MUNICIPAL PLANNING COMMISSION ACTION:

Supported - 1980 11 06

Bylaw No. 6259

(As Amended)
Being a Bylaw to adopt the Twin Brooks
Area Structure Plan

As to Conto as Manual City Solicitor

As to Conto as Manual City Solicitor

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WHEREAS pursuant to the provisions of The Planning Act, 1977, being Chapter 89 of the Statutes of Alberta, 1977, a Council may, by bylaw, adopt an Area Structure Plan; and

WHEREAS the Council considers it desirable to adopt an Area Structure Plan for Twin Brooks, for an area more particularly described as portions of Section 31, Township 51, Range 24, West of the Fourth Meridian and the South West Quarter of Section 32, Township 51, Range 24, West of the Fourth Meridian, generally located south and west of Blackmud Creek, east of Whitemud Creek, within the City boundary and north of the City boundary, approximately one mile west of Calgary Trail; and

WHEREAS the Municipal Planning Commission, at its meeting of 1980 11 06 supported the Twin Brooks Area Structure Plan.

NOW THEREFORE, upon the recommendation of the Municipal Planning Commission, and after due compliance with the provisions of The Planning Act, 1977, the Municipal Council of the City of Edmonton duly assembled, enacts as follows:

- 1. This bylaw may be cited as the "Twin Brooks Area Structure Plan bylaw".
- 2. Appendix "A" attached hereto and forming part of this bylaw, entitled The Twin Brooks Area Structure Plan, is hereby adopted as the Twin Brooks Area Structure Plan.

THE

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READ a first time this 7 day of READ a second time this 9 day of READ a third time and duly passed this 73

DECEMBER, A.

DECEMBER, A.

B day of FEBRUARY, A.

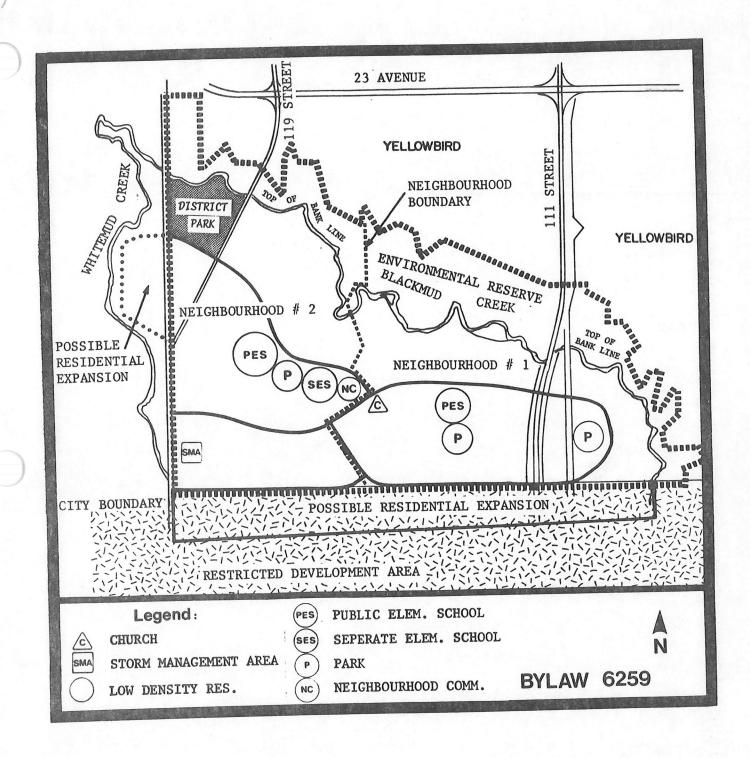
, A.D. 1980;

, A.D. 1980

OF EDMONTON

Mayor

City Clerk.



BY AN 6259 (AS AMENDED)

# TWIN BROOKS Area Structure Plan

KASKITAYO OUTLINE PLAN AREA

City of Edmonton



November 1980

UNDERWOOD McLELLAN LTD.

Consulting Engineers & Planners

## **BYLAW** 6259

# TWIN BROOKS

Area Structure Plan

## KASKITAYO OUTLINE PLAN AREA

City of Edmonton

prepared for

COSTAIN LIMITED
WIMPEY WESTERN LIMITED
TRIPLE FIVE CORPORATION

prepared by

UNDERWOOD McLELLAN LTD. Consulting Engineers and Planners

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### PART 1 ~ BACKGROUND INFORMATION

#### 1.1 <u>INTRODUCTION</u>

This document has been prepared to meet the statutory requirements of Section 62 of the Alberta Planning Act 1977 and to establish a basic framework and guidelines for the future subdivision and development of this new suburban area to be known as Twin Brooks.

The basic content requirements of an Area Structure Plan in the City of Edmonton are set out in Section 17 of the Edmonton General Municipal Plan (1980) as follows:

- 17.C.4 The preparation of Area Structure Plans shall adhere to the requirements of Section 62(2) of the Planning Act, 1977 and shall further indicate:
  - (a) Existing conditions in terms of land use, transportation, natural environment and social and economic characteristics of existing population.
  - (b) The environmental, social and economic impacts of land use proposals.
  - (c) The conceptual identification or designation of functional areas such as neighbourhoods, of the distribution of residential development by the type and density, commercial districts, industrial districts, and parks and institutional uses in accord with the policies and principles of the General Plan and any District Plan.
  - (d) Any information on public land requirements.

Underwood McLellan Ltd., Consulting Engineers and Planners, has been retained to prepare this Area Structure Plan by Costain Limited, Wimpey Western Limited and Triple Five Corporation, who control the majority of land within the Twin Brooks Area.

The Twin Brooks Area Structure Plan has been prepared in accordance with the Terms of Reference adopted by the Municipal Planning Commission and approved by the City Council. The draft reports have been submitted to the City of Edmonton Planning Department and circulated to various government agencies for their comments.

In addition, a public meeting was held on October 1, 1980 to receive public input at this stage of the planning process.

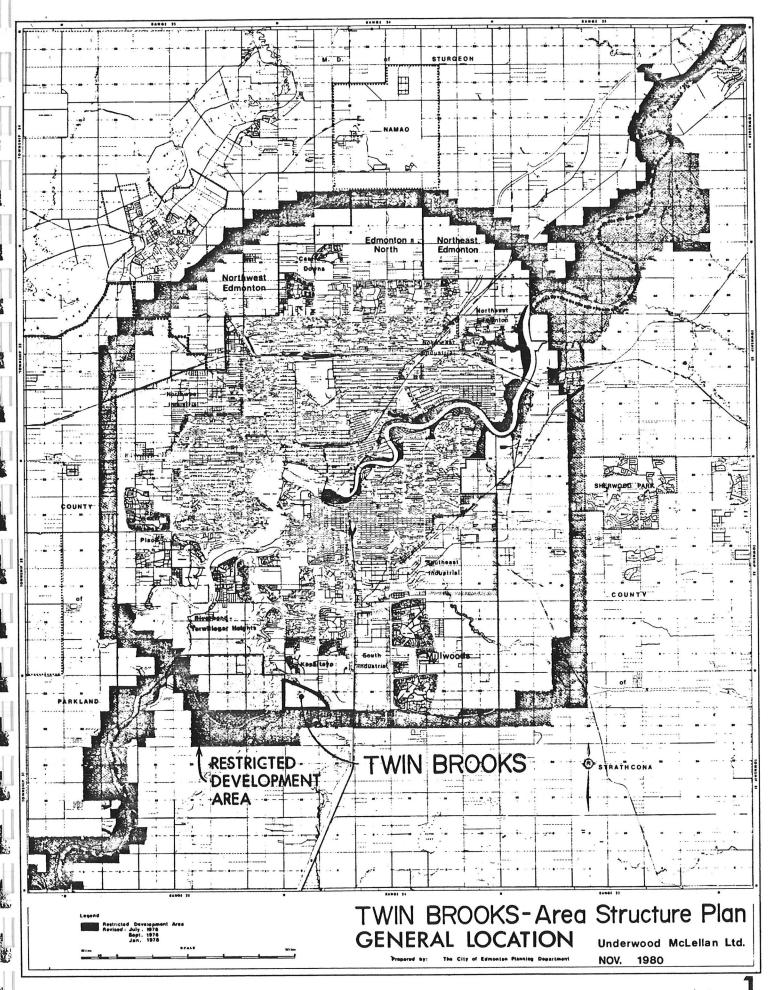
The draft report has now been revised to accommodate most of the comments from the Planning Department and other government agencies.

