City/County
Water and Wastewater Study

June 15, 2009

To: City/County Water and Wastewater Study Oversight Committee

From: C.H. Huckelberry
County Administrator

Mike Letcher
City Manager

Re: **Growth Technical Paper**

Introduction

One of the goals included in the Scope of Work for Phase II of the City/County Water and Wastewater Study was for the City and County to come to agreement on population growth, water, urban form, infrastructure and land use planning. The scope states:

> *The City and County need to come to common agreement on the location of our future population growth increment to 2050. Urban form, water and infrastructure planning will directly influence where this future population growth increment will occur. Locating this future population should be done in a manner so as not to disadvantage or adversely impact existing residents. New growth must be located where it is beneficial to the environment, economy, and conservation of our resources. Large-scale infrastructure systems will be necessary to support the growth centers and integrate with the existing urban infrastructure systems that are in place. Most importantly, long-term future water supply cannot occur at the expense of our existing residents or the environment.*

Stantec Consulting Inc. and Curtis Lueck & Associates, who recently have conducted work for Pima County in the areas of infrastructure and land use planning, were hired to work with a team of City and County staff to develop the attached technical paper.

The paper does not attempt to predict if, how much, or when growth will occur, but rather attempts to answer the question: *If growth does occur, how can we accommodate it in the most sustainable manner possible?* The paper looks at both the location of growth and the form of growth, and discusses criteria that can be used to evaluate areas most suitable for future development and the positive and negative aspects of various forms of development. The next paper that the Committee receives will build off of this paper, and will deal with specific issues of integrating land use and water resources planning.

The key finding of this paper is that the City and County can plan for future development in a way that increases choice in housing types and transportation modes for both existing and future residents, increases access to jobs and services, decreases costs to tax payers, and decreases water use, energy use, and land consumption.

Technical Paper Highlights

Form of Growth

One aspect of the scope question focuses on ensuring that growth does not adversely impact existing residents, and is sited in a manner that is most beneficial to the environment, economy and conservation of resources. These issues are affected by the form that development takes. The technical paper uses the term "urban form" to describe the arrangement, appearance and functionality of a community, which relates to the pattern of the built environment. Urban form includes such things as how compact or spread out development is, the amount and types of land uses whether separated or co-located together, the amount of public open space, the size of lots, the amount and location of roads, parks, and other infrastructure, how far people have to drive, the availability of transit, the walkability of the area, etc.

The paper uses benchmark data from other regions to analyze the pros and cons of various urban form patterns from a sustainability perspective. An important aspect of urban form is density, but it is only one consideration. Density in metropolitan Tucson presently averages about 4 people per acre or 2,560 people per square mile. The paper points out that as we grow, we have the opportunity to implement sustainable development approaches including good urban design, increasing density, and integrating a mix of land uses in selected locations as many other regions have done, which can have a variety of benefits such as:

- Reduced car passenger miles
- Fewer miles of road per capita
- Lower water consumption
- Lower energy consumption and greenhouse gas emissions
- Improved public health
- More walkable neighborhoods and urban spaces
- Public services at lower cost to taxpayers
- More transit opportunities
- More types of housing choices

Future Growth Locations & Scenarios

Another aspect of the scope question refers to location of future population growth. The paper models several growth scenarios for a hypothetical doubling of our population to two million people. This represents 973,000 more people than the current metropolitan area population of 1,027,000 (2008). This population threshold was chosen primarily for discussion purposes, but is consistent with (1) the water resource availability analysis done by Sharon Megdal showing current water resources to support 1.8 to 2.3 million people and (2) a buildable land analysis done by PAG showing land available to support 2.2 million people. Although the Scope of Work for the City/County study citied a date of 2050, this paper does not try to anticipate a date for when such a population increase may occur.

This paper focuses on the Water/Wastewater Study Area defined as the Tucson city limits plus the Tucson Water Obligated Service Area, plus unincorporated Eastern Pima County, excluding other cities and towns and tribal lands. Of the 973,000 new people modeled in the growth scenarios, 238,000 (based on Arizona Department of Economic Security (DES) projections) were subtracted and allocated in lump sum fashion to the towns of Marana, Oro Valley, and Sahuarita, with the remaining 735,000 allocated to the Study Area.

Factors and constraints were identified and GIS modeling was applied to vacant and underdeveloped land in order to determine the areas most suitable for future development. Factors are defined as preferentially weighted variables such as proximity to infrastructure and employment centers, while constraints eliminate certain lands from consideration such as parks, federal lands, protected open spaces, airports, hillsides, and floodways.

