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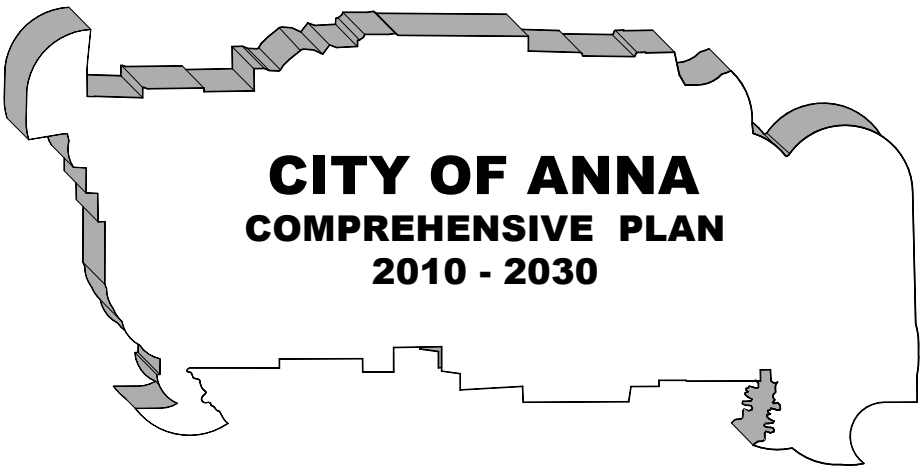

CITY OF ANNA

COMPREHENSIVE PLAN

2010 - 2030

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INTRODUCTION

As the binding force of the city, Anna provides and maintains transportation, water, wastewater, and storm water drainage, and trail/pedestrian infrastructure system services. This section details the policies and the direction in which these vital services will grow through 2030. In addition to the normal transportation systems, this study has identified two new transportation elements. These elements are "information conduits" and "gray water" transmission systems. An approach that coordinates several of the transportation elements, should prove to cost less, work better, and improve the city's appearance and operation. Anna must handle interstate and regional traffic with innovative solutions that meet or exceed local needs using appropriate and coordinated state-of-the art transportation systems.

THOROUGHFARES

Street and Thoroughfare networks tie a community together and link a community to the outside world. Local streets, collector and arterial streets should provide safe, reliable access to work, schools, shopping, and residences. The livelihood of a community can depend on how goods and services are imported or exported. Street networks to the outside world are important to the economic growth of a community in providing needed access to goods and services not found in the community. The future economy and the type of community ultimately to be developed are determined to a large degree by the condition of thoroughfare facilities and the manner in which these facilities handle traffic, both within the City itself, and between Anna and other towns and cities. The residents of Anna should be able to reach their desired destinations with ease and comfort resulting from proper street planning.

Streets are one of the most important physical parts of any city and, if adequate facilities are constructed, represent the largest single required expenditure of the City. Thoroughfare and other rights-of-ways occupy over 37 (unusually high number, however, annexations that occurred decades ago incorporated large areas of

throughfares such as SH. 121, U.S. 75, and F.M 455 without adjacent lands) along percent of Anna's total developed area and allow for circulation between all areas within the City. In addition to moving of traffic, streets provide access to and drainage for abutting properties, open space between buildings, and right-of-way for various utilities.

PURPOSE

The major purpose of the thoroughfare development plan is to provide guidance in the size, location, classification, standardization, and improvement of streets and thoroughfare facilities. It offers a framework for orderly development that is responsive to present and future traffic demands within the community.

This plan is designed to establish an action oriented thoroughfare plan for the City of Anna for the period 2010 to 2030 and beyond. The Thoroughfare Development Plan examines the existing thoroughfare network, route continuity, existing land uses, major traffic generators, traffic volumes, signalized intersections and railroad grade crossings. The study area includes all lands currently in the City as well as the extra territorial jurisdiction of Anna as of January, 2010.

This plan was developed in conjunction with anticipated area growth trends. It should not, however, be considered inflexible. On the contrary, the plan should be periodically reviewed and updated to guarantee that positive and dynamic responses are made to the ever-changing needs of the community.

STREET HIERARCHY

It is a well-accepted principle that a roadway system contains a hierarchy of components, each promoting a different ratio of emphasis on traffic movement and property access. Different type roadways are intended to serve defined needs with a specific balance between movement and access. Various roadway categories have evolved over time. The categories range form a freeway, which places total emphasis

on through traffic movement, to a local street whose primary function is access to adjacent property.

The street classification used in this plan are defined as follows:

Freeway or Expressway (Major Highway) -- This classification devotes total emphasis to the movement of traffic with little or no access to adjacent land. It is characterized by some degree of access control and normally is used for longer trip lengths at higher speeds. It serves the major centers of activity and high volume traffic corridors. The network formed is integrated and generally offers connections to areas outside the immediate study area.

Arterial -- Arterial streets serve major movements of traffic within an urbanized area while still providing some degree of access to adjacent property. They generally move high volumes of traffic through the City and provide access to the freeway and expressway network.

Collector -- The primary function of minor collector streets is to provide land access with secondary function of traffic movement. Basically it "collects" traffic from local areas and distributes it to the major collector network.

The collector minor network primarily serves localized areas. The main difference between minor collector and major collector streets is the length and type of trips accommodated.

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Collecter Street

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Local Street -- The primary function of local streets is property access. They are normally short in length and compose the highest percentage of total street miles within the City. Local streets are designed to serve low traffic volumes. Through traffic movement should be discouraged. Depending upon the type of area served, and the service demands placed upon them, local streets may be subcategorized as residential, industrial and business.

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Local Street Section

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Criteria and guidelines for the designation of specific facility types within each street classification are shown in Table 15.

TABLE 15
CITY OF ANNA
CHARACTERISTICS OF STREET CLASSIFICATIONS

Characteristics	Major Highway	Arterial	Collector	Local
Average Trip Length	>3 miles	>1 mile	<1 mile	<1/2 mile
Travel Speed	65 mph	25-45	20-30	25
Access Control	Partial	Partial	Partial	Minimum
Spacing	NA	1 mile	1/2 mile	300-500 ft.
Traffic Volumes (000's)	10-50	2-10	1-2	.1-2
Traffic Controls	Free Flow	Signals	Stop Signs	Yield Signs

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Each street within the City assumes certain characteristics based on the way it is used. This accommodates a classification hierarchy upon which an overall thoroughfare network may develop. An important point to realize is that some streets are not suitable for some classifications due to adjacent land uses, etc. The classification system, in conjunction with "sound" planning principles and methods will satisfy the demands of roadway users and will prevent a breakdown of the total thoroughfare system, or parts thereof.

Many streets have become major traffic routes because of usage in there past history, their length, and their surface condition. As an example, a street may come to be used as a major route since it traverses a long distance and is continuous. Such streets tend to adopt a functional classification, which often becomes permanent. If that street is not suitable as a major route, or if there is resistance to expanding the facility to properly accommodate the demand, it is very difficult to revert its usage to a lesser classification. Such attempts tend to disrupt existing traffic flows, but do not necessarily discourage its use. Due to natural growth in the area, traffic usually increases which results in congestion. Therefore, it is important that the existing street network be carefully examined, a network classification be assigned and a planned program of implementation pursued.

