2017 Infrastructure Tracker Annual Update

April 27, 2017

QUESTAR Gas

Agenda

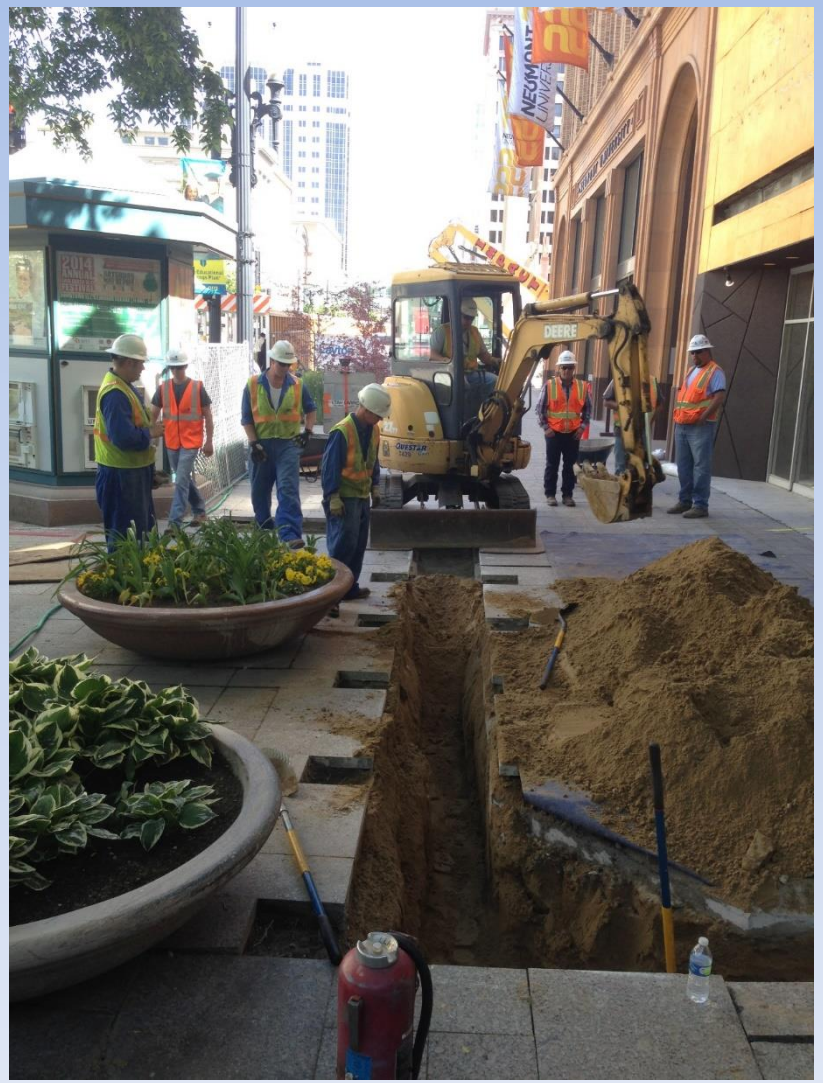
- PHMSA Mega Rule
- Belt Line Replacement
  - 2017 Projects
  - Scheduling
  - 2016 Cost Variance
- High Pressure Replacement
  - 2017 Projects Update
  - 2016 Cost Variance
  - Updated HP Replacement Program Evaluation Criteria
  - Scheduling

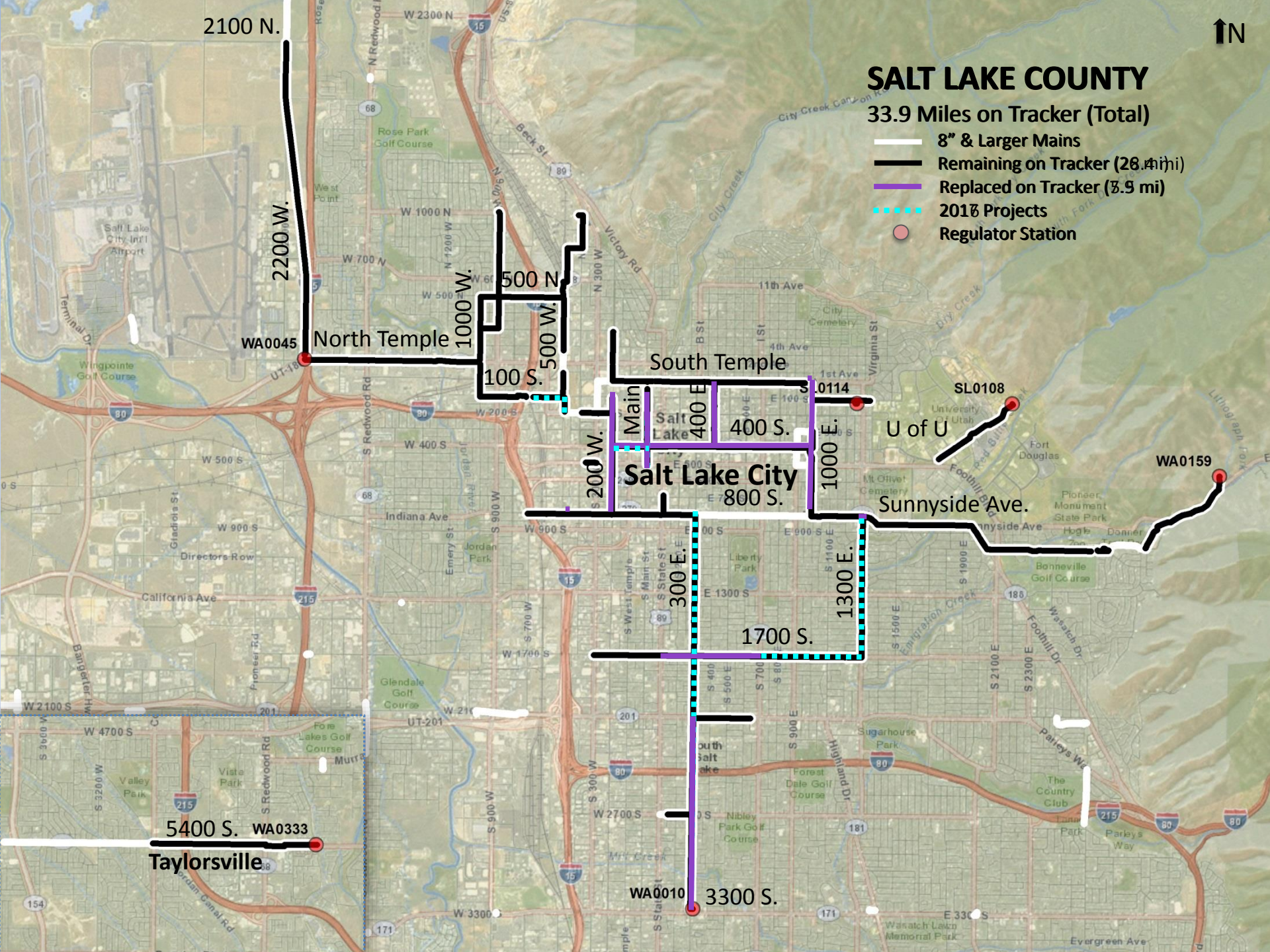
Pipeline Safety “Mega Rule” (not final)

