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The staff of the Land Use Planning Division of the Regional Planning Commission and Mr. Arnold L. Clement, Racine County Planner, and his staff are hereby acknowledged for their efforts in the preparation of this report.

ALTERNATIVE LAND USE AND SANITARY SEWERAGE SYSTEM PLANS

FOR THE

TOWN OF RAYMOND - 1990

Prepared for the

Town of Raymond,

Racine County, Wisconsin

by the

Southeastern Wisconsin Regional Planning Commission

January, 1974

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SOUTHEASTERN N

916 NO. EAST AVENUE

WISCONSIN

WAUKESHA, WISCONSIN 53186

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COMMISSION

March 22, 1974

Mr. Richard L. Hebron, Chairman and Members of the Town Board and Town Plan Commission of the Town of Raymond Route 1 Franksville, Wisconsin 53126

Gentlemen:

The Regional Planning Commission is pleased to submit this report on alternative land use and sanitary sewerage system plans to the Town Board and Town Planning Commission of the Town of Raymond. The report was prepared by the Commission staff with the assistance of the J. C. Zimmerman Engineering Corporation, consulting municipal engineers, pursuant to the request of the Town Board as set forth in a letter received here on April 13, 1973.

In addition to describing alternative land use and supporting sanitary sewerage system plans for the Town of Raymond, this report presents basic information on the existing population, employment, land use, and natural resource base of the Town, information essential to land use and sanitary sewerage system planning. It should be noted that the report does not make any recommendations to the Town regarding which of the alternative land use and sanitary sewerage system plans, or modifications thereof, should be adopted. This choice should properly be made by the elected officials of the Town after careful review of the alternatives and after receiving the reaction of interested citizens of the Town. The report does, however, provide a sound basis for the selection of a sound future course of action with respect to land use and sanitary sewerage system development within the Town.

Although delivery of this report constitutes the completion of the Commission's obligation regarding the Town's request for assistance in this specific local planning matter, the Commission and Commission staff stand ready to assist the Town officials in any way possible in using this report to reach agreement on a future course of action within the Town and to subsequently assist the Town officials in the implementation of that chosen course of action.

We trust that the information contained in this report will be helpful to the Town Board and Town Planning Commission in determining the direction which future growth and development should take in the Town of Raymond.

Sincerely. W Bauer

Executive Director

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INTRODUCTION

In April, 1973, the Town Chairman of the Town of Raymond, Racine County, Wisconsin, requested that the Southeastern Wisconsin Regional Planning Commission assist the Town in the review of the adopted regional land use plan as it applied to the Town and in the preparation of alternative land use plans and attendant alternative sanitary sewerage system plans for the northerly portion of the Town. Following this request, a series of meetings was held among the members of the Town Board, Town Plan Commission, the Racine County Planning staff, and the Regional Planning Commission staff to discuss the problems inherent in extending central public sanitary sewer service to the most northerly and northeasterly sections of the Town of Raymond and the land use implications of such extension.

Recognizing the need to prepare alternative land use plans for the area of concern as a prerequisite to the preparation of alternative sanitary sewerage system plans, the Town specifically requested that the Commission prepare at least three alternative land use plans for the Town, all of which were to include a wide range of urban land uses and of which one was to reflect the land use pattern for the Town as recommended in the adopted regional land use plan. It was further specifically requested that at least one method of providing central public sanitary sewer service to the proposed land uses under each plan design be explored and an estimate of the cost of such provision be included in a planning report to the Town. This report then constitutes the direct response to the initial request and the resulting agreement between the Regional Planning Commission and the Town for the preparation of the aforementioned alternative plans and attendant cost estimates and contains a summary of the findings of the planning efforts involved.

The planning work was accomplished in two stages, with the first stage including an analysis of existing (1970) land use development in the Town and of the natural resource base characteristics; the preparation of three alternative land use plans for review by the Town Plan Commission; a preliminary review of the alternative land use plans by the Town Plan Commission; and the subsequent preparation of a fourth alternative land use plan as requested by the Town Plan Commission.

The second stage of the planning work included the employment by the Commission of the J. C. Zimmerman Engineering Corporation to undertake the development of alternative general sanitary sewerage system plans for each of the four alternative land use plans prepared, together with estimates of the total cost of system construction, operation, and maintenance.

The following sections of this report present the findings of the two stage planning efforts as outlined above. It is intended that this report provide the information required by the Town Board, Town Plan Commission, and citizen body in the determination of the extent and direction of future urban and rural development in the Town of Raymond.

EXISTING LAND USE AND NATURAL RESOURCE BASE

The Town of Raymond is located in the north-central section of Racine County, bordered on the north by the City of Franklin in Milwaukee County and on the east by the Town of Caledonia, on the south by the Town of Yorkville, and on the west by the Town of Norway, all in Racine County. The total land and water area of the Town is 22,638.41 acres, or 35.4 square miles, of which approximately 33.2 square miles is encompassed within the Root River watershed and the remaining approximately 2.2 square miles of the western sections of the Town lying within the Illinois-Fox River watershed. The boundary between these two major watersheds also forms the subcontinental divide between the Great Lakes-St. Lawrence River watershed on the east and the Mississippi River Basin on the west. The Root River Canal traverses the Town flowing from south to north to its confluence with the main stem of the Root River in the City of Franklin. Map 1 shows the principal topographic and cultural features of the Town, including the drainage pattern. As shown on this map, the main stem of the Root River flows along the northern boundary of the Town meandering in and out of the Town.





LEGEND BOUNDARIES --- COUNTY --- SECTION SUBCONTINENTAL DIVIDE + STATE PLANE COORDINATE SYSTEM TOWN OF RAYMOND TRANSPORTATION ROUTES -(94)- INTERSTATE HIGHWAY -45- U.S. NUMBERED HIGHWAY - 03- STATE TRUNK HIGHWAY - COUNTY TRUNK HIGHWAY ---- LOCAL OR MINOR STREET WATER RELATED INFORMATION - RIVER AND LAKE SHORELINE --- INTERMITTENT STREAM OR WATERCOURSE MARSH OR SWAMP TOPOGRAPHIC INFORMATION - IO FOOT CONTOUR INTERVAL LINE 50 FOOT CONTOUR INTERVAL LINE WITH ELEVATION SHOWN IN FEET ABOVE MEAN SEA LEVEL





The topography of the Town may be characterized as flat to gently rolling and the soils are predominantly clay-loam with some outwash, gravelly soils in the low lying areas along the major streams. IH-94 is located along the eastern boundary of the Town and CTH "G" and "K" traverse the Town in an east-west direction interchanging with IH-94. In addition, CTH "U" traverses the Town in a north-south direction following approximately the extension of S. 76th Street in the City of Franklin. USH 45 is located on the western boundary of the Town.

The majority of the land area of the Town is presently devoted to agricultural uses. The Town has, however, experienced some scattered residential development in the past few years due in part to its proximity to the Milwaukee and Racine job markets, as well as an evident reduction in the interest in farming as a way of life in the Town. Map 2 presents a graphic summary of the existing (1970) urban land uses in the Town. It can be seen from the map that the diffused character of the urban residential uses is such that few large areas of land remain in the Town which can be efficiently farmed which have not been encroached upon by urban residential development. As shown on Map 3, almost all of the Town has, under the county zoning ordinance, been placed in the 'A-2'--agricultural zoning district. This district permits, in addition to agricultural uses, residential development on individual parcels of land 40,000 square feet in area or larger. Residential development on parcels of this size is urban in fact.

As shown on Map 4, approximately 90 percent of the Town of Raymond is covered by soils having severe or very severe limitations for urban residential development utilizing on-site soil absorption sewage disposal facilities (septic tanks). Characteristically, these soils have slow permeability rates, a high or fluctuating water table, high shrink-swell ratio, may have steep slopes, and may also be subject to periodic flooding or surface ponding. All of these characteristics are detrimental to development for urban use and particularly urban residential^a use

^aFor purposes of land use planning and development in southeastern Wisconsin, the Southeastern Wisconsin Regional Planning Commission has defined 'urban residential' as any dwelling unit placed on a parcel of land of less than five acres in area.

utilizing septic tanks for sewage disposal. In addition, urban development in the Town, in the absence of a centralized public water supply system, must rely on individual shallow wells for water supply. Such are basically recharged from rainfall and runoff within local catchment areas and are subject to contamination from local sources. Continued urban development in the Town utilizing both septic tanks and shallow wells may, therefore, result in both surface water pollution and contamination of individual shallow wells.

In order to provide additional agricultural lands during the first 30 years of this century, many of the historic wetlands and low lying areas of the Town were drained and the water table lowered by surface ditching and/or the installation of subsurface drain tiles. Consequently, few wetland areas remain in the Town. Conversion of land from rural to urban use without maintenance of these farm drainage systems may result in rising water tables, wet basements, and attendant drainage problems. Few woodland areas of substantial size remain in the Town, the original woodland cover having been removed for cultivation or the timber damaged or destroyed due to extensive pasturing. Because the Town of Raymond has little remaining wetland or woodland areas, it has little high value wildlife habitat areas as compared to other predominantly rural towns in southeastern Wisconsin. Table 1 presents a summary of the existing land uses in the Town in 1963 and 1970. Map 5 presents a graphic presentation of the general land uses in the Town in 1970. As shown, only 3.3 square miles of the land, or 9.3 percent of the total Town land area, is devoted to urban uses. A total of 3.5 square miles, or 9.8 percent of the Town, is in so-called "open lands"^b and the remaining 28.6 square miles, or 80.9 percent of the Town is devoted to agricultural uses. Prime agricultural areas representing the most productive farm lands have been delineated based on studies conducted by the Regional Planning Commission in 1964; and, as shown on Map 6, over 50 percent

^bOpen lands are comprised of woodlands, wetlands, surface water, and unused lands.

