Table of Contents

Section 1 - Purpose and Scope

1.1 INTRODUCTION

On June 28, 2006, the Regional Planning Commission adopted RPC Resolution 06-06, which recommended adoption of proposed amendments to the 2002 Truckee Meadows Regional Plan including amendments related to an Annexation Settlement Agreement (ASA, August 22, 2005) between Washoe County, the City of Reno and the City of Sparks relating to the cities' annexation programs. This was followed by the July 27, 2006 action by the Regional Planning Governing Board to adopt Resolution 06-03 to formally approve these amendments.

One result of this Regional Plan modification is a change to the boundaries of the Truckee Meadows Service Areas (TMSA) and the Spheres of Influence for the Cities of Reno and Sparks. The modification also creates a new classification called Future Service Area (FSA), as well as outlining policies regarding facility plans for public infrastructure.

This facility plan has been prepared to assist the City of Reno and Washoe County in satisfying the requirements of the ASA. The project has received the majority of its funding from the Regional Water Planning Commission's Regional Water Management Fund.

The ASA contains a deadline of July 1, 2007 for local governments to have completed the preparation of facility plans that will identify the infrastructure required to serve future growth. The term used in the ASA to describe the availability of facilities and financing mechanisms in time to serve new development is "Concurrency".

The facility planning process is being performed in parallel with other work by regional entities that is needed to clarify the assumptions to be used for facility planning, such as: 1) What is the meaning of Concurrency; and 2) What is the growth projection to be used for the facility planning process?

1.1.1 Concurrency

There is a Concurrency Management Working Group that includes staff from the three local governments, service providers, and stakeholders. This group has developed a draft document to define the term "Concurrency", the most recent draft of which is dated January 11, 2007, and titled "Concurrency Management Principles". Section 2 of the Concurrency Management Principles contains the most recent information available to describe the facility plan requirements, the key portion of which is quoted below:

> *"Each facility plan must (i) include provisions regarding funding and timelines, (ii) include an assessment of all responsible alternatives to additional capital investment (such as resource conservation, efficient design, and so forth), (iii) identify which facilities are required to address existing deficiencies, (iv) identify*

which facilities are required for new development, and (v) identify which facilities are required to address both existing deficiencies and new development."

1.1.2 Population / Development Forecast

This facility plan has been prepared to cover both the City of Reno (City) and Washoe County (County) portions of the TMSA. Each jurisdiction has provided its own projection of future growth through the year 2030 planning horizon. At the time of preparation of this plan, the only spatially distributed growth forecast model that was available for use and agreed to by both the City and County is the Regional Transportation Commission's (RTC) Traffic Analysis Zone (TAZ) model, which consists of a Geographic Information System (GIS) shapefile containing TAZ boundaries and a spreadsheet with future growth projected over time by TAZ. The City and County have each updated this model with their own projections for their individual jurisdictional areas. This updated model was used as the basis for this water, wastewater and flood control facility planning effort.

The starting point for analysis contained in the RTC TAZ model was the year 2002. The City projected forward from this point in time to 2030, while the County did its own analysis of existing residential units as of July 2006 and projected forward from 2006 to 2030. Some of the traffic analysis zone polygons cross City / County jurisdictional boundaries, and there is nothing in the model to distribute existing development between the City and the County. In order to prevent the double counting of existing units, it was necessary to determine this split and modify the City and County models to include an estimate of existing residential units by jurisdiction.

This was accomplished through the use of a GIS point shapefile provided by the County that contains the number of existing units (all types) by parcel as of July 2006. The TAZ polygons and jurisdictional boundaries were then overlaid on the point file, enabling the determination of a total number of existing units by TAZ and by jurisdiction. This information was then used to adjust the existing development data to 2006 numbers, which also provides a better basis for comparison of existing water commitments issued by water purveyors and wastewater flows received at the region's wastewater treatment plants.

1.1.3 City of Reno Growth Forecast

The City has provided an update to the RTC TAZ model that spatially distributes this forecast within the Reno TMSA. The model also identifies the projected number of dwelling units and acreage of non-residential development within the City of Reno TMSA/FSA boundary. The model has a projection through 2095 that could be used for a longer term, or 100-year growth projection. The 2030 and 2095 projections provide the best available estimate of what the long term need for facilities might be in order to satisfy the Concurrency requirement of the ASA.