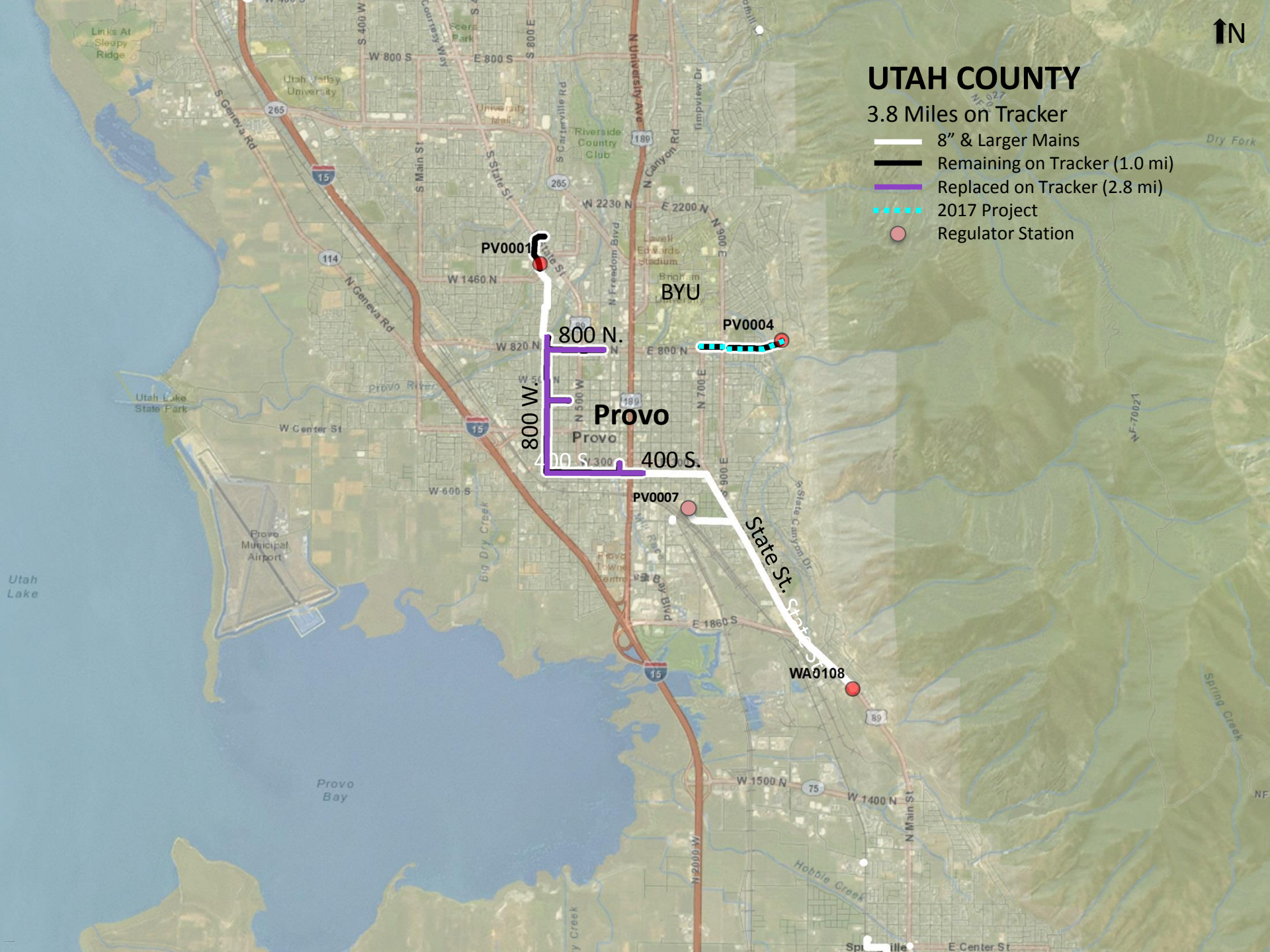
- New Administration Impacts
  - Delay of final rule
  - Speculation that non-statutory parts may be removed or reduced in scope (NTSB items)
    - Example: “the proposed rule’s guidance for verifying the maximum allowable operating pressures and materials of pipelines goes beyond what is covered under Congress’ mandate to the agency”
  - No clarifying information to date has been provided by PHMSA

