

'82 PREVIEW

MASTER PLAN • BISMARCK, NORTH DAKOTA REGION

'82 PREVIEW

MASTER PLAN • BISMARCK, NORTH DAKOTA REGION

prepared by:

HARMAN, O'DONNELL & HENNINGER ASSOCIATES, INC.
2727 East Second Avenue
Denver, Colorado

April, 1972

The preparation of this report was financed in part through an Urban Planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended, administered by the North Dakota State Planning Division.

The preparation of this report was assisted by
the cooperation of and information from the following
individuals:

ACKNOWLEDGEMENTS

BISMARCK BOARD OF CITY COMMISSIONERS:

E. V. Lahr, President
Patrick A. Conmy - Vice President
Wm. Buckingham, M. D.
Robert O. Heskin
Bill Kunz

BISMARCK CITY PLANNING COMMISSION:

Adrian Taylor, Chairman
Myron Benser
Duane Bentz
Edmund Spencer
Norman Peterson
E. V. Lahr
John Zuger
E. J. Booth

NORTH DAKOTA STATE PLANNING AGENCY:

Russell Staiger, Planning Administrator

CITY ADMINISTRATION:

Tom Baker - City Auditor
Grant L. Bergquist - Administrative Assistant
Edward Booth - City Engineer
Vincent Kavaney - Director of Inspections
Jack Hegedus - Deputy Director of Inspections
Clarence Brazzell - City Assessor

BURLEIGH COUNTY HOUSING AUTHORITY:

Gene Sandwick - Executive Director
John Loerch - Housing Assistant's Officer

CONTENTS

OBJECTIVES	1
TRENDS	2
SUMMARY OF THE BISMARCK HOUSING ANALYSIS	2
FRINGE AREA LAND USE PLAN	3
STREETS AND HIGHWAYS	3
FRINGE AREA WATER AND SEWER PLANS	4
CENTRAL BUSINESS DISTRICT	6
ADDITIONAL REFERENCES	7
BISMARCK FRINGE AREA MASTER PLAN	11

OBJECTIVES

Ten years to improve as one of the finest small cities in the United States or ten years to deteriorate! Differing from many small communities throughout our nation, Bismarck now finds itself in excellent condition: a good school system, outstanding hospital facilities, a fine park and recreation program, no major social problems, a new civic arena, another municipal golf course, adequate utility systems, active religious programs, a variety of new residential developments. Compared to many other communities plagued with "people problems" and hard pressed to catch up, Bismarck can point with pride to its current situation. This, however, is not to say that everything in the community is perfect nor that it will always be as desirable in the future. Just as forward looking, intelligent civic leaders of the past created today's assets, similar positive thinking and constructive action programs will be needed in the future.

Planning in all communities is carried out either by default (without conscious effort) or by organized carefully analyzed methods. We may afford the luxury of impulsive "who cares?" planning occasionally in our daily

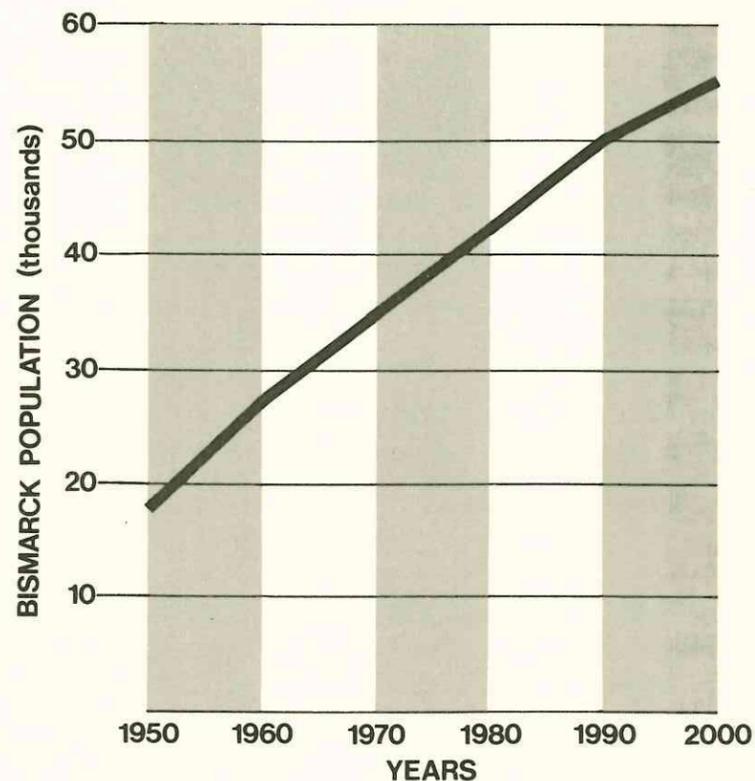
lives, but this type of random decision making cannot be used by public agencies. Streets need to be in the right location and wide enough to provide for future traffic; utility systems must be carefully planned in relation to growth trends and future population densities; parks need to provide a diversity of activities in convenient locations; fire stations must be close to high valuation properties and have good street access in all directions; and school classrooms must have space for changing enrollment demands. Thus intelligent foresight or planning must include as much rational thought as possible. Too much is at stake for municipal planning to be a last minute, impulsive process.

The purpose of this booklet is to summarize current information and plans which will be influential in shaping the city's direction during the next ten years and beyond. By recognizing existing conditions and possibilities for future improvement, everyone in the city will have a better opportunity to encourage and participate in desirable future development programs.

We sincerely hope that you will find the information in this summary report of interest and of value in your own daily lives and as participants in various programs which will have community wide impact.

TRENDS

Between 1950 and 1960 the City of Bismarck increased in population by almost 50% from 18,640 to 27,670. From 1960 to 1970 both the percentage and numerical increase declined from the previous decade but still showed a healthy jump of 7,000 new city residents. This gain of 25% was almost 10% higher than any other city in the State of North Dakota. While the City of Bismarck was increasing in population surrounding counties were losing numbers. The twelve county Bismarck trade area (excluding the Bismarck-Mandan urban area) reflecting the national trend of migration from rural areas to the cities decreased by 16% between 1960 and 1970. In spite of the surrounding decrease in the farm population, the Bismarck regional population of 36,000 in 1970 should exceed 44,000 by 1982 and gain an additional 12,000 in number by the year 2000.



Between 1950 and 1970 total dwelling units in the City of Bismarck increased from 5,446 to 11,156 or more than 100%. During the same time, the average

population per occupied dwelling unit dropped from 3.5 to 3.3. Projected into the future, the population increase between 1972 and 1982 should require almost 2,400 new dwelling units or an average of 240 new dwelling units per year. With the shift toward multi-family and mobile home living, it is expected that 60% or 1,450 of the new dwelling units will be of this type. The remaining dwelling units will be in lower density single family areas.

Impact of these population and housing increases prior to 1982 will result in the development of 400 new acres for residential use and a total of more than 1,100 acres of new development as shown in the following table.

NEW LAND USE REQUIRED BETWEEN 1972 AND 1982 IN THE BISMARCK REGION

Land Use	Percent of Land in Each Use	Acres Required
Residential	35	400
Streets	22	250
Schools	6	68
Parks	10	114
Public, Semi-Public and Local Business	7	80
Vacant Area	20	228
Total Acreage Required		1,140

Projecting the same land use requirements between 1982 and the year 2000 indicates 820 acres of additional land needed for residential use and a total of about 2,300 acres for all new development. In general terms and excluding development occurring within the present city boundaries, this means that approximately 1 1/2 square miles of newly developed area will need to be added to the City of Bismarck between 1972 and 1982 with an additional 3 1/2 plus square miles added for development in the subsequent two decades.

Another way to apply population and housing trends to the need for planning is to state that between 1950 and 1970 the developed area of the city increased about

four times to a total developed area of approximately 8 1/2 square miles. The future developed area is now expected to total more than 10 square miles by 1982 and more than 13 square miles by the year 2000.

SUMMARY OF THE BISMARCK HOUSING ANALYSIS

The analysis of the Bismarck housing market had the objective of determining the character of the present housing supply and defining and examining obstacles to the solution of current local housing problems.

The 1970 Census provided the basic data source supplemented with local specialized surveys. The total occupied dwelling units in 1970 was determined to be 10,808 with another 606 units vacant. Over 35% of this supply was built prior to 1940 and therefore represent potentially dilapidated or deteriorated units which should be recognized and improved as required.

An undesirable condition in any housing market is the over-crowding of existing dwelling units. The Census revealed possible overcrowding in a small portion of Bismarck dwelling units. It was determined that 5.7% of owner-occupied units and 2.6% of renter-occupied units could be considered over-crowded. The fact that such conditions exist indicates a need for larger and/or more dwelling units.

Making housing available to the low and moderate income groups is of particular concern in this analysis. A measure of such availability is the Census survey of the value of owner-occupied units and the rent level of renter-occupied units. For ownership units the median value was \$20,425 with nearly 95% of all these units valued at less than \$35,000. Therefore, the existing supply is within reach of the moderate income group especially since 55.4% of the supply is valued between \$15,000 and \$25,000. Recent sales activity has shown that 25% of all sales are under \$18,000.

For renter-occupied units the Census determined that the median rent level was \$90 per month. Current

rent levels range from about \$49 to near \$300 per month. The largest percentage of units are rented for \$60 to \$79. Over 99% of all rental units rent for under \$200. The current rental market displays a shortage of studio and four-bedroom apartments.

Within the last two years Bismarck has embarked upon an aggressive program of providing elderly and low income housing under the direction of the Burleigh County Housing Authority. On July 12, 1971, construction was begun on 250 units of public housing under the Turukey program for the elderly and low income families. An additional 120 units of elderly housing and an undetermined number of units for the handicapped have been requested by the Authority.

The projected housing market is anticipated to require a minimum of 7,400 new units by the year 2000 to house the increase in the number of households. Additional units will be needed to replace units demolished over this time period.

In general, the Bismarck area housing market is in a favorable condition. Certain sub-sectors of the market particularly studio and four-bedroom apartments, have a shortage of supply, however the balance of the market has an adequate supply to permit residential mobility and to allow choice as to unit size.

In the opinion of local builders and developers, certain aspects of city regulations, such as street standards, are excessively strict forcing construction costs unnecessarily upward. Some developers have expressed an interest in offering new styles of housing and community design, however due to the limited market these developers do not want to accept the risk of innovative housing styles.

The city is proceeding with several utility extension programs in order to encourage new residential development. Additional encouragement comes from the bankers of the area who have supplied ample mortgage money at interest rates averaging about 7 1/2%.

Thus, Bismarck faces only a few housing problems, none of which can be termed critical. The overall supply and demand factors are in balance and no real obstacles impede the solution of the aforementioned problems.

