapolis — Marion County, Division of Planning, 1972, pp. 115-116.

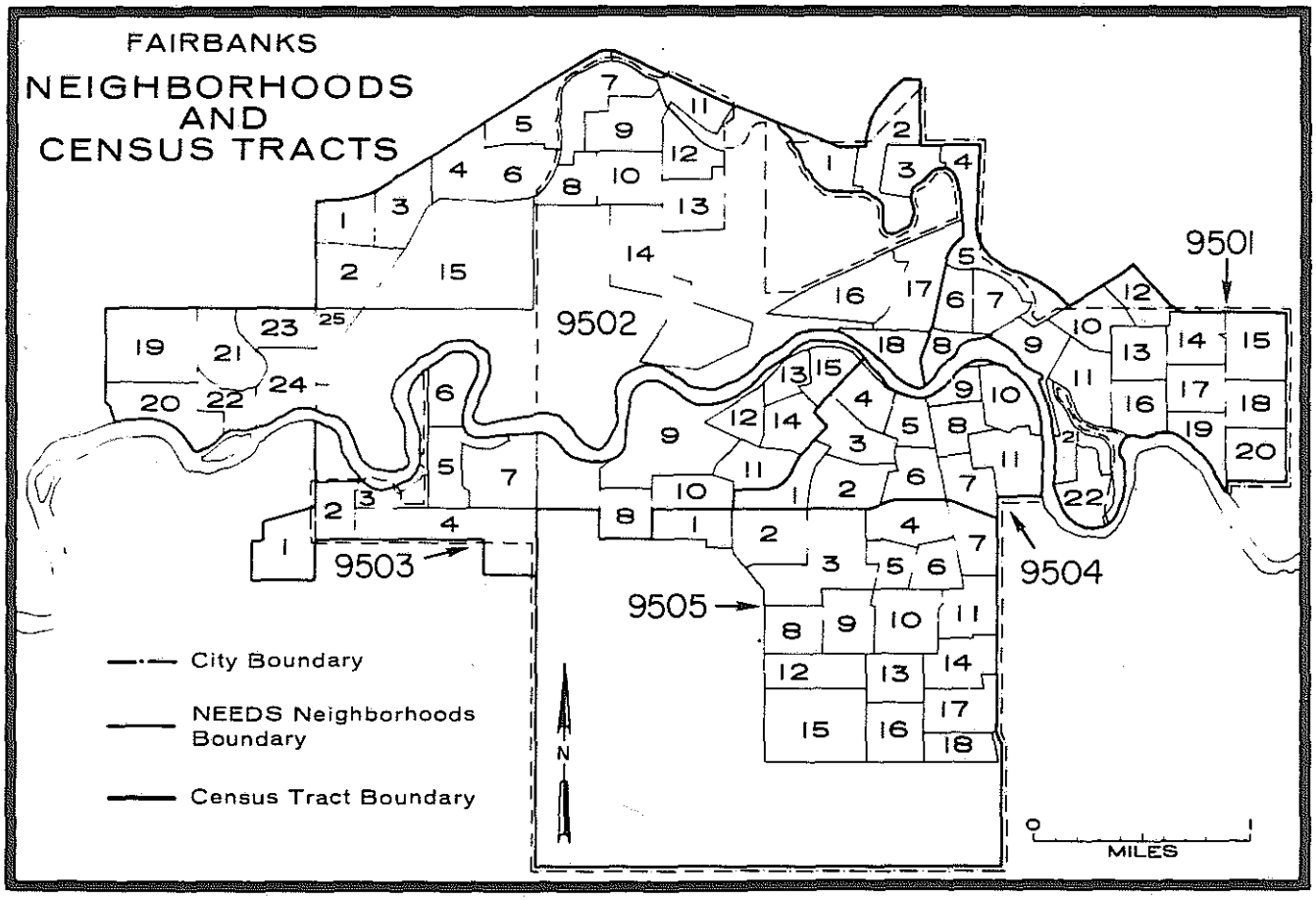

Figure 1-1. Fairbanks Neighborhoods and Census Tracts.

on all four sides by streets. Each block was surveyed for general "block statistics." Within each block, every fourth premise was surveyed. To avoid periodicity in data collection, each of the six surveyors was assigned a sampling number and blocks to survey based on random selections. For example, Surveyor 1 was given the number one as his survey number. Thus, he surveyed the first, fifth, ninth . . . premises in the block assigned. If a block contained six premises, he would survey the third, seventh, etc., premises in the next block assigned to him. All surveyors began at the northwest corner of each block.

To assure reliability of data, certain blocks were selected for resurvey by someone other than the original surveyor. Through this means it was determined that some of the surveyors had difficulty in estimating the size of premises and buildings. Thus, "crowding of structures" and "crowding of population" have not been used in the analysis. All surveying was conducted "from the sidewalk" to minimize bothering local residents.

Since the data represented a sample of a particular block's characteristics, block and premise data were combined for analytical purposes into larger geographic units, called "neighborhoods." The neighborhoods are approximately one-quarter mile in length and width. Further, the neighborhoods also fall within a specific census tract. The data, then, is generalized at two levels, the neighborhood and the census tract. The advantages of this system are that:

1. The resulting data presents a fairly accurate picture of a small areal unit.

2. Both the data and the regions (neighborhood and census tract) are readily adaptable for future use in computer analysis and data storage.

3. Both gradual and abrupt spatial changes in housing quality, premise conditions, etc., are displayed by this method.

4. Future studies of change can easily focus on areas identified as being "poor" in one or more environmental characteristics.

5. If future researchers and planners wish to use other geographic regions, the data can be easily reorganized.

Specific neighborhood data is contained in Appendix III. The writers recognize that, as a 1971 ASHA report notes, the 1970 census tracts were not designed for planning purposes.[2] Nevertheless, there is some census data which is not broken down to the block level and must be utilized at the tract level. This information can be used both in our study and in future studies using similar geographic regions. Finally, census block data, along with our own data, will allow other studies to develop new regions without "losing" much previously collected data.

Maps

Maps utilizing NEEDS data have been designed to show neighborhood variations. The data have been grouped into four categories or quartiles reflecting increasing proportions of a particular environmental characteristic. Quartiles were derived by the "equal steps" method. Accordingly, all values are arranged in categories ranging from lowest to highest, say, 0 to 88 percent. The four categories of increasing intensity would be 0 to 22, 23 to 44, 45 to 66, and 67 to 88 percent.

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[2] Alaska State Housing Authority, *A Plan for the Development of Planning Districts in the Fairbanks North Star Borough.* (Anchorage: ASHA, 1971), pp. 5-6.

CHAPTER 2
ENVIRONMENT AND POPULATION

The Environmental Setting

Lloyd has noted that most of the older settlements in northern North America have developed as a result of a series of unplanned events, such as the recent urban expansion of what once was a small trading center for trappers.[1] Fairbanks was such a community that developed by chance, when Felix Pedro discovered gold in the area in 1902. A trader, Captain Barnette, previously had been convinced by Pedro to locate in the area; thus, when the gold strike occurred, Barnette stayed. The immediate area where Barnette located (along the Chena River) has now become the City of Fairbanks.

Unfortunately, unplanned settlements are often located on poor sites. This becomes most apparent, however, only after the small settlement has grown into a large town or city. At that point it cannot be moved, in contrast to small villages such as Minto and Tanana in interior Alaska and Rae-Edzo and Aklavik-Inuvik in northern Canada. The large communities must attempt to adapt to the environmental constraints as well as possible and pay the consequences where adaptation is not attained. Fairbanks is this type of community.

The urban region of Fairbanks is surrounded on the west, north, and east by hills rising to 1,500 feet above sea level. To the south, the region is bounded by the Tanana River. The urban region, then,

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[1]Trevor Lloyd, "Human Society in the Arctic Today," in Frank R. Fischer, ed., *Man Living in the Arctic* (Washington, D.C.: National Academy of Sciences — National Research Council, 1961), pp. 125-134.

lies in the Tanana Valley floodplain, and is bisected by the Chena River, a tributary of the Tanana River. The city area is quite flat, with relief varying only a few feet. Average elevation is 435 feet above sea level.

Historically, this physiographic situation has presented the Fairbanks settlement with serious problems. The Chena River has overflowed its banks and flooded the city six times since 1902: 1905, 1911, 1930, 1937, 1948, and 1967. The most devastating flood was in 1967. Lasting from 12 August to 20 August, it caused the loss of seven lives and damages of approximately $98 million.[2] According to Childers and Meckel, the river level was 2.7 feet above that of the previous high in 1948.[3] As a result, the waters flooded the entire urban area.

While devastating floods such as those of 1948 and 1967 are fairly rare, they may, nevertheless, recur at anytime. The response to this hazard potential by local, state, and federal officials has been twofold. First, more elaborate and effective warning devices and action plans have been established. The 1967 flood caught officials and residents essentially unprepared. The second response has been slower in developing. Only by 1973 were plans finally approved for a U.S. Corps of Engineers proposal to construct a dam on the Little Chena River, a tributary of the Chena. During storm periods, the dam will temporarily impound excess water flow.[4] Further, extensions are being made to the already existing diversion dike that prevents water from the Tanana River from overflowing into the Chena River upstream from Fairbanks. With these actions, flood hazards should be minimized in the future.

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[2]W. George, "Analysis of the Proposed Little Chena River, Earthfill Nonretention Dam, Fairbanks, Alaska," in T.L. Pewe and J.R. Mackay, ch., *Permafrost: North American Contribution, Second International Conference* (Washington, D.C.: National Academy of Sciences, 1973), pp. 636-648.

[3]Joseph M. Childers and James P. Meckel, *Flood of August 1967 at Fairbanks, Alaska*, Atlas HA-294, (Washington, D.C.: U.S. Geological Survey, 1967).

[4]W. George, "Earthfill Nonretention Dam," p. 637.

Studies by Rieger, *et. al.*[5] and Wolff and Haring[6] indicate that much of the land surrounding the present urbanized area is very poor for building purposes. Steep slopes, permafrost, bogs, and water areas all curtail urban expansion. Permafrost presents a particularly pernicious problem since it occurs sporadically throughout the area and in some places in the form of ice-wedges or ice lenses. Permafrost conditions are most common along the western, northern, and southern edges of the urban area.[7] Much of "central" Fairbanks (i.e., the area immediately north of the Alaska Railroad) remains relatively undeveloped because of permafrost and bog conditions. Within the city and College areas, Salchaket soils predominate. According to Rieger, *et. al.* the Salchaket soil "... are dominantly sandy but commonly contain layers of silty material. They are underlain by thick deposits of coarse sand and gravel."[8] Further, permafrost is absent here or occurs deep in the gravel zone. Thus, permafrost has been a real, but limited, building hazard to date. Expansion of the urbanized area will mean a greater hazard from ice rich permafrost.

Wolff and Haring note that earthquakes represent a natural hazard for the North Star Borough, primarily in areas with an unstable soil and substrate. Fortunately, Fairbanks lies in "... a good earthquake resistant foundation ..." within the Tanana Valley.[9] While earth tremors occasionally occur in the area, no significant earthquake damage has occurred in Fairbanks since its founding.

Because of its interior and northern location, Fairbanks is characterized climatically by low annual precipitation and great seasonal contrasts in sunlight duration and temperature. Average

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[5]S. Rieger, J.A. Dement, and D. Sanders, *Soil Survey of Fairbanks Area, Alaska*, (Washington, D.C.: U.S. Government Printing Office, 1963).

[6]Ernest Wolf and Robert C. Haring, *Natural Resource Base of the Fairbanks — North Star Borough, Alaska* (Fairbanks: Institute of Social, Economic and Government Research, 1967).

[7]Alaska State Housing Authority, *Housing in the Fairbanks North Star Borough* (Anchorage: ASHA, 1971).

[8]S. Rieger, *et. al.*, *Soil Survey of Fairbanks Area*, p. 15.

[9]E. Wolf and R. Haring *Natural Resource Base of Fairbanks Area, Alaska*, pp. 58-59.

annual precipitation is 11.21 inches, with 58 percent of the moisture occurring from June to September. Mean monthly temperatures range from a low of -7.3°F in January to a high of 59.8°F in July. Daily extremes range from -66°F (January, 1934) to 99°F. (July, 1919). During the winter, cold stable air masses develop in interior Alaska. Locally, Fairbanks witnesses frequent periods of temperature inversions due to the cold air settling in the Tanana Valley.

These climatic conditions have profound effects on environmental quality in Fairbanks.[10] The cool temperatures allow permafrost to exist, and therefore also play a role in the freeze-thaw activity that disrupts soils, roads, and even structures. Further, the long, severe winters put added stress on buildings and increase heating bills for residents. Public water systems must be specially designed and, along with sewer systems, properly insulated. Again, extra construction and maintenance costs are involved. Since low temperatures slow chemical actions, decomposition and dilution rates of organic and inorganic wastes are limited. Accumulation of debris, therefore, is a potential problem. Finally, increasing moisture and waste products associated with population expansion and technological growth have combined with frequent winter temperature inversions to produce a serious air pollution problem in the Fairbanks area.

Population

The growth of Fairbanks, since is beginnings in 1902, has been characterized by economic boom and bust periods and associated population growth, stagnation, and even decline. Until the 1940's, Fairbanks depended heavily upon the gold mining industry. In turn, the strength of gold mining greatly affected population levels. Thus, the population rose to 3,541 in 1910 with the gold "fever" but declined to 1,155 by 1920, when the gold "bust" made its impact felt.[11] The Alaska Railroad and more sophisticated mining operations accounted largely for the rise in population to 2,101 in 1930, and 3,455 in 1939.

Since the 1940's, the population of Fairbanks has grown

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[10] Amos Alter, "Arctic Environmental Health Problems," *CRC Critical Reviews in Environmental Control*, 2(1971), pp. 459-515.

[11] Richard Cooley, *Fairbanks, Alaska, A Survey of Progress* (Juneau: Alaska Development Board, 1954).

steadily, albeit with vicissitudes not clearly indicated by the decennial census. This continuing growth is explained by the expanding economic base of the region. Boom and bust conditions are cushioned by the expanded type and number of economic activities in the area.

During the 1940's, the area witnessed the development of two military bases: Ladd Air Force Base, now the Army's Ft. Wainwright, which is adjacent to Fairbanks, and Eielson Air Force Base, which is 26 miles east of the city. In addition, the Alaska Highway, which was built for military purposes during the war, has continued to contribute to Fairbanks' economic growth and stability. Finally, during the 1940's, Fairbanks became a significant regional distribution center for goods and services. Thus its transportation role and economic role were mutually enhanced. Expanded federal and state services in the 1950's and 1960's have further aided in building a stable economy. The development of the oil pipeline from Prudhoe Bay to Valdez, and future mineral exploration and development in central and northern Alaska will add further strength to the local economic base.

From 1939 to 1960, the population of Fairbanks grew rapidly with economic surges: 3,455 in 1939, to 5,771 in 1950, to 13,311 in 1960. Much of this growth was fostered by the presence of military bases in the area. By the mid-1960's, however, the military population began to decline, and it has continued to do so. Today even though Eielson AFB remains fully operational, the Army occupies only half of Ft. Wainwright.

During the 1960-1970 period, Fairbanks showed a definite leveling off in both population and economic activity. Within 1960 boundaries, the population actually declined over the decade by 1,773 people, or 13.3 percent. However, because of the 1970 annexation, city population increased from 13,311 in 1960 to 14,771 in 1970. Regionally, a similar pattern of diminished growth also appears. Using the 1970 Fairbanks Census Division boundary for 1960 and 1970, the figures show limited change: 43,412 to 45,864, respectively. Since 1973, the Fairbanks population has again witnessed a rapid population rise associated with the oil pipeline construction. Most experts believe the population growth rate will slow greatly when construction is completed. However, the

broadened economic base and the continuing search for new minerals will prevent any significant decline in population.

Reflecting the increasing stability of the area's economic base has been the increasing "maturity" of the population age-sex structure. As shown in Figure II-1, the 1939 proportion of males to females in Fairbanks was quite large (59.7 percent). Also, there was a large concentration of males and females in the 20-to-44 age group (49.5 percent). Both of these factors indicate a "frontier" type of population typical of the narrow, mining-oriented economy.

Fairbanks' population characteristics changed markedly after 1939. The predominance of males declined to 57.6 percent in 1950 to 52.4 percent in 1960 and 51.9 percent in 1970. Comparatively, males accounted for 49.4 percent and 49.9 percent of national population, respectively, in 1960 and 1970. Similarly, the age structure reflects more nearly that of the U.S. as a whole, with a decrease in the 20-to-44 age population. Nevertheless, the 1970 Fairbanks 20-to-44 age group still constituted 41.4 percent of the population while nationally, this group accounted for only 32.7 percent of the population. Overall, the increasing number of families in Fairbanks is reflected in the growth of the 19-year-old and under population. While this group was quite small in 1939 (20.5 percent), it accounted for 37.7 percent of the population by 1970. This figure compares closely to a national level of 36.8 percent.

Another indicator of the maturity of the Fairbanks population is the permanence of residence. Generally, the Fairbanks population has been highly mobile because of the nature of the economy. Military and mining personnel and university students and faculty tend to change their residences fairly often. Construction, also prominent in the Fairbanks region, is characterized by seasonal activity, as is seasonal nonpermanent labor.

