



# 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



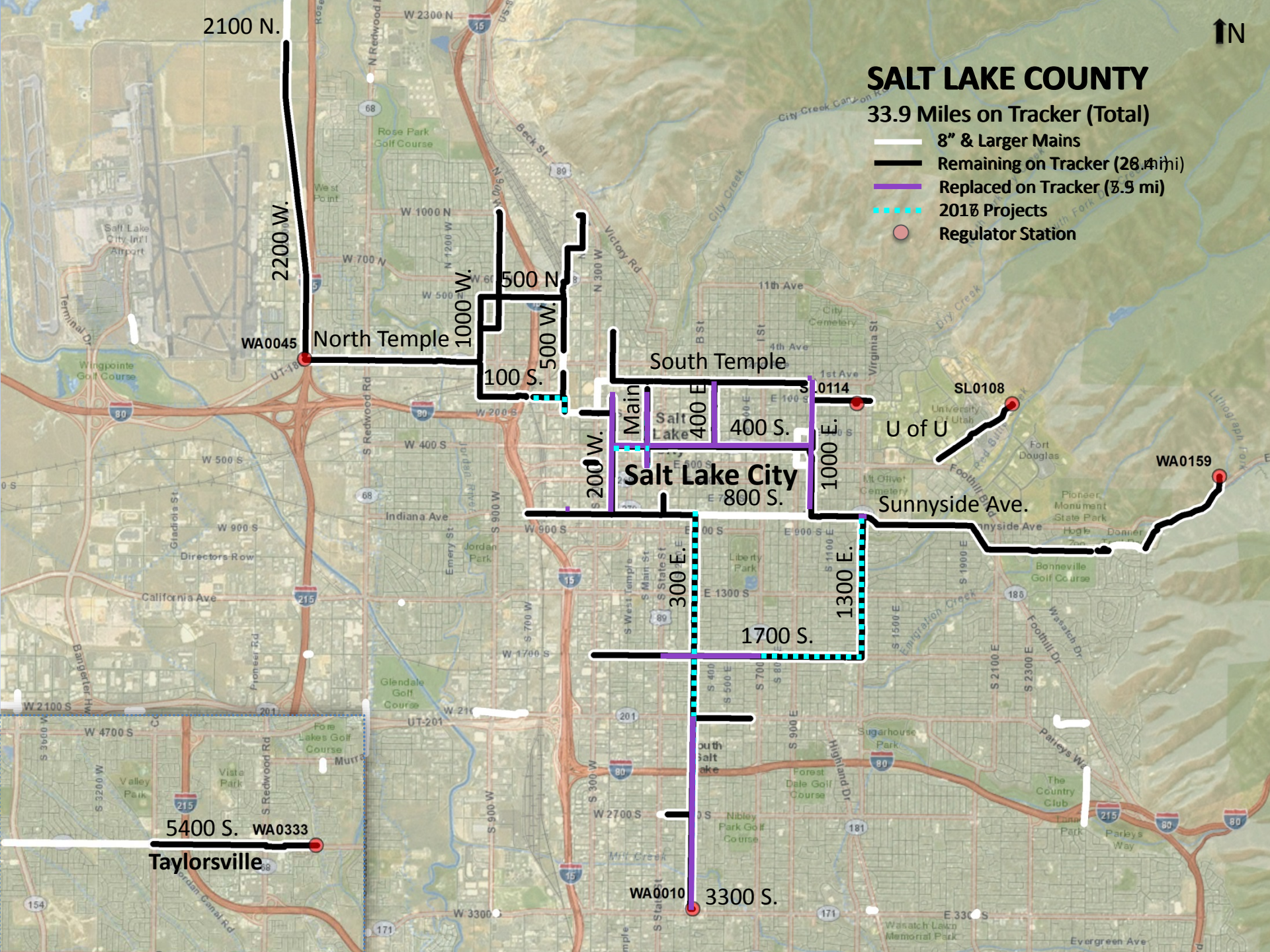




# SALT LAKE COUNTY

33.9 Miles on Tracker (Total)

- 8" & Larger Mains
- Remaining on Tracker (28.4 mi)
- Replaced on Tracker (3.9 mi)
- 2018 Projects
- Regulator Station