FRINGE AREA LAND USE PLAN

In response to the anticipated growth of the Bismarck area, a long range fringe area land use plan has been formulated in order to properly guide physical development in such a manner as to create beneficial relationships between such development and the existing and proposed infrastructure of the community. Discussed individually in this section are the basic land use components as proposed for the fringe area and as presented on the land use plans in the last section of this report. In addition to land uses, recommendations are set forth for the expansion of the city's water and sewer systems and for the redevelopment of the Central Business District.

single family residential

The present trend in the location of new single family subdivisions has been generally northward onto the rolling hills of the Hay Creek area. In keeping with this trend, future single family areas are planned for the area extending two miles north of Interstate 94.

Additional single family areas should also occur to the south of the city in the more easily developed flat terrain. It is anticipated that single family subdivisions will fill the area from Kirkwood Plaza south to Cottonwood Lake; and from Riverwood Golf Course to near 9th Street.

Outlying nodes of single family development are expected to be created near Mary College and Apple Creek Country Club. Such areas will serve the special needs and interests of the college staff, and capitalize upon the beauty of the Apple Creek flood plain and golf course.

multi-family residential

For future multi-family residential areas, three portions of the city offer favorable locational potential for this type of development. The prime area for substantial multi-family development is located to the east of the U.S. 83-Interstate 94 interchange. Beginning north of the Interstate and extending south to below Divide Avenue, this area is adjacent to excellent transportation arteries serving the major employment centers and retail

shopping and service areas. On the west side of Bismarck along Ward Road and near Bismarck Junior College is another multi-family site which is uniquely adjacent to the college, major transportation routes, and recreational resources.

The third site for multi-family residential has already experienced some development of this use. It is located adjacent to and west and south of the Kirkwood Plaza Shopping Center. This site is well located in relation to the growing industrial area of southeast Bismarck while also being within a block of Bismarck's river front parks. Also located on major transportation routes this site is within a few minutes travel of the central business district and the state capitol grounds.

It is anticipated that with the growth of Mary College additional multi-family housing will be required to the northeast of the present building complex. This area permitting dormitory and apartment units is envisioned to serve the residents of the campus community.

These three principal multi-family sites may be supplemented by small scattered multi-family developments around the fringe area and also upon land now vacant within the city or upon sites redeveloped following the removal of existing, obsolete structures.

commercial

The future needs for commercial land in the Bismarck area are limited to highway-oriented, convenience, and neighborhood commercial centers since the CBD and Kirkwood Plaza meet the need for a regional shopping center. Six new locations for commercial enterprise within Bismarck are designated on the land use plan. Three of these locations at interchanges of Interstate 94 are predominantly highway-oriented commercial. The other three locations being near residential areas and major arterial streets are basically neighborhood and convenience shopping centers. These three sites are located at the intersection of Century Avenue and Washington Street, 26th Street and Rosser Avenue, and at the intersection of Washington Street and the proposed southern circumferential which leads to the Airport Expressway. Two additional convenience commercial sites are located in the satellite development areas: one adjacent to Mary College, the other in the Apple Creek County Club area.

industrial

The location of future industry in the Bismarck region is naturally constrained by available appropriate topography and proximity to the major transportation systems. Consequently, the area most conducive to industrial expansion is the southeast sector of the city near the Bismarck airport and the juncture of the Burlington Northern and Soo line railroads, an area which follows the trend of current industrial growth. A secondary industrial area is located south of the interchange of U.S. 10 and Interstate 94. Being located away from the direction of major residential growth, existing and proposed arterials provide convenient access from all residential areas to this growing industrial district.

parks and schools

Presently containing more park area per population than any other city in North Dakota, it is proposed that Bismarck retain this distinction by an extensive expansion of its park and open space system. The lowlands of the Missouri River along River Road north of Interstate 94 and the major valley which extends out of these lowlands north of Ward Road towards Washington Street are to be preserved as open space with minimum development of recreation facilities. On the east edge of the city a five mile portion of the Hay Creek Valley is to be developed into a major openspace corridor with numerous areas for active recreation facilities. It is also proposed that minor corridors of openspace winding through the developing residential areas be established to provide pedestrian access from these areas to the major parks, schools, and open spaces. In future residential areas which are not adjacent to major parks, parks and open space within the subdivisions should be developed possibly linked with an elementary school site, a commercial center, or some natural feature such as a reclaimed gravel pit.

To meet the educational needs of these future residential areas, two new elementary school sites are proposed in the north part of town. These sites are in addition to those already owned though not developed by the Bismarck school system. The farsightedness of the school district's acquisition program has accurately projected current residential growth trends and has purchased sites in the appropriate areas. The two new sites

proposed for the fringe areas are located respectively south of Century Avenue and west of Washington Street, and east of Washington Street and north of Century Avenue: both sites being near the location of the new junior and senior high schools on Century Avenue. Such locations lying interior to the neighborhoods, relieves the potentially dangerous situations arising from the conflict of the child pedestrian and the high speed, high volume arterial street traffic.

STREETS AND HIGHWAYS

The proposed fringe area street system is divided into three classifications of facilities: arterials, collectors, and locals. The arterial system is intended to be the major traffic carrying facility within the city providing access between neighborhoods and the industrial and commercial districts of the city.

Serving the neighborhoods are the collector and local streets. These collectors tie the local streets to the arterials, while providing access to very few dwelling units since most units are proposed to front onto the local street system. The local streets are generally planned in a curvilinear pattern with many streets being loops and cul-de-sacs to provide traffic control. Such street patterns are more compatible with the topography of the area, more esthetic and appealing to the motorist, and safer for the residents of the neighborhood. While departing from Bismarck's current policy of not permitting cul-de-sacs, it is believed that their use can foster more innovative architecture, housing styles, and land planning. Most intersections are planned in a "T" configuration to minimize potential vehicular conflicts; four-way intersections are permitted only where necessary.

FRINGE AREA WATER AND SEWER PLANS*

water

The purpose of this study is to determine the suitability of the existing municipal water system for extension into the fringe area, and to outline the long range additions required to accomplish this extension when development warrants. The greatest importance is given to

the interim and ultimate systems' ability to deliver water at sufficient pressures under the most adverse water demand conditions, thus assuring that the system will be capable of meeting any imposed requirements.

Based on the Land Use Plan prepared for the area, it is expected that the fringe area will have provided residential, commercial and industrial sites for the projected 61% increase in Bismarck's population by the Year 2000. Because of increased per capita use of water, it is anticipated that water consumption will increase by 83% over the 1970 utilization. This development will require extension and expansion of the city's water system to provide safe, quality water to the fringe area, and for adequate service to the remainder of the city.

The existing Bismarck water system presents a solid nucleus for expansion. Ample capacity is generally available in the distribution system for increased service, as indicated by the relatively little pressure loss encountered in the system under greatly-increased flows. Analysis of the present watermain grid disclosed that only minor strengthening would be necessary to extend service to the fringe area. Additional water treatment and storage facilities, and the actual main extensions into the fringe area will, for the most part, adequately provide for the necessary expansion.

To prepare for the necessity of providing for the expanded service area in the future, it is recommended that--

1. the water treatment plant capacity should be increased, through the addition of another treatment unit, as soon as funds are available. Increased capacity to about 18 million gallons per day (m.g.d.) from its current nominal capacity of 10.5 m.g.d., is indicated immediately, with provisions to expand to 24 m.g.d. in the future;
2. the Intermediate Pressure reservoir and High Pressure elevated tank proposed for construction on Century

*Utility system analyses were prepared by the firm Toltz, King, Duvall, Anderson and Associates, Incorporated, St. Paul, Minnesota.

Avenue, north of the Ward Road Interchange, should be scheduled as soon as possible, along with the mains required to connect these storage facilities with the system. The estimated cost of this project is \$1,170,000. A total of 9.5 million gallons of additional storage capacity will be required by the Year 2000;

3. the Intermediate Pressure main extension east of 26th Street on the extension of The Boulevard should be constructed, at least to the east Bismarck Interchange, in conjunction with the thoroughfare contemplated to cross the Hay Creek Valley in this area. This project is estimated to cost \$150,000, not including the reservoir or the main from Interstate 94 to the reservoir site;
4. more detailed study should be given to the possible areas of localized pressure difficulties indicated in the analysis of the existing system; and
5. future water main construction should be based on the overall plan for service to the fringe area, with the provision of adequate main sizing, etc. The facilities plan should be reviewed from time to time to determine whether the plan is appropriate in the light of then-current trends and development.

The total cost for the distribution system is estimated at about \$3.7 million, while the additional cost for storage facilities and water booster stations is estimated at \$2.2 million. No estimate for treatment plan expansion was prepared. These estimated costs are exclusive of hydrants, local service mains or other appurtenant construction, and are based on current cost levels. Contingencies and engineering costs are included in the estimates.

sewer

The providing of adequate wastewater collection, conveyance and treatment is one of the most important services provided by municipal government, since this responsibility involves not only the general health and welfare of the citizenry, but also the protection of public waters from pollution caused by untreated wastewater. Although hard-pressed by a very rapid rate of growth,

especially in the past two decades, the city of Bismarck has been able to meet the demand created for additional sewage facilities brought about by population gains and increased commercial and industrial development.

For the most part, an extension of the city's basic sewer system has adequately provided collection facilities to newly-added areas or those undergoing development. Although some capacity deficiencies and other internal system problems caused by the increased volume to be handled have required interim solutions, in-system diversions and alterations, and localized relief measures, it has been relatively inexpensive and easy to provide additional service prior to this point-in-time.

The existing sewage system was studied to a limited extent to determine, in general, the effect of heavy, additional wastewater loads which would be imposed by fringe area development. Bismarck's sewer system generally flows from north to south and from east to west, so that the city's entire wastewater volume is collected at a master pumping station on South Washington Street, near Indiana Avenue, where the wastewater is given preliminary treatment and is pumped to the city's treatment lagoon. The city's aerated treatment lagoons, constructed in 1967, are designed to serve a population of 55,000 persons. Thus, no deficiency in capacity for additional development of the fringe area will exist for some time.

The goal of this study is to define the routing of facilities to serve the fringe area generally, and to develop more specific data regarding the location, size and cost of facilities to more immediately provide service to the detailed study area. The fringe area around Bismarck was divided into two sub-areas for the purpose of this study: a detailed study area approximately one mile wide outside of the detailed study area. The entire study area includes approximately thirty-two square miles, not including the city, while the detailed study area involves some fifteen square miles. Since the city occupies about eleven square miles, it is apparent that the entire study area is three times the present size of Bismarck, and the detailed study area is more than 1 1/3 times the city's size.

