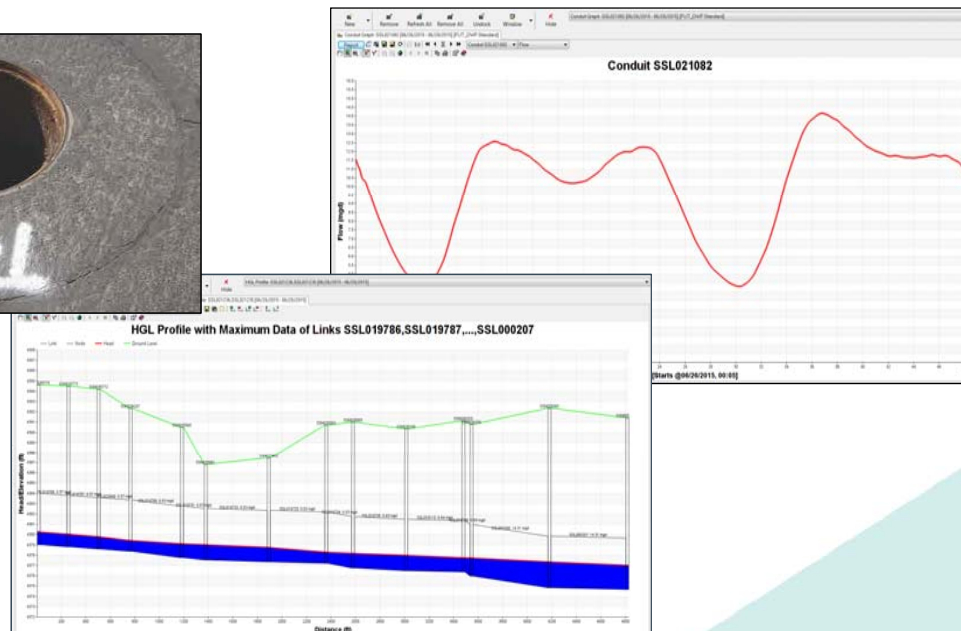


Sewer Model Update

Sanitary Sewer Model Council Workshop

January 23, 2017



Today's Agenda

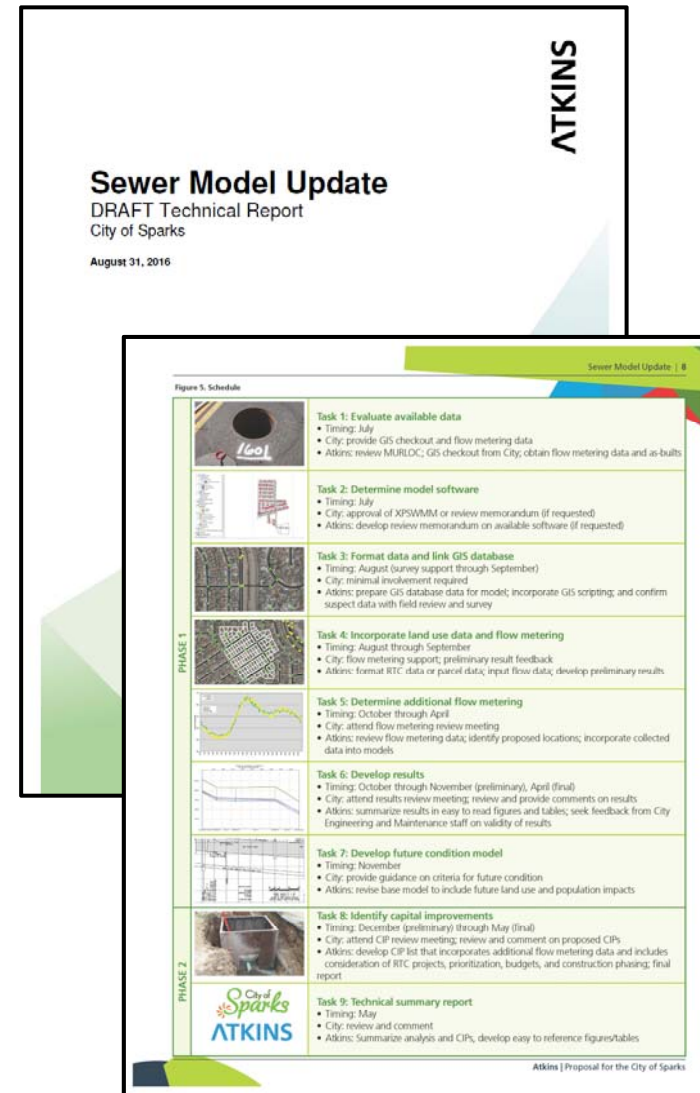


1. Why did we do this update?
2. What area did the update encompass?
3. What information did we use, and where did it come from?
4. What did the update tell us?
5. What implications do the model results have on fiscal policies?
6. Model demonstration.
7. Possible Council direction to staff and/or action.



Living Model Approach

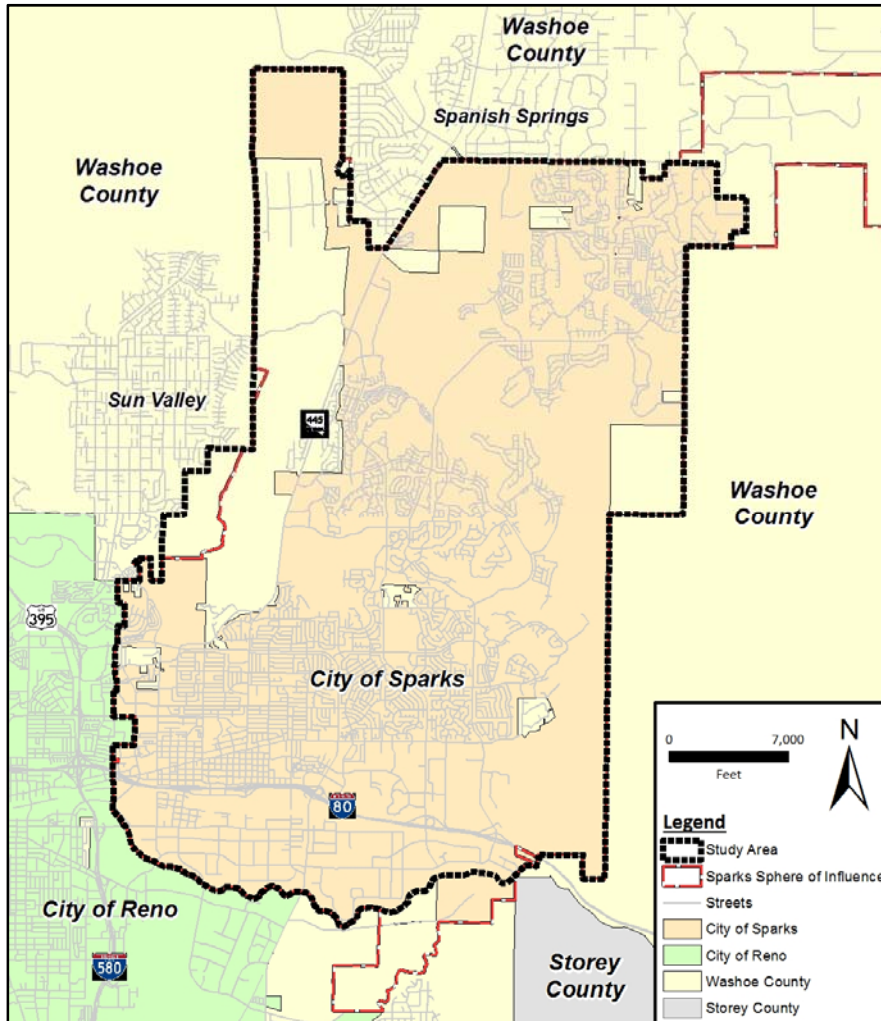
1. Utilize technology and best available data
2. System capacity
3. Ability to address development / redevelopment impacts to sewer system
4. Capital Improvement Projects (CIP)