Various factors were combined into four different urban form scenarios that were used to place population within the suitable areas. The four scenarios include:

1) Status quo scenario (growth continuing as is)
2) Enhanced habitat protection scenario
3) Infrastructure efficient/taxpayer savings scenario
4) Transit oriented development scenario

These scenarios are hypothetical and meant to illustrate different ways the community could grow and different results that would be achieved. The scenarios are not meant to be mutually exclusive and elements of each could be used in conjunction with each other. Note that the amount of future growth allocated to the towns of Marana, Oro Valley, and Sahuarita was held constant for all four scenarios.

The major difference in inputs to the four scenarios is the density of future growth allocated to the suburbs, outside of already planned but unbuilt or partially built communities. The exception to this is the Transit Orientated Development Scenario, which also increased densities within the urban area along rapid bus transit lines, the street car alignment, and alignments for light rail and commuter rail.

The table below describes the relative benefits of the four scenarios across various indicators, and also includes the density averages used to place development in new growth areas. The indicators show that siting future development in a way that is different from the status quo could increase choice in housing types and transportation modes for both existing and future residents, increase access to jobs and services, decrease costs to tax payers for public infrastructure, and decrease water use, energy use, and land consumption.

	Status Quo	Enhanced Habitat Protection	Infrastructure Efficient/Tax Payers Savings	Transit Orientated Development
Density within new growth areas*	2,500 pers/sq mile or 1.56 residences per acre (RAC)	3,600 pers/sq mile or 2.25 RAC	8,000 pers/sq mile or 5.0 RAC	8,000 pers/sq mile (11,000 – 23,000 pers/sq mile along urban transit lines and nodes) or 5.0 RAC (6.9-14.4 RAC)
Housing type choice	–	√	√√	√√√
Transportation mode choice	√	√	√√	√√√
Access to jobs & services	√	√	√√	√√√
Cost of services/tax levels	–	√	√√	√√
Water, resource, energy and land consumption	–	√	√√	√√√
Walkable communities	–	√	√	√√

*Outside of already planned but un-built or partially-built communities

Looking across all four scenarios, and in particular the areas that are either within the City of Tucson, or within the City of Tucson's metropolitan planning area, four possible focused growth areas emerge:

- Infill within the Existing Built Environment
- Houghton Corridor
- Southlands
- Southwest Area

These are consistent with growth areas identified in the City General Plan and identified in regional growth modeling done by Pima Association of Governments (PAG). In addition, these areas are consistent with the County's efforts to support new development in areas outside of the Conservation Lands System. What is different from one scenario to another is the amount and intensity of growth in each of these four areas.

<u>City of Tucson Considerations</u>

- In the four scenarios modeled, the population build-out for the Tucson Water Obligated Service Area ranges from approximately 330,000 in the status quo scenario to just over 500,000 in the transit-oriented development model. The Phase 1 report indicated that based on conservative (high) gallons per capita per day numbers, Tucson Water can serve 366,000 more people with currently available renewable water resources. Population build-out is a factor the City of Tucson must consider in deciding if Tucson

Water should extend service beyond its obligated area and whether additional water resources need to be acquired. It is important to also consider that more compact development forms and higher density development uses less water per capita and are less expensive in terms of water infrastructure. The issue of providing water service to future growth areas will be explored further in the July technical paper on *Integrating Land Use Planning with Water Resources and Infrastructure*.

- The City of Tucson would prefer that future growth and development take place within incorporated areas to ensure fiscal sustainability. When development occurs adjacent to but outside City limits, residents drive into the City and use City infrastructure and services but the City doesn't receive the revenues needed to pay for this. For example, non-city residents may come into the City to shop and the City does receive sales tax, however the City misses out on property tax, state shared revenue, impact fees, and sales tax from unincorporated areas. We need to look at future growth from a fiscal sustainability perspective. In recent years we've implemented impact fees which fund the initial construction of infrastructure needed to serve growth, however we must also consider how the ongoing provision of public services and maintenance of facilities are funded. We must ensure that future growth areas are self-sustaining and are not subsidized by current residents.

- An economically vibrant downtown is an important priority to the City of Tucson in any future growth scenario. The need for an urban walkable place with housing, employment and entertainment opportunities that are accessible to transit is critical to the future viability and sustainability of a community our size. As the paper points out, creating an urban walkable place is achievable given the amount of available developable land in the downtown area and the proximity of the University which is a connection that can be strengthened.

- Re-investment and revitalization of Tucson's existing built environment is a high priority for the City in any future growth scenario. Vacant and underdeveloped land exists throughout the built environment. Infill can bring investment, resources, jobs, services and transit to older and stressed areas of the City that most need it. Infill in the existing built environment is key to a sustainable future for Tucson. However infill must be well-designed and considered in context. It should help strengthen existing neighborhoods and contribute to maintaining and improving our sense of place. Future growth should benefit existing residents and improve the quality of life in the built environment.