Census data for 1960 and 1970, nevertheless, indicate a tendency towards a more stable population. Whereas in 1960, 23.5 percent of the population had lived in the same residence for the past five years, the figure had increased to 27.1 percent by 1970. The total city population that had lived in the borough over the past five years increased slightly from 22.8 percent to 23.2 percent.

Spatially, the population of the Fairbanks region is characterized by low densities. Only a few neighborhoods have "large" apartment

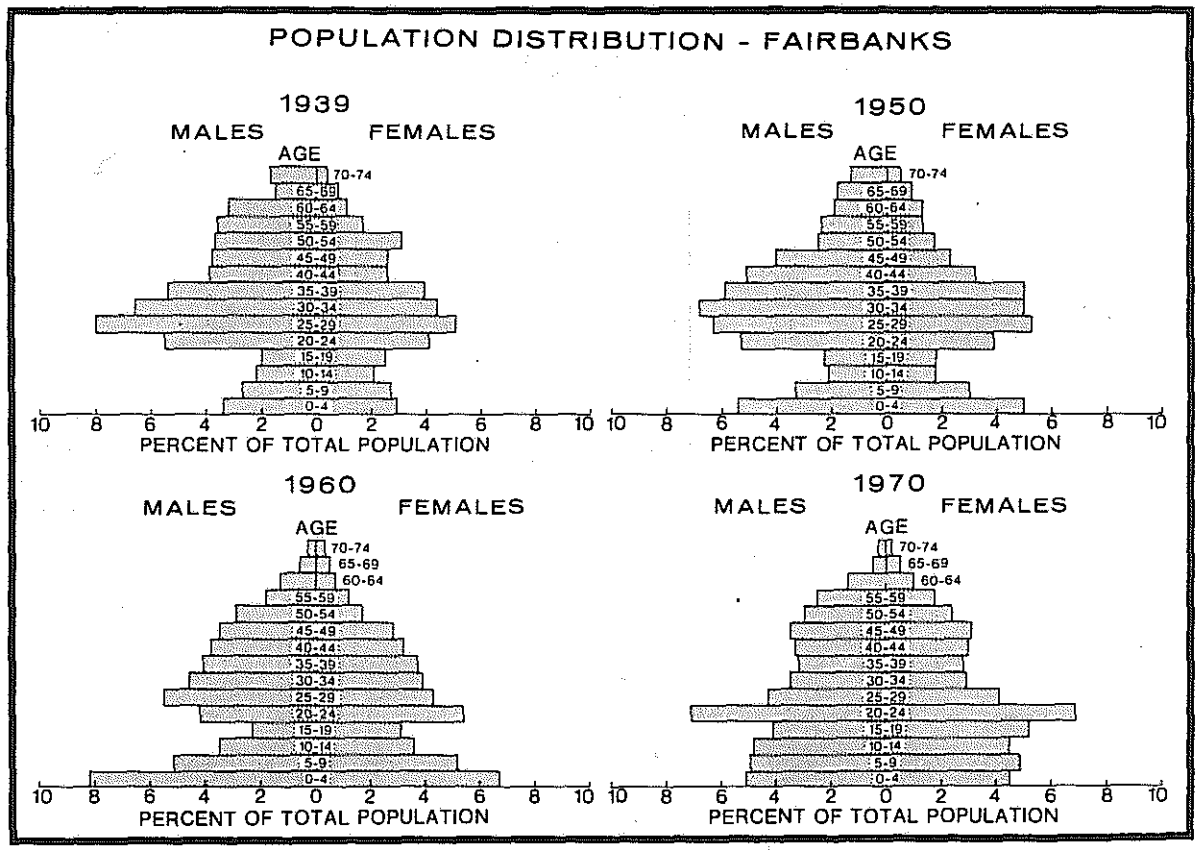

Figure 2-1. Population Distribution in Fairbanks.

complexes or many closely-spaced single residential homes. Typically, the most concentrated populations are found in the older part of town, especially census tract 9504. Here, a number of hotels and large apartment complexes such as Fairview Manor (9504, neighborhood [N]:1) account for the sizable population (Table II-1 and Figure I-1). Slaterville (9501, N:6-8) and Island Homes (9501, N:21-22), represent relatively dense single family residence areas. Also, trailer parks in College (9502, N:3) and Lemeta (9502, N:1), and apartment complexes in Birch Park (9503, N:12), Bjerremark

Table II-1
1970 POPULATION: FAIRBANKS AREA

Census Tract	9501	9502	9503	9504	9505
Population[a]	4,771	3,597	3,776	4,141	3064
Total Population	19,349				

Source: U.S. Bureau of the Census, *Block Statistics, Selected Areas in Alaska,* (Washington, D.C.: U.S. Government Printing Office, 1971) pp. 17-22.

[a]Figures are for the areas actually studied within the census tract.

(9505, N:10), and Arctic Park (9505, N:1-2) form significant population concentrations.

The decline in population within the 1960 city boundary area was widespread by 1970. The slowing down of the economy only partially explains this population change. During the 1960's, a number of residential structures and hotels were removed because of urban renewal, fire, and condemnation. The 1967 flood, in particular, demolished numerous residences. This point will be further examined in the section on housing.

Areas recently annexed by the city have generally witnessed population growth between 1960 and 1970 (Table II-2).[12] Aurora had the most significant gain, increasing by over 900 people. Areas already heavily populated in 1960 did not make significant gains, i.e., Graehl-Hamilton Acres (9501, N:9-20) and Lemeta-Johnston (9501,

[12]R. Evans and P. Raybeck, "Age and Race by Sex Characteristics of Alaska's Village Population," *Alaska Review of Business and Economic Conditions,* Vol. 10, No. 2 (1973), pp. 1-64.

Table II-2
POPULATION CHANGES IN SELECTED AREAS
OF FAIRBANKS, 1960 AND 1970

Area	1960	1970	Differences
Aurora	293	1,205	+912
Graehl-Hamilton Acres	2,162	2,281	+119
Island Homes	659	589	-70
Lemeta-Johnston	1,227	1,231	+4
College	1,755	3,434	+1,679

Source: Evans and Raybeck, "Age and Race by Sex Characteristics of Alaska's Village Population," *Review of Business and Economic Conditions*, 10(2):1-64, 1973.

N:1-5, 9502, N:11). Indeed, Island Homes actually lost population; however, this community was particularly hard hit by the 1967 flood. The growth of College (9502, N:1-6, 15, 19-25) which nearly doubled, was primarily due to the expansion of the University of Alaska and the establishment of the International Airport to the southwest of Fairbanks in 1959. Today, College and Fairbanks blend together with no significant breaks in population.

Minority groups form only a small portion of the entire Fairbanks area population (Table II-3). Excluding Ft. Wainwright, Natives make up the largest minority according to the 1970 census. Athabascan Indians, whose traditional homeland includes interior Alaska, not surprisingly, constitute the largest proportion of Natives (56.4 percent). The sizable number of Natives in College reflects the influence of the university. According to Milan, Natives are highly dispersed within the Fairbanks area, with the greatest concentrations in "downtown" Fairbanks.[13]

Blacks constitute 5.1 percent of the city population, but are not found in significant numbers in the outlying areas (Table II-3), except for Ft. Wainwright. The total number of Blacks at Ft. Wainwright is larger than for the entire remainder of the settlement

[13]Fred A. Milan, Institute of Social, Economic and Government Research, University of Alaska, Fairbanks, Alaska, 99701, Personal Communication, July 1974.

Table II-3
MINORITY POPULATIONS
IN THE FAIRBANKS SETTLEMENT AREA, 1970

Area	Total Population	Minority Group		
		Indian	Aleut-Eskimo	Blacks
Aurora-Johnston	1,464	67	15	4
Graehl	349	43	9	1
Lemeta	1,318	35	29	24
Fairbanks	14,771	536	384	755
South Bjerremark	402	26	26	—
Ft. Wainwright	9,097	59	52	1,107
College	3,434	67	129	26

Source: Evans and Raybeck, 1973.

areas. Outside of Ft. Wainwright, Blacks are concentrated in two sectors, the first being "downtown" Fairbanks, especially in and near Birch Village (9503, N:12), a federal housing project area (Figure II-2). The greatest number, however, are found in South Fairbanks. Here they constitute 19.8 percent of the total 9505 population as defined in this study. Overall, the clustering of minority groups is limited. Natives and Blacks do not dominate any large sector of the settlement area, nor are they concentrated in the same areas, except for Birch Village and a few blocks in South Fairbanks. Conversely, both groups are almost absent from certain housing development areas such as Taku and Westgate (9503, N:5-7), Hamilton Acres (9501, N:13-20), Island Homes (9501, N:21-22), and the community of College west of University Boulevard (9502, N:19-24).

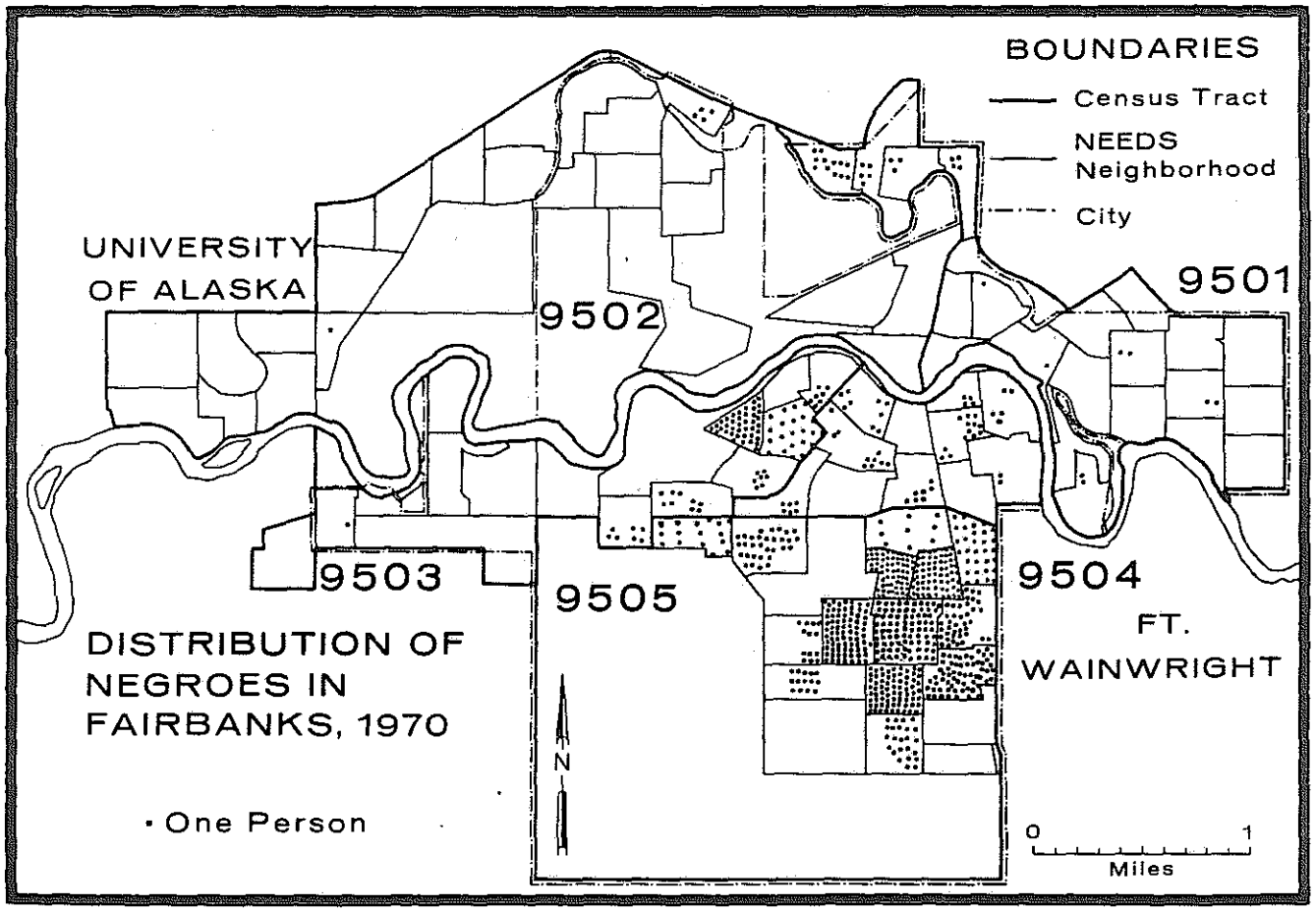

Figure 2-2. Distribution of Negroes in Fairbanks, 1970.

CHAPTER 3
HOUSING

Ever since the World War II population expansion began in Fairbanks, the settlement has had too few dwellings, and too many of those have been of poor quality. According to Cooley:[1] "In November of 1952, the city council passed a resolution encouraging more construction of badly needed housing. The resolution pointed out that the 'continued increase in population has made it evident that present housing is inadequate .' " He also notes that according to the 1950 census, there were 1,874 dwelling units in the City of Fairbanks, but ". . . over 18 percent were considered dilapidated, and a larger number were without running water, bathing facilities or toilets."[2] Similarly, the Beck report notes that: "The residential areas are characterized not only by a shortage of dwelling space, but doubling up occurs in a rampant fashion, with house after house more rightfully categorized as dormitories. In this sense too, a great number of shack towns exist on the periphery of the city where little, if any, standards of health or decency are enforced."

During the 1950's, several measures were attempted to improve housing quality. The most notable of these was the city's use of urban renewal funds to clear out some of the worst structures in the

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[1]Richard Cooley, *Fairbanks, Alaska, A Survey of Progress* (Juneau: Alaska Development Board, 1954), p. 35.

[2]*Ibid.*

[3]R.W. Beck and Associates, *Comprehensive Plan, Fairbanks, Alaska* (Seattle: R.W. Beck and Associates, 1953), p. ii.

old downtown area and establish a public housing apartment complex containing 75 units (1954). Further, the development of new housing in outlying areas such as Mooreland Acres (9503, N:8), Hamilton Acres, Taku-Westgate, and Island Homes helped relieve the pressure on the old downtown area. The establishment of new housing facilities at Ft. Wainwright (then Ladd AFB) and Eielson AFB considerably reduced the number of military personnel seeking housing in the civilian community.

Nevertheless, even by 1959, the Clark-Coleman report noted the continued existence of poor housing conditions:[4]

> ". . . Fairbanks suffers from considerable structural deterioration. Over 62 percent of all structures within the corporate limits are presently substandard. Ninety percent of those structures judged substandard are used for residential purposes. The bulk of deterioration occurs near the central part of the City.
>
> However, many sub-standard structures can be found in the outlying sectors. In most parts of the City, sound new buildings stand side-by-side with cabins, shacks and other substandard structures. Were it not for the efforts of the Building Inspector, conditions would definitely be much worse. Progress can be noted, but a problem of large magnitude still remains.
>
> In addition to the problem of poor structural quality, the variety and availability of housing presents a bleak picture. Fairbanks experiences a relative 'boom and bust' cycle every twelve months, and a reduction in population by as much as 28 percent of the Fairbanks trade area during the winter months. A fluctuation as large as this one makes it difficult for any city to provide 'decent, safe and sanitary' housing in amounts adequate to meet the variety of demands imposed upon it. Fairbanks, unfortunately, is also confronted with the additional problems of high construction costs, a short building season and an unpredictable demand from the dependents of military personnel."

While population growth was slow during the 1960's, the housing problem was not diminished, primarily because of the devastating effects of the 1967 flood, which destroyed or severely

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[4]Clark-Coleman and Associates, *Comprehensive Plan for Fairbanks, Alaska* (Seattle: Clark-Coleman and Associates, 1959), p. 11.

damaged hundreds of dwellings. Thus, with the population expansion beginning in the late 1960's, associated with the oil prospecting in Prudhoe Bay, housing again became, according to ASHA "... a concern of highest priority. Rapid growth of the Borough's population and economy have outgrown the capacity of the existing housing stock to provide a suitable residential environment."[5]

While there has been general agreement that Fairbanks' housing quality has been quite poor, past surveys have used considerably different criteria for evaluating housing conditions.

In 1958-59, the Fairbanks' city engineer's office conducted a detailed survey of city housing. Three groupings were established for housing quality, based on a detailed study of the entire dwelling unit:[6]

> Standard — A standard building must have a concrete foundation on a pressure treated mudsill. It must also have proper construction in wall studs, floor joists, ceiling joists, and roof rafters so as to meet the Uniform Building Code as adopted by this City. A standard house must be in a state of good repair and must not have any reason for endangering human life or safety.
>
> Marginal — A structure which is considered marginal is one which does not meet some of the above qualifications (due to refusal to see or gain admittance to see parts of the structure. Therefore, marginal tended towards standard in almost all cases.
>
> Substandard — A substandard structure is one which does not meet any or all of the above qualifications and which is considered a safety hazard.

The results showed housing conditions to be exceedingly poor (Table III-1). Sixty-three percent of all residential structures were considered substandard. Further, the study noted that 14.1 percent of the structures were vacant, with nearly all of these being considered substandard. Thus, the actual vacancy rate was estimated at 2 percent, whereas 4 to 7 percent was considered

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[5]Alaska State Housing Authority, *Housing in the Fairbanks North Star Borough* (Anchorage: ASHA, 1971), p. 1.

[6]Clark-Coleman, *Comprehensive Plan for Fairbanks*, pp. 10-11.

