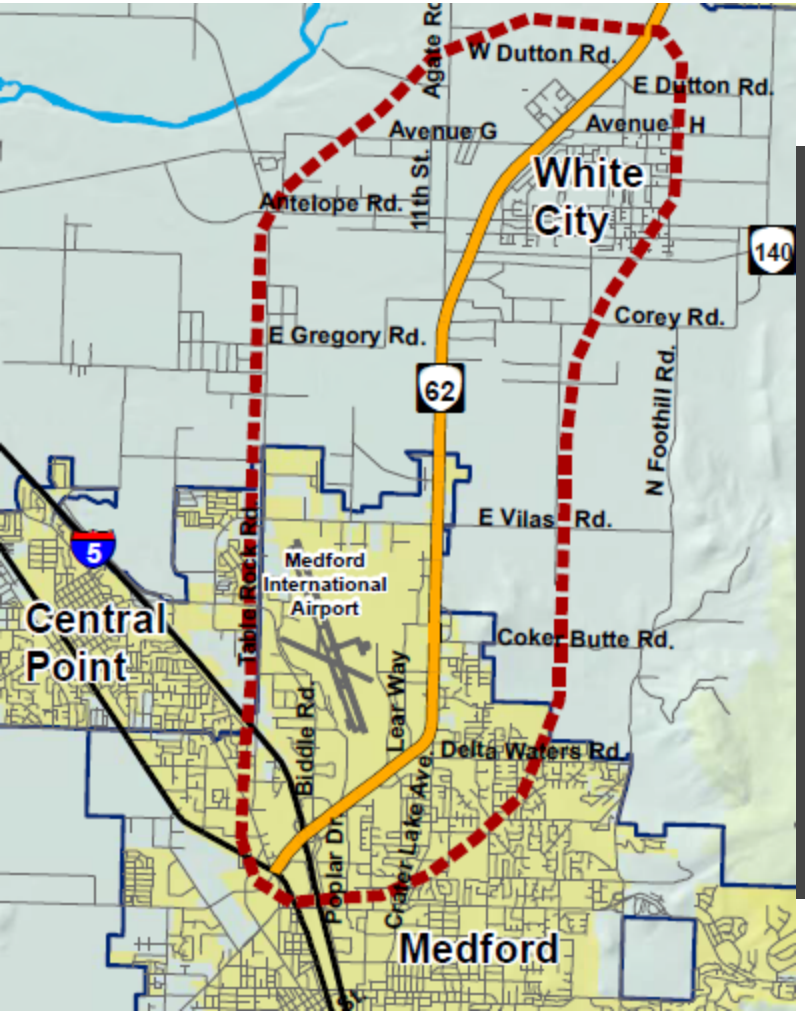


OR62 – Vilas Road

Interchange Area Management Plan (IAMP)

TAC Meeting

Presented by: Katie Brown

July 17, 2018

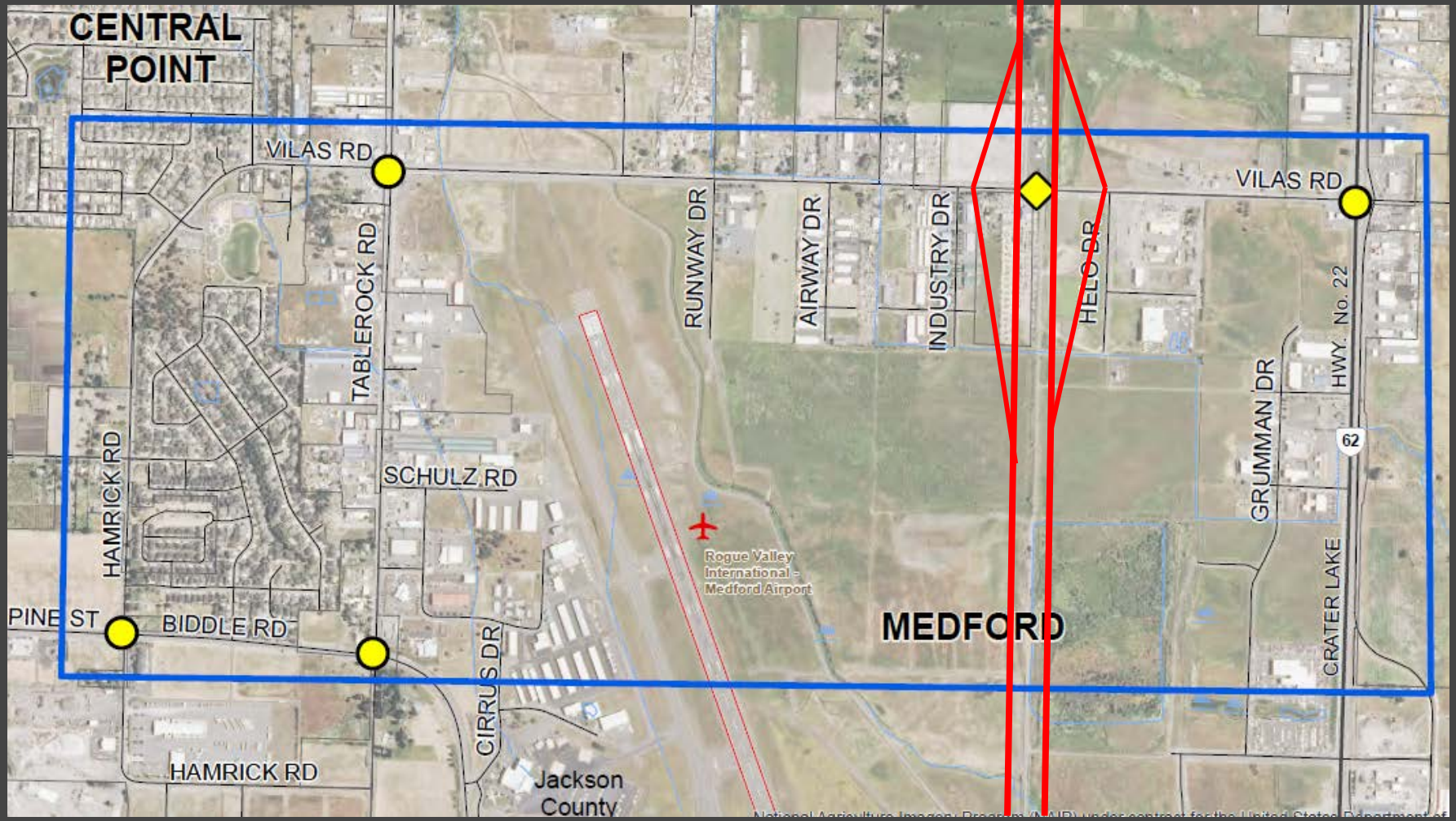
Background

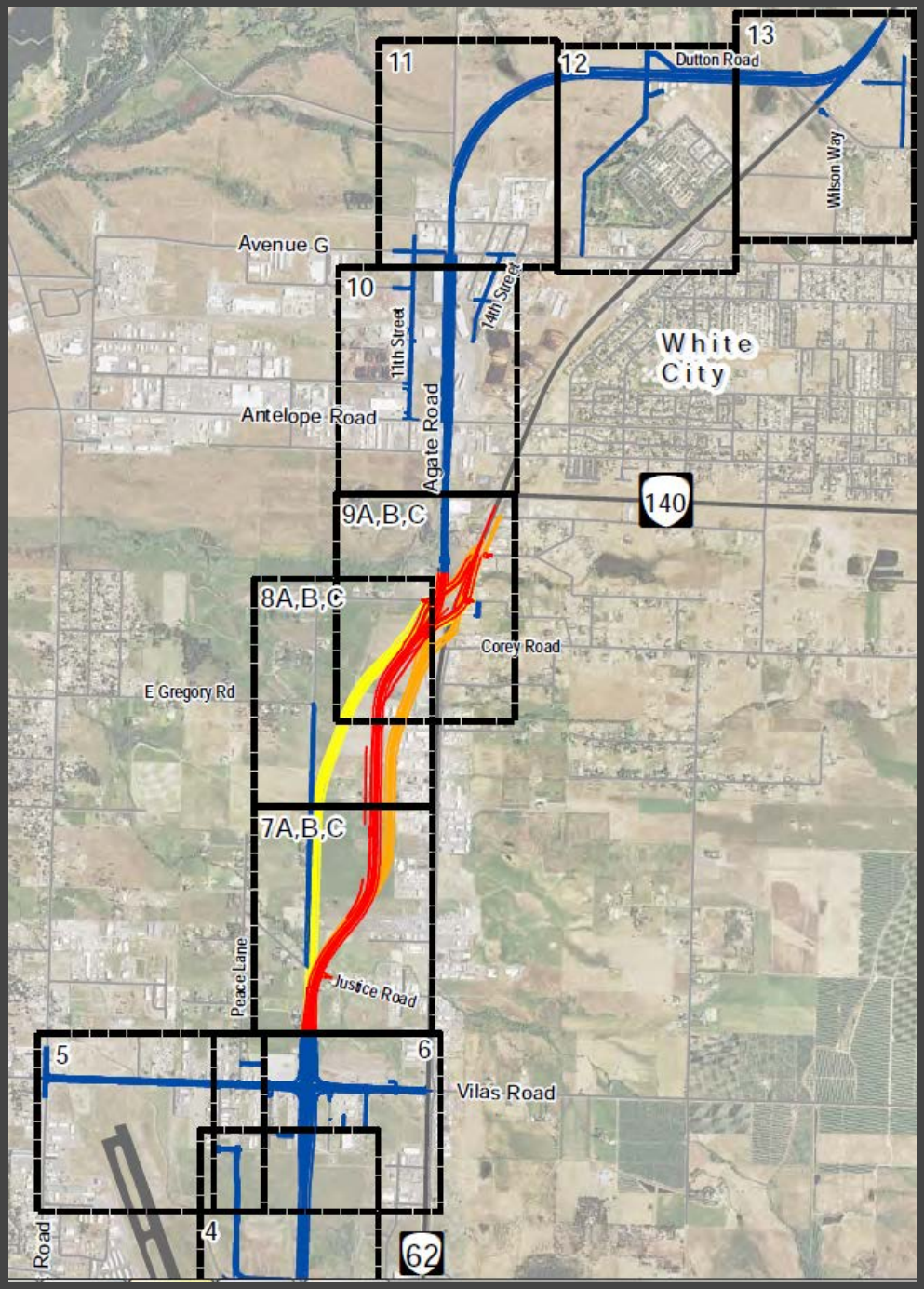
Analysis Results

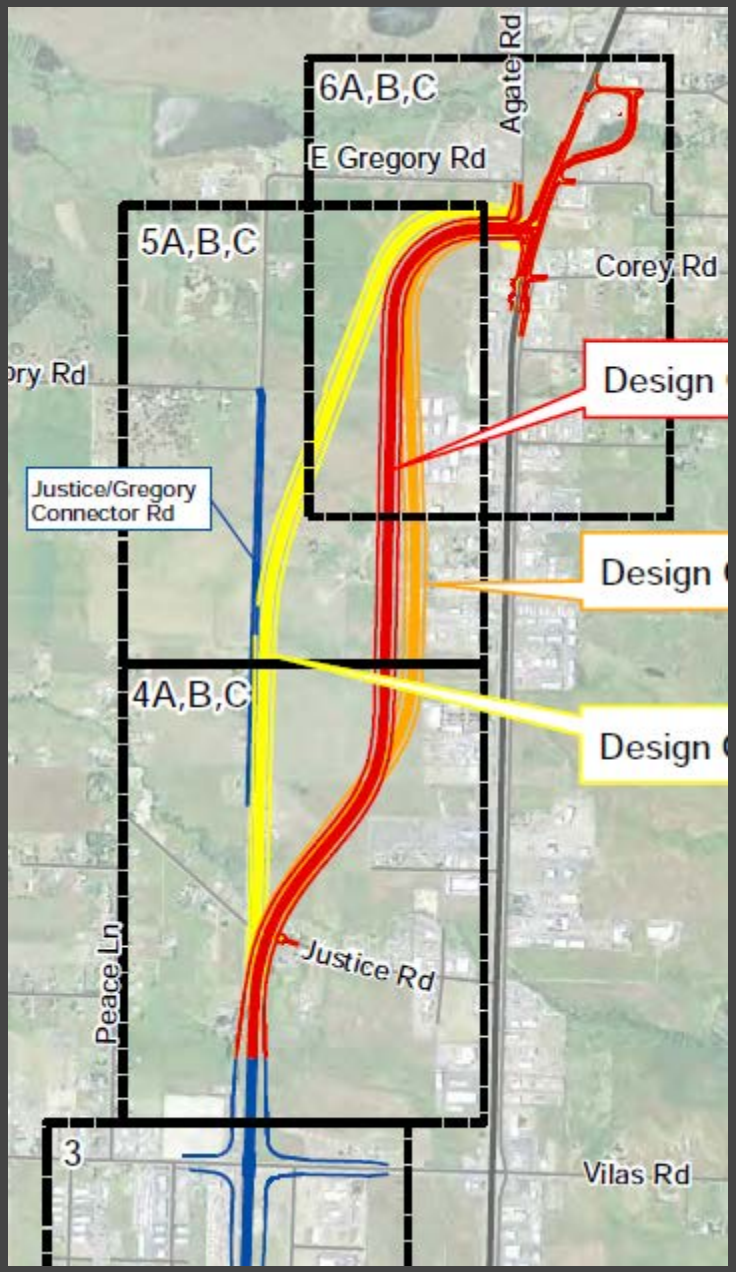
Conclusions

Background

OR62 & Vilas Road Interchange

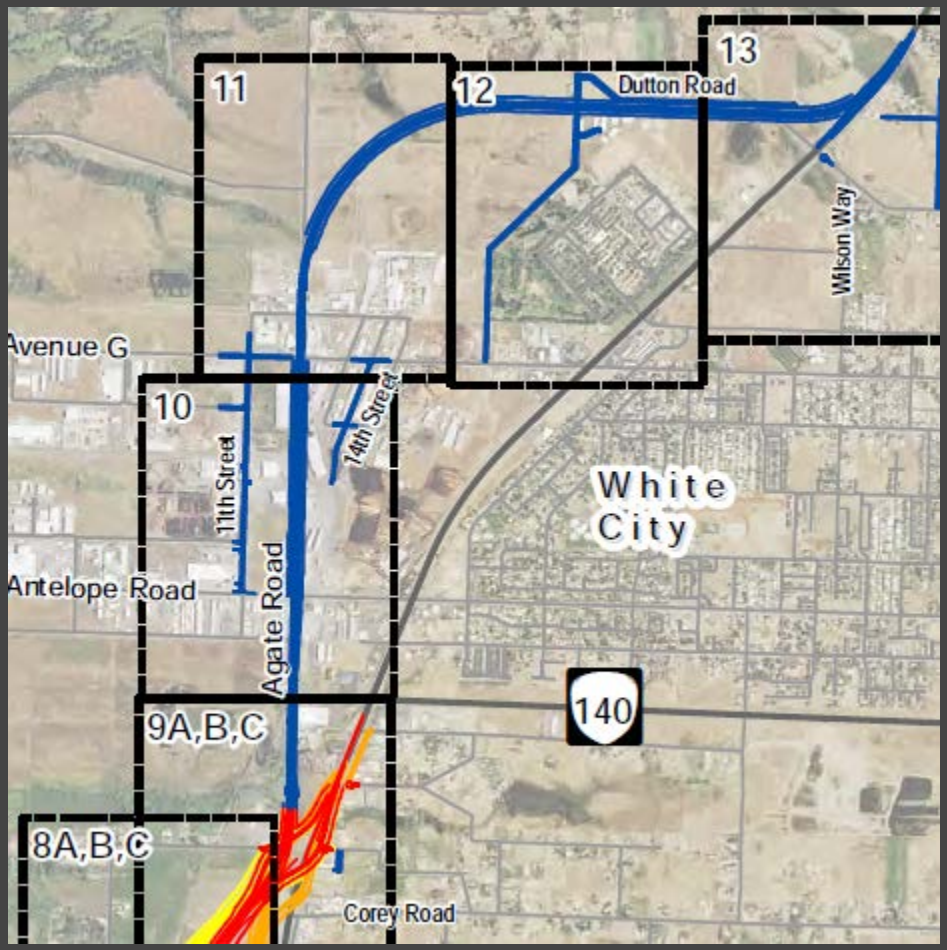

CENTRAL POINT
VILAS RD
VILAS RD
TABLEROCK RD
RUNWAY DR
AIRWAY DR
INDUSTRY DR
HELO DR
HWY. No. 22
GRUMMAN DR
CRATER LAKE
62
HAMRICK RD
SCHULZ RD
Rogue Valley International - Medford Airport
MEDFORD
PINE ST
BIDDLE RD
CIRRUS DR
HAMRICK RD
Jackson County