ROUTE CONTINUITY

Many of the streets in Anna lack the desired overall network continuity because of offsets or physical barriers such as the Railroad. At other points, it is due to the original layout of the street network and the subsequent development, which has taken place within the City. The lack of system-wide continuity places limitations on the traffic capacity and the function of the overall network. The street surfaces in the older section of Anna are poor in condition and narrow. New streets less than 10 years old are in good condition with surface widths ranging from 27 feet to 31 feet in residential areas. The current arterial streets are maintained by TXDOT with surfaces in good

condition, however, are narrow relative to the traffic volumes they carry. It should be noted that many streets in the new subdivisions have dead-end streets. It is anticipated that these route continuity scenarios will be solved once future developments are built to finish through streets.

LAND USES AND MAJOR TRAFFIC GENERATORS

Anna contains a well-rounded mix of land uses. The Future Land Use Plan that has been developed includes the Thoroughfare Plan. A Central Business District, recreational facilities, the school system all complement the residential areas of the community. Vehicle trips within the City, resulting from population demand, and trips originating from outside the City for work, recreation and educational purposes, have placed relatively high traffic volumes on all of Anna's major streets.

An analysis of the existing street network must consider the major traffic generators within the City, which influence the traffic volumes and flow patterns. The locations of major traffic generators within the City are shown in Figure 20. The major local traffic generators in Anna include the schools, retail areas, and the central business district. Currently, the generators are adjacent to or are in close proximity to existing major and minor collector streets. This close proximity scheme should continue with the development of the thoroughfare plan. This will allow for the continued concentration of vehicular trips along major routes without negatively impacting local streets. Table 16 provides a listing of the current thoroughfares indicating Pavement widths and conditions.

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TABLE 16
CITY OF ANNA
EXISTING THOROUGHFARES

EXISTING THOROUGHFARE NAME	APPROXIMATE WIDTH OF R.O.W./PAVEMENT	SURFACE CONDITION
U.S. HIGHWAY 75	300'± 45-63'±	CONCRETE GOOD
WHITE STREET (FARM TO MARKET 455)	80'-120' 29-62'±	ASPHALT FAIR TO GOOD
POWELL PARKWAY (STATE HIGHWAY NUMBER 5)	80'± 25'±	ASPHALT GOOD
ROSAMOND PARKWAY	60'-120'± 24'±	CONCRETE GOOD
FERGUSON PARKWAY	60'-120'± 24'±	CONCRETE GOOD
WEST CROSSING BOULEVARD	80'± 44'±	CONCRETE GOOD

SOURCE: 2009 SURVEY BY PLANNING AND DEVELOPMENT

An analysis of the existing street network must consider the major traffic generators within the City, which influence the traffic volumes and flow patterns. The major local traffic generators in Anna include the schools, retail areas, and the central business district. Currently, the generators are adjacent to or are in close proximity to existing major and minor collector streets. This close proximity scheme should continue with the development of the thoroughfare plan. This will allow for the continued concentration of vehicular trips along major routes without negatively impacting local streets.

Table 17 provides a guideline for daily vehicle trips for the major land use categories.

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TABLE 17
CITY OF ANNA
TRIP GENERATION BY LAND USE

LAND USE	TRIPS PER UNIT
Residential	
Single Family Detached	10 each unit
Duplex/Townhouse	5.2 each unit
Multi-Family	6.1 each unit
Commercial & Office	
Specialty Retail Center	40.7/1000 s.f.
Restaurant	82.0/1000 s.f.
Drive-in Restaurant	74.9/1000 s.f.
Service Station	748/station
Supermarket	125/1000 s.f.
24 hour Open Convenience	625.5/1000 s.f.
General Office	12.3/1000 s.f.
Medical Office	54.6/1000 s.f.
Post Office	139.7/1000 s.f.
Office Park	20.6/1000 s.f.
Industrial	
light Industrial	5.4/1000 s.f.
Heavy Industrial	1.5/1000 s.f.
Industrial Park	7.0/1000 s.f.
Manufacturing	3.8/1000 s.f.

*Average Weekday Trip based on ITE Trip Generation Tables.

GEOMETRIC DESIGN STANDARDS

Roadway geometric design standards are composed of various elements, which affect the functional operation of street facilities. Each major element is discussed in detail and specific standards are presented.

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Consideration for changes will be given when existing topographic features prohibit reasonable use of specified design requirements. A request for such changes must be made is accordance with requirements in the adopted Subdivision Rules and Regulations, which indicate the minimum acceptable design standards.

DESIGN ELEMENTS & THOROUGHFARE ANALYSIS

The design elements set forth specific goals for thoroughfares within Anna in comparison to existing thoroughfare conditions.

RIGHT-OF-WAY

Right-of-way width is generally determined by the pavement section (roadway type) required to perform the function for which the thoroughfare is designed. Considerations may also include safety areas, sidewalks, utility locations and other functions. Right-of-way widths for each roadway classification are shown in Table 17.

LANE WIDTHS

Driving lane widths are generally 11 feet to 13 feet. The standards shown in Table 18 for Minor and Major Collectors do not accommodate curb lane parking and are based upon the premise that full widths, as shown, should be totally usable for moving traffic.

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TABLE 18
CITY OF ANNA
RIGHT-OF-WAY WIDTHS

TYPE	DESIGNATION	R.O.W.	PAVEMENT (Face to Face)	Median (Face to Face)
Expressway*	E	150'-500'	NA	NA
Arterial	A	120'	2 @ 36'	26'
Collector Divided	C2D	80'	2 @ 24'	20'
Collector Undivided	C2U	80'	48'	None
Neighborhood/Collector	C	60'	36'	None
Local Residential	R	50'	31'	None

*Includes U.S. Highway 75 and the Collin County Outer Loop.

Arterial are recommended to be divided street sections with a total of 72' of driving surface from back of curb to back of curb. Collectors Divided and Undivided are recommended to be are recommended to be 49 feet wide from back of curb to back of curb including four moving traffic lanes and no parking. Neighborhood Collectors are recommended to be 36' wide from back of curb to back of curb. Local streets are 31 feet back of curb to back of curb with parking permitted.

DESIGN SPEED

Design speed is that speed chosen for the design of a street and the related physical features of a roadway, which influence vehicle operation. These design features include such items as roadway curvature, sight distance and grades. Normally, design speeds are higher on higher-level functional classifications and are higher than the expected running speed of the traffic in order to provide a margin of safety in the design of facilities. For recommended design speeds see Table 19.

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FIGURE 21

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TABLE 19
CITY OF ANNA
DESIGN SPEED

Roadway Classification	Range of Design Speed (MPH)	Average Running Speed (MPH)
Outlying Undeveloped Areas	40-55	40-45
Arterial Street	35-40	30-40
Collector Street	30-40	25-35
Local Street	25-35	20-30

Roadway Access Management

The basic objective of access management is to protect the utility (functional ability) of a roadway. This general objective encompasses specific goals such as:

- To preserve or improve roadway capacity and expedite traffic flow.
- To reduce traffic hazards and potential accidents.
- To achieve the best possible balance of benefits among the property owner, the roadway user and the community at large.
- To protect public investment by preventing premature dysfunctioning.
- To improve the appearance of a roadway and its adjacent area.

The basic interrelationship between landowners and transportation facilities is illustrated by a continuous cycle of activities. This cycle begins with land use and continues with: on site activities generating trips; trips connecting points of origin and destination and therefore, defining transportation needs; transportation facilities providing additional access to land; land values increasing; more development being placed on the land, and then the cycle begins anew.