This Area Structure Plan will provide the link between the Edmonton General Municipal Plan and Neighbourhood Plans.

#### 1.2 TWIN BROOKS LOCATION

The Twin Brooks Area Structure Plan covers the triangular area bounded by the Blackmud Creek to the northwest, the present City boundary to the south and 119 Street (original government road allowance) to the west.

Plate 1 shows the location of Twin Brooks relative to the major urban activity centres, other outline plan areas and the Restricted Development Areas in the Edmonton vicinity. It is situated in the south central part of the City. The south industrial area is situated to the east between Kaskitayo and Mill Woods, which is in close proximity to both of these residential communities. The future Riverbend-Terwillegar Heights district borders on the Whitemud Creek immediately to the west.



The central business district and the University of Alberta lie directly to the north, approximately 10 km and 8 km away, respectively. They are readily accessible by way of 111 Street and the Calgary Trail (Highway 2) which lies about 1.5 km to the east of Twin Brooks.

The Province of Alberta Restricted Development Area surrounds the City and extends along the river valley as shown on Plate 1. That part encircling Edmonton is generally understood to be a corridor which would contain a future outer ring road and major utility lines. The restricted area varies from 800 to 1600 m in width in the vicinity of the Twin Brooks area with the greater width in the Whitemud Creek area.

#### 1.3 <u>HISTORY</u>

The Twin Brooks lands have previously been included in the Kaskitayo Outline Plan. They were a part of the area identified for future urban development in the Kaskitayo Development Policy and Guidelines Report prepared by the City Planning Department in 1970. That report indicated that "the southern boundary of the Kaskitayo area is formed by the proposed alignment of the Outer Ring Road".

The Kaskitayo Outline Plan provided the basic guidelines for development of the area. It included the lands south of 34 Avenue to the Outer Ring Road and generally between the Whitemud Creek and the Calgary Trail.

The outline plan was approved by City Council in October 1973. Development in the area began almost immediately and has proceeded at a rapid pace since that time. The particular amenities of the Kaskitayo area and its location

with respect to places of employment, shopping facilities and the City transportation system has enabled it to meet a broad range of residential needs. While the single family form of housing covers the largest land area, there are also significant numbers of townhouse and apartment units within the district which has been developed within the general guideline of 22 persons per acre.

The entire Kaskitayo area lying to the north of the Blackmud Creek is now either developed, being constructed or in the final stage of development approval. Plate 2 shows this community and the extent of detailed subdivision carried out to date.

In 1979, the Local Authorities Board approved an application to annex the Twin Brooks area within Sections 31 and 32 to the City of Edmonton effective January 1, 1980.

## PART 2 - EXISTING FEATURES

This part summarizes the development influences upon the Twin Brooks lands. Consideration is given to the natural features, existing ownership and uses, and access to the area. Parts of this material have been obtained from an Environmental Impact Assesment Study of the area prepared by MTB Consultants Ltd. Reference should be made to Plate 3 which indicates many of the features described.

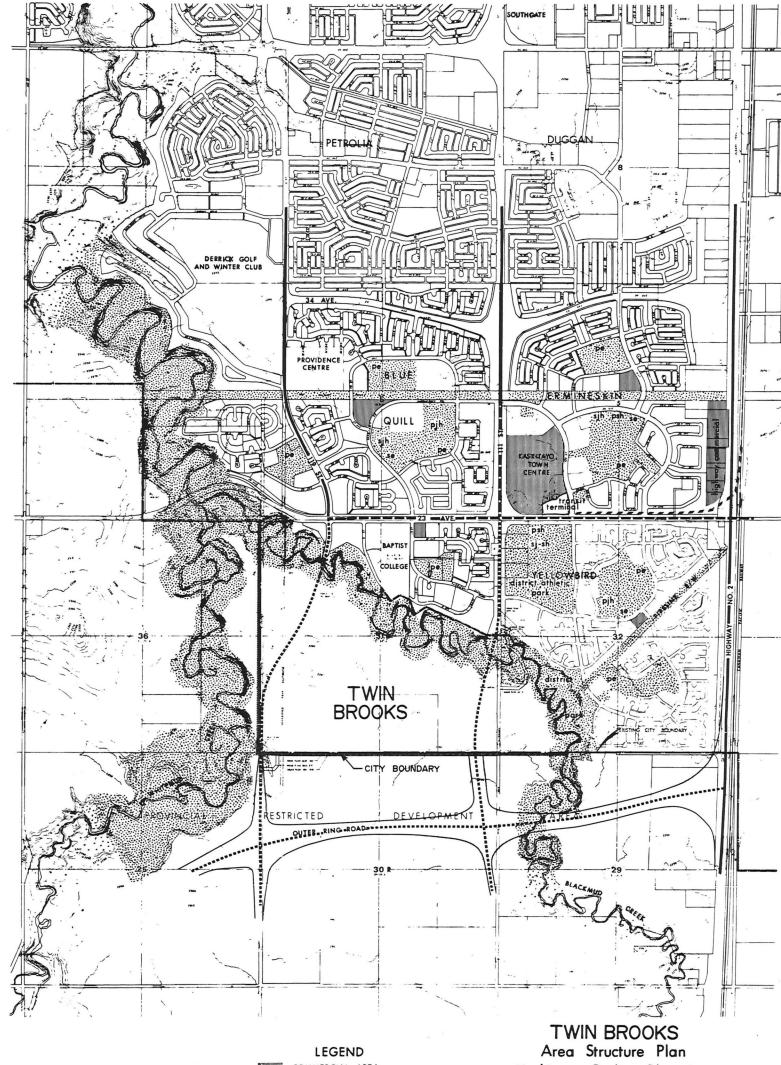
#### 2.1 NATURAL FEATURES

#### 2.1.1 Topography

The Twin Brooks lands include about 160 ha (400 acres) of table land. The upland is triangular in shape, and relatively flat. The slope of the site is towards the north and west with relief being in the order of 5 m.

The most significant features of the area are the two ravines: the Whitemud which forms the western boundary and the Blackmud which lies between these lands and the developed part of Kaskitayo to the north and east. (They have substantial topographic relief with the creek bottoms being anywhere from 18m to 30 m below the top of the bank.) The main valleys are approximately 150 m wide with a small stream meandering from valley wall to valley wall. The banks are relatively steep, with slopes ranging from 15% to 45%.

Numerous promontories and view points occur along the ravine system which should be retained as natural assets for public use. Housing development is to be set back from the tops of bank at a safe distance. A detailed slope stability analysis was carried out to determine the appropriate development line, based on the geotechnical requirements of the area.



METRES od McLellan Ltd. NOV. 1980



COMMERCIAL AREA

PARKS, SCHOOLS & OPEN SPACE

EXISTING MAJOR ROADS

BUDGETED MAJOR ROADS

PLANNED MAJOR ROADS
PLANNED TRANSIT LINE

Kaskitayo Outline Plan Area

LAND USE & ACCESS

plate 2

A top of bank survey has been carried out for the development by Walker, Newby & Associates.

