

# Western Regional Water Commission

## STAFF REPORT

**DATE:** June 15, 2017

**TO:** Chairman and Members, Western Regional Water Commission ("WRWC")

**FROM:** Jim Smitherman, WRWC Water Resources Program Manager  
Jeremy Smith, PhD, Truckee Meadows Regional Planning Agency ("TMRPA")

**SUBJECT:** Presentation of a detailed scope of work for Phase 1 of the TMRPA project to develop a regional storm water drainage network Geographic Information System ("GIS") map, and possible direction to staff.

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### **SUMMARY**

At the June 1, 2017 meeting of the Northern Nevada Water Planning Commission ("NNWPC"), TMRPA staff presented a detailed scope of work for Phase 1 of the regional storm water drainage network Geographic Information System ("GIS") map project, consistent with the WRWC's direction of April 19, 2017 to proceed with Phase 1 of the project. The NNWPC approved the scope and budget, and authorized the WRWC Program Manager to execute an interlocal agreement with the Regional Planning Governing Board ("RPGB") for Phase 1, in an amount not to exceed \$21,000. The RPGB approved the agreement on June 2, 2017. The "Phase 1 Detail – Data Gathering and Assessment" scope of work and budget is attached.

### **PREVIOUS ACTION**

On April 19, 2017, the WRWC received a report summarizing the NNWPC's April 5, 2017 discussion and recommendation concerning the TMRPA proposal for the development of a regional storm water drainage network GIS map. After asking several questions of staff and discussing the proposal among the members, the WRWC approved a motion directing staff to move forward with Phase 1 of the proposal at a cost of \$21,000 and after completion in approximately 4 months, return with a detailed project plan for the next phases. TMRPA staff clarified that the project would start after July 1, 2017, which would result in a Phase 1 completion date sometime in October or November 2017.

### **FISCAL IMPACT**

Funding for the project, in an amount not to exceed \$21,000, is available in the adopted FY 2017-2018 WRWC final budget, Cost Center WP310602

### **RECOMMENDATION**

Staff recommends that the WRWC accept the report on Phase 1 of the regional storm water drainage network Geographic Information System ("GIS") map project, and provide appropriate direction to staff if desired.

**POSSIBLE MOTION**

“Move to accept the report on Phase 1 of the regional storm water drainage network Geographic Information System (“GIS”) map project.”

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Attachment: Phase 1 Detail – Data Gathering and Assessment scope of work and budget

**Project:** GIS-Based Regional Stormwater Conveyance Network  
Jeremy Smith, GIS Coordinator



### **Phase 1 Detail – Data Gathering and Assessment**

Following a request from the Western Regional Water Commission (WRWC), the Truckee Meadows Regional Planning Agency (TMRPA) created a draft proposal to compile and construct a GIS map of the region's stormwater conveyance network (initial scope of work attached). The initial scope of work contemplated 3 phases to ultimately achieve completion of the GIS network. This document describes in more detail the steps, materials and costs required to complete Phase 1 of the proposal – data gathering and assessment of coverage.

The first step toward completion of a GIS-based regional stormwater network is an accounting of existing GIS data that describes the infrastructure (e.g. pipes, retention ponds, and ditches) used to convey stormwater. Many of these features have been mapped previously as part of the day to day operations of public works and community development departments in the region or as a part of larger modeling efforts undertaken in years past (e.g. with consultants such as HDR). Thus, our initial approach will be coordination with staff from the local jurisdictions and departments that deal with these data (Table 1). TMRPA staff will acquire any and all existing GIS data or relevant map data describing regional stormwater infrastructure. Once gathered, all data will be input into a centralized GIS database and related map to initiate an assessment of data coverage for our region.

The centralized data will be evaluated for connectedness and coverage. We anticipate the data will be most connected within a respective jurisdiction's service territory, with opportunities for connections at jurisdictional boundaries. Further, the coverage of the data will be assessed in relation to other development and infrastructure pieces such as landcover measures, built parcels and the Washoe County road network. The presence of developed area will act as a proxy for where stormwater GIS data should be mapped. Using this related information regarding development; TMRPA will be able to create and report metrics describing the connectedness and completeness of data coverage for a given area. We anticipate reporting the described metrics by hydro basin (see Figure 1) as these areas reflect stormwater source areas and related areas of flow.