It is important that thoroughfare facilities be protected from becoming obsolete and that

they continue providing levels of service for which they were designed. Effective policies and standards managing access control contribute to their functional protection.

Intersection Spacing -- theoretically, the ideal location and spacing of signalized intersections is at points which minimize impacts on major roadways and permit progressive through traffic movements.

Direct Access Driveway Design -- Driveway openings from major thoroughfares should be provided as part of the functional plan for off street parking and for access to parcels of land. Along arterial roadways, where volumes and speeds are higher, driveway designs should correspond with vehicular capabilities in order to facilitate a free flow both on and off the roadway. A curb return should allow a vehicle to follow a path outlined by the curb without jumping the curb. Vehicles entering a driveway should be able to turn right, from the curb lane, without slowing suddenly or encroaching on other travel lanes to their left. Likewise, a vehicle exiting from a driveway should be able to turn into the right lane without encroaching on the adjacent lane.

Most non-residential driveways are intended to allow vehicles to enter and leave at the same time. Sufficient width must be provided to permit this to be done with ease.

In Anna the Access management is extremely poor since most properties abutting a thoroughfare have direct access to the thoroughfare. This causes a significant reduction in the carrying capacity of the thoroughfares; however, because of the past rural nature of the City some of these conflicts will continue. It should be noted that future thoroughfares to be added to the system should be constructed to facilitate roadway access management as stated above. Additionally, cross access easements are being required, especially along TXDOT facilities since access to individual properties is being discouraged and joint access is being encouraged. The interval for access is generally 400 feet or more depending on the speed of the traffic on the thoroughfare.

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INTERSECTION DESIGN CRITERIA

In any thoroughfare network, a major intersection is a critical point of congestion and delay. While thoroughfare links can accommodate relatively high traffic volumes, the intersection of Arterial streets must serve twice the traffic volumes of any given street link. As a result, it is necessary to place major emphasis on this critical part of the network. This may result in the need for fewer lane miles of city streets, and the need for more special use lanes at certain intersections. Special design considerations may be required to increase intersection capacity. There is a natural conflict, which exists between private needs and additional intersection capacity needs since commercial development traditionally locates at major intersections to gain maximum exposure. An intersection can be described as the actual crossing of two streets plus that portion of the streets within 150 feet of the crossing.

POLICIES

- Anna shall use access management practices to make the investment in the roadway infrastructure as cost efficient as possible. These practices include placement of curb cuts, median opening spacing, and parallel access roads (public and private).
- Residential streets shall be designed to include traffic calming practices that promote the use of collectors and arterials for trips that are not locally oriented.
- The transportation network shall be designed to optimize emergency routes for police and fire operations and promote efficient delivery of services such as mail and solid waste.
- The city should plan, design, and build a network of arterials and collectors that provide acceptable levels of service while complementing the land-use decisions in the comprehensive plan.
- The city shall use the thoroughfare plan to plan and design transportation improvements, program capital improvement plan projects, and guide

development review decisions. Many of the arterials in Anna are state roadways, so cooperation with the Texas Department of Transportation (TXDOT) is essential to the construction and operation of the city's transportation system.

- Major arterials are intended to carry traffic across town and between major intensity centers. These facilities shall be divided by landscaped medians. Arterials should be at least four lanes, with left-turn lanes provided at all major intersections. Collectors shall have at least one full lane in each direction to carry traffic to the arterial system.
- A transportation lobbying campaign should be conducted to ensure participation in federal, state, and regional infrastructure funding decisions. Local funding participation in priority projects should be considered for inclusion in the city's capital improvement program.
- The Anna trails plan should be adopted and the network of sidewalks, bike trails, and greenbelt paths should be included in the CIP for funding. Developers shall aid this network by dedicating rights-of-way and constructing portions of the network across their properties. Linkages to daily destinations that serve daily needs should be emphasized to reduce use of automobiles.
- The city will promote the use of roadways parallel to and outside the limits of the 100-year floodplains to provide a natural riparian environment by establishing green space between the road and the floodplain.
- Green space is required even if the channels are improved so that the limits of the parallel roadways may be dedicated to the city to serve as open space, limit flood exposure, and facilitate channel maintenance.

THOROUGHFARE PLAN

GOAL - This thoroughfare development plan is to provide guidance in the size, location, classification, and standardization of thoroughfare facilities.

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Objective – To provide a framework for orderly development based on the Future Land Use Plan, projected population growth and anticipated economic development in order to be responsive to present and future traffic demands within the community.

Figure 22 illustrates the Thoroughfare Plan for the overall planning area. Completion of the system will occur over a period of time as the facilities are warranted, either as the adjacent lands develop or as may be required to accommodate special traffic movements through undeveloped sections.

In areas where development is sparse, the alignments are shown as corridors. Street alignments are approximate and should be formalized as development takes place. The Thoroughfare Development Plan provides continuity of the roadway network within a street classification hierarchy and is based on the Comprehensive Land Use Plan. The Thoroughfare Development Plan also takes into account proposed land use development potential to the year 2030 and beyond. This has enabled the plan to address future needs of the community as they are presently envisioned. As the Land Use Plan changes, so must the Thoroughfare Development Plan change.

Some of the recommendations involve highway improvements by the Texas Department of Highways. For highway improvements within the City Limits, the City is normally obligated for the costs of right-of-way, utility relocations, and drainage systems, which may be necessary for construction. As these are improvements of major benefit to Anna, the City should make every effort to assure that such funds are available at the time of construction.

THOROUGHFARE CONCLUSIONS

It is desirable from the standpoint of both circulation and maintenance costs for the City to develop all thoroughfares to adequate standards. However, it is not necessary to construct thoroughfares to their full-anticipated capacity if such capacity conditions will not occur for many years. Improvements should be made according to the

proposed standard as the street approaches its anticipated capacity. However, all required rights-of-way should be designated and dedicated when platted or replatted as soon as possible.

Through use of the Thoroughfare Plan, the designation of rights-of-way for thoroughfares to be constructed in the future will aid the City of Anna in acquiring adequate rights-of-way as streets are actually developed. The Thoroughfare Plan can put property owners on notice as to the City's intentions to develop the thoroughfare system, and prevent the development of conflicting uses, which might interfere with the system.

State Highways have been integrated into the Thoroughfare Plan. The City should fully utilize the capabilities of the Texas Department of Highways in the expansion of these facilities. As State funds are becoming more limited, the City should make every effort to cooperate in the expansion of highways and farm roads, in accordance with the Thoroughfare Plan, as funds are made available.

Most of the thoroughfares identified on the Plan other than State Highways will be the responsibility of the adjacent property owner as their land develops. As such the majority of the Thoroughfare Plan should rely heavily on developer construction of Thoroughfares and **should not** be included in a time frame or local budget unless development has already occurred on both sides of the planned improvements. Additionally, Roadway impact fees should be adopted so that needed vehicular transportation facilities can be built.

As part of this process a design “Thoroughfare Standards Rules and Regulations” document has been assembled and included as Appendix A.

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WATER

The purpose of this segment of the Comprehensive Plan is to provide an analysis of the existing City of Anna water supply system, and an analysis of the systems operations. No recent system wide water system analysis has been conducted that considers all of the current development activity that has occurred in Anna.