Study Area



ATKINS



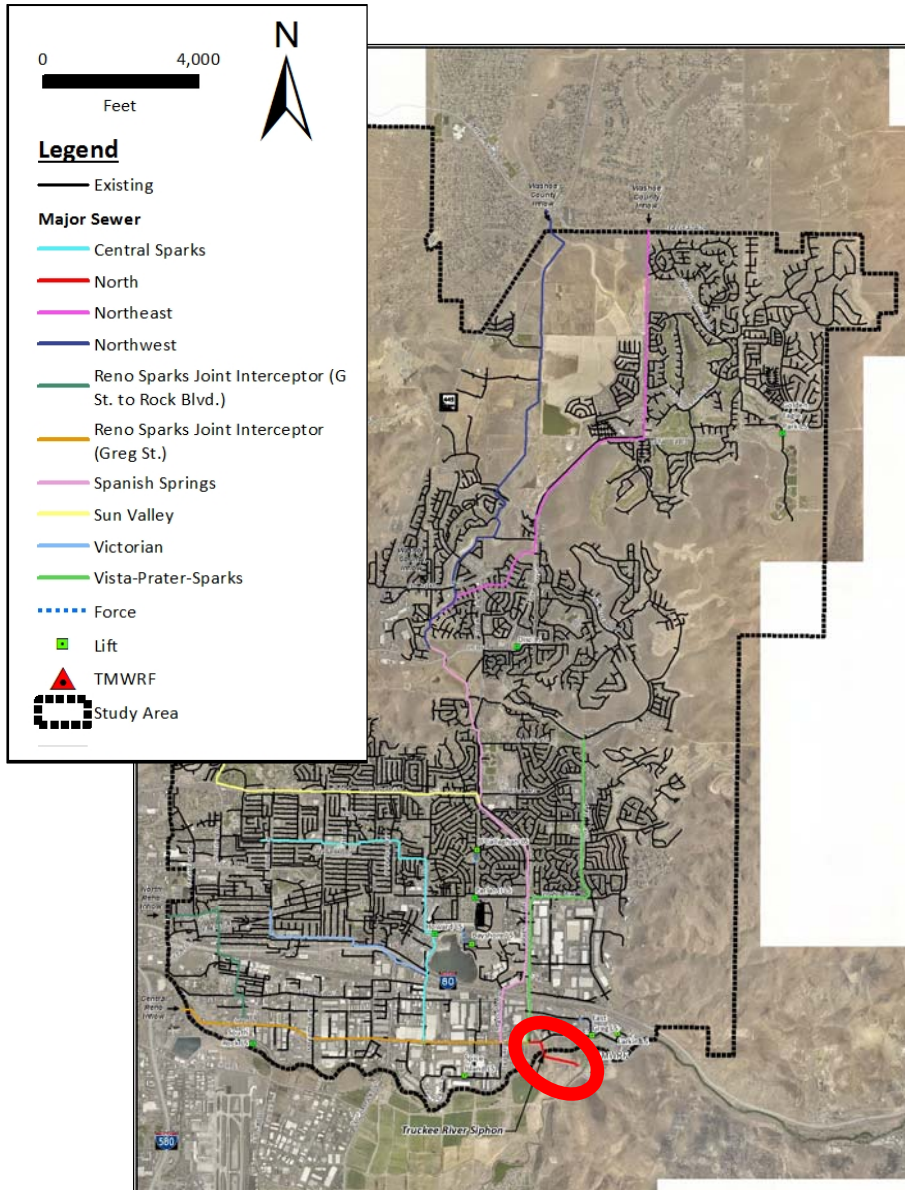
- 42 square miles
- 84% Sparks, 16% Washoe County by land area
- Including external inflows through flow metering



Existing Wastewater System



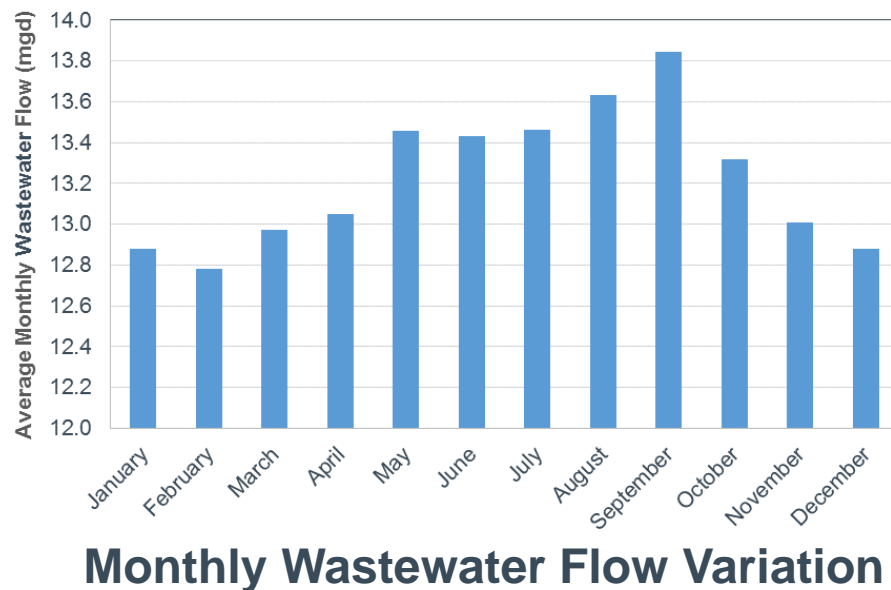
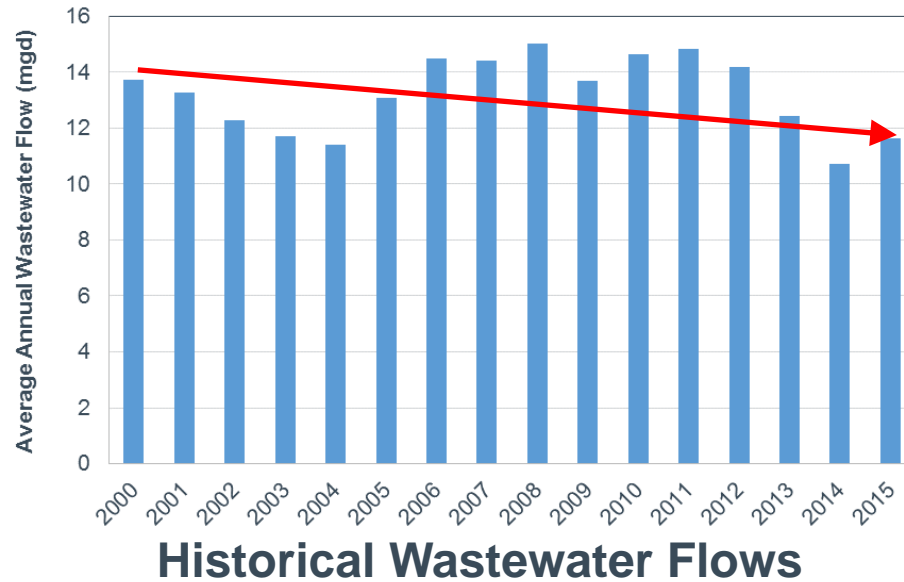
ATKINS



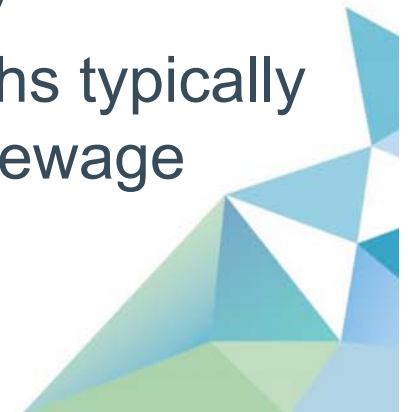
- 355 miles of gravity sewer (8" to 60")
- 75% of system $\leq 8"$
- 10 lift stations
- Truckee River siphon
- External inflows from Sun Valley, Washoe County and City of Reno
- All of Sparks' flow ultimately carried by North Interceptor



Historical Flows (N. Interceptor)