The fringe area around Bismarck is expected to develop to a point that, by the Year 2020, its population will

total an estimated 32,000 persons. Because normal, urban densities, such as those which are currently prevalent in Bismarck, would not sustain the acceptable application of on-site, individual disposal systems, it will be necessary for central sewage systems to be installed to collect and convey the wastewater from the area to a point of proper treatment.

An analysis of the city's existing sewer system indicates that capacity provisions for an increase in tributary population of this magnitude are not available; in fact, certain capacity deficiencies already exist in the Bismarck system which require relief, and additional, similar capacity problems may become apparent as the per capita wastewater generation of this existing population increases.

Therefore, it is unlikely that any major portion of the fringe area can be made tributary by merely extending the Bismarck system. This consideration is further compounded by the fact that a major portion of the fringe area extends into drainage areas other than that in which the city's sewer system operates.

The estimated cost of the proposed trunk sewer is shown to be \$1,935,000. Additional branches costing \$222,000 are required in the initial implementation of the plan.

First Stage

a) Trunk sewer system from 26th Street and Bismarck Avenue, to Interstate 94, including lift station and force-main.	\$ 955,000
b) Branch to intercept existing lagoon south of Interstate-94	\$ 49,000
c) Branch to intercept existing lagoon north of Interstate-94	\$ 34,000
	<u>\$1,038,000</u>

Second Stage

a) Trunk sewer system from 26th Street and Bismarck Avenue, through new lift station on South Washington Street.	\$ 980,000
b) Extensions north of Interstate-94 in and west of Hay Creek	\$ 139,000
	<u>\$1,119,000</u>

These costs are based on current construction cost levels. (ENR Construction Cost Index - 1520).

As a result of the study, the following recommendations are made:

- a) Consideration should be given to the implementation of the initial stages of the plan before development of the fringe area results in the adoption of more temporary means of providing sewer service, and thus results in duplication of effort and higher cost.
- b) Application should be made for Federal funds to assist in the construction costs.
- c) A detailed study of the Indiana Avenue/Michigan Avenue Trunk Sewer should be undertaken to define the extent of necessary remedial action and to determine the availability, if any, of capacity for fringe area use.
- d) All temporary wastewater treatment facilities should be phased out as soon as possible in favor of central treatment at the city's facilities.

CENTRAL BUSINESS DISTRICT

Whereas the established shopping center and location of public buildings was once an active core for the entire

city and surrounding region, many of its attractions and functions have diminished in recent years. Problems have occurred as follows:

1. Functional obsolescence of many buildings;
2. Congestion of traffic on the streets;
3. Hazardous pedestrian routes;
4. Inadequate, inconvenient parking;
5. Little aesthetic appeal;
6. No quiet areas;
7. Mixed land uses;
8. Absence of identity.

While many of the preceding difficulties are common to most old business districts, they can be corrected.

1. Create a mall area from two to three blocks in length designed primarily for pedestrian use where shoppers can move in safety and with pleasure between retail centers and various display areas.
2. Further improve pedestrian flow through the use of a climatized elevated walkway system joining the retail area to adjacent off-street parking.

3. Improve traffic flow along the edge of the core area so that vehicles may move more freely to and from the edges of the pedestrian shopping area.
4. Encourage one or more new major department stores to locate in the downtown Bismarck area to provide multi-choice retail opportunities as a further attractor into this area.
5. Make every effort to work with hospital and medical interests in the continuance of these facilities close to the central business district.
6. Develop one or more new large hotels close to the core area as a further activity supplement to this area.

The central area of Bismarck literally faces a crossroads at this time. If conservative attitudes prevail, many of the activities once centered here will relocate in other sections of the city. If forward looking improvement programs can be coordinated for the central area, the "heart" of the city may once again reflect the vitality of the entire community.

ADDITIONAL REFERENCES

The following listed reports may be studied for additional information about Bismarck's future plans:

Bean, Trafton & Associates, Downtown Bismarck, North Dakota, Boulder, Colorado, August 1968, 41 pp.

Introduction; Conclusions - Economy, Regional Map, Travel Downtown, Reasons for Going Downtown, Opinions about Downtown, Land Use, Employees, Property Valuations, Parking; Concept - Department Stores, Parking, Pedestrian Travelways, Landscape Areas, Vehicular Travel, Other Retail Uses and Services, Private Offices, Hotel and Motel, Travel Center, High-Density Residential Uses, Public Buildings; Design Criteria - Land Use Summary, Floor Area Summary, Employee - Resident Summary, Parking Summary, Valuation and Tax Summary.

City of Bismarck, Planning and Zoning Ordinances, North Dakota, July 1969, 66 pp.

City Planning Commission; Zoning, Master Plan; Regulations Governing the Subdivision of Land.

Harman, O'Donnell & Henninger Associates, Inc., Bismarck Housing Market Analysis, Denver, Colorado, March 1972, 24 pp.

Purpose and Scope; Population Characteristics; Analysis of Housing Market; The Projected Housing Market.

Harman, O'Donnell & Henninger Associates, Inc., Fringe Area Land Use Plan, Denver, Colorado, April, 1971, 4 Analysis Sheets (40"x60").

Geologic and Physical Characteristics; Land Use Suitability; Existing Land Use; Fringe Area and Regional Land Use Plans; Census Data; Population Projections; Factors Which Influence Industrial and Residential Expansions; Future Housing and Land Use Requirements; Growth Areas; New Developments 1966-1970; Review of Development Information.

Harman, O'Donnell & Henninger Associates, Inc., Fringe Area Street Planning, Denver, Colorado, March 1972, 14 Analysis Sheets (20"x30").

Guide for future subdividing in the fringe areas; Collector and local street patterns, and proposed fringe area land uses.

Harman, O'Donnell & Henninger Associates, Inc., Summary Report, Denver, Colorado, April, 1972.

A compilation of recent publications pertinent to the planning program; includes utilities, housing, land use and streets.

Harman, O'Donnell & Henninger Associates, Inc., Zoning, Denver, Colorado, April, 1971, 2 Analysis Sheets (40"x60")

Existing Zoning; Recommendations; Proposed zoning for the City of Bismarck.

Henderson, James M., Krueger, Anne O., Economic Growth and Adjustment In The Upper Midwest: 1960-1975, January 1967, 65 pp.

Introduction; Transition in the Upper Midwest; Economic Development of the Upper Midwest: 1960-1965; Economic Development of the Upper Midwest: 1965-1975; State Summaries - Montana, North Dakota, South Dakota, Minnesota; Data Sources and Methods, Sector Classifications; Estimation for 1965; Projection to 1975.

Kume, Jack,; Hansen, Dan E., Geology and Ground Water Resources of Burleigh County, North Dakota - Part I Geology, Grand Forks, North Dakota, 1965, 111 pp.

Introduction; Geography; Physiographic Units and Landforms; General Stratigraphy - Subsurfaces Bedrock; Detailed Stratigraphy - Surface Bedrock; Glacial Deposits; Drainage History; Synthesis of Pleistocene History; Economic Geology.

Kume, Jack,; Hansen, Dan E., Geology and Ground Water Resources of Burleigh County, North Dakota - Part I Geology, 1965, (Maps).

Drift Isopach Map - Burleigh County, North Dakota; Diversion and Wisconsin Drainage Map - South Central North Dakota; Stratigraphic Cross Sections - Burleigh County, North Dakota.

Laird, Wilson M., Land Form and Geologic Map of Burleigh County, North Dakota, North Dakota Geological Survey, (Map).

Map with Glacial Land forms; Bedrock Geology; Railroads; Highways; Gravel Pits; Lignite Mines or Pits.

North Dakota Economic Development Commission, Directory of North Dakota Manufacturers, 1969-1970, Bismarck, North Dakota, 1970, 136 pp.

Introduction; Product Listing of Manufacturers, Alphabetical Listing of Manufacturers; Geographic Listing of Manufacturers; Products Listed and their Industrial Code Numbers.

North Dakota State Department of Labor, Biennial Report of the Commissioner of Labor to the Governor and to the Legislature, For the Period July 1, 1968, thru June 30, 1970, 50 pp.

Introduction; Inspections Minimum Wages and Child Labor; Minimum Wage Inspection Report; Investigations Report on Minors; Report of Employment Certificates Issued.

North Dakota State Highway Department Planning and Research Division; U.S. Department of Transportation Federal Highway Administration, Bismarck - Mandan: 1968 Population Economic Base Study, 1971, 35 pp.

Introduction; Present Data; Trade Area; Study Area - Population, Employment, School Enrollment, Sales - Wholesale and Retail, Construction and Housing Vacancy, Utilities - Telephone and Electricity; Future Data - Outlook; Projections.

North Dakota State Highway Department Planning and Research Division; U.S. Department of Transportation Federal Highway Administration, Bismarck - Mandan: 1968 Traffic Characteristics, 1971, 70 pp.

Summary; Introduction; Study Area Identification; Sample Size; Coding and Accuracy Check; Traffic Volume; Travel Time Study; Trip Characteristics; Zone to Zone Movements.

North Dakota State Outdoor Recreation Agency, North Dakota Outdoor Recreation Plan - 1970, 1970, 144 pp.

Introduction; Plan Summary and Recommendations; Characteristics of North Dakota; Recreation Land Administration; Standards; Supply Inventory; Outdoor Recreation Demand; The Needs Study; Action Program; Special Consideration; Coordination and Maintenance.

North Dakota State Planning Agency, North Dakota Economic Atlas, Bismarck, North Dakota, January 1, 1969, 51 pp.

Maps and Graphs - Population; Income and Employment; Political Subdivisions and Planning Units; Natural Resources; Agriculture, Mining; Electric Energy; Transportation; Education; Historic, Scenic and Recreational Information; Military; Meteorology.

North Dakota Tax Department, North Dakota Sales and Use Tax Statistical Report, 1970 (annual), 31 pp.

Introduction; Summary of Changes in Sales and Use Tax Rates and Taxable Base; Explanation of SIC Code Numbers; Description of SIC Code Numbers; Kind of Business; Twelve Largest Cities in North Dakota; Cities, Villages and Other Post Offices in North Dakota; Counties in North Dakota; Other States and Countries; Collection of Sales and Use Taxes, including Penalties.

Randich, P. G., Geology and Ground Water Resources of Burleigh County, North Dakota - Part II Ground Water Basic Data, Grand Forks, North Dakota, 1965, 273 pp.

Introduction; Map of Physiographic Provinces; System of Numbering Wells and Test Holes; Map of Burleigh County Showing Location of Wells; Map of Burleigh County Showing Location of Test Holes; Records of Wells and Test Holes in Burleigh County; Logs of Test Holes; Chemical Analyses of Ground Water in Burleigh County; Chemical Analyses of Ground Water from Glacial Drift Showing Trace or Minor Constituents; Water-Level Measurements in Selected Wells in Burleigh County.