Table III-1
FAIRBANKS: CONDITION AND TYPE OF STRUCTURES, 1958

Type	Standard		Substandard		Marginal		Total
	Number	Percent	Number	Percent	Number	Percent	
Residential	575	(21.8)	1,655	(62.7)	410	(15.5)	2,540
Commercial-Industrial, Public	84	(26.5)	188	(59.3)	45	(14.2)	217
All Structures	659	(22.3)	1,843	(62.3)	455	(15.4)	2,957

Source: Clark-Coleman and Associates. *Comprehensive Plan for Fairbanks, Alaska,* 1959.

optimal. Geographically, substandard housing was widespread. Approximately 145 of the 204 city blocks fell into the category: 55 percent or more of the structures being substandard. The greatest concentrations of substandard housing occurred in South Fairbanks (9505, N:1-4) and the downtown area (9504).

The 1960 census presented a much different picture, indicating that over two-thirds of this housing was "sound." In contrast to the 1958 survey, the census of housing was based solely on an exterior analysis of residential structures. The categories and criteria were as follows:[7]

> Sound housing is defined as that which has no defects, or any slight defects which are normally corrected during the course of regular maintenance. Examples of slight defects include: lack of paint; slight damage to porch or steps; small cracks in walls, plaster, or chimney; broken gutters or downspouts; slight wear on floors or doorsills.
>
> Deteriorating housing needs more repair than would be provided in the course of regular maintenance. It has one or more defects of an intermediate nature that must be corrected if the unit is to continue to provide safe and adequate shelter. Examples of intermediate defects include: shakey or unsafe porch or steps; holes, open cracks, or missing materials over a

[7]Bureau of the Census, *Block Statistics, Selected Areas in Alaska, 1960 Census of Housing* (Washington, D.C.: U.S. Government Printing Office, 1961), p. x.

small area of the floors, walls, or roof; rotted widow sills or frames; deep wear on stairs, floors, or doorsills; broken or loose stair treads or missing balusters. Such defects are signs of neglect which lead to serious structural deterioration or damage if not corrected.

Dilapidated housing does not provide safe and adequate shelter. It has one or more critical defects; or has a combination of intermediate defects in sufficient number to require extensive repair or rebuilding; or is of inadequate original construction. Critical defects result from continued neglect or indicate serious damage to the structure. Examples of critical defects include: holes, open cracks or missing materials over a large area of the floors, walls, roof, or other parts of the structure; sagging floors, walls, or roof; damage by storm or fire. Inadequate original construction includes structures built of makeshift materials and inadequately converted cellars, sheds, or garages not originally intended as living quarters.

Overall, the census housing survey revealed an almost equal percentage of "deteriorated" and "dilapidated" housing units (Table III-2). The poor housing was widespread, occurring with high percentage in Slaterville, the old downtown area, and in South Fairbanks. The newer sections of town such as Westgate, Taku, etc., had less than 25 percent of their structures in the deteriorating and dilapidated categories.

The high proportion of housing units lacking some or all plumbing facilities underlined again the poor housing conditions and the slow expansion of community water and sewer services. Crowded living conditions and the existence of numerous small cabins are partially revealed by the large percentage of housing units with 1.01 or more persons per room (Table III-2).

The 1966 housing survey by Cornell, *et. al*, portrayed housing conditions as having improved little from the time of the 1958 survey. Unfortunately, the study is not clear on what specific evaluative criteria were used in the survey:[8]

Condition for structures was determined by visual survey and

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[8]Cornell, Howland, Hayes, and Merryfield, *Land Use Report, Fairbanks North Star Borough* (Seattle: 1968), p. 6

Table III-2
FAIRBANKS HOUSING QUALITY
ACCORDING TO THE 1960 CENSUS

Subject	Number	Percent
All Housing Units	4,832	100.0
CONDITION AND PLUMBING		
Sound	3,320	68.7
With all plumbing facilities	3,052	63.2
Lacking some or all facilities	268	5.5
Deteriorating	828	17.1
With all plumbing facilities	617	12.8
Lacking some or all facilities	211	4.4
Dilapidated	684	14.2
OCCUPIED HOUSING UNITS		
Persons Per Room		
1.00 or less	3,161	71.9
1.01 or more	1,233	28.1

Source: Bureau of the Census, *Block Statistics, Selected Areas in Alaska, 1960 Census of Housing,* 1961.

records available. The following four categories were used to determine condition:

- Good (Good original construction with no visible defects).
- Fair (Good original construction with any defects limited to those that would normally be corrected during the course of regular maintenance).
- Deteriorating (Needs more repair than would be required in the course of regular maintenance).
- Dilapidated (Does not provide safe and adequate shelter, is clearly substandard with respect to size or general conditions).

Therefore, it is difficult to make comparisons with the 1958 city engineer's survey. Cornell, *et. al.* however, do indicate that if the 1959 city boundaries are used for their study, 66.4 percent of the residential structures, i.e., combined single and multiple structures, would be classified as poor (48.9 percent), or dilapidated (17.5 percent) (Table III-3). If their criteria were very similar to the 1958 city engineer's survey, clearly there had been little improvement in housing conditions. For the entire city in 1966, the data showed "poor" structures constituting 44.8 percent and dilapidated 17.6 percent of the residential structures (Table III-4).

The 1970 Census of Housing did not include detailed analyses of housing quality, as it deleted the survey on the number of "sound," "deteriorating," and "dilapidated" housing.[9] Thus, comparisons with 1960 were limited (Table III-5).

Nevertheless, over the 10-year period, a definite reduction occurred in the number of total housing units (10.3 percent) and number of occupied housing units (10 percent) within the area defined by the 1960 census. This significant reduction was caused, in large part, by the 1967 flood, and subsequent condemnations and urban renewal efforts. Fire, a particular hazard during the winter months, also contributed to the reduction of the number of structures. Between 1966 and 1972, 206 structures were condemned in Fairbanks, using 1960 boundaries (Figure III-1).

At the same time, there were some qualitative improvements in housing conditions by the 1970's. The number of total housing units lacking some or all plumbing facilities dropped markedly from 24.1 percent in 1960 to only 5.9 percent for the same area in 1970. This improvement reflects both the elimination of many poor and dilapidated structures and the expansion of the city water and sewer facilities. The number of overcrowded housing units (1.01 persons per room or greater) declined from 28.1 percent of all occupied housing units in 1960 to 17 percent for the same area in 1970. This change is explained largely by (1) the decline of one-room cabins, (2) the expansion in housing in outlying areas, and (3) the decline in population by almost 1,800 people. Nevertheless, Fairbanks' resulting 17 percent is still twice the national figure of 7 percent for

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[9]Bureau of the Census, *Block Statistics, Selected Areas in Alaska, 1970 Census of Housing* (Washington, D.C.: U.S. Government Printing Office, 1971).

Table III-3
FAIRBANKS: TYPE AND CONDITION OF STRUCTURES IN 1966, USING 1959-1960 CITY BOUNDARIES

Type of Structure	Condition								Total
	Good		Fair		Poor		Dilapidated		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Single Dwellings	442	13.3	455	13.7	1,726	52.0	697	21.0	3,320
Multiple Dwellings	140	19.6	321	44.9	246	34.5	7	1.0	714
Other Structures	69	13.3	133	25.6	268	51.5	50	9.6	520
Total	651	14.3	909	20.0	2,240	49.2	754	16.6	4,554

Source: Cornell *et.al., Land Use Report,* Fairbanks North Star Borough, 1966.

Table III-4
FAIRBANKS: TYPE AND CONDITION OF STRUCTURES IN 1966

Type of Structure	Condition								Total
	Good		Fair		Poor		Dilapidated		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Single Dwellings	799	14.7	963	17.7	2,561	47.1	1,115	20.5	5,438
Multiple Dwellings	234	25.1	394	42.4	296	31.7	9	1.0	933
Other Structures	122	14.0	219	25.2	439	50.5	90	10.3	870
Total	1,155	16.0	1,575	21.8	3,296	45.5	1,214	16.8	724

Table III-5
FAIRBANKS: TYPE AND CONDITION OF DWELLING UNITS ACCORDING TO THE 1970 CENSUS

Type of Dwelling Unit	Total Number	Lacking Some or All Plumbing Facilities		1.01 or More Persons Per Room	
		Number	Percent	Number	Percent
City of Fairbanks, 1970					
Year-round	5,231	272	5.2	—	—
Occupied	4,874	218	4.5	794	16.3
NEEDS Study Area					
Year-round	6,566	384	5.8	—	—
Occupied	6,189	253	4.9	1,001	16.2
1960 City Boundary					
Year-round	4,355	258	5.9	—	—
Occupied	3,940	174	4.4	688	17.0

Source: Bureau of the Census, *Block Statistics, Selected Areas in Alaska, 1970 Census of Housing*, 1971.

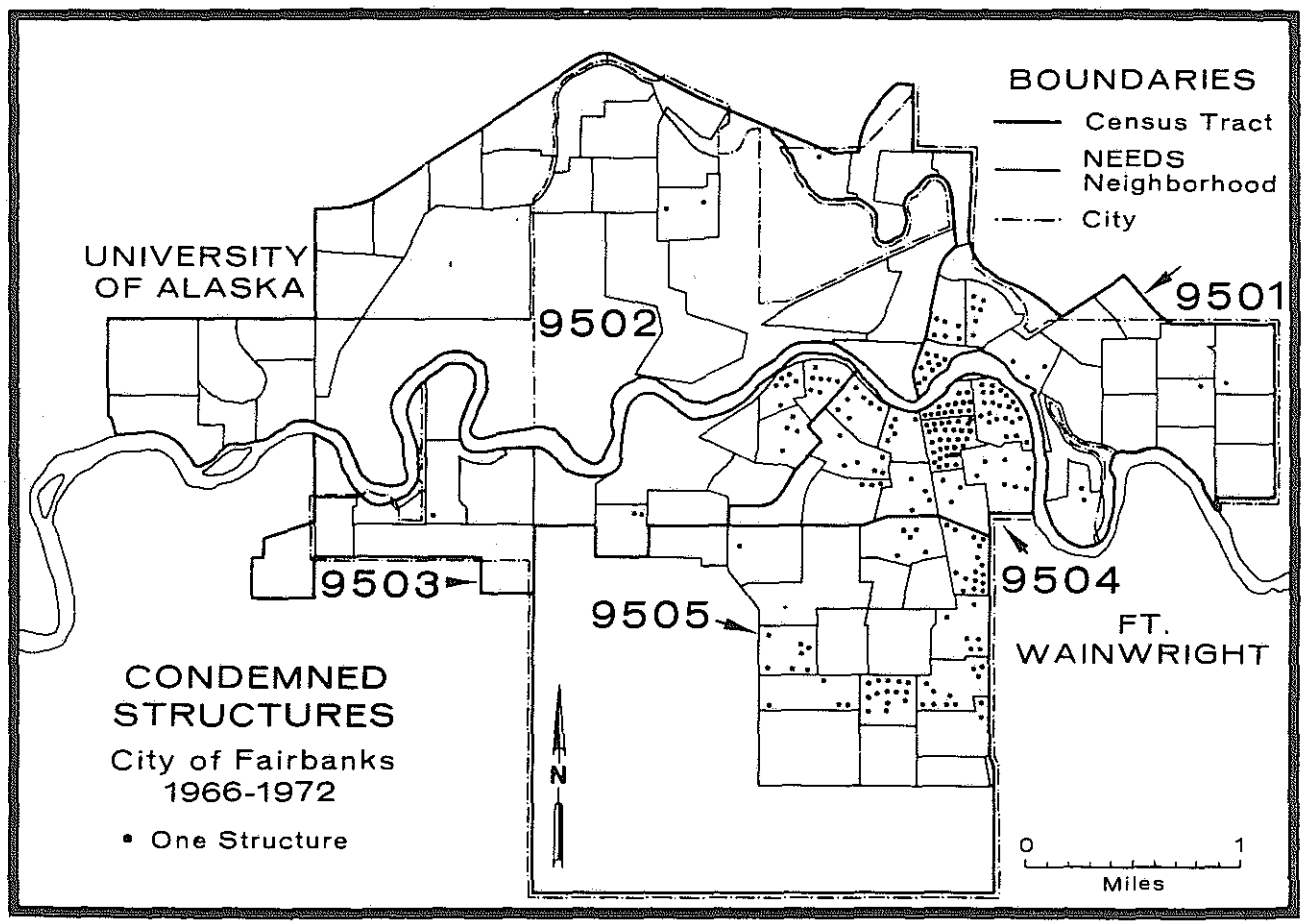

Figure 3-1. Condemned Structures.

occupied housing units with 1.01 or more persons per room. Clearly, there is still too much crowded housing in the Fairbanks area.

The 1972 NEEDS sample survey, like the 1960 census, used external criteria for judging housing quality. According to NEEDS, the major groupings and criteria were:[10]

Minor Deficiencies are present when:

1. A significant portion of the exterior surface has cracked or peeling paint.
2. The outside walls have loose or missing material. They show broken surfaces; or protective surface material has shifted from its normal position; or wall material such as aluminum siding has become unattached and is hanging or portions of the outside wall are missing.
3. There are breaks and cracks in window panes; window frames are loose or rotting; frame or sash shows rotting, missing caulking or other loose material. (The door frame is similarly rated.)
4. Missing or torn screens are found. All windows opening to the outside are considered. This does not apply when the building is air-conditioned.
5. Outside porches and stairs have rotted or broken materials or open cracks.

Moderate Deficiencies are present when:

1. The roof has loose or missing material.
2. The visible roof surface shows a broken surface or a completed hole through the surface thickness; or roofing material has shifted from its normal position; or a worn surface without holes or missing material; or loose surface material due to warping, bulging, or swelling.
3. Chimneys and cornices have cracks, rotted or missing material.
4. Outside walls have rotted or open cracks. The walls shows signs of rotting in the surface; or the wall thickness has worn thinner; or open cracks larger than a pencil width appear in the wall surface.
5. The foundation has loose or missing materials or open cracks. The foundation has broken materials; or

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[10] See in particular, Department of Metropolitan Development, *NEEDS Urban Environmental Survey, Stage I* (Indianapolis: Division of Planning and Zoning, Indianapolis-Marion County, 1972), pp. 115-116.

protective surface material has shifted from its normal position; or holes in the foundation exist due to missing bricks or blocks; or cracks larger than a pencil width appear.

Major Deficiencies are present when:
1. Obvious sagging of the main roof occurs.
2. Outside walls are out of plumb.
3. Chimneys are out of plumb.
4. Stairs or porches are peeling or warping.
5. Foundations are sagging or leaning.
6. The structure is condemned.

Since a structure may have no deficiencies or any combination of minor, moderate, or major deficiencies, the columns of minor-to-major deficiencies in Tables III-6 and III-7 do not add up to the category called "any deficiency."

The NEEDS survey indicated that for the entire study area (Table III-6) 37.4 percent of all main structures had no deficiencies. Very similar results were reflected in the residential housing analysis (Table III-7) here called "occupied structures" where 40.2 percent of the structures had no deficiencies. Undoubtedly, the impact of the long, severe winters has affected many superficial features of the structures, as indicated by 39.8 percent of all main structures and 40.4 percent of all residential structures having some deficiencies.