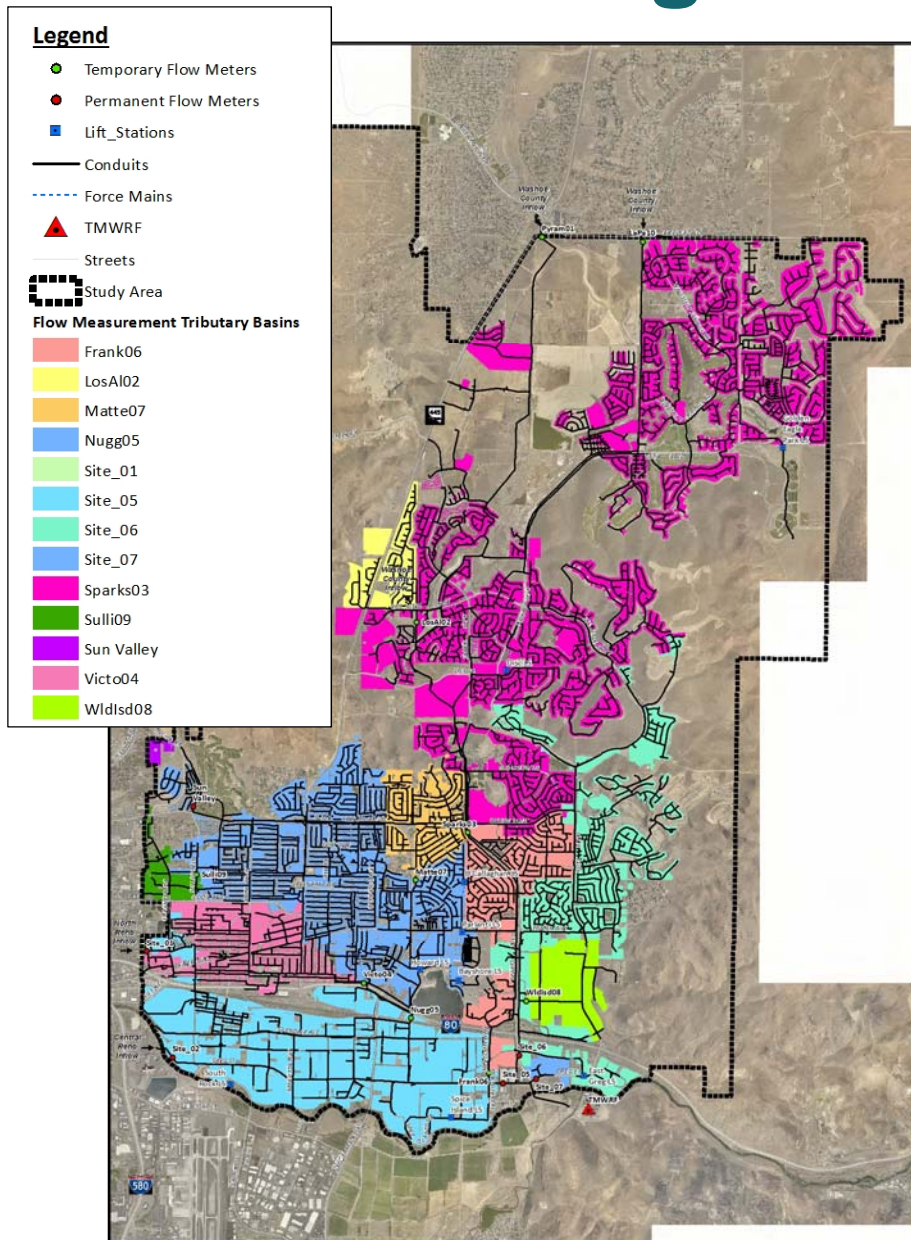
- 11.63 MGD in North Interceptor (2015)
- Sparks generates about 70% of North Interceptor flow
- Declining flows despite increase in population (2000 to 2015)
- Summer months typically yield highest sewage generation



Flow Metering



ATKINS



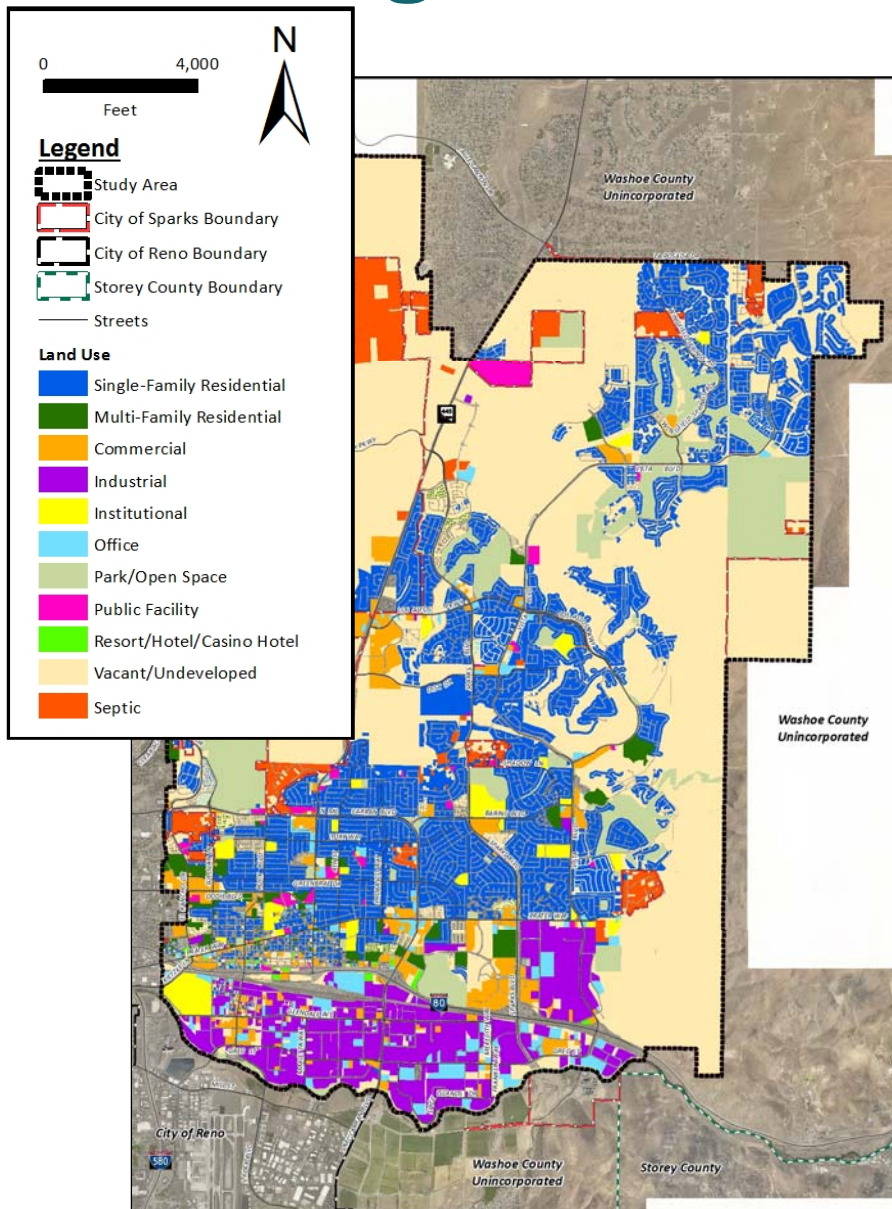
- 14-day metering period (June 18 - July 1, 2015)
- 6 permanent meters
- 10 temporary meters
- Metered external inflows from Sun Valley, Washoe County and City of Reno
- Significant storm occurred on June 30, 2015 and was captured in meter data



Existing Land Use



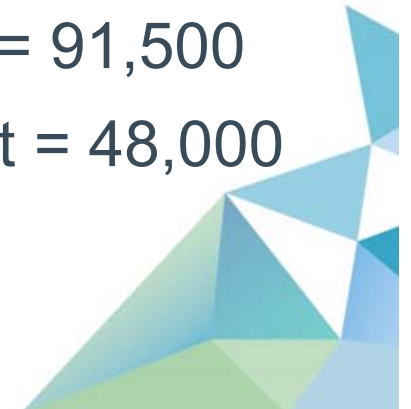
ATKINS



- 11 land use categories
- TMRPA land use GIS database
- Sparks' zoning data
- 36,000 parcels
- 39,000 residential dwelling units
- Populations:

Residential = 91,500

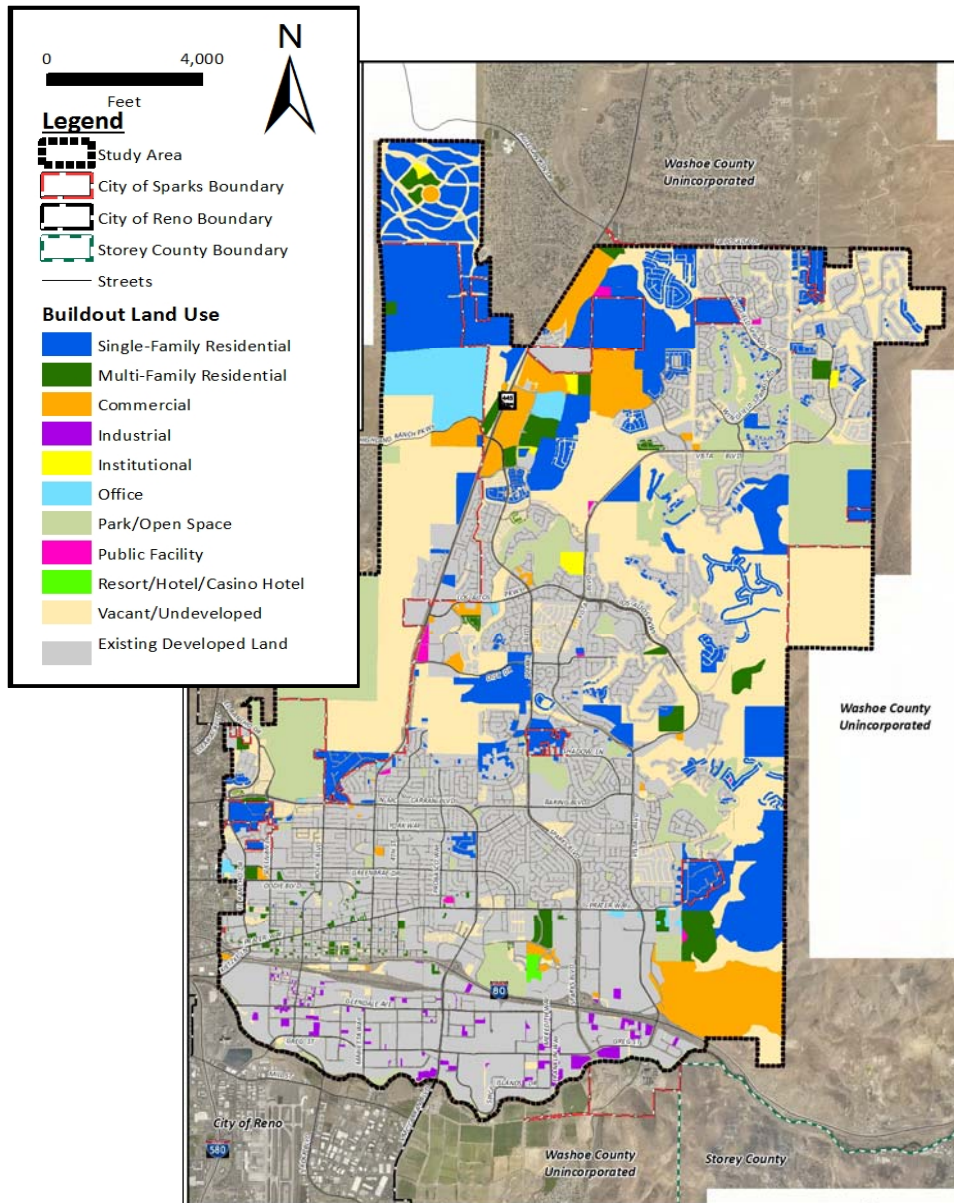
Employment = 48,000



Buildout Land Use



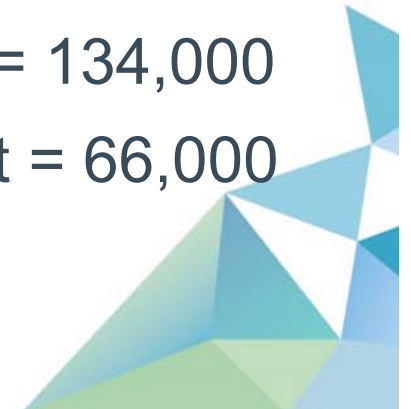
ATKINS



- Based on current Zoning Designations and unconstrained development area
- + 18,000 residential dwelling units
- + 1,900 non-residential acres
- Buildout populations:

Residential = 134,000

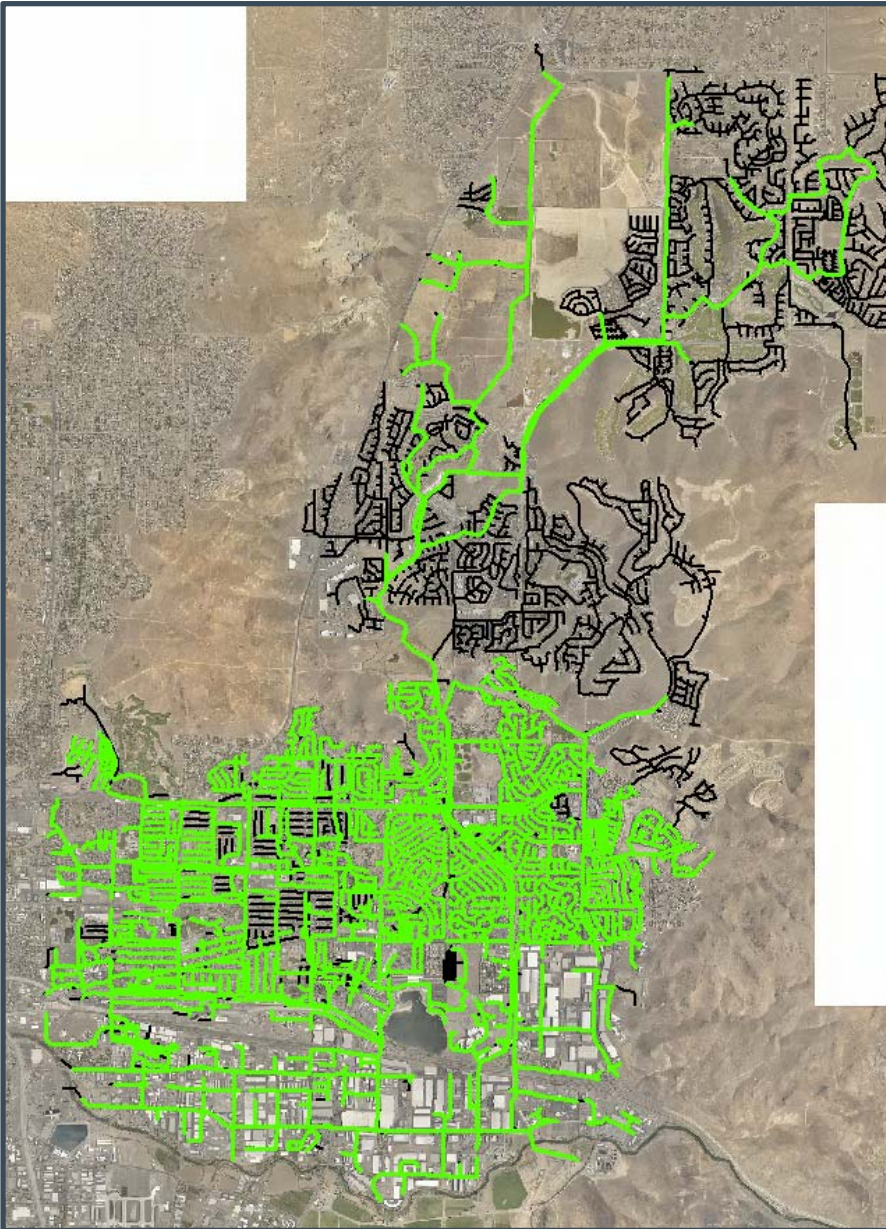
Employment = 66,000



Model Development



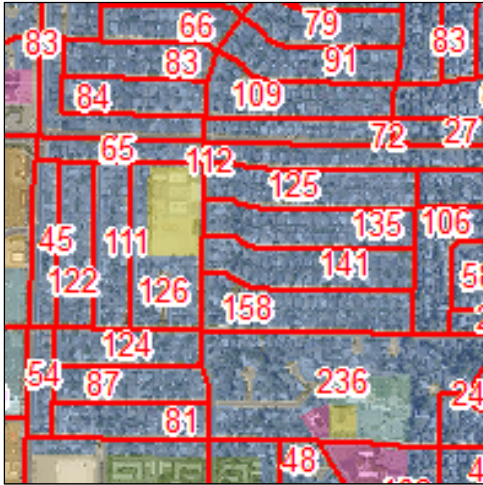
ATKINS



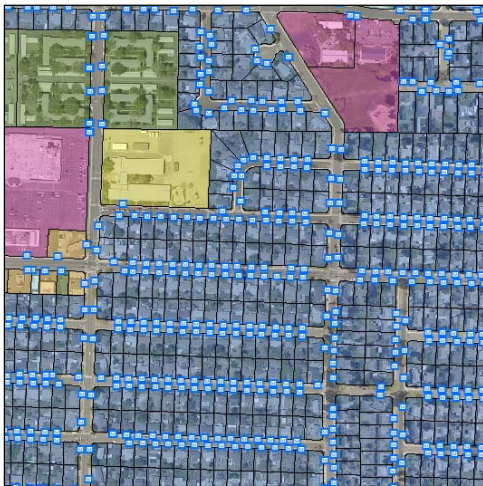
- Sparks GIS database
- As-built construction plan review
- Field inspection and survey
- 215 miles of sewer
- 65% of system
- External inflow inputs
- Truckee River siphon
- 5 lift stations
- Parcel-scale model



Data Sources



TMRPA population data
& US census block level data
(employment and residential)



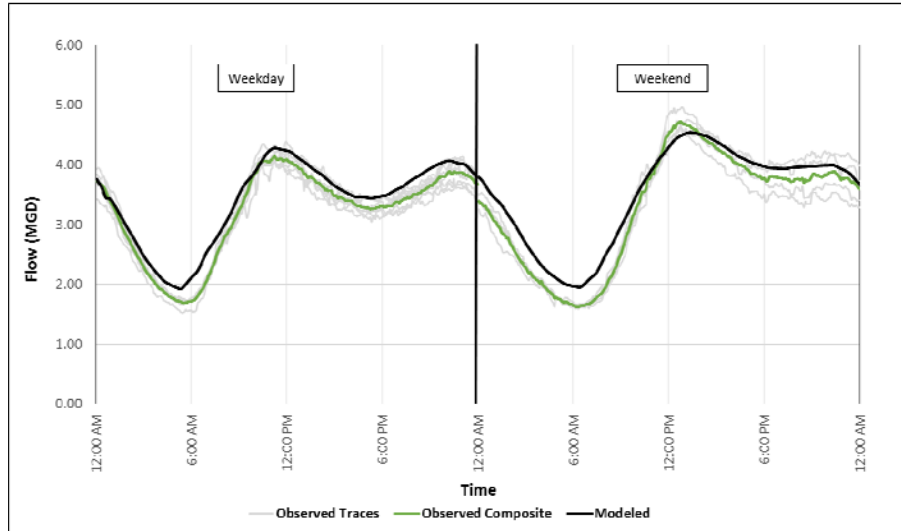
TMWA water meter records



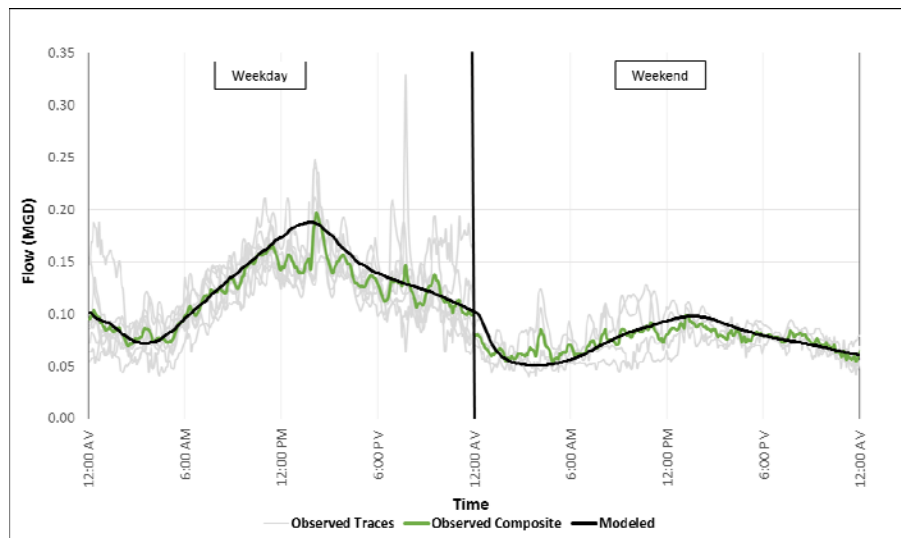
Dry Weather Model Calibration



ATKINS



Residential Calibration



Non-Residential Calibration

- Target of +/- 10% of observed peak flow and volume
- Weekday and weekend calibration
- Residential vs. non-residential patterns