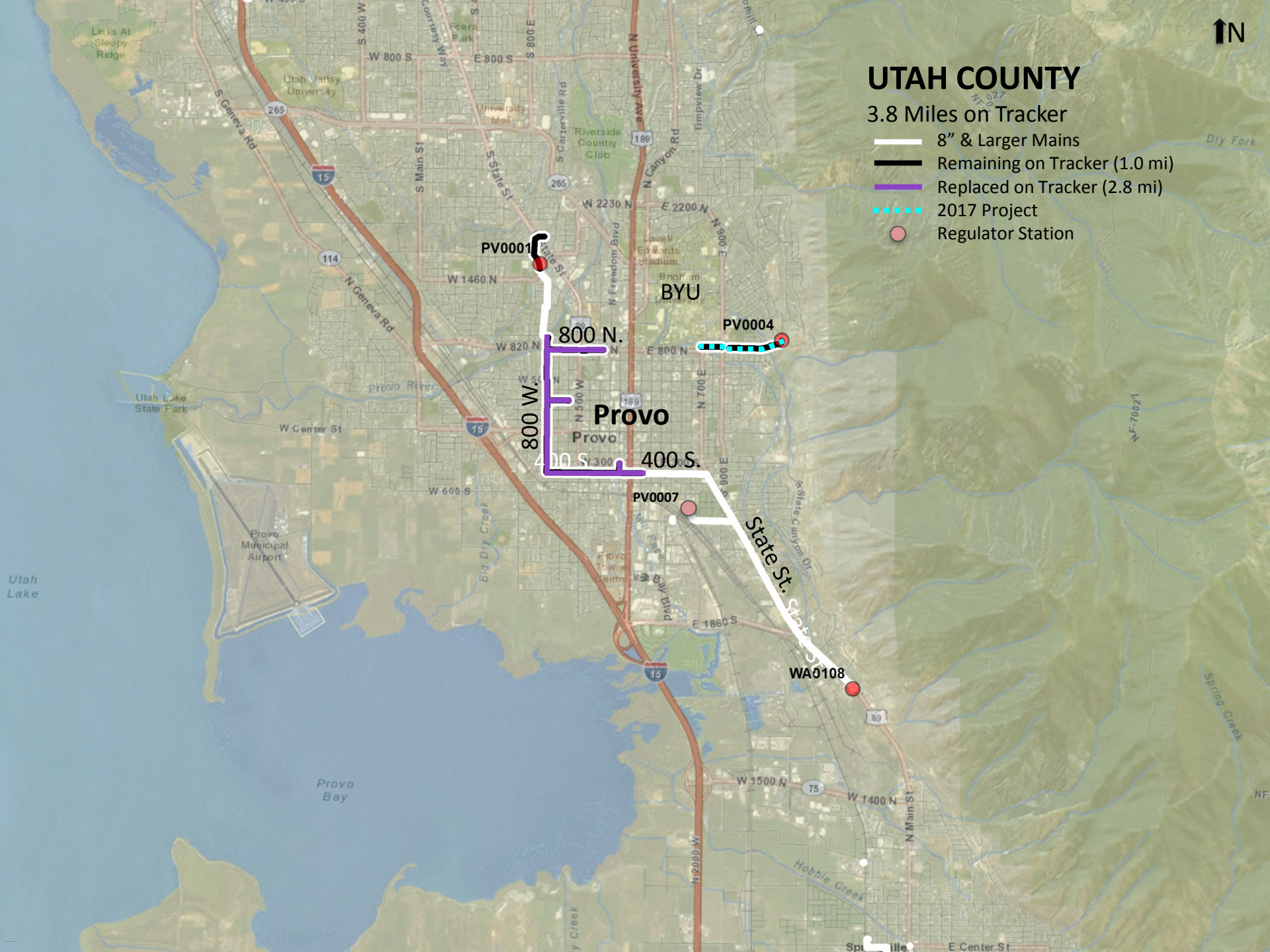




# UTAH COUNTY

3.8 Miles on Tracker

- 8" & Larger Mains
- Remaining on Tracker (1.0 mi)
- Replaced on Tracker (2.8 mi)
- 2017 Project
- Regulator Station



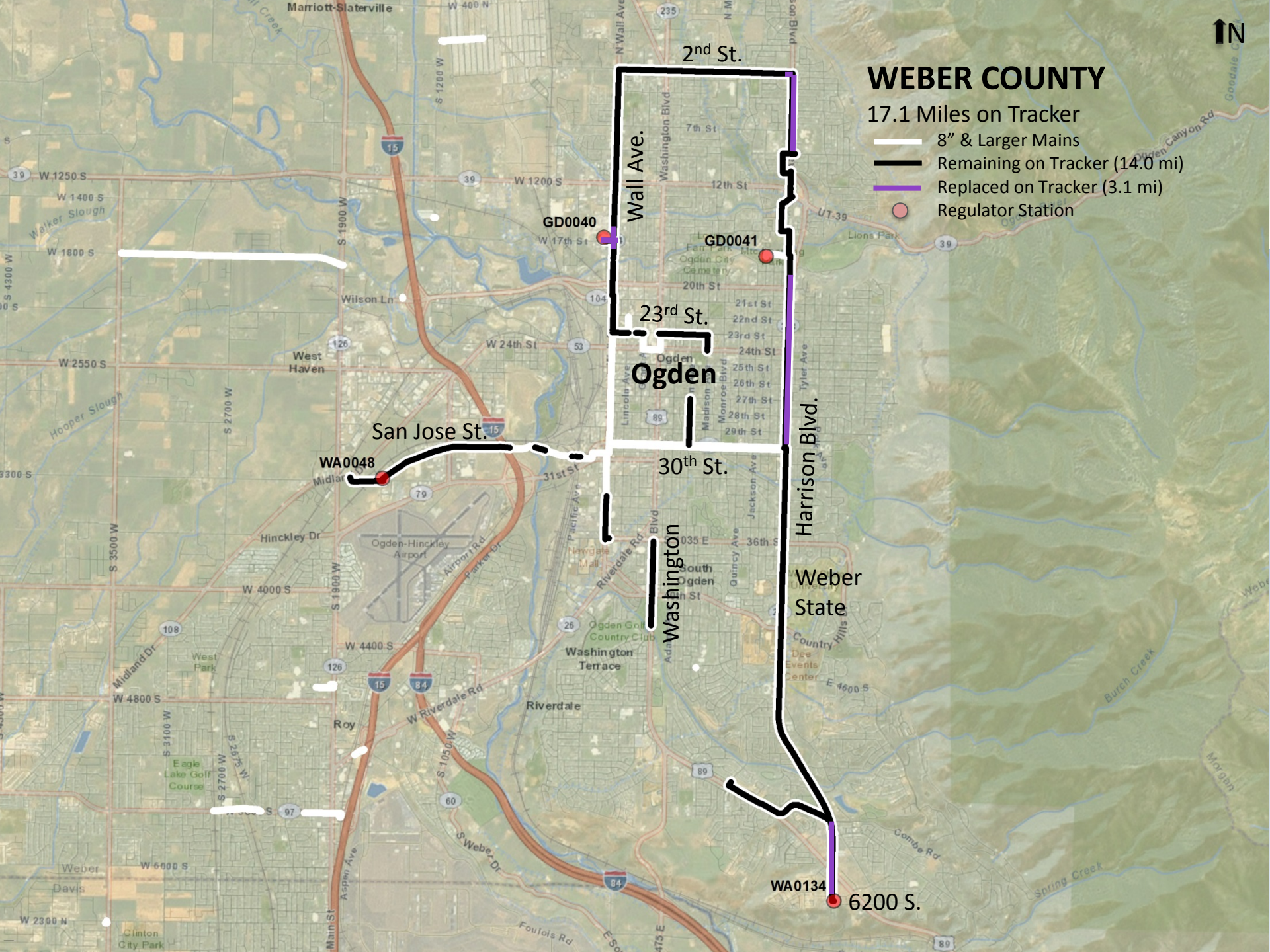




# WEBER COUNTY

17.1 Miles on Tracker

- 8" & Larger Mains
- Remaining on Tracker (14.0 mi)
- Replaced on Tracker (3.1 mi)
- Regulator Station







# 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

SY0001

Clearfield

CL0007

Freeport Cntr

Bluff Rd.

Gentile St.

Layton

LY0001

KY0001

Kaysville

Shepard Ln.

WA0401

Farmington

WA0215

WA0784

Pages Ln.

