

Issue Paper No. 6 – Population and Flow Projections - Resolved
 Hardin County Water District No. 2
 Regional Wastewater Facilities Plan

This issue paper presents information regarding populations and flow projections that will help determine needs for areas of concern. The information presented in this issue paper will be discussed at Advisory Committee Meeting No. 5.

Population Projections

Hardin County population data is available from the Kentucky State Data Center, which is part of the Urban Studies Institute at the University of Louisville. Table 1 below summarizes the historical and projected population of Hardin County.

Table 1: Historical and Projected Population by Kentucky State Data Center

| | Census 1990 | Estimate 1995 | Census 2000 | Projections | | | | | |
|----------------------------|----------------|------------------|----------------|-------------|---------|---------|---------|---------|---------|
| | | | | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
| Hardin Co with Ft. Knox | 89,240 | 91,520 | 94,174 | 97,956 | 102,848 | 108,505 | 113,497 | 117,911 | 121,847 |
| Annual Growth Rate | | | | 0.61% | 0.76% | 0.80% | 0.69% | 0.59% | 0.47% |
| Household Population | 81,720 | 85,986 | 90,251 | 94,033 | 98,925 | 104,582 | 109,574 | 113,988 | 117,924 |
| Number of Households | 29,358 | 31,928 | 34,497 | 36,514 | 39,034 | 41,603 | 43,589 | 45,344 | 46,910 |
| Pop per Household | 2.78 | 2.69 | 2.62 | 2.58 | 2.53 | 2.51 | 2.51 | 2.51 | 2.51 |

The overall growth rate for Hardin County from 2000 to 2030 is 29%, which shows strong projected growth for the county when compared to the state-wide county average of 20% or the overall state growth rate of 21%

This population data was further subdivided by Lincoln Trail Area Development District (LTADD) as part of a traffic analysis for the Hardin County Metropolitan Planning Organization (MPO). The county was broken down into 254 distinct areas, based on Census Blocks. The LTADD data excluded Ft. Knox population changes and predicted a new growth rate of 35% through 2030. The Ft. Knox population is predicted to decline. Although Ft. Knox population was not used in the study, recently announced personnel shifts by the Base Closure and Realignment Commission, may affect the areas growth. Figure 1 shows the 254 zones created by LTADD.

A review of individual growth in these zones will aid the Advisory Committee in selecting additional areas for sewer services. While some population growth was identified with some of the Areas of Concern originally defined by the committee, new areas of growth should also be considered. Additionally, areas along the new E'town-to-Radcliff Connector (E2RC) should be considered a possible growth area. Figures 2 and 3 illustrate the projected growth zones and the E2RC alignment. Figure 2 shows the projected growth in number of people, and indicates only a handful of the zones will see considerable increase in actual number of people. These areas are north of Rineyville and along the proposed E2RC. Figure 3 indicates additional growth by mapping the percentage increase of population in the county. The figure also shows growth in Rineyville and the E2RC area, but also shows higher percent increases near Glendale and certain zones in Elizabethtown near the interstate.

Further analysis of the LTADD data illustrates that most growth is projected to occur in the county. The zones within the Vine Grove planning area indicate 20% growth, and the Radcliff planning area shows 18% growth. The Elizabethtown planning area is predicted to grow 29%,



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and all the remaining county zones will grow 39%. Both Vine Grove and Radcliff have planning areas that are similar to their city limits, however Elizabethtown’s planning area is significantly larger than its current city limits. The zones within the city limits are projected to grow 21%, while the remaining area between the city limits and the planning area boundary is projected to grow 67%. If the remaining area is consolidated with the county zones, the net growth in the county would be 44%. Table 2 summarizes the population findings.

Table 2: Zone-specific growth by LTADD

| Area | Population 2003 | Population 2030 | Population Change | % Population Growth |
|-------------------------------------|-----------------|-----------------|-------------------|---------------------|
| Vine Grove Planning | 4,619 | 5,543 | 924 | 20% |
| Radcliff Planning | 21,382 | 25,263 | 3,881 | 18% |
| Elizabethtown Planning | 30,382 | 39,324 | 8,942 | 29% |
| Elizabethtown City | 24,699 | 29,845 | 5,146 | 21% |
| Elizabethtown Remainder | 5,683 | 9,479 | 3,796 | 67% |
| County minus Planning Areas | 31,781 | 44,303 | 12,522 | 39% |
| County with Elizabethtown Remainder | 37,464 | 53,782 | 16,318 | 44% |

Subdivision Development

While population projection studies are valuable planning tools, actual construction data is the best growth indicator. Figure 4 shows the 13 subdivisions actively under construction. With a total of 423 homes proposed, the 13 developments are very close to either an area of concern or a growth zone. Eight of the 13 developments are within the Elizabethtown Planning area, but outside the city limits. Subdivision development inside the city limits of Elizabethtown, Radcliff, or Vine Grove was not obtained. However, historical data may indicate a trend in the county. Over 6,000 lots have been approved for development since 1990. According to the Hardin County Planning and Development Commission, nearly 70% of lots since 2000 have been approved in the Rural Residential Sector, which is defined as the areas of Hardin County not in one of the three planning areas. Additionally, over 1700 permits were issued by Hardin County for single family dwellings since the year 2000. Converting these permits to actual population using 2.5 people per home reveals a much stronger growth rate than indicated by KSDC or LTADD. A comparison of building permits is summarized in Table 3. Table 4 also illustrates strong county growth through lots platted and building permits.