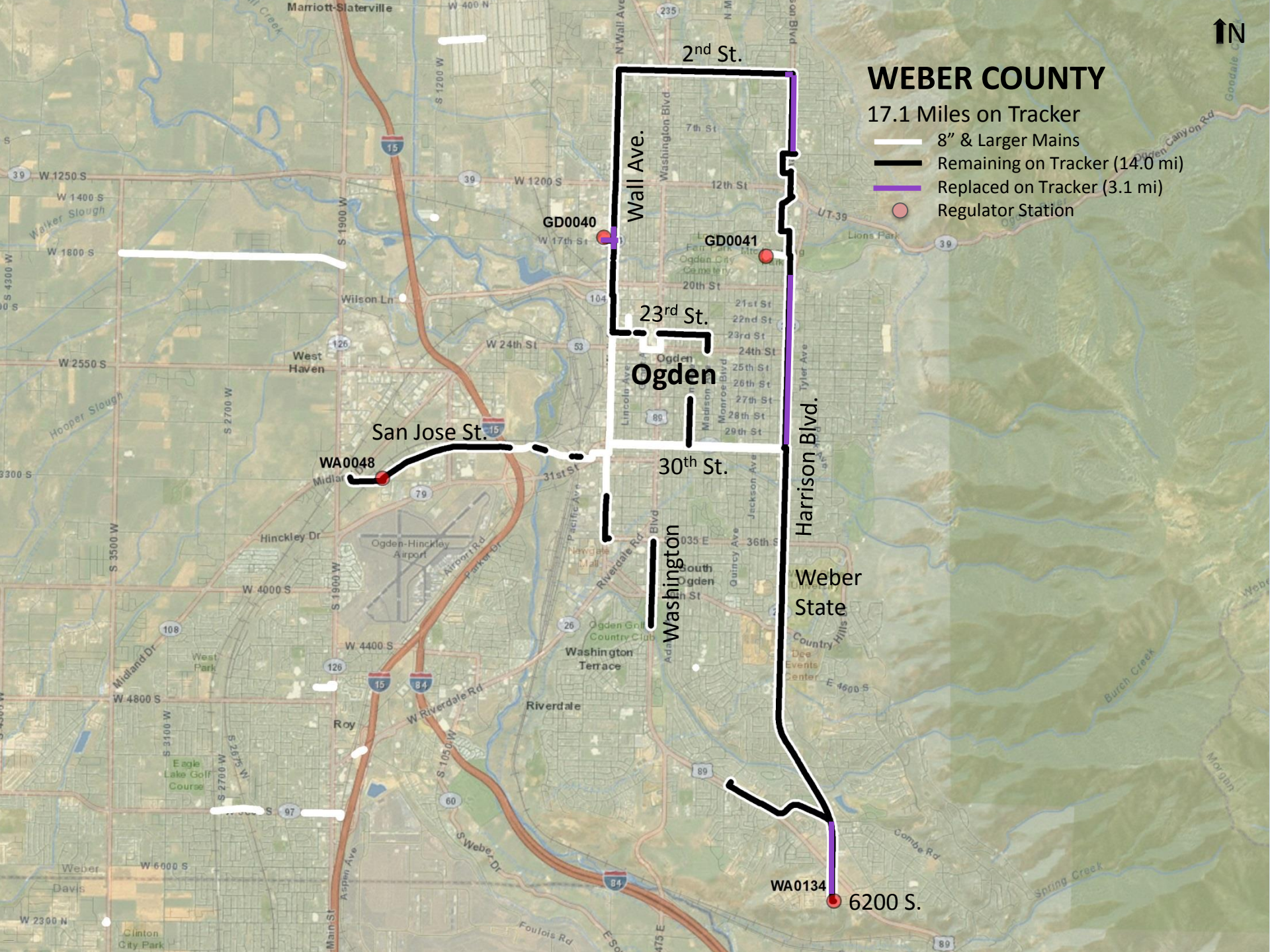
Belt Line Replacement

- Belt Line Maps
- Pipe Retired
- Pipe Remaining
- Work Prioritization
- Belt Line 2017
  - Schedule
  - Progress Update




SALT LAKE COUNTY
33.9 Miles on Tracker (Total)
8" & Larger Mains
Remaining on Tracker (26.4 mi)
Replaced on Tracker (7.5 mi)
2017 Projects
Regulator Station
N
2100 N.
2200 W.
1000 W.
500 N
500 W.
100 S.
North Temple
WA0045
South Temple
SL0114
SL0108
U of U
Main
Salt Lake
400 E
400 S.
200 W.
Salt Lake City
800 S.
1000 E.
Sunnyside Ave.
WA0159
300 E.
1300 E.
1700 S.
5400 S.
WA0333
Taylorsville
WA0010
3300 S.


N
UTAH COUNTY
3.8 Miles on Tracker
8” & Larger Mains
Remaining on Tracker (1.0 mi)
Replaced on Tracker (2.8 mi)
2017 Project
Regulator Station
PV0001
BYU
PV0004
800 N.
800 W.
Provo
400 S.
PV0007
State St.
WA0108
Links At Sleepy Ridge
Utah Valley University
Riverside Country Club
Lavell Edwards Stadium
Utah Lake State Park
Provo Municipal Airport
Utah Lake
Provo Bay
Dry Fork
Spring Creek
Hobble Creek
W 800 S
E 800 S
W 2230 N
E 2200 N
W 1460 N
W 820 N
E 800 N
W Center St
W 600 S
E 1860 S
W 1500 N
W 1400 N
E Center St
N University Ave
N Freedom Blvd
N Canyon Rd
S State St
S Main St
N Main St
S Geneva Rd
N Geneva Rd
W 2000 W
N 500 W
N 700 E
E 900 S
S State Canyon Dr
Big Dry Creek
Provo River


N
WEBER COUNTY
17.1 Miles on Tracker
8" & Larger Mains
Remaining on Tracker (14.0 mi)
Replaced on Tracker (3.1 mi)
Regulator Station
2nd St.
Wall Ave.
GD0040
GD0041
23rd St.
Ogden
San Jose St.
WA0048
30th St.
Harrison Blvd.
Washington
Weber State
WA0134
6200 S.
Marriott-Slaterville
West Haven
Hinckley Dr
Ogden-Hinckley Airport
Washington Terrace
Riverdale
Roy
Davis
Clinton City Park
Eagle Lake Golf Course
Ogden Golf & Country Club
Lions Park
Ogden City Cemetery
Dee Events Center
Newgate Mall
Wilson Ln
W 24th St
W 2550 S
W 1250 S
W 1200 S
W 1400 S
W 1800 S
W 4000 S
W 4400 S
W 4800 S
W 6000 S
W 2300 N
W Riverdale Rd
S Weber Dr
Foulois Rd
Combe Rd
Spring Creek
Burch Creek
Hooper Slough
Walker Slough
Ogden Canyon Rd
UT-39
Midland Dr
Aspen Ave
Main St
Washington Blvd
Riverdale Rd
Pacific Ave
Lincoln Ave
Madison
Monroe Blvd
Tyler Ave
Jackson Ave
Quincy Ave
Country Hills
7th St
12th St
20th St
21st St
22nd St
23rd St
24th St
25th St
26th St
27th St
28th St
29th St
31st St
36th St
E 4600 S

DAVIS COUNTY
15.3 Miles on Tracker
8" & Larger Mains
Remaining on Tracker (14.2 mi)
Replaced on Tracker (1.0 mi)
2017 Project
Regulator Station
N
SY0001
Clearfield
CL0007
Freeport Cntr
Bluff Rd.
Gentile St.
Layton
LY0001
KY0001
Kaysville
Fruit Heights
WA0402
Shepard Ln.
Farmington
WA0215
WA0784
Pages Ln.
BF0005
Bountiful
WA0385
1100 N.
NSL
Hill Afb
Syracuse
Centerville
Woods Cross
Farmington Bay
Antelope Island State Park
Wasatch-Cache National Forest