The provision of ample public utilities such as water facilities is vital to Anna's life and growth. It was the introduction of water piped under pressure and water-carried waste disposal, which made possible the urban concentrations of population, as we know them today. The average citizen has come to expect water to be available, in the quantity desired, and gives no thought to the source of that water or the destination of the resulting wastes. The instant response to these demands requires considerable planning, effort, and investment in plants and equipment.

The community leaders should be concerned with the proper relationship of the utility systems to each other and to the land use plan. The complexity of the utility systems increases greatly as they cover larger areas and serve increasing numbers of customers. This water plan will help direct the City towards the efficient updating and expansion of Anna's water system.

WATER SYSTEM PLANNING

In order to plan a future water system capable of providing the requirements of the projected community, it is necessary to evaluate the present system, including the water supply and distribution system network and its capability of providing service for the present and projected demands. The City must have a dependable water supply that will provide for all water demands; including domestic, industrial, and commercial, as well as an allowance of about 25 percent for distribution system

leakage, fire fighting, and other unmetered uses. The present average usage throughout the United States is around 100 gallons per capita per day. In industrial cities with heavy industrial water consumption the average usage may be 300 gallons per capita per day or more.

Most cities maintain pressure in the water distribution system by providing elevated water storage, preferably at some high topographical location or locations in the city. Water is pumped from ground storage reservoirs located at wells, a treatment plant, or delivery point, into the system to maintain a high level of water in the elevated tank and thus a high pressure in the system. A balanced system should provide pumps with capacity to supply the average daily consumption, with additional pumps, which can put sufficient water into the system to meet the maximum daily demands and maintain the system pressure. To satisfy the peak hourly demands, water can be used from the elevated storage along with that provided by additional pumps.

Water storage reservoirs in a water system provide water for three principal purposes: (1) to meet hourly demands which are in excess of water supply facilities; (2) to meet the increase in demand created during fire event; and (3) to meet the system demands during short interruptions of water supply. Also, the City should be in compliance with current per service connection requirement of the Texas Commission on Environmental Quality for elevated storage (Rules and Regulations for Public Water Systems - TCEQ).

Ground storage consists of a reservoir placed on or just below the ground surface. Water in a ground storage reservoir is treated and ready for use, but must be pumped from the reservoir into the distribution system with high service pumps. Ground storage is generally located at a water treatment plant, near a well site, or at a delivery point.

Elevated storage consists of a reservoir elevated above the area, which it is to serve. This elevation can be accomplished via a tower type structure or a tank

location on high ground. Water in this type reservoir is also treated and is ready for use. Due to its elevation above the ground there is sufficient pressure to flow the water into the distribution mains by gravity without pumping. However, the elevated storage tank must be filled from the source of supply via the pumping facilities.

Maximum hourly demands for water can be supplied in several ways. One method is to maintain pumping capacity at the source or supply sufficient to pump water at a rate high enough to supply the maximum hour demand. Another method is to supply water with pumps at the source of supply with capacity to meet the maximum daily consumption rate and to supply the higher maximum hourly demand by permitting water in the elevated tank to drain into the system during peak consumption hours. Either of these methods is acceptable practice; some combination of the two might be determined to be a more economical experience has shown that the peak pumping capacity should be approximately 125 percent of the maximum daily demand.

Materials used in water system construction usually have a fairly long life, but will ultimately have to be replaced. In water system planning, attention should be given to the deterioration of any facilities which have served their purpose and which may be either too expensive to maintain or overly expensive to operate, and an efficient schedule or replacement developed.

In general, no water lines less than eight (8) inches in diameter should be installed. Lines should be sized to maintain proper pressure and flow rates at all locations. Consideration must be given to the location of water lines in relation to sanitary sewers and other public utilities.

The proper provision and distribution of fire hydrants and valves is critical to the operation and maintenance of a water distribution system. Fire hydrants should be located so that all structures are within 300 feet of the fixture. Water valves should be placed such that no unnecessary interruptions occur over large areas when line repairs are made at any particular location.

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The Texas Commission on Environmental Quality has set forth guidelines for the location, installation, and operation of water lines and all other water works utilities (Rules and Regulations for Public Water Systems - TCEQ).

In planning for a growing city, consideration must be given to the extension of the utility system into new areas as building construction progresses. Unless utility expansion is orderly and adequate, growth of the City into new areas cannot and will not occur. Building may not be completely stopped by failure to extend service into the new areas, but the character of the development that does occur is likely to he inferior and has an adverse effect on the City as a whole.

WATER SYSTEM INVENTORY

The City of Anna owns its water supply distribution system. Potable water is currently obtained from seven active wells. The City currently serves approximately 3,107 active water connections (2,783 within the City and 324 in the ETJ). The inventory and updating of the existing City system was compiled in 2009. Water system capacities are also indicated in Table 20. Pipe diameter ranges in size from 1 inch to 18 inches. The Anna water system configuration

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has five ground storage tanks, seven wells, three elevated storage tank (one is out of service), and distribution lines. The City has an additional “Take Point” for water from the North Texas Municipal Water District.

The Water system operation has four operator’s with certificates. The highest certificate is an “A” classification which the City has one, additionally the City has one Class "B" Operator's Certificates and two “C”, which more than complies with Texas Commission on Environmental Quality. Daily operation and maintenance of the water facilities consists of the following:

1. Check chlorine residual;
2. Check water Ph;
3. Check water alkalinity;
4. General maintenance as needed and required;
5. Check Wells; and,
6. Check tank levels.

With respect to system standards and design criteria, the Texas Commission on Environmental Quality has developed specific minimum guidelines. These standards are less than those required for an approved public water supply. They provide a basis for evaluation, however. Current available data from the Anna water system, as compared with Texas Commission on Environmental Quality standards, are indicated

in Table 21. As shown, the City's standards are above those of the Texas Commission on Environmental Quality. All calculations are based on 3107 water connections.

TABLE 20
CITY OF ANNA
WATER SYSTEM INVENTORY

FACILITY	CAPACITY
Well # 1 (5th Street Plant) Ground Storage Tank Ground Storage Tank Elevated Storage (Out of Service)	Average 150 gpm 100,000 gallons 300,000 gallons (55,000 gallons)
Well # 2 (North Powell Pkwy. Plant) Ground Storage Tank	Average 135 gpm 300,000 gallons
Well # 3 (C.R. 370) Well # 4 Ground Storage Tank Elevated Storage	Average 340 gpm Average 155 gpm 300,000 gallons 200,000 gallons
Well # 5 (Smith Street Park)	Average 420 gpm
Well # 7 (Public Works North Site) Well # 8 Elevated Storage	Average 350 gpm Average 320 gpm 200,000 gallons
South Take Point Ground Storage Tank	 1,000,000 gallons

All lines should be looped to ensure uninterrupted service should a line breakage occur. In commercial areas, 8-inch lines must be installed. However, no dead-end water mains should be more than 1800 feet in length if allowed.

Additionally, standard three-way fire hydrants require an 8-inch or larger diameter water main with a minimum of 5 inch valve openings. Fire hydrants are to be

properly located every 300 feet in commercial areas and every 600 feet in residential areas so that every building in the City limits will be within 500 feet of a standard City fire hydrant. Fire hydrants on mains less than 8 inches are not recognized as providing effective fire protection.