11
12
13
Dutton Road
Wilson Way
Avenue G
10
14th Street
11th Street
Antelope Road
Agate Road
White City
140
9A,B,C
8A,B,C
Corey Road
E Gregory Rd
7A,B,C
Peace Lane
Justice Road
5
6
Vilas Road
4
62
Road



JTA Build

Full Build



Scenario Definitions

- No Build/No-mitigation (NBNM)
  - Base Conditions
  - No Interchange
  - JTA Build, 2-lane Vilas Rd
  - Tier 1 Projects included

No-build/No-mitigation

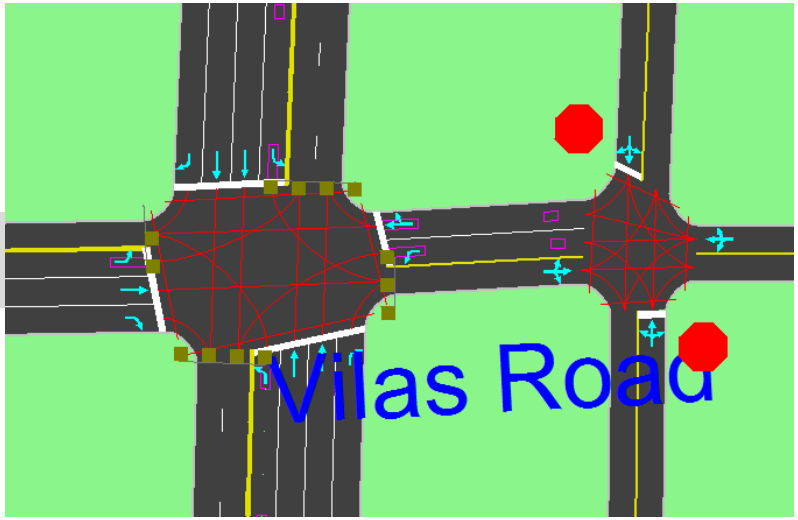
Scenario Definitions

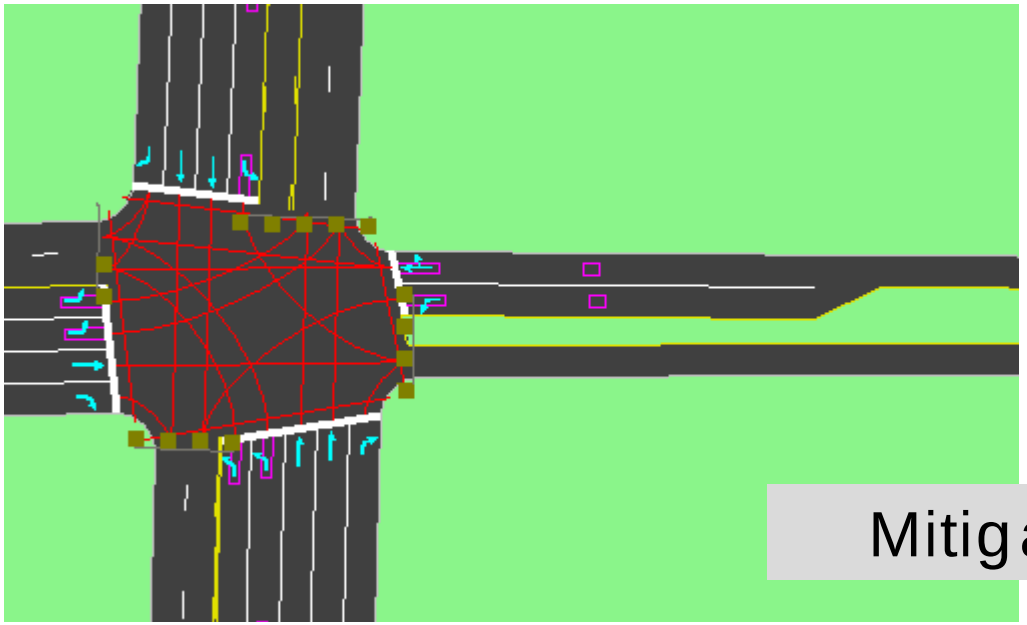
- No Build Mitigated (S0T1)
  - NBNM with mitigations attempting to meet v/c, LOS, and MMLOS standards
  - Signals added when PSW met

- No Build Mitigated with Tier 2 projects (S0T2)
  - S0T1 with Tier 2 Projects

CLH and CLA

No Mitigations





Mitigated

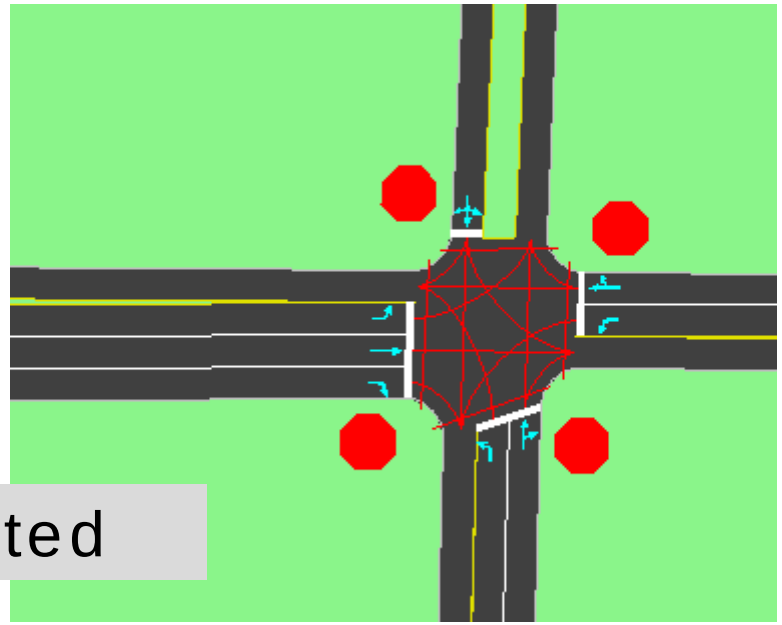
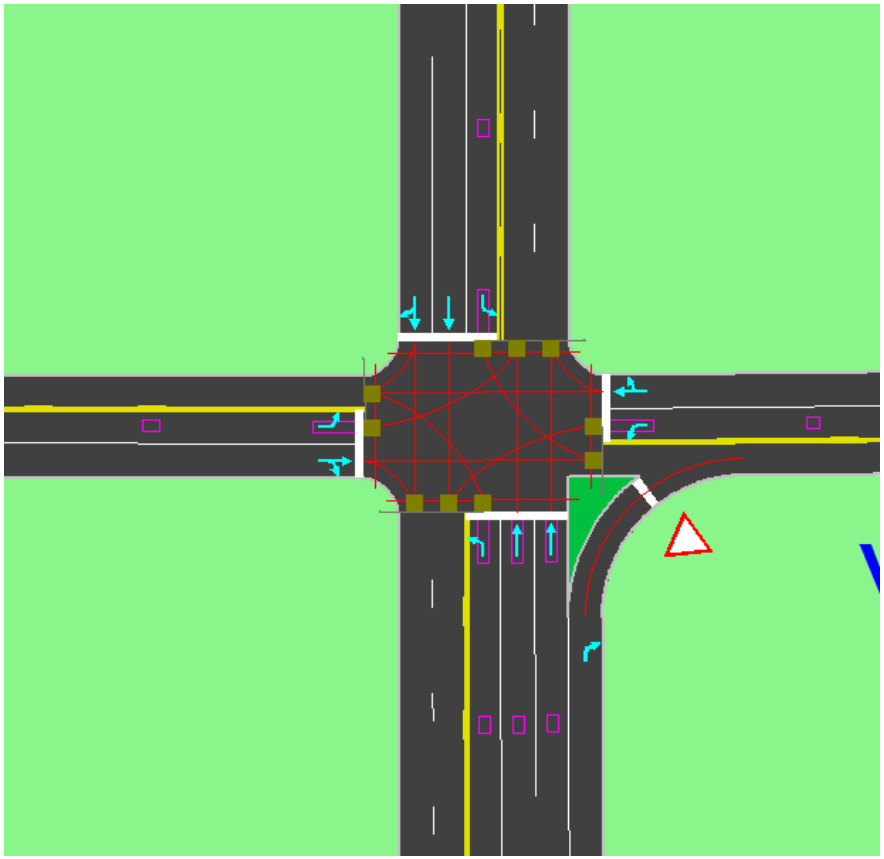
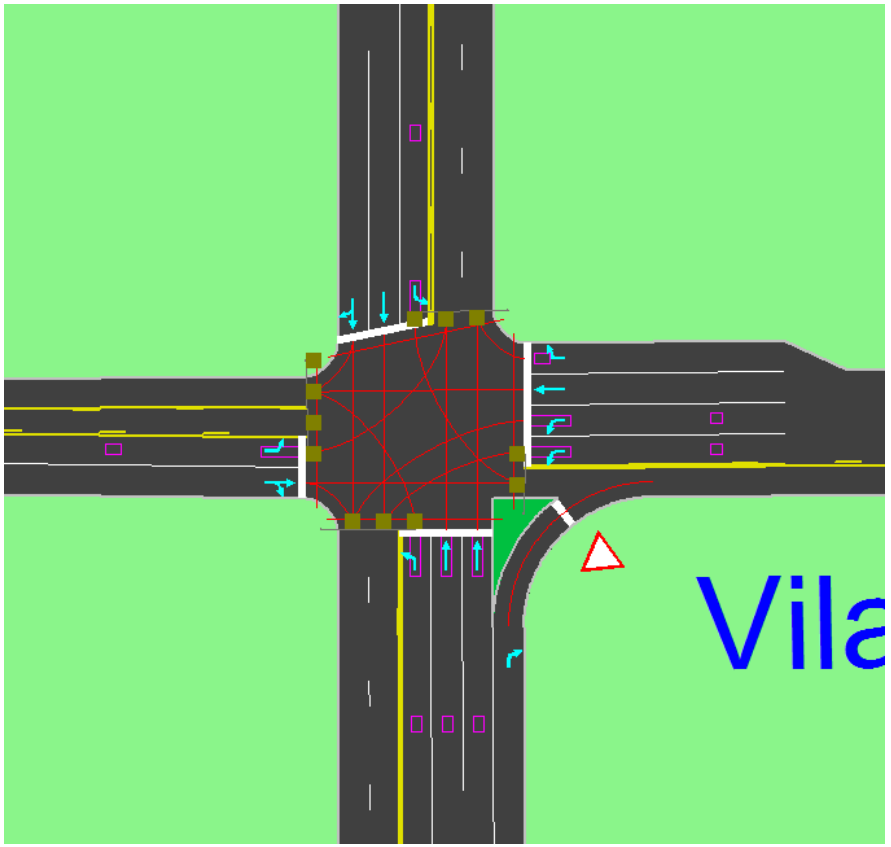


