

Rolla Comprehensive Plan Update, 2005

UTILITIES AND FACILITIES MEMORANDUM 1/27/2005

Public Utilities Services

Rolla's growth is largely dependent on the provision of public utilities of adequate capacity and quality to accommodate projected development. Critical public utilities include providing safe drinking water, the collection and treatment of wastewater, energy distribution, storm water management, and solid waste management. The focus of this analysis will be the investment and actions required to continue providing these essential public utilities services as Rolla grows.

Sanitary Sewer System

The sanitary sewer system consists of two components, the wastewater collection system and wastewater treatment plants. Rolla has three wastewater treatment plants including the Southeast Treatment Facility (the City's largest capacity plant), the Southwest Treatment Facility, and the Vichy Road Treatment Facility. On average the plants process 3.35 MGD (Million Gallons/Day). Please refer to the Sanitary Sewer System map for the locations of these facilities.

The southeast treatment plant is located off Highway 72 near the juncture of Burgher Branch and the Dutro Carter Creek. This facility was upgraded in 2001 to increase the maximum capacity to 4.125 MGD. The plant serves an area totaling 8,015 acres, including a considerable portion of Rolla and the UGA. At present the southeast plant treats wastewater equal to 28,000 P.E. (population equivalents), and has the capacity to add 13,000 P.E. Rolla's potential growth to the south and east can be accommodated by this facility without additional expansion. However, the far southeast tip of Rolla and a corresponding portion of the UGA remain outside of the southeast treatment plant service area. Wastewater generated by development in this area may have to be pumped over the ridgeline using a force main and lift station until a new treatment plant is constructed further east along the Little Dry Fork Creek. A new southeast treatment plant improvement would likely become necessary beyond the planning horizon of this Plan.

The southwest plant, located off Martin Springs Drive near Beaver Creek, and the Vichy treatment facility located near Spring Creek, serve considerably less population and area. Both plants currently have the capacity to treat .40 MGD and now serve 2,500 P.E. and 3,000 P.E., respectively. The Vichy plant service area covers 893 acres with the ability to add 1,000 P.E. to its present treatment load. The southwest treatment plant will be upgraded in 2006-2007 to expand capacity to .60 MGD. This facility serves 1,649 acres and can handle an additional 1,500 P.E. (working toward 7,000 P.E. after the 2006-2007 upgrade). Each plant can manage the growth anticipated in their respective service areas with existing and planned upgrades.

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Electric Services System

The Rolla Municipal Utilities (RMU) is owned by the City of Rolla and provides electric service for residential and commercial customers within the corporate limits of Rolla. The electrical distribution system serves 8,329 customers for an average of 53 customers per lineal mile of line. There are 6,894 residential meters and 1,435 commercial electric meters. Commercial users, however, consume 70 percent of the average 828,632 kWh used each day, while residential customers use 30 percent. The distribution system is shown on the Electric Distribution System map. Electric power is presently purchased through the Missouri Public Energy Pool (MoPEP) that represents 26 cities in this state. MoPEP exists to procure power at competitive prices and is considering entering into the generation of power to secure electricity supplies for the future. Electricity is distributed through the Union Electric Phelps substation near the Hy Point Industrial Park.

RMU will support the development of Rolla by increasing the capacity and area coverage of transmission lines as needed, will increase service capacity of existing substations, and will relocate and construct a new bulk power station in north central Rolla to improve service reliability.

Water Distribution System

Rolla is fortunate to have access to a more than sufficient supply of high quality underground water. The RMU water system currently has a well capacity of 13.5 MGD (million gallons/day) in 2005 with a total storage capacity of 6.95 MG. All wells have fluoridation and chlorination treatment equipment. RMU serves 5,761 residential meters (residential uses consume an average of 1.04 MGD) representing 41 percent of total consumption. There are 834 commercial meters— using an average of 1.14 MGD or 45 percent of total consumption. UMR and other entities use the remaining 14 percent. Total consumption averages 2.52 MGD. RMU can provide approximately five times the current average daily water usage.