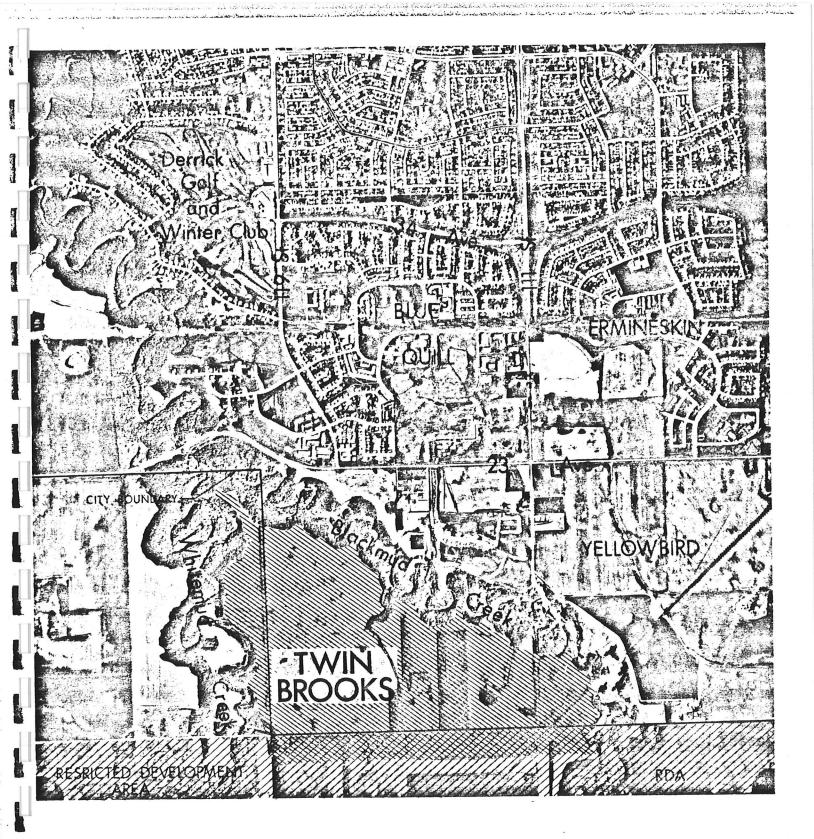
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#### 2.1.2 Soils Stability

The soils encountered in the area are typical of the Edmonton area, consisting of an upper stratum of lacustrine clay and silt to depths of between 6 and 9 m below the table land surface overlying a glacial till which in turn rests on bedrock. The bedrock consists mainly of shale, mudstone and sandstone. In one respect the bedrock is not typical of the Edmonton formation of which it is a member, and that is in its low to medium plasticity. This condition has resulted in an absence of failure and slumping in the area, confirmed by field reconnaissance. Such slope failures as have occurred are confined to lacustrine clays and glacial till, and are caused by surface run-off and seepage. Both these factors will be eliminated or greatly reduced by the installation of a storm drainage system, and by the construction of roads and other facilities which will intercept overland flow.

The Report on Slope Stability and Development Setback Distances, from which the above information is taken, also describes in detail the method used to determine the development setback line from the valleys of Blackmud and Whitemud Creeks.

Briefly stated, it is assumed that regression of the valley slopes will occur due to slumping of the overburden due to seepage and surface erosion, and failure of the bedrock due to toe erosion by either Creek. Two design slopes were calculated, one for the overburden and one for the bedrock, with factors of safety of 1.5, which would be the angle of





Underwood McLellan Ltd. NOV. 1980 Photo Date: May 27, 1978 Geographic Air Surveys TWIN BROOKS
Area Structure Plan
Kaskitayo Outline Plan Area
SITE CHARACTERISTICS

slope after failure (present slopes are steeper). Using these slopes, starting from the existing toe of the valley side, a line was established beyond which it is not expected that there will be any ground failure during the life of any structures that may be built there. It is recommended that all buildings be behind this development line.

#### 2.1.3 Soil Category

The upper lacustrine material, as mentioned, consists of low to medium plastic clay, with some silt. This will pose no hindrance to development. The area has an agricultural land capability of 1 under the Canadian Land Inventory Classification System. Most of the test holes drilled on the site revealed the presence of ground water. However, this is not expected to pose any serious construction problems.

#### 2.1.4 Vegetation

The only major tree cover is in the two ravines. It is a most aesthetically pleasing and valuable component of the site. The expanse of forests and shrubbery provide a pleasant relaxed environment as well as habitat for a variety of wildlife. A less obvious but equally important value of the valley vegetation is stabilization of surface soils on the steep side slopes and creek banks. Spruce and poplar are the major tree species in the area and exist at varying stages of maturity.

#### 2.2 EXISTING LAND USES & OWNERSHIP

The majority of the Twin Brooks lands are held as large parcels. Plate 4 indicates the owners at the present time. The main parts of the area are within Sections 29, 30 and 31, Township 51, Range 24, W4M, with smaller areas in S.W. 32 on the east and Section 36, Range 25, on the west.

All of the table land has been cultivated as are the lands in the Restricted Development Area to the south. Within the City area there is one farmstead, located on the 16 ha (40 acre) Buzenus property. There are other residences in the vicinity of the ravines: The Forman home in the northwest ravine area and the Broughton and Wheaton properties near the road diversion across Blackmud Creek at 111 Street. The Wheaton home is within the ravine land, whereas the Broughton residence is on the top edge of the ravine bank. There are three homes in that part of the RDA that will be included in the Plan.

A number of oil and gas pipelines cross the eastern part of the area and serve industrial developments further within the City. One line crosses the southern portion of the site, adjacent to the roadway, in a 15 m right-of-way. Special site planning considerations will have to be given to the development of the land uses around the pipelines. There are no actively producing oil or gas wells in this area.

Several roads have been developed, with the road allowance on the 111 Street alignment being the main access to the north. The road allowance to the west of Section 31 is not developed across the Blackmud Creek and serves only the south side. An east-west road runs along the City boundary. These roads have been built to a rural standard with ditches on both sides. The most travelled routes have been hard surfaced.

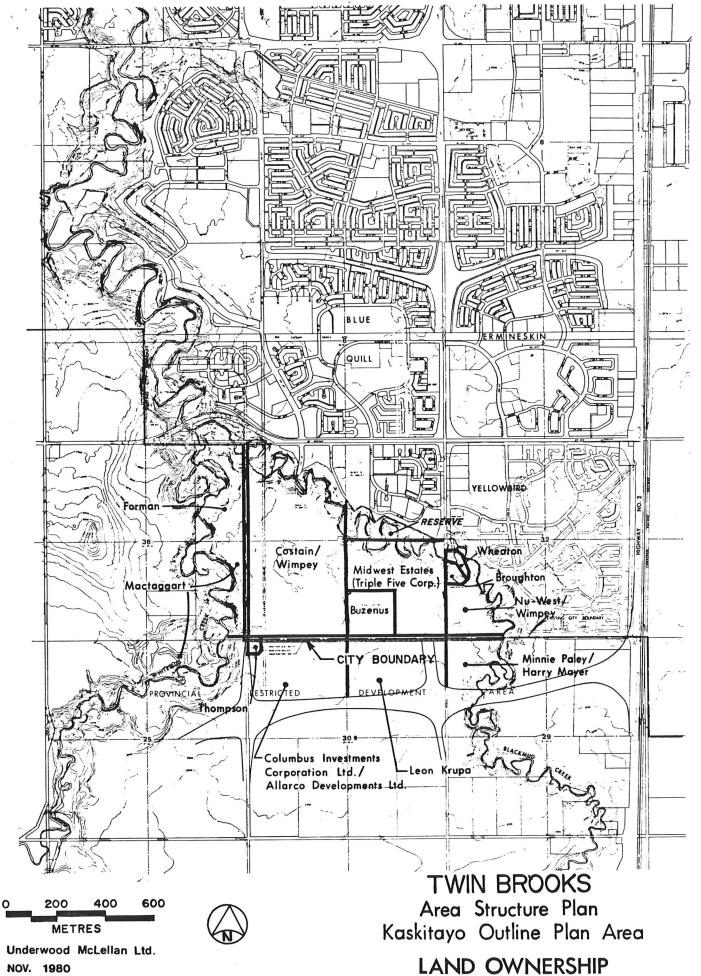


plate 4

#### 2.2.1 <u>Archeological Analysis</u>

An archeological analysis of the Twin Brooks area within the City boundary was carried out in the fall of 1979 by Archeological Researches International Ltd. An intensive archeological reconnaissance was made in which all parts of the property were walked, with more detailed inspection being done on specific sites.