Table Rock Road & Vilas Road

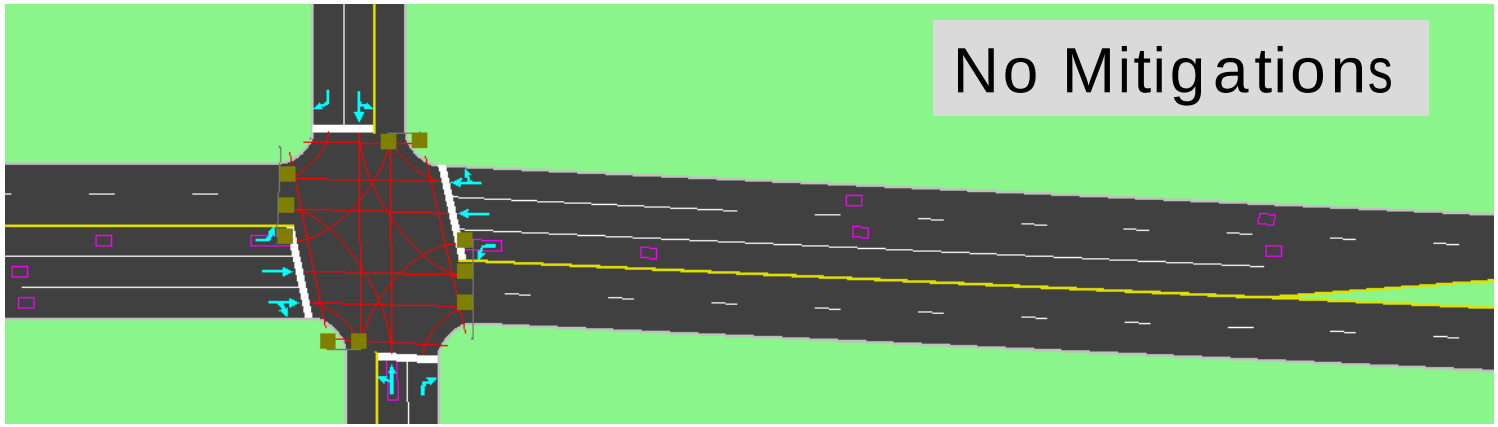
No Mitigations

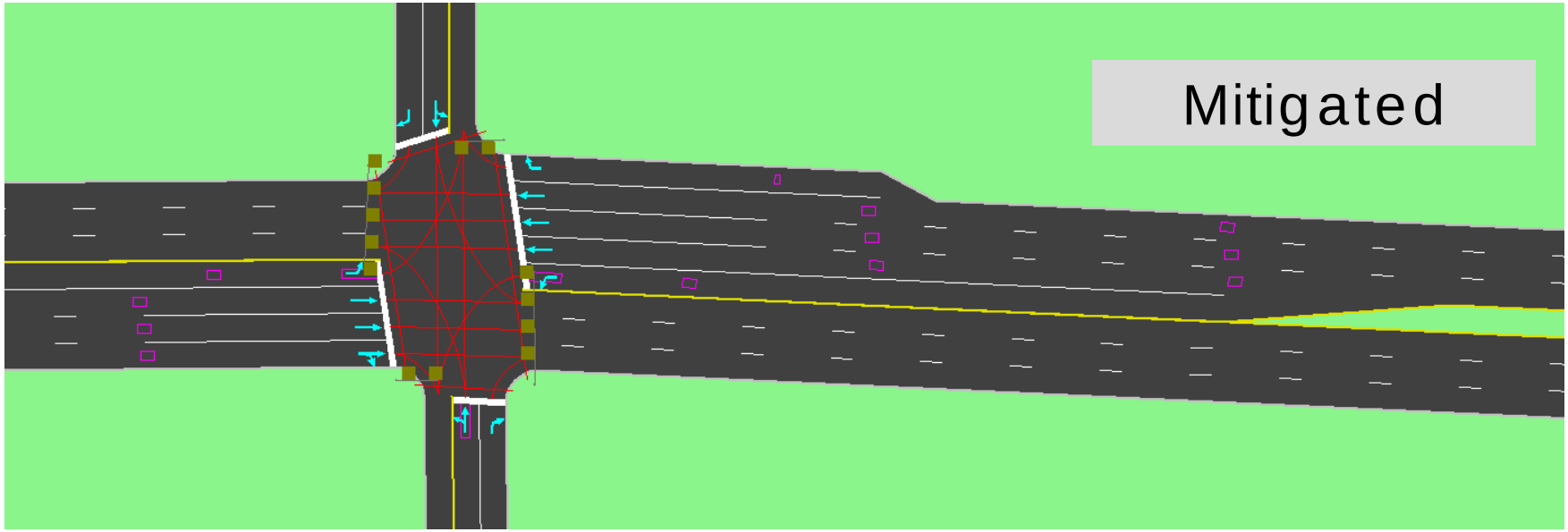




Mitigated

Biddle Road & Hamrick Road





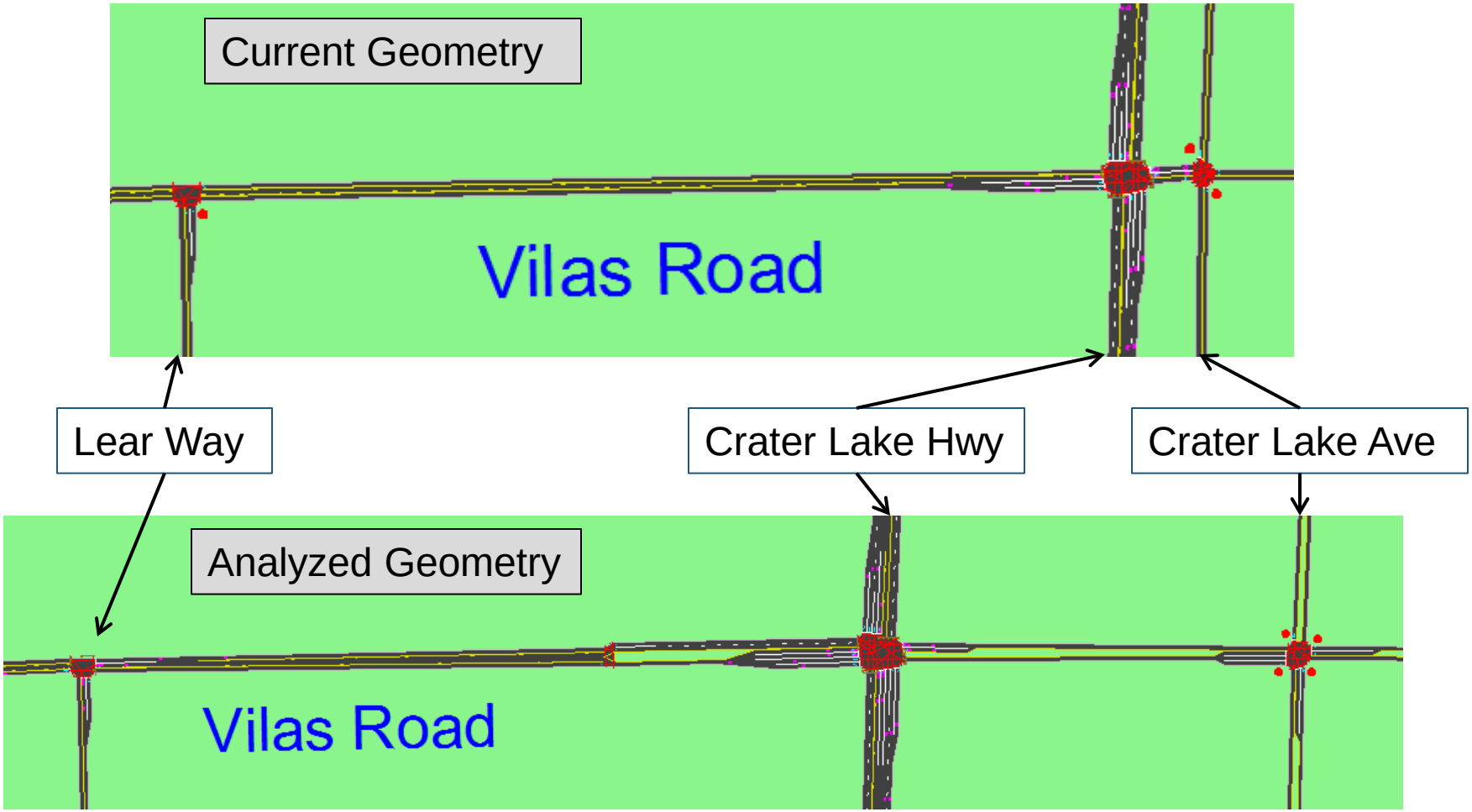
RVMPO RTP Tier 2 Projects Within Study Area

Project No.	Location	Project Type	Proposed Project Description
626	Peace Ln – Vilas Rd to City Limits	Urban Upgrade	Upgrade to minor collector standard including one lane in each direction, bike lanes, and sidewalks
628	Lear Way - Vilas Rd to northern city limits	New Roadway	Construct new minor collector roadway (includes one lane each direction, bike lane, and sidewalk)
632	Vilas Rd – Table Rock to eastern UGB	Widening	Widen to major arterial standard including two-lanes in each direction, center turn-lane, bike lanes, and sidewalks
I39	Crater Lake Ave & Vilas Rd	Intersection	Re-align Crater Lake Ave to the east and install traffic signal
I40	Crater Lake Highway & Vilas Rd	Intersection	Monitor needs after construction of Crater Lake Highway Bypass
I44	Vilas Rd & Lear Way	Intersection	Install traffic signal or roundabout when warranted
I43	Vilas Rd & Industry Dr	Intersection	Install traffic signal or roundabout when warranted

RVMPO RTP Tier 2 Projects in Model Runs Outside Direct Study Area

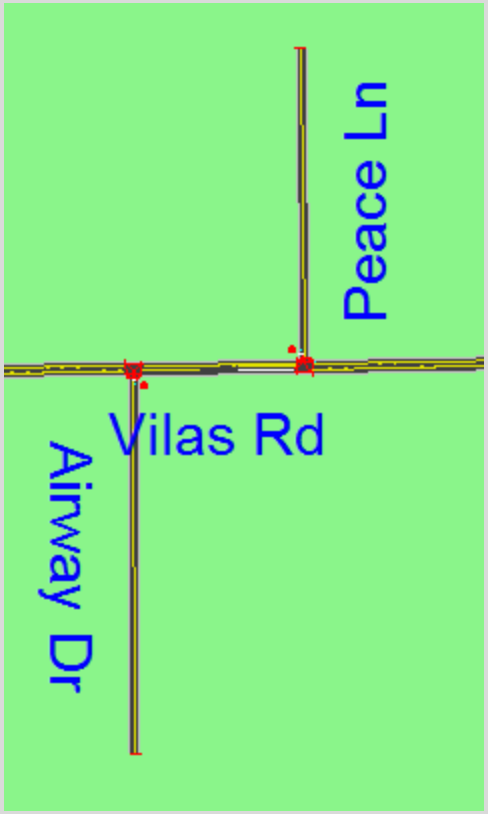
Project No.	Location	Project Type	Proposed Project Description
629	International Wy – Vilas to Coker Butte	New Roadway	Construct new major arterial roadway (includes center turn-lane, bike lane, and sidewalk)
630	Springbrook Rd - Coker Butte to Vilas Rd	New Roadway	Construct new major collector roadway (includes center turn-lane, bike lane, and sidewalk)
631	East-West collector- CLH to Eastern UGB between Coker Butte and Vilas Rd	New Roadway	Construct new minor collector roadway (includes one lane each direction, bike lane, and sidewalk)

Included in all scenarios beyond NBNM

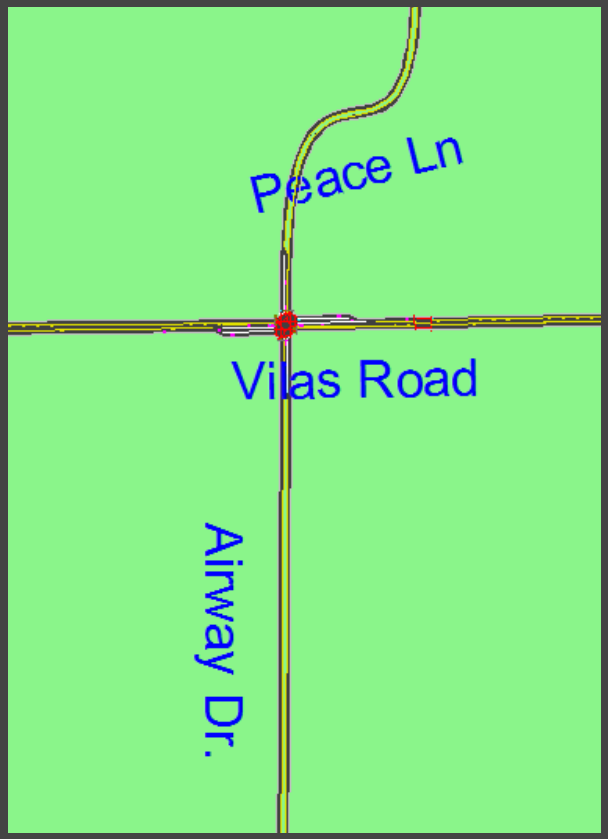


Included in all scenarios beyond NBNM

Current Geometry



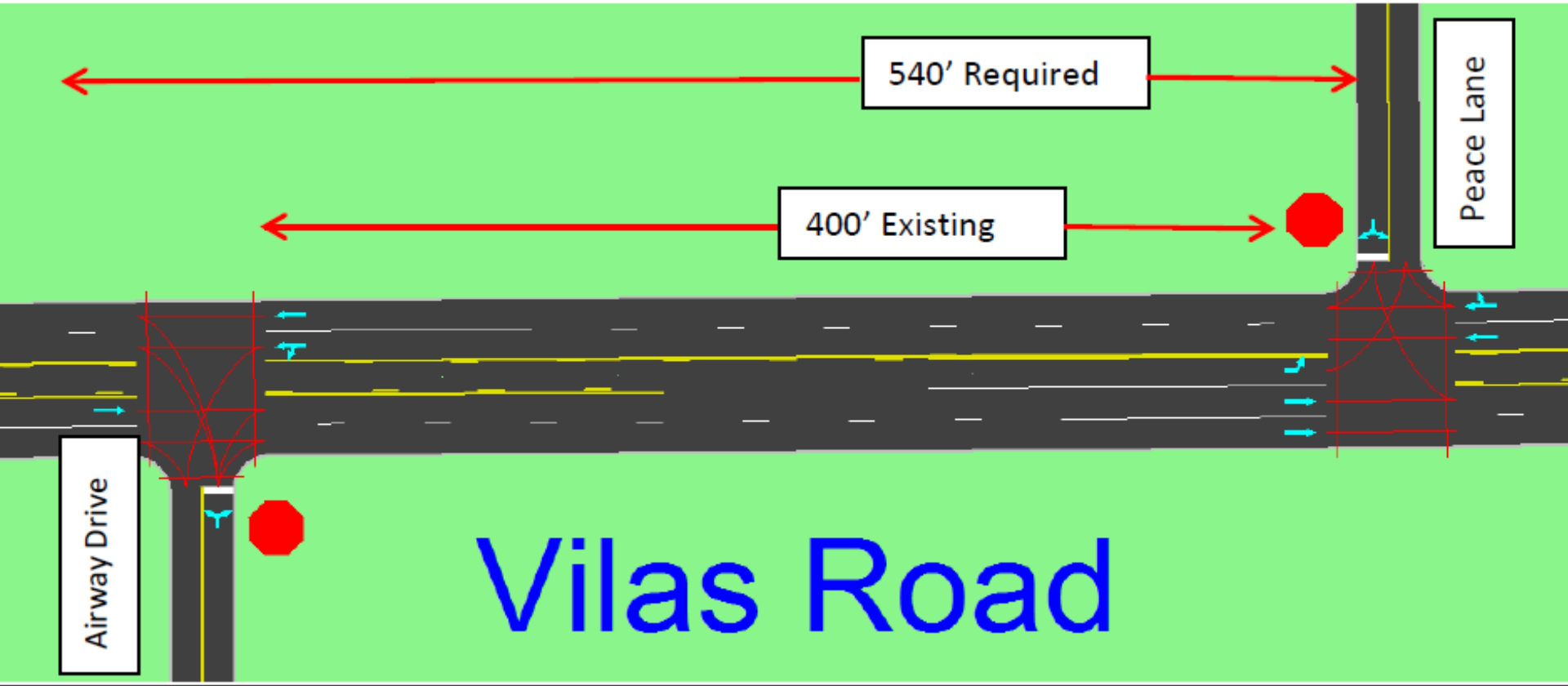
Analyzed Geometry



Peace Lane and Airway Drive

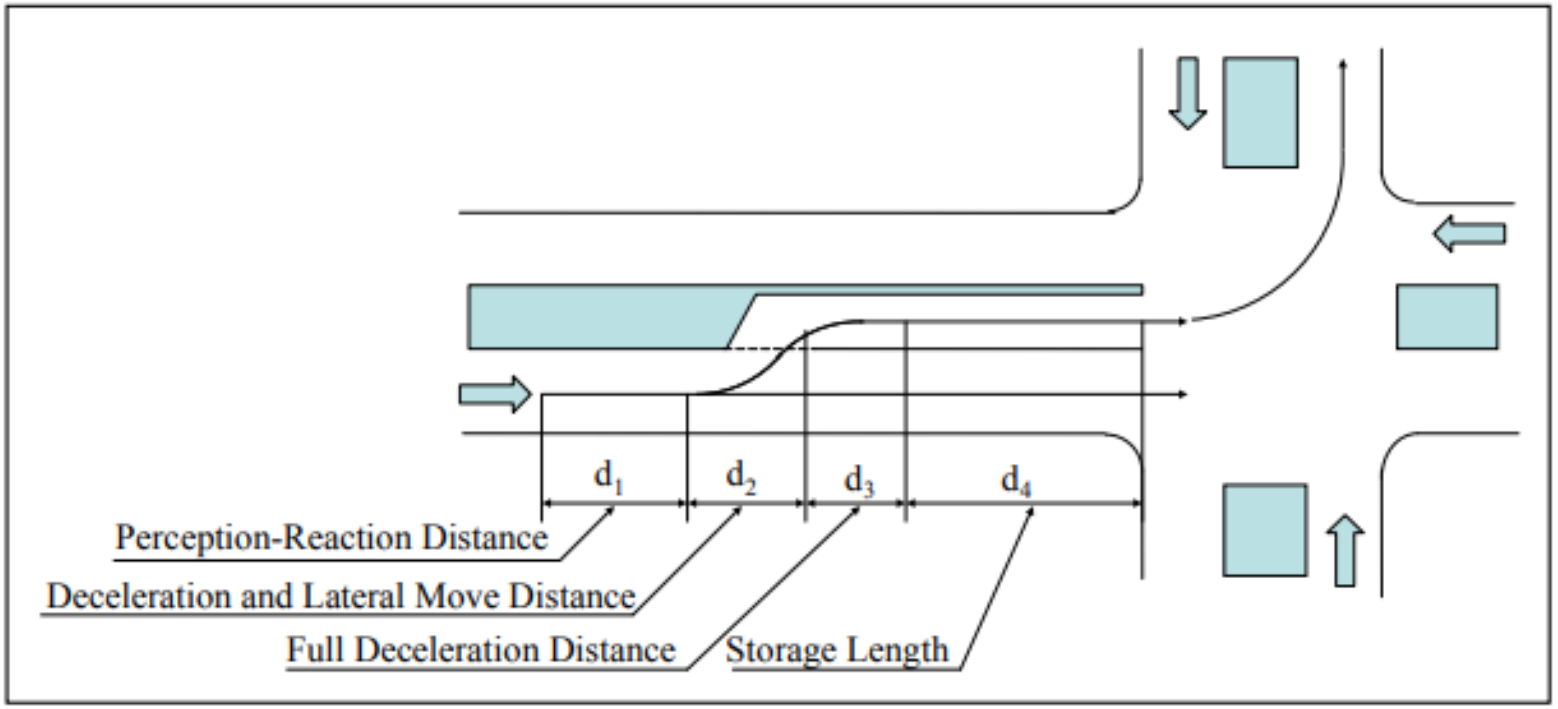
Functional Area Analysis

Accommodate Necessary Elements?