The water distribution system could be expanded to 9,330 residential meters, an increase of almost 62 percent above current demand, (please refer to the Water Distribution System map). This existing capacity should be able to support projected City growth levels through the planning horizon.

Solid Waste Management System

For the foreseeable future, Rolla's non-recyclable solid waste will be sent to a landfill. Rolla faces the same issues as other communities throughout the nation in terms of solid waste management. Federal and state regulations impact landfill design and operation. Increased regulation leads to a shortage of approved landfill space and that increases the cost to communities. The availability of landfill space for Rolla's households and businesses is, therefore, the ultimate long-term capacity question for solid waste management. Rolla's growing recycling program will certainly help reduce waste volume

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and the need for more landfill space. However, Rolla currently generates 18,000 tons of solid waste annually, with an average of 1,800 to 2,000 pounds per household each year. Waste volume is projected to increase by 6 percent annually.

The City currently provides solid waste collection and disposal services within the corporate limits. It is assumed that this service responsibility will not change. The Phelps County Landfill Board operates a transfer station near Rolla east of the HyPoint Industrial Park that collects Rolla's waste for removal to a landfill. Rolla's solid waste is sent to the Black Oak Landfill near Hartville, Missouri. Rolla has a five-year contract with Waste Management Corp., the operator of this landfill. The Black Oak Landfill is projected to have a 20 + year lifespan at current and projected fill rates. Rolla's projected population and waste growth can be accommodated during the planning horizon at this facility. This conclusion is based on the assumption that Rolla will be able to successfully renew this contract.

Natural Gas Distribution System

AmerenUE provides natural gas service to Rolla. Most of the City is served through the "City Gate" located at North U.S. Highway 63 near the City limits. There are three smaller regulator stations serving the HyPoint Industrial Park and the eastside of Rolla. The Natural Gas Distribution System map illustrates the existing gas line coverage in Rolla as of 2005. AmerenUE does not anticipate any capacity problems for maintaining Rolla's service levels for the projected growth of business and household customers.

Storm Water Management System

The terrain within the City limits is somewhat varied. Within the City gentle slopes generally exist to the east and south. Much of the land to the west and north in Rolla can be characterized as steep (10-15 % grade) to very steep (15 % grade or better). Three major channels drain storm water from Rolla. Spring Creek drains much of northwest Rolla to the north. Dutro Carter Creek and its tributaries (Burgher Branch, Deible Branch, and Love Branch) drain most of Rolla to the southeast leading to Dry Fork Creek. Little Dry Fork transverses the extreme southeast tip of Rolla and also flows to the east and Dry Fork Creek. Please refer to the Environmental Factors map to view the drainage channels, flood plains, and community topography.

Rolla requires that adequate site drainage and detention be provided for all new development. In 2002 the City adopted Chapter 15 of the Rolla City Code pertaining to the management of storm water and flood control. This code added regulations establishing a Land Development Permit process for all subdivisions and developments greater than one acre. The City requires the approval of Erosion and Sediment Control Plans and a Storm Water Improvement Plans. The primary requirement is that proposed development will not result in additional identifiable adverse flooding of other property or cause environmental degradation. An important component of this system is the requirement that "stream buffers" of at least 50 feet shall be preserved and restricted from

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development as permanent green zones. These buffers, while adding to the community's open space, will be purchased by the City using funds generated by development fees.

The City has aggressively sought to reduce or eliminate flooding by preparing an Open Channel Improvement Program. To implement this program, the citizens of Rolla have authorized the use of sales tax proceeds to fund regional detention basins and other improvements (please refer to the Environmental Factors map that illustrates the proposed locations for these facilities). By the end of 2006, the City will establish seven regional detention basins along the Deible and Burgher Branches as well as Spring Creek consuming approximately 33 acres. The total projected costs will be \$ 3 million. Once implemented, this flood control program will virtually eliminate present and future flooding in Rolla.

Telephone Service

Sprint provides a network of fiber optics throughout Rolla. This "backbone fiber optics" system enables households and businesses to utilize a variety of communication options. The backbone fiber optics provides higher transmission rates, reduced interference, higher quality transmission and many more lines in the same space occupied by older copper lines. This system, according to Sprint officials, has the capacity and can easily be expanded to meet the projected growth needs of Rolla.