Randich, P.G.; Hatchett, J.L., Geology and Ground Water Resources of Burleigh County, North Dakota - Part III Ground Water Resources, Grand Forks, North Dakota, 1966, 92 pp.

Introduction: Principles of Ground-Water Occurrences; Chemical Quality of Ground Water; Geologic Units and

Their Water-Bearing Properties--Cretaceous System, Tertiary System, Quaternary System; Utilization and Availability of Ground Water in Burleigh County; Summary and Conclusions.

Randich, P. G.; Hatchett, J. L., Geology and Ground Water Resources of Burleigh County, North Dakota - Part III Ground Water Resources, Grand Forks, North Dakota, 1966 (map).

Hydrofacies Map of Alluvial and Melt-Water Channel Deposits in Southern Burleigh County: 1,500-1,550 Foot Interval; 1,550-1,600 Foot Interval; 1,600-1,650 Foot Interval; 1,650-1,700 Foot Interval; and 1,700-1,750 Foot Interval; Map Showing Location and Potential Yields of Glaciofluvial and Alluvial Aquifers in Burleigh County, North Dakota; Map Showing Configuration of Piezometric Surface and Direction of Ground-Water Movement in Melt-Water Channel Aquifers in Southern Burleigh County; Bedrock Topographic Map - Burleigh County, North Dakota; Test Hole Locations and Lines of Cross Sections - Burleigh County, North Dakota; Bedrock Geologic and Pre-Wisconsin Drainage Map - South Central, North Dakota.

Toltz, King, Duvall, Anderson and Associates, Incorporated, Fringe Area Sewer Plan, St. Paul, Minnesota, 1971, 30 pp.

Introduction; Existing Facilities; Study Area; Projected Capacity Requirements; Adequacy of Existing Sewerage Facilities for Study Area Flow; Proposed Plan for Fringe Area Sewer Service; Alternative Plans; Summary, Conclusions and Recommendations.

Toltz, King, Duvall, Anderson and Associates, Incorporated, Fringe Area Water Plan, St. Paul, Minnesota, January, 1972, 31 pp.

Introduction; Existing Facilities; Study Area; Projected Requirements; Proposed Plan for Fringe Area Water Service; Summary, Conclusions and Recommendations.

Tri-State Engineers, Comprehensive Area-Wide Plan for Water and Sewer Development and Waste Disposal - Burleigh County, North Dakota, Bismarck, North Dakota, 1970, 63 pp.

General Location Map - North Dakota; General Des-

cription of Burleigh County; Political; Population; Area Economics; Public Facilities and Utilities; Natural Mineral Resources; Land Uses and Patterns; Water Resources; Municipal Water Systems; Water Pollution Sources; Flood Hazards; Water and Sewer Development Plan; Maps on: Municipal Water and Sewer Development; Topographical Map - Burleigh County; General Map - Burleigh County; Political Subdivision and Land Ownership.

Urban Planning Consultants, Inc., Central Area: Design Study, for Bismarck Urban Renewal Agency, Chicago, Illinois, December 1971, 68 pp.

Introduction; Existing Situation; Problem Areas; Concepts; Plan Element Relationships; Block by Block.

U.S. Department of Agriculture Soil Conservation Service and North Dakota Agriculture Experiment Station, Soils of Burleigh County, North Dakota, Volume I, Bismarck, North Dakota, April 1971, 104 pp.

How to Use the Report; Descriptions of the Soils; Descriptions of the Mapping Units; Soil Interpretations; Table of Predicted Average Acre Yield of Principal Crops; Table of Interpretations of Engineering Properties; Map of General Soil, Burleigh County; Index of Map Sheets; Map Sheets.

U.S. Department of Agriculture Soil Conservation Service, Soils of Burleigh County, North Dakota, Volume II, April 1971, Aerial Photos.

Soils Maps of Burleigh County; North Dakota.

U. S. Department of Commerce/Bureau of the Census, North Dakota Final Population Counts, October 1970, 11 pp.

Urban and Rural Residence; Urbanized Areas; County Subdivisions; Incorporated Places; Unincorporated Places, Boundary Changes; Percents and Symbols; Tables on--Population of Counties: 1970 and 1960, Population of County Subdivisions: 1970 and 1960, Population of Places: 1970 and 1960.

U. S. Department of Commerce/Bureau of the Census, North Dakota General Housing Characteristics, October 1970, 11 pp.

Standard Metropolitan Statistical Areas; Places; Towns; Housing Units and Group Quarters; Year-Round Housing Units; Occupied Housing Units; Population and Persons; Race; Tenure; Vacant Housing Units; Rooms; Persons per Room; Plumbing Facilities; Units in Structure; Value; Contract Rent; Medians and Rates; Tables on General Housing Characteristics: 1970.

U.S. Department of Housing and Urban Development, Comprehensive Planning Assistance Handbook I: Guidelines Leading to A Grant, Washington, D.C., March 1969, 70 pp.

General Information; Statewide Planning; Planning Service by States to Localities and Non-Metropolitan Dis-

tricts; Metropolitan Regional Councils; Large Cities with Population Over 50,000; Interstate Regional Commissions; How to Apply; Basic Materials; Supplements to Chapters - Initial Housing Element, Non-Metropolitan Districts, Indian Reservations, Federally-Impacted Areas, Disaster Areas, Historic Preservation Planning, Airport System Planning, New Community Planning, Urban and Regional Information Systems, Inservice Training; Coordination.

U. S. Department of Housing and Urban Development, Digest of Insurable Loans and Summaries of Other Federal Housing Administration Programs, Washington, D.C., March 1970, 87 pp.

Property Improvement and Mobile Home Loans; Single Family Home Mortgage Insurance; Multi-Family Rental

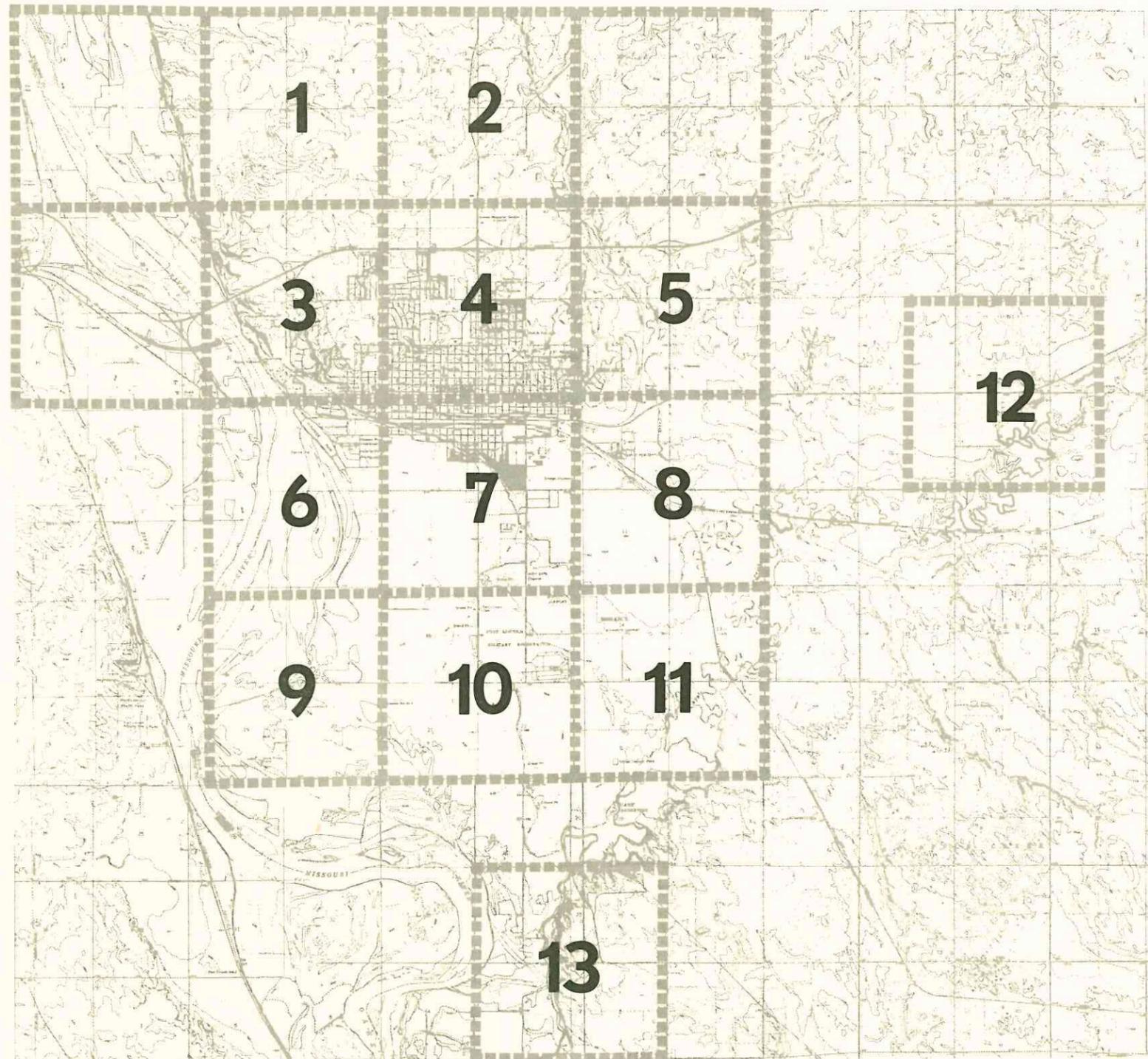
Housing Insurance; Multi-Family Home Mortgage Insurance.

U.S. Department of Housing and Urban Development/ Federal Housing Administration, Analysis of the Bismarck Mandan, North Dakota Housing Market, December 1, 1970, Washington, D.C., March, 1971, 17 pp.

Introduction; Anticipated Housing Demand; Occupancy Potential for Subsidized Housing; Sales Housing Under Section 235; Rental Units under the Public Housing and Rent-Supplement Programs; Rental Units Under Section 236; Sales Markets; Rental Market; Economic, Demographic, and Housing Factors; Employment; Income; Nonfarm Population and Households; Residential Construction Trends and Housing Inventory; Vacancy.

BISMARCK FRINGE AREA MASTER PLAN

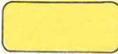
This key map indicates the respective areas of Bismarck in the sequence in which they are discussed.



The following series of maps is a guide for the future land use development of the Bismarck fringe area which is expected to develop prior to the Year 2000. Major areas of residential, commercial, and industrial use are defined as well as proposed school and park sites. Within the residential areas are presented the recommended street patterns and designs for the local neighborhood streets, collectors, and arterials. Hereafter these maps can be utilized by city officials to aid in the evaluation of proposed subdivisions, and by developers as conceptual street plans for their land development.