URBAN DEVELOPMENT IN THE TOWN OF RAYMOND--1970



LEGEND URBAN USES AGRICULTURAL AND OPEN SPACE USES MAJOR ELECTRIC POWER TRANSMISSION LINES BASE MAP INFORMATION BOUNDARIES ---- COUNTY SECTION ****** SUBCONTINENTAL DIVIDE + STATE PLANE COORDINATE SYSTEM TOWN OF RAYMOND TRANSPORTATION ROUTES -94- INTERSTATE HIGHWAY -45- U.S. NUMBERED HIGHWAY -83- STATE TRUNK HIGHWAY - COUNTY TRUNK HIGHWAY ----- LOCAL OR MINOR STREET WATER RELATED INFORMATION WW RIVER AND LAKE SHORELINE INTERMITTENT STREAM OR WATERCOURSE MARSH OR SWAMP



OE/FRANKLIN MILWAUKEE CO. (A-3) RAYMOND 10-1 M-3 ------B-5+ SEVENMAR A-2 A-2 R-4 KNEELAN B-5 B-3-B-5 B-5 Δ-SMIL P-2 B٠ B-5 B-3-A-2 MOND -M-3 7 A-2 20 24 R-2-41 8-2 FOURMILE B-3 n 4 **⊾в-з**. R-2-28 в-A-3 C-1 33 88 -2 A-2 A-2 NR ANAMOD YORKVILLE

LEGEND

ZONING DISTRICTS R-1 COUNTRY ESTATE: 5 ACRES, 300 FEET R-2 RESIDENTIAL: 150 FEET, 40,000 SQUARE FEET, NO SEWER R-3 RESIDENTIAL: 100 FEET, 20,000 SQUARE FEET, SEWER R-4] RESIDENTIAL: 75 FEET, 10,000 SQUARE FEET, SEWER R-5] RESIDENTIAL: 60 FEET, 7,200 SQUARE FEET, SEWER R-6 TWO-FAMILY RESIDENTIAL: 100 FEET, 10,000 SQUARE FEET [R-7] MULTI-FAMILY RESIDENTIAL: 120 FEET, 15,000 SQUARE FEET R-8 PLANNED RESIDENTIAL: 10 ACRES B- I NEIGHBORHOOD BUSINESS B-2 COMMUNITY BUSINESS B-3 COMMERCIAL SERVICE B-4 PLANNED BUSINESS: 200 FEET, 2 ACRES B-5 HIGHWAY BUSINESS: 400 FEET, 4 ACRES B-6 WATER ORIENTED BUSINESS A-1 FARMING-EXCLUSIVE A-2 FARMING-UNRESTRICTED OR 40,000 SQUARE FEET RESIDENTIAL A-3 FARMING-HOLDING A-4 TRUCK-FARMING M-1 LIGHT INDUSTRIAL AND OFFICE M-2 GENERAL INDUSTRIAL M-3 HEAVY INDUSTRIAL M-4 QUARRY P-I INSTITUTIONAL P-2 RECREATIONAL PARK C-1 CONSERVATION DISTRICT FLOODLAND REGULATORY AREAS 10 - YEAR RECURRENCE INTERVAL FLOOD INUNDATION LINE V 100-YEAR RECURRENCE INTERVAL FLOOD INUNDATION LINE



MAP 3

ZONING IN THE TOWN OF RAYMOND--1973

of the agricultural land in the Town is considered as prime agricultural lands and, as such, should be preserved for agricultural use. These predominant agricultural areas of the Town have, however, been substantially encroached upon by scattered urban development. The result has been agricultural areas in which it is more difficult to farm efficiently and productively and urban areas which are more difficult to serve efficiently with traditional urban services.^C

In addition to the individual land uses, the floodlands of the Root River and its major tributaries are also shown on Maps 2, 4, and 6. These floodlands, together with the various adjacent rural land uses, form a significant physical feature having high natural resource value termed an environmental corridor. Any development in the Town should be carefully adjusted to thus feature and serve to preserve and protect it in essentially natural open uses as recommended in the adopted regional land use plan and the adopted comprehensive plan for the Root River watershed. The environmental corridors in the Town encompass a total area of 1,682 acres, or 7.4 percent of the total area of the Town. In addition, as shown on Map 6, there are four specific privately owned sites in the Town that have been identified by the Regional Planning Commission as having significant potential for development as recreation areas. All four of these sites still remain in essentially an undeveloped state and should be preserved as potential county or community recreation areas. Three of the four sites, located in U. S. Public Land Survey Sections 1, 3, and 5, should receive high priority for such use due to their proximity to existing intensive urban development.

^CTraditional urban services in southeastern Wisconsin include central public water supply and sanitary sewerage facilities, public schools, public libraries, fulltime police and fire protection, snow removal and street maintenance, solid waste collection and disposal, and centralized gas, electric power, and telephone services. In medium and high density urban areas, mass transit facilities are also considered a traditional urban service.

TABLE 1

LAND USE IN THE TOWN OF RAYMOND, RACINE COUNTY, WISCONSIN 1963 AND 1970

			1963	-1970
Land Use Categories ^a	1963 Acres	1970 Acres	Change in Acres	Percent Change
Residential	30.39	71.61	40.68	131.52
Undeveloped ^b	457,15	695.69	238.54	52.18
Developed	. ·			
Total Residential	488.08	767.30	279,22	57.21
Commercial				
Major	n/a	n/a		
Other	4.66	26.12	21.46	460.52
Total Commercial	4.66	26.12	21.46	460.52
Industrial			1	
Major	n/a	n/a		
Mining	279.80	59.70	-220.10	-78.660
Other	5.44	24.02	18.58	341.54
Total Industrial	285.24	83.72	-201,52	-70.65°
Transportation and Utility				
Transportation	1,093,46	1,099.22	5,76	0,53
Off-Street Parking	7.02	22.16	15.14	215.67
Total Transportation	1,100.48	1,121.38	20.90	1.90
Compressit and Institution				
Othen				
other .	44.11	46.19	2,08	4.71
Total Government and				
Institution	44.11	46.19	2.08	4.71
P				
Recreation				
Major	n/a	n/a		
Neighborhood	.00	.00	· · · · · · · · · · · · · · · · · · ·	
Other	42.55	57.43	14.88	34.97
Total Recreation	42.55	57.43	14.88	34.97
Total Urban Land	1,965.12	2,102.14	137.02	6,97
A				
Agriculture	10 000		~ · · · ·	
Croplands	18,623,15	18,105,26	-517.89	-2.78
Relateda	66.84	209.51	142.67	213.45
Total Agriculture	18,689,99	18,314.77	-375.22	-2.01
Open Land				
Water and Wetland	665.75	760.18	+94.43	14,18
Woodland	1,245.06	1.170.02	-75.04	-6,03
Unused Land	72.49	291.30	218.81	301.85
			<u>^</u>	^
Total Open Lands	1,983.30	2,221.50	238.20	12.01
Total Rural Lands	20,673.29	20,536.27	-137.02	-0.66
Total Area of Town				
(Urban and Rural)	22,638.41	22,638.41		

^aPursuant to SEWRPC 1963 and 1970 Land Use Inventories.

^bUndeveloped residential lands are those lands visibly under urban residential developments but having no structures on the lands.

^CMajor loss in mining activity was due primarily to conversion between 1963 and 1970 from active quarrying to unused lands, thereby accounting for significant increase in the open lands category.

dRelated agricultural lands include lands used for fur farms, orchards, and similar special agricultural activities.

SOILS IN THE TOWN OF RAYMOND



LEGEND

SOILS HAVING SEVERE OR VERY SEVERE LIMITATIONS FOR URBAN DEVELOPMENT ON PARCELS OF LESS THAN ONE ACRE IN SIZE AND UTILIZING ON-SITE SOIL ABSORPTION SEWAGE DISPOSAL SYSTEMS (SEPTIC TANKS)

SOILS HAVING SLIGHT TO MODERATE LIMITATIONS FOR URBAN DEVELOPMENT ON PARCELS OF LESS THAN ONE ACRE IN SIZE AND UTILIZING ON-SITE SOIL ABSORPTION SEWAGE DISPOSAL SYSTEMS (SEPTIC TANKS)

- IOO-YEAR RECURRENCE INTERVAL FLOOD INUNDATION LINE

BASE MAP INFORMATION

BOUNDARIES

--- COUNTY

SECTION

****** SUBCONTINENTAL DIVIDE

+ STATE PLANE COORDINATE SYSTEM

11 TOWN OF RAYMOND

TRANSPORTATION ROUTES

- ----- INTERSTATE HIGHWAY

- STATE TRUNK HIGHWAY

- COUNTY TRUNK HIGHWAY
- ---- LOCAL OR MINOR STREET

WATER RELATED INFORMATION

- ---- INTERMITTENT STREAM OR WATERCOURSE
- MARSH OR SWAMP



LAND USE IN THE TOWN OF RAYMOND--1970





8000 PEET



POPULATION AND EMPLOYMENT

Reviewing the housing and population characteristics for the Town of Raymond, as shown in Table 2, it is apparent that this essentially rural town experienced a substantial increase in population during the 1960 to 1970 period. The addition of 1,391 people during the ten-year period was an increase of nearly 60 percent in the Town while the population of Racine County as a whole increased by only about 21 percent and the Region's population increased by about 12 percent. This increase in population was evidently essentially non-farm population; and, in fact, only about eight percent of the employed population in the Town, 14 years old or older, listed their occupation as being farming or farm related in the 1970 census, as shown in Table 3.

There was also a slight increase in persons per housing unit during the decade, a reverse of the county and the regional trend. Of all housing units in the Town, a larger percentage were occupied by renters (19 percent) in 1970 than was the case in 1960 (17 percent). The housing vacancy rate dropped substantially from 5.7 percent in 1960 to 2.0 percent in 1970. An expected normal vacancy rate is considered to be 3.0 percent.

The significant increase in population was apparently one of the factors leading to the action by the Town Board and Town Plan Commission to review the possibilities and feasibility of providing utilities to an expanding population in the Town. It should again be noted, however, that in reviewing the existing land use pattern in the Town, this additional growth was not, for the most part, concentrated in any one area of the Town but scattered throughout the Town as evidenced by the pattern of urban development as shown on Map 7. As already indicated, such development is not only difficult to serve with traditional public services but also is disruptive to good agricultural practices; and if population continues to increase, as has been the case in the past decade, a determination needs to be made regarding the future development of the Town in either a scatter manner, as was the

TABLE 2

	Y	ear	1960-1970 Change				
CHARACTERISTICS	1960	1970	Number	Percent			
Total Population	2,344	3,735	1,391	59.34			
Total Housing Units	627	954	327	52.15			
Persons per Housing Unit	3.74	3,92	0.18	4.81			
Owner Occupied Housing Units	491	755	264	53.77			
Renter Occupied Housing Units	100	179	79	79.00			
Vacant Housing Units	36	20	-16	-44.44			
Population in Owner Occupied Housing Units		3,026					
Population in Renter Occupied Housing Units		709					

POPULATION AND HOUSING CHARACTERISTICS OF THE TOWN OF RAYMOND-1960 AND 1970

Source: 1970 U. S. Census and SEWRPC.