Public Facilities

City government does not control many of the community facilities discussed in this section. Consequently, planning for these facilities must be undertaken with the recognition that improving coordination between local entities can promote efficiency and result in a superior outcome for residents of Rolla and the region. This section will address fire protection facility needs, parks, public education, library, and medical facilities.

Public School System

The Rolla Public School District # 31 serves a 198 square mile area including all of the City of Rolla except for a portion of the I-44 right-of-way east of the Highway V interchange. School district population equaled 26,759 in 2000, of which 63.7 percent or 17,049 lived in Rolla. The public school system currently operates three elementary schools (grades K-4), one middle school (grades 5-7), one junior high school (grades 8 and 9) and one senior high school. The district also has two vocational/technical buildings serving local as well as students from other districts. The total system enrollment for January 2005 was 4,047 students. The average enrollment over the past seven fall enrollment periods has been relatively stable at 4,089.

A school district's enrollment will vary over time depending on many demographic and economic variables, some difficult to predict. Individual building use will likewise vary according to the same factors that include local birth rates, migration, resident aging, and

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city development patterns. The variance for elementary schools, in a system like Rolla's where there is only one middle school, junior and senior high school, will be particularly influenced by new residential development. Much of Rolla's residential growth has been in the south side (mostly single-family units) and in the northeast with multi-family construction. As a result, Wyman Elementary School maintained a high level of enrollment at 509 as of January 2005. Truman Elementary School, located on 18th Street, had 490 in January. When the Mark Twain Elementary School enrollment figure is considered (422 in January 2005) it is evident that the elementary school component of the Rolla Public School District may be nearing maximum capacity. The maximum enrollment capacity for elementary schools in Rolla is considered 500 students. Enrollments in excess of this number may lead to undesirable student/teacher ratios and classroom overcrowding.

The senior high (capacity between 1,200 to 1,300 students) had a January enrollment of 1,070. The junior high, with a maximum capacity of between 720-750 and the middle school (capacity of 1,100) had enrollments of 647 and 909 respectively. The five-year enrollment projections for the middle school, junior high, and senior high indicate that these facilities will have the capacity to support anticipated student load.

The Public Facilities map identifies the location of existing school and other public facilities. A one-mile radius around the elementary schools is shown to illustrate service coverage for each school. The map shows that a significant portion of Rolla's south side is not within the one-mile service radius of an elementary school. This fact alone may not fully support the need for a fourth elementary school to serve southeast Rolla. The statement is more compelling when the current building capacities are considered, particularly Wyman Elementary School, in conjunction with Rolla's projected student population growth.

By the 2006-07 school year, according to the projections developed by the Rolla Public School system, enrollment at Rolla's three elementary schools will exceed 1,500 for the first time since the 1996-97 school year. Enrollment levels are projected to reach 1,616 by the 2009-10 school year. A new south side elementary school may be justified by the end of this decade to keep class size down and reduce the need to bus additional students to Wyman and Mark Twain Elementary Schools. Most of Rolla's population growth will continue to occur in the south side as new subdivisions are developed. New single-family owner-occupied housing units tend to generate more pupils than other types of development.

Assuming a new elementary school is needed, what standards should be used to determine site size? The Missouri Department of Elementary and Secondary Education (DESE) suggests a minimum site of 10 acres plus 1 acre for each 100 students. Therefore, the Rolla Board of Education should consider acquiring at least a 15-acre site during the next few years. Acquiring the site in advance of need will reduce the impact of inflating land prices on the cost of the project and will allow the integration of facility planning between local governments, utility companies, and the development community.

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Fire Protection System

The 2001 Fire Protection Study provided City officials with information necessary to guide decision-making concerning improvements to Rolla's fire protection services. The study made several recommendations concerning procedures and staffing, but was clear that a third fire station was needed soon to improve response coverage in the south side. Rolla currently has two fire stations (please refer to the Fire Protection System map). In order to improve response time and help lower fire insurance costs, a third station should be located in the vicinity of Lions Club Drive and Southview Drive.