Spatially, there is no essential difference between deficiency distributions in main structure and occupied structures (Table III-6, III-7). Census tracts 9504 and 9505 clearly have the most severe housing quality problems with 34.4 percent and 55.3 percent of their occupied structures, respectively, in the combined moderate and major deficiency categories (Table III-7 and Figure III-2). Within the downtown area there still exist many old small cabins with major deficiencies (9504). Many of these structures were devastated by the flood and made uninhabitable. These have been condemned (Figure III-1) but not all have been removed, especially in Neighborhood 10. In 1972, Fairbanks residents voted down a referendum which would make this neighborhood and portions of Neighborhoods 8 and 11 urban renewal areas. The planned extension of the Steese Highway through the area will eliminate all of these structures and many others in Neighborhoods 9 and 11. Also within the downtown area, between 1971 and 1974, four hotels have been condemned and one has burned down. Thus, the housing availability within this part of

Table III-6
FAIRBANKS AREA – MAIN STRUCTURE QUALITY, NEEDS, 1972

Region	Total Number of Structures	Minor Deficiencies		Moderate Deficiencies		Major Deficiencies		Any Deficiences	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
9501	404	108	26.7	65	16.0	20	4.9	122	30.1
9502	301	78	25.9	75	24.9	23	7.6	120	39.8
9503	225	56	24.9	40	17.7	15	6.6	76	33.8
9504	237	84	35.4	55	23.2	20	8.4	95	40.0
9505	219	113	51.5	77	35.2	36	16.4	135	61.6
Total	1,386	439	31.7	312	22.5	114	8.2	548	39.5

Table III-7
FAIRBANKS AREA HOUSING QUALITY, NEEDS, 1972

Region	Total Number of Structures	Minor Deficiencies		Moderate Deficiencies		Major Deficiencies		Any Deficiencies	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
9501	373	92	24.6	52	13.9	10	2.6	112	30.0
9502	267	68	25.5	64	23.9	18	6.7	109	40.8
9503	210	53	25.2	36	17.1	13	6.2	72	34.3
9504	174	62	35.6	43	24.7	17	9.7	78	44.8
9505	194	95	49.2	75	38.8	32	16.5	121	62.6
Total	1,217	370	30.4	270	22.1	90	7.3	492	40.4

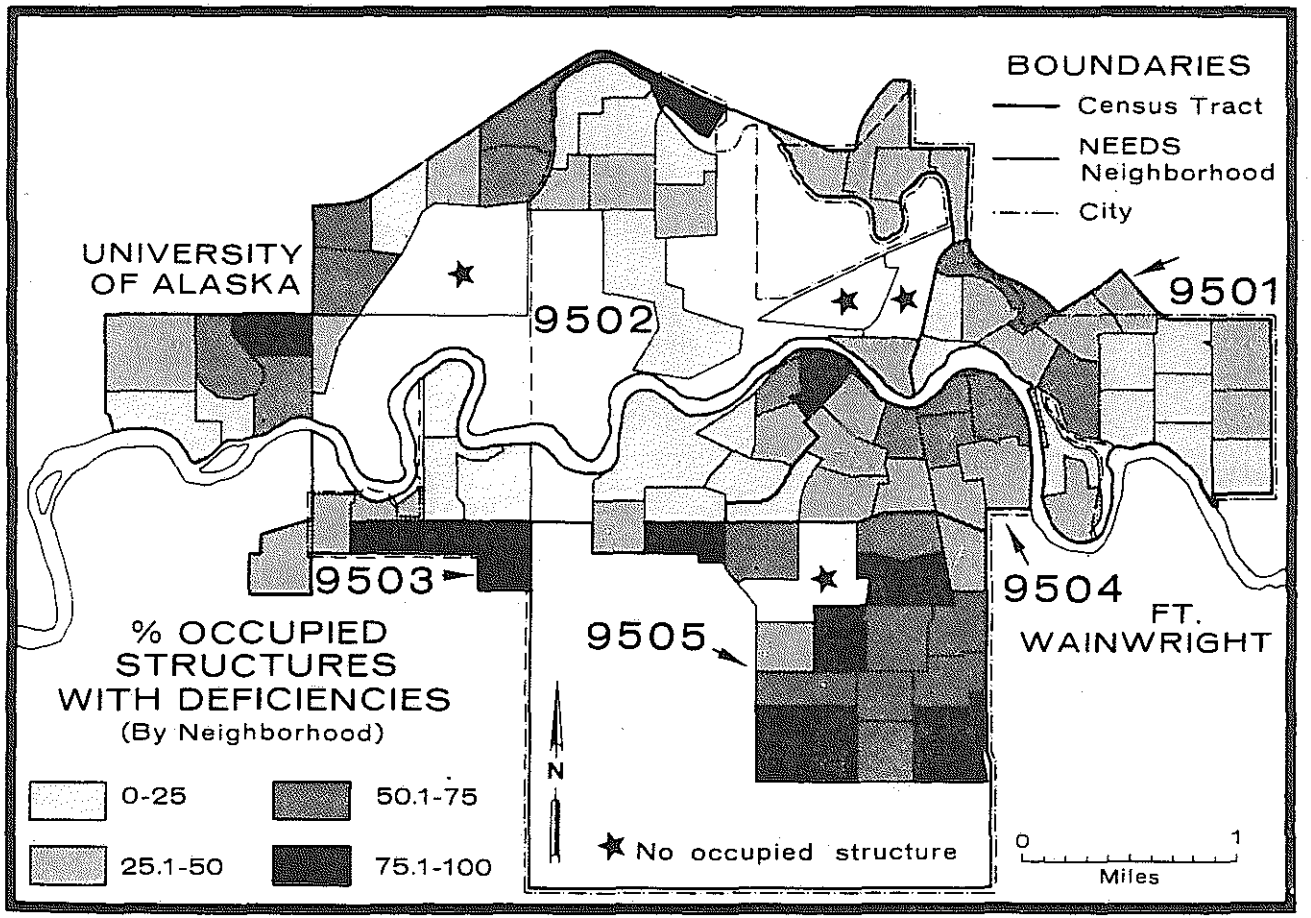

Figure 3-2. Percent of Occupied Structures with Deficiencies.

Fairbanks has markedly declined, since only one hotel has been built in Region 9504 since 1971.

Region 9505 or South Fairbanks, clearly has the most severe housing quality problems with 38.8 percent of the housing structures there having some moderate deficiencies and 16.5 percent having major deficiencies. Indeed, half of the structures in all but two of the region's neighborhoods had some deficiency (Figure III-2). Additionally, data from the 1970 census indicates that this region has a significantly high proportion (18.9 percent) of occupied structures with 1.01 or more persons per room. During 1974, a number of new apartment buildings were built in Neighborhoods 8 and 9. However, given the population rise in Fairbanks, it is doubtful that the housing pressure in this area has been relieved. Certainly, little action has been taken to improve the quality of existing housing in the area. In contrast to Regions 9504 and 9505, many new housing developments have appeared in Regions 9501, 9502, and 9503, since the mid-1950's. Thus, areas such as Hamilton Acres, Aurora, and Taku-Westgate show few occupied structures with deficiencies (Figure III-2).

Comparisons

While 22 other cities in the nation have had NEEDS surveys, only a small number have reported their findings. To compare results in Fairbanks with other NEEDS cities, we have used Eagle Pass, Arizona (population 19,000) and Douglas, Arizona (population 12,300).[11] Both of these cities are close in size to Fairbanks; both face unusual environmental problems (especially drought); and both, like Fairbanks, have significant minority populations (i.e., Mexican-Americans in the southwest). The survey format was the same in all three cities, with one exception. A sample survey method was used in Fairbanks, whereas in Douglas and Eagle Pass every premise was surveyed.

Of the three settlements, Fairbanks has the most severe housing problem (Table III-8). Both Eagle Pass and Douglas have more structures with combined minor deficiencies and no deficiences, 85 and 76 percent, respectively, compared to 71 percent in Fairbanks. Obversely, Fairbanks has the largest proportion of structures with

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[11] U.S. Public Health Service, *Douglas, A NEEDS Survey*, (No publisher listed, 1970).

moderate and major deficiencies, 29 percent. The more extreme environment in Fairbanks may help explain its poor relative position in this housing survey.

Comparisons of the Fairbanks NEEDS survey with the 1960 city census data are difficult, since (1) NEEDS was a sample survey, (2) the criteria used were not exactly the same or in the same format, and (3) in NEEDS, apartment buildings were considered as one unit, whereas in the census, each apartment was considered as one unit.

Recognizing these stringent limitations, some guarded comparisons were made regarding changes in housing quality over the

Table III-8
RESIDENTIAL STRUCTURES: QUALITY
IN PERCENT OF STRUCTURES

Area	None	Minor	Moderate	Major
Fairbanks[a]	41	30	22	7
Eagle Pass	62	23	13	2
Douglas	41	35	15	9

[a]NEEDS Area

1960-to-1972 period: (1) Both surveys showed that most residential structures were in good condition. (2) By 1972, many of the small one-room cabins and unsafe hotels had been condemned and removed. Despite this, a number of older structures still remained, and many of these and other buildings in the old town area were further battered by the 1967 flood. Thus, by 1972 there remained a high proportion of residential structures with moderate and major deficiencies. (3) The expansion and increased use of city water and sewer facilities represented the only significant area of housing quality improvement, as noted earlier. Thus, housing quality has been and remains a severe problem for Fairbanks.

The reasons for continued poor housing conditions in Fairbanks have been spelled out in detail by Cornell *et. al.* in 1967 and by the

authors in another article.[12] Briefly there are six overriding causal factors:

1. **Many old structures and poor original construction.** As a 1961 report notes for the downtown area: "Many structures date from the 1910's and 1920's, are of log construction and have crib basements and no foundations." The 1972 City Center Plan also emphasized the old age and poor conditions of structures in much of Census Tract 9504.[13]

2. **Severe environment.** The long, cold winters; permafrost; and freeze-thaw action place excessive pressures on residential structures. In addition, periodic floods have damaged and destroyed many homes. According to a 1971 ASHA report, the 1967 flood caused severe damage to approximately 600 residential structures.[14] Further, the Small Business Administration made over 3,000 disaster home loans following the flood.

3. **Poor maintenance of structures.** A rather large percentage of structures had minor and moderate deficiencies, indicating a lack of proper maintenance by owners. The short outdoor working season and high cost of materials may be partly responsible for this situation.

4. **High costs.** Inflated labor, material, and transport costs in the area have combined to force the price of housing beyond the reach of many residents. In 1970, rental units averaged $199 per month while the median value of homes was $30,000. New homes in 1972 were selling for over $42,000. Since that time both apartment rents and housing costs have jumped considerably. Compounding these problems is the high cost of capital. Mortgage rates on many home loans today average over 9 percent.

5. **Building codes.** The Uniform Building Code was adopted in 1958 by the city to ensure safe living conditions. Unfortunately, an attempt to survey existing city structures in the late 1960's and early

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[12] Roger W. Pearson and Daniel W. Smith, "Fairbanks: A Study of Environmental Quality," *Arctic*, Vol. 28, No. 2, June, 1975.

[13] John Graham and Company, *City Center Plan, Fairbanks, Alaska* (Fairbanks: John Graham and Co., 1972).

[14] ASHA, *Housing in Fairbanks North Star Borough*, p. 23.

1970's failed, because only one person was assigned to the inspector position, and funds for his position were cut off in 1972. The North Star Borough has failed to adopt the Uniform Building Code. However, it does have some regulations pertaining to flood proofing, fire prevention, and waste disposal. Since no condemnation regulations exist in the borough, abandoned and dilapidated structures are allowed to stand (Figure III-1). Significantly, the structures surveyed within the city had a lower proportion of deficiencies than the structures in the borough area (Table III-9). The lack of adequate codes for the borough area is particularly distressing since it is now the largest area of new home construction.

6. Lack of Public Housing. For many people unable to afford either new homes or new apartments, poor and crowded housing is the only answer. The only public housing development in the area was built in 1954. While proposals have been made for both public (Turnkey Project) and private low-cost housing, the need, unfortunately, is now, as well as in the future. South Fairbanks, downtown, and College are three sites in desperate need of new low-cost housing.

Table III-9
CITY-BOROUGH STRUCTURE CONDITIONS ACCORDING TO NEEDS, 1972

Category Deficiency	City		City	
	Number	Percent	Number	Percent
Main Structures	1,119	–	189	–
Minor	378	31.5	61	32.0
Moderate	264	22.0	48	25.1
Major	97	8.1	17	8.6
Any	459	41.0	89	47.6
Occupied Structures	1,042	–	175	–
Minor	310	29.8	60	34.2
Moderate	225	21.4	45	25.7
Major	76	7.2	14	8.0
Any	408	39.2	84	48.0

CHAPTER 4
PREMISE CONDITIONS

Previous urban and environmental studies of Fairbanks have all neglected the issue of premise quality, except for the main structure. A premise is defined by NEEDS as consisting of "...a main structure and its immediate surrounding area, or a parcel of undeveloped land (vacant lot)."[1] The focus in this chapter will be on premise features other than the main structure. Premise conditions are important from at least three viewpoints. First, health can be and is affected by premise conditions. Putresible material and discarded objects, from old tires to abandoned autos, provide support for insects and rodent pests that can transmit numerous diseases to man. Children playing in heavily littered areas may incur accidental cuts, broken bones, or even eye injuries. Unfortunately, little data has been collected nationally to indicate the seriousness of this issue. Second, the "look" of a block, neighborhood, or community is important since it reflects the attitudes of the residents.[2] Unsightly neighborhoods often become run down over time, thus adding to environmental quality problems. Third, poor premise conditions in a neighborhood or community are esthetically unappealing and therefore may serve to discourage tourism and thus negatively affect the economy of the area. Few people, after all, care to visit an unsightly town. However, many visitors to Fairbanks have unhappily discovered that they have traveled hundreds of miles to Alaska to do so.

Assessing premises is made difficult by changing seasonal conditions and the intensity of enforcement of local laws. The

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[1]Bureau of Community Environmental Management, *"NEEDS": Neighborhood Environmental Evaluation and Decision System, Stage I Environmental Instruction Manual*, (Cincinnati: U.S. Department of Health, Education and Welfare, N.D.), p. 10.

[2]Jack Hayes, ed., "Landscape For Living," *The Yearbook of Agriculture, 1972* (Washington, D.C.: U.S. Government Printing Office, 1972).

seasonal cycle of premise condition quality is as follows: during the summer and fall, there is a continuous build-up of waste material because of numerous, often hurried, outdoor projects by community residents. In winter, the accumulation of waste material increases at a slower rate since most projects are conducted indoors. Also, wastes are hidden by snow. By spring and early summer the snow has gone, revealing 10 to 11 months of waste accumulation. Accordingly, "spring cleanup" programs occur generally in May, so that by early June, most central Alaskan communities are at their best. Our premise survey occurred in late July and August, or during the early litter build-up period.

Fairbanks now has fairly strict laws covering litter violation on both public and private property. The city police department has assigned an officer to be in charge of litter control. Thus there are increasing efforts to clean up and keep clean the Fairbanks environment.

Indicators

Five factors have been selected for assessing premise conditions in Fairbanks: auxiliary structures, abandoned vehicles, uncollectable discards, rubbish, and neglected landscapes.

1. Auxiliary Structures. According to the NEEDS survey: "An auxiliary structure is a detached, uninhabited structure located on a premise." Commonly, auxiliary structures are not maintained as well as residential structures. Yet, if they are in exceptionally poor condition they can be both safety hazards and dwelling areas for rodents. According to NEEDS, a poor auxiliary structure cannot be rehabilitated, and therefore, requires removal. Overall, 26 percent of the auxiliary structures in Fairbanks were rated as being in poor condition (Table IV-1). Proportionally, region 9505 rated worst with nearly half (45.7 percent) of its auxiliary structures rated as poor (Figure IV-1). Also, the borough contained a higher percentage of poor structures than was true of the city (Table IV-2). Nevertheless, Fairbanks' rating, while not praiseworthy, was better than either than either Douglas or Eagle Pass (Table IV-3).

2. Abandoned Vehicles. The combination of severe winters and bad roads add extra wear and tear to Alaskan vehicles. As a result, many vehicles are either abandoned or kept for parts. By the early

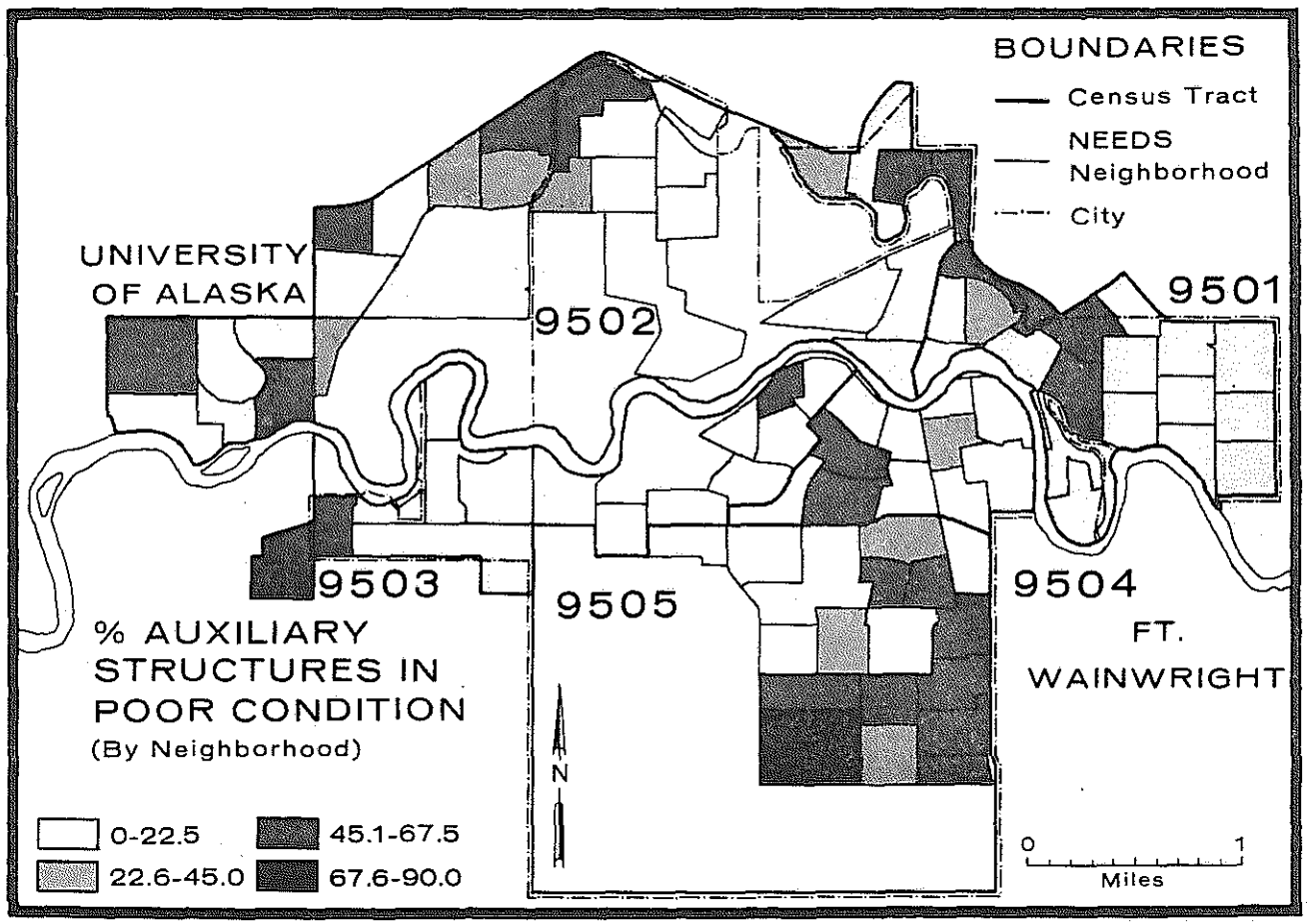

Figure 4-1. Percent of Auxiliary Structures in Poor Condition.

