

Date: 5 July 2009

To: City/County Water and Wastewater Study Oversight Committee and Staff

From: Bonnie Poulos

Re: Growth Technical Paper

The following are my comments and suggestions concerning the Growth Technical Report that was discussed at the June 25, 2009 meeting of this committee.

1. The Growth Technical Paper was written from a perspective that is biased toward the idea that Urban Form is the solution to the issues concerning future growth and increased population. Although well-written and researched, it struck me as a one-sided look at the complex land use issues that will affect the region over the next 20-50 years.
2. Further, the white paper did little to further our discussions about future needs and possible solutions to increasing amounts of wastewater and increasing demands for water that will inevitably follow an increase in the region's population base. It is obvious that a fair amount of research went into the writing of this report, but the conclusions drawn are not based on statistically significant data, at least not from what is shown in the report.
3. First and foremost, I'd like to make the request that all future white papers directly address their topics to the mission of developing sound (sustainable) water and wastewater policies in the future. Specifically, each white paper topic should focus their information on how it relates to the increasing scarcity of water and increasing amount of wastewater, the increasing costs to obtain new water and to treat more wastewater and possible ways to address those issues within the context of the white paper topic.
4. The Growth Technical Report was 100 pages long yet it barely addressed how land use planning affects the water and wastewater infrastructure needs when the population is double what it is today. The white paper spends most of the time showing figures and tables that are (questionably) interpreted as showing that increasing densities solves a host of problems associated with that kind of anticipated growth.
5. The table on page 8 of the report, which is repeated on page 82 as Table 15, is presented as a "qualitative" assessment of four proposed growth scenarios. It is lacking in substance and has no apparent scientific basis. To show that "higher infrastructure efficiencies" are not achievable in the status quo scenario, but are optimally achieved in the transit-oriented scenario, is subjective and misleading. The latter scenario may achieve greater efficiency in transit use, but greater efficiencies with regard to water use and wastewater treatment costs are unsubstantiated in the transit-oriented model. Likewise in this table, showing that "lower water, resource, energy, and land consumption" can only be best achieved by a transit-oriented scenario is open to much debate. And finally, under "more easily implemented" the status quo scenario is given high marks, with all the others receiving bare mention; I would argue that the current economy renders such an assessment untrue.

6. With all the cities of comparable size in the US, was it really necessary to use cities in Canada as peer communities (Edmonton, Vancouver, Calgary)? They may have similar demographics, but the political, regulatory and economic differences from US cities is quite significant.
7. Many of the figures and tables could easily be eliminated from this white paper; for example do we really need three views of the same figure (Figs. 7, 8, and 9) to show Tucson's relationship to the other cities with regard to density?
8. It really is not until page 51 of the white paper that the report really addresses water and wastewater and the usefulness of the data is questionable. In particular there are issues with Figs. 21, 22, 23 and 24.
  - a. First of all, the use of  $R^2$  values without any supporting statistical data is pretty much meaningless except to show how close to the chosen line your data points lay. Correlations that shows  $R^2$  values of 0.25 (Fig. 21), 0.53 (Fig. 22), and 0.33 (Fig. 23) are most likely not correlated to each other and even  $R^2$  values of 0.82 (Fig. 24) are relatively meaningless when there are so few data points.
  - b. Even if one ignores the  $R^2$  values and looks at the data points on the graphs, the conclusions reached are different from that reflected in the white paper. For example, with regard to the density of the water main network in a community and the density of people per square mile (Fig. 21), although there looks like a trend based on the line that was drawn through the data points, the statistical significance of the population density is critical to the interpretation of the data points which appear to show no added benefit above about 4,000 people per square mile. I would argue the same point in Fig. 22 where the density of the wastewater collection system is purported to be more efficient with increasing population density.
  - c. The conclusions drawn from Fig. 23, comparing water consumption to population density ( $R^2=0.33$ ), are the most questionable of these three figures. The data points suggest that once a population density of about 3,000/sq.mi. is reached, there is no significant increase in per capita consumption of water. The report states "Water consumption is clearly influenced by population density as shown in Figure 23. The denser the community, the less water it uses." When in fact all you can say from the figure is that communities with densities less than 3,000/sq.mi. appear to use more per capita water than communities with densities greater than that. A more substantive question based on this data would be, how do those communities with population densities below 3,000/sq.mi. and are shown below the line, keep their water consumption as low as (or lower than) communities with densities of 5,000 to 10,000 per sq.mi.?
  - d. The premise of Fig. 24, that size of the water utility (number of people served) is related to the amount of water used per person, is compelling but with only 11 data points it is hard to know if the results are meaningful.
  - e. Even more significant is that there are no figures that show what the total use of water is by the peer communities based on the size of their population, which could present a

vastly different picture than per capita water use. An important bit of information is missing from all the scenarios with regard to water and wastewater needs because there is never any discussion of *total usage* in those density models.

9. On page 59, the report states “Dense communities consume less water, particularly those over a density of 3,000 per square mile.” Nowhere in the white paper is this proven. All that was presented was data that shows *per capita use* may be less over that density, but nothing was ever presented that showed dense communities consume less water overall.
10. A glaring deficiency of the white paper, aside from not being more focused on how land use planning impacts water and wastewater issues, is that there is no discussion of the cumulative effects of density (i.e., more numbers of people) on the infrastructure needs and available resources. I am at a loss to how we can come to any agreements about “population growth, water, urban form, land use planning and infrastructure” without understanding the impact of more people.
11. Another major problem with the white paper on Growth is the lack of attention to infrastructure costs. The report discusses growth areas such as the southwest region of unincorporated Pima County but fails to mention that the County’s recent Southwest Infrastructure study indicated costs of \$40,000 per rooftop for new infrastructure needs to accommodate the increased growth. I disagree with the recommendation that future development in new growth areas not be *overly* subsidized by existing residents – none of it should be subsidized by existing residents unless they receive real and tangible benefits from the new development. What about a discussion of what to do if the state legislature restricts jurisdictions from collecting impact fees? How new growth impacts the ability to maintain and rehabilitate existing infrastructure in the already urbanized core of the region is also not mentioned. Again, I have to ask, how do we have this discussion and hope to come to agreement if we ignore these issues in a white paper written ostensibly about growth in the region?
12. And finally I question the future of the Conservation Lands System (CLS) which really exists as a planning tool only for unincorporated Pima County. It provides policy direction, it is not an ordinance. Under the “enhanced habitat protection” scenario, no mention is made of the widely used planning tool that gets a property annexed into another jurisdiction that has no CLS mandate in order to circumvent habitat protection. It seems to me that this question is very germane if this is the basis for one of the four scenarios. How do the jurisdictions work together to promote the highest standards for land use planning in light of increased growth all over the region? At the present time, each jurisdiction is writing its own habitat protection policies – some of which are more like habitat takings policies – for undeveloped areas such as the Houghton corridor. Regional agreement on the CLS would be far less costly than acquiring all the sensitive lands that need protection from development and more effective than multiple plans in each jurisdiction.