TABLE 21
CITY OF ANNA
WATER SYSTEM STANDARDS

FACILITY CAPACITY	TCEQ	ANNA
Total Storage	200 gal./connection	675
Elevated Storage	100 gal./connection	128
Wells	0.6 gpm/connection	0.602
Minimal Residual Pressure	20 psi	55
Normal Operating Pressure	35 psi	65
Certified Operators	1	4

TCEQ = Texas Commission on Environmental Quality
Based Upon 3107 connections served by system.

WATER SYSTEM ANALYSIS

As illustrated in Table 21, the major elements of the water system are adequate according to the standards set. However, if development or roof top expansion starts again as projected with levels less than experienced several years ago the elevated storage capacity could go critical in two years. With the time lag from engineering, to funding, to land acquisition, to actual construction capacity could be outstripped. Therefore, from a planning time frame now is the time to start developing an action plan to address the elevated storage situation. Another significant need will be the development of an additional north/south transmission

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line from the "Take Point" location to some point in the system creating a loop feature in case the new 18 inch water main from White Street to the take point is disturbed or shutdown for some reason. As shown on Table 21 the well capacity during periods of high water usage are minimal at best and the future reliance on water from the North Texas Municipal Water District will dramatically increase. At this point no water is being taken, however a period of accelerated growth could change this.

****
Water "Take Point" with 1,000,000 gallon ground storage and pump house.
****

Other water transmission lines are needed within the City. Sections of the Downtown area are currently being served by water lines that are under Farm to Market Highway 2862 (Fourth Street) which are in critical condition. Redevelopment of the Downtown area will mandate additional water transmission lines not only from a supply standpoint but a fire protection issue. A grant has been received from the Texas Community Block Grant Program which will help with this matter. It is anticipated that the water line upgrade will start in 2010. Additional water lines and

looping of water lines need to occur throughout the City to ensure that adequate residual pressures and delivery of adequate water supplies continue.

Many portions of the City lack adequate sized looping of distribution lines with several lines in undersized condition.

TABLE 22
CITY OF ANNA
POTENTIAL SERVICE CAPACITY

FACILITY	MAXIMUM CONNECTIONS	2010 CONNECTIONS	AVAILABLE CONNECTIONS
Total Storage	21,000*	3,107	18,786
Elevated Storage	4,000	3,107	893
Well Capacity	3,116	3,107	9**

Based on TCEQ Minimum Acceptable Standards and Current Anna data.
*Includes new 1,000,000 gallon "Take Point" tank.
** No new wells are needed due to North Texas Municipal Water District water supply delivered to "Take Point".

The water/wastewater department are one and the same. They also perform additional duties such as drainage maintenance, park maintenance, street maintenance, water line extensions, and many other duties within the city and therefore difficult at best to allocate how much expense is solely for water costs.

Presently, operation of the City's water system facilities is adequate with maintenance conducted on a regular basis. The City will begin a detailed inventory of existing features of the water system through the use of a recently purchased GPS system which will help with location of facilities. Then as updates are made, a more effective approach can be achieved in evaluating future projects.

The current water rate adopted for 2010 are as follows:

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Meter Size	Minimum Charge		
	Institutional Customers (effective 12/1/2008 – 7/31/2009) *(Ord. No. 440-2009, adopted 4/14/2009)*	Institutional Customers (effective after 7/31/2009) *(Ord. No. 440-2009, adopted 4/14/2009*	All Other Customers
00.625" x ¾"	$18	$18	$18
1"	$18	$45	$45
1 ½"	$18	$90	$90
2	$18	$144	$144
3	$18	$270	$270
4	$18	$450	$450
6	$18	$450	$900
8	$18	$1,800	$1,800
10	$18	$4,500	$4,500

Inside City Water Rates – All Customers.

Each Customer shall pay the minimum charge specified in (a) above for the first 2,000 gallons of water usage plus the following additional user charges:

2,000 – 10,000 gallons	$5.26 per 1,000 gallons
10,001 – 15,000 gallons	$6.58 per 1,000 gallons
15,001 – 20,000 gallons	$7.89 per 1,000 gallons
20,001 +	$10.52 per 1,000 gallons

Outside City Water Rates – Residential Customers.

Each Customer shall pay 1 ¼ times the rate charged to Customers inside the City limits. *(Ord. No. 433-2009, adopted 2/24/2009)*

Outside City Water Rates – Commercial Customers.

Each Customer shall pay 1 ¼ times the rate charged to Customers inside the City limits. *(Ord. No. 433-2009, adopted 2/24/2009)*

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In the past, the water system has met the City's needs. The critical elements of the water system are the distribution system's line size, and the lack of looping. As the City grows, additional burdens will be placed on these inadequate facilities of the water system infrastructure.

Based on input from the public, staff, and City Council, the following problems were developed and ranked according to the perceived need of the water system of Anna:

1. Construction of a new elevated water storage facility west of U.S. Highway 75 and north of West White Street.
2. Replace old undersized water mains in the central sector of City
3. Loop distribution lines throughout the City to provide improved distribution and pressure.
4. A portable generator to insure the delivery of water in case of power failure.
5. The City should strive to keep water cost as low as possible.
6. The City should encourage the conservation of water resources by customers of the water system.

No other problems are perceived as being in need of resolution.

DROUGHT CONTINGENCIES AND CONSERVATION

The TCEQ has published a system for notification for drought-related water problems. This system also includes priorities and states of water rationing during times of drought. This system is recommended as follows:

Priority

E - Emergency. Could be out of water in 45 days or less.
P - Priority. Could be out of water in 90 days or less.
W - Watch. Water shortage possible.
R - Resolved. No longer experiencing water capacity problems.

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Stage
Stages of water rationing

1. Mild rationing. Usage of water for outdoor purposes, such as lawns, gardens, and car washing, can be restricted by utility.

2. Moderate rationing. All outdoor water usage is prohibited except by hand-held hoses with manual on/off nozzles. Water usage for livestock is exempt from this restriction.

3. Severe rationing. All outdoor water usage is prohibited; livestock watering may be exempted by the utility. All consumption may also be limited to each customer in specific ways.

A renewed public interest in water resources was embodied in the passage of Senate Bill 1 (SB 1) by the 75th Texas Legislature. SB 1 is a comprehensive omnibus water bill that addressed improving many different areas of water management, ranging from water planning and regulation to data collection and dissemination. Included in this bill is the establishment of regional water planning groups.

The Texas Water Development Board is responsible for administrating the state and regional water planning groups. Collin County of which Anna is part of is within Region C Water Planning Group. A revised water plan for Region C is planned for release in April of 2010 by the Texas Water Development Board.

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POLICIES

- The City will develop and operate a water infrastructure system that is safe, reliable, cost-effective, environmentally sensitive, and sufficient to meet future demands in cooperation with other entities.
- Developments will be constructed and property owners will maintain their properties and private infrastructure so they do not compromise public health, endanger public drinking supplies, or pollute the environment.
- Water facilities should be located in areas that meet engineering criteria and are compatible with adjacent properties to the greatest extent possible.
- Generally, infrastructure extensions to residential and commercial development will be the responsibility and expense of the developer. The city will follow development as determined by the private sector or as directed by the governing body by oversizing lines and upgrading trunk system. The city may also extend infrastructure to certain areas targeted for growth in the growth management plan.
- Promote infill infrastructure improvements over new line extensions that expand the geographic coverage of the city's infrastructure systems.
- Evaluate the use of impact fees to fund additional infrastructure to accommodate system growth and help manage utility rates.
- Use adequate public facilities criteria or other tools to influence compact versus satellite growth policies.