Table IV-1
AUXILIARY STRUCTURES IN
THE FAIRBANKS NEEDS AREA

Region	Total Number of Auxiliary Structures Surveyed	Poor Auxiliary Structures	
		Number	Percent
9501	103	24	23.3
9502	94	24	25.5
9503	83	10	12.0
9504	40	7	17.5
9505	92	42	45.7
Total	412	107	26.0

Table IV-2
PREMISE CONDITIONS IN THE FAIRBANKS NEEDS AREA

Category	City		Borough	
	Number	Percent of All Premises	Number	Percent of All Premises
Poor Auxiliary Structures[a]	84	24.3[a]	23	34.8[a]
Abandoned Vehicles	117	9.2	35	16.6
Rubbish	225	17.6	69	32.7
Uncollectable Discards	220	17.2	64	30.3
Neglected Landscape	225	17.6	66	31.3

[a]Percent of all Auxiliary Structures.

Table IV-3
PREMISE CONDITIONS IN FAIRBANKS, ALASKA; DOUGLAS, ARIZONA; AND EAGLE, ARIZONA, BY PERCENT OF PREMISES

Study Area	Poor Auxiliary Structures	Abandoned Vehicles	Neglected Landscape	Uncollectable Discards	Rubbish[c]
Fairbanks[a]	26.0	10.2	19.5	18.9	38.6
Douglas	32.0	5.5	N.A.[b]	N.A.	32.0
Eagle Pass	46.0	8.1	24.0	N.A.	26.0

[a]NEEDS study area.

[b]Data not available.

[c]Data by percent of blocks with at least one premise with significant rubbish accumulation.

Table IV-4
FAIRBANKS AREA PREMISE CONDITIONS BY REGION, NEEDS, 1972

Region	Total Number of Premises	Rubbish		Neglected Landscape		Uncollectable Discards		Abandoned Vehicles	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
9501	420	59	14.0	62	14.7	69	16.4	32	7.6
9502	331	87	26.2	74	22.3	74	22.3	48	14.5
9503	243	42	17.3	41	16.5	31	12.0	14	5.6
9504	248	30	12.0	43	17.3	32	12.9	16	6.4
9505	246	76	30.9	71	28.9	78	31.7	42	17.1
Total	1,488	294	19.8	291	19.5	284	18.9	152	10.2

Source: Roger W. Pearson and Daniel W. Smith. "Fairbanks: A Study of Environmental Quality." *Arctic*, Vol. 28, No. 2, June, 1975.

1970's, the City of Fairbanks considered the situation serious enough to take dramatic action, since the abandoned vehicles were proving a visual blight and a potential safety hazard. Since 1971, the city has conducted a summer program for removing junk vehicles. During the first two summers alone (1971-1972) over 250 vehicles were removed from public and private premises.[3]

The 1972 data reflects an early stage of an aggressive and ongoing city program for cleaning up abandoned vehicles, which has now (1974) been taken over by the borough. The NEEDS survey revealed 152 premises with at least one abandoned vehicle, or 10.2 percent of all premises (Table IV-4). Geographically, the greatest problem areas were south Fairbanks and College (Figure IV-2). Proportionally, there were more abandoned vehicles in the borough than in the city. However, at the time there was no borough program pertaining to abandoned vehicles. In comparison with Douglas and Eagle Pass, Fairbanks in 1972 had the highest proportion of abandoned vehicles (Table IV-3). Hopefully, the efforts begun by the City of Fairbanks and now the borough will continue, so that the abandoned vehicle problem can be minimized if not eliminated.

3. **Neglected Landscapes, Uncollectable Discards and Rubbish.** These three indicators of premise conditions have been grouped together because of their general similarity. According to NEEDS they are defined as follows:[4]

> **Neglected Landscaping** — refers to the general condition of the yard or premise. A neglected landscape is one in which little or no effort has been put into the yard.
>
> **Uncollectable Discards** — refers to larger nondisposable items such as appliances and furniture left abandoned on the premises. Examples are refrigerators, trunks, ovens, ranges, etc. Such items placed on a porch that are obviously not in use are considered uncollectable discards.
>
> **Rubbish** — refers to nondecomposible solid wastes (excluding ashes) consisting of either:
> A. Combustible wastes such as paper, cardboard, plastic containers, yard clippings and wood.
> B. Noncombustible wastes such as tin cans, metal, glass and crockery.

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[3]Douglas Gray, "Good-bye Winter, Hello Spring. Litter," *Fairbanks Daily News-Miner*, 5 May 1973, p. A-23.

[4]Bureau of Community Environmental Management, *NEEDS*, pp. 39-41.

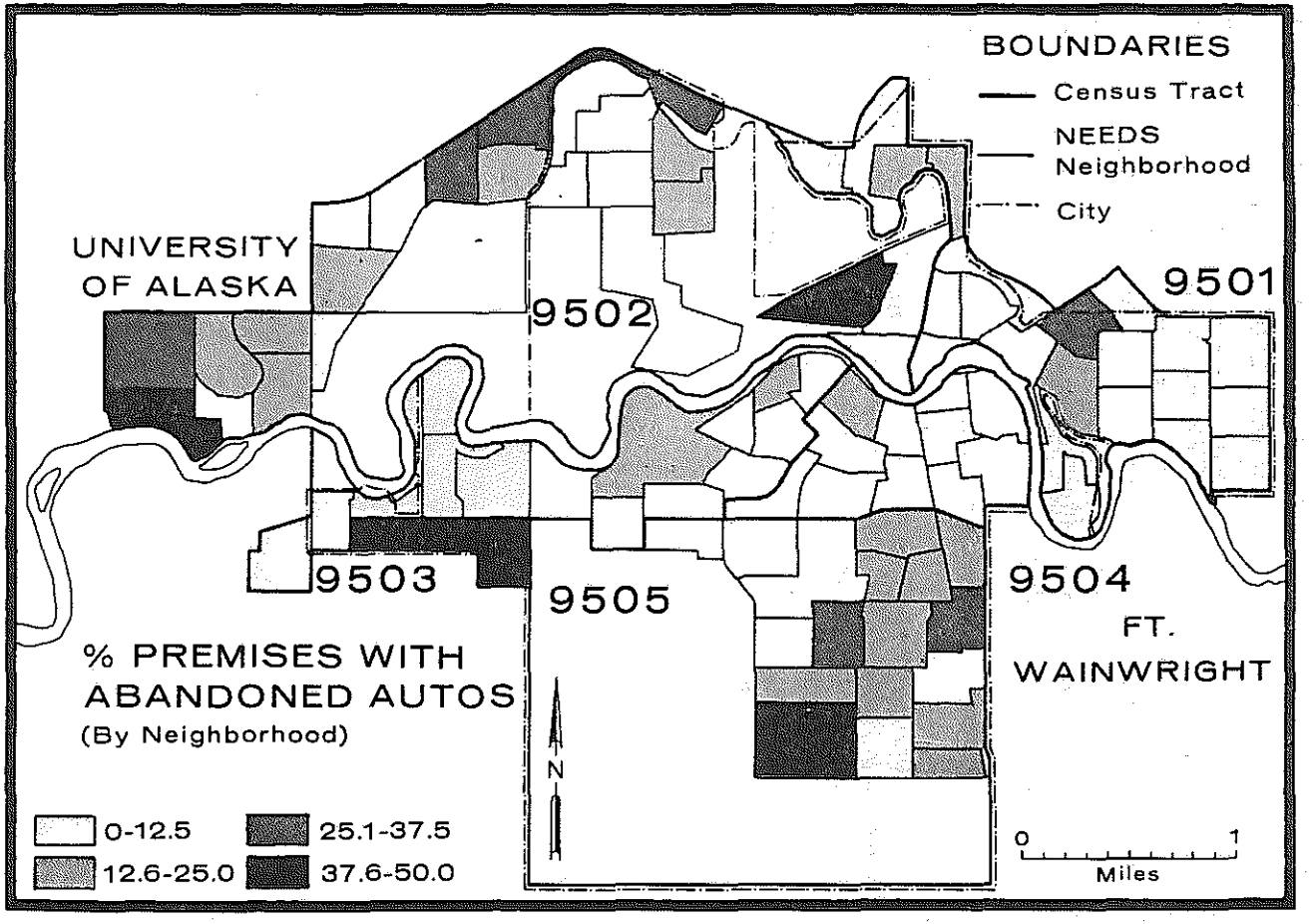

Figure 4-2. Percent of Premises with Abandoned Automobiles.

Similar to the previous indicators of premise conditions, all three categories — neglected landscaping, uncollectable discards, and rubbish accumulation — indicate that south Fairbanks and College are problem areas (Table IV-4 and Figures IV-3 and 4). South Fairbanks has a large number of vacant premises, which in the past have been used as dumping grounds by many people. Interestingly, the city dump is only a short distance south of region 9505. Comparisons between city and borough conditions also reveal similar patterns, with borough premises having a much higher proportion of waste material and neglected landscaping (Table IV-2).

In general, premise conditions in Fairbanks are less than satisfactory, despite current efforts towards improvement (Table IV-3). While city regulations are adequate, the large influx of temporary residents will continue to make enforcement difficult. Also, community concern with premise conditions appears to be lacking in certain areas, i.e., south Fairbanks and College. The need for borough statutes regulating public and private premise conditions in the Fairbanks urban area is obvious.

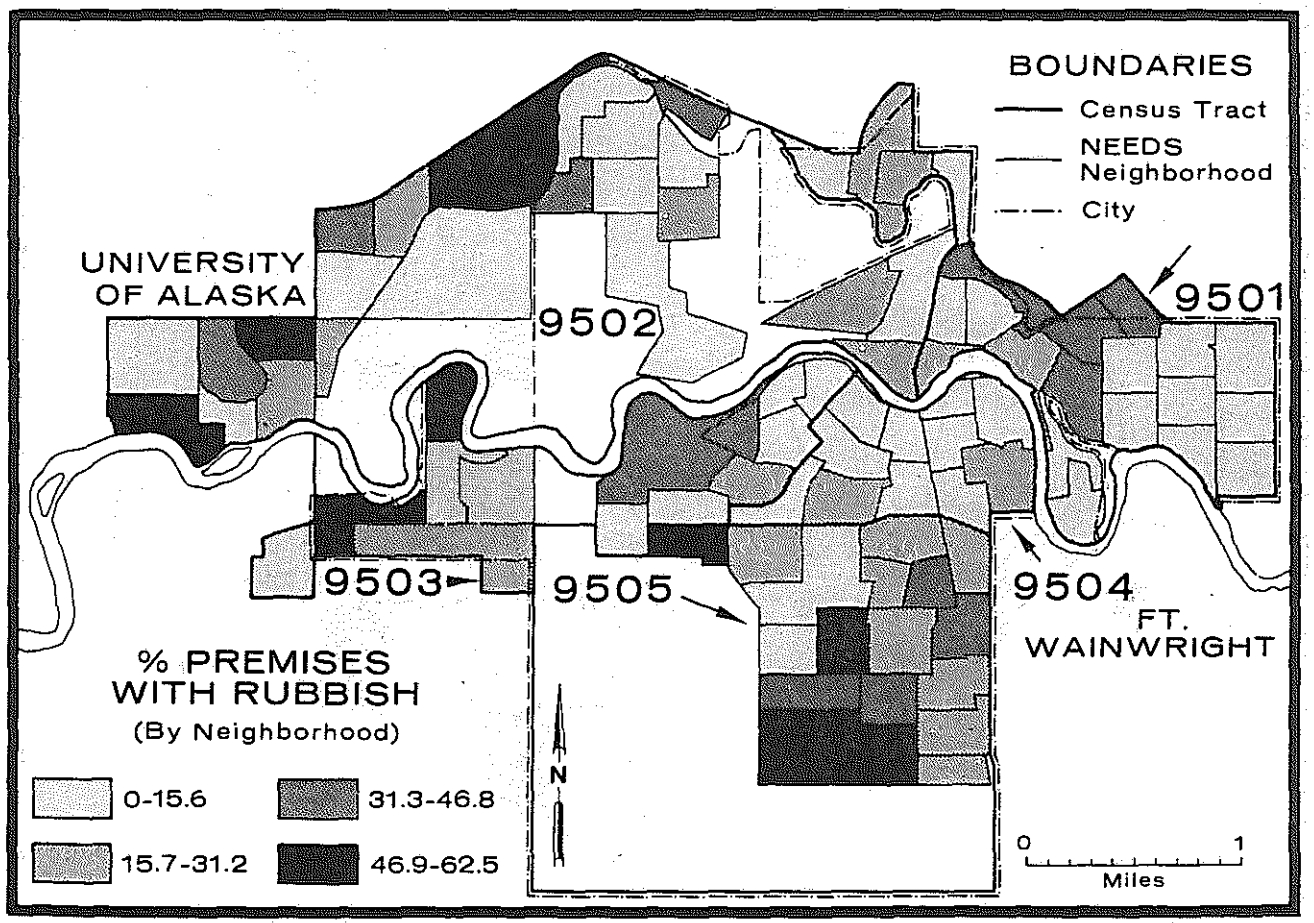

Figure 4-3. Percent of Premises with Rubbish.

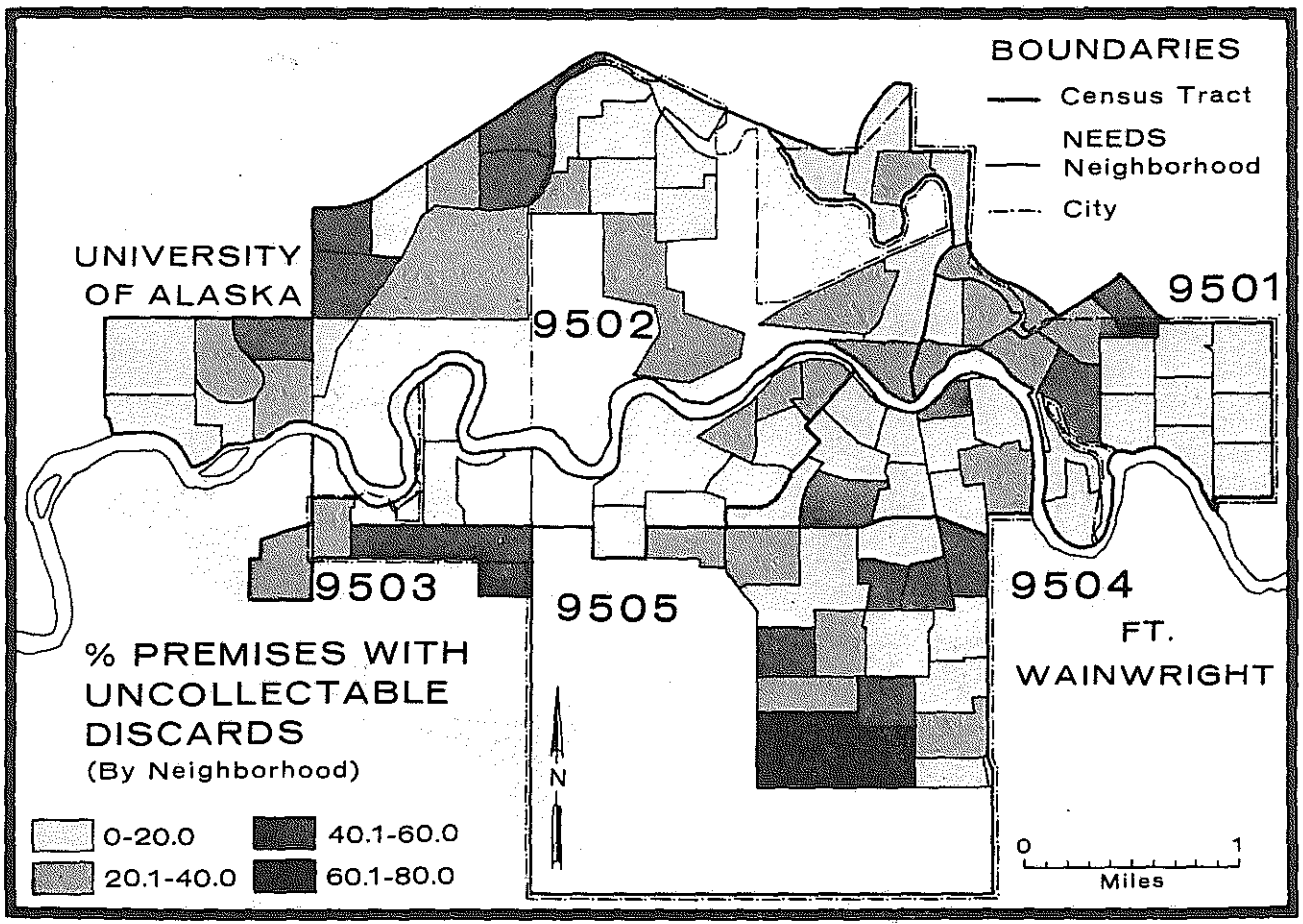

Figure 4-4. Percent of Premises with Uncollectable Discards.