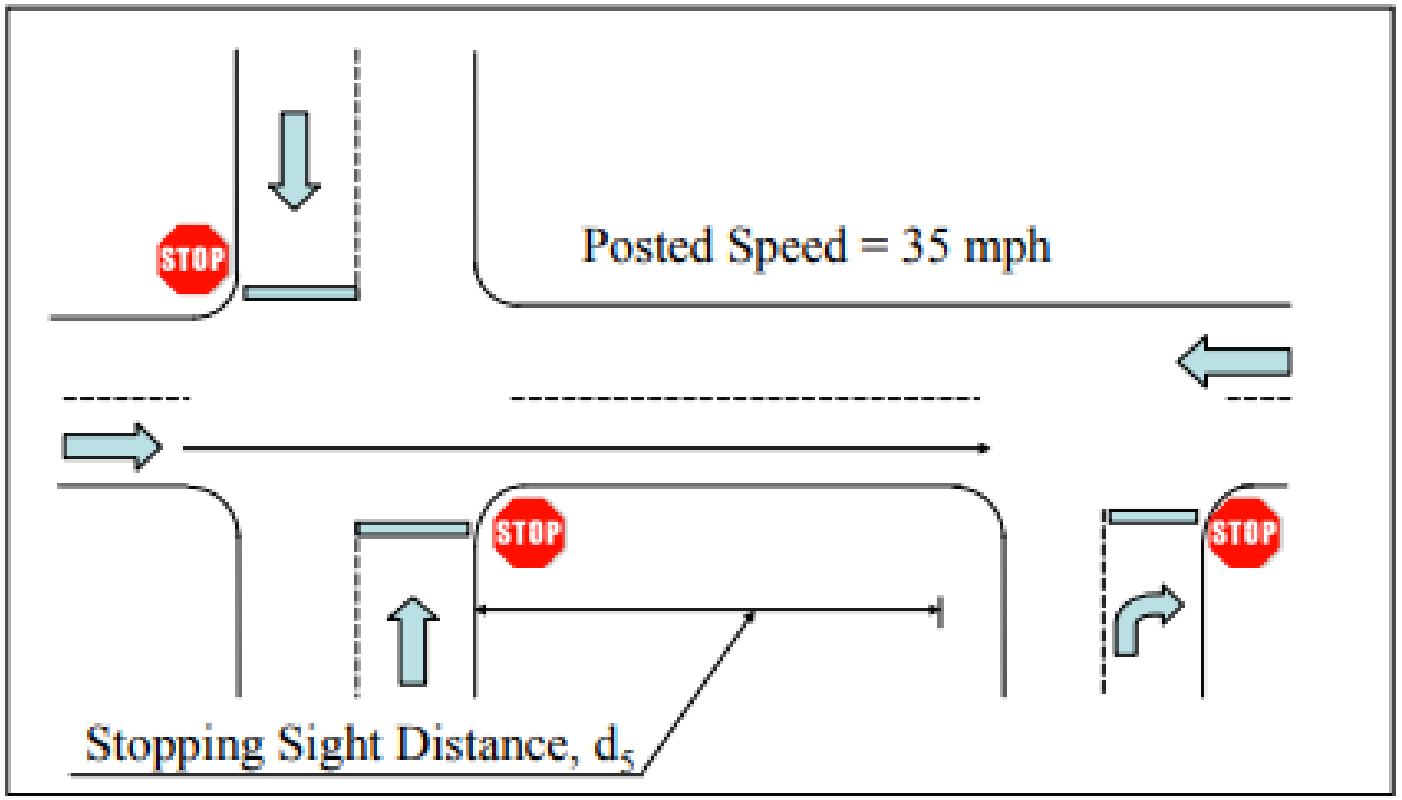
Functional Area Elements

Upstream



Functional Area Elements

Downstream



Functional Area Analysis

Input

	Limiting	Desirable
Reaction distance[1] d_1 (ft)	65	130
Deceleration (ft/sec^2)	9.2	6.7
	Passenger Car	**Truck**
Acceleration (ft/sec^2)	3.2	1.1

[1]**These reaction distances are for unfamiliar drivers. For familiar drivers the reaction distance is 0 feet.**

Results

- Four lane Vilas Road scenarios not feasible
- Two lane Vilas Road scenarios only feasible for "familiar drivers" where reaction distance = 0 feet.

THEREFORE

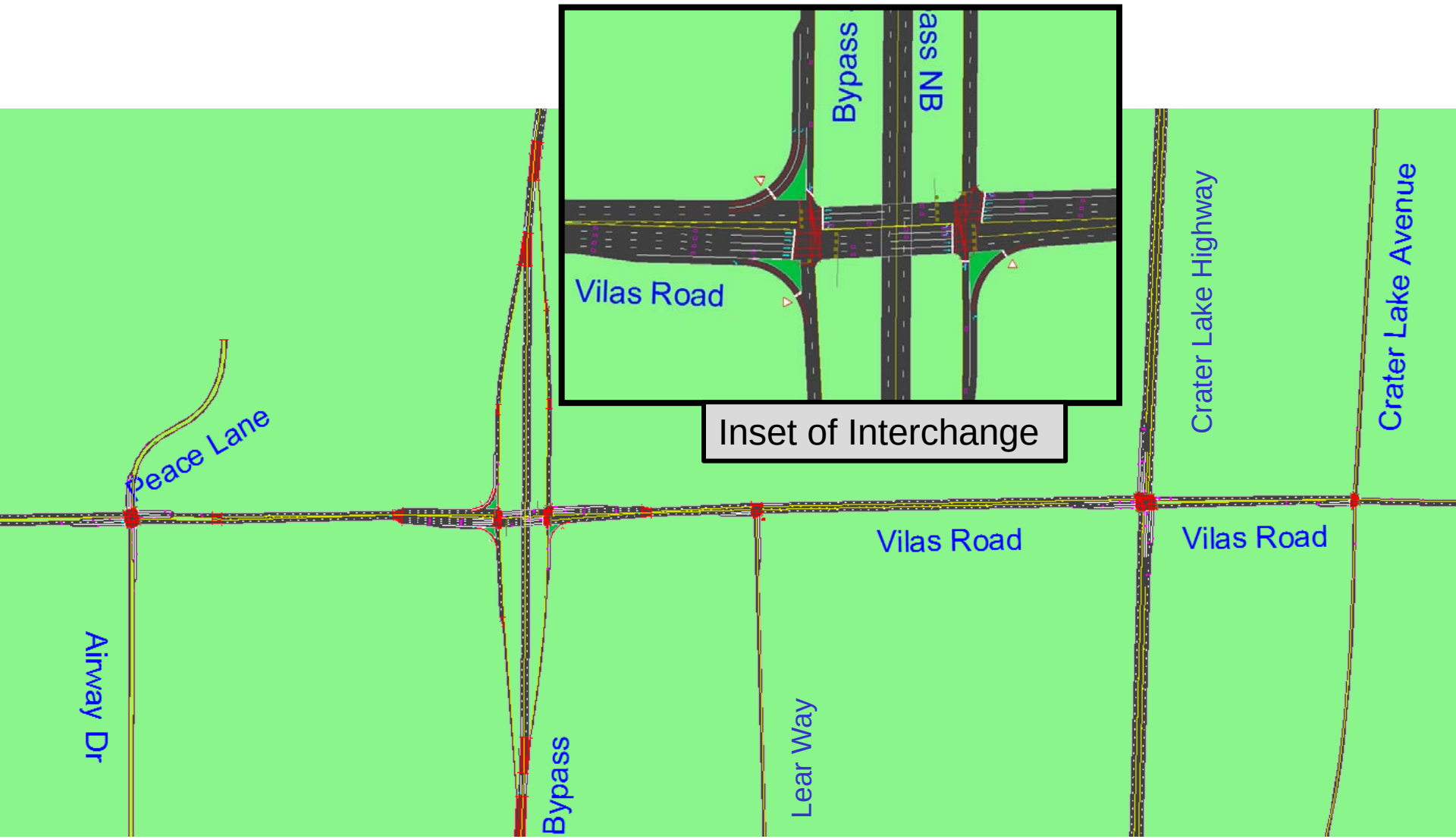
400 feet is NOT sufficient to accommodate necessary

- Acceleration
- Reaction distance
- Legal turn signal distance of 100' required by the OR Vehicle Code
- Deceleration

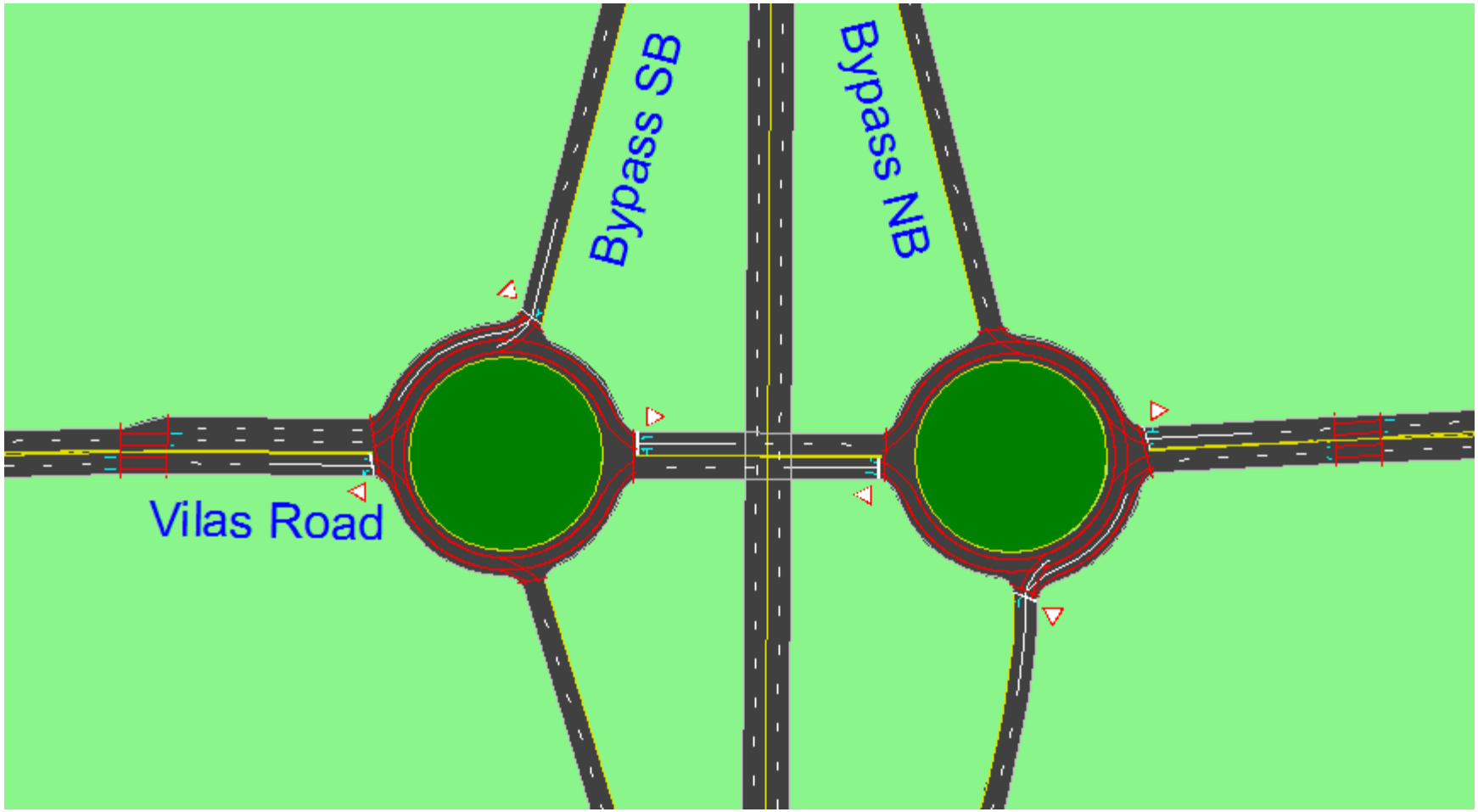
Scenario Definitions

- JTA Build or Full Build with or without Tier 2 Projects and:
  - Two or four through-lane Vilas Road
  - Tight Diamond or Roundabout