1.1.4 Planning Approach for City of Reno TMSA Facility Plan

The following approach was developed in coordination with City staff to project future water demand and wastewater flows:

1. Use City of Reno TAZ forecast of population and development potential at 2030 for the City portion of the planning area in order to generate water demands, wastewater flows, and conceptual level facility plans for backbone infrastructure.

2. Develop planning level cost estimates for this infrastructure. The estimates of demand and flow, and infrastructure cost have been split between development target zones (Transit Oriented Corridors and Regional Centers) and other areas.

3. Update the City of Reno TAZ forecast to include information from University of Nevada, Reno (UNR)'s Small Business Development Center for approved tentative map units when this number exceeds the number of units indicated for the TAZ zone. (Report: Residential Subdivision Activity – September 2006, Greater Reno-Sparks Area)

4. Update City of Reno TAZ forecast to include information from specific large scale development projects where additional facility planning and more detailed information has been provided by project proponents.

5. Provide comparison of potential water demand against potentially available water resources by planning sub-area at 2030 and 2095.

6. Provide estimates of total wastewater flow generation by planning sub-area at 2030 and 2095 and compare against available or planned future treatment capacities. Identify any wastewater treatment or reclaimed water disposal limitations that are particularly significant in this comparison.

7. Review Truckee Meadows Water Authority (TMWA) Resource Plan for significant information regarding available water resources and forecasting methodology that might affect the above analysis.

8. Rely on the TMWA Water Facility Plan for areas within TMWA's service territory, with the exception of a review of fire flow requirements that might trigger new facilities in high density development target areas such as TODs and Centers.

9. Utilize existing facility planning documents for backbone infrastructure requirements to the extent that they are relevant for the current growth assumptions.

10. Utilize development plans from certain master planned projects where more detailed information is available to supplement City Master Plan or Zoning information. Such information was used in Cold Springs, Winnemucca Ranch (Spring Mountain and Sage), and the portion of Sunny Hills that was in the July 2007 TMSA boundary.

1.1.5 Planning Approach for Washoe County TMSA Facility Plan

Similar to the City of Reno, the County has also provided an update to the RTC TAZ model with respect to projected future dwelling units within the County TMSA at 2030, including

consideration of approved projects. Additional data provided included a GIS shapefile containing polygons with TAZ number and approved planned land uses and a point shapefile containing the number of dwelling units by parcel as of July 2006. This planned land use file was used to summarize planned land use acreages by TAZ in order to: 1) develop non-residential water demands and wastewater flows, and 2) develop an average residential lot size by TAZ for the application of residential water demand factors.

The County data was not updated with UNR approved development information because the County had already included such an analysis in the update to the TAZ model.

1.2 CONCEPTUAL LEVEL ANALYSES

The TMSA Facility Plan consists of several components, including projected improvements for water, wastewater and flood control infrastructure improvements. The following sections describe the level of detail provided in this Facility Plan. It should be noted that the infrastructure sizes and locations are conceptual, and are based upon planning level information. It should be anticipated that the recommended sizes and locations of facilities will be further refined as more detailed information and development plans are available.

1.2.1 Water Facility Plans

For this project, a Conceptual Level Water Facility Plan includes the following:

1. Identification of potentially available water resources to serve future growth based on the Water Resource Baseline in the adopted Regional Water Management Plan, or subsequent updates provided by the RWPC.

2. Documentation of land use assumptions.

3. Documentation of existing demands based on information provided by water purveyors, if available.

4. Projection of build-out water demands based on master planned land uses as provided by the City of Reno. Water demand factors are developed based on data for equivalent land uses from the relevant water purveyor in the region.

5. Identification of pressure zones and potential tank sites.

6. Identification of potential wholesale or in-basin water delivery locations, including qualitative descriptions of potential improvements to existing systems based on available information from the relevant water purveyor in the region.

7. Water transmission capacity needed to serve pressure zones in terms of “equivalent water transmission capacity”. Equivalent water transmission capacity is defined as the transmission capacity and pipe size required to serve build-out of a region. More detailed planning of the region in the future will likely result in the design of a more distributed

network of smaller diameter pipes following detailed street/lot layouts that provide the same overall capacity.

8. Planning level facility cost estimates for major backbone infrastructure including transmission piping, tanks, wells, treatment, or pump stations, as appropriate, based on recent construction costs in similar conditions. Cost estimates include a 30% contingency, plus an allowance for engineering, permitting, and construction management.