A report was prepared, entitled "Final Report of an Historical Impact Assessment of a Proposed Subdivision in the South Kaskitayo District".

The Report concluded that the site had been totally disturbed by plowing and wind erosion, and that nothing of prehistoric significance will be lost by intensive construction activity. It was also found that all the early homestead buildings on the property have been torn down, moved or replaced, so nothing of historic significance remains.

#### 2.3 KASKITAYO DISTRICT OUTLINE PLAN AND DEVELOPMENT

The location of community and district facilities in the developed part of Kaskitayo are indicated on Plate 2.

The Kaskitayo Town Centre, now being constructed, will become a focal point of the area. Its location, in the northeast quadrant of the 111 Street and 23 Avenue intersection, makes it readily accessible from all parts of the community as well as other surrounding areas. The future development of a light rail transit terminal at this site will also increase the importance of this location relative to the City wide transportation system. The senior high school/district athletic park located to the south of the Town Centre reinforces this central focus of the community.

The linear grouping of these facilities along 111 Street provides a strong access relationship to the ravine and the Twin Brooks area. This major arterial street will extend south to tie to the Outer Ring Road and provide ready access to these central facilities and to the other communities.

Kaskitayo was developed on a neighbourhood basis, with two to three neighbourhoods combining to form a community. The neighbourhoods focus around elementary schools while the community is formed by the area within the junior high school and separate elementary school service boundaries. The district facilities form the focus, both in terms of location and services provided, for the communities as described above.

There are three communities in Kaskitayo lying to the north of the Blackmud Ravine: Ermineskin in the northeast, Blue Quill to the northwest and Yellowbird to the south and southeast. The residential development of Twin Brooks will form the final community to complete the district.

#### 2.4 ACCESS

Twin Brooks is served internally by the roadways described above. The existing City of Edmonton roadways north of the area include: 119 Street north of 23 Avenue and 111 Street (rural section); 23 Avenue (rural section). These roads connect to the south Edmonton circulation system including Calgary Trail (Highway No. 2) and Whitemud Freeway (45 Avenue).

Bus transit service is currently provided to the built up parts of the Kaskitayo district. The two main connection points are at Westbrook Drive and 119 Street and 31 Avenue and 106 Street.

As part of the ongoing development of the Kaskitayo growth areas, major elements of the overall transportation system have been planned. These are shown on Plate 2 and may be described as follows:

- 1. 111 Street a 4 lane divided arterial road with capability to be expanded to 6 lanes, planned to extend south to the Outer Ring Road and beyond. Present scheduling calls for the city to construct two lanes from 23 Avenue to 30 Avenue (Saddleback Road) in 1982. It is already in service north of 30 Avenue. For the portion south of 23 Avenue to the Saddleback Road, two lanes would be built by 1982.
- 2. 119 Street a future 4 lane divided arterial road that has been developed to 23 Avenue as a 2 lane, first stage.
- 3. 23 Avenue a 6 lane divided arterial road planned for staged construction between 111 Street and the Calgary Trail (Highway 2), with two lanes to be completed in 1981. For that portion between 111 Street and 119 Street, 2 lanes are to be constructed in 1982.
- 4. Outer Ring Road a limited access, high speed roadway that may eventually be constructed in the Restricted Development Area immediately south of Twin Brooks at some future date.
- 5. Kaskitayo Transit Center located in the northeast quadrant of the 111 Street 23 Avenue intersection will include a bus transit center and eventually a Light Rail Transit Station in conjunction with a regional shopping center complex. It is expected that the bus center will begin to operate as the final areas in Kaskitayo are "developed out". Detailed functional studies of the south leg of the LRT are now underway.

#### 2.5 MAJOR UTILITY SERVICES

The basic utility services have been installed or will be constructed in the immediate future as part of the Kaskitayo development to the north. They have been sized so as to have capacity to serve the Twin Brooks residential development. In most cases, their simple extension across the Blackmud ravine will bring them into the development area, as described below. Plate 5 shows the general layout of these major utility service components.

#### 2.5.1 <u>Water</u>

The primary source of water for the area is the E.L. Smith Water Treatment Plant. A 900 mm diameter feeder main from this plant is installed on 34 Avenue. A 450 mm diameter main on 111 Street, connected to the 900 mm main, extends service to near 23 Avenue. A 600 mm main extends southward to a reservoir site.

The reservoir will be of 30,000 m<sup>3</sup> capacity, and will be built in 1980. The site is at the southeast corner of the intersection of Saddleback Road and 111 Street.

To serve Twin Brooks, the 600 mm line will be extended southward across Blackmud Creek, through the subdivision, across Whitemud Creek into Terwillegar Heights and connect to a 1050 mm diameter feeder main from the E.L. Smith plant. This will form an important component of the overall feeder main network in this part of the City.