Tight Diamond Interchange

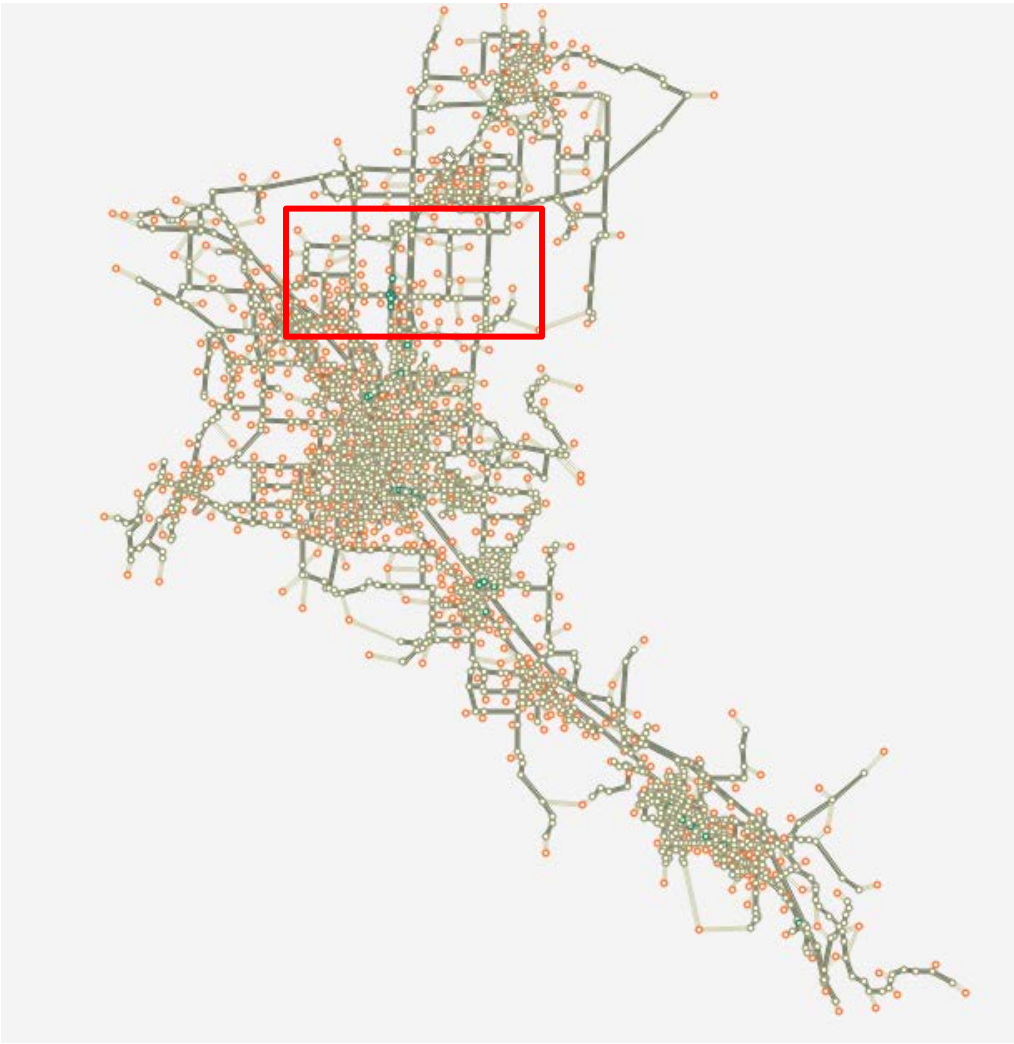


Roundabout Interchange

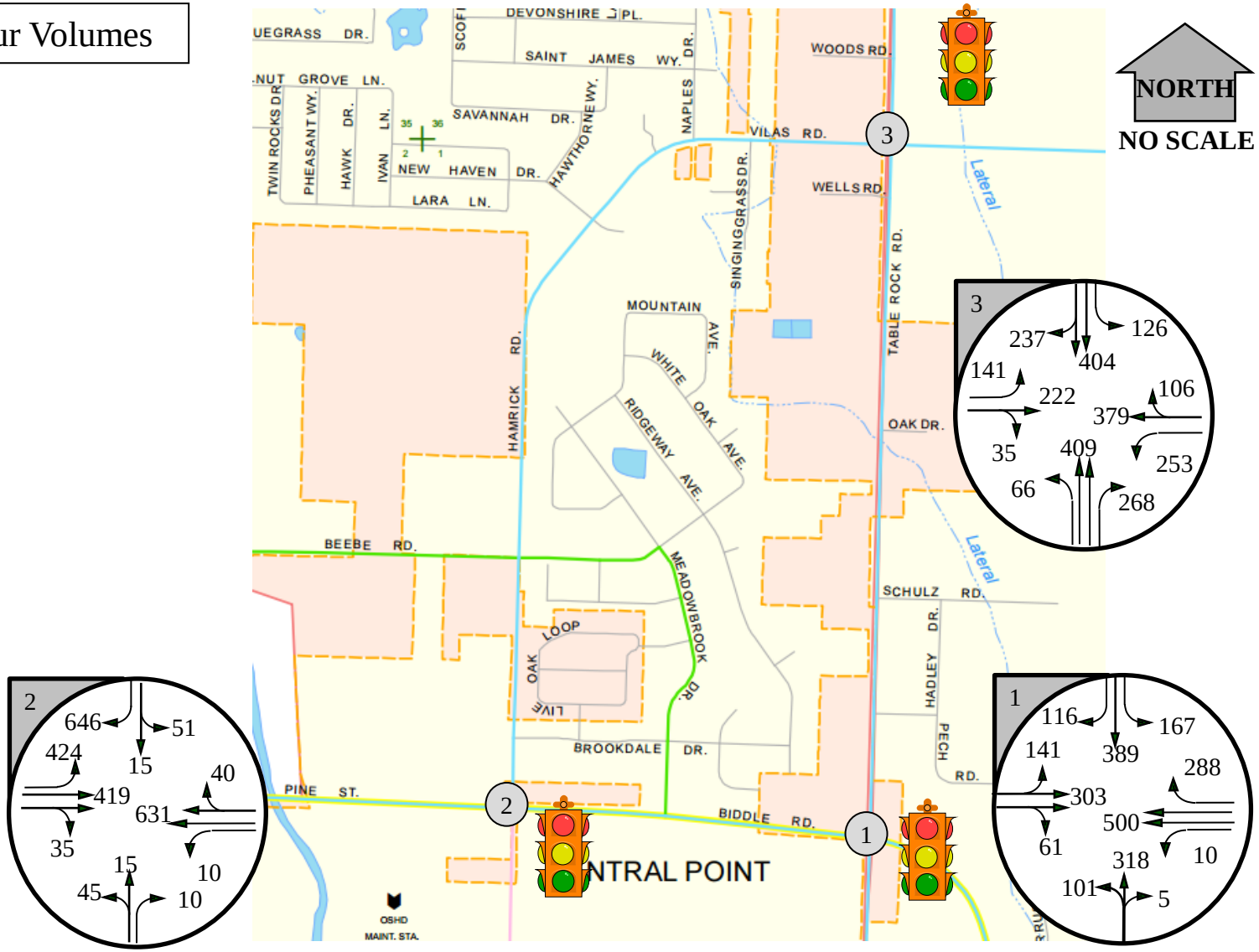


RVMPO v4.2 Travel Demand Model

2040 Volume Development

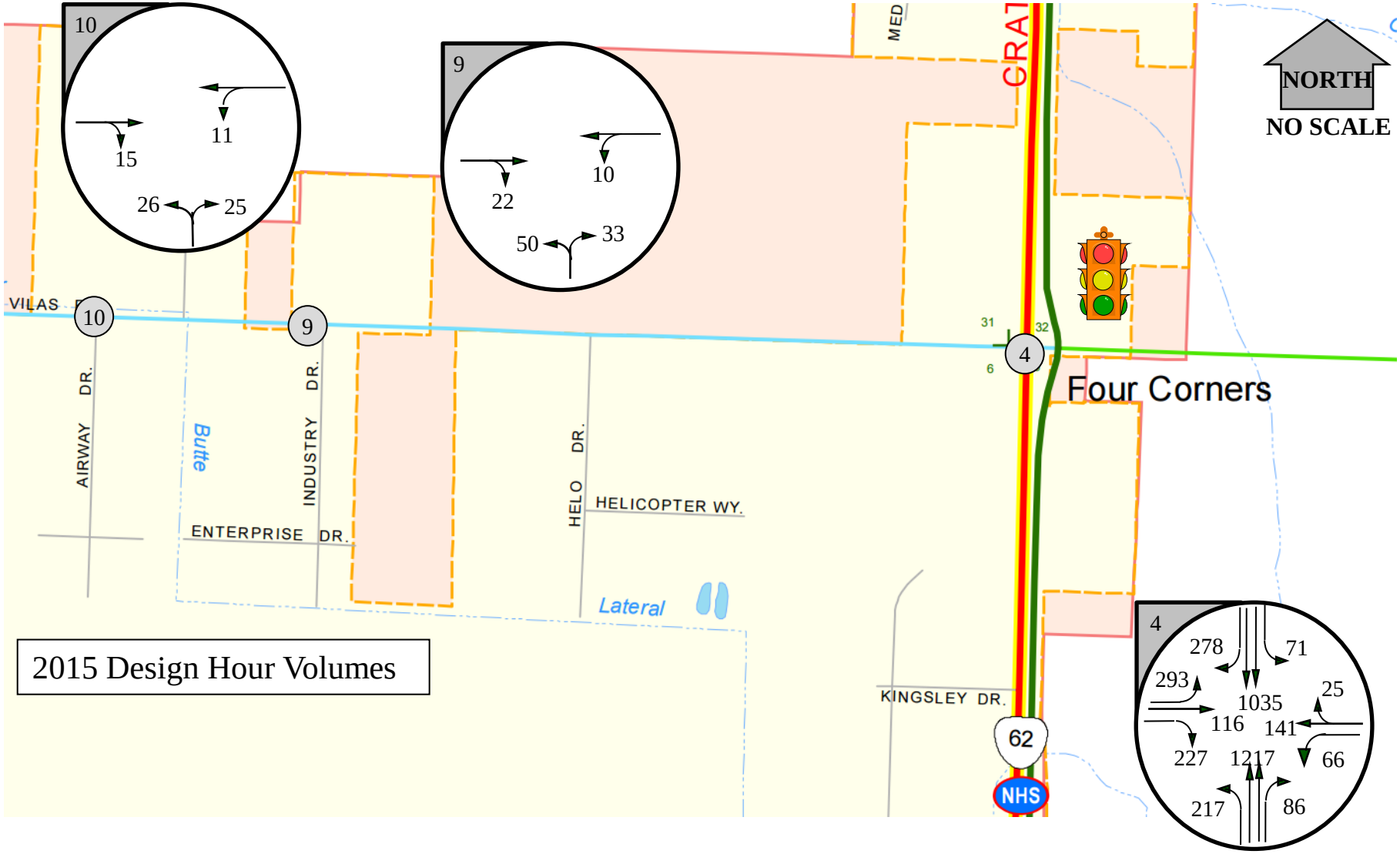


2015 Design Hour Volumes



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

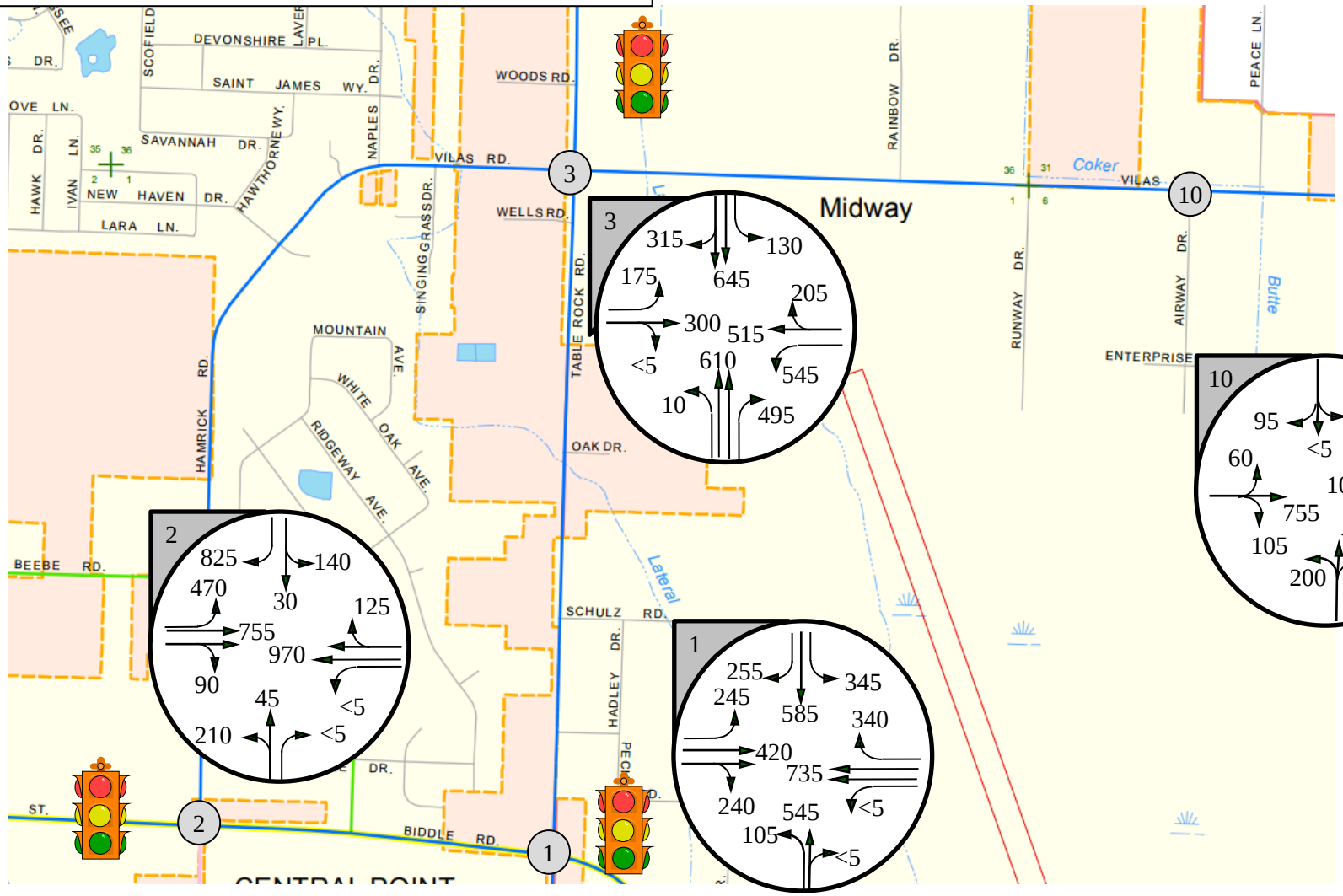
OR62 & Vilas Rd IAMP 2015 Design Hour Volumes (DHV)	**File : OR62-Vilas**	**Prepared By: Katie Brown**	FIGURE 4
	Date : 6/5/17	**Reviewed By: , P.E.**	



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 2015 Design Hour Volumes (DHV)	File : OR62-Vilas	Prepared By: Katie Brown	FIGURE 4
	Date : 6/5/17	Reviewed By: , P.E.	

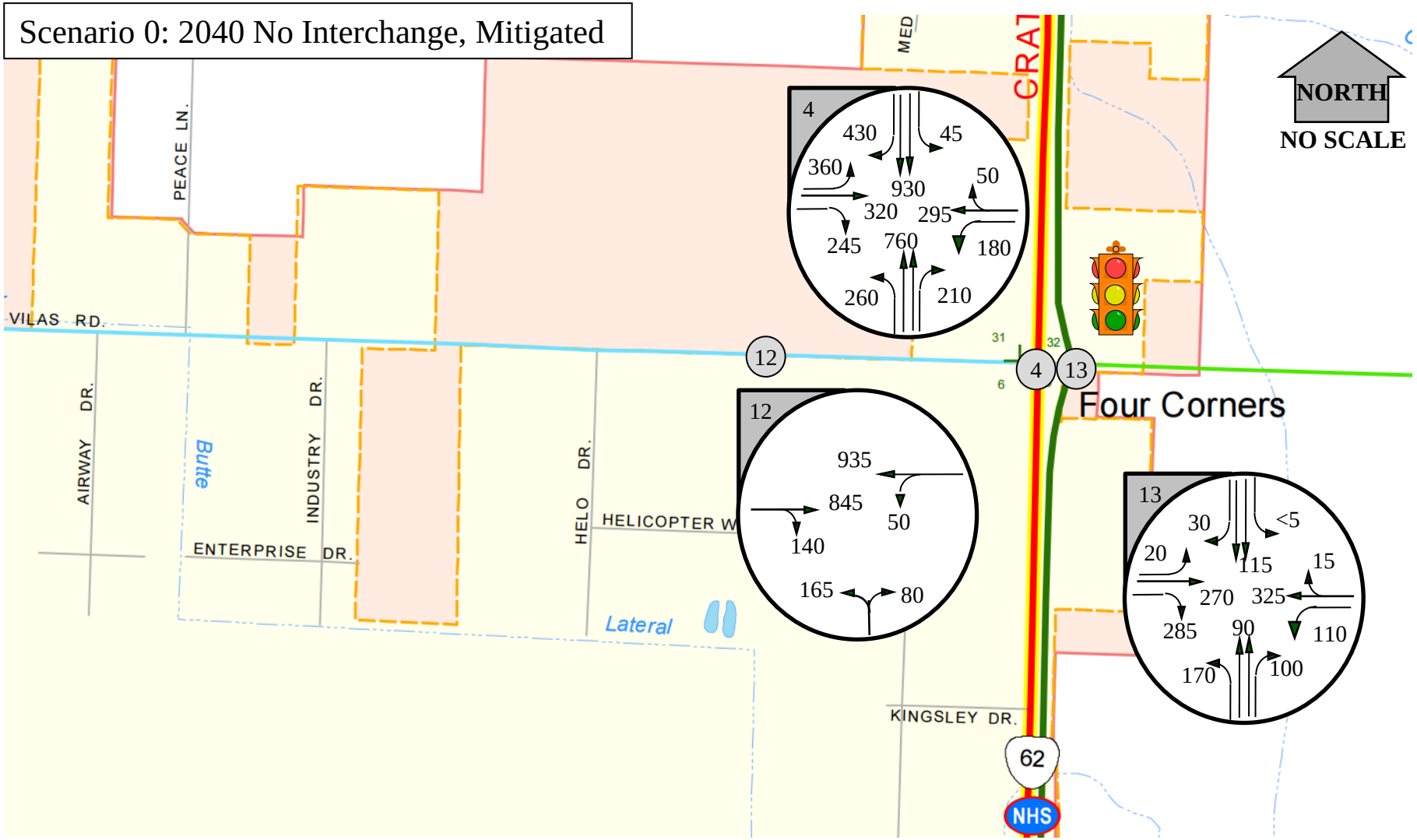
Scenario 0: 2040 No Interchange, Mitigated



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 2040 Design Hour Volumes (DHV)	File : OR62-Vilas	Prepared By: Katie Brown	FIGURE 1
	Date : 2/5/18	Reviewed By: , P.E.	

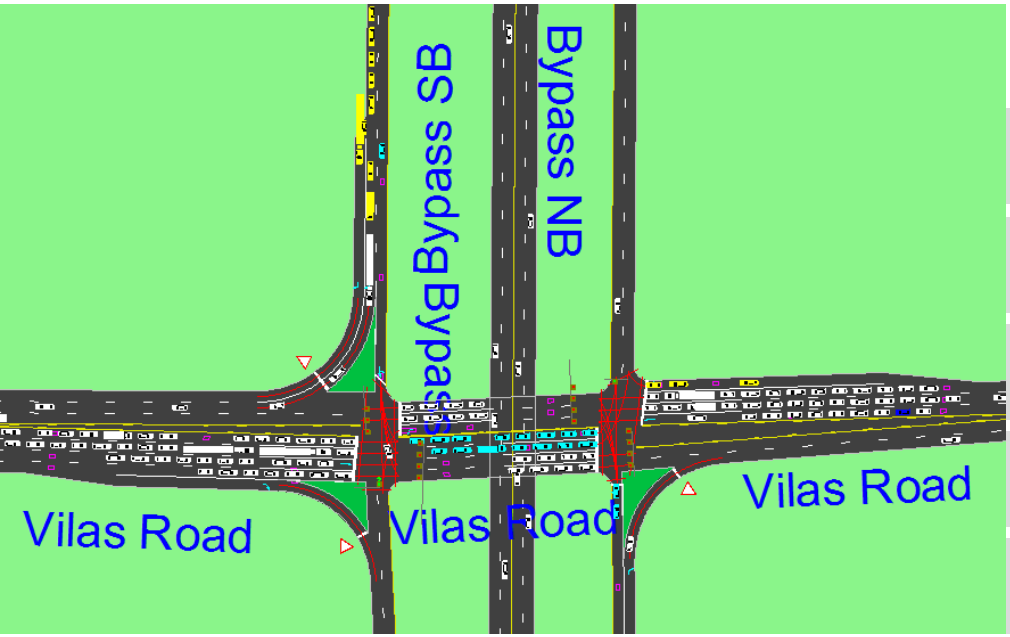
Scenario 0: 2040 No Interchange, Mitigated



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 2040 Design Hour Volumes (DHV)	File : OR62-Vilas	Prepared By: Katie Brown	FIGURE 2
	Date : 2/5/18	Reviewed By: , P.E.	