BF0005

Bountiful

WA0385

1100 N.

NSL



# 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
<b>Total</b>	<b>\$8,290,000</b>	<b>\$8,699,837</b>	<b>\$(373,422)</b>	



# 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

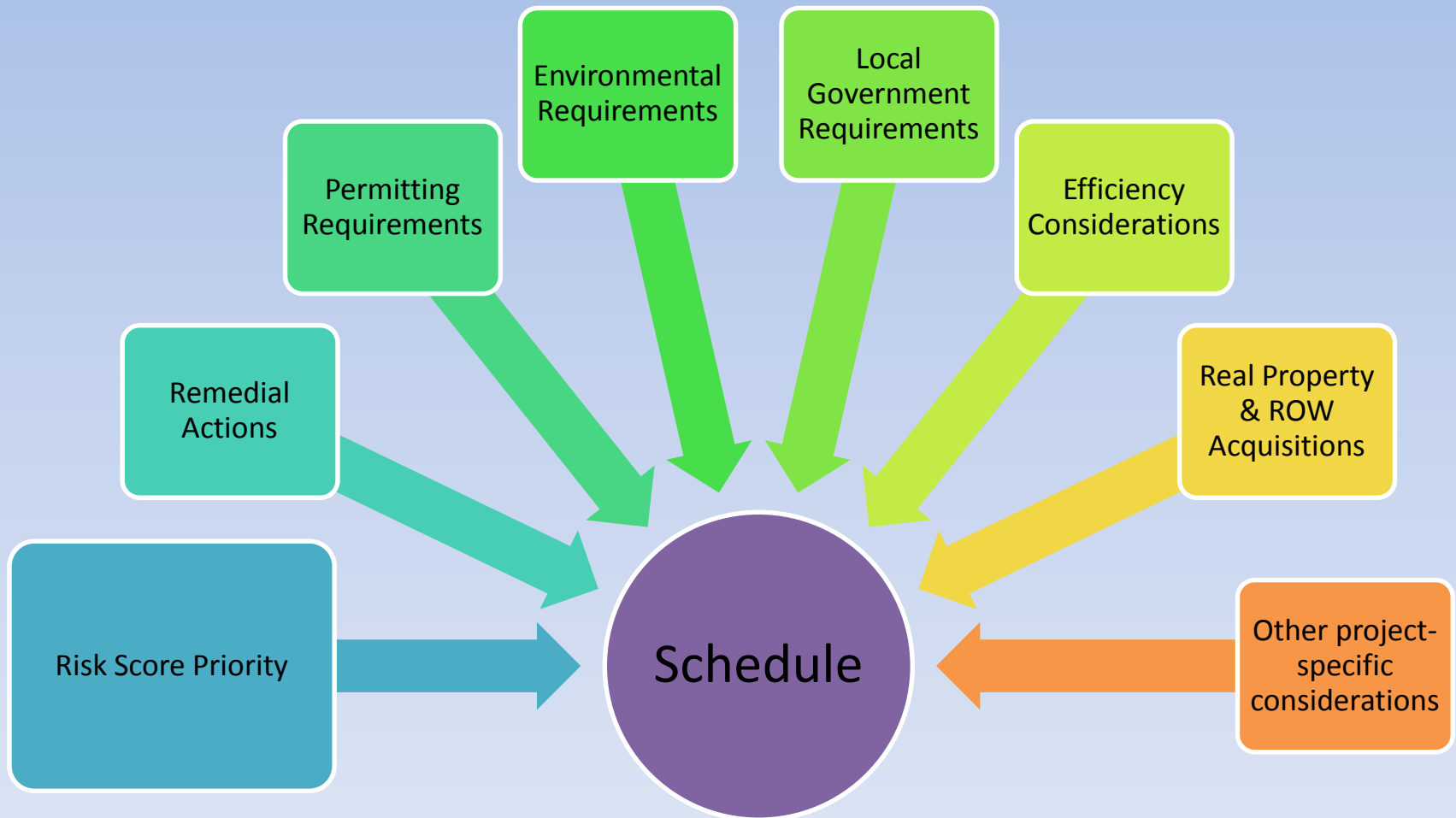
Original Tracker Pipe		
	Footage	Miles
Salt Lake County	178,848	33.9
Utah County	20,242	3.8
Weber County	90,259	17.1
Davis County	80,606	15.3
Total	369,955	70.1
Retired Tracker Pipe		
	Footage	Miles
Salt Lake County	41,502	7.9
Utah County	15,138	2.9
Weber County	16,169	3.1
Davis County	5,398	1.0
Total	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:

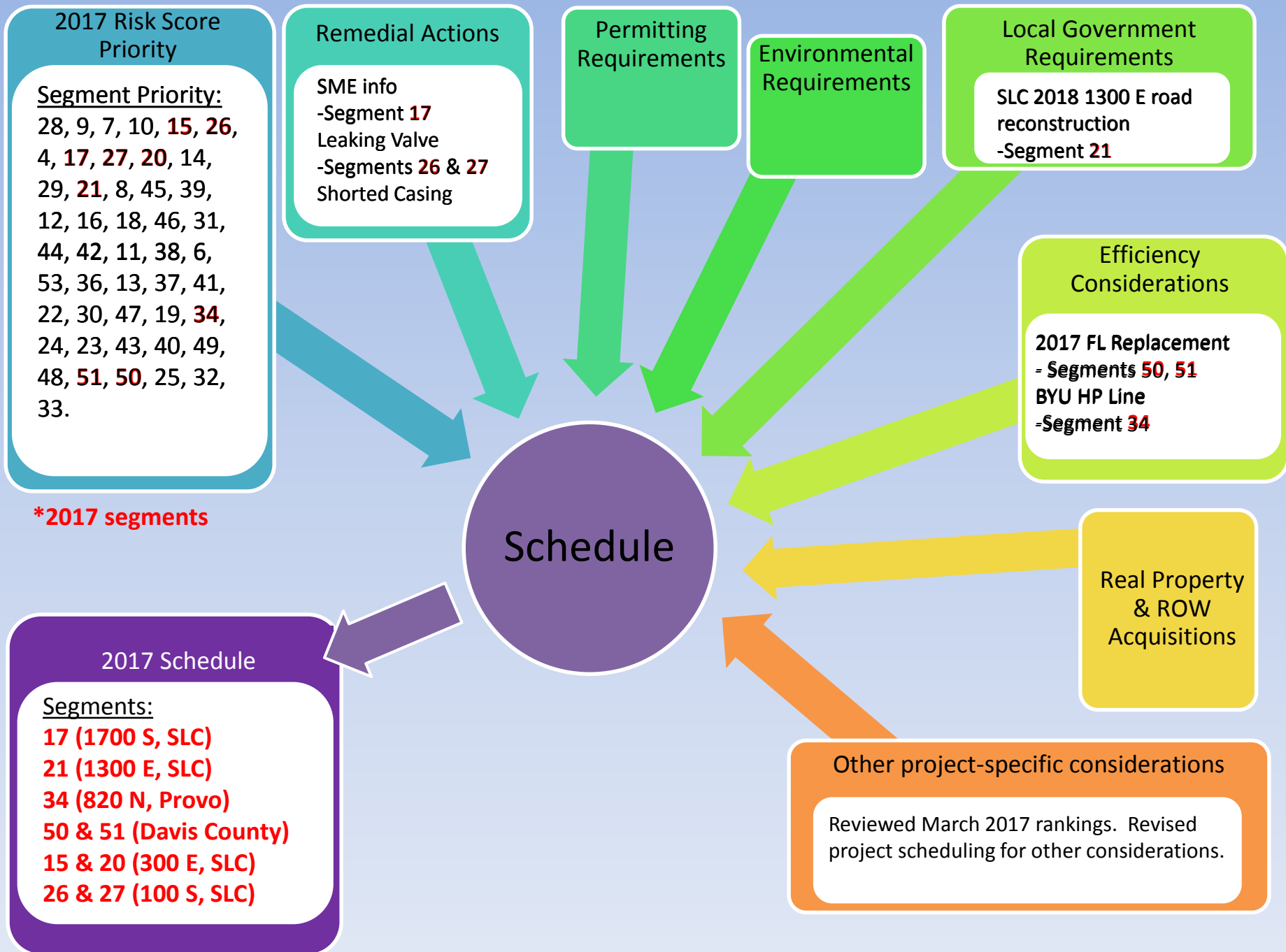
#### **Partially Complete Segments**

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





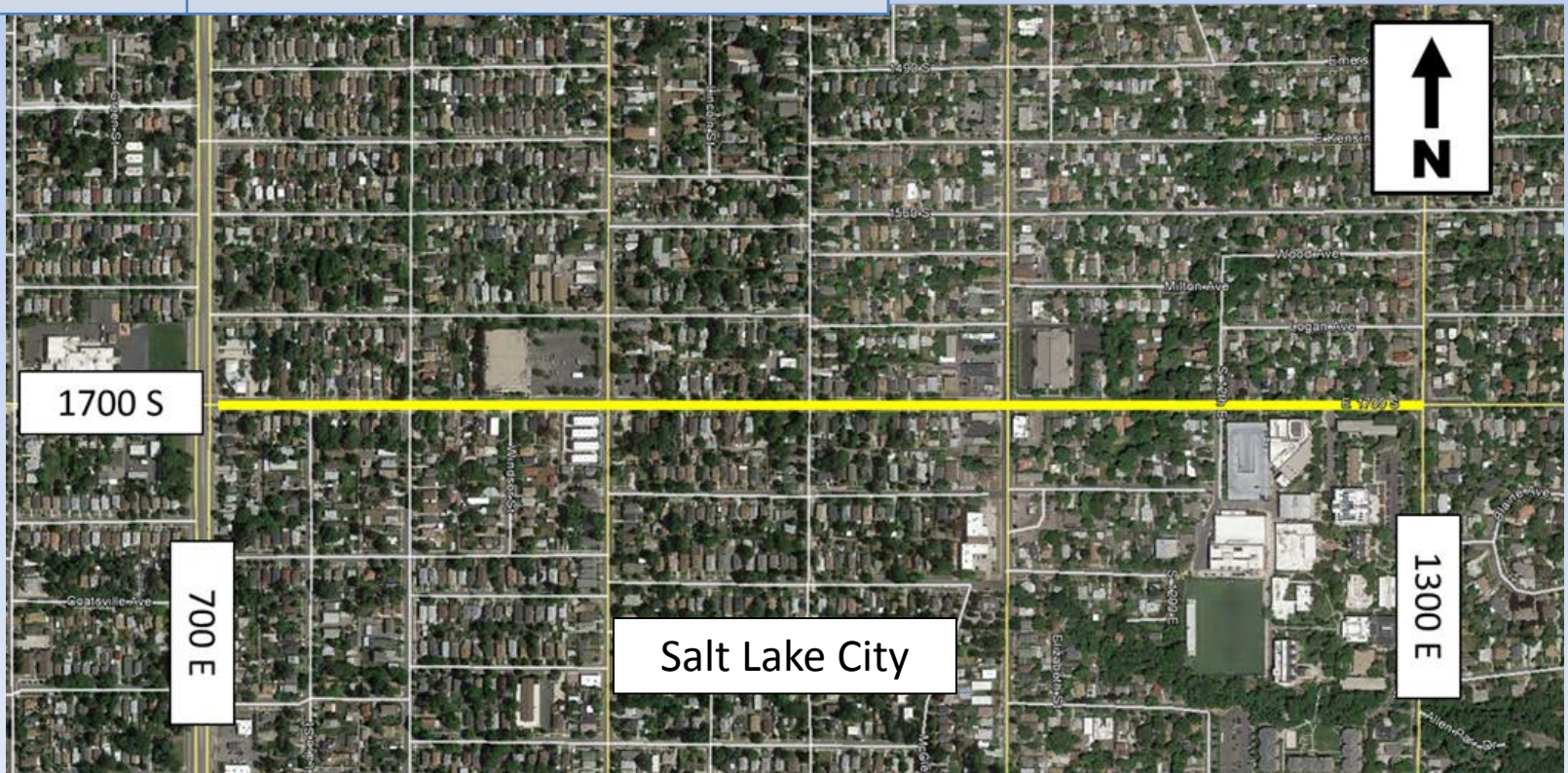
# Belt Line 2017

- 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