Further, TMRPA will evaluate attribute data included with the GIS features (e.g. pipe diameter). The attributes that describe the size, material and age of stormwater infrastructure will be critical for any potential, future efforts to model stormwater runoff. TMRPA will report available attribute information and associated "fill rates" for each data column.

Throughout the process, TMRPA staff will rely on counsel and review of our approach and conclusions from Jim Smitherman, Water Resources Program Manager for the WRWC. Mr. Smitherman has worked extensively with TMRPA staff on several regional data initiatives around water resources and wastewater management. Further, Mr. Smitherman's extensive network of staff contacts in stormwater, water resources and related disciplines will ensure that TMRPA have access to all existing stormwater-related GIS data in the region.

The final deliverables for Phase 1 of this project are envisioned to be three-fold. Firstly, TMRPA will store and make available to interested government entities the final collection of GIS data resultant from all data gathering efforts. Secondly, TMRPA staff will draft a Phase 1 final report describing the state of the data with associated coverage and attribute metrics. Thirdly, TMRPA will prepare and deliver a presentation to the WRWC, Northern Nevada Water Planning Commission (NNWPC), and Regional Planning Governing Board (RPGB) that summarizes the findings of the final report.

**Table 1. List of initial contacts by jurisdiction or entity**

Jurisdiction/Entity	Departments	Contact Names
Washoe County	Community Services Department, Tech Services/GIS	Dave Solaro/Quinn Korbolic
Sun Valley General Improvement District	Public Works	Darrin Price
City of Reno	Public Works	John Flansberg
City of Sparks	Community Services, GIS	John Martini/Jon Walker
Truckee Meadows Flood Project	n/a	Jay Aldean
Truckee Meadows Storm Water Permit Coordinating Committee	n/a	Theresa Jones

**Schedule**

The initial scope of work contemplated the Phase 1 portion to begin on July 1, 2017 and to progress over a period of 4 months. We propose additional flexibility in the starting month to include potential for an August or September start timing. This variability will help TMRPA staff manage the time required to complete Phase 1 alongside increasing demand for staff time in support of the 2017 Regional Plan Update effort.

**Table 2. Schedule of activities by month**

Month	Activities
1	Connect with staff at identified local entities and acquire GIS data describing stormwater conveyance.
2	Data compilation and GIS assessment using available features. Includes targeted field verification of GIS data.
3	Reconnect with jurisdiction staff and present draft findings for review and critique. Perform needed edits to meet staff recommendations.
4	Draft final report with vetted findings and present to NNWPC, WRWC, and RPGB

**Budget**

The WRWC approved approximately \$20,000 to complete the tasks and activities contemplated in the Phase 1 scope. This value was based on the initial scope of work (attached). Since drafting the initial scope, TMRPA has considered some small changes to the timing of budget items, specifically with regard to intern labor. The Phase 1 detailed scope now contemplates ca. 320 hours of intern time (roughly 20 hours per week over the 4-month, Phase 1 project period).

The budget still contemplates about 15% of staff time for the GIS Coordinator and GIS/Planning Analyst, as well as a small amount of time for overhead and support from the Executive Director (ca. 1%). The associated labor rates in Table 3 below represent fully loaded rates as projected in the draft TMRPA budget for fiscal year 2017-2018.

A standard ArcGIS license and laptop computer will be required to support any GIS work undertaken by an intern in support of this project. Further, a GPS unit that is capable of uploading necessary GIS files as background layers will facilitate efficient field verification of targeted features when necessary.

The new budget to complete Phase 1 is shown below in Table 3 and describes the anticipated costs for labor and materials.