WATER SYSTEM GOALS AND STRATEGIES

WATER SERVICE GOALS

The water service goals are as follows:

- Develop and maintain long-term water supply contracts to ensure an adequate water supply to service Anna's.

- Expand water system capabilities and provide additional overhead storage to meet anticipated increase in demand. Design the water distribution system to provide flexibility in the refilling of tanks, providing sufficient water to meet average-day, peak-day, and peak-hour demand conditions as well as emergency fire conditions.
- Construct improvements to the transmission and distribution systems to accommodate population growth demands.

WATER SERVICE STRATEGIES

Long term ultimate planning area build out plans have been developed. Figure 23 shows the future needs of the City to serve all areas in terms of water line sizes, elevated storage facilities, ground storage requirements

- Based on long term population projections, Anna will need to purchase additional water supplies from the North Texas Municipal Water District.
- Follow the provisions of SB1, passed by the Texas Legislature in 1997, as a comprehensive approach to water planning. Among other issues, SB1 provided a framework for the state to develop a state-wide drought contingency plan that incorporates water planning through the year 2050. Collin County falls into Region C, along with fourteen other counties. Because growth within Region C will demand more water supply than the region can provide, negotiations for possible future interbasin transfers from other regions should begin.
- Build additional elevated storage to accommodate future water needs.
- As Anna grows, the infrastructure must be upgraded to provide for the transportation of treated water from the plant and storage facilities through the existing system into newly developed areas; and, proper balancing of new elevated storage tanks to the existing elevated storage tanks and allow for adequate refill rates.
- Utilize the Anna Water Conservation and Drought Contingency Plan to help reduce per capita water use during peak summer months. The conservation

plan strongly encourages the use of drought tolerant/native species for landscaping, reduction in lawn grasses, low water-use plumbing fixtures, increased public awareness through public education, and provides for both internal and external water audits.

- The city currently operates a wastewater treatment plant, however, no reuse program is currently in place. A reuse program for supplying treated wastewater effluent for future parks is a definite possibility and has been included into the overall "Plan". The creation of this system of reuse (gray water system) would extend the existing capacity of the water supply, treatment, and transmission systems and lower operating costs for high-volume park water users.

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WASTEWATER

The wastewater system study and analysis consists of an inventory of current conditions and problems facing the City of Anna in the treatment and collection of its wastewater. The second portion of this report focuses on the development of a wastewater system plan with a long-term strategy for improvements to the existing system.

To appropriately plan a wastewater collection and treatment system for a community, the planner must have knowledge of the existing system, area topography and growth trends. Peak wastewater flows which are expected to be generated at selected points in the service area are then determined and compared with the existing system capacities. Adjustments to the system can then be proposed.

The topography of a community heavily influences wastewater collection and treatment. Since gravity sewers are much preferable to lift stations and force mains (in terms of both economics and operational complexity) the ideal arrangement is a sewage treatment plant located at the downstream end of a drainage basin with gravity sewers extending along drainage ways within the basin. Anna is not fortunate in this regard since the City sits on several ridgelines and has three general drainage area witch generally flow to the south and southeast directions. The current location of mains in Anna has the need for 7 public lift stations.

WASTEWATER SYSTEM INVENTORY

The first step in the inventory process was to insure that all know lines and capacities of lift stations were determined. This was accomplished with the help of the Anna Public Works Director and his staff.
The City of Anna owns its wastewater system. The collection system is comprised of gravity flow wastewater mains, 7 lift stations, 7 force mains and a wastewater

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treatment plant located at the south central sector of the City.

****
Wastewater treatment Plant
****

The wastewater collection system is comprised of clay tile and polyvinyl-chloride pipe ranging from 6-inch to 30-inch pipe terminating at the wastewater treatment plant. The wastewater collection system serves 2,587 connections. Inside the City not all residential customers are served with wastewater services (13 existing wastewater customers are outside the City).

****
Lift Station on Taylor Boulevard (C.R. 367)
****

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****

Lift Station on Elm Grove Street

****

Anna will be reversing the flow at the Pecan Grove lift station in the near future and send effluent down a newly constructed gravity wastewater line. This effluent will be treated by the North Texas Municipal Water District. At the south edge of the City is a metering station that has been built which will meter the flows that the City will be responsible for.

****

Metering Station located south of County Road 366.

****

The wastewater rates are based on water usage with the following rates adopted in 2010:

Inside City Sanitary Sewer Rates – Residential Customers.
Each Customer shall pay the minimum charge specified above for the first 2,000 gallons of water usage plus a user charge of $4.35 for each additional 1,000 gallons of water used, except that the maximum monthly charge shall not exceed $77.00 for sanitary sewer service charges.

Inside City Sanitary Sewer Rates – Commercial and Industrial Customers.
Each Customer shall pay the minimum charge specified above for the first 2,000 gallons of water usage plus a user charge of $4.35 for each additional 1,000 gallons of water used.

Outside City Sanitary Sewer Rates – Residential Customers.
Each Customer shall pay 1 ½ times the rate charged to Customers inside the City limits, except that the maximum monthly charge shall not exceed $115.00 for sanitary sewer service charges.

Outside City Sanitary Sewer Rates – Commercial and Industrial Customers.
Each Customer shall pay 1 ½ times the rate charged to Customers inside the City limits.

WASTEWATER SYSTEM ANALYSIS

Criteria to analyze the wastewater system is based on TCEQ standards which are derived from the Texas Administrative Code Title 30, Part I, Chapter 317 - Design Criteria for Sewerage Systems. Most of the wastewater collection system's major components are in good condition. However, many lines are still clay tile allowing

for excessive infiltration. Additionally, many yard lines do not have cleanouts so that when stoppages have occurred plumbers have knocked holes in the lines and then covered the hole up with an old license plate or coffee can or tin plate. Over time this has become a major source of "Inflow/Infiltration leading to excess flows at the plant. This problem should be addressed by finding the leaks and when in yards have the owners of the property correct the problem.

Industrial wastewater is currently not a problem in the City. If an industrial user requiring special treatment move into Anna the city should adopt ordinances that will address unusual treatment needs.

Operational procedures designed to maintain compliance with the Texas Health Department and U.S. Environmental Protection Agency standards are adequate for plant operation. Daily operational procedures carried out by two City licensed "B" operators and two licensed "C" operators to ensure adequate maintenance of the systems and facilities. Daily maintenance procedures for the plant should include:

1. Inspect and operate treatment facilities;
2. Check pumps and pumping rates; and,
3. General maintenance as required.

Currently, All of the wastewater lines are 6 inches in size or larger. Any new line construction should also be 6-inches or larger.

The City of Anna wastewater treatment plant is permitted by TCEQ for 500,000 gallons and discharges to a tributary of Slayter Creek. It should be noted that the actual capacity of the plant is approximately 950,000 gallons. Additionally, the City has an old operational Emhoff tank with a capacity of 250,000 gallons. When the City is experiencing high flows due to excessive inflow and infiltration the Emhoff tank system can be used.