The need for this facility will increase since much of Rolla's residential growth will be in the south side. The consultants stated that the timing for a third fire station should be linked to the growth of hydrants in the south side. Under current development trends in the south side, the new hydrant threshold of 74 would be reached by 2009. A fire station typically requires a 1.5 to 2 acre site (depending on training needs and collateral uses) and building areas of 5,400 square feet to accommodate one pumper/tanker, one ladder truck, and a crew of 12.

The study also recommended, once a third fire station is operational, that fire station # 2 should be relocated from its present location near downtown. The replacement site should be northwest of the present location to be more accessible to the areas north of I-44. Relocation of fire station # 2 would enable the existing building to be used for other purposes, such as a senior center.

Parks and Open Space System

The Parks, Recreation And Open Space Master Plan prepared by Bucher, Willis & Ratliff was presented to City Council in September 2003. Although not adopted by City Council as an amendment to the Comprehensive Plan, the Master Plan provided an excellent assessment of Rolla's parks and open space system. The planning process used to prepare the Master Plan relied on a variety of techniques to arrive at a series of improvement goals covering the 10-year planning horizon envisioned in the Plan. These included workshops, focus groups, a community attitudinal survey, and public meetings.

The Rolla park system had 219 acres of parks at 28 different locations as of 2003. Rolla is blessed with two publicly available, but privately owned and maintained park and open space areas such as the Lions Club Park and the Audubon Art and Nature Center. These areas, when added to the City owned land, totals 459 acres or 9.6 percent of Rolla's total land use. Not included in this figure is the University of Missouri Rolla's 70-acre golf course that is available for community use. Please refer to the Parks and Open Space System map.

The Master Plan identified goals and findings pertaining to the future physical development of Rolla's park and open space system. They are as follows:

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1. Additional parkland is needed in the south side of Rolla where residents do not have equitable access to the system. The consultants stated that the problem was not a deficiency of land in the overall parkland inventory. Indeed, based on the standard of between 7 to 10 acres of usable parkland per 1,000 residents, the City had a small surplus of 4.77 acres when using the 10 acres per 1,000 standard. If the City were to include the community park acreage provided by the Lion's Club, the City would further exceed standards by 160 acres. The problem was more an issue of land/facility distribution.

The area near the intersection of Lions Club Drive and Southview Drive was recommended in the Plan as a preferred location for a community-scale park. A community park of at least 25 acres capable of providing space for active and passive recreation activities was recommended. Part of this park could be acquired and used for storm water detention and as part of the buffer area required in flood plains. It may also be an ideal location for a third south side fire station.

2. There are 10 undeveloped parcels dedicated as parkland which total 17.93 acres. These "mini" parks do offer neighborhood-based open space, but are expensive to maintain and develop. Some of the less well-known undeveloped mini parks could be sold or traded to secure land more suitable for the park and open space system in the future.
3. Link parks and other points of interest in the community by developing a greenway and trail system. The existing trail system of 7.2 miles has been well received and utilized. Indeed, the continuation of this system was strongly supported by Rolla residents based on the attitudinal survey. A major addition planned for this system would be the trail along Lions Club Drive and Deible Branch cutting diagonally across southern Rolla and extending to State Highway 72, ultimately completing the circuit by connecting to Green Acres Park as shown on the Pedestrian/Bikeway Plan map. Another trail addition could follow near Love Branch, along Burgher Branch including Coventry Park and to the east along 10th Street.

The trail system does not, at present, extend to northern Rolla. An additional trail improvement program should be developed in conjunction with the development of the Audubon Art and Nature Center, perhaps connecting to the City trail system south of the UMR campus at 10th Street.