Pima County Considerations

- The Conservation Lands System (CLS) implements the Sonoran Desert Conservation Plan and in doing so provides a regional framework for identifying lands suitable for development versus lands suitable for conservation. Lands most suitable for development are located outside of the CLS. Agreement between the City and County on target growth areas outside of the CLS prior to the upcoming City and County General/Comprehensive Land Use Plan updates will provide an important starting point for these planning efforts.

- During 2007, the County undertook land use, infrastructure, and employment center studies for the Southwest planning area. These studies assumed higher concentrations of housing and employment densities than the average for the County, and estimated 120,000 more people would reside in this area over the next 45 years. The studies also included cost estimates for the necessary infrastructure and services to support such an increased population. The County is currently developing financing strategies, such as increased roadway development impact fees for this area, to ensure that the infrastructure is primarily developer-funded. Assuming the City and County can reach agreement on target growth areas, similar land use, infrastructure, and financial planning efforts could occur and be reflected as part of the Cost of Development Elements of the City General and County Comprehensive Plans.

- A significant portion of the County's funding sources for providing services are property taxes, State shared revenues, and costs for services. As the State continues to decrease funding to local governments, the County must ensure that future development occurs in the most fiscally responsible manner. This includes adding value to the tax base and ensuring that affordable transportation and housing choices exist for residents such that residents can afford to continue paying for other goods and services.

- A significant amount of industrial land is located near the airport, Davis Monthan Air Force Base, and along I-10. To make these parcels "shovel-ready" as part of our regional economic development strategies, the City and County need to make sure utilities (including water, wastewater, and electricity) are planned and available for these properties.

- The County faces similar challenges to the City in ensuring that new development projects are compatible with surrounding neighborhoods and offer existing residents beneficial amenities and services that make them an asset to the neighborhood and community. Often it is the design of the new development, not the density, that results in whether adjacent neighborhoods find value in the project.

- The State statutory constraints that permit lot splitting/wildcatting in unincorporated Pima County continue to impact the ability of this region as a whole to manage growth in a sustainable manner. Dirt roads, exempt wells, and septic tanks degrade the region's environment and expose the eventual property owners to substandard health conditions in some cases. Incentives and legislative actions must be explored to prompt land owners into either rezoning land to higher densities or undergoing subdivision platting.

- With the support of voters, the County will continue funding the acquisition of natural areas for conservation, recreation, and the protection of water resources. These acquisitions help to define an urban form by acting as constraints to development.

Recommendations

- City General Plan/County Comprehensive Plan Updates and Land Use Regulations

  1. The City and County should direct future growth to areas identified as most suitable for development, outside of the Conservation Lands System, which include infill opportunities in the existing built environment, Houghton Corridor, Southlands, and the Southwest Area.

  2. The City and County should require new development and redevelopment projects to implement smart growth and sustainable urban form concepts with minimum densities, mix of uses, and open space preservation to achieve the benefits described in this paper. The City and County should implement "density by design" to focus on creating as vibrant a built environment as the natural environment that defines us.

  3. The City and County should evaluate new development and redevelopment projects proposing a land use change on their ability to provide housing and transportation choices, access to jobs and services, reduced water and energy consumption, infrastructure efficiencies, amenities offered to surrounding neighborhoods, and fiscal sustainability.

  4. The City and County should work to support the emerging regional visioning process that will ultimately contribute to reaching a broad consensus on community values, and eventually urban form as one of the potential goals.

- Capital Improvement Planning and Fiscal Sustainability

  1. The City and County should establish a joint capital improvement planning coordination process for the targeted growth areas to direct land use planning, phasing of development, timing and funding of public services and infrastructure, and construction sequencing in the targeted growth areas. City and County Capital Improvement Programs should implement City and County General/Comprehensive Plans.

  2. Future development in new growth areas should be evaluated in terms of fiscal sustainability from both the capital (initial construction of infrastructure) and operating (ongoing public services and maintenance of infrastructure) perspectives to ensure that new development is self-sustaining and not being overly subsidized by existing residents.

  3. The City and County should pursue efforts at a regional level to develop an impact fee structure that provides incentives for development in targeted growth areas, including downtown and infill redevelopment areas, and disincentives outside of these areas.

- Open Space Acquisitions

    1. Natural preserves assist in defining the urban form, as well as providing multiple benefits such as recreational opportunities, conservation of water resources and natural floodplain functions, and protection of scenic views. In some cases, purchasing land outright or through conservation easements is the most realistic way to preserve areas not suitable for development. The City and County should continue to pursue land acquisition efforts.

It is respectfully recommended that the Committee consider this report and provide input to the City and County on its recommendations.

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