At this time Anna does not have any special sewer treatment needs. However, at

times excess grease is being experienced at several of the lift stations. As such the City should adopt ordinances that require restaurants to submit grease trap report regularly to the City so that the problem can be curbed.

In regards to sanitary sewer system improvements the highest priority and greatest community needs are ranked as follows:

1. Increasing the capacity of lines in several areas of the City.
2. Replacing the clay tile lines and brick manholes especially in the older part of the City.
3. Making provisions for future development by the expansion of the existing wastewater treatment plant.

In analysis of the wastewater system, standards for review are as follows:

1. No wastewater lines other than house laterals and force mains shall be less than 6 inches in diameter.

2. All wastewater lines shall be designed and constructed with hydraulic slopes sufficient to give a velocity when flowing full of not less than 2.0 feet per second.

3. Wastewater lines should be laid in straight alignment where possible with uniform grade between manholes.

4. Manholes should be placed at points of changes in alignment, grade or size of wastewater line, and at the intersection of wastewater lines and the end of all wastewater lines that will be extended at a later date. Additionally, manholes should not be spaced more than 500’ apart.

5. The inside diameter of the manholes shall be not less than 4 feet.

6. Provide an average of 100 gallons of wastewater treatment facilities per

capita.

7. Wastewater lines shall be designed for the estimated future population to be served, plus adequate allowance for institutional and commercial flows.

8. Wastewater and water lines shall be installed no closer to each other than nine feet between outside diameters.

POLICIES

- Developments will be constructed and property owners will maintain their properties and private infrastructure in such a manner that will not compromise public health, endanger the public drinking supplies, or pollute the environment.
- Wastewater facilities will be located in areas that meet engineering criteria and are compatible with adjacent properties to the greatest extent possible.
- Oversee the development and operation of wastewater infrastructure so that it is safe, reliable, cost effective, environmentally sensitive, and sufficient to meet future demands in cooperation with other entities.
- Generally, wastewater collection infrastructure extensions to residential and commercial development will be the responsibility and expense of the developer.
- The City will follow development as determined by the private sector or as directed by the governing body by oversizing lines and upgrading trunk system. The city may also extend infrastructure to certain areas targeted for growth in the growth management plan.
- The City may participate in the cost of oversizing wastewater lines to meet future development, subject to fund availability and approval by City Council.

- In order to help finance improvements necessary to serve population increases, the State Legislature enacted legislation enabling cities to charge a Capital Impact Recovery (IMPACT) fee to each new commercial and residential development. The City has been successful in using this tool and should continue to use.
- The city reserves the right to prohibit any connection to the city sewer system when it is determined that a line or the system is overloaded.

WASTEWATER SYSTEM GOALS AND STRATEGIES

WASTE WATER SERVICE GOALS

The water service goals are as follows:

- Protect surface and groundwater supplies from contamination by inadequately treated wastewater, wastewater system overflows and/or on-site sewage systems.
- Expand beneficial use of wastewater effluent, reducing the demand for raw water supply and treatment while at the same time decreasing the cost of water to certain large customers.

WASTEWATER SERVICES STRATEGIES

- It is anticipated that the rural areas will continue to use septic tanks beyond the year 2010. All areas around Anna should establish effective collection and treatment systems to alleviate potential water quality problems. Active permitting, monitoring, and enforcement will be required.
- Beneficial use of treated wastewater involves using the reclaimed water (effluent) as it leaves the Wastewater Treatment Plant. The effluent water, while not drinking water quality, is of high enough quality to be safely used for a number of purposes.

- An effluent reuse system providing parks and future golf courses for irrigation purposes is part of the recommendations of this “Plan”. By using wastewater effluent for non-drinking water applications, costs for treating raw water to drinking water standards can be avoided. This would make cheaper water available to large users, cut down on the amount of water treated at the water production plants, and help meet water conservation standards currently being implemented.
- As population continues to grow, raw water is quickly becoming the most valuable commodity in the North Texas area. Because treatment technology is rapidly evolving and regulatory requirements are becoming more stringent, the quality of effluent is improving dramatically. With the cost of developing new raw water sources becoming astronomical, direct reuse of wastewater effluent will soon become the economic alternative.

Improvements to the Anna wastewater system, which comply with Texas Commission on Environmental Quality Agency standards, will be an integral part of an overall Five-Year Capital Improvement Program for the City. The recommended wastewater system improvements have been indicated on Figure 24.

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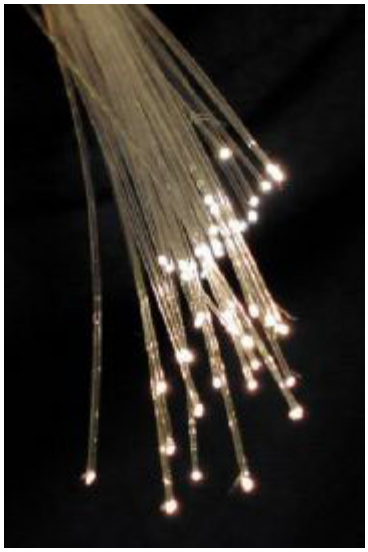
TECHNOLOGY

As Thoroughfare networks tie a community together and link a community to the outside world so can "**TECHNOLOGY**". As part of this Comprehensive Plan is the endeavor to develop a policy to help usher Anna into the information age.

A decade ago, strategic technology planning was a novelty for local governments. In most places, it still is. But increasingly, the viability of a community is linked to its access and use of information and communications technologies. Technology today is as vital to economic growth as transportation and utility systems were in the past.

Technology infrastructure and the transportation and economic development policies created to take advantage of it will determine a region's future. Communities that integrate technology into their strategies and plans will have a distinct edge over those that play catch-up.



Digital technologies enable a level of regional collaboration unequaled in the past. A simple initiative such as on-line permitting will bring a closer relationship between the development community and local government while reducing the bottom line typically associated with this process. Neighborhoods plagued by poor access to technology resources can benefit from shared and coordinated services, providing resources previously unavailable and reducing the cost to organizations to provide these services. We believe that actively planning for the use of digital technologies can bring immense benefits to all communities including:

- Stimulating business formation and supporting existing small businesses by sharing resources they may not be able to afford individually;
- Improving marketing of local communities by clearly publishing information

and trends on-line;

- Providing tools for low-income communities to improve education and job skills;
- Integrating the often fragmented workforce service delivery system to fill gaps and avoid duplication;
- Facilitating the modernization of existing industries and businesses;
- Reducing traffic congestion by moving some services to digital networks and minimizing the need to accomplish all tasks through physical travel;

RECOMMENDATIONS

As an integral part of the Comprehensive Plan the “CMPUC” recommends that the City of Anna investigate ways to fund and install a fiber optic cable ring throughout our community for public and private use. This initiative is a unique opportunity which includes linking public agencies together via fiber optic cable, while providing external broadband telecommunications access for public agencies and private entrepreneurs.

It will provide us with the necessary tools to connect to external high-speed bandwidth for telecommunications purposes. Clearly, this approach will give us a competitive advantage for economic development purposes. It will also provide our community with educational and informational capabilities we are only beginning to imagine.