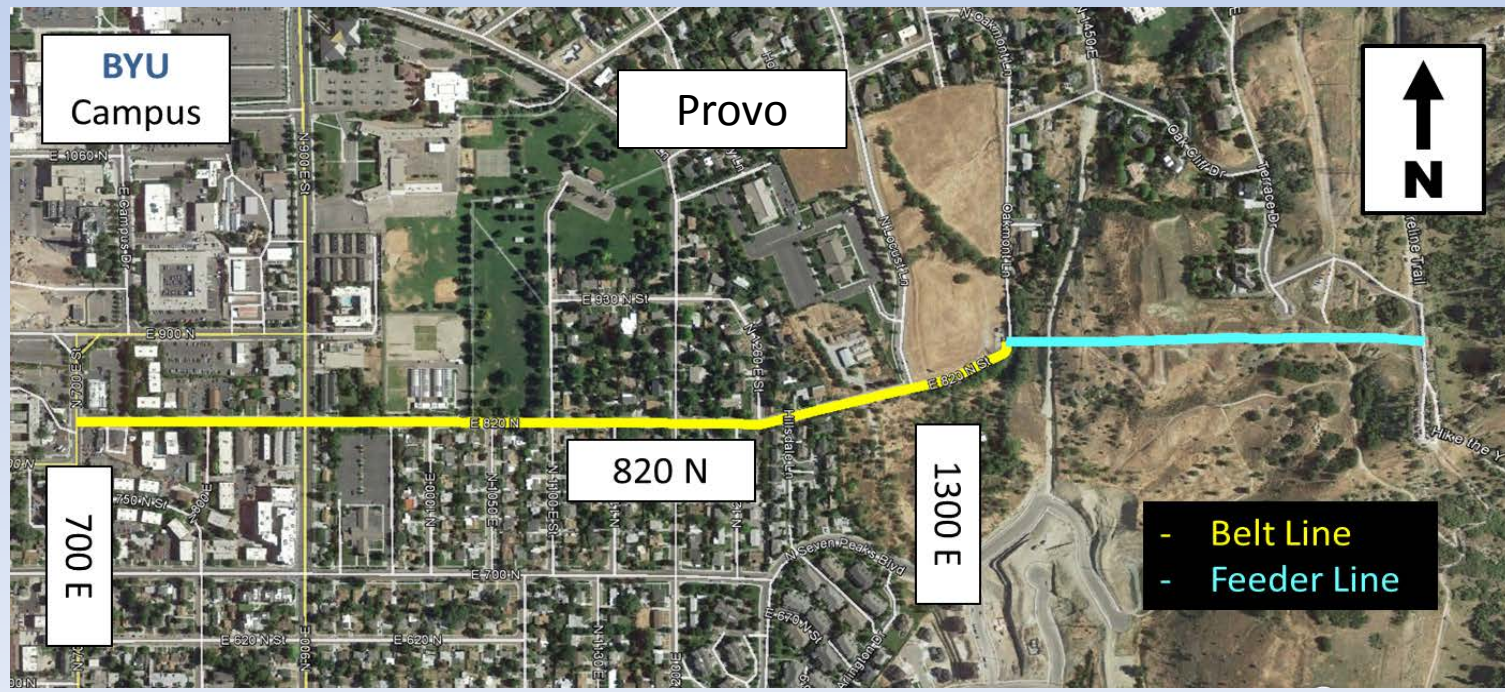
Belt Line:	100 S between 700 W and 500 W and 500 W between 100 S and 200 S in Salt Lake City, Salt Lake Co.
Construction:	Summer 2017
Challenges Include:	Running line, limited workspace, pedestrian traffic
Footage:	2,200 ft.