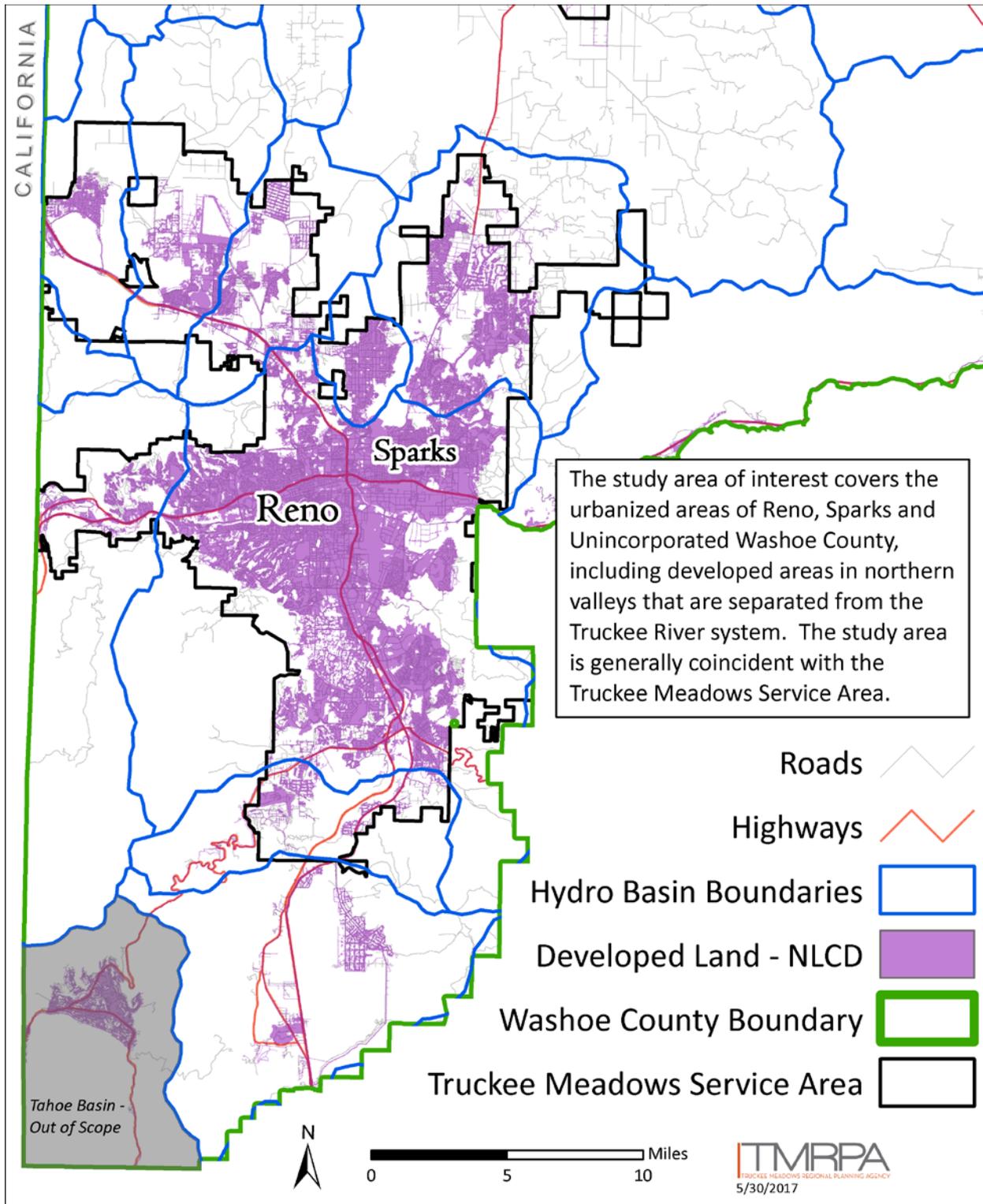
**Table 3. Phase 1 budget detail**

<b>Labor</b>	<b>Total (\$)</b>	<b>Rate (\$/hr)</b>	<b>Hours</b>
Executive Director	752	94	8
GIS Coordinator	5,512	53	104
GIS/Planning Analyst II	4,160	40	104
Intern	3,840	12	320
<b>Subtotal labor costs</b>	<b>14,264</b>		