Belt Line 2016 Cost Variances

Project	Budget	Actual	Variance	Explanation
Salt Lake County	8,215,000	8,458,628	(243,628)	Re-route of 16” pipe on 300 East resulted in an additional approximate 1,600’ of pipe installation.
Davis County	75,000	241,209	$(166,209)	Installation costs higher than anticipated
Total	**$8,290,000**	**$8,699,837**	**$(373,422)**	

Belt Line Pipe

Original Tracker Pipe		
	Footage	**Miles**
Salt Lake County	178,848	33.9
Utah County	20,242	3.8
Weber County	90,259	17.1
Davis County	80,606	15.3
Total	**369,955**	**70.1**

Belt Line Pipe

Original Tracker Pipe		
	Footage	**Miles**
Salt Lake County	178,848	33.9
Utah County	20,242	3.8
Weber County	90,259	17.1
Davis County	80,606	15.3
Total	**369,955**	**70.1**

Retired Tracker Pipe		
	Footage	**Miles**
Salt Lake County	41,502	7.9
Utah County	15,138	2.9
Weber County	16,169	3.1
Davis County	5,398	1.0
Total	**78,207**	**14.8**

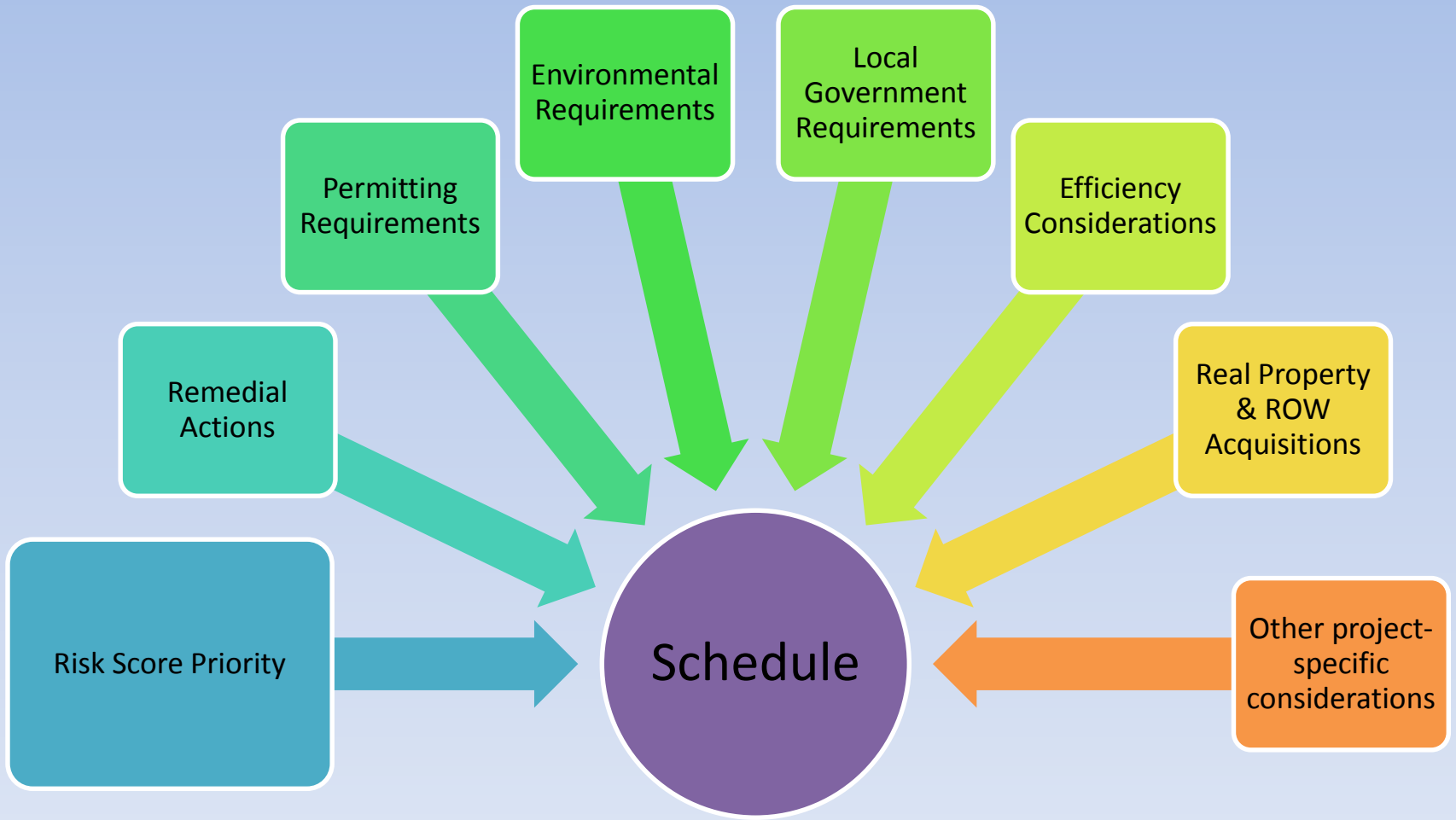
Belt Line Pipe

Original Tracker Pipe		
	Footage	**Miles**
Salt Lake County	178,848	33.9
Utah County	20,242	3.8
Weber County	90,259	17.1
Davis County	80,606	15.3
Total	**369,955**	**70.1**

Retired Tracker Pipe		
	Footage	**Miles**
Salt Lake County	41,502	7.9
Utah County	15,138	2.9
Weber County	16,169	3.1
Davis County	5,398	1.0
Total	**78,207**	**14.8**

Remaining Tracker Pipe		
	Footage	**Miles**
Salt Lake County	137,346	26.0
Utah County	5,104	1.0
Weber County	74,090	14.0
Davis County	75,208	14.2
Total	**291,748**	**55.3**

Scheduling Belt Line Replacements



Scheduling per Section III of the Settlement Stipulation, Docket 13-057-05, Exhibit 5

Project Segments

March 2016 Risk Score Priority

Segment Priority:

Partially Complete Segments

20, 28, 15, **16**, 27, **17**, 9, 7, 26, 14, **4**, **10**, 29, **21**, 8, 45, 18, 12, 39, 46, 44, 31, 42, 11, 6, 53, **40**, **37**, 38, **22**, 36, **41**, 30, 19, **13**, 47, 34, 43, 25, 24, 23, 48, 49, 51, 50, 32, 33.