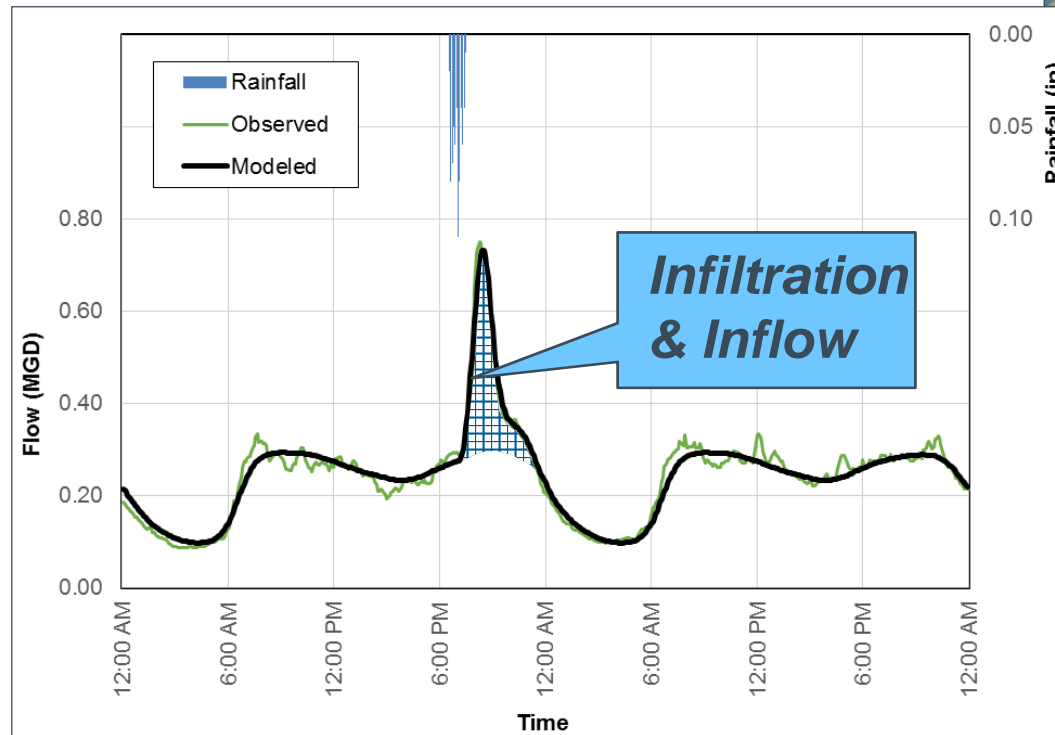


Wet Weather Model Calibration

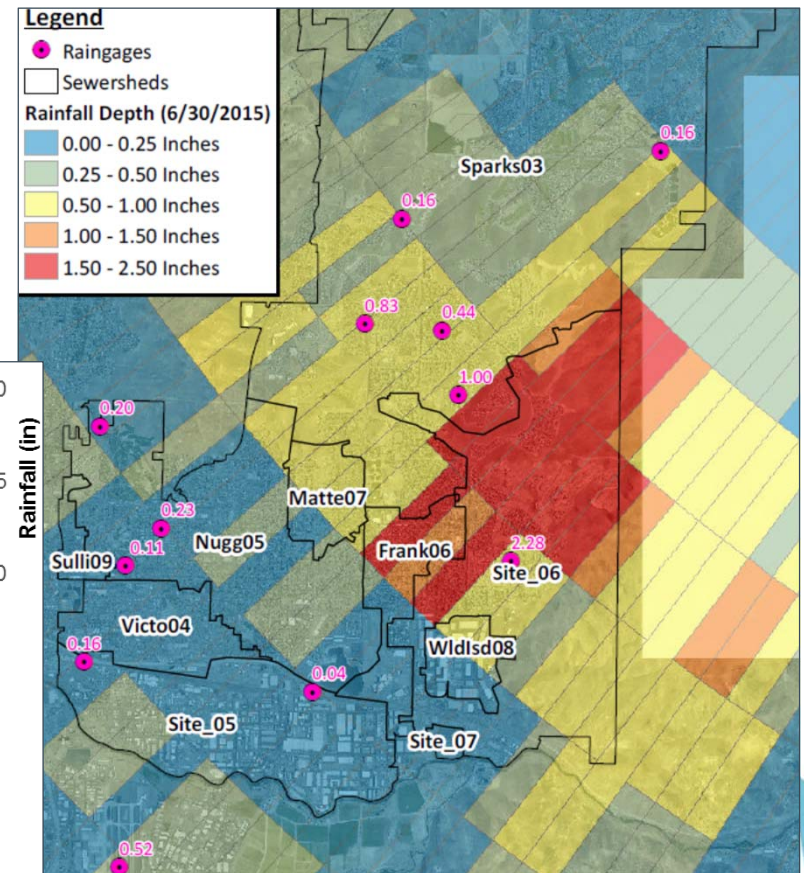


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- Rainfall derived inflow and infiltration (RDI&I)
- NEXRAD rainfall data

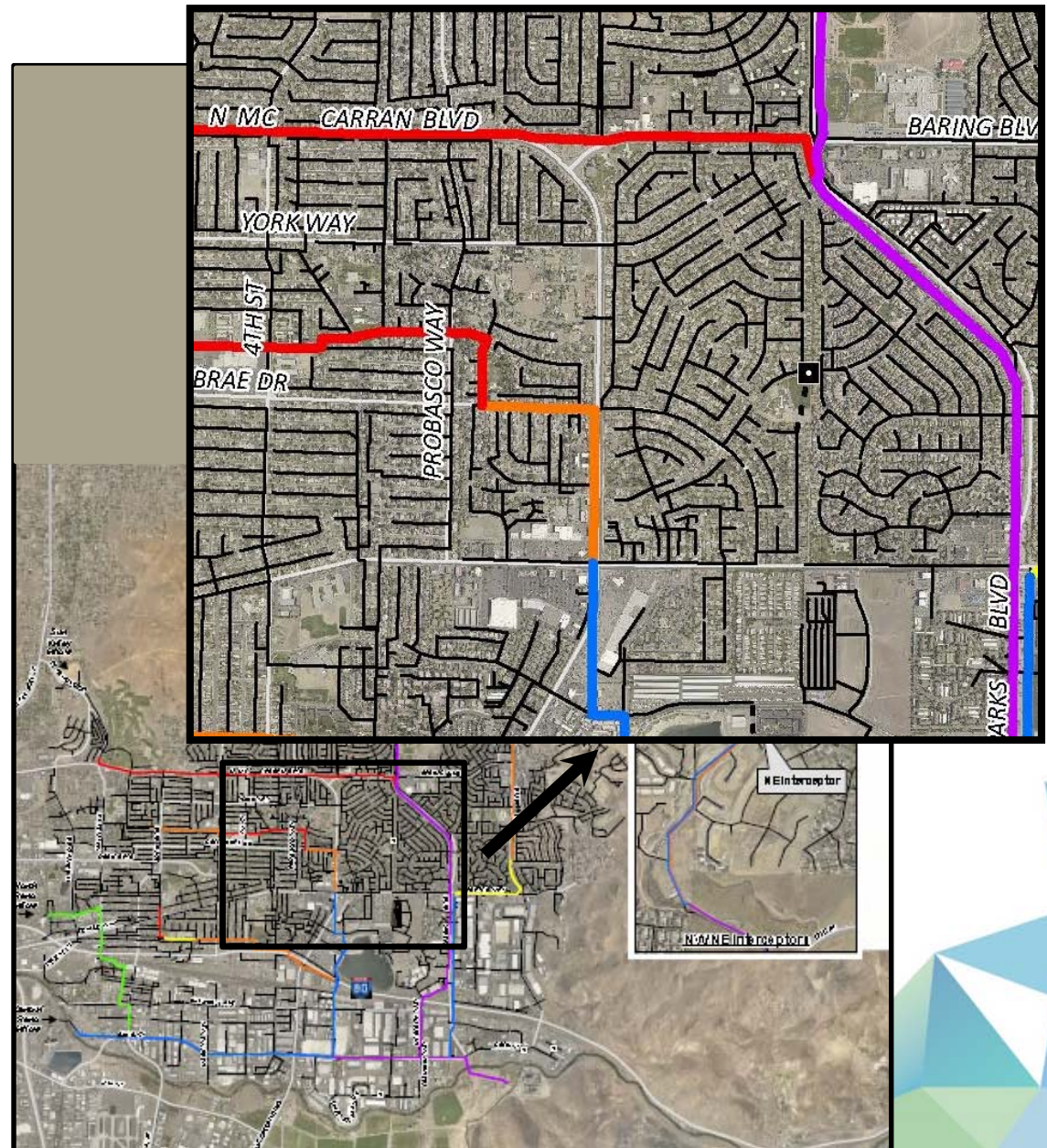
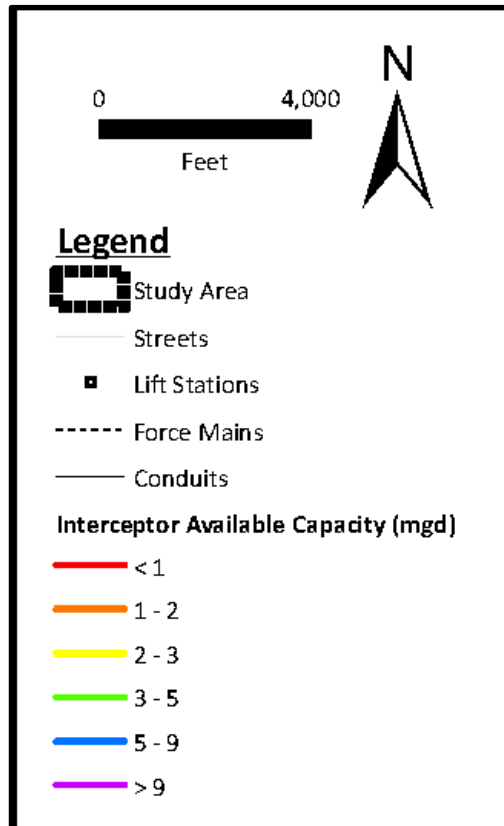


Wet Weather Response



NEXRAD Rainfall Data
(June 30, 2015 Storm)

Existing Conveyance System Capacity



CIP Development

CIP Cost Summary:

Results	Budget
Existing CIPs	\$10.2M
Bulldout CIPs	\$6.4M
Total CIPs	\$16.6M

- CIP Prioritization- existing vs. buildout, dry vs. wet weather
- Development timeline and triggers
- Excludes operation and maintenance costs