GOALS

We must realize that fast access to the Internet has become a critical component of community infrastructure. There has been an explosion of the so-called “dot-com”

business phenomenon. For communities to benefit from this revolutionary economy, they must be prepared with the infrastructure and tools necessary to utilize it. We know that high-speed bandwidth is a critical "must-have." In the past, roads and sewers have been required for viable, long-term economic development. Fiber optics and bandwidth access are now at the heart of achieving the paradigm shift that is desired. By making this infrastructure available, a community is able to attract earth-friendly, low polluting companies that have little impact to existing city services plus increased revenue to city coffers. This all comes back to the taxpayer by providing more funds for quality of life improvements and enhancements, family wage jobs and an economically viable, clean community.

By having the participation of many local agencies including schools, government, emergency services and medical providers, the citizen is provided with better, faster and more cost effective service with less duplication. Citizens have long expected government and business to work together to reduce expense to the taxpayer. This is one approach that makes that possible. It also allows companies with specific technology infrastructure needs to locate their business in the City; this becomes a win-win as the local economy benefits greatly.
Our Goals Include:

- Create an Institutional Network (I-Net) linked by fiber optic cables.
- Successfully identify options for and implement high-speed, large bandwidth access for external telecommunications, becoming the community Point-of-Presence (POP) to the Internet and potentially providing voice transmission options for our community
- Offer competitively priced excess capacity (bandwidth) to businesses for economic development purposes
- Specifically and aggressively recruit high-paying, environmentally friendly, technologically-based companies that require this sort of telecommunications infrastructure

- Form a telecommunications utility which will generate revenue to enhance and maintain both our traditional and telecommunications infrastructure, while reducing our reliance on more traditional funding sources (i.e., property taxes)
- Leverage our franchising authority with telecommunications companies to complement our educational and economic developmental opportunities

SO HOW DOES ALL OF THIS WORK?

A cable modem uses co-axial cable to connect home and business computers to the city's fiber optic system. This system is directly connected to larger, faster telecommunications systems across the country and around the world. Connecting your computer to a cable modem allows you to achieve incredible connection speeds and without tying up your phone or the need for a second telephone line. It allows you to download pictures, graphics and large volume text in a fraction of the time it would take on a telephone line.

Each graphic picture contains thousands of bits of information to make up the image. As you receive the image, small bundles of information are sent until the entire image is reconstructed. There are many different connection types, but up until now most were too expensive for the average person to use.

STRATEGIES

Mission: To support, build and promote the technology resources of Anna for commerce, education, and government.

We Are The Innovation Economy

The technology–driven Innovation Economy is creating tremendous opportunities for the citizens of Texas. Technology is an engine of growth for the entire state economy.

Technology is making every kind of business more competitive. As Harvard economist Michael Porter observes, "There is no real distinction anymore between

'high–tech' businesses and 'low–tech' businesses. There are simply 'high–tech' and 'low–tech' ways of competing." The companies that succeed are those that use technology intelligently to produce and distribute the goods and services that customers want.

Opportunities for The City of Anna

Conceptually, creating a technology infrastructure is the same as building the interstate highway system, the railroads, our electrical lines and phone lines. Broadband is being rolled out throughout the country, across state and county lines, but it is up to each community to define its own needs and find the means to finance it.

From Anna Master Plan Update Committee Technology Plan:

- Many of us believe that in order for our community to survive we must have access to broadband dependent technologies that will allow our communities to compete in the new millennium.
- Put another way, we believe and we advocate that no person should have their education, business, health care, or recreational opportunities limited due to their zip code or telephone prefix. We have endured economic disparity between us and our urban cousins for so long that we have no intention of watching the digital disparity continue between urban citizens and rural citizens.

ECONOMIC DEVELOPMENT

We want to utilize the broadband infrastructure and applications to retain and attract businesses. The potential benefits include:

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- An end to the economic disparity between communities in north Collin County with other more centrally located Cities in the Dallas/Forth Worth Metroplex.
- A means of redirecting the work patterns within communities. Cottage industries can reach global markets, local businesses can engage in e–commerce, take advantage of collaboration with other companies, market more effectively, and obtain critical information to keep them competitive. This could lead to more young adults staying in Anna to work, rather than migrating to the Dallas/Fort Worth Metroplex and beyond.
- Many businesses in rural communities need access to broadband services, but are uncertain about the most cost effective means of accessing those services. They are somewhat bewildered in the constantly changing telecom world.

IMPLEMENTATION

The top strategy for implementation will be to adopt standards so that additional easements and conduits are required along certain thoroughfare right-of-ways as identified on Figure 25.

The first right-of-way where this could become a reality would be in the proposed rebuilding of White Street (State Highway 455) which is slated for construction in the near future.

The second step will be the actual installation of fiber Optics within the conduits eventually building A redundant digital backbone with the necessary power system to support it.

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WATER REUSE (GRAY WATER)

Water, like used motor oil, newspapers and aluminum cans, can be recycled. If possible, all our precious resources need to be carefully used, reused and recycled.

Removing contaminants from the water produces recycled water. Recycling water for reuse is an opportunity to meet some of our City's water supply needs. While using recycled water would be new to Anna, it is not a new idea. California has been recycling water for years such as the Golden Gate Park in San Francisco has been irrigated with recycled water since the 1930's. The golf courses at Pebble Beach are irrigated with recycled water. The City of Santa Barbara has been selling recycled water for irrigation for a number of years.

Through our wastewater treatment system, our water is being treating and disinfected to produce a high-quality water supply that can safely be put in streams that eventually end up in groundwater reservoirs and in many areas reused for irrigation and drinking water. This Comprehensive Plan is recommending that the water that is produced at our treatment plant should be examined for the potential of reused to irrigate our parks and landscaping instead of totally allowed to flow downstream.

IT'S NATURE'S WAY

Water is constantly cycling through phases and processes. In nature, water evaporates, condenses, falls to the earth as rain, is absorbed into soil, plants and animals and then is processed into water and solid byproducts. Wastewater treatment at a plant is simply an accelerated process that mirrors nature’s way of recycling water and replenishing water supply.

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Recycled water has become key to meeting the water needs of communities across the United States where water supplies are limited and dependent on rainfall. Rather than using precious drinking water supplies to irrigate landscape, recycled water can be used. It is a more dependable water supply for irrigation because it is not rain-dependent, and, therefore recycled water will be available even during droughts. Recycled water can be safe and approved for irrigation of school grounds, parks and golf courses.

THE PROCESS

The Water Reclamation Facility uses processes similar to those found in a natural stream to purify water. However, energy is used to accomplish the task at an accelerated rate in a confined space. Sedimentation removes most of the suspended materials, microbes remove dissolved material and then the microbes are removed by sedimentation, filtration removes very fine suspended materials and remaining microbes, and finally U.V. Light (Ultra Violet Light) is used for disinfection.

STRATEGIES

The top strategy will be to adopt standards so that additional easements are required along certain thoroughfare right-of-ways as identified on Figure 26. These easements can be the same as those received along certain thoroughfares for Technology Conduits.

An investigation will need to occur to examine the existing wastewater treatment plant to see what modifications if any will need to occur to safely reuse treated water.

Purple pipes and signs would mark the locations where recycled water is being used. The system would originate at the existing wastewater treatment facility and

be pumped through the system to parks, and golf courses that are in close proximity.

Gray water can also be used at an individual residential level. These waters would include only sink, shower, and tub waters and would not include toilet water. Households would require separate plumbing systems and will need to monitored closely to ensure cross contamination did not occur. These systems are being used in several Texas cities after special guidelines are adopted.