Completed segments:

1, 2, 3, 5, 35, 52, 54

March 2017 Risk Score Priority

Segment Priority:

Partially Complete Segments

28, 9, 7, **10**, 15, 26, **4**, **17**, 27, **20**, 14, 29, **21**, 8, 45, 39, 12, **16**, 18, 46, 31, 44, 42, 11, 38, 6, 53, 36, **13**, **37**, **41**, **22**, 30, 47, 19, 34, 24, 23, 43, **40**, 49, 48, 51, 50, 25, 32, 33.

Completed segments:

1, 2, 3, 5, 35, 52, 54

- Prioritized by relative risk score

2017 Risk Score Priority

Segment Priority:
28, 9, 7, 10, **15**, **26**, 4, **17**, **27**, **20**, 14, 29, **21**, 8, 45, 39, 12, 16, 18, 46, 31, 44, 42, 11, 38, 6, 53, 36, 13, 37, 41, 22, 30, 47, 19, **34**, 24, 23, 43, 40, 49, 48, **51**, **50**, 25, 32, 33.

***2017 segments**

Remedial Actions

SME info
-Segment **17**
Leaking Valve
-Segments **26** & **27**
Shorted Casing

Permitting Requirements

Environmental Requirements

Local Government Requirements

SLC 2018 1300 E road reconstruction
-Segment **21**

Efficiency Considerations

2017 FL Replacement
- Segments **50**, **51**
BYU HP Line
-Segment **34**

Schedule

Real Property & ROW Acquisitions

Other project-specific considerations

Reviewed March 2017 rankings. Revised project scheduling for other considerations.

2017 Schedule

Segments:
17 (1700 S, SLC)
21 (1300 E, SLC)
34 (820 N, Provo)
50 & 51 (Davis County)
15 & 20 (300 E, SLC)
26 & 27 (100 S, SLC)

Belt Line 2017

- Current 2017 Projects Schedule:
  - Salt Lake County ($6.97M)
    - 1700 S in SLC (February - May)
    - 1300 E in SLC (February – July)
    - 300 E in SLC (Summer)
    - 100 S in SLC (Summer)
  - Utah County ($1.10M)
    - 820 N in Provo (Spring-Fall)
  - Davis County ($9.02M)
    - Phase I with FL replacement (January – December)

Belt Line Work 2017

Belt Line:	1700 S between 700 E & 1300 E in Salt Lake City, Salt Lake Co.
Construction:	February – May 2017
Challenges Include:	Limited closures and workspace
Footage:	4,600 ft.

Belt Line Work 2017

Belt Line:	1300 E between 800 S and 1700 S in Salt Lake City, Salt Lake Co.
Construction:	February – July 2017
Challenges Include:	Limited closures and workspace. Heavy traffic.
Footage:	7,000 ft.

Belt Line Work 2017

Belt Line:	100 S between 700 W and 500 W and 500 W between 100 S and 200 S in Salt Lake City, Salt Lake Co.
Construction:	Summer 2017
Challenges Include:	Running line, limited workspace, pedestrian traffic
Footage:	2,200 ft.

Belt Line Work 2017

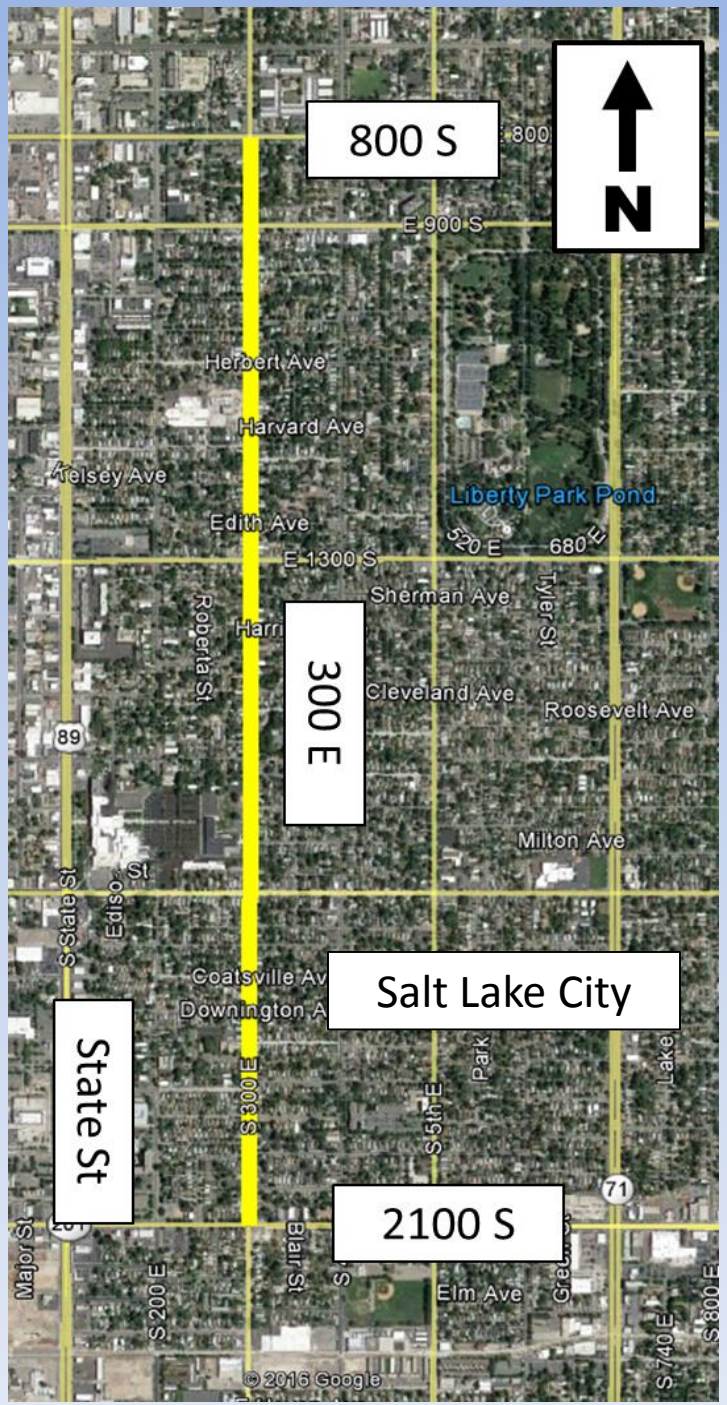
Belt Line:	820 N from 700 E to Oakmont Lane in Provo, Utah Co.
Construction:	June-November
Challenges Include:	Limited workspace, running line, vehicular and pedestrian traffic
Footage:	4,000 ft.