TABLE 3

EMPLOYED POPULATION 14 YEARS OLD AND OVER BY OCCUPATION AND SEX IN THE TOWN OF RAYMOND - 1970

		MALE	FEN	ALE	TOTAL		
OCCUPATION	NUMBER	PERCENT OF TOTAL	NUMBER	PERCENT OF TOTAL	NUMBER	PERCENT OF TOTAL	
Professional, Technical, and Kindred Workers	92	10.17	73	19.62	165	12.92	
Managers, Administrators Except Farm	46	5.08	9	2.42	55	4.31	
Sales Workers	30	3.31	25	6,72	55	4.31	
Clerical and Kindred Workers	11	1.22	114	30.65	125	9.79	
Draftsmen, Foremen and Kindred Workers	269	29.72	6	1.61	275	21.53	
Operatives, Except Transport	215	23.76	44	11.83	259	20.28	
Transport Equipment Operatives	55	6.08	10	2.69	65	5.09	
Labor, Except Farm	9	.99		.00	9	.70	
Farmers and Farm Managers	62	6.85		.00	62	4.86	
Farm Laborers and Foremen	42	4.64	3	.81	45	3.52	
Service Workers, Except Private Household	37	4.09	59	15.86	96	7,52	
Private Household Workers		.00	9	2.42	9	.70	
Occupation Not Reported	37	4.09	20	5.38	57	4.46	
TOTAL	905	100.00	372	100.00	1,277	100.00	

Source: U. S. Bureau of the Census and SEWRPC.

RECREATION, OPEN SPACE, AND OTHER NATURAL RESOURCE VALUES IN THE TOWN OF RAYMOND--1970







practice heretofore, or in a concentration of urban development where public utilities and other services can feasibly be provided.

ALTERNATIVE LAND USE PLAN PREPARATION

Following a general analysis of the major elements of existing land use and the natural resource base, alternative land use plans were formulated. As already indicated, one of the basic issues to be addressed in the planning effort was the feasibility of extending public sanitary sewerage service from the Milwaukee metropolitan sewerage system into the Town of Raymond, with the basic alternative to such provision being a curtailment of urban development in the Town due to the physical constraints already described.

In the conduct of the preparation of alternative land use plans, it was assumed that:

- The 1990 population forecast for the Town of Raymond as documented in the adopted regional land use plan would approximate the population to be accommodated in all of the alternative land use plans to be examined. This population level is 10,500 persons.
- Urban neighborhoods would be delineated in the plan preparation process, and there would be no provisions made for further urban development in the Town outside of the neighborhoods as delineated.
- 3. One of the alternative land use plans explored would duplicate the recommended urban development shown on the adopted regional land use plan for the Town of Raymond.
- 4. If the Town Board, after reviewing the alternative plans, decides to proceed with the formation of a Town Sanitary District and the construction of sanitary sewerage facilities connected to the Milwaukee metropolitan sewerage system, the legal agreements for connection to that system and continued service to the Town could be satisfactorily negotiated with the Milwaukee Metropolitan Sewerage Commission and involved municipalities.

ALTERNATIVE LAND USE PLAN NO. 1 FOR THE TOWN OF RAYMOND--1990



TABLE 4

DEMOGRAPHIC AND LAND USE DATA SUMMARY FOR THE TOWN OF RAYMOND IN 1970 AND 1990 BASED ON ALTERNATIVE LAND USE PLAN NO. 1

DATA	KNE	ELAND NEIGHB	ORHOOD	4	AYMOND - N.E NEIGHBORHOOD	•	ALL	OTHER TOWN A	REAS	TOTAL TOWN OF RAYMOND			
SUMMARY CATEGORY	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	
POPULATION	398	4,268	4,666	277	2,552	2,829	3,060		3,060	3,735	6,820	10,555	
DWELLING UNITS	94	1,067	1,161	68	637	705	792		792	954	1,704	2,658	
POPULATION/DWEL- LING UNIT	4.23	4.00	4.02	4.07	4.00	4.01	3.86		3.86	3.91	4.00	3.97	
LAND USE (In Acres)													
Residential	89	1,067	1,156	54	637	691	624		624	767	1,704	2,471	
Retail and Service	2	7	9	l	4	5	23		23	26	11	37	
Industrial	3		3	2		2	79		79	84		84	
Transportation and Utilities	118	220	338	63	132	195	941		941	1,122	352	1,474	
Governmental and Institutional	1	40	41		24	24	45		45	46	64	110	
Recreational							57		57	57		57	
Subtotal (Urban)	213	1,334	1,547	120	79 7	917	1,769		1,769	2,102	2,131	4,233	
Agricultural	2,733	-1,334	1,399	1,522	-797	725	14,060	-470	13,590	18,315	-2,601	15,714	
Open Lands	301	-301		305	-305		1,615	-606	1,009	2,221	-1,212	1,009	
Primary Environ- mental Corridor		301	301		305	305		1,076	1,076		1,682	1,682	
Subtotal (Rural)	3,034	-1,334	1,700	1,827	-797	1,030	15,675		15,675	20,536	-2,131	18,405	
TOTAL LAND USE	3,247		3,247	1,947		1,947	17,444		17,444	22,638		22,638	

- 5. The Town would comply with the comprehensive plan for the Root River watershed which recommends that no new central public wastewater treatment facilities having outfall to the Root River or its tributaries be constructed in the Root River watershed, thereby removing the alternative of constructing Town operated wastewater treatment and collection facilities.
- 6. The arterial streets and highways, as depicted on the Racine County jurisdictional highway plan under preparation at the time of publication of this report, would be included as a part of each alternative land use plan and would include proposed realignment and reconstruction of portions of existing CTH "K" and CTH "U" and the proposed rerouting and possible reconstruction of CTH "G" along Seven Mile Road throughout its length in the Town of Raymond.

Prior to the actual delineation of urban land use areas and residential neighborhoods for any of the alternative plans, it was necessary to make a determination as to the extent of 'developable' land in the areas of the Town in which urban development is expected or should take place. This task was accomplished by the utilization of the following procedures for each U. S. Public Land Survey quarter section: 1) adding the total acres of existing urban development, the total acres of delineated primary environmental corridors, the total acres of water, wetland, and floodland areas outside of the environmental corridors, and the total acres of soils having severe or very severe limitations for urban development served by public sanitary sewers and lying outside of the environmental corridor to obtain a total land area that, because of either existing development or natural resource base considerations, cannot or should not be developed for urban use; and 2) subtracting this total area from the gross area of the quarter-section to obtain a 'developable' land area suitable for urban use.

Alternative Land Use Plan No. 1

The first alternative land use plan considered consists of the land use development recommended for the Town in the adopted regional land use plan. At the time that the regional land use plan was prepared, the intent of the recommendation that a part of the Town be developed for low density^d urban development was that this part of the Town would be suitable for relatively high value, large lot, predominantly single-family residential development. Such development results in residential density at the equivalent of approximately one acre per dwelling unit. It should be noted that such development is still considered to be urban, requiring traditional urban services and consequently would require the extension or provision of central public utilities. These recommendations include the addition by 1990 of approximately 2,131 acres (3.3 square miles) of low density urban development to be located in U. S. Public Land Survey Sections 1, 2, 3, 4, 5, 8, 9, 10, and 11 and encompass a total population of 7,495 of which 675 resided in the 3.3 square mile area in 1970 (see Map 7 and Table 4). The urban development, as delineated in this alternative, is encompassed within two density urban neighborhoods, the first of which includes all areas of U.S. Public Land Survey Sections 3, 4, 5, 8, 9, and 10 lying west of the Root River Canal, called the Kneeland Neighborhood, and the second including all areas within U. S. Public Land Survey Sections 1, 2, 3, 10 and 11 lying east of the Root River Canal, called the Raymond-Northeast Neighborhood. A primary environmental corridor encompassing the Root River Canal, adjacent floodplain areas, and attendant woodland, wetland, and wildlife habitat areas form a natural boundary between the two neighborhoods.

The Kneeland Neighborhood is bounded on the west by S. 108th Street, on the south by Six Mile Road, on the north by the county line, and on the east by the Root

^dLow density urban development is defined by the Southeastern Wisconsin Regional Planning Commission as urban development having a density of from 0.2 to 2.2 dwelling units per net residential acre, or 350 to 3,499 persons per square mile.

ALTERNATIVE LAND USE PLAN NO. 2 FOR THE TOWN OF RAYMOND--1990



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DATA	KNEELAND NEIGHBORHOOD			RAYMOND - N.E. NEIGHBORHOOD			' POC	'POCKET' RESIDENTIAL DEVELOPMENT			COMMERCIAL/ INDUSTRIAL AREA			ALL OTHER TOWN AREAS			TOTAL TOWN OF RAYMOND		
SUMMARY CATEGORY	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	
POPULATION	187	3,280	3,467	140	3,410	3,550.	45	192	237	138		138	3,225		3,225	3,735	6,882	10,617	
DWELLING UNITS	47	820	867	36	853	889	12	48	60	36		36	823		823	954	1,721	2,675	
POPULATION/DWEL- LING UNIT	3.98	4.00	4.00	3.89	4.00	3.99	3.75	4.00	3.95	3.83		3.83	3.92		3.92	3.92	4.00	3.97	
LAND USE (In Acres)												1							
Residential	40	328	368	27	341	368	10	48	58	22		22	668		668	767	717	1,484	
Retail and Service	1	ц	5		5	5				17	58	75	8		8	26	67	93	
Industrial				5		5				l	162	163	78		78	84	162	246	
Transportation and Utilities	47	103	150	38	107	145.	3	10	13	78	20	98	956		956	1,122	267	1,389	
Governmental and Institutional	ı	11	12		12	12		2	2				45		45	46	25	71	
Recreational										34		34	23		23	57		57	
Subtotal (Urban)	89	446	535	70	465	5,35	13	60	73	152	240	392	1,778		1,778	2,102	1,211	3,313	
Agricultural	589	-589		551	-551		151	-151		225	-225		16,799		16,799	18,315	-1,516	16,799	
Open Lands	80	-80		171	-171		124	-124		159	-159		1,687	-843	844	2,221	-1,377	844	
Primary Environ- mental Corridor		223	223		257	257		215	215		144	144		843	843		1,682	1,682	
Subtotal (Rural)	669	-446	722	722	-465	257	275	-60	215	384	-240	144	18,486		18,486	20,536	-1,211	19,325	
TOTAL LAND USE	758		758	792		792	288		288	236		536	20,264		20,264	22,638		22,638	

 TABLE 5

 DEMOGRAPHIC AND LAND USE DATA SUMMARY FOR THE TOWN OF RAYMOND IN 1970 AND 1990 BASED ON ALTERNATIVE LAND USE PLAN NO. 2

Source: SEWRPC.