LEGEND

land use:

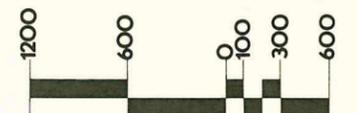
-  **single family**
-  **multi-family**
-  **commercial**
-  **industrial**
-  **park and open space**
-  **proposed schools**

streets:

-  **existing arterial**
-  **existing collector and local**
-  **proposed arterial**
-  **proposed collector**
-  **proposed local**



April, 1972

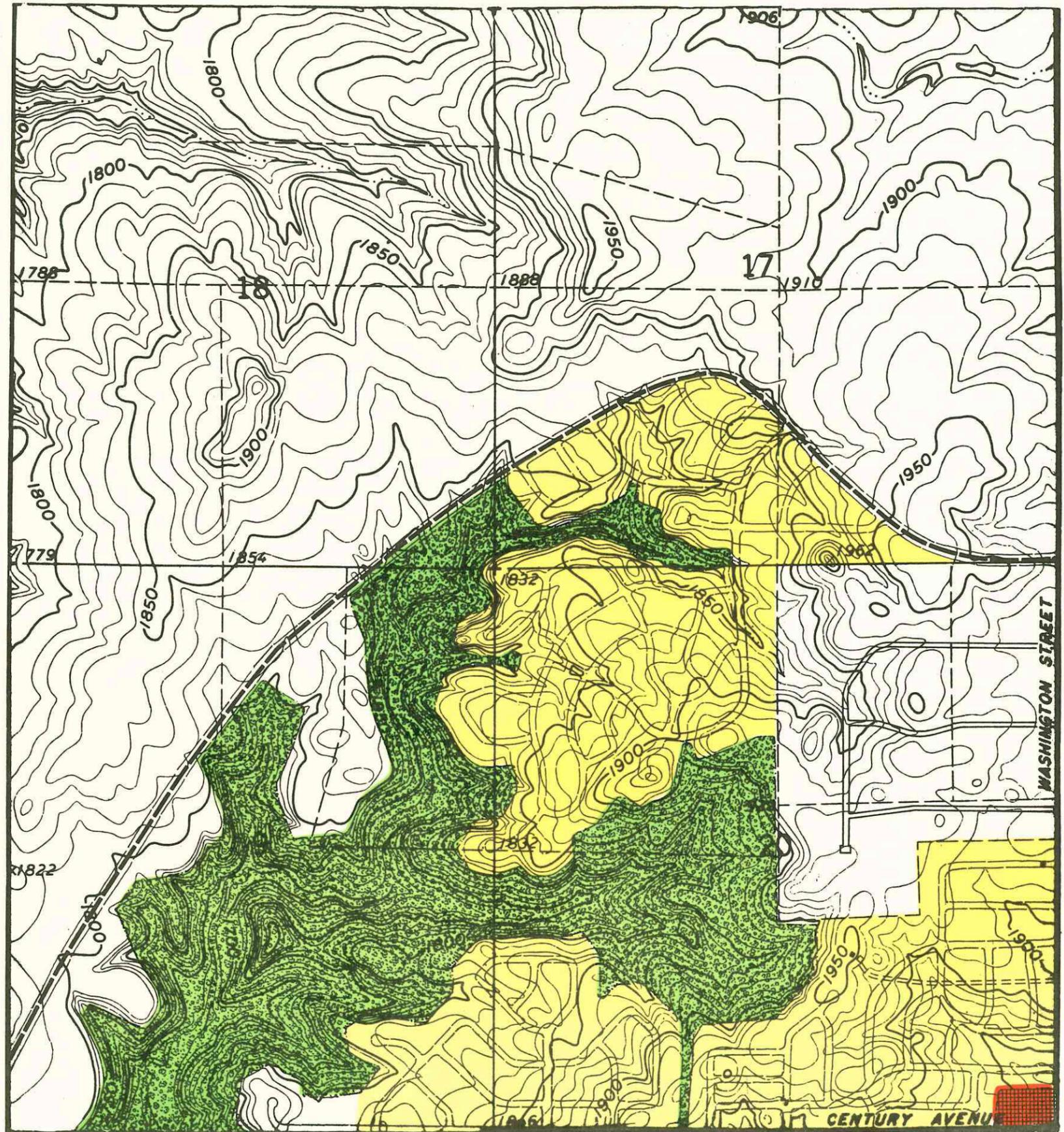


The preparation of this document was financed in part through an Urban Planning Grant from the Department of Housing and Urban Development under the provisions of Section 701 of the Housing Act of 1954, as amended, administered by the North Dakota State Planning Division.

This northwest portion of the city is proposed to contain large lot single family subdivisions planned around an extensive park and open-space area. This park area includes most of the steeper slopes in this watershed.

The major proposed circumferential arterial around Bismarck passes through this portion tying Washington Street to River Road.

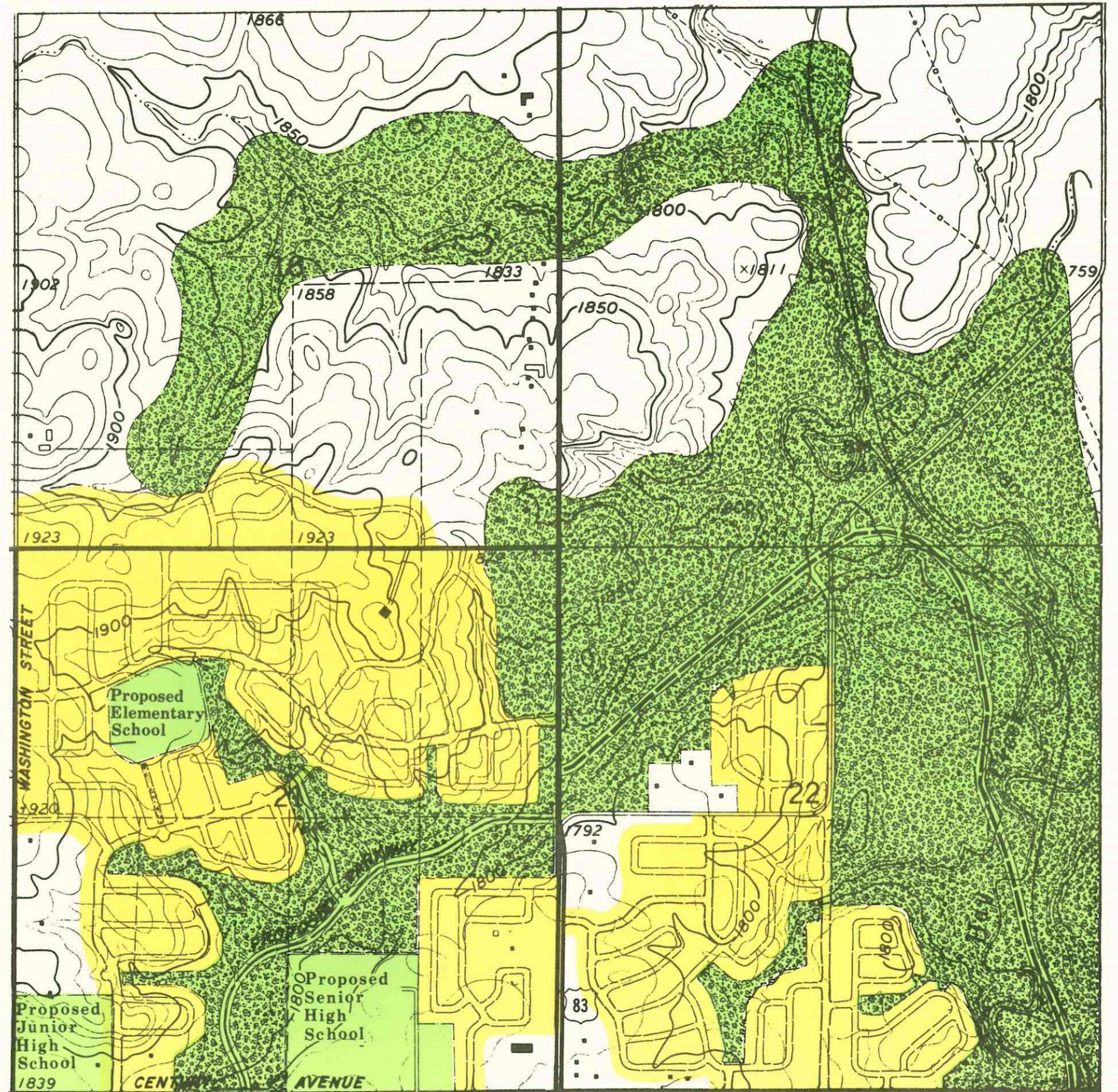
Commercial needs of the future residents of the area are supplied by a neighborhood shopping center at Century Avenue and Washington Street.



These four sections of the fringe area contain a major portion of the proposed park and openspace system in the Hay Creek drainage area. Single family residential areas border much of this system or are adjacent to internal openspace links to the main system.

In addition to the existing sites for new junior and senior high schools, an elementary school site is proposed interior to this development area. Openspace links offer pedestrian access to the school site from most of the surrounding residential area.