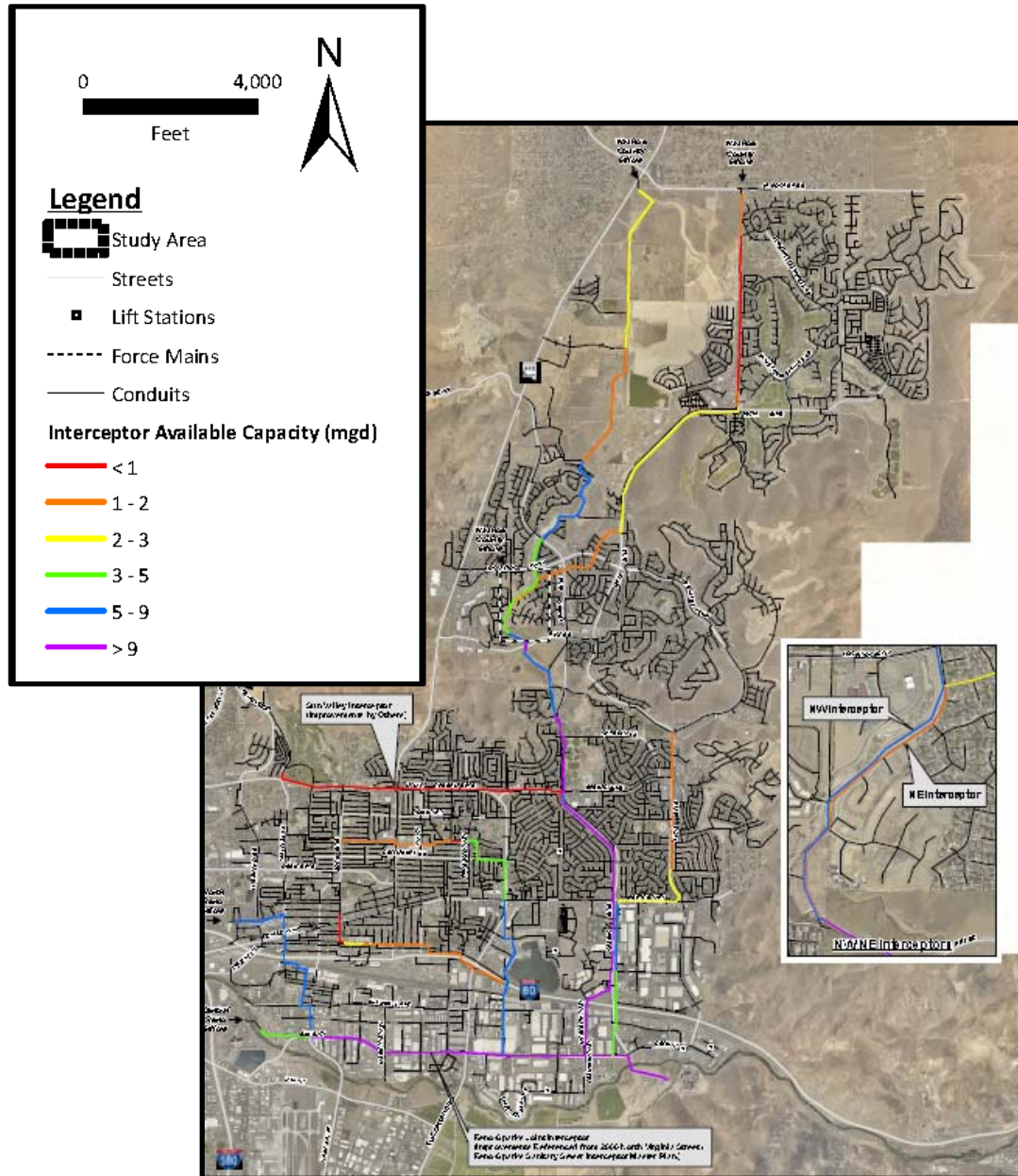
CIP Development

- Initial 5-year CIP programmed - \$7,216,915
 - Addresses high-priority project needs
-
- | | |
|---|-------------|
| ➤ El Rancho Drive Sanitary Sewer Reliever | \$1,477,810 |
| ➤ Stanford Way Sanitary Sewer Upsize | \$977,345 |
| ➤ FY20 Sanitary Sewer Project | \$1,759,875 |
| ➤ FY21 Sanitary Sewer Project | \$1,974,105 |
| ➤ FY22 Sanitary Sewer Project | \$1,027,780 |



Buildout Conveyance System Capacity

ATKINS



- Estimates of buildout sewer capacities assume full construction of all CIPs
- This \$16 million CIP provides sufficient conveyance capacity for buildout based on current Zoning Designations and unconstrained development areas



TMWRF Treatment Capacity



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- Current TMWRF permitted capacity is 40 million gallons per day (MGD)
- Current Flow to TMWRF is 28 MGD
 - 24 MGD discharged to Truckee River
 - 4 MGD discharged to Reuse
- Regional Planning Consensus Forecast (2035) is 35 MGD to TMWRF
- Total nitrogen disposal limits may restrict TMWRF capacity below the permitted capacity

Truckee Meadows Water Reclamation Facility



TMWRF Capacity Expansion



- Removal of Dissolved Organic Nitrogen
- Study underway with University of Nevada to identify effective treatment processes
 - Carbon column treatment
 - Ozone treatment
 - Enhanced Coagulation
- Options for expansion
 - Identify “stranded capacity”
 - Increase reuse
 - Expansion of TMWRF
- Once options are vetted, costs need to be determined



Sparks Sewer Flow Projections



- Current Total Contribution to TMWRF from Sparks system is 9.43 MGD
- At the end of the Consensus Forecast Period (2035) Sparks Contribution to TMWRF will be 13 MGD or less.
- Sparks share of TMWRF capacity is 14.58 MGD
- The model estimates that at buildout Sparks will require 16.35 MGD of treatment capacity at TMWRF

Study Area Sewer Flow Projections

Jurisdiction	Estimated Wastewater Generation (MGD)	
	Existing	Buildout
Washoe County	0.63	2.29
Sun Valley	0.94	2.10
City of Sparks	7.86	11.96
Total	9.43	16.35

- Capacity Agreements:
Washoe County = 2.29 MGD
Sun Valley = 2.10 MGD



Policy Implications

- Collection System and TMWRF CIP's may necessitate user fee and/or connection fee increases.
- Land use intensifications in excess of current land use assumptions will increase future costs of CIP and treatment.
- Delay in determining CIP costs, and adopting associated user and connection fees, will increase the magnitude of future fee hikes.



Next Steps



- Adoption of the model by City Council in February
- Continue evaluating TMWRF capacity expansion options
- Initiate user and connection fee rate study





Model Demonstration



Model Summary



**VISIONING
EXERCISES**



**DATABASE
DESIGN**

+



**LEGACY DATA
INTEGRATION**



**LIVING
DATABASE**

- Provides snapshot of data
- Allows for future data
- Incorporates business processes
- Provides actionable intelligence

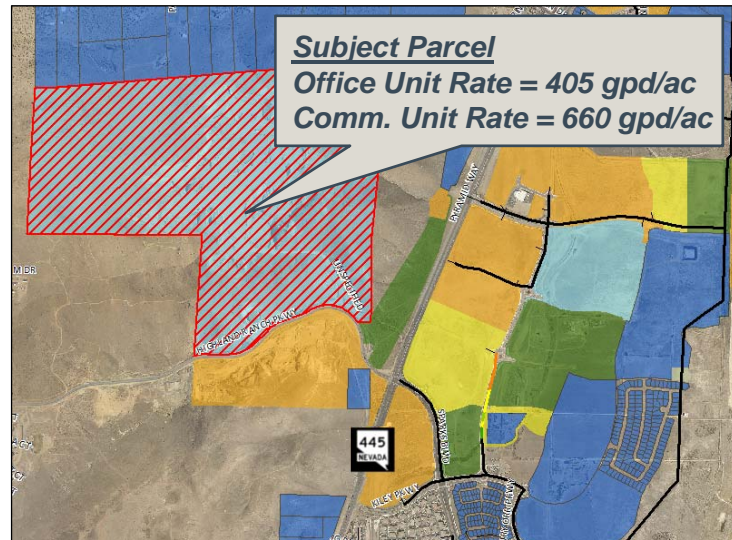
- The “Living” model approach
- Determine current system capacity
- Prepared for development and redevelopment inquiries