River Canal. The Raymond-Northeast Neighborhood is bounded on the west by the Root River Canal, on the north by the county line, on the east by S. 43rd Street extended and the Root River, and on the south by Six Mile Road (see Map 7). The total land use areas for each major land use category in each of the two neighborhoods has been calculated and tabulated in Table 4.

The total 1990 population of the Kneeland Neighborhood is projected at 4,666, of which 398 resided within the neighborhood area in 1970. To accommodate the additional 4,268 people would require the conversion of 1,334 acres of rural land to urban neighborhood development in addition to the 213 acres of urban development in the neighborhood area in 1970. The specific projected 1990 uses for the neighborhood are shown in Table 4.

As also shown on Table 4, the total 1990 population of the Raymond-Northeast Neighborhood is projected at 2,829, of which 277 resided in the neighborhood area in 1970. To accommodate the additional 2,552 people would require the conversion of 797 acres of rural land to urban neighborhood development in addition to the 120 acres of urban development in the neighborhood area in 1970. The specific projected 1990 uses for the neighborhood are also shown on Table 4. It should be noted that no recreation land has been projected in either neighborhood due to the extent and proximity of the primary environmental corridor forming the boundary between the neighborhoods, which corridor lands are expected to be used in part for recreational purposes. In both neighborhoods, the majority of the urban development would be comprised of residential lands and those lands required for transportation facilities necessary to serve the residential neighborhoods. S. 43rd Street between Six Mile Road and Seven Mile Road, and Six Mile Road between S. 76th Street and S. 43rd Street would be added to the arterial street and highway system as local urban arterials serving the neighborhoods. In addition, there would be some land devoted to neighborhood convenience shopping and some land devoted to school facilities as well as other institutional facilities such as churches. It should also be noted

that this proposal would require the conversion within the Kneeland Neighborhood of two square miles of what is presently considered prime agricultural lands to urban use to accommodate the projected populations involved.

Alternative Land Use Plan No. 2

The second alternative plan considered proposes a quite different pattern of development than that proposed in the first alternative. Common to both plans, in fact common to all four alternative land use plans, is the recommendation for the preservation of the primary environmental corridors. Alternative Land Use Plan No. 2, however, proposes that urban land development take place at medium density,^e therefore requiring less land area to accommodate the same population level as accommodated in the plan for low density development (see Map 8). This alternative land use plan recommends the addition by 1990 of approximately 911 acres (1.4 square miles) of medium density urban development to be located generally in U.S. Public Land Survey Sections 2, 3, and 10 and accommodating a total population of 6,690 (see Table 5). In addition, a 'pocket' of existing low density residential development and agricultural and open space uses located in U. S. Public Land Survey Section 1 and lying north of the Root River and south of the county boundary would be expected to be fully developed at low density by 1990 and accommodate the total population of 237, of which 45 resided in the 'pocket' area in 1970. Also, in addition, it is proposed to develop for industrial purposes by 1990 those non-urban developable lands remaining in Section 1 not already included in the 'pocket' development or in the primary environmental corridor areas and to also develop for retail and service uses those 'developable' land areas lying east of the environmental corridor in U. S. Public Land Survey Section 12.

The medium density urban development, as delineated in this alternative, is encompassed within two neighborhoods, the first of which includes all land areas in

^eMedium density urban development is defined by the Southeastern Wisconsin Regional Planning Commission as urban development having a density of from 2.3 to 6.9 dwelling units per net residential acre, or 3,500 to 9,999 persons per square mile.

U. S. Public Land Survey Sections 3 and 10 lying west of the Root River Canal and tributary environmental corridors, called the Kneeland Neighborhood; and the second including all areas within U. S. Public Land Survey Sections 2 and 3 lying east of the Root River Canal, called the Raymond-Northeast Neighborhood. As was the case in Alternative Land Use Plan No. 1, the primary environmental corridor encompassing the Root River Canal, adjacent floodplain areas, and attendant woodland, wetland, and wildlife habitat areas forms a natural boundary between these two neighborhoods. As shown on Map 8, the western boundary of the Kneeland Neighborhood is the western boundary of Section 3; the north boundary, an unnamed creek. The Raymond-Northeast Neighborhood is bounded on the west by the Root River Canal, on the north by the county line, on the east by the Root River and S. 43rd Street, and on the south by Seven Mile Road.

The total land use areas for each major land use category in the two neighborhoods and for the 'pocket' area and the industrial and commercial areas have been calculated and tabulated in Table 5. The total 1990 population of the Kneeland Neighborhood is projected at 3,467, of which 187 resided in the neighborhood area in 1970. To accommodate the additional 3,280 people will require the conversion of 446 acres of rural land to urban neighborhood development in addition to the 89 acres of urban development in the neighborhood area in 1970. The specific projected 1990 uses for the neighborhood are shown on Table 5. Also, as shown on the table, the total 1990 population of the Raymond-Northeast Neighborhood is projected at 3,550, of which 140 resided in the neighborhood area in 1970. To accommodate the additional 3,410 people will require the conversion of 465 acres of rural land to urban neighborhood area in 1970. The specific projected 1990 uses for the neighborhood area in 1970. The specific projected at area is projected at 237, of which 45 resided in the area in 1970. To accommodate

the additional 192 people would require the conversion of 60 acres of rural land to low density neighborhood development in addition to the 13 acres of urban development in the area in 1970.

The proposed industrial area located in Section 1 would require the conversion and development of 175 acres of rural land to urban development in addition to the existing 77 acres of urban land located in this area in 1970 for a total of 252 acres developed by 1990. Of the additional 175 urban acres, 162 acres would be devoted to industrial use and 13 acres to transportation facilities serving the industrial development. It is expected that, when developed, the industrial area would offer employment to approximately 2,400 people.

The retail and service area proposed to be located in Section 12 would require the conversion and development of 65 acres of rural land to urban development in addition to the 75 acres of urban land located in this area in 1970 for a total of 140 acres developed by 1990. Of the proposed 65 additional acres, 58 would be devoted to retail and service uses and 7 would be devoted to transportation facilities serving the new commercial development. It is also expected that this retail and service area, when fully developed, would offer employment to approximately 800 people.

Predominant uses in each of the two medium density neighborhoods are residential lands and transportation lands necessary to serve the residential use area. In addition, land would be set aside for neighborhood commercial uses as well as for elementary school and other institutional facilities required by the neighborhood residents. It is not expected that the 'pocket' residential area north of the Root River would require either an elementary school facility to be located within the area or local neighborhood commercial facilities to be located in the area, therefore, no land has been devoted in the proposal for these purposes.

As was the case in the first alternative land use plan considered, it should be noted here that no recreation land has been projected in either of the medium density

ALTERNATIVE LAND USE PLAN NO. 3 FOR THE TOWN OF RAYMOND--1990


				-														
ΠΑΤΑ	RA N	YMOND - N.E EIGHBORHOOI	5. D	RA	YMOND HEIG NEIGHBORHO	HTS OD	'POC	KET' RESIDE DEVELOPMENT	NTIAL	IN	COMMERCIAL/ DUSTRIAL AR	EAS		ALL OTHEN TOWN AREAS	R S		TOTAL TOWN OF RAYMOND	
SUMMARY CATEGORY	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990
POPULATION	140	3,410	3,550	278	4,130	4,408	45	192	237	138		138	3,134		3,134	3,735	7,732	11,467
DWELLING UNITS	36	853	889	66	1,033	1,099	12	48	60	36		36	804		804	954	1,934	2,888
POPULATION/DWEL- LING UNIT	3.89	4.00	3.99	4.21	4.00	4.01	3.75	4.00	3.95	3.83		3.83	3.90		3.90	3.92	4.00	3.97
LAND USE(In Acres)																		
Residential	27	341	368	57	413	470	10	48	58	22		22	653		653	767	802	1,569
Retail and Service		5	5		6	6				17	58	75	9	<u></u>	9	26	69	95
Industrial	5		5							1	162	163	78		78	84	162	246
Transportation and Utilities	38	107	145	46	129	175	3	10	13	78	20	98	957		95 7	1,122	266	1,388
Governmental and Institutional		12	12		14	14		2	2				46		46	46	28	74
Recreational										34		34	23		23	57		57
Subtotal (Urban)	70	465	535	103	562	665	13	60	73	152	240	392	1,764		1,764	2,102	1,327	3,429
Agricultural	551	-551		650	-650		151	-151		225	-225		16,738		16,738	18,315	-1,577	16,738
Open Lands	171	-171		44	-44		124	-124		159	159		1,723	-934	789	2,221	-1,432	789
Primary Environ- mental Corridor		257	257		132	132		215	215		144	144		934	934		1,682	1,682
Subtotal (Rural)	722	-465	25 7	694	-562	132	275	-60	215	384	-240	144	18,461		18,461	20,536	-1,327	19,209
TOTAL LAND USE	792		792	797		797	288		288	536		536	20,225		20,225	22,638		22,638

TABLE 6 DEMOGRAPHIC AND LAND USE DATA SUMMARY FOR THE TOWN OF RAYMOND IN 1970 AND 1990 BASED ON ALTERNATIVE LAND USE PLAN NO. 3

Source: SEWRPC.

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neighborhoods or in the low density 'pocket' development due to the extent and proximity of the primary environmental corridors forming the boundary or boundaries of these predominantly residential areas, which corridor lands are expected to be used in part for recreation purposes. The land areas required for additional urban development by 1990 would be devoted almost entirely to residential uses and the transportation uses required to serve the residential development.

This alternative plan seeks to place the majority of urban development as close to the county boundary as possible in order that such development can be most efficiently served by the extension of public utilities from Milwaukee County and yet allow for the possibility of urban development west of the Root River Canal. This plan, as already mentioned, also provides for an expanded retail and service and industrial tax base located near a major interchange area on IH-94 which would place these areas at a convenient distance from the major cities of Milwaukee, Racine, and Kenosha in Wisconsin as well as within the Chicago market area without disrupting the residential areas of the immediate community by introducing heavy industrial and commercial traffic. This alternative would also seek to preserve almost all of the remaining prime agricultural land in the Town in addition to preserving the delineated primary environmental corridors.