CHAPTER 5
ENVIRONMENTAL SANITATION

The economic "boom" and "bust" cycles in Fairbanks have not only impacted housing and premises, but have also produced concomitant stresses on community sanitation. The rapid population expansion caused by the 1902 gold rush, for example, led to sewage and solid waste disposal problems, while air contamination occurred in winter from wood-burning heaters in homes and coal wastes from the local power plant. One further side effect of the demand for wood fuel was the leveling of many thousands of board feet of timber.

At the time, these environmental stresses were accepted by the Fairbanks population as necessary evils associated with a "boom town" in a gold mining area. Economic conditions and points of view changed, however, and by the 1970's, the community had made substantial gains in countering environmental stresses. This chapter attempts to assess the level of achievement and the remaining problems by focusing on four topics in the field of environmental sanitation: (1) a supply of potable water, (2) waste water collection and disposal, (3) solid waste management, (4) air quality control.

Water Supply

Since the city's founding, the supply of potable water has been a serious problem. As Wold notes, the population jumped from 800 in the winter of 1903 to 5,000 by the summer of 1904.[1] Clearly, local wells would not alone suffice, so in 1905, the Northern Commercial Company (the city's large general store) completed a combined water and steam utilidor system to serve the commercial area and nearby

[1]JoAnn Wold, *Fairbanks: The $200 Million Gold Rush Town* (Fairbanks, Alaska: Wold Press, 1971), pp. 13 and 15.

residences.[2] This system remained intact during the 1920's and 1930's. During this time a small nonpotable summer water distribution system was laid on the ground surface to help meet needs such as fire control and lawn watering. Most residents received potable water either from their own wells or from delivery companies.[3] It was not until 1953, after the Korean conflict military boom had begun, that the city put into operation a truly potable water distribution system.

As suggested in Chapter 2, this water system operates under severe winter weather conditions. The designers of the system recognized this and developed a new approach to water supply.[4] The system makes use of the local power plant to heat the water before treatment and a single main recirculating system to prevent freezing. The most important part of the system is the pit-orifice service connection which allows the water to be circulated into the warm part of buildings without the use of pumps. The system is considerably more expensive to install and operate than conventional grid or branching distribution systems found in warmer climates.

Unfortunately, the water system does not lend itself to easy expansion. In fact, expansion usually requires the installation of a new distribution loop and related heating and pumping facilities.

The source of water used by the City Municipal Utilities System Water Treatment Plant is chlorinated cooling water from the city power plant. This water is drawn from wells located near the banks of the Chena River. The wells have a combined capacity which far exceeds the 3 million gallons per day capacity of the treatment plant. As of 1973 the distribution system had a total of 3,139 customers.

The well water has a high iron concentration which varies from two to four milligrams per liter. As noted, it is chlorinated and heated at the power plant as a part of the plant's cooling process.

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[2]*Ibid.*, p. 19.

[3]*Ibid.*, p. 35.

[4]John R. Wallace, Jr. and Herbert C. Westfall, "How a Water Supply was Designed for a Permafrost Area," *Public Works Magazine*, Vol. 85, No. 1, (January 1954) pp. 64-67.

Then, activated silica, more chlorine, ferric sulfate and lime are added. Periodically, cationic polyelectrolyte is added to promote sedimentation of the iron rich floc which is created. The processes of coagulation, flocculation, sedimentation, and filtration are used to remove the iron and provide some softening. The final steps of the treatment process include fluoridation and post chlorination as needed before the water is stored. On demand, the water is pumped into the distribution system. During the period from November to about May the water is continuously recirculated at about one foot per second. The product is an excellent quality water, exceeding the standards for drinking water set by the U.S. Public Health Service.[5]

The Fairbanks City Council has restricted the water supply coverage to areas inside the city limits. Areas outside the city limits rely on haulage, wells, and small private utility systems. A recent (1974) survey of the well water quality in the interior of Alaska, outside the City of Fairbanks, showed that 7.5 percent of the population used haulage, 17.5 percent used private supply systems, and the remaining 75 percent used wells as their source of domestic water.[6] The results further showed that serious quality problems exist in some areas.

The most general water quality problems facing the area appear to be hard water (average of 258 milligrams per liter of calcium and magnesium hardness), and high iron and manganese content as well waters which frequently exceed federally recommended standards. Localized but significant problems are high nitrate concentrations, and in the hills to the west and north of Fairbanks, quantity of groundwater.[7]

Wastewater Collection and Disposal

Fairbanks' first sewer line was rather limited. It ran down the

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[5]Public Health Service, *Drinking Water Standards Revised 1962* (Washington, D.C.: U.S. Department of Health, Education and Welfare, 1969).

[6]Daniel W. Smith and Lawrence A. Casper, *Ground Water Quality Effects on Domestic Water Utilization* (Fairbanks, Alaska, University of Alaska, Institute of Water Resources 1974).

[7]*Ibid.*, p. 29.

center of the main street (paralleling the water and steam utilidor) and discharged effluent into the Chena River near the site of the present Cushman Street Bridge (9405, N:59). Most residents used septic tanks and pit privies. While a sewer system was developed for the entire city in 1939, it was continually plagued with problems, especially winter freezing, so many residents did not use it. When the city water system was developed in the early 1950's, the sewer system was simultaneously improved. The discharge was diverted from the Cushman Street Bridge area to a point downstream (9503, N:9) from the city's power plant and water supply wells (9503, N:15). Not until 1963 was a primary sewage treatment plant built (9503, N:9) to serve the city. By 1972, there were four sewage treatment plants outside of the city, none of them interconnected with each other or the city system.[8] Primary treatment existed at the two Ft. Wainwright plants to the east of the city. Secondary treatment plants served the Fairbanks International Airport and the College utilities system, both west of Fairbanks. All four systems discharged wastes into the Chena River.

Dissolved oxygen studies of the Chena River have shown little additional detrimental effect of the discharges beyond the naturally occurring winter flows.[9] Studies have shown that waste water discharges have a substantial effect on the stream coliform counts. Since the coliform organism is used as an indicator of fecal contamination and possible pathogenic contamination, the 10,000 time increase in coliform concentration (from 50/100 ml to 500,000/100 ml) as the water passes the city has led to considerable concern.[10] Based on such data as that cited above, the Alaska Department of Environmental Conservation required the city's

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[8] *Fairbanks Metropolitan Area Comprehensive Plan, Sewerage Facilities and Solid Waste Disposal* (Fairbanks, Alaska: Philleo Engineering and Architectural Service, 1972).

[9] Paul J. Frey, Ernest W. Mueller, and Edward Barry, *The Chena River: The Study of a Subarctic Stream* (College, Alaska: Federal Water Quality Administration, Alaska Water Laboratory, 1970), 96 pp.; and Robert L. Crow, *Preliminary Engineering Report on Sewage Treatment and Interceptor Sewers for the City of Fairbanks* (Fairbanks, Alaska, 1959).

[10] *Ibid.*; and, Ronald C. Gordon, *Winter Survival of Fecal Indicator Bacteria in a Subarctic Alaskan River* (Corvallis, Oregon: U.S. Environmental Protection Agency, 1972).

discharge to the river to be terminated. Fairbanks, with the assistance of state and federal funds and in cooperation with the military is in the process of routing all sewage to the Tanana River, providing primary treatment with sludge incineration and ultimately utilizing a pure oxygen secondary treatment process.[11]

A number of small but significant water contamination events have occurred in the Fairbanks vicinity over the years. For example, failure of septic tank systems has concerned public health officials. Improper installation procedures in regard to the cold climate and permafrost have been the main cause of failures. Such systems are now banned in permafrost areas. Small sloughs in the area have also been overloaded with wastewater discharges. Noyes Slough, which runs through the northern portion of the community has been one of the more recent areas to be "cleaned up" by the state requiring private home owners to install package biological treatment units.

The new treatment facility being built by the city will eventually service all of the present city, the Ft. Wainwright area, and the Fairbanks International Airport. The facility will also be capable of handling the College system as well as many of the locations where individual home units exist.

Solid Waste Disposal

Premise conditions as discussed in Chapter 4 are the result of a number of social and environmental conditions. The focus here is limited to the mechanical acts of collection and disposal of solid waste and will not delve into the underlying reasons of why the debris has not been removed.

The management of solid waste in the Fairbanks area has undergone substantial changes since 1970. The current collection program consists of six separate solid waste collection systems: the city, the University of Alaska, Ft. Wainwright, a private concern which collects in and around the community of North Pole, and two privately owned concerns that serve some residential and commercial establishments within the city and the commercial and residential places outside Fairbanks. The areas served by each system are fairly well delineated by agreements between the various operators. In

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[11] *Fairbanks Metropolitan Area Comprehensive Plan.*

addition, a seventh collection method involves individual hauling of wastes to the landfill site. Excluding individual hauling and junk automobiles, it was estimated in 1972 that over 30,000 tons of refuse was disposed of in the Fairbanks area.[12]

Historically, the area has been served by a number of dump sites with varying degrees of maintenance. At present, two disposal sites are in operation: the Fairbanks North Star Borough landfill and the Ft. Wainwright landfill. The Ft. Wainwright facility is managed by the Army as a sanitary landfill with regular covering of the refuse. The current borough operating procedure for the disposal site developed from a series of serious confrontations between the Alaska Department of Environmental Conservation and the former operator of the site, the City of Fairbanks.

As a result of numerous fires, rat, and vector problems, and a possible leachate problem, the state closed the disposal site in 1972. After assurances were made that the site would meet minimum standards of operation, it was again opened. Soon afterwards, however, the borough took over management of the site.

Currently the disposal site is operated as a modified sanitary landfill. It is located south of town near the Tanana River in an area with a shallow ground water table. Concern about ground water contamination resulted in discontinuing the use of excavated compaction cells. Elevated cells which are filled with refuse, compacted, and covered regularly are now used. One of the most serious and expensive problems with present procedures is the lack of cover material at the site. This has resulted in the need for cover material to be trucked to the area from the surrounding region. Recently, the leachate problem at the landfill site was studied, with the conclusion that no significant contamination was occurring.[13]

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[12] *Ibid.*

[13] R&M Consultants, *Groundwater Leachate Study, Fairbanks Sanitary Landfill* (Fairbanks: Alaska R&M Consultants, Inc., and Arctic Environmental Engineers, 1975).

AIR POLLUTION

Air pollution problems in Fairbanks are more extensive than one would like to believe. The air constituents of prime concern are particulates and carbon monoxide.[14] Particulates are of three distinctly different types, each with unique occurrence characteristics. These three are the natural dust problem, nonwater particulates from combustion, and ice fog. The 1967 and 1970 average of geometric monthly means for particulates ranged from over 20 micrograms per cubic meter in February to over 420 micrograms per cubic meter in September.[15] State regulations are set at 60 micrograms per cubic meter. This data did not adequately cover the ice fog contribution.

The sources of the natural dust problem during the summer are the many unpaved streets in and near town, clear areas used for stockpiling and storage of equipment and supplies, dry stream beds and loess-covered hills. In the latter case, spring runoff causes loess material to flow onto road surfaces where vehicles throw the particulates into the air.[16] In winter, the principal source of natural particulates are the cleared and sanded streets where dry, low temperature, and limited solar radiation conditions combine, permitting individual dust particles to be agitated by passing vehicles.

Sources other than natural dust also become significant during the winter. Particulates from automobiles and space heaters often contribute substantially to the total problem. The nonwater particulates from automobiles have been shown to spread widely throughout the area.[17] The common occurrence of the radiation type of temperature inversions during the cooler nine months of the

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[14]State of Alaska, *Air Quality Control Plan*, Vol. I, (Juneau: Department of Environmental Conservation, 1972), 143 pp.; and Timothy M. Gilmore and Thomas R. Hanna, *Regional Monitoring of Ambient Air Carbon Monoxide in Fairbanks, Alaska* (Juneau: Department of Environmental Conservation, 1973).

[15]State of Alaska, *Air Quality Plan*.

[16]Joseph G. Holty, "Air Quality in a Subarctic Community," *Arctic*, Vol. 26, No. 4, pp. 292-302.

[17] David Nyquist, L.A. Casper, and Jacqueline D. LaPierre, *A Survey of Lotic Waters with Respect to Dissolved and Particulate Lead* (Fairbanks, Alaska: University of Alaska, Institute of Water Resources, 1972).

year adds to the pollution problem substantially by causing the contaminates to be concentrated near the ground.

When extremely cold conditions and temperature inversions develop in winter, moisture discharged to the air freezes to form very small ice particles which do not readily settle. These ice particles are called ice fog. As late as the 1950's, the ice fog problem was evident only when temperatures reached the -49°F. range. However, because continued expansion of the sources of moisture — power plants, houses, vehicles, etc.—ice fog now occurs at average temperatures as high as -25°F. Thus, the incidence of winter ice fog has greatly increased, since there are far more -25°F. days than -40°F. days.[18]

Of the air quality problems facing Fairbanks, carbon monoxide, mainly from vehicles, is the most serious health hazard.[19] Gilmore and Hanna, for instance, reported that from December 1972 to February 1973, 73 percent of the days exceeded the U.S. standard of 9 parts per million average for eight hours.[20] Clearly, basic measures such as improved traffic flow and mandatory vehicle emission inspections will be insufficient to solve the carbon monoxide problem from vehicles. Existing vehicle idling regulations must be rigorously enforced, and electric plug-ins and protective garages must be expanded. Fortunately too, there has been a growing demand for a community-wide mass-transit system. At present, there is only one bus serving the community. It runs between the University of Alaska campus and downtown Fairbanks. Given the rapidly increasing number of vehicles in the community, however, any proposed solutions will invariably be costly.

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[18]*Arctic Rapid Transit System: A Proposal.* (Fairbanks, Alaska: Arctic Health Research Center, Environmental Sciences Branch, 1973).

[19]State of Alaska, *Air Quality Plan;* and Richard W. Joy, Timothy Tilsworth, Darrell D. Williams, *Carbon Exposure and Human Health* (Fairbanks, Alaska, University of Alaska, Institute of Water Resources, 1975).

[20]Gilmore and Hanna, *Regional Monitoring of Ambient Air Carbon Monixide in Fairbanks, Alaska.*

CHAPTER 6
ISSUES AND DIRECTIONS

This study has focused on four basic environmental quality issues that have been, and still are, of general concern to Fairbanks community residents: site conditions, quality of residential structures, premise conditions, and waste control.

In summary, our findings were as follows:

1. **Site Conditions.** Fairbanks faces severe limitations in urban growth because of its site. In the past, the Chena River has been a source of problems, causing six destructive floods since 1902. Fortunately, a current dam and levee construction program by the Corps of Engineers will minimize future flood damages. Protection of the urban site comes at a price, however, since the entire project will cost approximately $16 million. The valley location of Fairbanks is also undesirable from an air pollution viewpoint since winter temperature inversions contain airborne wastes. Expansion as well as "filling in" of the urban area is handicapped by the presence of permafrost. Road and structure construction costs are increased in permafrost areas. The current dispersed, low density housing pattern, i.e., the spread-out nature of the community because of permafrost in the center of the city — the industrial area — is costly in terms of increased travel distances. The increased travel further aggrevates the air pollution problem, and the longer piping distances make utilities delivery costly and difficult. In short, the urban area is too large to be moved, so costly technological solutions and increased regulation of waste disposal provide the primary means of adaptation to site.

2. **Structure Quality.** From its beginnings, Fairbanks has faced the twin problems of overcrowding and too many poor quality structures. Studies of the area vary considerably in the criteria used to judge housing, thus no quantitatively accurate picture of changing conditions emerges. Generally, however, it appears that housing

quality has improved from the 1950's, when over three-fifths of the city housing was rated substandard. The improvement can, in part, be attributed to destruction and subsequent condemnation of many homes in the city (Obversely, some "good" homes were made "bad" by the flood). Also, the development and expansion of many new subdivisions during the late 1950's and 1960's has provided the community with hundreds of good quality homes. Unfortunately, the expansion of new housing, both single residences and apartments, has not kept pace with the population growth accompanying the arctic slope oil boom. Hence, crowding remains a serious problem. Given these conditions, it would seem that a few positive measures are in order. First, there is a definite need for low cost public and private housing. Too many people in the community are unable to afford quality homes and apartments. Their only options now are to choose poor quality, low cost, and overcrowded dwelling units, Second, more apartment building construction might be considered for the downtown area. This action would counter further "suburban" sprawl, and therefore reduce traffic volume. For the elderly, downtown, low-cost housing would also mean greater proximity to services (Figure VI-1). Third, expanded and enforced borough codes, preferably similar to the city codes, need to be developed to cover existing and future residential structures. The current phenomenon of borough residential sprawl in the Ballaine Road, Goldstream, Farmers Loop, and College areas makes imperative rigorous land-use planning. Uncontrolled expansion of these areas will only generate new and increased environmental quality problems and community service costs. Fourth, loan programs should be considered again as a means to improve low quality housing in South Fairbanks, College, and the downtown area.