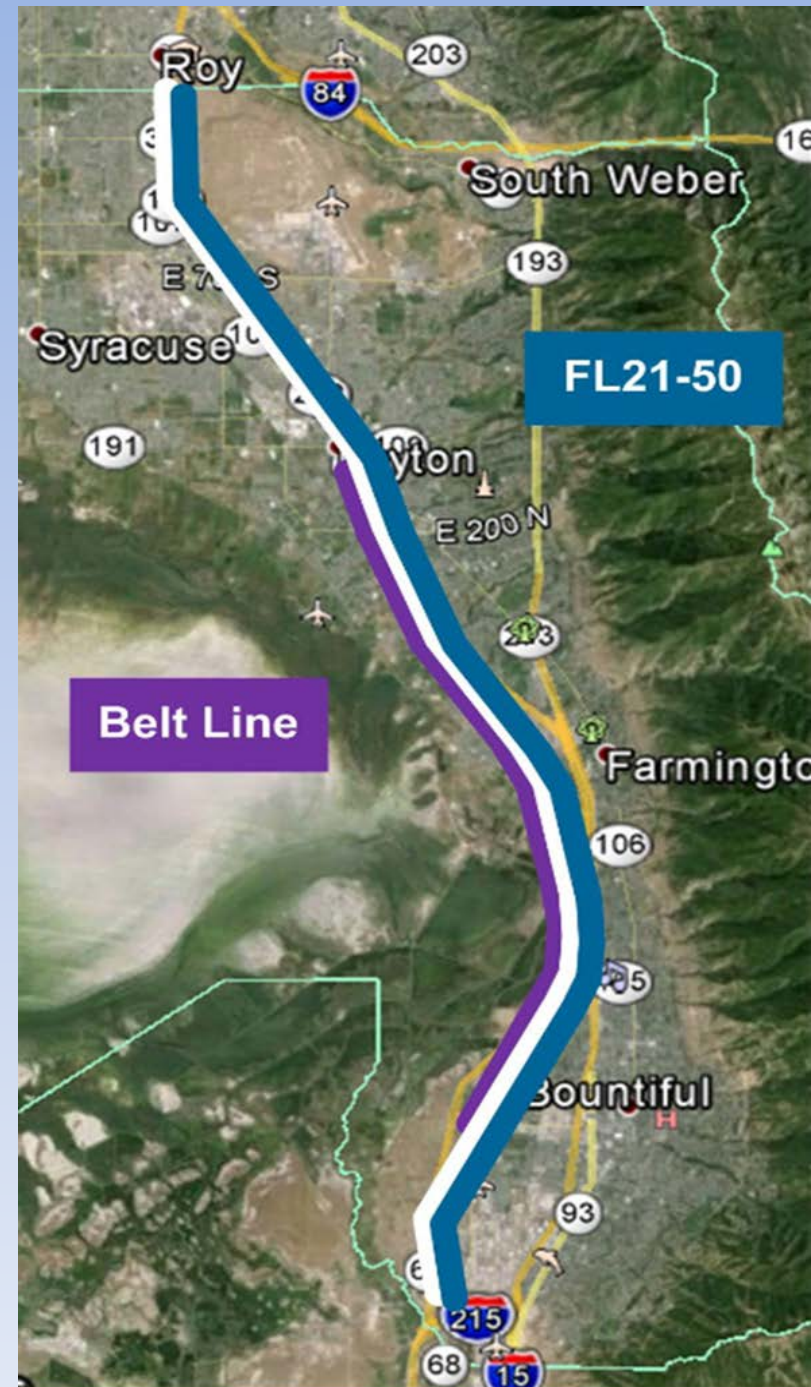
# Belt Line Work 2017

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

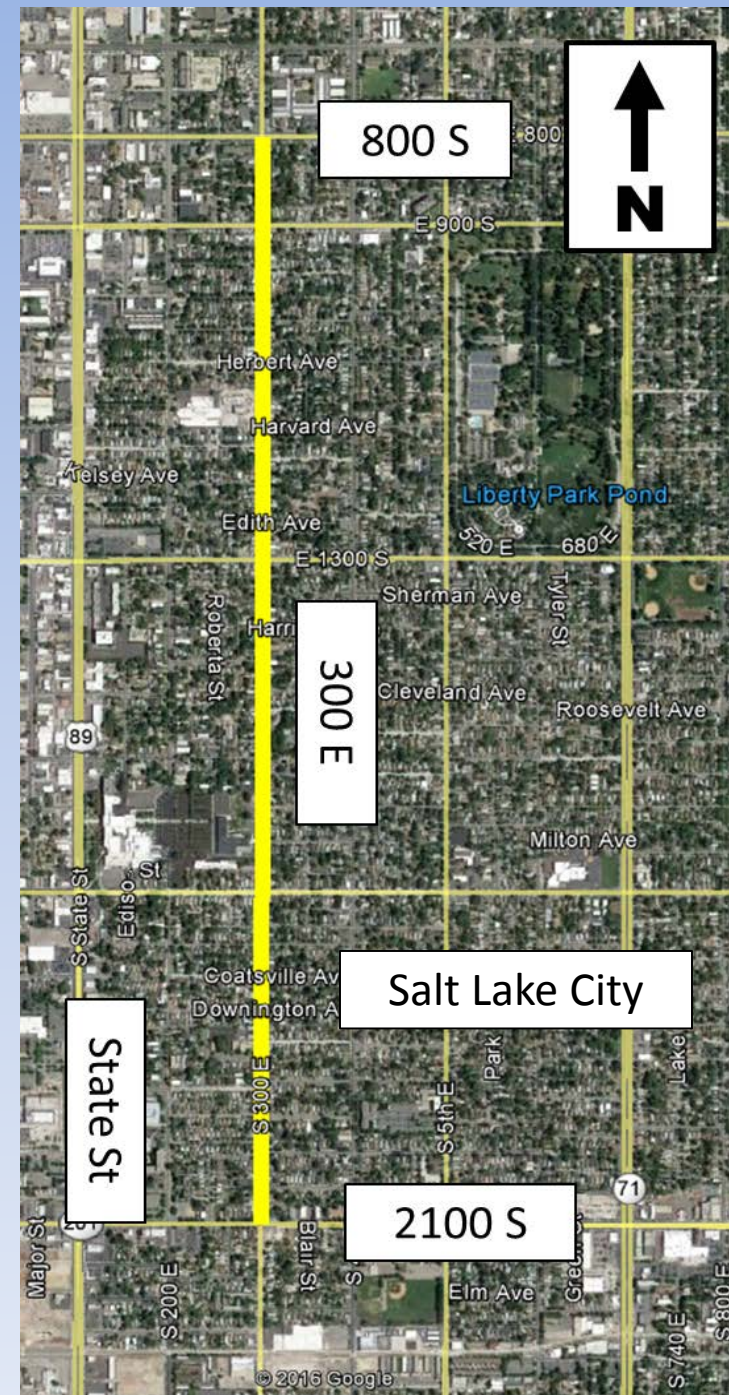
Belt Line:	Davis County Beltline Replacement in conjunction with FL21-50 replacement
Construction:	January – December
Challenges Include:	Water table, working over existing lines, permits
Footage:	29,000 ft.





# 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



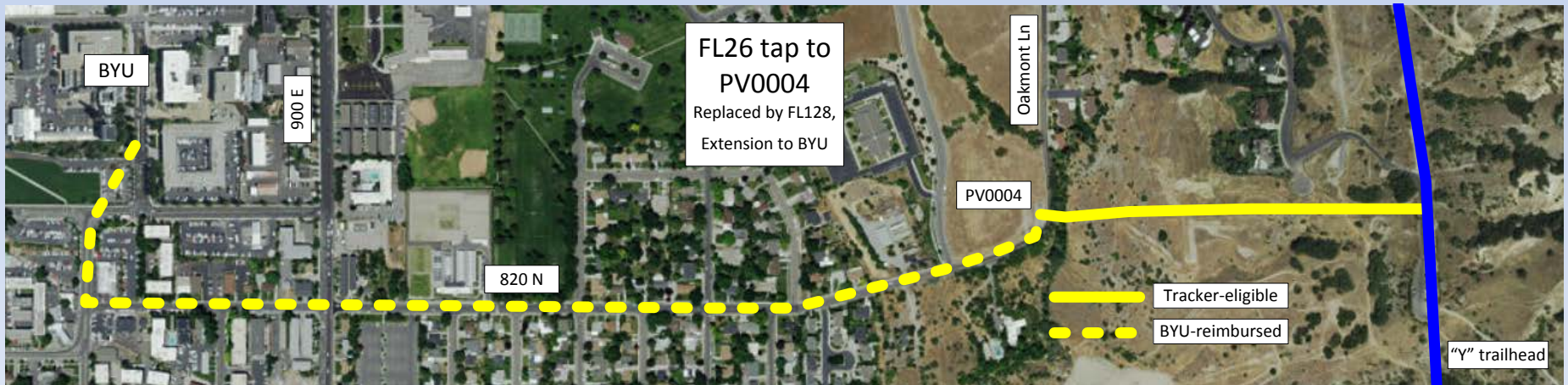
Line:	21-50
Schedule:	2017-2020
Challenges Include:	Water table, working over existing lines, UDOT permits
2017 Budget	\$45,500,950
2017 Footage:	54,280 ft.





# 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	
<b>Total</b>	<b>\$62,600,000</b>	<b>\$62,329,702</b>	<b>\$270,299</b>	



# HP Replacement Risk Evaluation Criteria

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

## Likelihood of Failure (LOF)

### Previous

Construction Year (14%<sup>a</sup>)

Pipe/Equipment Condition (24%<sup>a</sup>)

Manufacturing – Pipe (14%<sup>a</sup>)

Pressure Test Records (24%<sup>a</sup>)

Reconditioned (24%<sup>a</sup>)

### New

Construction (15%<sup>b</sup>)

Manufacturing (55%<sup>b</sup>)

External Corrosion (30%<sup>b</sup>)

<sup>a</sup> SME-based weighting

<sup>b</sup> 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%<sup>a</sup>)

- Pre-1955 – High Risk
- 1955 - 11/1970 – Medium Risk
- Post 11/1970<sup>a</sup> – Low Risk

#### ✓ Pipe/Equipment Condition (24%<sup>a</sup>)

- SME

Manufacturing – Pipe (14%<sup>a</sup>)

Pressure Test Records (24%<sup>a</sup>)

Reconditioned (24%<sup>a</sup>)

<sup>a</sup> SME-based weighting

### New

#### Construction (15%<sup>b</sup>)

- 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%<sup>b</sup>)

External Corrosion (30%<sup>b</sup>)