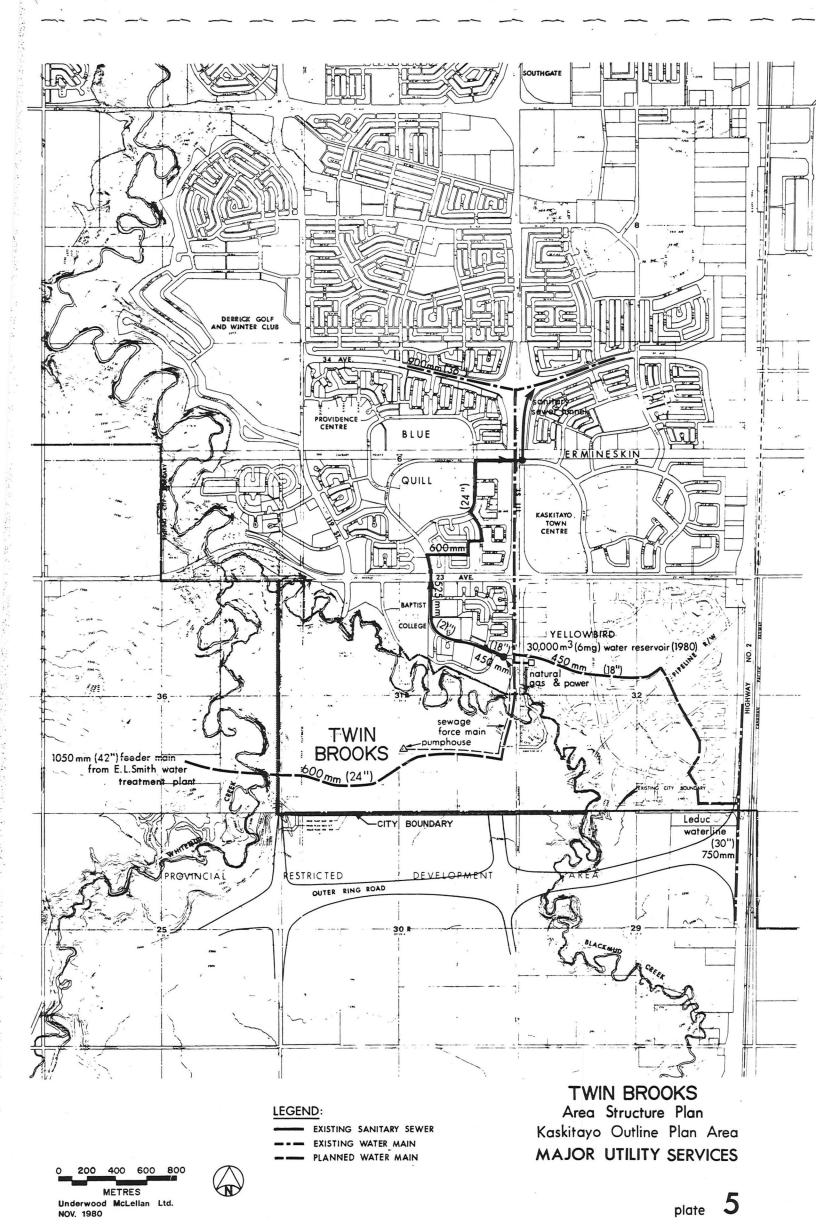
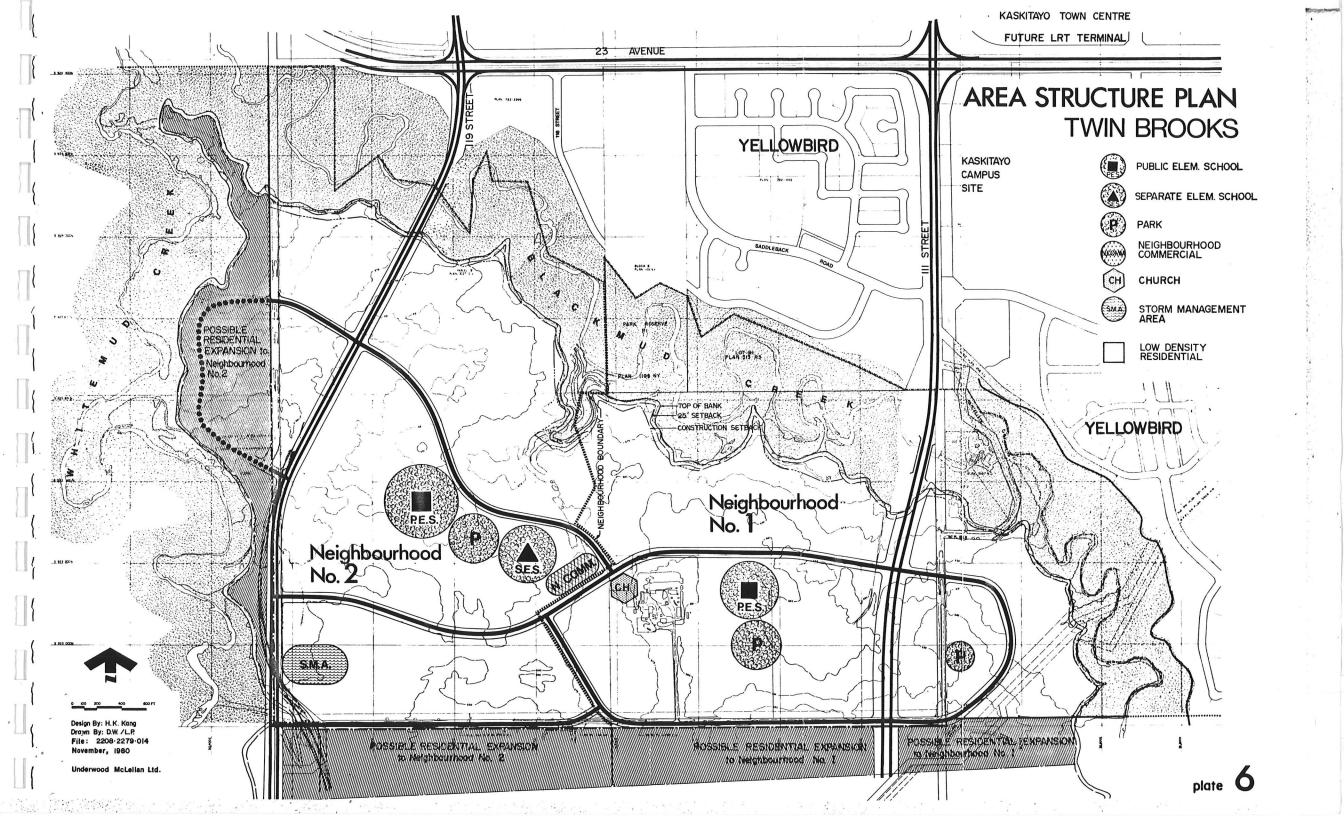


plate 5



The 600 mm main, connected to the reservoir, will serve the Twin Brooks area satisfactorily. Looping to ensure emergency water supplies, prior to completion of the connection across the Whitemud Creek, can be made by tieing to the lines in the Yellowbird area.

#### 2.5.2 Sanitary Sewage

Sanitary sewer service for Twin Brooks will be provided by a recently constructed 450 mm diameter sewer which terminates at the intersection of Saddleback Road and 111 Street. Due to topographic reasons, it will be necessary to pump the sewage to this sewer. A sewage lift station will be constructed in the development, to which all areas will drain by gravity. The sewage will be pumped through a 250 mm force main along the new alignment of 111 Street across Blackmud Creek to the trunk sewer.

#### 2.5.3 Storm Drainage

Storm water runoff from the area could be drained into Whitemud and Blackmud Creeks, or into the 30th Avenue major storm sewer. It is considered that the latter alternative is impractical, as it would entail installing a large sewer down the Valley side and then along the bottom of Whitemud Creek to make connection with the trunk sewer.

The preferred alternative is to discharge the storm water into the Creeks. Edmonton Water and Sanitation has indicated that these discharges are not to exceed a total volume of  $0.28~\text{m}^3/\text{s}$  (10 cubic feet per second). Moreover, Alberta Environment has indicated that direct discharge into the Creek, with suitable outflow structures, would be acceptable to them. This matter will be the subject of discussions with Edmonton Water and Sanitation.

An additional regulating pond will be needed in the upland area. It will be a "dry" pond in accordance with the recommendations of the Slope Stability Report referred to elsewhere. (A "dry" or detention pond is one which contains water for a short period after rainfall. Normally it is dry and may be landscaped and used for recreation purposes).

The storm runoff from roofs and streets will be picked up by a conventional storm drainage system and carried to the regulating ponds.

#### -2.5.4 Other Utilities

Other utilities, such as natural gas, power, telephone and cable T.V. can be supplied by extension of facilities from adjoining areas.

PART 3
AREA STRUCTURE PLAN
DEVELOPMENT CONCEPT

## PART 3 ~ AREA STRUCTURE PLAN: DEVELOPMENT CONCEPT

The primary objective of this residential Area Structure Plan is to provide basic guidelines for the development of the lands in a manner that is compatible and complementary to the overall development within the Kaskitayo district. A further purpose is to provide a framework which will enhance the creation of an attractive residential area which is in harmony with the uniquely attractive surrounding ravines and open spaces.

#### 3.1 <u>DEVELOPMENT OBJECTIVES</u>

The following basic objectives are to be achieved in the development of the Twin Brooks area:

- To provide high quality, innovative residential development opportunities
- to conserve and optimize the use of the natural environment through sensitive integration of development with natural features
- to optimize the amount of land designated for recreational purposes
- to provide for residential development on a neighbourhood basis as part of, and compatible with, the Kaskitayo district
- to provide for a variety of urban and suburban lifestyles by allowing a range of densities and a diversity of dwelling types
- to provide soft and hard services to the standards of the City
- to provide for the integration of parts of the Restricted Development Area where development will be permitted, and the Table land between 119 Street and Whitemud Creek when these areas are annexed to the City

These objectives form the basis of the Area Structure Plan Concept for the Twin Brooks Area.

#### 3.2 LAND USE PATTERN

#### 3.2.1 Residential

Residential development will form the primary land use within Twin Brooks. In keeping with General Municipal Plan objectives and policies, development will occur on a neighbourhood basis. These neighbourhoods will be centered around an elementary school.