Belt Line Work 2017

Belt Line:	Davis County Beltline Replacement in conjunction with FL21-50 replacement
Construction:	January – December
Challenges Include:	Water table, working over existing lines, permits
Footage:	29,000 ft.

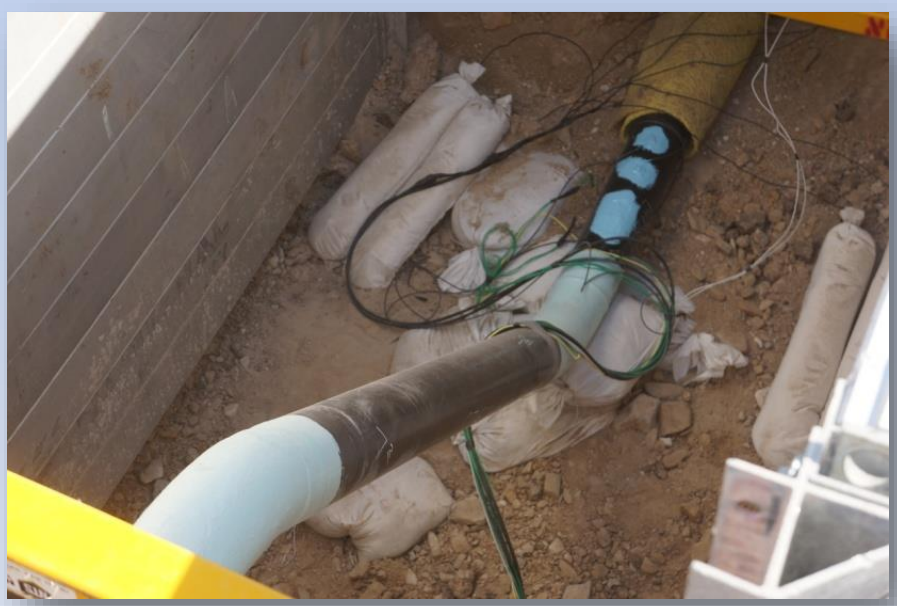
Belt Line Work 2017

Belt Line:	300 E between 800 S and 2100 Salt Lake City
Construction:	Summer 2017
Challenges Include:	Limited workspace, pick and relay due to congested utility corridor
Footage:	Approx. 3,300 ft.



High Pressure Replacement

- HP Replacement Program
  - 2017 Projects Update
  - 2016 Cost Variance
  - Updated HP Replacement Program Evaluation Criteria
  - Scheduling

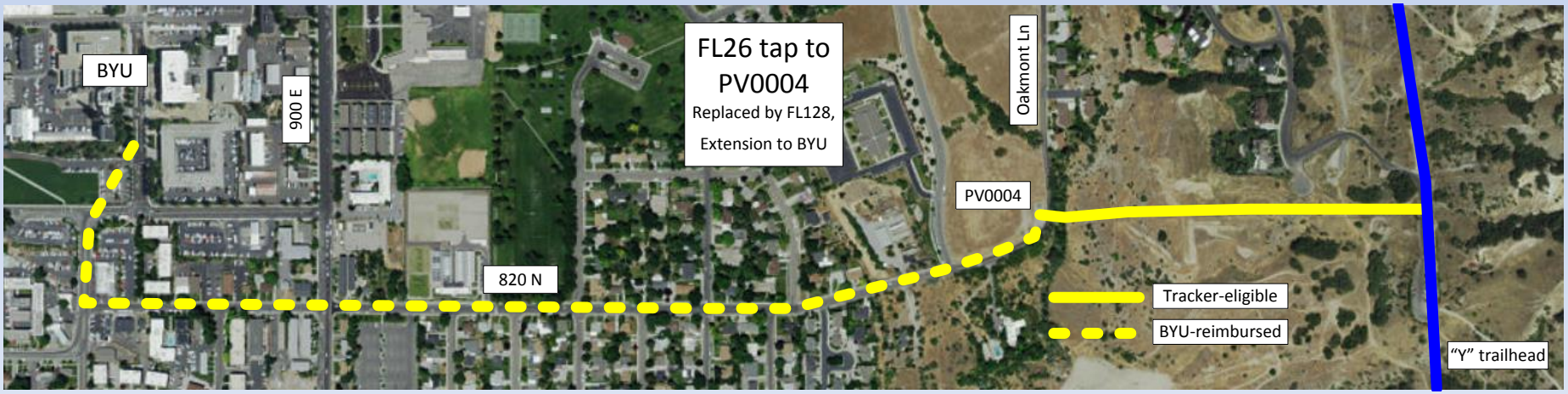


Feeder Line Update

Line:	21-50
Schedule:	2017-2020
Challenges Include:	Water table, working over existing lines, UDOT permits
2017 Budget	$45,500,950
2017 Footage:	54,280 ft.