<sup>b</sup> 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%<sup>a</sup>)**
- ✓ **Pipe/Equipment Condition (24%<sup>a</sup>)**
- ✓ **Manufacturing – Pipe (14%<sup>a</sup>)**
  - 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%<sup>a</sup>)**
  - Record not found – **High**
  - Record found - **Low**
- ✓ **Reconditioned (24%<sup>a</sup>)**
  - Yes – **High**
  - No – **Low**

<sup>a</sup> SME-based weighting

### New

- Construction (15%<sup>b</sup>)**
- Manufacturing (55%<sup>b</sup>)**
  - 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%<sup>b</sup>)**

<sup>b</sup> 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%<sup>a</sup>)
- ✓ Pipe/Equipment Condition (24%<sup>a</sup>)
- ✓ Manufacturing – Pipe (14%<sup>a</sup>)
- ✓ Pressure Test Records (24%<sup>a</sup>)
- ✓ Reconditioned (24%<sup>a</sup>)

### New

**Construction (15%<sup>b</sup>)**

**Manufacturing (55%<sup>b</sup>)**

- 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%<sup>b</sup>)**

- TIMP Evaluation (Coating, Age, History, etc.)

<sup>a</sup> SME-based weighting

<sup>b</sup> 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

**HCA's (67%)**

**Census Data (33%)**

### New

**Population (Safety) (80%)**

**Throughput (Volume) (20%)**



# HP Replacement Risk Evaluation Criteria

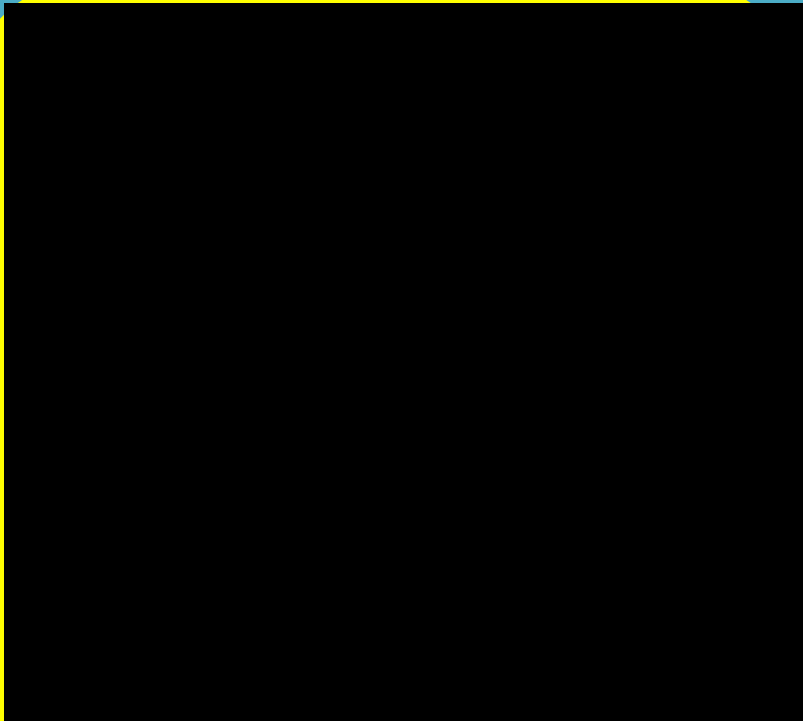
Risk = Likelihood of Failure (Threat) x Consequence of Failure (Consequence)