9. Discussion of relevant policies from the adopted Regional Water Management Plan and their effect on water planning within the facility plan study area.

10. Identification of any known constraints affecting the water facilities in the facility plan study area.

1.2.2 Wastewater Facility Plans

For this project, a Conceptual Level Wastewater Facility Plan includes the following:

1. Documentation of land use assumptions.

2. Documentation of existing wastewater flows based on information provided by wastewater treatment providers, if available.

3. Projection of build-out wastewater flows based on master planned land uses as provided by the City of Reno. Wastewater flow factors are developed based on data for equivalent land uses from either the wastewater treatment provider in the region to be planned, or from the 208 Regional Water Quality Management Plan, as appropriate.

4. Identification of gravity wastewater collection areas and potential need for wastewater pump stations.

5. Identification of wastewater treatment plant locations to provide service (new or existing), and capacity needed, with consideration of information contained in 208 Regional Water Management Plan.

6. Discussion of existing effluent disposal methods and limitations and reference to information contained in the 208 Regional Water Quality Management Plan, as appropriate.

7. Wastewater interceptor capacity needed to serve collection areas in terms of "equivalent wastewater collection capacity". Qualitative descriptions of potential improvements to existing systems will be included, based on available information from the relevant wastewater treatment provider in the region. Equivalent wastewater collection capacity is defined as the interceptor capacity and pipe size required to serve build-out of a region

based on average slopes within the collection area. More detailed planning of the region in the future will likely result in the design of a more distributed network of smaller diameter pipes following detailed street/lot layouts that provide the same overall capacity.

8. Planning level facility cost estimates for major backbone infrastructure including gravity interceptor and force main piping, wastewater pump stations, treatment, and effluent disposal, as appropriate, based on recent construction costs in similar conditions. Land costs are not included in the estimates. Cost estimates include a 30% contingency, plus an allowance for engineering, permitting, and construction management.

9. Discussion of relevant policies from the adopted Regional Water Management Plan and their effect on water planning within the facility plan study area.

10. Identification of any known constraints affecting wastewater facilities in the facility plan study area.

1.2.3 Flood Control Facility Plans

For this project, a Conceptual Level Flood Control Facility Plan includes the following:

1. Review of existing available documents and studies of the area, including previous development analyses and plans, previous master plans, and readily available site specific scientific studies.

2. Documentation of the extent of known flooding and high water levels.

3. Field visits to record and photo document general observations of topography and geomorphology, location of existing natural channels, potential for channel migration, playa conditions and potential behavior, civil infrastructure that may need upgrade, replacement or removal, and assistance with interpretation of project specific and other available mapping. Engineering judgment will be exercised on which areas to visit due to the number of facilities.

4. Conceptual level studies as necessary to quantify hydrologic flow potential, estimate extent of flood plains and order of magnitude for required structures, and recommended locations for conveyance and storage facilities.

5. Calculation methods to be used for analysis may vary include stochastic or deterministic modeling as appropriate commensurate with the level of accuracy needed to answer planning level questions. Facilities may not be analyzed to the point that specific sizes are provided, but when needed, sizes that are provided will be based on simple estimation techniques. Any model produced for analysis of a flood control facility plan will be made available to the City for use as a planning tool for future development.

6. Coordination with the Truckee River Flood Project planning effort. Flood facility planning will incorporate elements from the "Local Sponsor Plan" alternative and a discussion on the Army Corps of Engineer's alternative when available.

7. A discussion of flood management strategy and potential alternatives for each area.

8. Planning level facility cost estimates for major backbone infrastructure including channel stabilization, structural channel improvements, flood storage and recharge infrastructure, and other major structural upgrades such as culverts and bridges, as appropriate, based on recent construction costs in similar conditions. Cost estimates include a 30% contingency, plus an allowance for engineering, permitting, and construction management. Facility sites may be identified to the extent of the required amount of land area, but not to the extent of individual parcels. Land costs are not included in the estimates.

1.2.4 Flood Control Planning Philosophies

Generally, flood control and stormwater master planning may be viewed from two distinct points of view, existing development and proposed development. The first (existing development) or what may be deemed as historical flood control master planning, is necessary for problems associated with existing urban infrastructure. When past construction of civil infrastructure occurs without utilizing appropriate drainage solutions, the resulting development typically has numerous flooding/drainage problems. As engineering knowledge in the area of hydrology and hydraulics has improved over time, much of the previously constructed drainage facilities have been shown to be lacking in required conveyance capacity, a stable geomorphic process, and water quality protection.