Analysis Results



- Capacity
- Queuing
- Crash
- Multimodal LOS
- Overall Simulation MOE

Standards/Targets for v/c by Intersection

Intersection	Standard/Target			
	ODOT (V/C Ratio)		Local	
	OHP	HDM	V/C Ratio	LOS
OR62	0.85	0.75	NA	NA
Vilas Rd & Table Rock Rd	NA	NA	0.90/0.95	D
Vilas Rd & Airway Dr/Peace Ln	NA	NA	0.95	D
Vilas Rd & Lear Wy	NA	NA	0.95	D
Vilas Rd & Crater Lake Hwy	0.85	0.75	NA	D
Vilas Rd & Crater Lake Ave	NA	NA	0.95	D
Table Rock Rd & Biddle Rd	NA	NA	0.90/0.95	D
Biddle Rd & Hamrick Rd	NA	NA	0.90	D

Analysis Results

Capacity

- All mainline free-flow segments, ramps, & merge/diverge sections meet HDM v/c standards
- OR62 NB north of interchange slightly exceeds standards
  - JTA Build, 2-Lane Vilas Rd, Tier 1
  - JTA Build, 4-Lane Vilas Rd, Tier 1

Analysis Results

Capacity

- Intersections consistently over capacity:
  - Hamrick Rd & Table Rock Rd with Biddle Rd
    - Build scenarios lower v/c & LOS but still do NOT meet standards
  - Table Rock Rd & Vilas Rd

Analysis Results

Capacity

No-Build/No-Mitigation Scenario:

- ALL unsignalized intersections over capacity with LOS F

Analysis Results

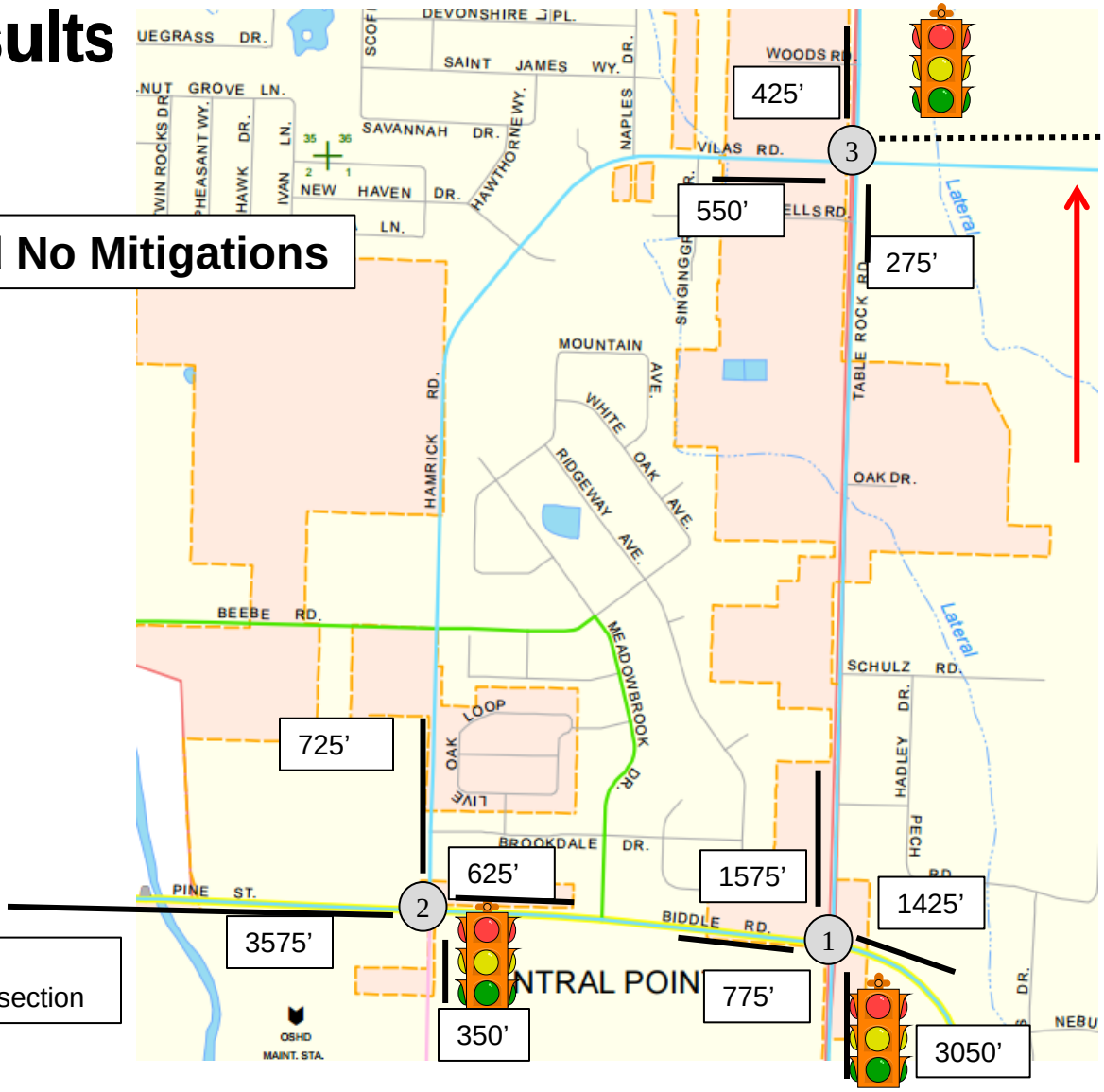
Capacity - Roundabouts

Scenario	v/c	LOS	Critical Movement
	Major / Minor		
NB Ramps			
S1T1R	0.87 / 0.44	**E / C**	WB / NB
S2T1R	1.51 / 0.62	**F / D**	WB / NB
S3T1R	0.87 / 0.50	D / D	EB / NB
S4T1R	1.11 / 0.71	**F / E**	WB / NB
S1T2R	0.80 / 0.79	**C / F**	EB / NB
S2T2R	**0.98 / 0.94**	**E / F**	EB / NB
S3T2R	0.77 / 0.53	C / D	EB / NB
S5T2R	**0.94 / 0.69**	**F / E**	WB / NB
SB Ramps			
S1T1R	**1.06 / 1.66**	**F / F**	EB / SB
S2T1R	**1.27 / >2.0**	**F / F**	EB / SB
S3T1R	**0.89 / 1.43**	**D / F**	EB / SB
S4T1R	**1.10 / >2.0**	**F / F**	EB / SB
S1T2R	**0.98 / 1.63**	**F / F**	EB / SB
S2T2R	**1.16 / >2.0**	**F / F**	EB / SB
S3T2R	**0.81 / 1.01**	**C / F**	EB / SB
S5T2R	**0.99 / 1.48**	**F / F**	EB / SB

Analysis Results

Queuing

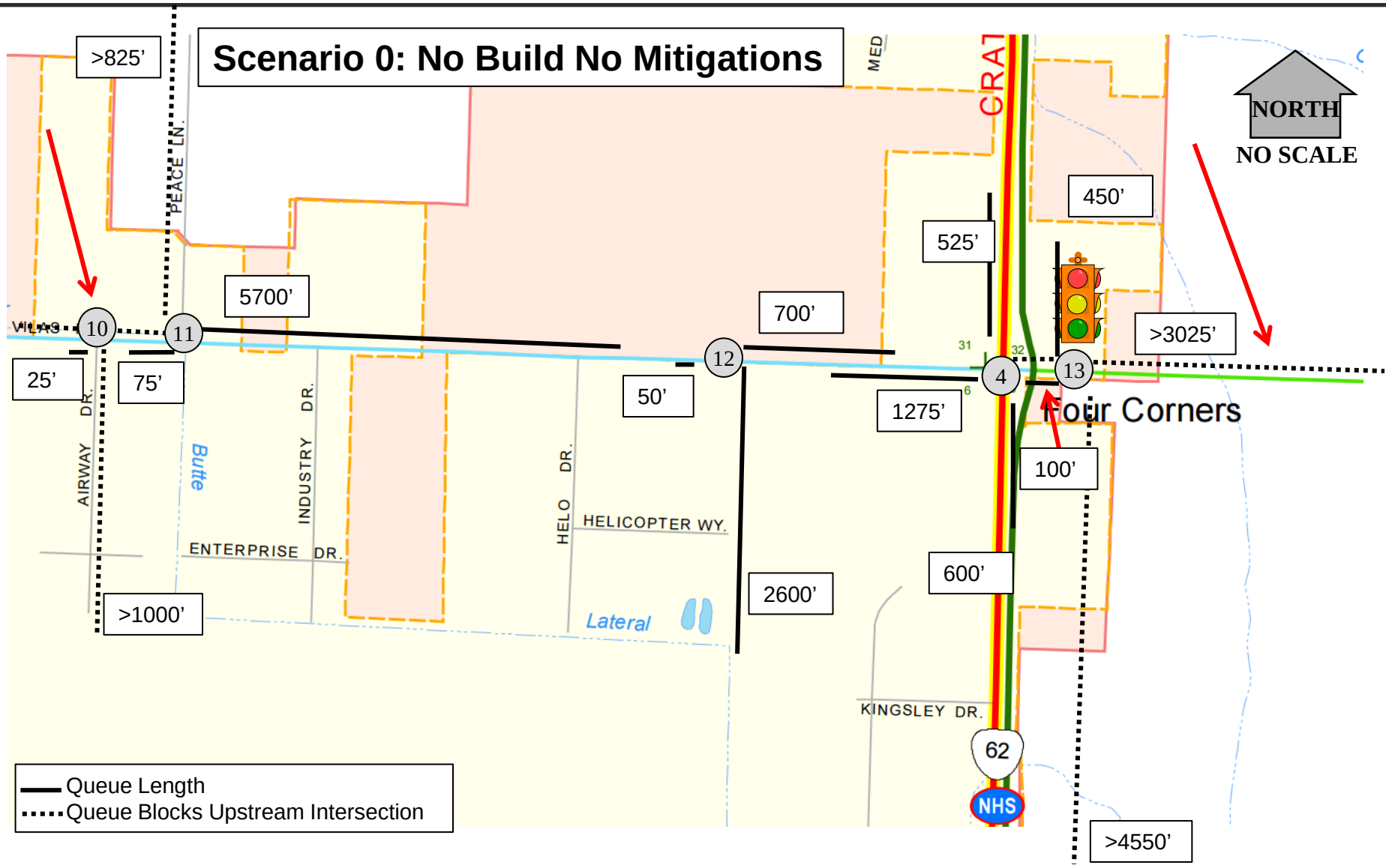
Scenario 0: No Build No Mitigations



Queue Length
Queue Blocks Upstream Intersection

OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

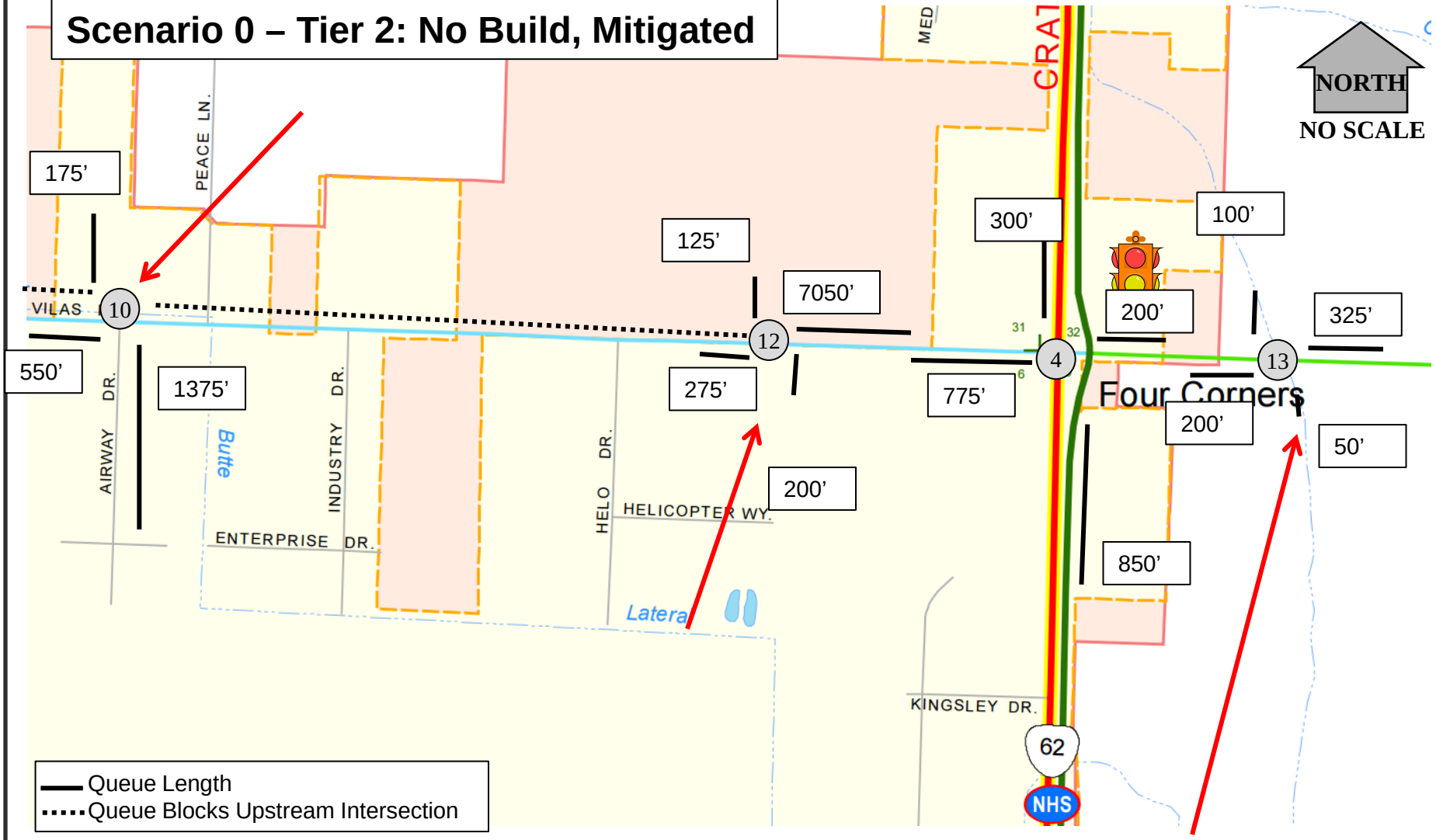
OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 0: No Build No Mitigations**	**File : OR62-Vilas** **Date : 5/9/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-1



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 0: No Build No Mitigations**	**File : OR62-Vilas** **Date : 5/9/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-2

Scenario 0 – Tier 2: No Build, Mitigated



OREGON DEPARTMENT OF TRANSPORTATION | **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

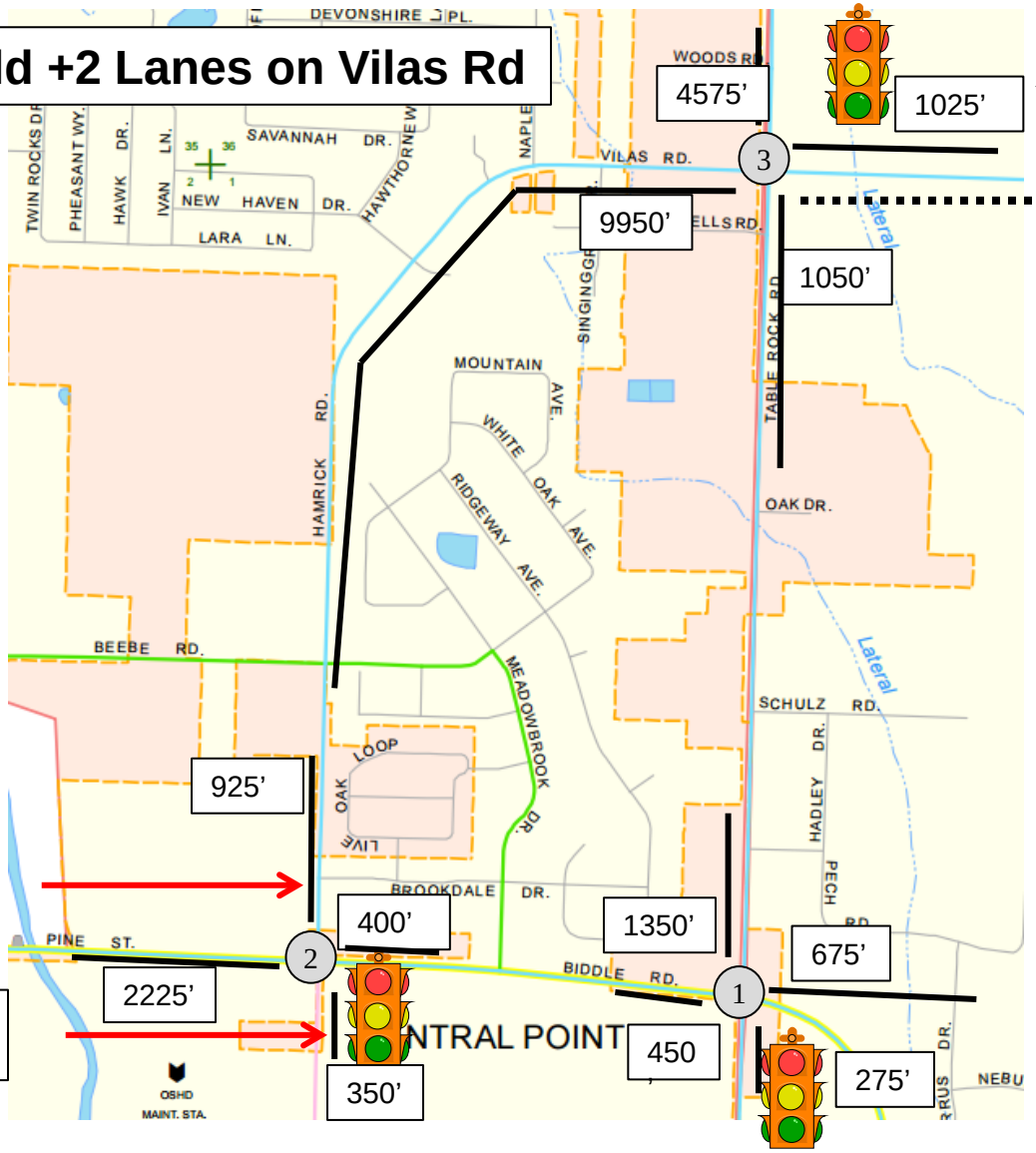
OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths
Scenario 0 – Tier 2: No Build, Mitigated