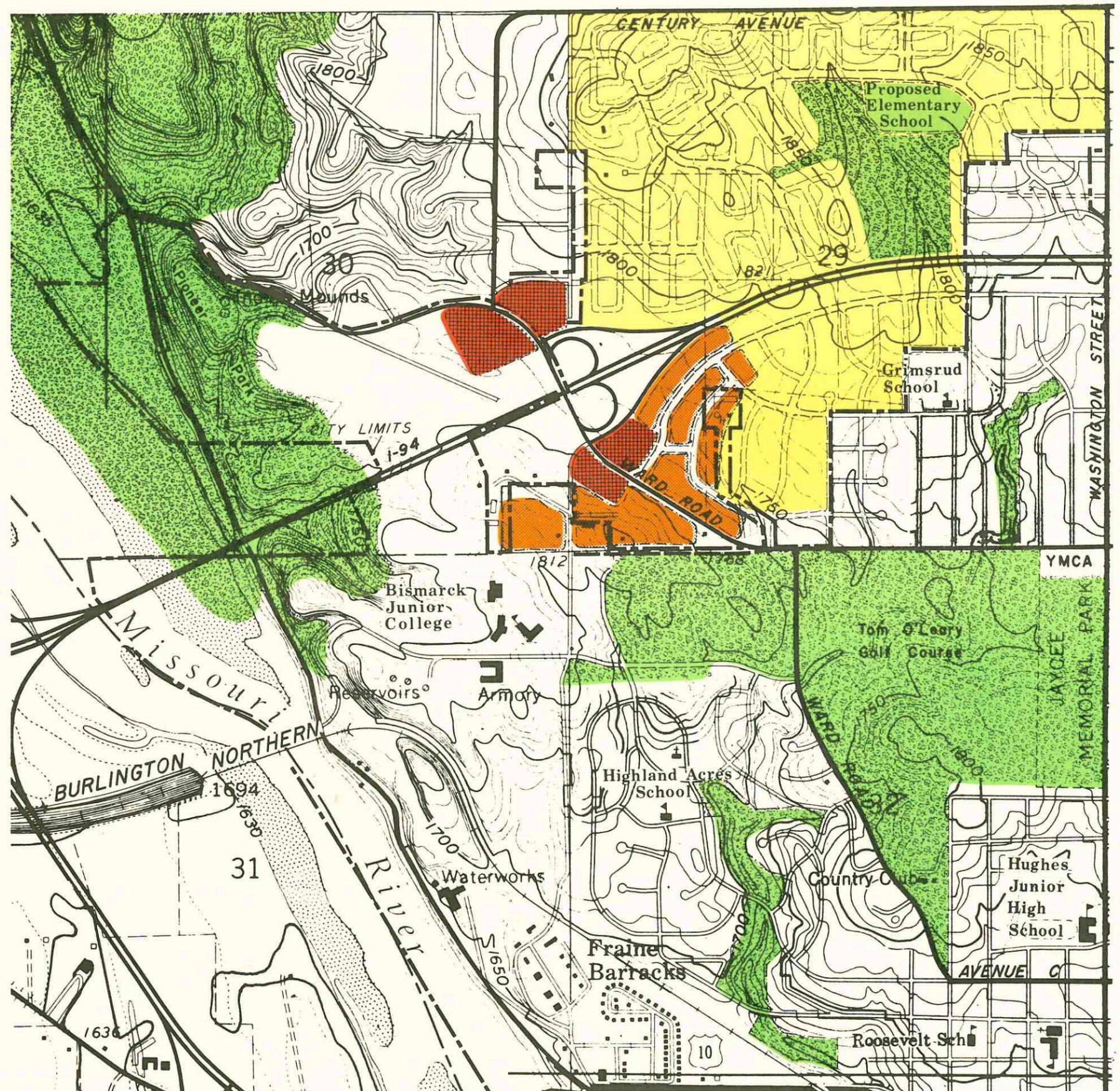
The major proposed circumferential arterial route ties to U.S. 83 and trends east and then south along Hay Creek.



Most of this portion of Bismarck is presently developed, however, for the remaining undeveloped area mainly residential uses are proposed. Single family development is anticipated in the area between Century Avenue and Interstate 94 with the exception of a school/park site.

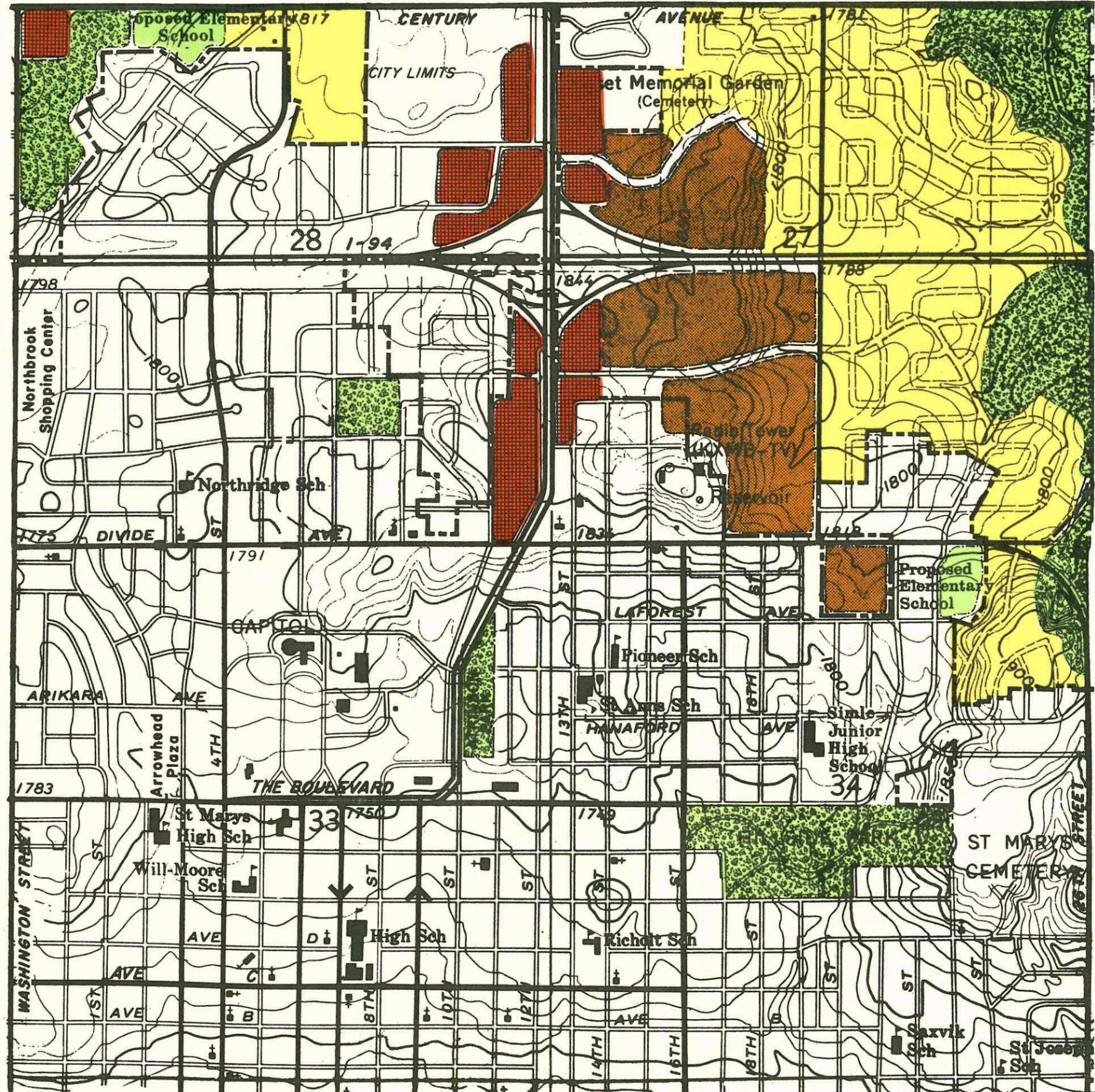
Highway commercial and multi-family uses are designated around the Ward Road - Interstate 94 interchange. Single family residential fills the remaining vacant areas near the Grimsrud School.

In the northwest part of this sector, the Missouri River flood plain and much of the bluffs are preserved as park and openspace.



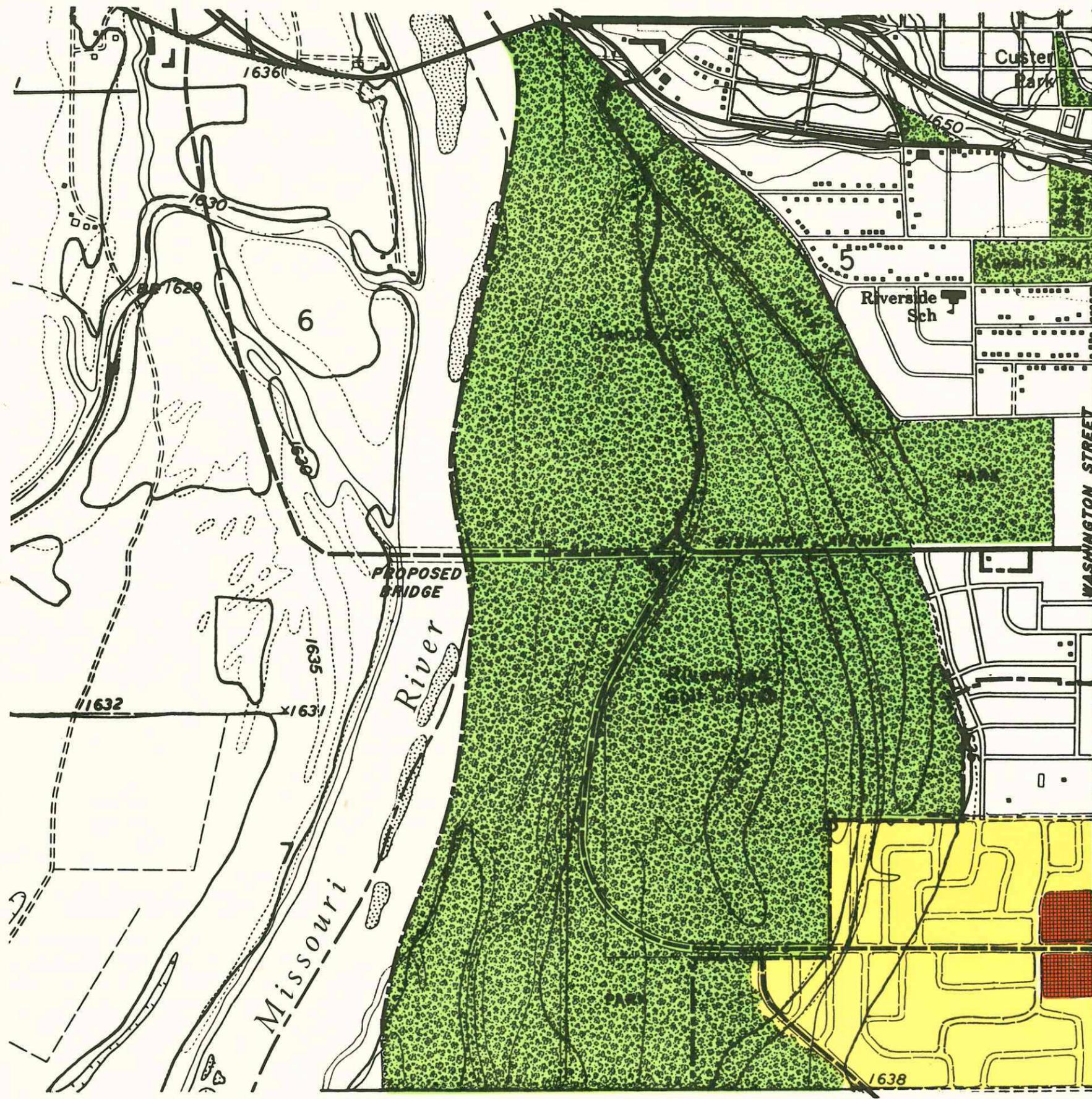
This north central sector of Bismarck is proposed to reach complete development with the addition of more single family residential use in the northwest and northeast corners of the sector. Along U.S. 83 is a proposed major commercial area to serve both the highway and surrounding neighborhoods. Another neighborhood commercial site is planned for the corner of Century Avenue and Washington Street.