Innovative residential forms and housing types which are complimentary to the other parts of the Kaskitayo District will be provided within the neighbourhood development concept. It will be important to utilize subdivision and housing designs that will enhance the provision and effective use of open space areas and utilize solar energy efficiently.

Plate 6 shows the schematic land use and circulation system that will guide future development plans for the area.

The density range for the Twin Brooks area will be from 44 to 68 persons per gross developable hectare (18 to 27 p./g.d.a.). All detailed plans of subdivision will conform to the "Guidelines for the Distribution and Design of Neighbourhood Densities". The lower range of densities with lower building forms will be in the vicinity of the ravine lands and in general within the northerly part of the site. Higher buildings, with higher densities, will be located further to the south so as not to block views of the ravine area and other city development to the north.

The actual density of development will be determined by market demand and cost realities at the time of subdivision plan approval. It is anticipated that the majority of the area will be for single family accommodation. The higher density range will, however, provide for nodes of multiple units within selected sites. These locations will be defined at the neighbourhood structure plan stage.

Two neighbourhoods are proposed for Twin Brooks as shown on Plate 6. Each will be served by a centrally located public elementary school. The boundary between Neighbourhood No. 1 to the east and Neighbourhood No. 2 to the west is established in general terms as illustrated on Plate 6. This boundary will be refined at the next planning stage when the actual road alignment is determined.

Table 1 sets out estimated population and distribution ranges for the overall areas. It shows the estimates for the land within the present City boundary, the land outside the present City boundary and for the combined situation. Approval of the Area Structure Plan will be only for that area within the present city boundary at the time of the passing of the bylaw.

TABLE 1
ESTIMATED POPULATION AND DISTRIBUTION

NEIGHBOUR-	GROSS DEVELOP- ABLE AREA		POPULATION			
HOOD			Rai	nge		9
	Hectares	Acres	18/Ac	22/Ac	Average	Projected
No. 1						
-within city limits -outside	69.2	171	3,078	3,762	3,307	(19.34/Ac)
city limits	15.4	38	684	836	735	(19.34/Ac)
TOTAL	84.6	209	3,762	4,598	4,042	(19.34/Ac)
				-		
No. 2						a de la companya de
-within city limits -outside	81.0	200	3,600	4,400	3,720	(18.60/Ac)
city limits	28.3	70	1,260	1,540	1,302	(18.60/Ac)
TOTAL	109.3	270	4,860	5,940	5,022	(18.60/Ac)
TOTAL AREA NO. 1 & NO. 2				,		
-within city limits -outside city limits	150.2 43.7	371 108	6,678 1,944	8,162 2,376	7,027	(18.94/Ac) (18.86/Ac)
TOTAL	193.9	479	8,622	10,538	9,064	(18.92/Ac)

TABLE 2 PROJECTED SCHOOL POPULATION

	ELEMENT	ARY	JUNIOR HIGH		SENIOR HIGH	
	Public <sup>(1)</sup>	Separate <sup>(4)</sup>	Public <sup>(2)</sup>	Separate <sup>(4)</sup>	Public <sup>(3)</sup>	Separate <sup>(4)</sup>
NEIGHBOURHOOD NO. 1	-					4 .
-within city limits -outside city	421	105	187	47	153	38
limits	93	23	42	10	34	9
TOTAL	514	128	229	57	187	47
NEIGHBOURHOOD NO. 2			-			
-within city limits -outside city	478	120	217	54	175	44
limits	167	42	76	19	61	15
TOTAL	645	162	293	73	236	59
TOTAL AREA						
-within city	899	225	404	101	328	82
-outside city limits	260	65	118	29	95	24
TOTAL	1159	290	522	130	423	106

<sup>(1)</sup> Based on .43 students/single family, .43/duplex, .43/town house and .11/apartment

<sup>(2)</sup> Based on .20/single family, .12/duplex, .12/town house and .04/apartment (3) Based on .16/single family, .12/duplex, .12/town house and .04/apartment (4) Separate school population is based on 25% of Public School Population

Source: Separate School Board.

#### 3.2.2 Institutional

Two public and one separate elementary school are proposed to serve the Twin Brooks Area. Table 2 shows an estimate of student generation figures applicable for ultimate development. It assumes that the elementary students from this area will attend their home schools and not take extensive advantage of special classes at other locations under a more open school system.

Junior and senior high school facilities in the other developed areas of Kaskitayo will be used by the Twin Brooks Area students. The close proximity of the Kaskitayo Campus will allow it to be used most conveniently. Other district schools will also be easily accessible by the transportation system that will be developed.

The actual size and location of the elementary schools and associated park and playground facilities will be defined at the neighbourhood structure plan stage. They will be centrally located within their catchment area and will be associated with other open space or natural areas of the development. The two public elementary school catchment areas will coincide with the neighbourhood boundaries whereas the separate elementary school will serve the entire area.

The separate school will be part of the Neighbourhood 2 complex. It should therefore be most central to the whole area and have good bus access and service.

Adequate area for churches and other institutional facilities will be provided with the sizes and locations to be defined at the neighbourhood structure plan stage.

Fire protection can be provided from the fire station located in the Erminskin community, near 23 Avenue and 106 Street.

Police protection will be extended from the existing stations serving the area.

#### 3.2.3 <u>Commercial</u>

Neighbourhood commercial facilities will be provided to serve the daily shopping needs of residents in the immediate area. This facility on a site of about 1 ha, should be located along the main collector within the neighbourhoods and with good access from all areas. The preferred location would be in a central position adjacent to the separate elementary school site as shown on Plate 6. The specific location and size of this facility for provision of convenience goods and services will be defined at the neighbourhood plan stage. The main commercial area serving Twin Brooks will be the Kaskitayo Town Centre.

#### 3.2.4 Parks and Open Space

Community league parks will be located with the joint school/park sites in accordance with City policies. Other open spaces, such as pocket parks, tot lots, playgrounds, ornamental parks and viewpoint parks will be designated at the neighbourhood plan stage in relation to the housing densities, the mix of population and environmental character of the areas.

A pedestrian and bikeway linkage system, largely following the sidewalk and street pattern, will connect the various open space components with the residential areas. The Twin Brooks area is endowed with ample amounts of natural open space potential. The Blackmud and Whitemud Creeks provide very attractive open space areas. While these have some environmentally sensitive areas they can be used for recreation purposes within the limits or guidelines suggested by the Environmental Impact Report.

Environmental reserves will be provided within the ravine areas in accordance with the Planning Act and relevant City policies. The land isolated between the top of bank and roadways or other development can be used for passive parks, view points or moderately active play areas, to be designated at the neighbourhood plan stage. However, there will be no development or disturbance of the vegetation or surface materials that may cause bank instability.

The existing pipeline rights-of-way will be retained for open space use unless the lines are moved to another location. Such uses would include park development, walkways, or other uses that may be allowed under current policies. Building locations relative to the lines will be defined at the detail planning stage.

A large open space area will be associated with the storm water management facility proposed on the southwestern edge of the area. The storm management facility will be of the dry type for detention of water temporarily during periods of high runoff. Open space uses that can be developed on this area will be defined at the neighbourhood plan stage when the site area and configuration is determined.

#### 3.3 <u>CIRCULATION</u>

#### 3.3.1 Roadways

The Twin Brooks area will ultimately be connected to the City-wide arterial networks. 111 Street, a major arterial, will run through the eastern portion of Twin Brooks, connecting the area to the Outer Ring Road in the south and 23 Avenue and the remainder of the grid arterial system to the north. 119 Street, a minor arterial located in the western part of Twin Brooks will also connect the area to 23 Avenue and the arterial grid system to the north.

Internal collector roadways, as shown on Plate 6, are designed to carry traffic generated within Twin Brooks. Local roadways will be designed in such a manner that any unnecessary through traffic will be discouraged. Predominant features of the local road systems will be loops and cul-de-sacs. In order to maximize the use of passive solar energy, local roads will be oriented in an east-west direction wherever possible. Also roads along the top of bank will be provided in accordance with the City policies.