File : OR62-Vilas | **Prepared By: Katie Brown**

Date : 5/9/18 | **Reviewed By: P. Schuytema, P.E.**

FIGURE J-6

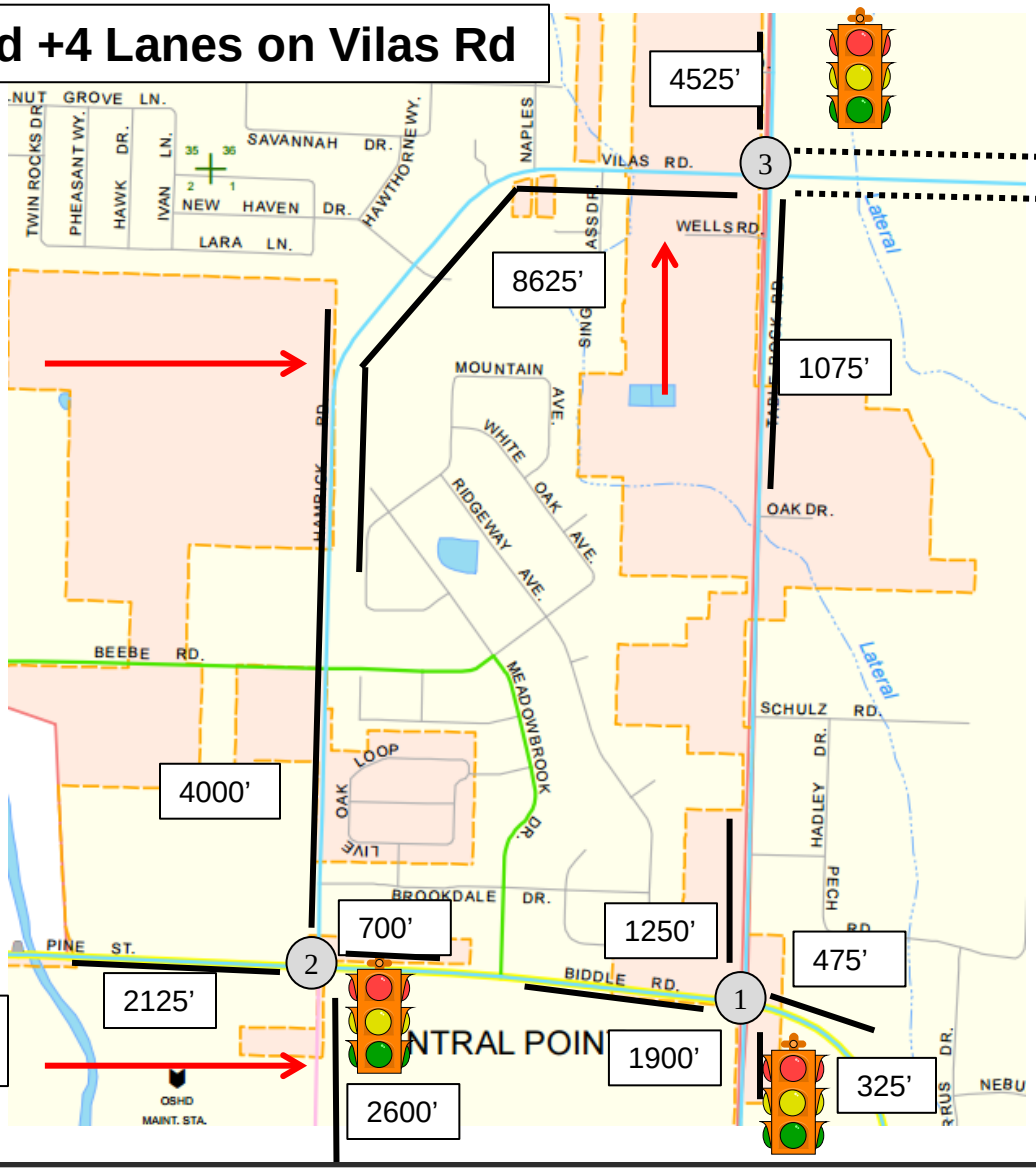
Scenario 1: 2040 JTA Build +2 Lanes on Vilas Rd



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 1: 2040 JTA Build +2 Lanes on Vilas Rd**	**File : OR62-Vilas** **Date : 5/7/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-7

Scenario 2: 2040 JTA Build +4 Lanes on Vilas Rd

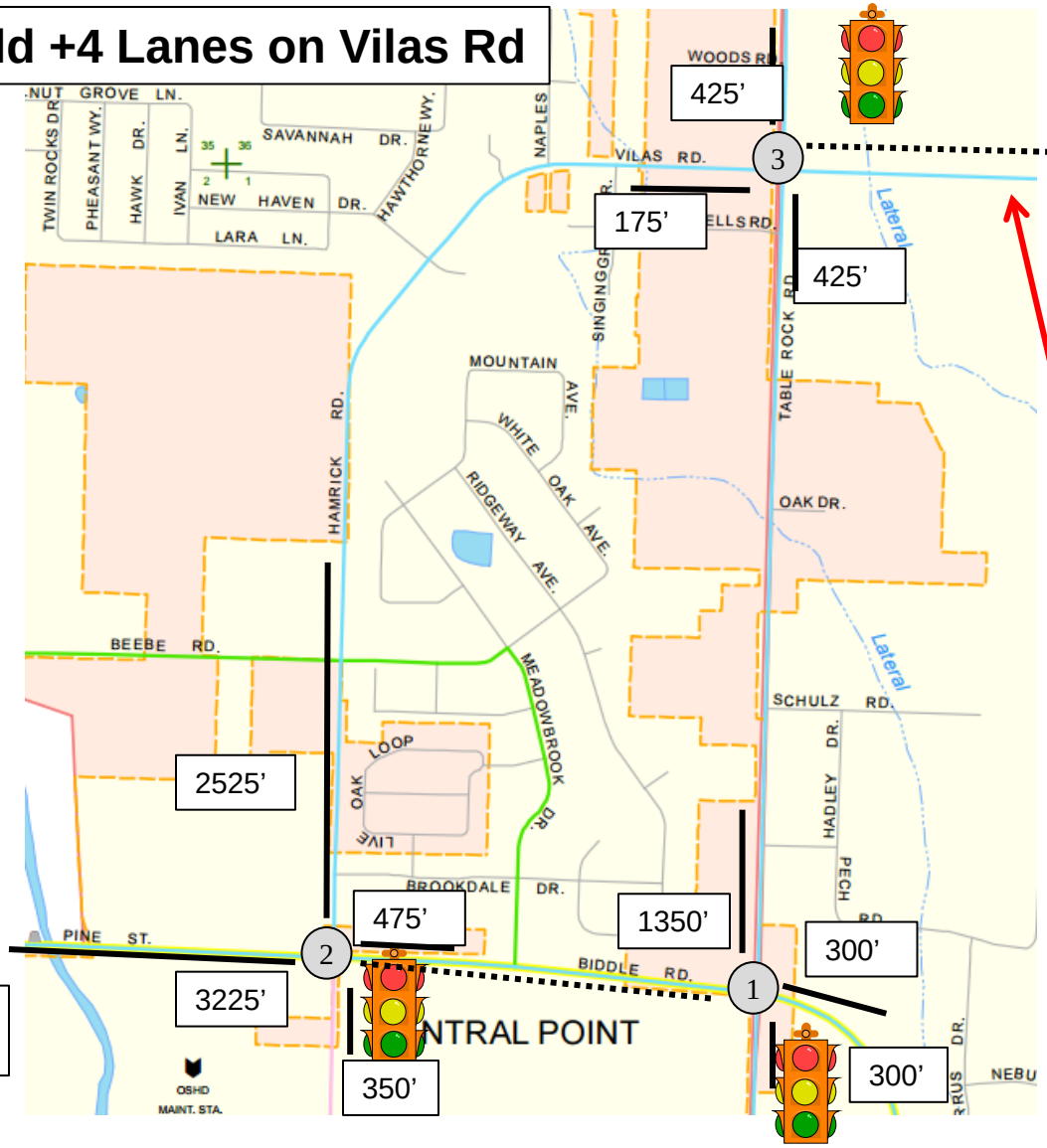


OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 2: 2040 JTA Build +4 Lanes on Vilas Rd**	**File : OR62-Vilas** **Date : 5/8/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-9

Scenario 5: 2040 Full Build +4 Lanes on Vilas Rd



Queue Length
Queue Blocks Upstream Intersection

OREGON DEPARTMENT OF TRANSPORTATION

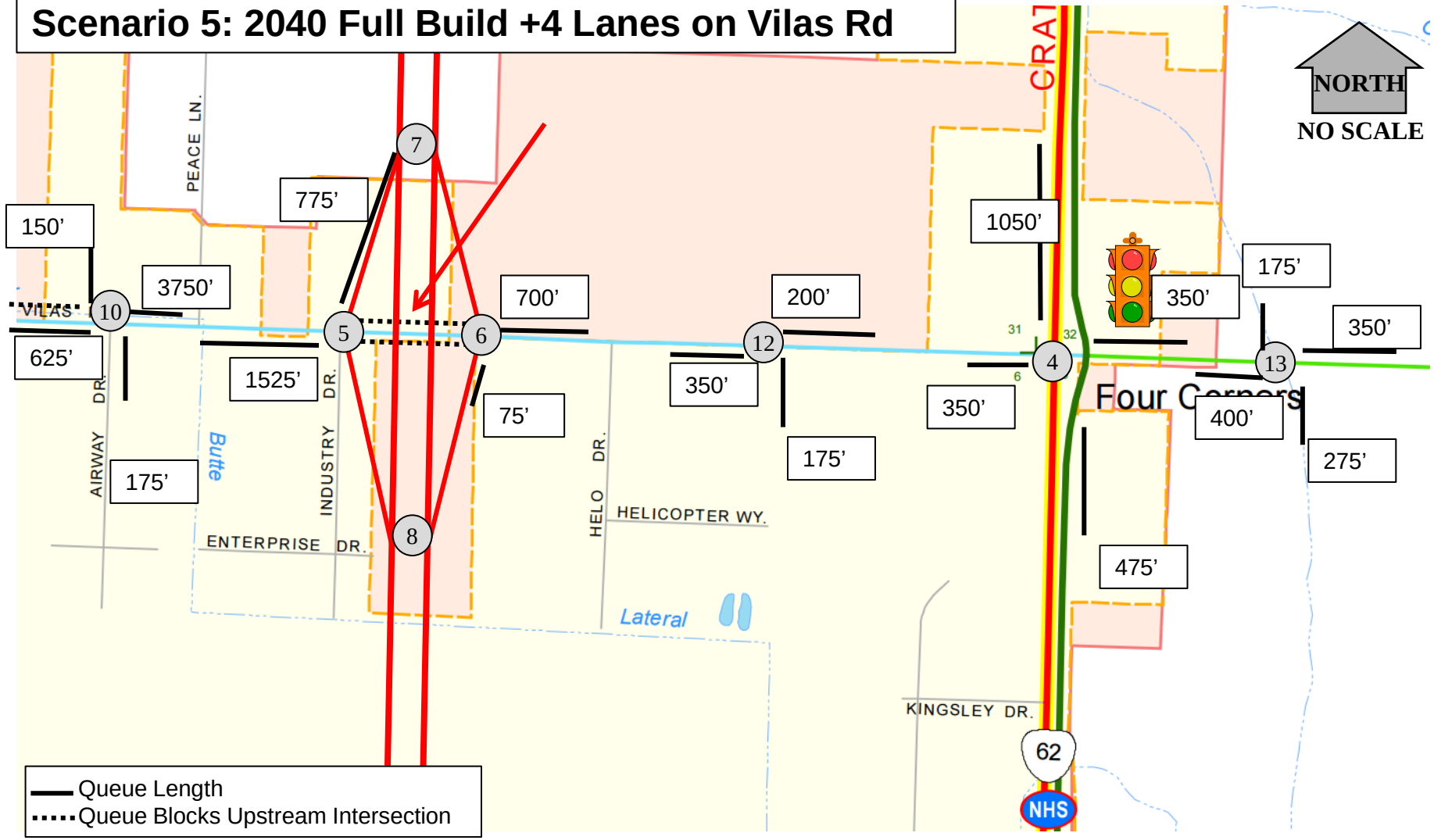
TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths
Scenario 5: 2040 Full Build +4 Lanes on Vilas Rd

File : OR62-Vilas
Date : 5/8/18
Prepared By: Katie Brown
Reviewed By: P. Schuytema, P.E.

FIGURE J-13

Scenario 5: 2040 Full Build +4 Lanes on Vilas Rd

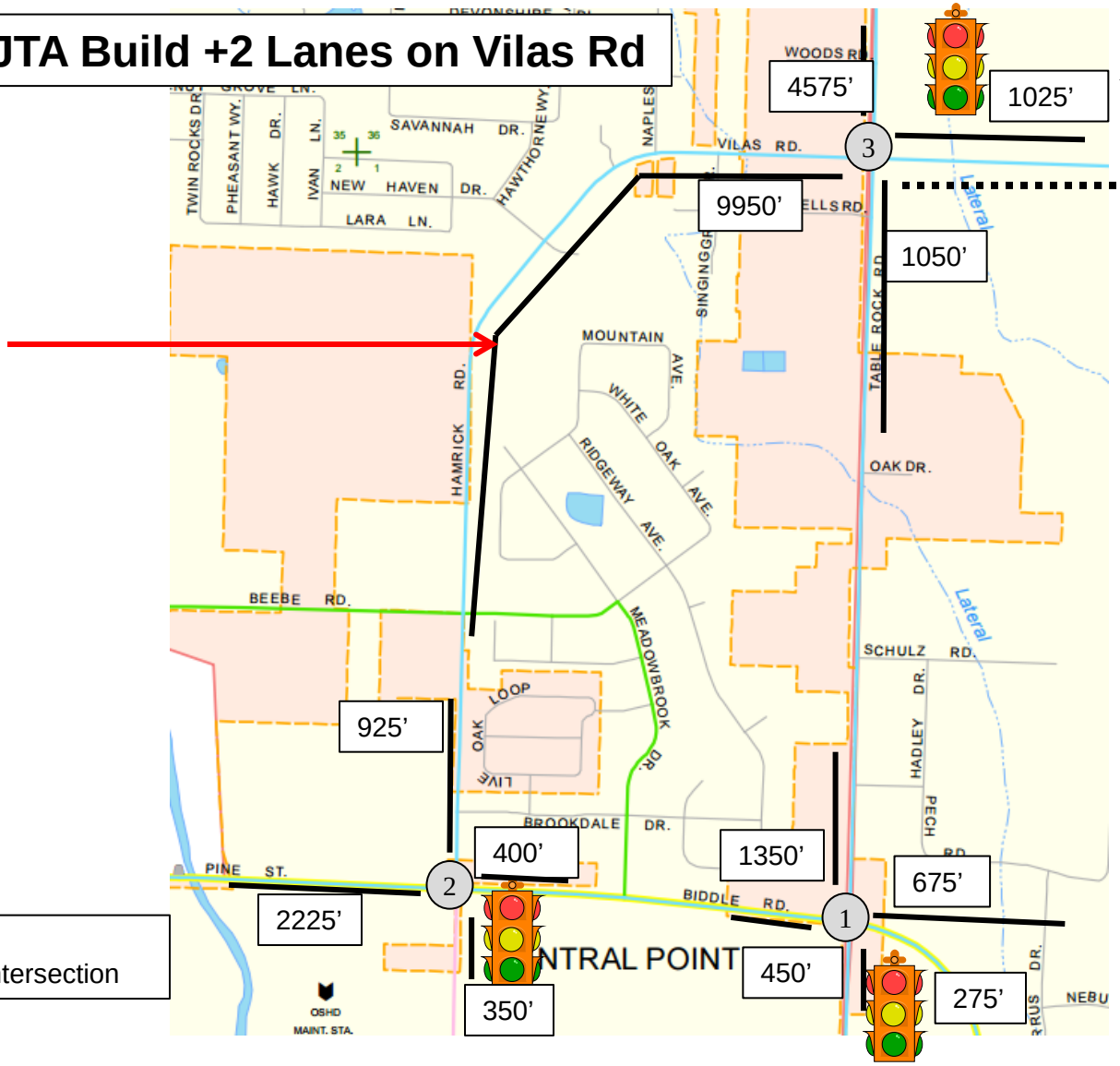


OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 5: 2040 Full Build +4 Lanes on Vilas Rd**	**File : OR62-Vilas** **Date : 5/8/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-14