Alternative Land Use Plan No. 3

The third alternative plan considered, while proposing the same density development, namely, medium density development, as proposed in the second alternative plan, recommends that no further urban development take place west of the Root River Canal but rather that urban development be concentrated in the northeast corner of the Town along the county boundary and along IH-94 (see Map 9). This alternative plan recommends the addition by 1990 of approximately 1,027 acres (1.6 square miles) of medium density urban development to be located in U. S. Public Land Survey Sections 2, 3, 12, and 13 and accommodating a total population of 7,540 (see Table 6). In addition, the 'pocket' low density residential area described in Alternative Plan

No. 2 would be developed as recommended in Alternative Plan No. 2, thereby accommodating 237 population by 1990, of which 45 resided in the 'pocket' area in 1970. As was the case in Alternative Land Use Plan No. 2, it is proposed to develop for industrial purposes by 1990 those non-urban developable lands remaining in U. S. Public Land Survey Section 1 not already included in the 'pocket' development or in the primary environmental corridor areas and to develop for retail and service purposes those developable land areas east of the environmental corridor in U. S. Public Land Survey Section 12.

The majority of the urban development, as delineated in this alternative, is encompassed within two medium density urban neighborhoods, the first of which includes all areas of U. S. Public Land Survey Sections 2 and 3 lying east of the Root River Canal and called the Raymond-Northeast Neighborhood and the second including all areas within the U. S. Public Land Survey Sections 12 and 13 lying west of the unnamed creek in this area and north of Five-and-a-Half Mile Road and called the Raymond Heights Neighborhood. As shown on Map 9, the Root River Canal forms the western boundary of the Raymond-Northeast Neighborhood and the unnamed creek forms the eastern boundary of the Raymond Heights Neighborhood as well as a portion of the eastern boundary of the Raymond-Northeast Neighborhood. The Raymond-Northeast Neighborhood is also bounded on the north by the county boundary, on the east by the Root River and S. 43rd Street, and on the south by Seven Mile Road. The Raymond Heights Neighborhood is bounded on the west by S. 43rd Street, on the north by Seven Mile Road, on the east by the unnamed creek, and on the south by Five-and-a-Half Mile Road. The industrial and retail and service areas of this alternative are the same as the areas described as a part of the recommendations in Alternative Land Use Plan No. 2 and would accommodate the same total employment. The low density residential 'pocket' area north of the Root River in Section 1 is also fully described in Alternative Land Use Plan No. 2.

MAP 10

ALTERNATIVE LAND USE PLAN NO. 4 FOR THE TOWN OF RAYMOND--1990



Source: SEWRPC.

DATA	COMMER	CIAL/INDUSTF	RIAL AREA	ALL OTHER TOWN AREAS			TOTAL TOWN OF RAYMOND		
SUMMARY CATEGORY	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990	1970	1970-1990 Increment	1990
POPULATION	138	·	138	3,597		3,597	3,735		3,735
DWELLING UNITS	36		36	918	"	918	954		954
POPULATION/DWELLING UNITS	3.83		3.83	3.92		3.92	3.92		3.92
LAND USE (In Acres)									
Residential	22		22	745		745	767		767
Retail and Service	17	58	75	9		9	26	58	84
Industrial	1	162	163	83		83	84	162	246
Transportation and Utilities	78	20	98	1,044		1,044	1,122	20	1,142
Governmental and Institutional		·		46		46	46		46
Recreational	34		34	23		23	57		2,342
Subtotal (Urban)	152	240	392	1,950		1,950	2,102	240	2,342
Agricultural	225	-225		18,090		18,090	18,315	-225	18,090
Open Lands	159	-159		2,062	-1,538	524	2,221	-1,697	524
Primary Environmental Corridor		144	144		1,538	1,538		1,682	1,682
Subtotal (Rural)	384	-240	144	20,152		20,152	20,536	-240	20,296
TOTAL LAND USE (Urban and Rural)	536		536	22,102		22,102	22,638		22,368

DEMOGRAPHIC AND LAND USE DATA SUMMARY FOR THE TOWN OF RAYMOND IN 1970 AND 1990 BASED ON ALTERNATIVE LAND USE PLAN NO. 4

Source: SEWRPC

TABLE 7

The total land use areas for each major land use category in each of the two neighborhoods have been calculated and tabulated in Table 6. The total 1990 population of the Raymond-Northeast Neighborhood is projected at 3,550, of which 140 resided in the neighborhood area in 1970. To accommodate the additional 3,410 people will require the conversion of 465 acres of rural land to urban neighborhood development in addition to the 70 acres of urban development in the neighborhood area in 1970. The specific projected 1990 uses for the neighborhood are shown on Table 6. Also shown on the table, the total 1990 population of the Raymond Heights Neighborhood is projected at 4,408, of which 278 resided in the neighborhood area in 1970. To accommodate the additional 4,130 people would require the conversion of 562 acres of rural land to urban neighborhood development in addition to the 103 acres of urban development in the area in 1970. The specific projected 1990 uses for the neighborhood are also shown on Table 6. The land uses proposed for development as a part of the low density residential 'pocket' area, the industrial area, and the retail and service area remain exactly the same as those proposed in Alternative Land Use Plan No. 2 and tabulated in Table 5.

The two medium density neighborhoods would be comprised for the most part of residential development and transportation land areas required to serve the proposed residential development. In addition, retail and service areas would be set aside for local neighborhood use and some land would also be set aside for the location of elementary school facilities to serve the neighborhoods. It is expected that the population residing in the low density 'pocket' area north of the Root River would be accommodated for school purposes at one or both of the elementary schools in the medium density neighborhoods.

As was the case in the previous two alternative land use plans considered, no specific land area has been set aside or proposed for recreation uses due to the extent and proximity of the primary environmental corridors forming the boundaries

of the neighborhoods, which corridor lands are expected to be used in part for recreation purposes.

This alternative plan would seek to preserve all of the remaining prime agricultural land in the Town as well as the delineated primary environmental corridor areas. This plan would place almost all of the urban development in the Town at a maximum advantage and convenience to transportation routes both to local employment centers and to employment centers in the Kenosha, Milwaukee, and Racine metropolitan areas.

Industry and commercial enterprises locating within the proposed industrial commercial areas would have convenient access to the surrounding metropolitan areas as well as to interstate connections over IH-94 without having to traverse primarily residential areas. In addition, this proposal would incorporate the already developed Raymond Heights Subdivision into a planned residential neighborhood area, thereby offering the potential for service with centralized public utilities not now the situation or not recommended in either Alternative Land Use Plan No. 1 or No. 2.

Alternative Land Use Plan No. 4

Following a preliminary review by the Raymond Town Plan Commission of Alternative Land Use Plan Nos. 1, 2, and 3, the Town Plan Commission requested that the Regional Planning Commission staff develop a fourth alternative land use plan which would propose no further urban residential development in the Town but would include the industrial and commercial development proposals as shown in Alternative Plan No. 2 and No. 3 (see Map 10). Alternative Land Use Plan No. 4, therefore, is a significantly different land use plan proposal than any of the other three alternative plans considered. Alternative Land Use Plan No. 4 could accommodate, therefore, essentially only that population presently residing in the Town and would propose no further urban residential development (see Table 7).

The industrial area is proposed to be located in Section 1 of the Town outside of the primary environmental corridor and would contain those land uses as described in Alternative Land Use Plan No. 2 and No. 3 and shown on Tables 5, 6, and 7. When fully developed, this industrial area would be expected to generate a total of 2,400 jobs. The proposed retail and service area would also be the same as described in Alternative Land Use Plan No. 2 and No. 3 and the uses within the retail and service areas are the same as those tabulated and shown on Tables 5, 6, and 7. A total of 800 jobs could be expected to be generated by the full development of this area.

This plan would require no further urban services related directly to residential development but would be intended to provide substantial tax base for the predominantly rural Town of Raymond and do so at an expected least cost in terms of the provision of central public urban services to the industrial and retail and service areas. Like Alternative Land Use Plan No. 3, this alternative, if implemented, would seek to preserve all of the remaining prime agricultural areas in the Town as well as the primary environmental corridors traversing the Town. Additional Land Use Alternatives

As previously indicated, it is the intent of this report to set forth practical alternatives from which the Town Board, the Town Plan Commission, and the Town citizen body may make a selection as to the future development of the Town. While not set forth herein or tabulated in this report, there are actually two additional alternatives open to the Town regarding future land use development in the Town. The first of these additional alternatives is to retain a complete status quo; in other words, allowing no further urban development of the Town. This alternative, however, could not be practically looked upon as a long-term guide for the development or, in this case, non-development of the Town but may have short-range advantages.

The second additional alternative open to the Town is the continued development of the Town as has taken place over the past 15 to 20 years; namely, allowing urban

development to occur in a scattered fashion throughout the Town as reflected on Map 2 in this report. This alternative, while the easiest to implement, could have many undesirable effects not only on the natural resource base but on the people residing in the Town from the standpoint of environmental quality and personal health and safety as well as the loss of the valuable farming lands. This latter alternative could not be recommended as a sound alternative for Town development nor would this alternative be in the best interests of the existing or future residents of the Town.

PLAN IMPLEMENTATION

If the Town assumes its proper responsibility to specifically shape future development in the Town and selects one of the alternative land use plans presented herein for formal adoption, it must be remembered that such a plan can only serve as a guide to the making of development decisions by the responsible public officials. The plan, thus, is only the beginning of a series of implementation actions required to achieve the objectives expressed in the plan. Adjustments to the plan can be made as required by changing conditions. One of the major tasks of plan implementation, therefore, becomes the reevaluation and the examination of the plan from time to time to bring the plan 'up-to-date' and reflective of the conditions prevailing at that point in time.

Immediate plan implementation actions that are recommended for consideration include the reexamination and adjustment of zoning categories on the zoning district map for the Town to reflect the alternative land use plan selected by the Town. In addition, there should be a strengthening of planning and development review procedures in the Town to assure that all of the development proposals are measured against the plan recommendations. If one of the alternative land use plans which includes residential neighborhood development is selected by the Town, it is strongly suggested that the Town seek to develop specific detailed neighborhood unit development plans for the neighborhoods in question in order that development proposals in

the neighborhoods can be more definitively reviewed. If the Town selects an alternative land use plan which includes the retail and service and industrial development, it is suggested that detailed plans be prepared by the Town for these non-residential areas in order to insure the best possible specific land utilization and access management and to avoid congestion and problems of convenience and safety related to the various types of industrial and commercial activities which may be attracted to these specific areas. It is further suggested that in these matters the Town continue to seek and utilize the assistance of the County Planner and his staff as well as any assistance available from agencies such as the Southeastern Wisconsin Regional Planning Commission.

ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN PREPARATION

Following the preparation of the four alternative land use plans, the J. C. Zimmerman Engineering Corporation was retained by the Regional Planning Commission and directed to conduct the engineering studies necessary to determine the feasibility of extending sanitary sewer service by the most direct methods from the trunk sewer facilities of the Metropolitan Sewerage District of Milwaukee County located in either the City of Franklin or the City of Oak Creek to the proposed urban development as shown on each of the alternative land use plans. Included in the engineering work was the preparation of estimates of sewage flow based on projected population of the urban development to be served by sanitary sewerage facilities in each alternative land use plan; estimates of the costs of constructing the facilities necessary to accommodate the estimated sewage flow; and estimates of the cost of operating and maintaining the constructed systems.

More specifically, the engineering consultant was directed to explore two separate methods of providing public sanitary sewerage facilities to the urban development as proposed in each alternative land use plan: 1) a total gravity system; and 2) a combination gravity flow, pumping station, and force main system. Both of these alternatives require the construction of a one-mile long 'outfall'

TABLE 8-A

ESTIMATED SEWAGE FLOWS FOR TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 1

LAND USE	MEASUREMENT UNIT	GALLONS OF FLOW PER UNIT PER DAY	MGD ^a	CFS ^b	GPM ^C
URBAN					
Residential	7,495 Population	d 670 gcd	5.02	7.78	3,493
Commercial	14 Acres	7,500 gad ^e	0.11	0.17	76
Industrial	5 Acres	7,500 gad	0.03	0.04	18
Transportation	533 Acres	n/a	0.00	0.00	
Governmental & Institutional	65 Acres	7,500 gad	0.50	0.73	310
Recreational		n/a	0.00	0.00	o
RURAL		n/a	0.00	0.00	ο
TOTALS			5.66	8.72	3,897

Outfall System Note:

24" Gravity Sewer @ s^f = 0.0022

(or)

Force Main - 18"

Pump Station 5.6 MGD @ 125' TDH^g

g TDH = Total Dynamic Head

Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

ALL GRAVITY ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 1



Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

MAP 12

COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 1



LEGEND PROPOSED URBAN DEVELOPMENT-1990 PRIMARY ENVIRONMENTAL CORRIDOR 18" PROPOSED TRUNK SEWER SHOWING SEWER SIZE IN INCHES 12" PROPOSED FORCE MAIN SHOWING SIZE IN INCHES 56 MGD PROPOSED PUMPING STATION SHOWING CAPACITY IN MILLIONS OF GALLONS PER DAY BASE MAP INFORMATION BOUNDARIES ---- COUNTY SECTION ****** SUBCONTINENTAL DIVIDE + STATE PLANE COORDINATE SYSTEM TOWN OF RAYMOND TRANSPORTATION ROUTES -(04)- INTERSTATE HIGHWAY -U.S. NUMBERED HIGHWAY - COUNTY TRUNK HIGHWAY - LOCAL OR MINOR STREET WATER RELATED INFORMATION INTERMITTENT STREAM OR WATERCOURSE MARSH OR SWAMP



Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

connection between the Town of Raymond and the metropolitan trunk sewer proposed to be extended to S. 27th Street and W. Oakwood Road in the City of Franklin. Due to the characteristically wet soils in the Town, the cost estimates assumed that all construction would require the special measures attendant to the installation of the sanitary sewers and appurtenant facilities in "wet ground." It should be noted that the construction cost estimates set forth herein are those costs attributed to the installation of the aforementioned 'outfall' sewer and the local trunk sewers and attendant facilities and do not include costs of providing local sewer service to individual parcels or uses, which cost is normally paid by the individual owner at the time of the purchase of the property served or by special assessment at the time of connection to the system. The estimated operating and maintenance costs are, likewise, those costs attributed to the operation and maintenance of only those local trunk sewers and attendant facilities within the Town of Raymond.

In estimating the peak rates of sewage flow, the unit sewage flows for residential development set forth in Chapter IX of SEWRPC Planning Report No. 16, <u>A Sanitary</u> <u>Sewerage System Plan for Southeastern Wisconsin, were used</u>. These are:

Population Of Residential Areas	Gallons Per Capita Per Day
0 - 2,000	795
2,001 - 10,000	670
10,001 - 20,000	545
Over 20,000	483

Peak sewage flow rates from lands proposed for retail and service, industrial, governmental, and institutional uses were estimated at the rate of 7,500 per acre per day. These latter flow rates assume "dry" industrial uses not requiring substantial quantities of water for food processing or other industrial processing.

A description of the two alternate sanitary sewerage service plans considered for each of the four alternative land use plans follows.

TABLE 8-B

COST OF CONSTRUCTING GRAVITY SANITARY SEWERS TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 1

I. OUTFALL SYSTEM				
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost
24"	24'-28'; Wet	1,000	\$170	\$ 170,000
24"	Tunnel (Over 28')	4,300	200	860,000
Connection to Met	ro-Sewer at W. Oakwood Rd.	& Miscellaneous Const:	ruction	75,000
Total Con	nstruction Cost			\$1,105,000
Overhead	and Contingency (35 Percen	t of Construction)		386,750
TOTAL COS	ST OF I - OUTFALL SYSTEM			\$1,491,750
II. LOCAL TRUNK SYSTEM	1			
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost
24"	Tunnel (Over 28')	7.000	\$200	\$1,400,000
24"	14'-Wet	13.700	42	575,400
21"	14' - Wet	3,300	39	128,700
18"	14' - Wet	7,100	37	262,700
15"	14' - Wet	2,800	35	98,000
12"	14' - Wet	18,400	33	607,200
Total Cor	struction Cost	-		\$3,072,000
0verhead	1,075,200			
TOTAL_COS	\$4,147,200			
TOTAL COS	ST OF GRAVITY SANITARY SEWE	R SYSTEM (I & II)		\$5,638,950

Source: J. C. Zimmerman Engineering Corporation.

TABLE 8-C

COST OF CONSTRUCTING COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN SEWER SYSTEM TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 1

I. OUTFALL SYSTEM							
Facility and Si	ze Approximate Depth	Length in Feet	Cost/Foot	Total Cost			
18" Force Main 5.6 MGD Pump St	ation	5,300	\$ 25	\$ 132,500 200,000			
Total	Construction Cost			\$ 407,500			
Overhe	ad and Contingency (35 Percent	nt of Construction)		142,625			
TOTAL	COST OF I - OUTFALL SYSTEM			\$ 550,125			
II. LOCAL TRUNK SYS	TEM						
Facility and Si	.ze Approximate Depth	Length in Feet	Cost/Foot	Total Cost			
24" 21" 18" 15" 12" 18" Force Main 5 MGD Pumping S Total Overhe	14' - Wet 14' - Wet 14' - Wet 14' - Wet 14' - Wet 14' - Wet 14' - Wet <u></u> <u>Construction Cost</u> <u>ad and Contingency (35 Percen</u> <u>COST OF IL - LOCAL TRINK SYS</u>	13,700 3,300 9,500 2,800 18,000 4,600 	\$ 42 39 37 35 33 25 n/a	\$ 575,500 128,700 351,500 98,000 607,200 115,000 175,000 \$2,050,800 717,780			
TOTAL	TOTAL COST OF II - LOCAL TRUNK SYSTEM TOTAL COST OF OUTFALL AND LOCAL TRUNK SYSTEM (I & II)						

Source: J. C. Zimmerman Engineering Corporation.

TABLE 8-D

ESTIMATED ANNUAL COST OF OPERATING AND MAINTAINING ALTERNATIVE SANITARY SEWERAGE SYSTEMS DESIGNED TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 1

A. ALL GRAVITY ALTERNATIVE		
I. OUTFALL SYSTEM		
Facility	Cost/Mile/Year	Total Cost/Year
One Mile of Sewer	\$250	\$ 250
II. LOCAL TRUNK SYSTEM		
ll Miles of Sewer	\$250	\$ 2,750
TOTAL Cost of A-(I and II)		\$ 3,000
B. COMBINATION GRAVITY, PUMP STATION	AND MAIN FORCE ALTER	NATIVE
I. OUTFALL SYSTEM		
Facility	Cost/Mile/Year	Total Cost/Year
Pump Station (5.6 MGD)		\$20,000
One Mile of Force Main	\$250	\$ 250
TOTAL Cost of B-I	\$250	\$20,250
II. LOCAL TRUNK SYSTEM		
Pump Station (5.0 MGD)		\$19,000
ll Miles of Force Main and Sewers =	\$250	\$ 2 ,7 50
TOTAL Cost of B-II		\$21,750
TOTAL Cost of B-(I and II)		\$42,000

Source: J. C. Zimmerman Engineering Corporation.

Each of the two alternative sanitary sewerage systems designed for each of the four alternative land use plans is depicted on Maps 11 through 18 and the data concerning each alternative sanitary sewerage system tabulated and set forth in Tables 8 through 11. Each table actually consists of a series of four tables which present data related to the extension of sanitary sewer service to one of the four alternative land use plans. For example, Tables 8A through 8D include: sewage flow data necessary for determining the size of sewers within each proposed system; information on the cost of constructing both the 'outfall' sewer system and the 'local trunk' sewers in the proposed all gravity sanitary sewerage system designed to serve Alternative Land Use Plan No. 1 and shown on Map 11; information on the cost of constructing the 'outfall' and 'local trunk' portions of the combination gravity, pump station, and force main sanitary sewerage system designed to serve Alternative Land Use Plan No. 1 and information on the annual cost of operating and maintaining both alternative sanitary sewerage systems designed to serve Alternative Land Use Plan No. 1 and shown on Map 12; and information on the annual cost of operating and maintaining both alternative sanitary sewerage systems designed to serve Alternative Land Use Plan No. 1 and shown on Maps 11 and 12.

All alternative sanitary sewerage system plans include an 'outfall' system and a 'local trunk' system. The outfall system is designed to connect the local trunk system within the town boundaries to the metropolitan trunk sewer proposed to be extended to W. Oakwood Road and S. 27th Street in the City of Franklin and has been placed in the same geographic location along S. 27th Street on each alternative sanitary sewerage system plan. In the all gravity system alternative, the outfall system consists of a sewer constructed in tunnel along S. 27th Street between the county line and W. Oakwood Road. The tunnel section is required due to the surface elevation in this area. In the combination gravity, pumping station, and force main alternative, the outfall system consists of construction of a force main from a pumping station located at S. 27th Street and the county line to the connection with the Milwaukee metropolitan sewers at S. 27th Street and W. Oakwood Road, a distance of approximately one mile.