- 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

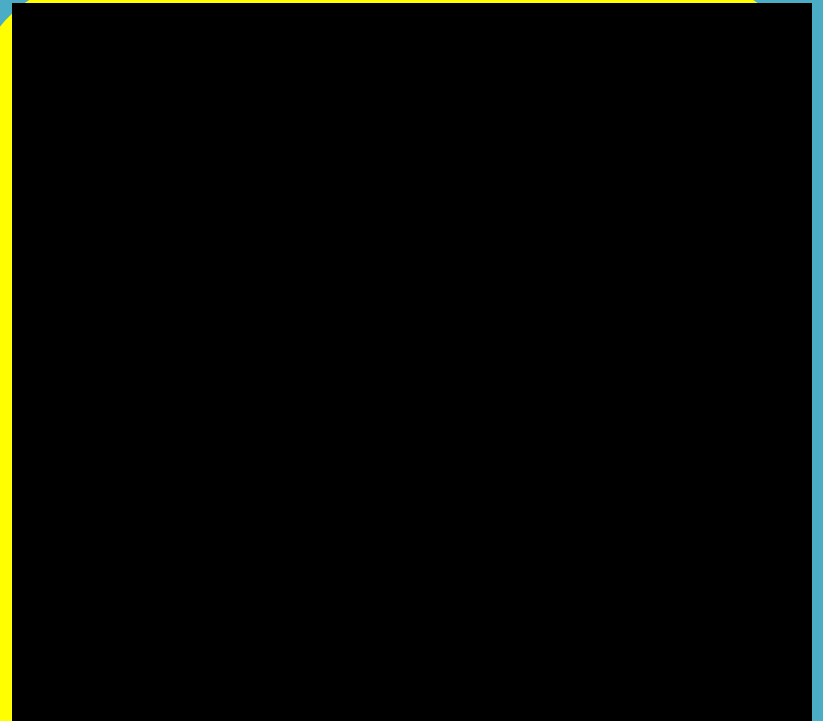
# Feeder Lines

- Prioritized by HP criteria

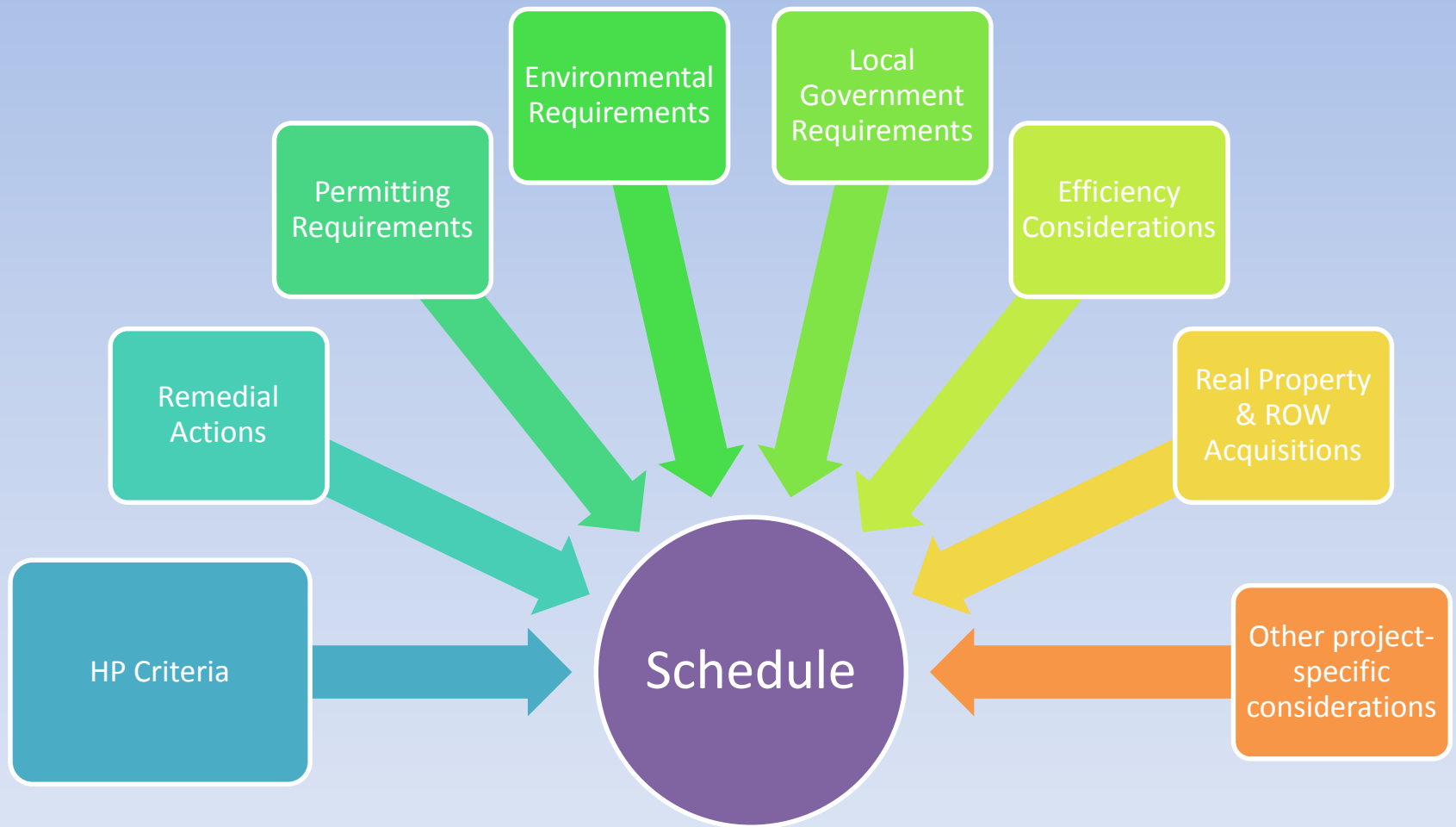
Prev. HP Criteria



New HP Criteria

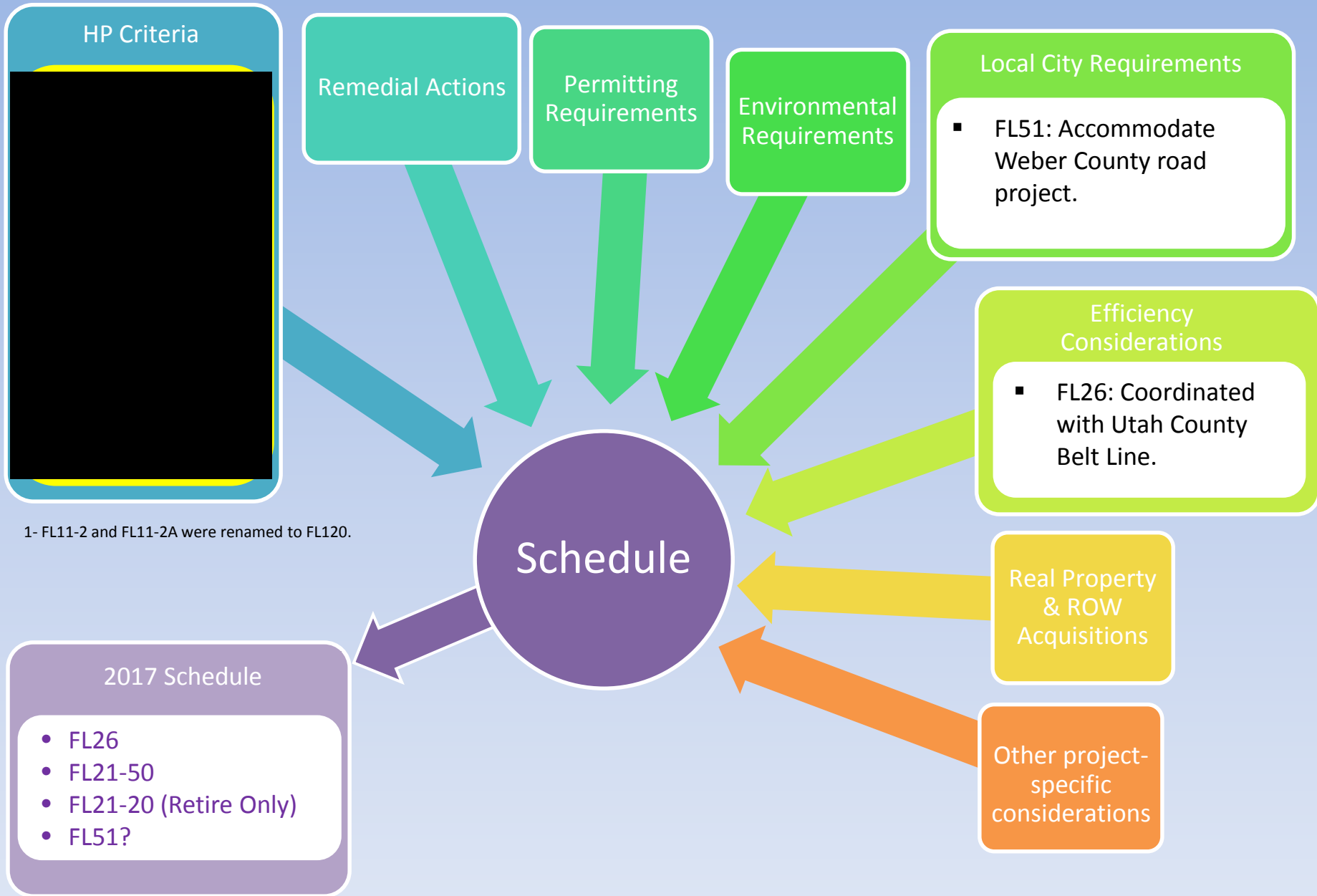


# Scheduling Feeder Line Replacements



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





# 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?**