3. **Premise Conditions.** Since no previous studies of the Fairbanks area have analyzed the issue of premise quality, it was not possible to determine degrees of change. This study used five indicators of premise quality: auxiliary structures, abandoned vehicles, rubbish accumulation, neglected landscaping, and uncollectable discards. Two problem areas were predominant in almost all five categories, namely, south Fairbanks and College. Commendable efforts have been made, and are continuing, by the city to improve premise conditions on both public and private land. Unfortunately, similar action is not being taken by the borough in its urban area, despite the obvious need. Both city and borough officials should consider cleaning up and maintaining the banks of the Chena River as well as Noyes Slough and Deadman's Slough. The costs of

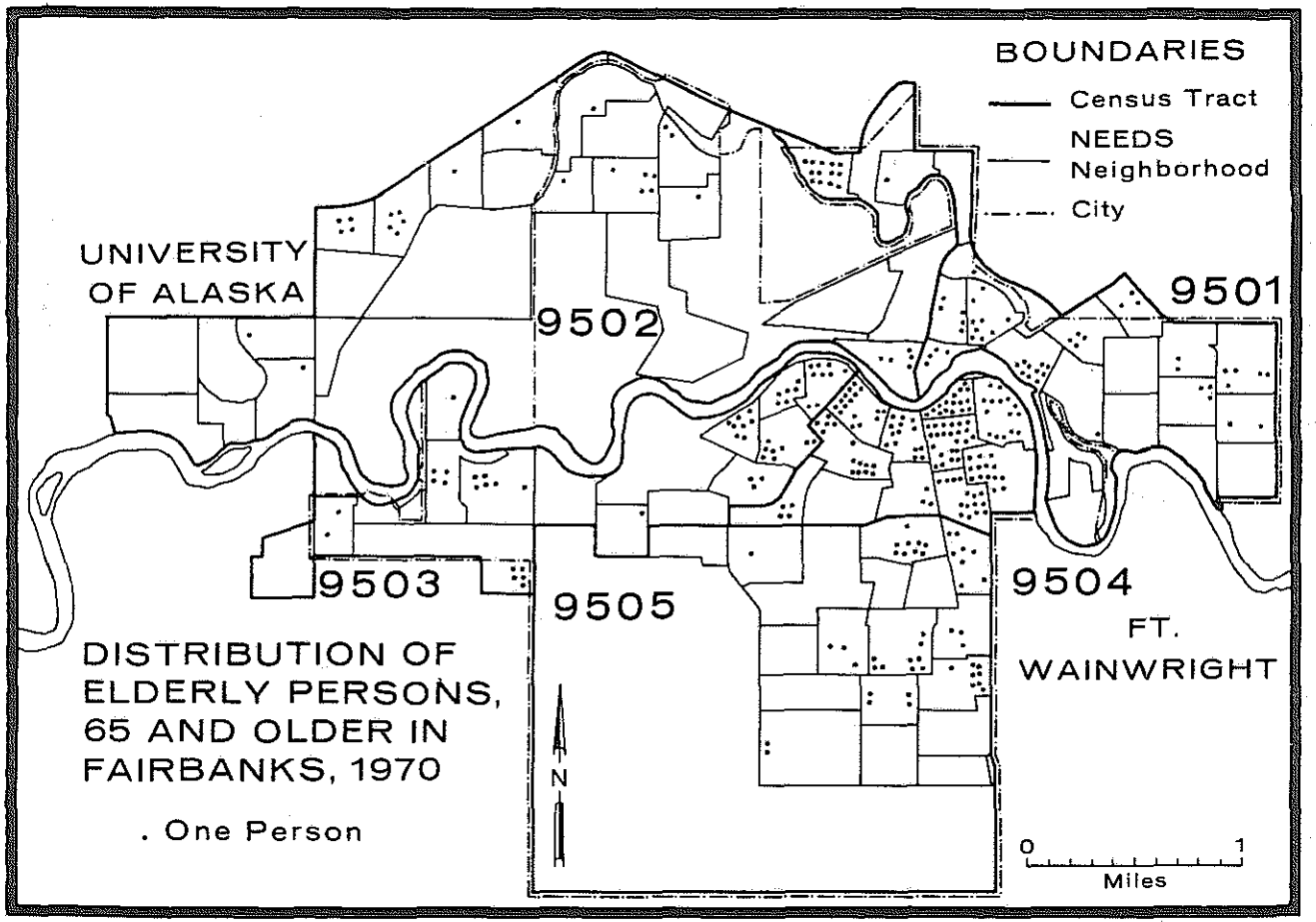

Figure 6-1. Distribution of Elderly Persons, 65 and Older in Fairbanks, 1970.

these efforts would be offset by reduced visual insult to tourists and residents. Recreational opportunities should also increase along the Chena and Noyes Slough with the expanded city-borough wastewater control programs.

4. **Waste Control.** In general, the city and borough governments have made some significant gains in improving waste control in the last few years, particularly with solid waste and wastewater control. Yet, some serious problems remain, especially in dealing with air pollution. The considerable increase in vehicular emissions and moisture generating sources (power plants, homes, etc.) has meant a considerable rise in winter air pollution and ice fog. For the immediate future, the situation will deteriorate because of increased population and therefore vehicular traffic, the lack of technological breakthroughs in vehicular emission controls, and the failure of the community to adopt a public transportation system. Unless community attitudes towards air pollution control change dramatically, there could be a significant increase in upper respiratory ailments, especially with the elderly population.

A more positive community attitude has been evidenced in waste water control. In the pre-World War II period, until the 1950's, the Chena River was polluted by heavy silt loads resulting from gold dredging operations in the tributary valley areas. By the 1940's, raw sewage entered the Chena via the Ladd Air Force Base and city sewer systems. Improvements in the 1950's included the expansion of the city sewer and water system and the construction of a primary sewage treatment plant. Nevertheless, sewage disposal remained a problem into the 1970's. The sewer-water system of the city was not comprehensive, and primary treatment of sewage flowing into the Chena by Ft. Wainwright and the city was not acceptable to the state. As a result, there is the current commendable action of expanding and integrating the city, Ft. Wainwright, and College sewage systems and building of a secondary sewage treatment plant.

Similar to the waste water system, until recently, the solid waste collection system was fragmented and noncomprehensive. Also treatment of wastes at the city dump was inadequate, i.e., burning of trash and incomplete coverage. Recent borough efforts towards improving the pick-up system and the dump operation, are steps in the right direction. But again, as in the case of waste water treatment, state regulations and tough enforcement actions were necessary to implement current improvements.

To a large degree, solutions to environmental quality problems in

Fairbanks have resulted from disasterous events, i.e., dam and levee construction following six Chena River floods, and from state and federal legal pressures in air quality, wastewater treatment, and solid waste control. Except for recent city actions on improving premise conditions, little local initiative has been taken towards improving the quality of the urban environment. Jurisdictional differences between city and borough have shown that the "laissez-faire" borough policy on housing and premises has led to overall poorer environmental quality conditions than is true for the city. Alternatively, cooperative city and borough efforts in the areas of wastewater and solid waste management have demonstrated how environmental quality can be improved effectively throughout the community. Clearly, there is a need for city-borough cooperation and, especially, more local initiative.

Need for an Image

Planning. As planners point out, the most important step in urban and regional planning is the establishment of community goals and objectives.[1] In other words, the residents and leadership of a community must know what they want their area to become. Given these conditions and effective local leadership, environmental quality problems, as one aspect of community planning, can be dealt with in a productive manner. Perhaps the most notable example of local action in environmental quality control is Chattanooga, Tennessee, only recently called the "most polluted city in the U.S."[2] Local leaders, backed by community residents have made dramatic improvements in cleaning up the city's air and water. Significantly, since the pollution control program began in 1969, more industries have been attracted to the community, and the number of tourists has increased.

In Fairbanks, to use Kevin Lynch's term, there appears to be no clear "image" of what the city should become and exactly what emphasis should be put on environmental issues.[3] Swanson, *et. al.*,

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[1] Jeanne M. Davis, "Techniques For Planning Tomorrow's Landscapes," in Jack Hayes, ed., *Landscape For Living, The Yearbook of Agriculture, 1972* (Washington, D.C.: U.S. Government Printing Office, 1972), pp. 332-340.

[2] " 'Most Polluted City in U.S.' Shows the Way to Clean Up," *U.S. News and World Report*, June 17, 1974, pp. 81-83.

[3] Kevin Lynch, *The Image of the City* (Cambridge: M.I.T. Press, 1960).

gives some clues, however. The purpose of their sample survey was to gain "...a clearer understanding of how residents feel about community services and what their feelings are about expanding taxes for particular services."[4] The survey showed a mixed response towards increasing taxes for "better pollution control." Forty-seven percent of the Fairbanks city residents and 48 percent of the borough residents polled favored increased taxes. Also, 48 percent of the city residents favored expanding the areal coverage of the sewer and water system. City interest for a public transit system was quite low, only 28 percent. In terms of maintaining services, sewer and water ranked second in a choice of 11 items, while pollution control and a city transit system ranked eighth and tenth, respectively. Thus, there is little community willingness to expand critical environmental quality services, despite the rapid rise in the urban area population. The failure to support an urban area transit system is of considerable significance, since it means the continued increase of residential dispersion and vehicular traffic. These two processes work to counter all air pollution control programs. The survey also indicated that both city and borough residents felt tourism was vitally important to the continued economic growth of Fairbanks. Unanswered was the question: what qualities of the community will continue to attract increasing numbers of tourists?

City planning is an ongoing process, since cities, physically, are constantly changing. Thus, in addition to establishing goals and objectives, community residents and leaders must be kept continually informed of actual and expected changes occurring in the urban landscape. In the past, Fairbanks has relied heavily on large comprehensive surveys, such as the 1953 Beck report and the Clark-Coleman and Cornell-Holland studies of 1959 and 1966, respectively.[5] Unfortunately, there has been no comprehensive study of community conditions since the flood of 1967, despite enormous changes in the geography of the Fairbanks area. Our survey has been purposely narrow in scope as was the 1973 City Center study by

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[4]D. Swanson, J.W. Mathews, and O.R. Morgan, "Tanana Valley Opinion Poll" (Unpublished Report, Fairbanks: Cooperative Extension Service, University of Alaska, 1973).

[5]Division of Planning and Research, *Bibliography of Community Planning in Alaska Since Statehood* (Juneau: Office of the Governor, State of Alaska, 1973).

John Graham and Associates. We believe a comprehensive urban area study and planning report would be most beneficial to the community at this time.

Unfortunately, comprehensive plans are costly, time consuming, and do not appear often enough to keep up with community changes. At the present time, much critical data relating to urban planning in the Fairbanks area is either not available or is dispersed in a wide number of agencies and offices. Hence, it is not readily available for community study.

It is with these points in mind that the authors would like to suggest a few ideas in data collection for community decision makers (City Council, Borough Assembly, planning and regulatory agencies, etc.).

1. A statistical volume and an atlas should be simultaneously developed and maintained. Past studies, such as the 1970 Census, the NEEDS Survey, and the City Center Plan can be used to provide base-line information for the 1970-72 time period. The statistical volume would help to illuminate quantitative changes in the community, e.g., population numbers, housing starts, and vacancy rates. The atlas would help show *where* the problem areas of a community are located. The NEEDS survey revealed that while region 9504 had serious housing problems, premise conditions were comparatively good. Equal efforts need not be applied to all parts of the urban area.

2. Updating of information should be continuous and cumulative. Trends or dramatic changes in certain features, e.g., housing and population, may be vaguely realized by community leaders, but precise information is more valuable and useful for planning purposes. Collection of much data already takes place, as indicated; thus, compiling it at one point should not be a very costly procedure. Also, updating of information will indicate quickly if community programs are working. Premise conditions could be easily and quickly surveyed to determine if the city program is working. Using the NEEDS data, a survey of just the "poor" areas could be conducted at a very modest cost to determine if premise conditions there had improved or deteriorated. Also, to supplement the atlas, annual aerial photographic coverage of the urban area from the property assessor's office could be integrated at modest costs and

thereby provide additional data to verify expansion of building construction, roads, and changing premise conditions, etc.

3. Maximum community involvement should be a major aspect of the project. This effort need not be a costly undertaking if maximum use is made of local community resources. Local, state, and federal agencies are already collecting a significant portion of data needed for planning purposes. This data, as noted, need only be brought together into a comprehensive source. Also, too, these can be integrated into the planning documents. Sample surveys are inexpensive, yet accurate and efficient. Also, surveyors can be quickly and easily trained for many projects. NEEDS used a project combination of university students and Neighborhood Youth Corps (N.Y.C.) people to conduct its sample survey. Good results were obtained at a low cost. And, unlike a professional outside planning consultant's study, all the money for the project stayed in the area. Finally, results of the surveys, data collection, etc., should be made readily available to the community for study and comment.

The Image. The general image of the North, as the last part of North America largely unaltered by man, is held by many people in Alaska and in the other states. Clean air, pure waters, and unlittered landscapes all form part of their mental image of the North. For most of Alaska and northern Canada the image is indeed, correct. Yet in settlement areas this is not the case. As the Swedish architect Ralph Erskine points out: "Do the cities and building of the North well serve the needs of their inhabitants? My answer is 'No'."[6] Numerous studies in northern Canada suggest that many villages have poor sites, inadequate housing, and lack of proper waste control facilities.[7] Whitehorse, capital of the Yukon Territory, faces environmental quality problems paralleling those in Fairbanks, in particular, issues resulting from the recent phenomenon of rapid and widespread population and economic growth.[8] The valley location of the main settlement area of Whitehorse would

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[6]Ralph Erskine, "Architecture and Town Planning in the North," *The Polar Record*, 14 (1968), 165-171.

[7]G.W. Heinke, *Bibliography of Arctic Engineering* (Ottawa: Department of Indian Affairs and Northern Development, 1972); and, G.W. Heinke, *Report on Municipal Services in Communities of the Northwest Territories* (Ottawa: Department of Indian Affairs and Northern Development, 1973).

[8]Reid, Crowther, and Partners, *General Development Plan, Whitehorse Metropolitan Area* (Vancouver: Reid, Crowther and Partners, 1970).

appear to present future problems of air quality control similar to Fairbanks. In Alaska, the *Alaska Natives and The Land* and a wide range of private and public reports and surveys indicate the existence of serious environmental health problems, particularly housing and waste control in villages and towns throughout the state.[9] Also the University of Alaska's recent study of Anchorage indicates that the largest city in the state, despite its wealth and relatively mild climate, faces numerous and severe environmental quality issues.[10]

In brief, the image of the North with its pristine environment is only partly true. Serious environmental quality problems persist in settlements throughout the North. These problems, as we have seen in the case of Fairbanks, have arisen not just because of the severe environment or the high costs of labor, material, and transportation. Individual and community neglect have also played significant roles. One reaction to this situation has been the creation of strict state and federal environmental laws and enforcement procedures. Local response to these measures in Fairbanks has been at best mixed, with many people objecting not only to the intent of the laws but also their very existence. Yet it seems clear that this "Frontier Alaska" attitude, i.e., the rejection of rules and regulations is anachronistic, given the severe and multifold environmental quality problems facing the community of Fairbanks.

If northerners, and Fairbanks residents in particular, attempted to fulfill their image of a clean, healthy urban environment, then, perhaps, all the environmental rules and regulations would not be so onerous. We hope the present and future residents will succeed in transforming the environmentally healthy image of Fairbanks into a reality.

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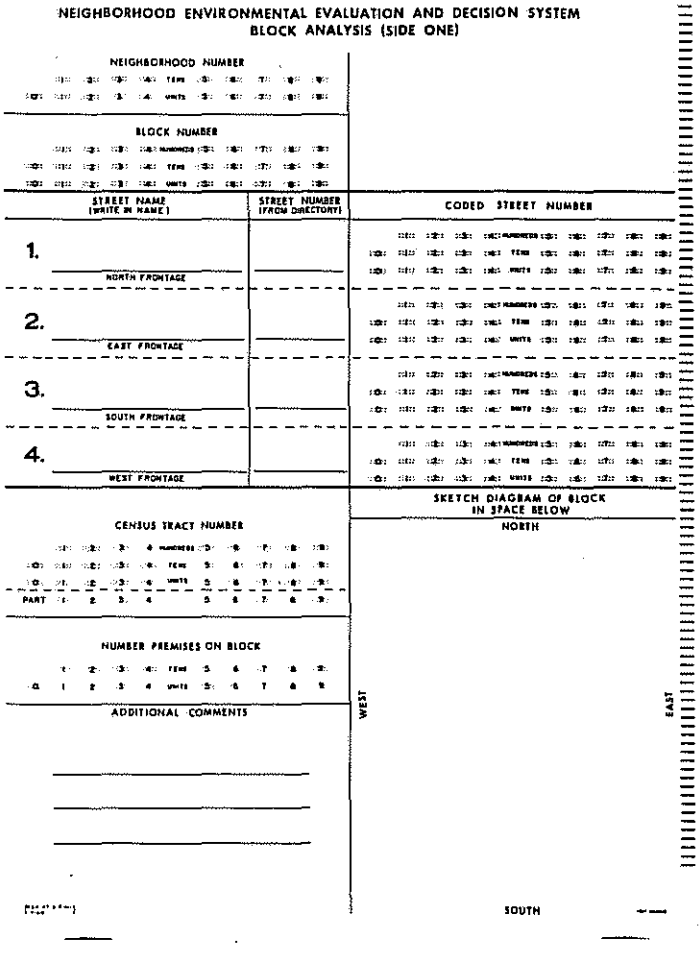
[9]Federal Field Committee, *Alaska Natives and the Land* (Washington, D.C.: U.S. Government Printing Office, 1968); and Amos J. Alter, "Arctic Environmental Health Problems," *CCR Critical Reviews of the Environment*, Vol. 2, (1972) pp. 459-515.

[10]Lidia L. Selkregg, ed., *Environmental Atlas of the Greater Anchorage Area Borough, Alaska* (Anchorage: University of Alaska, 1972).