<b>Materials</b>	<b>Cost (\$)</b>	<b>Description</b>
ArcGIS license	3,500	Upgrade to Standard license for ArcGIS software
Laptop	1,000	Dell Latitude 5000 Series
GPS unit	1,200	Spectra MobileMapper 50 GIS GPS Receiver
<b>Subtotal material costs</b>	<b>5,700</b>	

<b>Grand Total</b>	<b>\$19,964</b>
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Figure 1. General study area map showing regional hydro basins and areas of development



**Initial Full Scope of Work – Attached for Reference**

**DRAFT Scope of Work: GIS-Based Regional Stormwater Conveyance Network**

**Project Description**

At the request of the Western Regional Water Commission, the Truckee Meadows Regional Planning Agency (TMRPA) presents this proposal to connect and complete a GIS data network of regional stormwater conveyance. The project is envisioned in 3 phases. The first phase will concentrate on identifying and gathering together all existing GIS data that maps stormwater conveyance and will evaluate/confirm the level of work required to complete the network. The second phase will consist of creating new GIS data to fill in identified gaps in the network and ensure network connectivity. The final phase will be focused on situating that network within the context of an urban and exurban hydrologic regime by mapping impervious surfaces and contributing stream runoff areas.

During each phase a plan for ongoing maintenance of updated or newly created GIS data layers will be identified. A brief summary of the three phases is presented in table 1 below.

**Table 1. Summary**

<b>Project Phase</b>	<b>Summary of Work</b>	<b>Major Milestones</b>
<b>1</b>	Acquisition and assessment of available municipal GIS information describing stormwater conveyance	<ul style="list-style-type: none"> <li>• Gather existing data in partnership with local agencies/entities</li> <li>• Identification of data gaps and estimation of time/cost to complete network</li> <li>• Creation of technical advisory committee to oversee work completed in phases 2 and 3</li> </ul>
<b>2</b>	GIS data editing and feature creation to complete a topologically connected network of "regional-scale" stormwater conveyance	<ul style="list-style-type: none"> <li>• Digitization of GIS line features to fill in identified gaps in the existing conveyance network</li> <li>• Assignment of key attributes (e.g. diameter, type) as possible</li> <li>• Targeted field data collection or validation as required</li> <li>• Ensure topological connectivity of line network</li> </ul>
<b>3</b>	Creation of ancillary GIS data layers to support stormwater-event modeling on the completed conveyance network	<ul style="list-style-type: none"> <li>• Literature review and methods assessment for impervious surface modeling</li> <li>• Creation of impervious surface model within developed areas of the region</li> <li>• Implementation of ArcGIS Hydro Modeling tools to identify hillside runoff networks and hydrographic areas contributing to conveyance network intake locations</li> </ul>

This project is intended to deliver our region with a comprehensive, regional-scale GIS model of stormwater conveyance and contributing features. This GIS data will provide planning and engineering staff at affected local entities with information to assess potential impacts of future precipitation and runoff events. These data will be highly valuable for several municipal-type functions such as: evaluating areas at high risk during flood events and estimation of potential economic loss; preparation of emergency response strategies; preparation and implementation of stormwater network maintenance schedule and tasks; identification of contributing areas to stormwater water quality monitoring locations; and assessment of potential impacts to stormwater conveyance given future land-use development.

The regional stormwater conveyance network and ancillary GIS data layers will be compatible with previous GIS data work completed by TMRPA and will be incorporated into the existing scenario-planning toolset used to evaluate future development patterns in our region and thus inform regional land use policy.

The following table (2) contemplates estimated costs for materials, labor and professional services as understood at this time. These costs are subject to change with the completion of phase 1 and a close inspection of required work to complete phases 2 and 3. Whenever possible we propose using existing TMRPA staff resources, in-kind services/hours from partner agencies, and leveraging affordable intern labor to keep costs low. However, we may be required to augment in-house efforts by contracting the assistance of academic researchers or professional consultants. Total cost estimates by fiscal year for both funding and anticipated in-kind support are indicated in table 3.