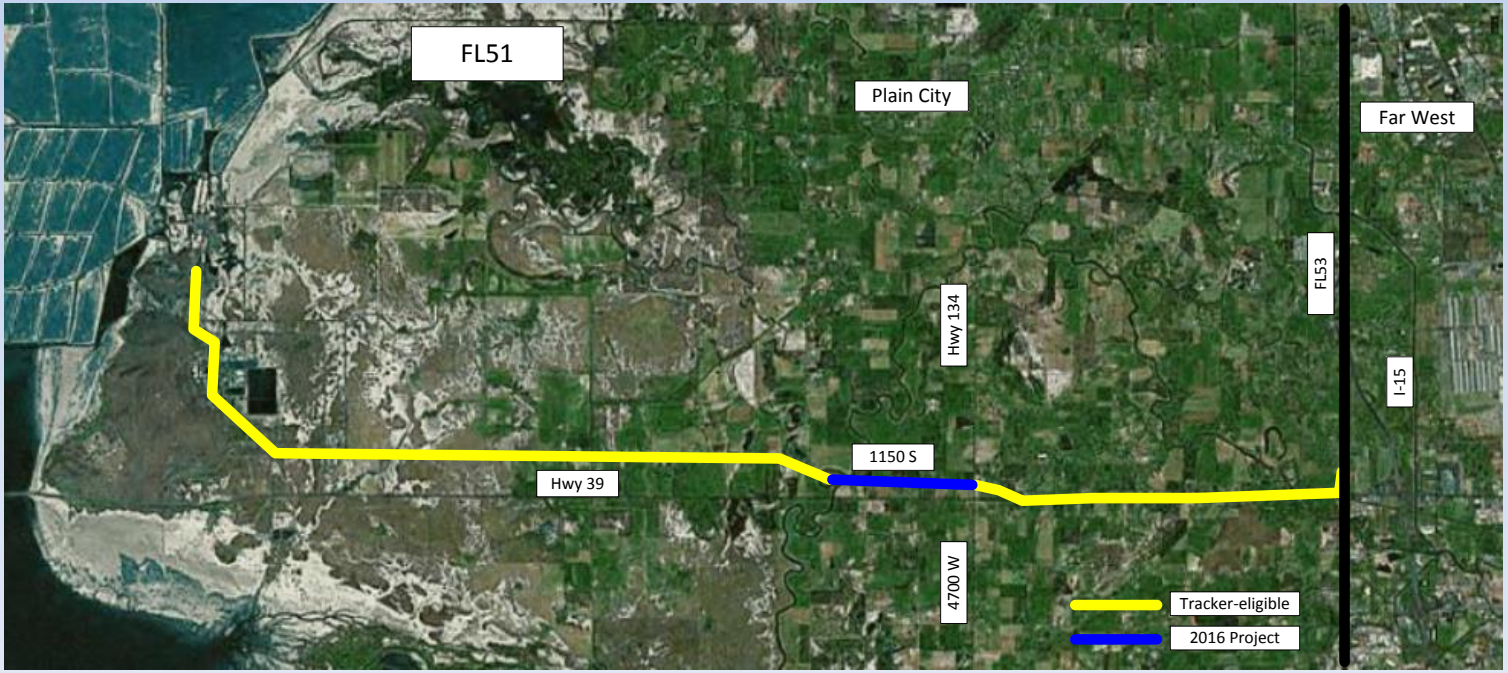
Feeder Line Update

Line:	PV0004 (tap on FL26)
Schedule:	2017 pending BYU approval
Challenges Include:	Coordination with BYU construction project
2017 Budget	$400,000
2017 Footage:	1,400 ft. (to retire)



Feeder Line Update

Line:	FL51
Schedule:	Unknown
Challenges Include:	Coordinating construction schedules
2017 Budget	Unknown
2017 Footage:	Road construction by Weber County west of 2016 replacement work.



2016 Cost Variance

Project	Budget	Actual	Variance	Explanation
FL6	$8,500,000	$7,372,767	$1,127,233	Retirement and Restoration efforts will be complete in spring 2017.
FL24	$27,300,000	$29,039,092	$(1,739,092)	Multiple reroutes through Orem and Provo added extra time and footage. UDOT required bore be attempted. Failed bore crossing of a UDOT road.
FL21 (FL117)	$17,000,000	$16,594,897	$405,103	Retirement and Restoration efforts will be complete in spring 2017
FL11-FL13	$1,250,000	$1,774,319	$(524,319)	Expanded wetland and difficulty handling and disposing of ground water.
FL89	$4,000,000	$3,350,141	$649,859	Retirement and Restoration efforts will be complete in spring 2017
FL51	$4,000,000	$3,698,440	$301,560	Mild winter conditions and minimal restoration requirements contributed to this project being under planned spend.
Pre-engineering	$550,000	$500,045	$49,955	
Total	**$62,600,000**	**$62,329,702**	**$270,299**	

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

Likelihood of Failure (LOF)

Previous	New
Construction Year (14%[a])	**Construction (15%[b])**
Pipe/Equipment Condition (24%[a])	**Manufacturing (55%[b])**
Manufacturing – Pipe (14%[a])	**External Corrosion (30%[b])**
Pressure Test Records (24%[a])	
Reconditioned (24%[a])	

[a] SME-based weighting

[b] Weighting based on Incident Counts from PHMSA Database

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

Likelihood of Failure (LOF)

Previous

✓ **Construction Year (14%[a])**

- Pre-1955 – High Risk
- 1955 - 11/1970 – Medium Risk
- Post 11/1970[a] – Low Risk

✓ **Pipe/Equipment Condition (24%[a])**

- SME

Manufacturing – Pipe (14%[a])

Pressure Test Records (24%[a])

Reconditioned (24%[a])

[a] SME-based weighting

New

Construction (15%[b])

- Construction Year
  - Pre-1948 or unknown
  - Post 1948 through pre-1955
  - Post 1955 through November 1970
  - Post November 1970 and pre-1985
  - 1985 or later
- Construction SME Factor
- Leak History from Construction Threats

Manufacturing (55%[b])

External Corrosion (30%[b])

[b] Weighting based on Incident Counts from PHMSA Database

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

Likelihood of Failure (LOF)

Previous

✓ **Construction Year (14%[a])**

✓ **Pipe/Equipment Condition (24%[a])**

✓ **Manufacturing – Pipe (14%[a])**

- Low Freq Electric Resistance Weld – High
- Electric Flash Weld – High
- Longitudinal Seam Weld Factor< 1.0 – High
- Pre-1960 – Medium Risk
  - Double Submerged Arc Weld
  - Submerged Arc Weld
- Post 1960 – Low

✓ **Pressure Test Records (24%[a])**

- Record not found – High
- Record found - Low

✓ **Reconditioned (24%[a])**

- Yes – High
- No – Low

[a] SME-based weighting

New

Construction (15%[b])

Manufacturing (55%[b])

- Longitudinal Seam Weld Type
  - (Low Freq) Electric Resistance Weld
  - Submerged Arc Welded
  - Electric Flash Weld
  - Seamless
  - Continuous Seam Weld
  - Double Submerged Arc Weld
  - High Frequency Electric Resistance Weld
- Post-Construction Pressure Test
  - No test history or test less than 1.1 x MAOP
  - Test pressure of at least 1.10x MAOP
  - Test pressure to at least 1.25x MAOP
  - Test pressure to at least 1.50x MAOP
  - Test pressure to 2.00x MAOP or greater
- Reconditioned Pipe Factor
  - Yes
  - No

External Corrosion (30%[b])

[b] Weighting based on Incident Counts from PHMSA Database

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

Likelihood of Failure (LOF)

Previous	New
✓ **Construction Year (14%[a])** ✓ **Pipe/Equipment Condition (24%[a])** ✓ **Manufacturing – Pipe (14%[a])** ✓ **Pressure Test Records (24%[a])** ✓ **Reconditioned (24%[a])**	**Construction (15%[b])** **Manufacturing (55%[b])** ○ Manufacturing SME Factor ○ Leak History from Manufacturing Threats ○ Operating Stress Level (%SMYS) • Below 10% • 10% to <20% • 20% to <30% • 30% to <40% • 40% or greater **External Corrosion (30%[b])** ○ TIMP Evaluation (Coating, Age, History, etc.)