Rights-of-way and pavement widths proposed as well as capacity considerations are detailed in the transportation impact study in Appendix A of this document.

Development for that portion of Twin Brooks west of 111 Street shall be contingent on the traffic levels on the collector roads leading to 111 Street, and shall be based on the following:

- a) based on the provision of one collector lane in each direction on the southerly collector only, upgraded to rural standards, development west of 111 Street shall be limited to 900 dwelling units; or
- b) based on the provision of two collector lanes in each direction on the northerly collector only, development west of 111 Street shall be limited to 1,800 units.

(c) based on the provision of one collector lane in each direction on the southerly collector, upgraded to rural standards, and, two collector lanes in each direction on the northerly collector, development west of 111 Street shall be limited to 2,700 units.

In either (a) or (c), the developer shall be required to construct two lanes to rural standards on the existing grid to the southerly limit of Twin Brooks.

In each case, a monitoring program shall be established as development approaches the threshold figure in each case. The results of this program will be used to establish the need for, the responsibility of, and the timing of, the construction of 119 Street and the Blackmud Ravine crossing.

#### 3.3.2 Public Transit

The proposed local transit bus routing to serve the Twin Brooks area will be set up using the following criteria:

- (a) maximum walking distance of 400 m
- (b) continuous two-way routing on the collector system
- (c) connection via 111 Street to the future transit centre and LRT station in the Kaskitayo District Center at 23 Avenue and 109 Street.

The proposed bus route will commence at the future transit centre, proceed west along 23 Avenue, south along 111 Street, west along the east-west collector road, then follow 119 Street north a distance of approximately 400 metres, where bus turn around will be provided. The return routing will be the reverse of this sequence.

The transit route length (one-way) is about 5 km or 10 km round trip. At an average route speed of 20 km/h, this would allow for 1/2 hourservice with one bus or 15 minute service with two buses (for service to and from the transit centre at 23 Avenue and 109 Street).

#### 3.3.3 <u>Pedestrian Circulation</u>

The main facilities for pedestrian travel will be the sidewalk system associated with the road network serving the area. Only minor walkway connections between long local streets, or to give good access to bus stops, schools and parks will be provided.

A main feature of the area will be the top of ravine walkways associated with the local street system. Minor walkway connections through the park-open space lands will also be used to provide continuity of the routes along this prime amenity area.

#### 3.4 <u>UTILITIES</u>

Municipal utilities can be provided to the Twin Brooks area by the extension on facilities now developed in Kaskitayo, as described in Part 1 of this document. The location of utilities as shown on Plate 5 are approximate only with precise alignments and sizes to be established at the neighbourhood plan stage.

Storm water will be drained into the Creek system in accordance with City and Alberta Environment policies relating to flow rates and volumes. The proposed system, described earlier, requires on-site storage of rain and snow melt during high periods of runoff for the upper lands, using a "dry pond", which will be integrated into the open space system of Neighbourhood 2 and will be an amenity related to the surrounding residential area.

The precise design of these storm water management facilities will be determined at the neighbourhood plan stage.

#### 3.5 DEVELOPMENT STAGING

Staging of development in Twin brooks will, upon plan approval, realistically be dependent upon provision of utilities and access.

Utilities will be made available in the 111 Street area. The staged construction of 111 Street will form the main access to the area from the north. Once the main trunk utilities and roadway are extended across the Blackmud Ravine their extension to any part of the area can readily be made.

Since there are two major areas of separate land ownership, it is anticipated that the first stages will occur in the vicinity of the school-park site, in the approximate centre of the area. The area would grow outward, in all directions from this general area. Thus both neighbourhood 1 and 2 will be developed simultaneously.

Those areas of Twin Brooks that are now outside the City would be the last to develop, even if annexation occurs in the near future. They are on the outer edges of the area and the normal expansion outward from the first stages would make them suitable for longer range use. Provision will be made, however, to service these areas as a natural extension to the City.

While the details of development staging will be set out during the neighbourhood plan and subdivision approval process, the following time frame can be anticipated:

- Approval of Area Structure Plan, in 1980 and Neighbourhood Structure Plan(s) and first stage(s) subdivision in early 1981.
- First stage(s) on-site construction and extension of utility trunks into the area starting in late 1981.
- Completion of first stage(s), start on next stages of construction, housing construction and staged construction of 111 Street to the area in 1981.

This program foresees housing units being available for occupancy in 1981. The number of residents at that time will depend upon the size of the development stages and market conditions during this period. The timing for schools and other community facilities would be related to the population growth and the shared use that might be made of the facilities in other parts of Kaskitayo.

PART 4
TRANSPORTATION IMPACT ANALYSIS

# PART 4 ~ TRANSPORTATION IMPACT ANALYSIS

#### 4.1 INTRODUCTION

The Twin Brooks Transportation Impact Study is prepared as a part of the Area Structure Plan requirements. It is intended to outline the internal transportation system, connections to the City and Regional systems and to quantify the impacts of development on the transportation system. In order to assess effects of complete future development, the study also accounts for the lands outside of the City limits as they may eventually form part of the development unit.

As indicated in the Area Structure Plan documentation, the planned ultimate residential population in Twin Brooks ranges from 8550 to 10,450 depending on density. An approximate median level of 9750 was used in this analysis. The general location is immediately south of the Blackmud Ravine, east of the Whitemud Ravine and falling generally between the 111 Street and 119 Street arterial roadways.

#### 4.2 TRIP GENERATION AND DISTRIBUTION

#### 4.2.1 <u>Generation</u>

Utilizing average values from recent City Transportation Systems Design Department data, total A.M. peak hour person work trips are estimated at 0.19 per capita.

Twin Brooks (Ultimate projected totals)

270

A.M. Peak Hour Person Work Trips

1,870 Transit Trips (1)

Vechicle Work Trips (2) A.M. Peak Hour 1,320

Estimated 24 Hour (3) Week Day Vehicular Volumes 14,600

#### Notes:

A.M. Peak Hour

- (1) Estimated peak hour modal split to transit is 15%.
- (2) Assuming auto occupancy of 1.2.
- (3) Assuming 24 hour weekday volume equals A.M. peak hour work trips increased by 10% for other purposes and assuming that this number represents 10% of total daily trips.

#### 4.2.2 Distribution

Transit trip distribution (A.M. peak hour work trips) is assumed to be similar to that for Riverbend or the existing Kaskitayo area. Vehicle trip distribution (A.M. peak hour work trips) is also assumed to be similar to existing residential distribution in south and southwest Edmonton. Trip distribution is estimated from a Transportation Systems Design Department superzone trip table for the year 1991. It should be noted that transit trips are estimated at only 15% of total person trips for this report in order to ensure that roadway volumes are not underestimated.

#### TWIN BROOKS - TRIP TABLE

### A.M. Peak Hour Work Trips

Destination % o	Transit Trips		Vehicle Trips	
	of Total	Trips	% of Total	Trips
Downtown	68	183	38	502
University	10	27	9	118
South Central	1	. 3	4	53
S.W. Edmonton	0	0 -	0	0
Jasper Place/West Edmonton	1	2	5	66
N.W. Edmonton	3	. 7	10	132
North Central	3	7	. 3	40
N.E. Central	4	10	2	26
N.E. Edmonton	1	2	0	0
Central S.E. Edmonton	2	5	3	40
S.E. Industrial	3	10	11 .	145
South Industrial/Mill Woods	s 2	7	. 9	119
East Edmonton/Strathcona	0	2	1	13
South	0	0	3	40
Internal	2	5	2	26
Totals	100	270	100	1320

## 4.2.3 <u>Travel Assignment</u>

Two cases are assumed for Travel Assignment from Twin Brooks:

Alternate 1 is with only 111 Street crossing of the Blackmud Ravine in place. Alternate 2 is with both 111 Street and 119 Street operating. Vehicular A.M. peak hour work trip volumes are shown for both alternatives on Plate 7 for a distance of 5 km from the Blackmud Creek crossing(s) for each alternative.