Two elementary school sites are proposed for the area, one of which, along Century Avenue, is presently owned by the school district. Adjacent to these sites are future park and openspace areas.



This area along the Missouri River is proposed as an extensive park and openspace to preserve the river front as public domain. New single family residential use is planned along the west side of Washington Street with commercial needs supplied by two neighborhood centers.

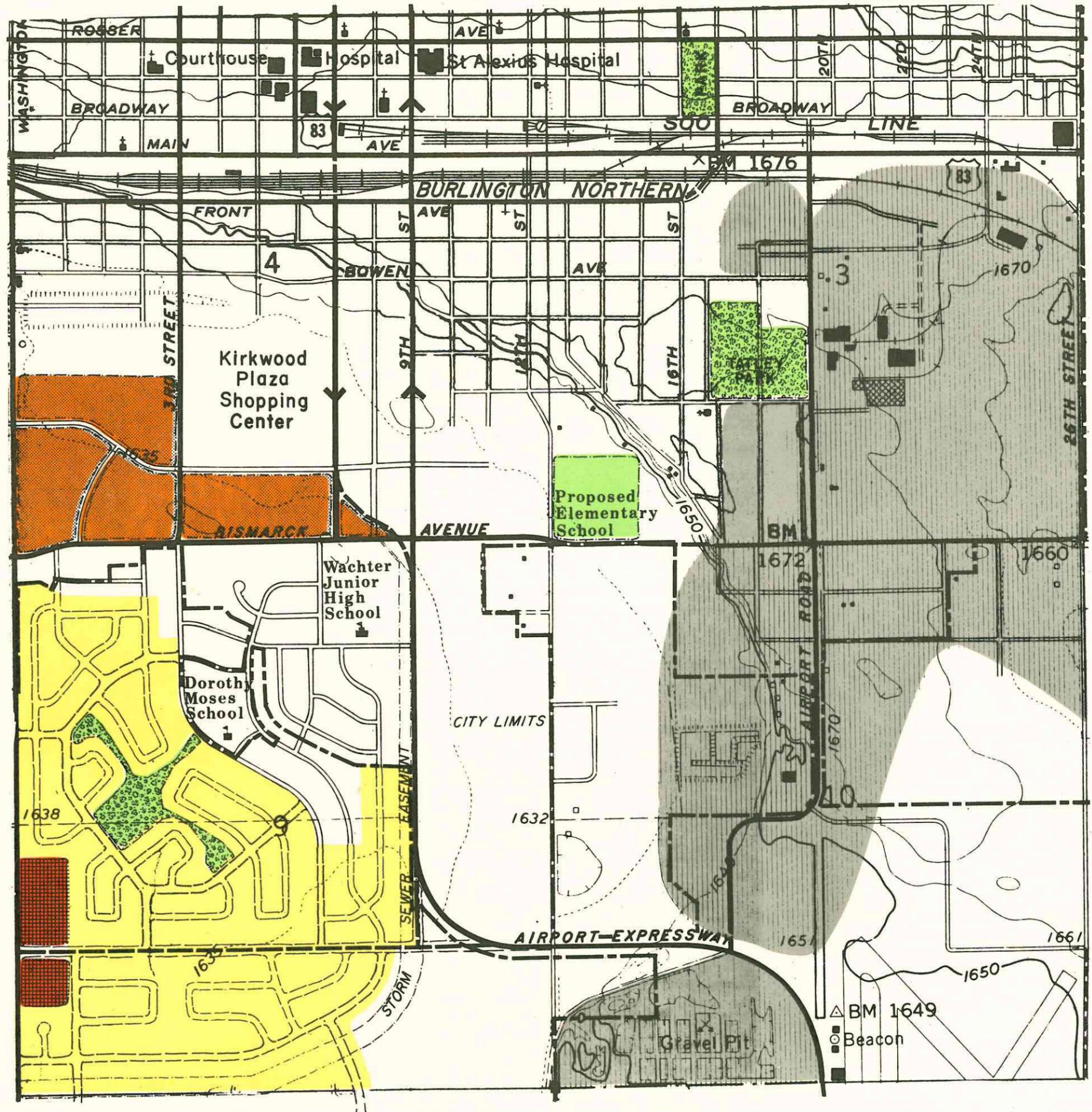
The proposed bridge over the Missouri River on the extension of Bismarck Avenue is presented with major arterial street connections to Mandan and south around the city.



This south central area is one of the prime future development sections. Large multi-family developments are anticipated near Kirkwood Plaza, while further south major single family areas are expected to develop. Reclamation of existing gravel pits could provide attractive living areas and offer recreation potential. Neighborhood commercial facilities are anticipated along Washington Street.

An industrial belt is proposed from the railroads near the CBD south to the airport. A new arterial street is planned to connect the Airport Expressway to Washington Street.

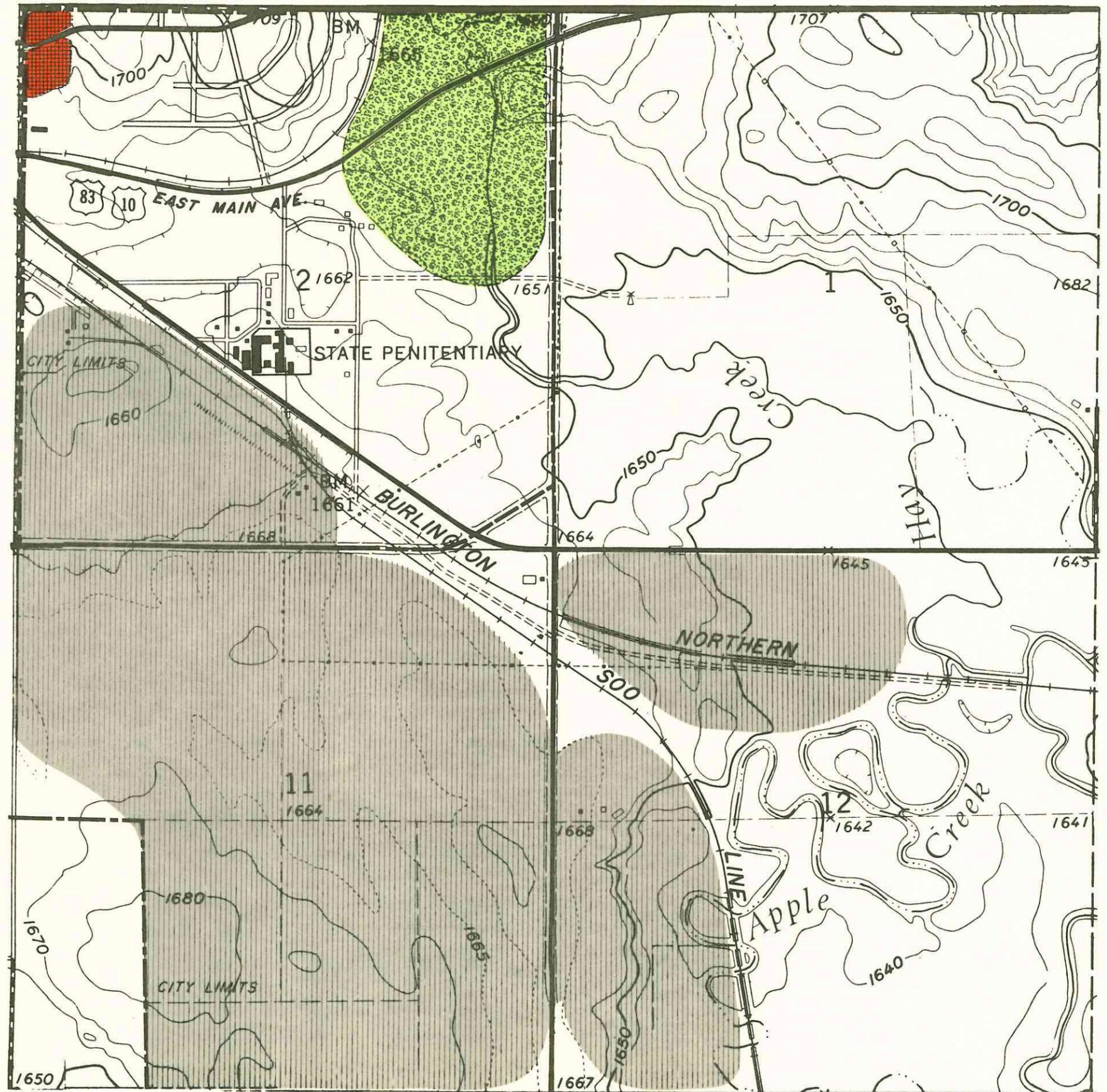
At 12th Street and Bismarck Avenue, a new elementary school is to be constructed soon since the site presently owned by the school district, Wachter School, is to be phased out.