The local trunk system of each alternative sanitary sewerage system plan varies only in the size and length of the trunk sewers. The local trunk system designed to serve Alternative Land Use Plan No. 1, as shown on Maps 11 and 12, for example, is the longest system due to the extent of the urban development proposed in this predominantly low density plan. Alternative Land Use Plan No. 4, which proposes no further residential development in the Town but only industrial and commercial development concentrated in the northeast corner of the Town, can be served with a relatively limited local trunk system as shown on Maps 17 and 18.

In every alternative, the local trunk system follows the stream valleys except at those points where the system must traverse upland areas in order to be contained within the community boundaries. In the all gravity local trunk systems designed to serve Alternative Land Use Plans 1, 2, and 3, a section of tunnel is required to be constructed along the county line between the Root River Canal on the west and the main stem of the Root River on the east. The combination gravity, pumping station, and force main system for these three alternatives includes the construction of a pumping station at the Root River Canal and the county line and the construction of a force main easterly from the pumping station for a distance of approximately 4,600 feet to connect with a gravity sewer. It should again be noted that the local trunk sewer system shown on the maps and included in the cost tabulation on Tables 8 through 11 includes only those sewers having a diameter of 12 inches or larger and does not include smaller size sewers required to service individual parcels or uses throughout the proposed urbanized area as shown on the alternative land use plans.

Table 12 is a summary of the construction and annual operation and maintenance costs for each of the alternative sanitary sewerage system plans designed to serve each of the four alternative land use plans for 1990.

SUMMARY

In April 1973 the Town of Raymond Town Board requested that the Regional Planning Commission undertake the necessary studies to determine the feasibility of the

TABLE 9-A

ESTIMATED SEWAGE FLOWS FOR TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 2

LAND USE	MEASUREMENT UNIT	GALLONS OF FLOW PER UNIT PER DAY	MGD ^a	CFS ^b	GPM ^C
URBAN					
Residential	7,392 Population	670 gcd ^d	4.95	7.65	3,289
Commercial	85 Acres	7,500 gad ^e	0.64	0.99	444
Industrial	168 Acres	7,500 gad	1.26	1.94	871
Transportation	433 Acres	n/a	0.00	0.00	0
Governmental & Institutional	26 Acres	7,500 gad	0.18	0.28	126
Recreational	34 Acres	n/a	0.00	0.00	0
RURAL		n/a	0.00	0.00	0
TOTALS			7.03	10.86	4,730

Outfall System Note:

27" Gravity Sewer @ S^f = 0.0022

(or)

Force Main - 20"

Pump Station 7.1 MGD @ 125' TDH

a_{MGD} = Million Gallons/Day d_{gcd} = gallons/capita/day

^bCFS = Cubic Feet/Second ^egad = gallons/acre/day ^cGPM = Gallons Per Minute ^fS = Slope ^gTDH = Total Dynamic Head

Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

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ALL GRAVITY ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 2









MAP 14

COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN ALTERNATIVE - SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 2





GRAPHIC SCALE



TABLE 9-B

COST OF CONSTRUCTING GRAVITY SANITARY SEWERS TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 2

I. OUTFALL SYSTEM						
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
27"	24'-28'; Wet	1,000	\$175	\$ 175,000		
27"	Tunnel (Over 28')	4,300	210	903,000		
<u>Connection to Metr</u>	ro-Sewer at W. Oakwood Rd. &	Miscellaneous Constru	uction	75,000		
Total Con	struction Cost			\$1,153,000		
Overhead	and Contingency (35 Percent	of Construction)		403,550		
TOTAL COS	ST OF I - OUTFALL SYSTEM		•	\$1,556,550		
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
21"	Tunnel (Over 28')	7,000	\$190	\$1,330,000		
30"	14'- Wet	5,200	47	244,400		
24"	14'- Wet	2,600	42	109,200		
21"	14'- Wet	4,100	39	159,900		
18"	14'- Wet	1,400	37	51,800		
15"	14'- Wet	2,200	35	77,000		
12"	14'- Wet	6,800	33	224,400		
Total Con	struction Cost			\$2,196,700		
Overhead and Contingency (35 Percent of Construction)						
TOTAL COST OF II - LOCAL TRUNK SYSTEM						
TOTAL COST OF GRAVITY SANITARY SEWER SYSTEM (I & II)						

Source: J. C. Zimmerman Engineering Corporation

TABLE 9-C

COST OF CONSTRUCTING COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN SEWER SYSTEM TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 2

I.	OUTFALL SYSTEM						
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
	20" Force Main		5,300	\$ 30	\$ 159,000		
	7.1 MGD Pumping Stati	lon			230,000		
	Connection to Metro-S	Sewer at W. Oakwood Rd. &	Miscellaneous Constr	uction	75,000		
	Total Constr	ruction Cost			\$ 464,000		
	Overhead and	l Contingency (35 Percent	of Construction)		162,400		
	TOTAL COST C	OF I - OUTFALL SYSTEM			\$ 626,400		
II.	LOCAL TRUNK SYSTEM				·		
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
	30"	14' - Wet	5,200	\$4 7	\$ 244,400		
	24"	14' - Wet	2,600	42	109,200		
	21"	14' - Wet	4,100	39	159,500		
	18"	14' - Wet	3,800	37	140,600		
	15"	14' - Wet	2,200	35	77,000		
	12"	14' - Wet	6,800	33	224,400		
	16" Force Main		4,600	20	92,000		
	3.5 MGD Pumping Stati	.on		n/a	150,000		
		uction Cost			\$1,197,500		
	Overhead and Contingency (35 Percent of Construction)						
	TOTAL COST O	F II - LOCAL TRUNK SYSTER	M		\$1,616,500		
	TOTAL COST OF OUTFALL AND LOCAL TRUNK SYSTEM (I & II) \$2,242,900						

Source: J. C. Zimmerman Engineering Corporation

TABLE 9-D

ESTIMATED ANNUAL COST OF OPERATING AND MAINTAINING ALTERNATIVE SANITARY SEWERAGE SYSTEMS DESIGNED TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 2

A. ALL GRAVITY ALTERNATIVE						
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
One Mile of Sewer	\$250	\$ 250				
II. LOCAL TRUNK SYSTEM	<u> </u>					
Six Miles of Sewer	\$250	\$ 1,500				
TOTAL Cost of A-(I and II)		\$ 1,750				
B. COMBINATION GRAVITY, PUMP STATION A	ND FORCE MAIN ALTE	RNATIVE				
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
Pump Station (7.1 MGD)		\$22,000				
One Mile of Force Main	\$250	\$ 250				
TOTAL Cost of B-I		\$22,250				
II. LOCAL TRUNK SYSTEM						
Pump Station (3.5 MGD)		\$16,000				
Six Miles of Force Main and Sewers	\$250	\$ 1,500				
TOTAL Cost of B-II	\$250	\$17,500				
TOTAL Cost of P. (I and II)						

Source: J. C. Zimmerman Engineering Corporation.

provision of public sanitary sewer service to a part of the Town of Raymond. This request resulted in a contract between the Town and the Regional Planning Commission to provide four alternative long-range land use plans as well as two alternative public sanitary sewerage system plans for each land use plan for review by the Town Board, Town Plan Commission, and the citizen body within the Town prior to a final determination as to the future development of the Town and the expenditure of local public funds to provide the necessary public services to future urban development in the Town.

As a prerequisite to preparation of the plans, studies were conducted to determine the type and extent of existing urban and rural land development, the major components of the natural resource base prevalent in the Town, the physical constraints on land development in the Town, and the population and employment characteristics in the Town.

The first alternative land use plan proposed low density land development, as recommended in the adopted regional land use plan for 1990, and would ultimately encompass a population of 7,495 in addition to the existing population in the remaining areas of the Town. The second and third alternative land use plans proposed essentially medium density land development concentrated in the northeastern section of the Town and ultimately encompassing a population of 7,392 and 8,330, respectively, in addition to the existing population in the remaining areas of the Town. In addition, these two land use plans included proposals for community commercial and industrial development adjacent to IH-94 and Seven-Mile Road in the Town.

The fourth alternative land use plan prepared at the specific request of the Town Plan Commission proposed no further urban residential land development in the Town but, rather, development of only the community commercial and industrial land uses as proposed as a part of Alternative Land Use Plans 2 and 3. In addition, recommendations were made for the development of additional arterial streets and highways

TABLE 10-A

ESTIMATED SEWAGE FLOWS FOR TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 3

LAND USE	MEASUREMENT UNIT	GALLONS OF FLOW PER UNIT PER DAY	MGD ^a	CFS ^b	gpm ^c
URBAN					
Residential	8,330 Population	670 gcd ^d	5.58	8.63	3,711
Commercial	86 Acres	7,500 gad ^e	0.65	1.01	453
Industrial	168 Acres	7,500 gad	1.26	1.93	867
Transportation	431 Acres	n/a	0.00	0.00	0
Governmental & Institutional	28 Acres	7,500 gad	0.23	0.35	156
Recreational	34 Acres	n/a	0.00	0.00	0
RURAL			0.00	0.00	0
TOTALS			7.72	11.92	5,187

Outfall System Note:

27" Gravity Sewer $@S^{f} = 0.0022$

(or)

Force Main - 20"

Pump Station 8.6 MGD @ 140' TDH^g

-

^aMGD = Million Gallons/Day ^bCFS = Cubic Feet/Second

^CGPM = Gallons Per Minute

^dgcd = gallons/capita/day ^egad = gallons/acre/day

^fS = Slope

g TDH = Total Dynamic Head

Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

ALL GRAVITY ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 3





GRAPHIC SCALE

MILE 8000 FEET



MAP 16

COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 3







Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

TABLE 10-B

COST OF CONSTRUCTING GRAVITY SANITARY SEWERS TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 3

I. OUTFALL SYSTEM							
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost			
27" 27" Connection to Me	\$ 175,000 903,000 75,000						
Overhead	and Contingency (35 Percent	of Construction)		\$1,153,000			
TOTAL CO	DST OF I - OUTFALL SYSTEM			\$1,556,550			
II. LOCAL TRUNK SYST	II. LOCAL TRUNK SYSTEM						
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost			
21" 30" 24" 21" 18" 12" Total Cc Overhead TOTAL CC	\$1,330,000 244,400 155,400 101,400 395,900 174,900 \$2,402,000 840,700 \$3,242,700						
TOTAL CC	\$4,799,250						

Source: J. C. Zimmerman Engineering Corporation.