APPENDIX I

A. NEEDS Block Analysis Form
B. NEEDS Exterior Premise Analysis Form


NEIGHBORHOOD ENVIRONMENTAL EVALUATION AND DECISION SYSTEM
BLOCK ANALYSIS (SIDE ONE)
NEIGHBORHOOD NUMBER
BLOCK NUMBER
STREET NAME (WRITE IN NAME)
STREET NUMBER (FROM DIRECTORY)
CODED STREET NUMBER
1.
NORTH FRONTAGE
2.
EAST FRONTAGE
3.
SOUTH FRONTAGE
4.
WEST FRONTAGE
SKETCH DIAGRAM OF BLOCK IN SPACE BELOW
NORTH
CENSUS TRACT NUMBER
PART
NUMBER PREMISES ON BLOCK
ADDITIONAL COMMENTS
WEST
EAST
SOUTH

NEIGHBORHOOD ENVIRONMENTAL EVALUATION AND DECISION SYSTEM
BLOCK ANALYSIS (SIDE TWO)

NEIGHBORHOOD NUMBER

BLOCK NUMBER

DENSITY

SHADED AREA FOR CATEGORY CHECKS

STREET ANALYSIS	FRONTAGE 1	FRONTAGE 2	FRONTAGE 3	FRONTAGE 4
TYPE OF STREET				
STREET PAVEMENT CONDITION				
CURBS AND GUTTERS				
SIDEWALK CONDITION				
STREET LIGHTING				
OFFSTREET LOADING				
ONSTREET PARKING				
CITY WATER LINES				
STREET WIDTH				

ENVIRONMENTAL STRESSES	FRONTAGE 1	FRONTAGE 2	FRONTAGE 3	FRONTAGE 4
NOISE				
VIBRATION				
GLARE				
ODOR				
SAFETY HAZARDS				

AIR POLLUTION LEVEL — MODERATE — CONSIDERABLE — EXTREME

NATURAL DEFICIENCIES

- BLOCK SUBJECT TO FREQUENT FLOODING
- BLOCK WITHIN 1,000 FEET OF STAGNANT AND/OR POLLUTED BODY OF WATER.
- SEVERE TOPOGRAPHY ON THE BLOCK
- BLOCK WITHIN 1,000 FEET OF STAGNANT AND/OR POLLUTED BODY OF WATER.
- MODERATE TOPOGRAPHY ON THE BLOCK.

AVAILABILITY OF SHOPPING FACILITIES

- SHOPPING FACILITIES LOCATED WITHIN ¼ MILE OF BLOCK (No Penalty).
- SHOPPING FACILITIES LOCATED MORE THAN ¼ MILE, BUT LESS THAN ½ MILE OF BLOCK.
- SHOPPING FACILITIES LOCATED AT 1 MILE OR BEYOND.
- SHOPPING FACILITIES LOCATED MORE THAN ½ MILE, BUT LESS THAN 1 MILE OF BLOCK.

AVAILABILITY OF PUBLIC TRANSPORTATION

- LOCATED WITHIN ¼ MILE (No Penalty).
- LOCATED OVER ¼ MILE OR NOT AVAILABLE.
- FREQUENCY OF SERVICE IS 2 BUSSES PER HOUR.
- LOCATED WITHIN ¼ TO ½ MILE OF BLOCK.
- FREQUENCY OF SERVICE GREATER THAN 2 BUSSES PER HOUR (No Penalty)
- FREQUENCY OF SERVICE IS 1 BUS PER HOUR OR LESS.

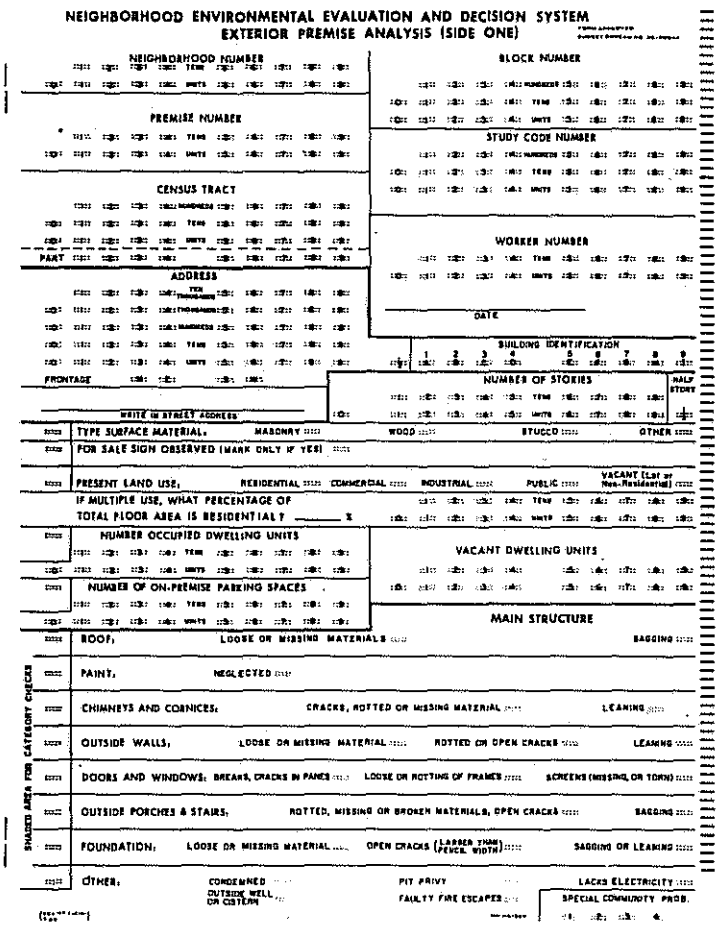
AVAILABILITY TO PARKS AND PLAYGROUNDS

- PARK OR PLAYGROUND LOCATED WITHIN ¼ MILE OF BLOCK (No Penalty).
- PARK OR PLAYGROUND LOCATED MORE THAN ¼ MILE, BUT LESS THAN ½ MILE OF BLOCK
- PARK OR PLAYGROUND LOCATED AT ½ MILE OR BEYOND.

AIRCRAFT STRESSES

DESCRIBE CONDITION _____

SELECT PENALTY POINTS FROM TABLE



NEIGHBORHOOD ENVIRONMENTAL EVALUATION AND DECISION SYSTEM
EXTERIOR PREMISE ANALYSIS (SIDE ONE)

NEIGHBORHOOD NUMBER
PREMISE NUMBER
CENSUS TRACT
PART
ADDRESS
FRONTAGE
WRITE IN STREET ADDRESS
BLOCK NUMBER
STUDY CODE NUMBER
WORKER NUMBER
DATE
BUILDING IDENTIFICATION
NUMBER OF STORIES
HALF STORY
TYPE SURFACE MATERIAL: MASONRY WOOD STUCCO OTHER
FOR SALE SIGN OBSERVED (MARK ONLY IF YES)
PRESENT LAND USE: RESIDENTIAL COMMERCIAL INDUSTRIAL PUBLIC VACANT (Lot or Non-Residential)
IF MULTIPLE USE, WHAT PERCENTAGE OF TOTAL FLOOR AREA IS RESIDENTIAL? ____ %
NUMBER OCCUPIED DWELLING UNITS
VACANT DWELLING UNITS
NUMBER OF ON-PREMISE PARKING SPACES
MAIN STRUCTURE

SHADED AREA FOR CATEGORY CHECKS

ROOF; LOOSE OR MISSING MATERIALS SAGGING
PAINT; NEGLECTED
CHIMNEYS AND CORNICES; CRACKS, ROTTED OR MISSING MATERIAL LEANING
OUTSIDE WALLS; LOOSE OR MISSING MATERIAL ROTTED OR OPEN CRACKS LEANING
DOORS AND WINDOWS; BREAKS, CRACKS IN PANES LOOSE OR ROTTING OF FRAMES SCREENS (MISSING, OR TORN)
OUTSIDE PORCHES & STAIRS; ROTTED, MISSING OR BROKEN MATERIALS, OPEN CRACKS SAGGING
FOUNDATION; LOOSE OR MISSING MATERIAL OPEN CRACKS (LARGER THAN PENCIL WIDTH) SAGGING OR LEANING
OTHER; CONDEMNED OUTSIDE WELL OR CISTERN PIT PRIVY FAULTY FIRE ESCAPES LACKS ELECTRICITY SPECIAL COMMUNITY PROB.

NEIGHBORHOOD ENVIRONMENTAL EVALUATION AND DECISION SYSTEM
EXTERIOR PREMISE ANALYSIS (SIDE TWO)

NEIGHBORHOOD NUMBER

BLOCK NUMBER

PREMISE NUMBER

PREMISE CONDITIONS

SHADED AREA FOR CATEGORY CHECK

UNACCEPTABLE FENCE OR RETAINING WALL (NEEDS REPAIRS OR IS UNSIGHTLY):

ABANDONED MOTOR VEHICLES: (MARK ONE, ONLY) — ONE — TWO OR THREE — MORE THAN THREE

RUBBISH ACCUMULATIONS: (MARK ONE, ONLY)
- ACCUMULATION DETRACTS FROM THE PREMISE
- ACCUMULATION DETRACTS FROM PREMISE AND ADJACENT PROPERTY
- ACCUMULATION DETRACTS FROM ENTIRE BLOCK FRONTAGE

UNCOLLECTABLE DISCARDS: (MARK ONE, ONLY) — ONE — TWO OR THREE — MORE THAN THREE

REFUSE STORAGE: LIDS NOT TIGHT FITTING OR ABSENT; PUTRESCIBLE REFUSE ON THE GROUND; TYPE CONTAINER USED NOT PROPER OR IS ABSENT

LANDSCAPING (MARK ONE, ONLY): NEGLECTED — NEEDS MAINTENANCE

OTHER: LIVESTOCK — POULTRY — RODENTS
MOSQUITOES — ABANDONED REFRIGERATOR (WITH DOOR ON) — OVERFLOWING SEPTIC TANK — FLIES
EXCESSIVE ANIMALS — SAFETY HAZARD — OTHER INSECTS OR PESTS

AUXILIARY STRUCTURE CONDITION: (MARK NUMBER OF EACH TYPE)
GOOD
FAIR
POOR

DIMENSIONS (IN FEET)

- LOT WIDTH
- LOT LENGTH
- MAIN STRUCTURE WIDTH
- MAIN STRUCTURE LENGTH
- AUXILIARY STRUCTURE WIDTH
- AUXILIARY STRUCTURE LENGTH

Appendix II
A. CONDITION OF OCCUPIED STRUCTURES

NEEDS Neighborhoods	Number of Structures	Minor Deficiencies	Moderate Deficiencies	Major Deficiencies	Any Deficiencies
9501	373	92	52	10	112
1	29	8	4	1	10
2	17	6	4	—	7
3	19	8	4	—	9
4	14	4	—	—	5
5	3	2	2	—	2
6	15	2	5	1	3
7	29	9	1	1	11
8	6	1	1	—	1
9	13	3	2	—	5
10	15	5	2	2	5
11	29	19	15	3	20
12	6	3	2	—	3
13	15	1	—	—	1
14	20	—	—	—	1
15	28	10	3	1	10
16	5	—	—	—	—
17	16	2	1	1	3
18	15	3	2	—	5
19	11	—	—	—	—
20	15	—	—	—	—
21	20	—	2	—	2
22	33	9	1	—	9

9502	267	68	64	18	109
1	14	8	1	4	9
2	11	6	6	—	7
3	19	3	—	1	4
4	19	6	5	1	7
5	15	4	6	2	11
6	12	5	4	2	7
7	12	2	—	—	2
8	14	3	4	1	5
9	12	—	—	—	—
10	24	2	6	1	9
11	18	8	12	2	14
12	12	2	1	—	3
13	11	2	1	—	3
14	1	—	—	—	—
15	—	—	—	—	—
16	—	—	—	—	—
17	—	—	—	—	—
18	11	1	2	—	3
19	7	1	2	1	3
20	5	—	—	—	—
21	12	6	4	1	9
22	15	—	1	—	1
23	5	3	3	1	4
24	11	4	4	—	6
25	7	2	2	1	2
9503	210	53	36	13	72
1	12	5	3	1	6
2	7	2	2	—	2

	3	5	1	—	1	2
	4	5	4	2	—	5
	5	20	1	1	1	2
	6	7	—	—	—	—
	7	43	2	1	1	4
	8	18	3	6	1	8
	9	1	—	—	—	—
	10	9	—	—	—	—
	11	18	3	1	—	4
	12	8	2	1	—	3
	13	12	6	5	1	9
	14	26	11	4	1	12
	15	19	12	10	6	15
II-3	9504	174	62	43	17	78
	1	1	—	—	—	—
	2	4	2	2	—	2
	3	26	5	5	2	7
	4	33	10	9	2	14
	5	9	3	1	—	5
	6	7	2	1	1	2
	7	14	7	1	—	7
	8	19	8	9	1	11
	9	7	1	1	—	2
	10	29	15	6	7	17
	11	25	9	8	4	11
	9505	193	95	75	32	121
	1	3	2	1	1	3
	2	19	10	6	3	11

3	—	—	—	—	—
4	14	5	5	3	9
5	11	9	7	—	9
6	9	3	7	4	8
7	29	7	2	2	8
8	4	1	1	—	2
9	13	10	5	2	10
10	20	6	8	2	11
11	6	4	4	1	4
12	7	4	1	1	4
13	18	10	10	4	12
14	21	12	6	3	14
15	6	5	4	2	5
16	4	2	3	—	3
17	4	3	3	2	4
18	5	3	2	2	4

Appendix II
B. CONDITION OF PREMISES

NEEDS Neighborhoods	Number of Premises	Abandoned Vehicles	Neglected Landscaping	Rubbish Accumulation	Uncollectable Discards	Auxiliary Total	Structures Poor
9501	420	32	62	59	69	103	24
1	31	2	7	4	5	11	3
2	19	2	4	5	3	12	2
3	20	3	4	5	6	6	3

4	15	2	1	2	2	4	2
5	7	—	3	2	2	3	2
6	17	1	1	—	—	7	1
7	32	1	7	4	11	8	2
8	9	1	1	2	2	1	—
9	16	1	3	4	5	2	—
10	18	6	4	6	5	4	2
11	32	8	10	11	13	7	4
12	8	1	5	3	4	1	—
13	17	—	—	—	1	—	—
14	23	2	3	3	2	6	—
15	30	—	4	3	3	10	1
16	5	—	—	—	—	—	—
17	22	1	2	2	2	4	1
18	18	—	2	1	1	5	1
19	12	—	—	1	1	—	—
20	16	—	—	—	—	—	—
21	20	1	—	1	—	5	1
22	33	—	1	—	1	7	—
9502	331	48	74	87	74	94	24
1	17	2	7	7	7	9	5
2	12	2	7	2	5	4	—
3	20	—	4	5	3	1	1
4	22	6	12	11	6	4	1
5	18	5	7	11	8	11	5
6	14	3	6	8	7	5	2
7	14	1	1	—	1	2	1
8	18	2	3	6	4	6	2
9	13	—	—	1	1	4	—

10	25	2	4	1	3	6	1
11	18	5	2	6	3	6	1
12	12	2	—	—	—	2	—
13	11	2	2	2	2	—	—
14	10	—	—	1	2	1	—
15	1	—	—	—	1	—	—
16	8	1	4	2	3	6	—
17	3	—	—	—	—	2	—
18	18	—	4	5	4	4	—
19	10	3	2	1	1	2	1
20	5	2	1	3	1	—	—
21	19	3	4	6	4	8	—
22	15	—	2	2	1	1	—
23	5	1	3	2	3	3	2
24	12	2	2	3	4	7	2
25	11	1	—	2	—	—	—
9503	243	14	41	42	31	83	10
1	13	—	1	1	5	7	4
2	9	—	1	5	2	3	2
3	8	—	7	5	1	2	—
4	9	4	3	2	4	3	—
5	22	1	2	—	—	4	—
6	10	1	1	6	2	—	—
7	43	—	3	4	—	10	—
8	20	2	5	3	1	10	—
9	6	1	1	2	—	4	—
10	11	—	—	—	—	5	—
11	20	—	2	4	—	4	—
12	9	1	5	4	3	5	—

13	15	2	3	1	6	6	3
14	27	–	4	4	–	13	–
15	21	2	3	1	7	7	1
9504	248	16	43	30	32	40	7
1	3	–	–	–	–	–	–
2	4	–	1	1	1	1	1
3	37	2	4	3	3	1	–
4	37	6	7	4	3	7	1
5	16	–	2	1	–	4	–
6	13	–	–	1	–	1	–
7	27	1	7	4	3	4	–
8	35	2	3	4	4	5	2
9	14	1	1	2	5	–	–
10	35	3	10	5	7	8	1
11	27	1	8	5	6	9	2
9505	246	42	71	76	78	92	42
1	4	–	–	2	1	–	–
2	22	1	1	6	5	2	–
3	2	–	–	–	–	–	–
4	21	4	5	6	4	12	5
5	14	2	6	4	6	8	4
6	15	3	7	7	7	4	2
7	34	6	5	7	17	11	2
8	8	1	2	1	4	2	–
9	15	4	5	9	5	4	1
10	22	4	6	4	2	6	1
11	11	3	2	4	–	1	–
12	9	2	3	3	3	1	1

13	20	4	7	9	9	10	9
14	25	3	8	5	5	18	10
15	6	3	5	3	4	5	2
16	5	—	4	3	4	7	4
17	7	1	4	2	2	—	—
18	6	1	1	1	—	1	1