Land Use Change Example

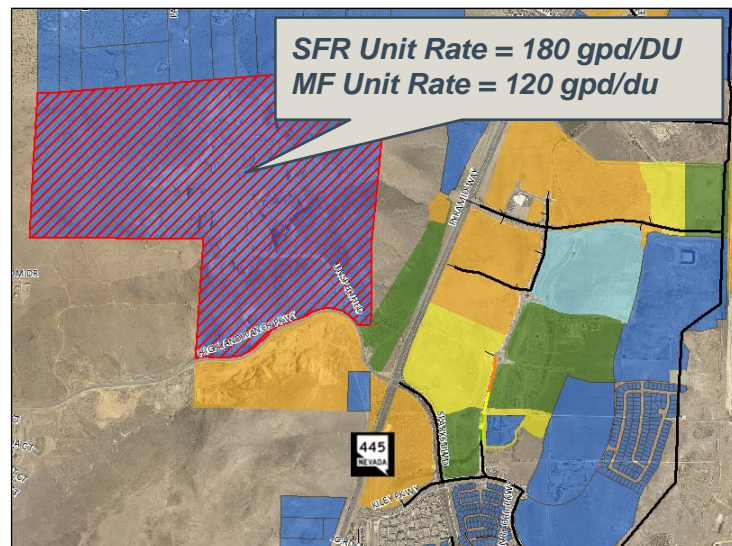


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Current Planned Land Use:

- 297 acres
- 84.2 acres Office
- 4.3 acres Commercial
- Remainder Open Space (5 units)
- 287 unconstrained acres
- Projected 0.038 MGD from parcel



Revised Land Use:

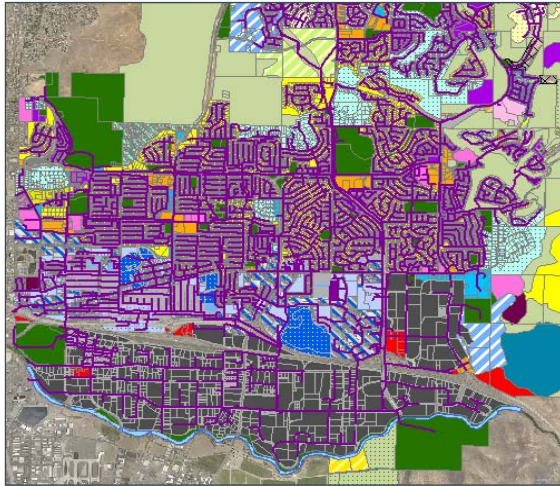
- 8 acres Commercial
- 1559 Single Family Units
- 422 Multi-Family Units
- 287 unconstrained acres
- Projected 0.337 MGD from parcel



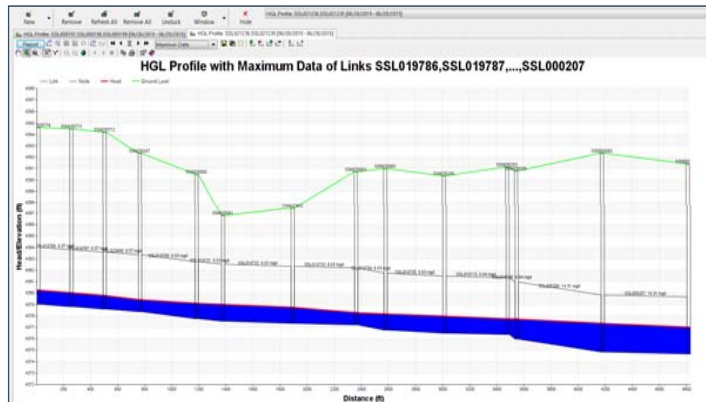
Steps



ATKINS



GIS Database



Hydraulic Model

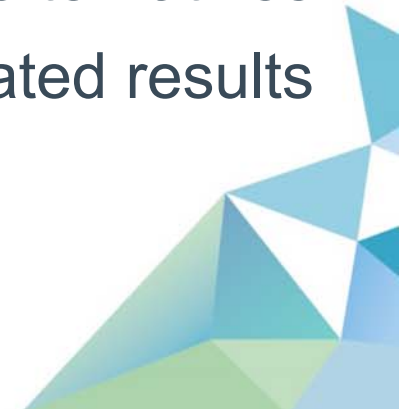
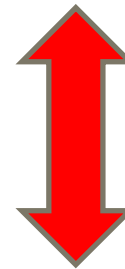
Steps

- 1) Update GIS parcel wastewater flows
- 2) Refresh model
- 3) Run model scenarios
- 4) View results
- 5) Determine impacts
- 6) Evaluate alternatives
- 7) View updated results

1 Hour



1+ Hours



Dynamic Results

Conduit (d/D) Results

— Criteria Satisfied

DWF Criteria Violated

— 0.50 - 0.60

— 0.60 - 0.70

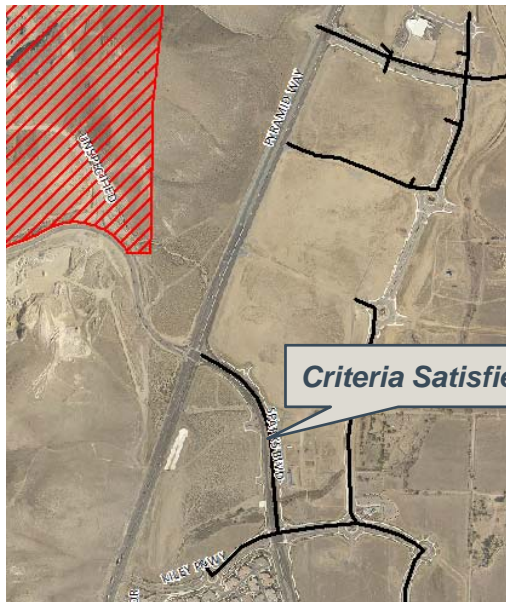
— 0.70 - 0.80

— 0.80 - 0.90

— > 0.90

WWF (5-Yr Storm) Criteria Violated

— > 0.90

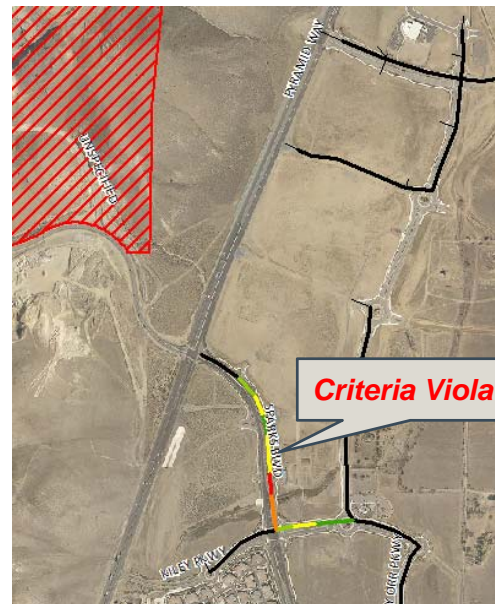


Current Zoning

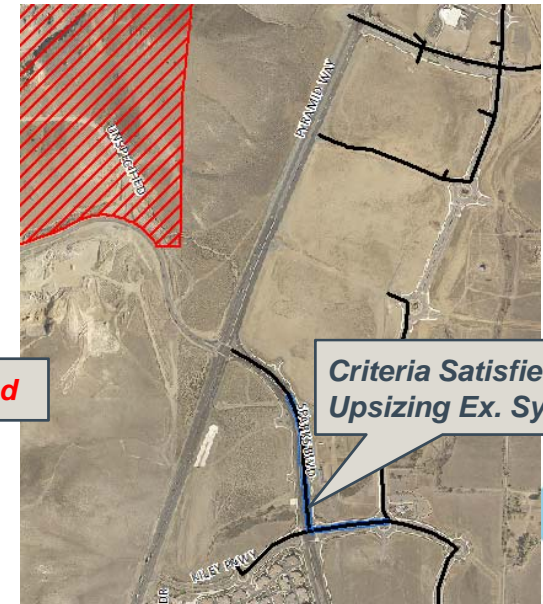
Benefits:

- Identify impacts
- Quick and informed decisions
- Sustainable approach

Revised Zoning



w/o Improvements



w/ Improvements

Questions?