In addition, consideration of habitat issues during past development was ignored and again it is found that much of the existing infrastructure does not meet the current standard of care. Master plans such as the *Washoe County Flood Control Master Plan*, KJC, 1991, and the Draft *Washoe County Regional Flood Control Master Plan*, WRC, 2005 are examples of this type of planning. These master plans address known flooding problems associated with existing urban development by proposing solutions and the associated project costs. The projects proposed in these plans are intended to be conceptual in nature for budgetary purposes. This planning document updates the most recent regional flood control master plan to reflect problems and solutions for the most recent flooding in 2005.

A second viewpoint of flood control planning is associated with new development. One trend in new land development is to plan new facilities around the existing natural features of the land; including topography (take advantage of land elevation differentials), flood plans, sensitive environmental areas and habitats, etc. Since new drainage facilities are specific to new development it is not typical to plan for those facilities until specific goals for development are defined. Under this scenario, watershed specific plans are developed in conjunction with new developments and specific flood control/drainage features are identified in those watershed

specific plans that meet the needs of the proposed development. New watershed specific master plans fitting this type of planning include named facility plans, such as *North Valleys Flood Control Hydrologic Analysis and Mitigation Options, Volumes 1 and 2*, by Quad Knopf, and *Somersett Development Storm Drainage Master Plan*, by Manhardt which were reviewed for this update.

Finally with respect to new development, there are reasons to develop what may be thought of as guidance planning tools for flood control and drainage for undeveloped areas. Historically, outlying properties have developed in some instances in a haphazard fashion with little or no thought of the ultimate configuration of drainage and flood control facilities. In order to address this problem, there needs to be a level of planning that identifies land features that are in the best interest of the public to protect. Examples would include preservation of natural flood plains to ensure the natural hydrologic and geomorphological function of the flood plain can continue and the natural riparian habitat flourish. Another example might be the preservation of natural stormwater infiltration to continue or even enhance groundwater recharge.

This master plan update includes mapping of natural drainageways to an approximate 100-year frequency storm event. Natural floodplain areas are mapped as well as areas where geomorphic processes are prominent and should be avoided by new structures. These areas are available on a GIS overlay and are easily applied by staff to areas of proposed development as initial guidance for protection of flood control corridors. The delineated floodplain areas are not intended for strict enforcement of no development impact, rather as a point of departure for working with each new permit request. The development code for the City of Reno currently provides for preservation of natural drainageways; but it allows for development to occur accordingly. The intent of the delineation of floodplains is to preserve this procedure.

1.3 HOW TO USE THIS REPORT

Water, wastewater and flood control infrastructure improvements are presented in this TMSA Facility Plan. Reno's portion of the TMSA is subdivided into several planning areas, including Spring Mountain, Sage, Cold Springs, Stead and Lemmon Valley, Truckee Meadows, South Truckee Meadows and Bedell Flat. Section 10, which covers the South Truckee Meadows portion of the TMSA, is incomplete as of this date. Washoe County provides the water and wastewater service to the majority of this area. Washoe County's portion of the TMSA Facility Plan, which includes the water, wastewater and flood control infrastructure improvements for the South Truckee Meadows area of Reno, is scheduled to be complete by September 2007.

Figures 1-1 and 1-2 show the different Reno planning areas, and which sections of the Facility Plan detailed information can be found regarding the recommended water, wastewater and flood control improvements. Each planning area and its associated figures, represents a portion of the overall TMSA, which may include a portion of Reno's TMSA, a portion of Washoe County's TMSA, or both. As development occurs within the TMSA, more detailed information and project specific plans will be generated. With this additional information, the level of detail of the facility plans will increase based on site specific conditions.

The facility recommendations presented herein are intended to provide the foundation for subsequent detailed planning and design. The City of Reno, Washoe County and the water, wastewater and flood control service providers having jurisdiction are the final authority regarding necessary infrastructure improvements. Preparation of updated facility plans will be necessary based on current information and the specific needs of the development at that time. These future planning efforts will further refine and define the exact facility requirements presented in this plan.