**Table 2: Cost Estimation**

Project Phase	Summary of Work	Cost Reimbursement or New Funding	In-Kind Services (Loaned Staff)
1	Acquisition and assessment of available municipal level GIS information describing stormwater conveyance and estimation of completion effort	<ul style="list-style-type: none"> <li>• Reimbursement for 0.31 FTE of TMRPA staff time from 7/1/2017 to 10/31/2017</li> <li>• Includes: 15% GIS Coordinator, 15% GIS/Planning Analyst, and 1% Executive Director/Overhead</li> <li>• Value: \$10,100 (reimbursement for existing costs)</li>   <li>• Purchase of hardware, software and/or data required to support stormwater network construction and maintenance of GIS data</li> <li>• Value: 10,000 (new funding )</li> </ul>	<ul style="list-style-type: none"> <li>• 10% of Jim Smitherman’s time to support stormwater GIS data gathering, research, and enlistment of technical advisory committee membership</li> <li>• Value: \$6,250 (in-kind)</li> </ul>

<p><b>2</b></p>	<p>GIS data editing and creation to complete a topologically connected network of "regional-scale" stormwater conveyance</p>	<ul style="list-style-type: none"> <li>• Reimbursement for 0.31 FTE of TMRPA staff time from 11/1/2017 to 6/30/2018</li> <li>• Includes: 15% GIS Coordinator, 15% GIS/Planning Analyst, and 1% Executive Director/Overhead</li> <li>• Value: \$20,200 (reimbursement for existing costs)</li>   <li>• Estimation of intern labor from 11/1/2017 to 6/30/2018</li> <li>-30 hours per week</li> <li>-\$17.00/hour (includes taxes)</li> <li>-32 weeks</li> <li>• Value: \$16,500 (new funding)</li>   <li>• Academic research or professional services as required</li> <li>• Value: \$7,500 (new funding)</li> </ul>	<ul style="list-style-type: none"> <li>• 5% of Jim Smitherman's time to support review of constructed GIS stormwater data and participation/chair of technical advisory committee</li> <li>• Value: \$6,250 (in-kind)</li> </ul>
<p><b>3</b></p>	<p>Creation of ancillary GIS data layers to support stormwater-event modeling on the completed conveyance network</p>	<ul style="list-style-type: none"> <li>• Reimbursement for 0.31 FTE of TMRPA staff time from 7/1/2018 to 12/31/2018</li> <li>• Includes: 15% GIS Coordinator, 15% GIS/Planning Analyst, and 1% Executive Director/Overhead</li> <li>• Value: \$15,200 (reimbursement for existing costs)</li>   <li>• Estimation of intern labor from 7/1/2018 to 12/31/2018</li> <li>-30 hours per week</li> <li>-\$17.00/hour (includes taxes)</li> <li>-24 weeks</li> <li>• Value: \$12,500 (new funding)</li>   <li>• Academic research or professional services as required</li> <li>• Value: \$7,500 (new funding )</li>   <li>• Financial contribution to Washoe County Basemap Committee to assist with acquisition costs for QL1 LIDAR data (high-quality). LIDAR data will provide a fine-resolution digital elevation model for impervious surface and hydrologic network modeling and is scheduled to be available in the first half of calendar year 2018</li> <li>• Value: \$5,000 (new funding – for inclusion in fiscal year 2017-2018 total)</li> </ul>	<ul style="list-style-type: none"> <li>• 5% of Jim Smitherman's time to support review of modeled impervious surface and contributing hillslope hydrologic network. Continued chair and participation on technical advisory committee</li> <li>• Value: \$5,000 (in-kind)</li> </ul>

**Table 3: Funding Schedule**

<b>Project Phase</b>	<b>Funding Amount</b>	<b>In-kind Amount</b>	<b>Fiscal Year</b>
<b>1, 2</b>	\$64,300	\$12,500	2017 - 2018*
<b>3</b>	\$40,200	\$5,000	2018 - 2019
	<b>\$104,500</b>	<b>\$17,500</b>	

\* Any designated funds for the Project remaining unexpended from the Regional Water Management Fund at the end of a fiscal year may be carried forward and applied to the Project budget for the succeeding fiscal year.

Additional funding notes:

Funds shall be available for transfer between project phases and/or line items within phases, not to exceed 10% of the total budget.

Additional in-kind services, not yet identified (e.g. from local government public works staff), may help keep costs lower than anticipated.