4. The need for additional athletic fields; namely, a full size soccer field (collegiate); dedicated baseball field with infield grass, and an adult/youth softball field was suggested in the Master Plan. Ber Juan Community Park is the proposed location for these facilities. It should be noted that the Rolla Public School District has plans, in conjunction with several community service clubs, to construct a competition grade baseball and soccer field near the high school at what is referred to as the Bray Sports Complex adjacent to

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Ber Juan Park. These facilities would, of course, be owned and maintained by the school district and would not necessarily be available for public use or tournament play. The opportunity, however, of coordinating the use of the school district facilities with those planned for Ber Juan Park could have significant recreation and economic benefits for Rolla.

5. The Plan urged the continuance and expansion of strategic partnerships involving the development and use of park and open space assets. Partnerships between such entities as the Audubon Society, Lion's Club, the Rolla Public Schools, and volunteer groups such as ACORN (A Community Organized to Restore Nature) should be used to increase the recreation venue in Rolla. The Master Plan acknowledged the importance of improving the physical appearance of Rolla's entryways and street corridors – linking these improvements to efforts to upgrade the park and open space system.
6. The issue of funding City park and open space land acquisition efforts, as well as the investment of public resources for park improvements, remains an on-going concern. Rolla has relied upon several sources to acquire and develop its park and open space system, including local tax dollars, state and federal grants, the mandatory park dedication or fees in-lieu ordinance, and most recently through land purchased for storm water management. The Plan stressed the need to increase funding for parks and open space acquisition, development and maintenance.

The controversy around the potential sale of Buehler Park for commercial development has continued. The interest is due to the fact that this 3.2-acre park is located near the interchange of Kingshighway and I-44, increasing its value for commercial reuse. Buehler Park is an attractive although underutilized park, being isolated from Rolla's resident population and neighborhoods. It is too small to be considered a neighborhood park (minimum of 5 acres required) and too constrained by adjacent commercial and institutional uses to be expanded. Sale of this property for commercial use represents a unique opportunity to inject significant new dollars into the park and open space system. However, as noted in the Master Plan, Buehler Park does serve a role as an entryway park and a place for tourists to visit. The acquisition and development of land, with less commercial value, near this interchange as a replacement tourist-oriented park, could be a reasonable compromise.

Public Libraries

The Rolla Public Library is located downtown at the intersection of Pine and 9th Street. The building was originally opened in 1915 as a U.S. Post Office and became the site of the public library in 1965. The library was expanded in 1983 and 1995 to total 8,000 square feet and with the current planned addition will have 10,500 square feet to accommodate programs and the 57,000 books, tapes, and other materials available for the

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library's patrons. The building sits on a 12,540 square foot lot; and cannot be further expanded because acquisition of adjacent properties would be prohibitively expensive. UMR has the 72,000 square foot Curtis Laws Wilson Library with 264,000 volumes. The general public may use the library with picture identification.

The role of libraries as repositories of books and other materials has evolved with the advent of the internet. Increasingly, major library collections are being digitized and made available to users without the need to physically visit a library. Traditional library functions will continue to be important services, but libraries of the future will likely resemble community centers with poetry readings, children's events, how-to classes, free internet access, art exhibits, language classes, etc. Building space needs and location should be influenced by this emerging reality.

There are some generally recommended standards from the Public Library Association to guide facility planning. There are also some national benchmarks. For example, in 1996 there were 2.8 books per capita in public libraries throughout the nation with a range of 5.2 in Maine to 1.5 in Tennessee (National Center for Education Statistics, March 2001). Rolla had 3.2 books per capita in 2005. The following table applies some of the standards to project Rolla's library space needs for 2005 to 2020.

TABLE 1
Rolla Library Facility Needs, 2005-2020

| | <u>2005</u> | <u>2010</u> | <u>2015</u> | <u>2020</u> |
|---|-------------|-------------|-------------|-------------|
| Rolla Population Estimate | 17,861 | 19,343 | 20,837 | 22,566 |
| Building Sq. Ft. Per Capita (0.65) | 11,610 | 12,573 | 13,544 | 14,668 |
| Acres Per 1,000 Residents (0.06) | 1.08 | 1.14 | 1.26 | 1.32 |

Source: Public Library Association, City of Rolla Community Development Department.