In general, it is anticipated that future planning and design will substantially conform to the TMSA Facility Plan. However, it is reasonable to foresee recommended changes to the TMSA Facility Plan as more detailed information is developed. When considering whether or not a refinement of the recommended facilities conforms with the TMSA Facility Plan and ultimately the Regional Water Management Plan and Truckee Meadows Regional Plan, the basic question to be answered is, "Does the design intent of the proposed facility (capacity, service function, construction phasing of major improvements, general location, design criteria, significant impact to other water related issues, etc.) substantially conform with the Regional Water Management Plan and the design intent of the applicable water, wastewater and flood control facility plans presented in this Plan?"

The Regional Water Management Plan includes Policy 4.1.a: Facility Plans and Infrastructure Studies, for determining whether a proposed revision to the TMSA Facility Plan is of such a kind or size that affects the working of the Regional Water Plan, and is in conformance with the Regional Water Plan. The Regional Water Planning Commission will ultimately determine whether a proposed revision to the TMSA Facility Plan requires a review for conformance with the Regional Water plan, pursuant to Policy 4.1.a below.

If the RWPC determines that a particular project or facility plan is in substantial conformance with this plan, then no further review by the Regional Planning Commission or Regional Governing Board is required.

Policy 4.1.a: Facility Plans and Infrastructure Studies – Conformance with Regional Water Plan

Pursuant to NRS 540A.230, facility plans and infrastructure studies of such a kind or size that affect the working of the Regional Water Plan, including water supply and storage, wastewater collection and treatment, stormwater, and flood control shall be reviewed by the RWPC for conformance with the Regional Water Plan.

Criteria to implement policy:

The RWPC shall review facility plans and infrastructure studies of such a kind or size that affect the working of the Regional Water Plan to make a determination that the facility or study conforms to the Policies and Criteria included in the Regional Water Plan;

Proposed facilities and infrastructure shall:

- be consistent or coordinate with existing facility plans or master plans, or demonstrate how they will address any differences with or changes to existing facility plans or master plans, and

- coordinate to avoid unnecessary duplication of facilities

- An evaluation may be provided of the project's impacts on other water-related issues (e.g. a proposed water project must indicate the potential impacts it would have on wastewater treatment).

- Any plan or study that is funded in whole or in part by the Regional Water Management Fund shall be subject to conformance review.

Discussion: The RWPC and local governments provide ongoing planning for the community's water, wastewater, stormwater and flood control needs. Identification and review of potential impacts to existing or planned infrastructure, and needs for new or improved facilities, should provide for integrated planning and management of the region's water resources and cost-effective infrastructure development and improvements.

Facilities are designed and constructed by water purveyors, wastewater treatment providers, and local governments as part of their respective Capital Improvement Programs (CIPs). CIPs are updated annually, at a minimum. When entities update and approve their CIPs, the RWPC shall review them and recommend that pertinent facilities be found in conformance with the Regional Water Plan pursuant to NRS 540A, Washoe County Code (WCC) this policy, and RWPC administrative policies and procedures.

As the RWPC, local governments, wastewater treatment providers, and water purveyors update their respective facility and resource plans, they analyze alternatives for financing and funding proposed facilities, sources or other requirements, and the effects of the funding alternatives on other facilities included in the Regional Water Plan. These plans are then presented to the RWPC for either conformance review or informational purposes, as appropriate under the NRS 540A, this policy, and RWPC administrative policies and procedures. Presentation of these plans to the RWPC provides Commissioners the opportunity to raise questions regarding linkages and comprehensive regional planning for water resources, with the result that overall resource issues can be addressed or additional work can be undertaken, as needed. Lists of such plans that are relevant to regional resource planning are contained at the end of various chapters, and again at the end of this plan. These plans also contain detailed alternatives for financing and funding the respective facilities or sources and should be consulted for such detail.

Facility plans reviewed and found in conformance with the Regional Water Plan are added to a list of projects maintained by the RWPC staff (See Appendix J). Pursuant to the RWPC administrative policies and procedures, the list is submitted as appropriate to the Board of County Commissioners for approval and is included in periodic updates of the Regional Water Plan.

The RWPC recognizes that not all facilities required to implement the Regional Water Plan are listed due to unforeseeable circumstances and/or the frequent necessity to alter facilities once final design and construction proceed. Consequently the RWPC will review facilities that are not in the current edition of the Regional Water Plan if such facilities are of such a kind or size that affect the working of the Regional Water Plan.