Table 3: Building Permit Summary by HCPDC

| Area | 2002 | 2003 | 2004 |
|------------------------------------|------|------|------|
| Vine Grove | 76 | 13 | 25 |
| Radcliff | 53 | 75 | 79 |
| Elizabethtown | 109 | 118 | 159 |
| County minus Planning Areas | 368 | 429 | 399 |
| Total County | 606 | 635 | 662 |
| Population (2.5 people per home) | 1515 | 1587 | 1655 |
| KSDC Predicted Population Increase | 756 | 756 | 756 |



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Table 4: Lots and Permits Summary by HCPDC

| Year | County Lots Platted | County House Starts | City House Starts |
|------|---------------------|---------------------|-------------------|
| 2000 | 735 | 232 | 277 |
| 2001 | 745 | 315 | 277 |
| 2002 | 479 | 368 | 238 |
| 2003 | 741 | 429 | 216 |
| 2004 | 566 | 399 | 263 |

Note: In 2004 67% of county plats were in rural residential area vs. 33% in urban growth area.

Industrial Development

In addition to rapid residential development, Hardin County is anticipating large industrial growth. Currently the County is pursuing a tenant for the large property south of Glendale. Once a tenant is found, substantial in-fill is likely to occur to support the industry. Figure 5 shows the 11 developing industrial areas in the county. As expected, most are near a growth zone, indicative of industrial employees moving to be near work. The 11 sites combine for over 4,000 acres of land, most of which is comprised by 2 sites: the Glendale site and the industrial holding area near the proposed extension of Ring Road to a new interchange with Western Kentucky Parkway.

Flow Projections

Understanding potential flow from all the new residential and industrial areas is a key component to the regional facilities plan. With a total of 26,000 new residents estimated by 2030, a standard rate of 100 gallons per person per day of wastewater generates 2.6 MGD of new flow from the entire county.

Industrial wastewater production varies greatly, but an average of 1,000 or 1,500 gallons per acre per day (g/a/d) is typically used for planning. If the Glendale site is eventually developed into an auto manufacturing facility, it may produce similar flow as the Georgetown Toyota auto plant which, according to state data, was designed for 2.2 MGD and currently averages 1 MGD. Use of a 1,000 g/a/d for industrial development would generate 4 MGD of industrial waste water.

The flow projections do not include potential flow from the already defined “areas of concern.” The areas of concern may account for as much as 10,000 people today, which would contribute an additional 1 million gallons per day of wastewater. It is also important to create a liveable community for residents which includes, among other things, sewer service. Otherwise, the new jobs created by industry will go to residents in other counties. Additionally, sewer service availability may substantially change the growth models that have been created for Hardin County. If sewer service is made available to an area, there is a greater likelihood that additional development will occur near the new sewer service. It may be necessary to provide a factor of safety in the residential flow to account for this. Table 5 summarizes the possible flow scenarios.



Issue Paper No. 6 – Population and Flow Projections - Resolved
 Hardin County Water District No. 2
 Regional Wastewater Facilities Plan

Table 5: Future Wastewater Demands

| Flow Source | Assumed Flow Rate | Total Flow (MGD) |
|--------------------------|-------------------|------------------|
| Industrial | 1000 g/a/d | 4 |
| Industrial | 1500 g/a/d | 6 |
| Residential | 100 g/c/d | 2.6 |
| Residential w/25% Extra | 100 g/c/d | 3.3 |
| Residential w/50% Extra | 100 g/c/d | 3.9 |
| Residential w/100% Extra | 100 g/c/d | 5.2 |

Issues To Be Resolved

To fully investigate the total impact of growth on the existing treatment plants, the committee should agree upon a residential per capita wastewater usage, and an industrial usage figure. The industrial use is considerably more than the residential, so careful consideration should be given. Additionally, it should be noted that while the residential growth is concentrated in less than 20 of the 254 population zones, the remaining 234 zones still account for nearly half the population growth. This gradual in-fill of residents may pose a significant problem in the future. The committee should consider recommendations to the county to significantly increase the minimum parcel size for septic service. This would encourage concentrated growth and discourage growth without sewer service. As previously noted, availability of new sewer service in certain parts of the county may spur growth that is not indicated in the population models. The committee should pay careful attention to if and how to deal with this unknown while developing ideas for the regional wastewater facilities plan.

Resolution: (resolution at the July 22, 2005 meeting)

The Advisory Committee recommended the following:

1. Population growth for the county wastewater plan should be at twice the rate of growth predicted in the MPO traffic plan. This is justified because of the recent population growth predicted by the number of housing starts has more than doubled the MPO predicted population growth.
2. Use a per capita contribution of 100 gallons per capita per day.
3. Vacant industrial land should assume wastewater generation at 1500 gallons per day per acre. Conservative predictions will not limit the type of industry that can be accommodated.
4. The minimum lot size for development without sewer service should be reconsidered by the County. The County should decide if regulations like this should be used to control and concentrate growth.