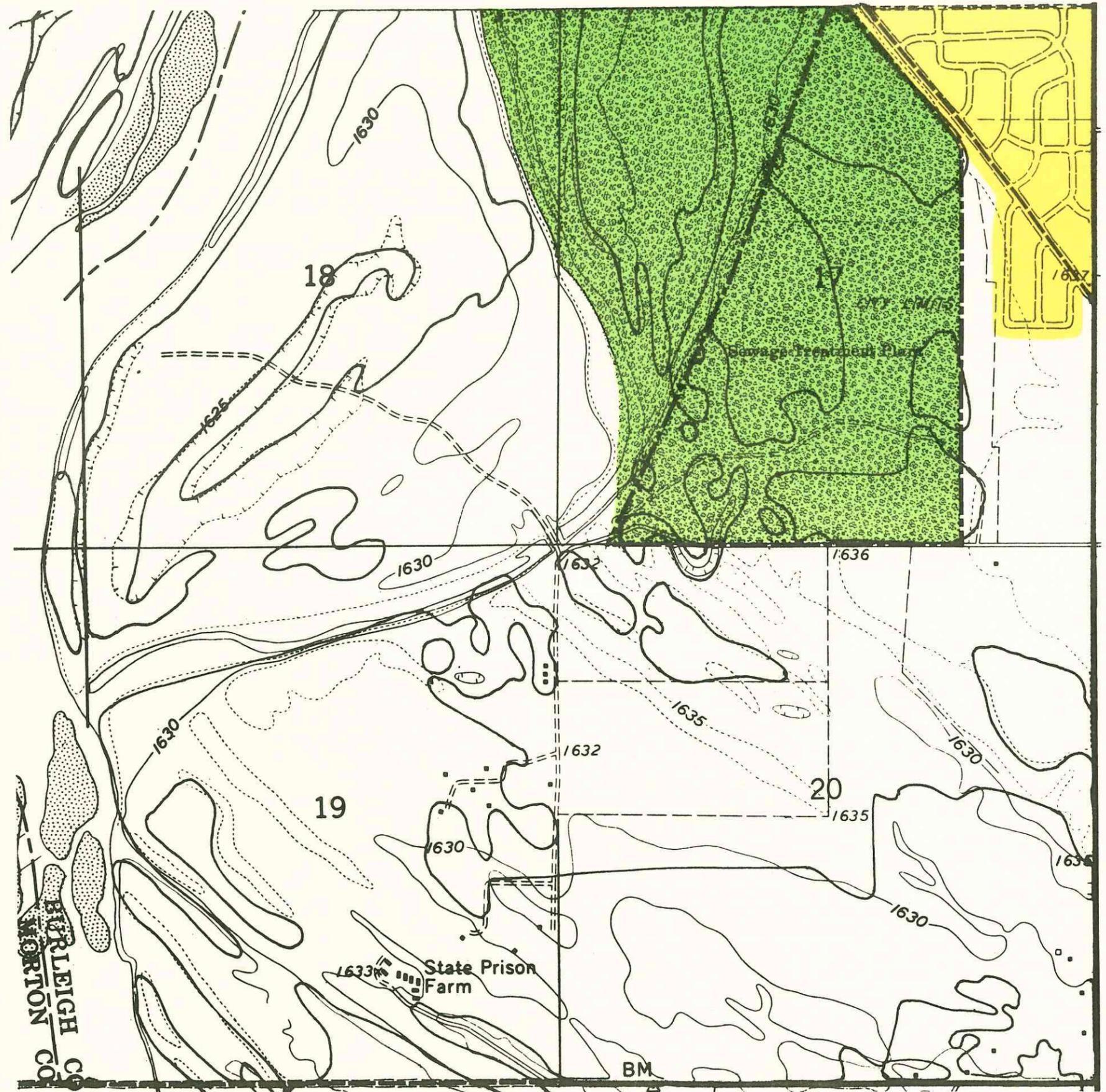
The industrial area of Bismarck is expected to follow along the rail lines and around the airport. New arterial streets are planned to better serve this area.

The southern end of the Hay Creek openspace extends into this area of the city and terminates near the penitentiary.

Small commercial sites are proposed for the intersection of 26th Street and Rosser Avenue.

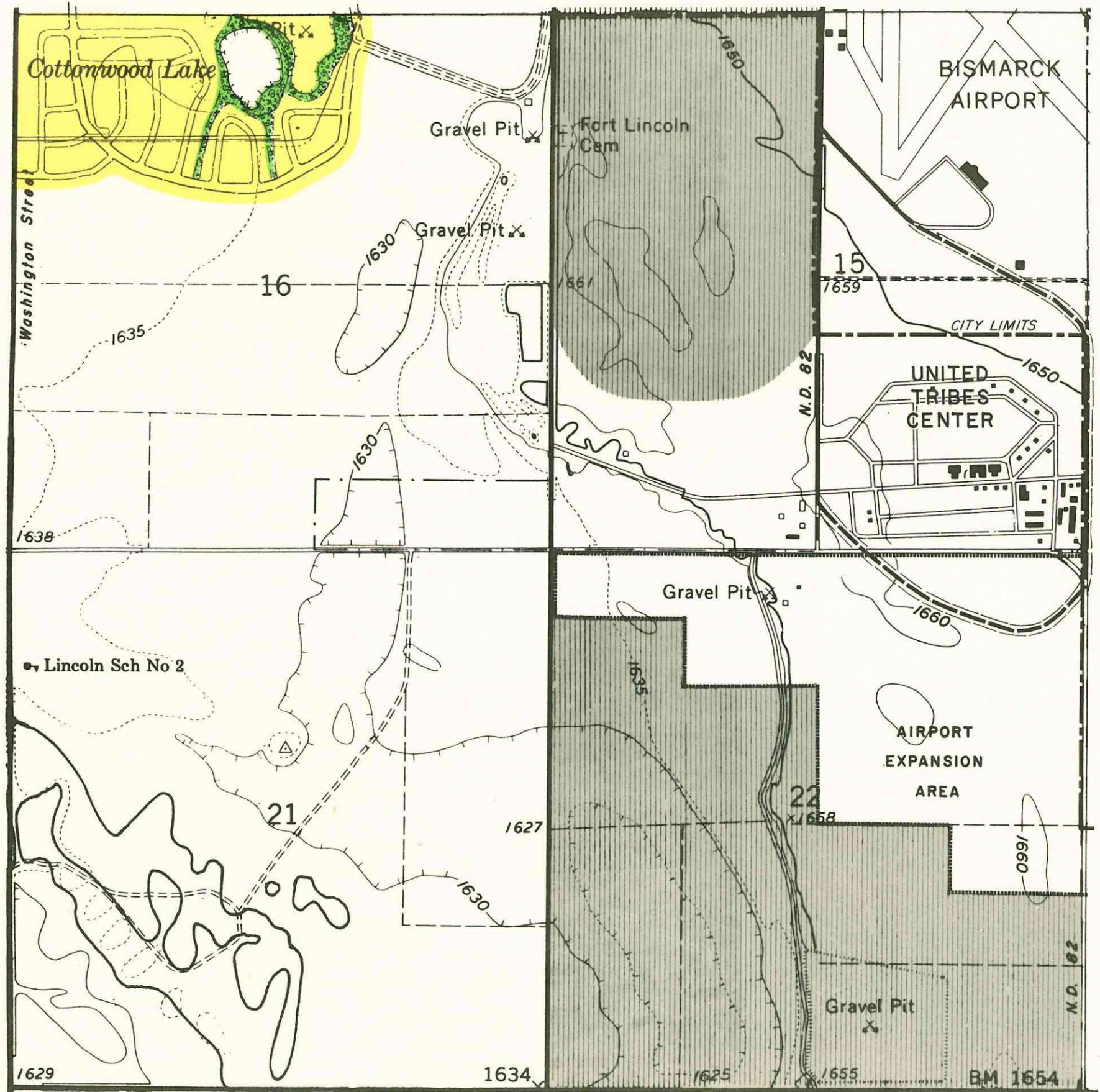


The southern limit of the single family development lies in this portion of the city, near the site of the new sewage treatment plant. This new plant is buffered from other uses by a large park area.

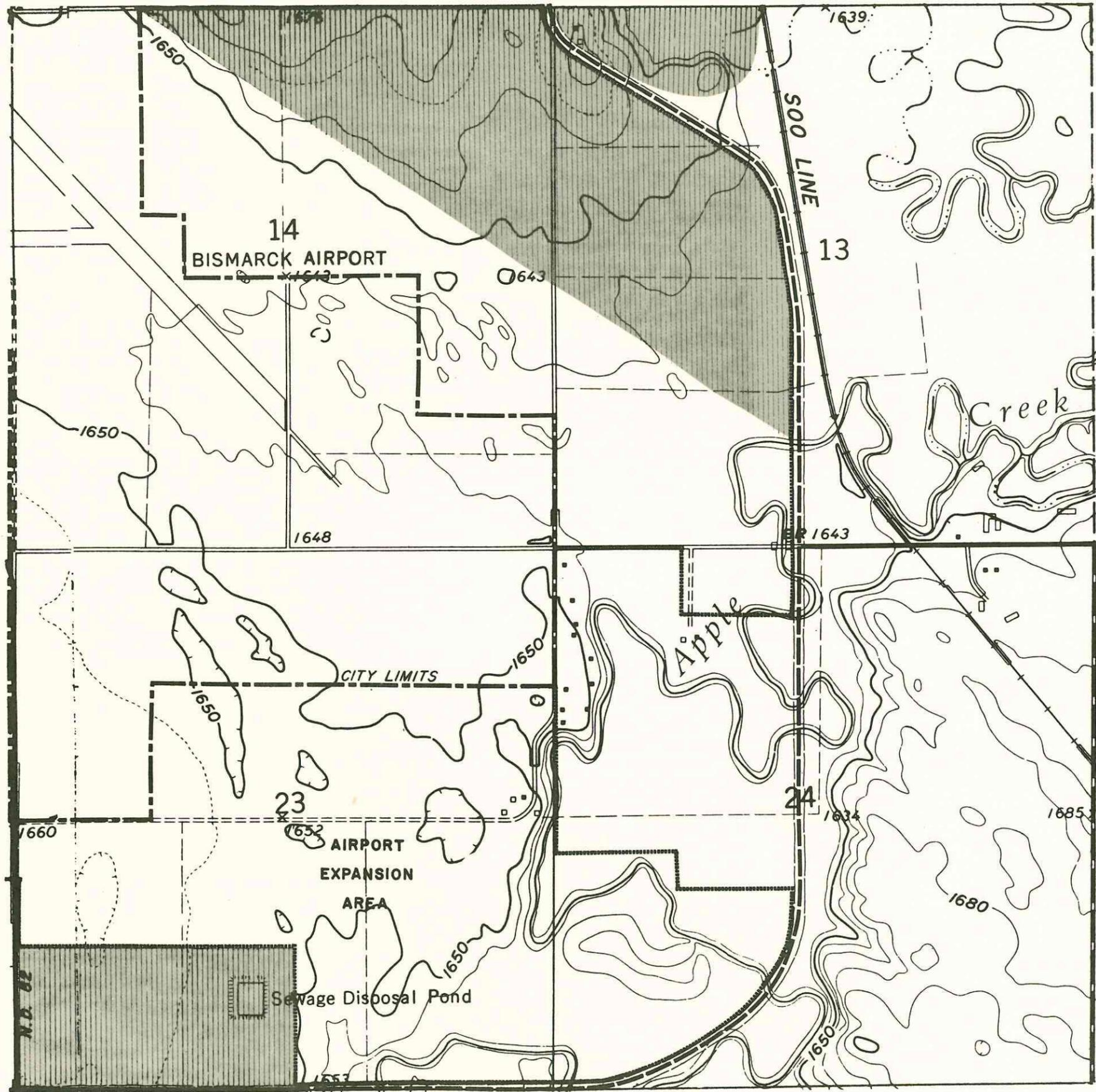


Around Cottonwood Lake is a proposed single family living area fronting on a park and openspace system.

Other industrial development is expected to the west of the present airport and south of the airport expansion area.



Airport-oriented industrial use continues in this sector of Bismarck and is served by a new circumferential arterial street.



The Mary College site is expected to experience a growth in single family and multi-family development. To serve this community, a small commercial area is proposed.