TABLE 10-C

COST OF CONSTRUCTING COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN SEWER SYSTEM TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 3

Ι.	OUTFALL SYSTEM					
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost	
	20" Force Main 5,300 \$ 30					
	8.6 MGD Pumping Stat	ion			250,000	
	Connection to Metro-	Sewer at W. Oakwood Rd. &	Miscellaneous Constr	uction	75,000	
	Total Const	ruction			\$ 484,000	
	Overhead an	d Contingency (35 Percent	of Construction)		169,400	
	TOTAL COST	OF I - OUTFALL SYSTEM			\$ 653,400	
II.	LOCAL TRUNK SYSTEM					
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost	
	30"	14'- Wet	5 200	\$ 117	¢ 000 000	
	24"	14'- Wet	3,700	47 42	244,400	
	21"	14'- Wet	2,600	39	101,400	
	18"	14'- Wet	10,700	37	395 900	
	15"	14'- Wet	2,400	35	84,000	
	12"	14'- Wet	5,300	33	174,900	
	16" Force Main	= ~	4,600	20	92,000	
	120,000					
	\$1,368,000					
Overhead and Contingency (35 Percent of Construction)					478,800	
TOTAL COST OF II - LOCAL TRUNK SYSTEM					\$1.846.800	
TOTAL COST OF OUTFALL AND LOCAL TRUNK SYSTEMS (I & II)					\$2,500,200	

Source: J. C. Zimmerman Engineering Corporation.

TABLE 10-D

ESTIMATED ANNUAL COST OF OPERATING AND MAINTAINING ALTERNATIVE SANITARY SEWERAGE SYSTEMS DESIGNED TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 3

A. ALL GRAVITY ALTERNATIVE						
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
One Mile of Sewer	\$250	\$ 250				
II. Local Trunk System		· · · · · · · · · · · ·				
Seven Miles of Sewer	\$250	\$ 1,750				
TOTAL Cost of A-(I and II)		\$ 2,000				
B. COMBINATION GRAVITY, PUMP STATION	AND FORCE MAIN ALTER	RNATIVE				
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
Pump Station (8,6 MGD)		\$ 4,000				
One Mile of Force Main	\$250	\$ 250				
TOTAL Cost B-I	***	\$ 24,250				
II. LOCAL TRUNK SYSTEM						
Pump Station (2.5 MGD)		\$ 14,000				
Seven Miles of Force Main and Sewers	\$250	\$ 1 , 750				
TOTAL Cost B-II		\$ 15,750				
TOTAL Cost of B-(I and II)	-	\$ 40,000				

Source: J. C. Zimmerman Engineering Corporation.

to serve the development as proposed in each of the four alternative land use plans.

Two alternative sanitary sewerage system plans were designed to serve each of the four alternative land use plans by the J. C. Zimmerman Engineering Corporation under an agreement with the Regional Planning Commission. One of the two alternative sanitary sewerage system plans would be an 'all gravity' system, and the second alternative sanitary sewerage system plan would be a combination gravity, pumping station, and force main system. The cost of constructing the eight alternative sanitary sewerage systems ranged from a low of \$826,230 to construct the combination gravity, pumping station, and force main system to serve Alternative Land Use Plan No. 4 to \$5,638,950 to construct the all gravity sanitary sewerage system to serve Alternative Land Use Plan No. 1. The cost of maintaining the systems ranged from a low of \$750 per year to operate and maintain the 'all gravity' system designed to serve Alternative Land Use Plan No. 3 to a high of \$42,000 per year to operate and maintain the 'combination' system designed to serve Alternative Land Use Plan No. 1.

In addition to the alternatives set forth, two additional alternatives for land development in the Town should be mentioned; namely, the alternative of maintaining a status quo with no further development of any kind in the Town and the alternative of continuing urban development in the Town on scattered individual parcels or within small subdivisions as has been the pattern of development over the past 15 to 20 years. Neither of these alternatives are recommended to be further explored by the Town Plan Commission but should be rejected out of hand. It should also be noted that which ever alternative is ultimately adopted by the Town Board, action should be taken to immediately revise the Town zoning district map to reflect any of the urban development proposals contained in the plan as well as to reflect the rural development and natural resource base conservation proposals contained in the plan. In addition, recommendations in the alternatives will require strengthening of local zoning and subdivision review procedures and actual curtailment of urban development in the more rural areas of the Town or those areas which cannot be adequately served with public utilities and facilities.

TABLE 11-A

				•	
LAND USE	MEASUREMENT UNIT	GALLONS OF FLOW PER UNIT PER DAY	MGD ^a	CFS	C GPM
URBAN					
Residential	138 Population	795 gcd ^d	0.11	0.17	76
Commercial	75 Acres	7,500 gad ^e	0.56	0.87	391
Industrial	163 Acres	7,500 gad	1.22	1.88	845
Transportation	98 Acres	n/a	0.00	0.00	0
Governmental & Institutional	0 Acres	7,500 gad	0.00	0.00	o
Recreational	34 Acres	n/a	0.00	0.00	0
RURAL		n/a	0.00	0.00	0
TOTALS			1.89	2.92	1,312

f_S = Slope

ESTIMATED SEWAGE FLOWS FOR TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 4

Outfall System Note:

18" Gravity Sewer @ S = 0.0022

(or)

Force Main - 12"

Pump Station 2.0 MGD @ 130' TDH

^aMGD = Million Gallons/Day ^bCFS = Cubic Feet/Second

^CGPM = Gallons Per Minute

^dgcd = gallons/capita/day ^egad = gallons/acre/day

^gTDH = Total Dynamic Head

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Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

ALL GRAVITY ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 4







HIC SCALE

MILE BOOD FEET

MAP 18

COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN ALTERNATIVE SANITARY SEWERAGE SYSTEM PLAN DESIGNED TO SERVE ALTERNATIVE 1990 LAND USE PLAN NO. 4





GRAPHIC SCALE

Source: J. C. Zimmerman Engineering Corporation and SEWRPC.

TABLE 11-B

COST OF CONSTRUCTING GRAVITY SANITARY SEWERS TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 4

I. OUTFALL SYSTEM			··			
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
18"	24'-28'; Wet	1,000	\$160	\$ 160,000		
T8	Tunnel (Over 28')	4,300	190	817,000		
Connection to Me	tro-Sewer at W. Oakwood Rd. a	and Miscellaneous Cons	truction	75,000		
Total C	onstruction Cost			\$1,052,000		
Overhea	d and Contingency (35 Percent	t of Construction)		386,200		
TOTAL C	TOTAL COST OF I - OUTFALL SYSTEM					
II. LOCAL TRUNK SYST	ЕМ					
Sewer Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
18"	14'-Wet	5,200	\$ 37	\$ 192,400		
15"	14'-Wet	2,200	35	77,000		
12"	14'-Wet	2,200	33	72,600		
Total C	\$ 342,000					
Overhea	120,000					
TOTAL C	\$ 462,000					

Source: J. C. Zimmerman Engineering Corporation.

TABLE 11-C

COST OF CONSTRUCTING COMBINATION GRAVITY, PUMPING STATION, AND FORCE MAIN SEWER SYSTEM TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 4

I.	OUTFALL SYSTEM						
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
	12" Force Main		5,300	\$ 16	\$ 84,800		
	2.0 MGD Pumping Stat	ion			110,000		
	Connection to Metro-	Sewer at W. Oakwood Rd. a	and Miscellaneous Cons	truction	75,000		
	Total Const	ruction Cost			\$ 269,800		
	Overhead an	d Contingency (35 Percen-	t of Construction)		94,430		
	TOTAL COST	OF I - OUTFALL SYSTEM			\$ 364,320		
II.	II. LOCAL TRUNK SYSTEM						
	Facility and Size	Approximate Depth	Length in Feet	Cost/Foot	Total Cost		
	18"	14'-Wet	5,200	\$ 37	\$ 192,400		
	15"	14'-Wet	2,200	35	77.000		
	72,600						
	\$ 342,000						
Overhead and Contingency (35 Percent of Construction)					120,000		
TOTAL COST OF II - LOCAL TRUNK SYSTEM					\$ 462,000		
TOTAL COST OF OUTFALL AND LOCAL TRUNK SYSTEMS (I & II)					\$ 826,230		
					1		

Source: J. C. Zimmerman Engineering Corporation.

TABLE 11-D

ESTIMATED ANNUAL COST OF OPERATING AND MAINTAINING ALTERNATIVE SANITARY SEWERAGE SYSTEMS DESIGNED TO SERVE TOWN OF RAYMOND ALTERNATIVE 1990 LAND USE PLAN NO. 4

A. ALL GRAVITY ALTERNATIVE						
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
One Mile of Sewer	\$250	\$ 250				
II. LOCAL TRUNK SYSTEM	•	·				
Two Miles of Sewer	\$250	\$ 500				
TOTAL Cost of A-(I and II)	_	750				
B. COMBINATION GRAVITY PUMP STATION-	B. COMBINATION GRAVITY PUMP STATION-FORCE MAIN ALTERNATIVE					
I. OUTFALL SYSTEM						
Facility	Cost/Mile/Year	Total Cost/Year				
Pump Station (2.0)		\$13,000				
One Mile of Force Main	\$250	\$ 250				
TOTAL Cost B-I		\$13,250				
II. LOCAL TRUNK SYSTEM						
Two Miles of Sewer	\$250	\$ 500				
TOTAL Cost of B-(I and II)		\$13,750				

Source: J. C. Zimmerman Engineering Corporation.

TABLE 12

SUMMARY OF THE COST OF CONSTRUCTING AND MAINTAINING ALTERNATIVE SANITARY SEWERAGE SYSTEMS DESIGNED TO SERVE THE FOUR ALTERNATIVE 1990 LAND USE PLANS FOR THE TOWN OF RAYMOND

1990 Land Use Plan Alternative	Projected Population Served	Sanitary Sewerage System Alternative	Estimated Total Construction Cost	Annual Operations and Maintenance Costs
Alternative 1	7,495	All Gravity	\$5,638,950	\$ 3,000
		Combination Gravity, Pump, and Forced Main	\$3,318,705	\$ 42,000
Alternative 2	7,392	All Gravity	\$4,522,050	\$ 1,750
		Combination Gravity, Pump Stations, and Forced Main	\$2,242,900	\$ 39,750
Alternative 3	8,330	All Gravity	\$4,799,250	\$ 2,000
		Combination Gravity, Pump Stations, and Forced Main	\$2,500,200	\$ 40,000
Alternative 4	138	All Gravity	\$1,882,200	\$ 750
		Combination Gravity Pump Stations, and Forced Main	\$ 826,230	\$ 13,750

Source: J. C. Zimmerman Engineering Corporation and SEWRPC.