Estimated peak direction A.M. peak hour work trips on various facilities at the 5 km radius from Twin Brooks are listed as follows: (for ultimate development of entire Twin Brooks Area).

#### For Alternates 1 or 2:

Whitemud Freeway northbound at 53 Avenue - 190 vehicles Whitemud Freeway eastbound at 91 Street - 150 vehicles 23 Avenue eastbound at Millwoods Road - 180 vehicles

#### For Alternate 1:

111 Street northbound at 61 Avenue - 560 vehicles
Highway 2 northbound at 61 Avenue - 100 vehicles

#### For Alternate 2:

111 Street northbound at 61 Avenue - 340 vehicles 119 Street northbound at 62 Avenue - 340 vehicles

As indicated by the foregoing tabulations, volume demands from Twin Brooks are dispersed relatively quickly on the road system. Maximum impact occurs with only 111 Street in service, with a maximum estimated peak direction volume of 560 on 111 Street at 61 Avenue. This amounts to about 70% of

the capacity of one lane. It should be noted however, that this impact would be approximately 60% of that indicated if the area currently within the City limits only is developed. There may be a good possibility of 109 Street being in service prior to the remainder of the area being developed, thereby minimizing the impact on 111 Street.

#### 4.3 <u>INTERNAL CIRCULATION</u>

The internal circulation pattern proposed is shown on Plate 6. The roadway standards proposed are:

111 Street - 4 or 6 lane arterial - 60 m R.O.W. - noise berms
119 Street - 4 lane arterial - 36 m R.O.W.

Main E-W Collector - 14.5 m top, 24 m R.O.W.

Other Collectors - 11.5 m top, 20 m R.O.W.

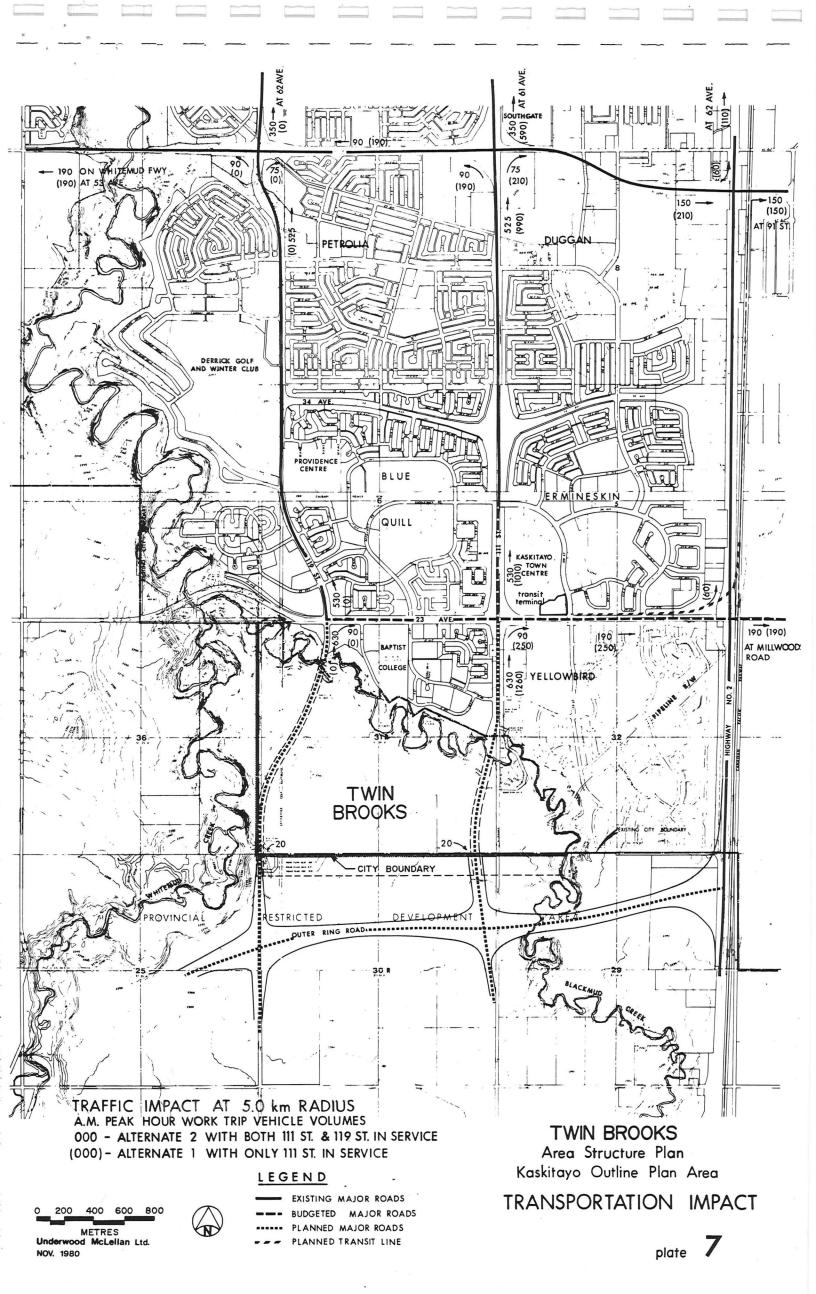
The pattern shown is proposed based on the following considerations:

- Probable initial access to the development by 111 Street only with 119 Street being constructed at a later date.
- Adequate spacing of collector intersections on 111 Street and on 119 Street. Location of the southerly collector intersection on 111 Street has been reviewed with Alberta Transportation's most recent plans for the interchange at the Ring Road and appears to be adequate (370 m + from the northerly intersection at the planned interchange).
- Minimum of two access points off either arterial to the development areas.
- A bus transit system routing covering the majority of the area with a maximum of 400 m walking distances from a route on the collector system.

The maximum volume estimated at any point on the collector road system would occur at the intersections of 111 Street and the two east-west collectors, without 119 Street in service. Estimated maximum peak direction volume is approximately 700 vehicles in the peak hour on one collector road. The majority of this volume, which is well within the capacity of a 14.5 m collector would be turning north. A two-lane turn would be required to handle this volume only during the period when 119 Street is not in service. All other intersection and roadway volume conditions predicted are well within the capacity of conventional arterial-collector intersections.

#### 4.4 DEVELOPMENT STAGES

It is expected that development of the area within the present City limits will occur at a relatively uniform pace from initial housing units in 1981 to full development in 1983/84. On this basis it would seem likely that a minimum of two lanes of 111 Street should be extended across the Blackmud Ravine to the south boundary of Twin Brooks by 1982. This would serve the full development of the area currently within the City limits as volumes for this area alone would be approximately 50% of those shown on Plate 7.



# APPENDIX A SUPPORTING DOCUMENTATION

# APPENDIX A ~ SUPPORTING DOCUMENTATION

- 1. The following list indicates the titles of supporting documents that have been referred to in this Area Structure Plan. They are available for review at the office of the City Planning Department and at Underwood McLellan Ltd.
  - <u>Kaskitayo'Outline Plan</u> City of Edmonton
  - <u>Guidelines for southwest Section Area Structure Plan</u> City of Edmonton
  - Top of the Bank Policy City of Edmonton
  - <u>Historical Impact Assessment of a Proposed Subdivision in</u>
    the South Kaskitayo District Archaeological Researches
    International Ltd.
  - Environmental Impact Assessment Study MTB Consultants Ltd.
  - Report on Subsurface Soil Conditions for the Proposed Subdivision for Costain Limited Underwood McLellan Ltd.
  - <u>Slope Stability and Development Setback Distances</u>
    <u>Whitemud-Blackmud Creek Triangle</u> Underwood McLellan Ltd.