[a] SME-based weighting

[b] Weighting based on Incident Counts from PHMSA Database

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

Consequence of Failure (COF)

Previous	New
HCAs (67%) **Census Data (33%)**	**Population (Safety) (80%)** **Throughput (Volume) (20%)**

HP Replacement Risk Evaluation Criteria

Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

- Summary of Improvements
  - Industry expert, Dynamic Risk, developed algorithms for Questar Gas utilizing current industry data and research
  - PHMSA incident based threat weightings
  - Data-driven
    - Geographical-information-system (GIS) based
    - More parameters
    - Improved utilization of system data
  - Increased granularity

Feeder Lines

- Prioritized by HP criteria

Prev. HP Criteria

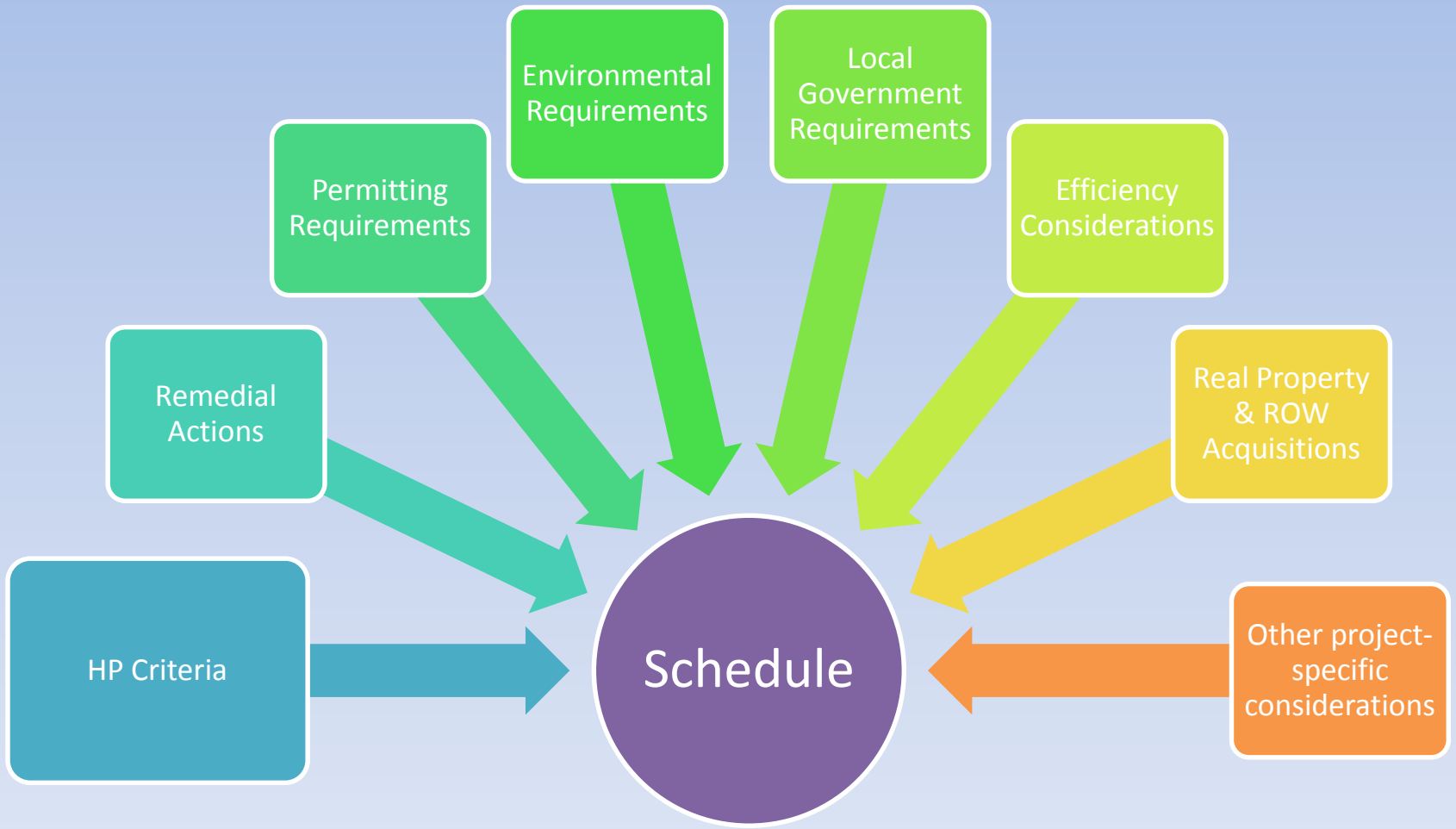
[redacted]

New HP Criteria

[redacted]

1- FL11-2 and FL11-2A were renamed to FL120.

Scheduling Feeder Line Replacements



Scheduling per Section III of the Settlement Stipulation, Docket 13-057-05, Exhibit 4

HP Criteria

[redacted]

Remedial Actions

Permitting Requirements

Environmental Requirements

Local City Requirements

- FL51: Accommodate Weber County road project.

Efficiency Considerations

- FL26: Coordinated with Utah County Belt Line.

Real Property & ROW Acquisitions

Other project-specific considerations

Schedule

2017 Schedule

- FL26
- FL21-50
- FL21-20 (Retire Only)
- FL51?

1- FL11-2 and FL11-2A were renamed to FL120.

2017 Schedule

Line	Location
FL26	Utah County
FL21	Davis County
FL51??	Weber County

Updated Schedule

- Original plan had a 2028 completion date.
- Updated plan has completion date as of 2035.
- Improved granularity of estimates.
- Costs higher than anticipated.
- Company anticipates seeking increase in annual budget in its next general rate case.

QUESTIONS?