The results of the calculations from the table would suggest that Rolla's leaders should begin planning for a new public library of approximately 15,000 sq. ft. on at least a 1.5-acre site to accommodate future growth. A second more traditional space planning guide, the "Public Library Space Needs: a planning outline from the Wisconsin Department of Public Instruction", used space allocation standards by function to conclude that a total of 11,400 sq. ft. would be needed for a facility to serve a community of 22,000 population.

The apparent urgency of this need, however, is somewhat mitigated by the impact of UMR's Curtis Laws Wilson Library. The Rolla Public Library serves a diverse population base from the City and surrounding area that may not have ready access to the UMR library. The provision of an adequate public library with the space to offer a full

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range of modern library services is an important component of the quality of life. Once vacated, the current library building could have a number of adaptive re-use options such as a community arts center, local government offices, or private office space.

University of Missouri-Rolla

UMR is a strong; some might say vital, component of Rolla's economic, cultural, and social infrastructure. The 249-acre campus, consuming much of Rolla's northwest quadrant, is certainly the single most important land user in the community. Beyond its impressive physical footprint, UMR's impact extends to such concerns as traffic flow, pedestrian safety, neighborhood preservation, urban redevelopment, housing development, urban design, etc. The direction of campus growth remains the City's main concern because that growth will influence all of the other issues. As a state institution, UMR is not subject to Rolla's development regulations, although there are many opportunities for the City and University to cooperate. Coordinating elements of UMR's 2004 and future campus Master Plans with Rolla's updated Comprehensive Plan is one of those opportunities.

Past University master plans have referred to the UMR campus as being "fragmented". The UMR campus actually has three components, the academic core where most of the classroom and administrative functions reside, the golf course property/Bullman Multi-Purpose Building, and the land area to the northwest of U.S. Highway 63 where various fraternities/sororities and campus support facilities are located (please refer to the Public Facilities map). Strategies to better unify the three areas have been an on-going challenge for campus planners. UMR does own a considerable amount of vacant land northwest of I-44 that could accommodate future campus growth. However, this area is remote from the main campus making it less desirable for most improvements.

The 2004 Master Plan presented an extensive list of building improvements, upgrades and demolitions that could take many years to complete. An impressive landscaping program was also presented. With the exception of the Residential College Building # 1 and 2, all of the improvements were planned for the core or main campus. The Plan identified "Potential Land Holding" areas. One Potential Land Holding area was shown to the west of 63 Highway between 11th Street, Poole Avenue, and University Drive. A second area was shown generally east of Pine Street between Elm, 14th and 18th Streets. The acquisition of land in the neighborhood to the west of 63 Highway, while helpful in the future to better link the fragmented components of the campus, might have a negative impact on the Powell Addition neighborhood and could increase vehicular/pedestrian conflicts on 63 Highway.

The presence of a major regional highway cutting through the campus has created traffic flow and pedestrian safety problems that UMR, in conjunction with MoDOT and the City, have been working to resolve. The improvements to University Drive and efforts to re-orient Rolla's primary entryway from I-44 to the University Drive interchange is an example of good cooperation and sound economic long-range thinking.

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Phelps County Regional Medical Center

The PCRMC is one of the leading regional referral centers in Missouri serving a population base of 150,000 (60-mile radius) with more than 1,300 full/part time employees in a 350,000 sq. ft. facility licensed for 232 beds. The hospital complex is located on 20.9 acres. In 2003 PCRMC completed a 72,000 sq. ft. expansion project and has released plans to add additional medical office space north of the hospital as well as develop a secondary entrance to the hospital property from 14th Street. The primary Comprehensive Plan objective would be to balance the hospital's need for more growth area and the Powell Additions resident's desire to maintain the integrity of their neighborhood from further institutional encroachment. PCRMC is not subject to City development regulations.

Rolla National Airport

The Rolla National Airport is owned by the City and is located approximately 12 miles north from Rolla on 63 Highway at the intersection of State Highway 28. There are 1,200 acres available for development. The airport, although located in Maries County, is considered in the Comprehensive Plan Update because it represents a significant economic development opportunity for the City and region. The City could impose development regulations through a covenant because Maries County does not have planning and zoning or building codes.