Scenario 1: 2040 JTA Build +2 Lanes on Vilas Rd



Queue Length
Queue Blocks Upstream Intersection

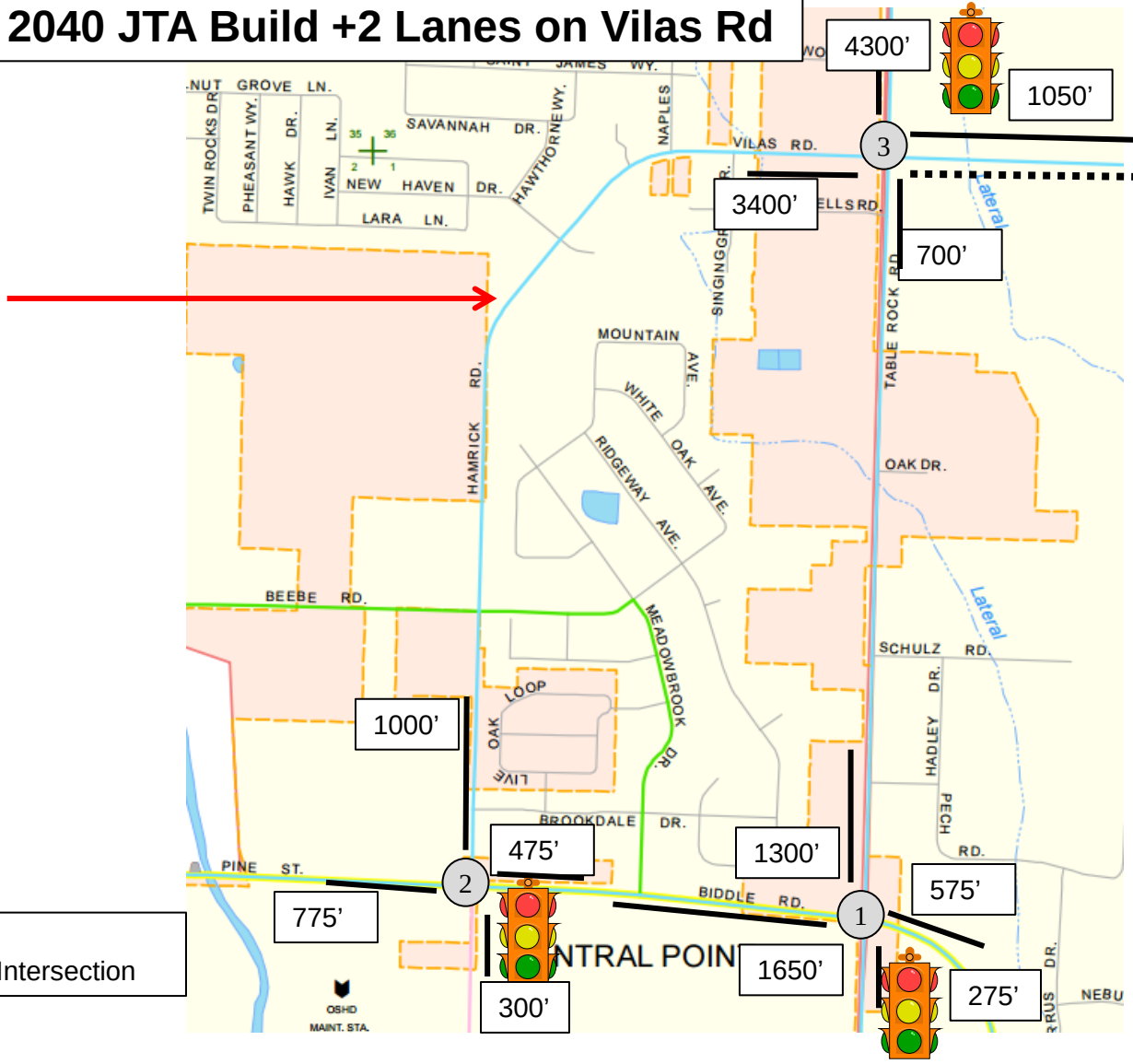
OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths
Scenario 1: 2040 JTA Build +2 Lanes on Vilas Rd

File : OR62-Vilas
Date : 5/7/18
Prepared By: Katie Brown
Reviewed By: P. Schuytema, P.E.

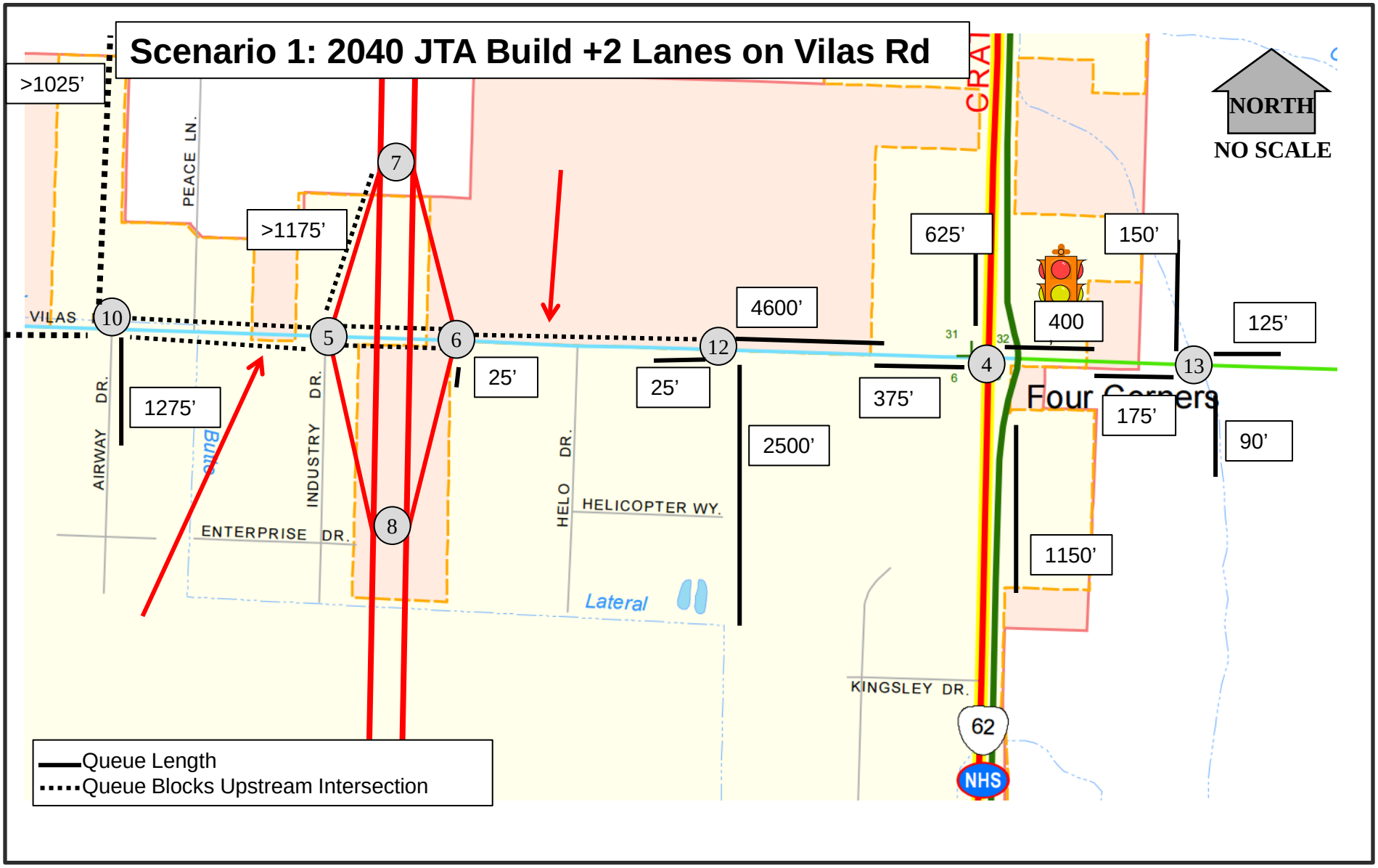
FIGURE J-7

Scenario 1-Tier 2: 2040 JTA Build +2 Lanes on Vilas Rd



OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 1- Tier 2: 2040 JTA Build +2 Lanes on Vilas Rd**	**File : OR62-Vilas** **Date : 5/8/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-15



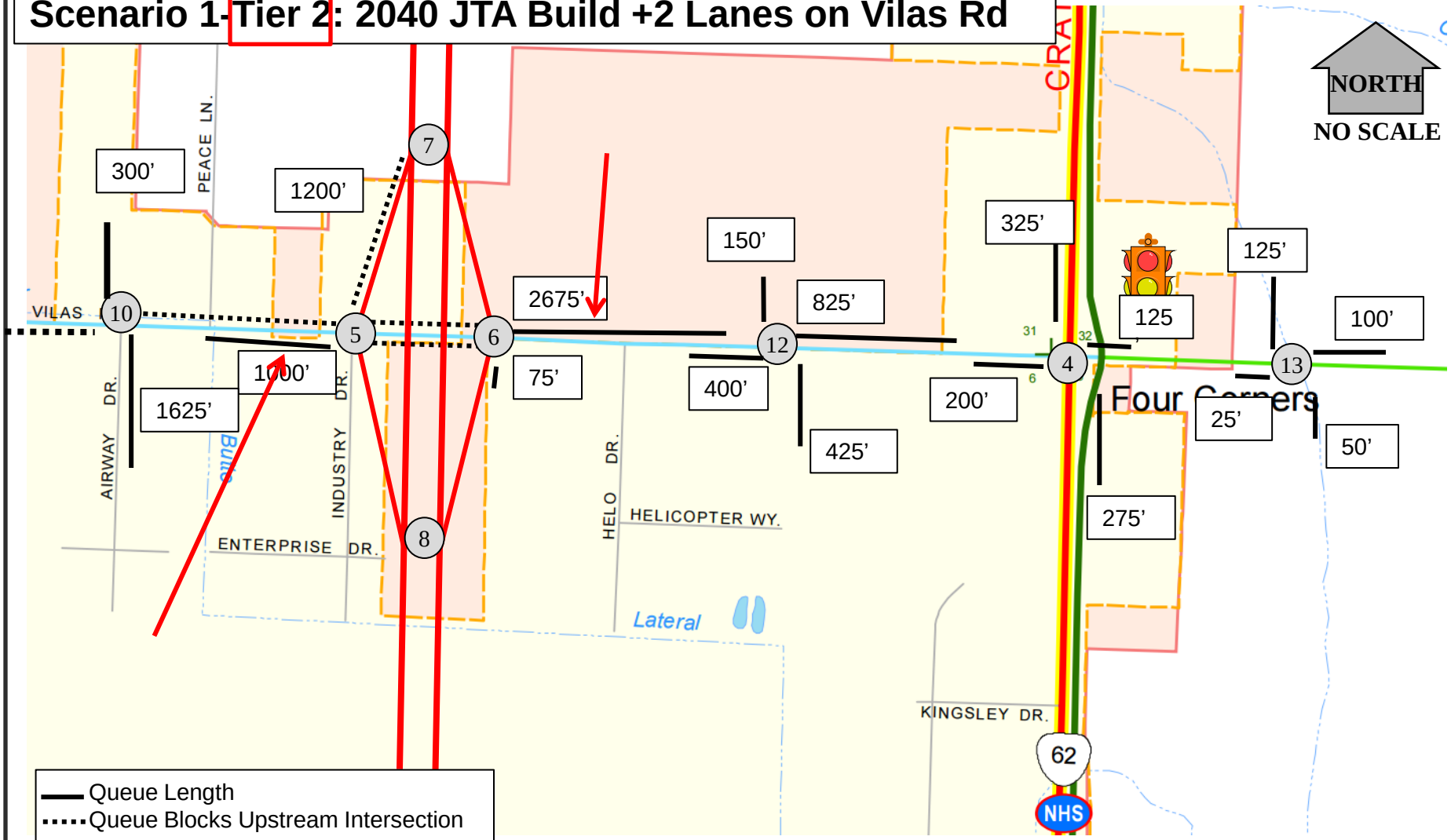
OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths
Scenario 1: 2040 JTA Build +2 Lanes on Vilas Rd

File : OR62-Vilas	**Prepared By: Katie Brown**	FIGURE J-8
Date : 5/7/18	**Reviewed By: P. Schuytema, P.E.**	

Scenario 1-Tier 2: 2040 JTA Build +2 Lanes on Vilas Rd



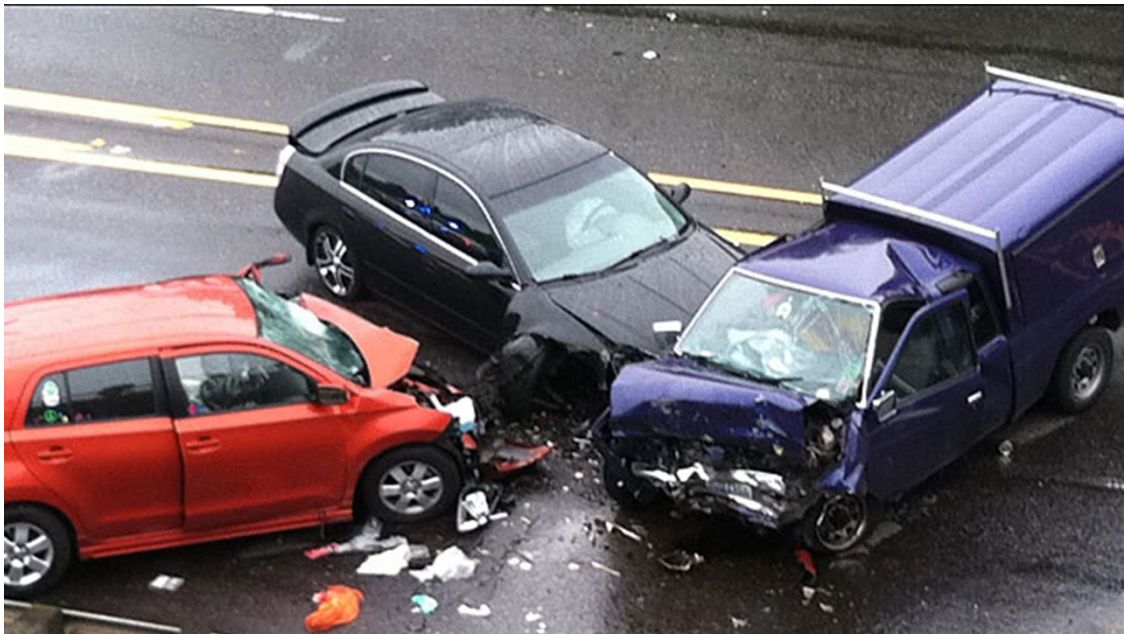
OREGON DEPARTMENT OF TRANSPORTATION **TPAU** TRANSPORTATION PLANNING ANALYSIS UNIT

OR62 & Vilas Rd IAMP 95th Percentile Queue Lengths **Scenario 1- Tier 2: 2040 JTA Build +2 Lanes on Vilas Rd**	**File : OR62-Vilas** **Date : 5/8/18**	**Prepared By: Katie Brown** **Reviewed By: P. Schuytema, P.E.**	FIGURE J-16

Analysis Results

Crash Frequency

- No-Mitigation has highest crash frequency of No-Build scenarios
- Full Build, 2-lane Vilas Rd, Tier 2, Roundabout has lowest crash frequency of Build scenarios
- +Tier 2 Projects
  - JTA Build crashes slightly decrease
  - Full Build crashes decrease



Analysis Results

Multimodal Level of Service (MMLOS)

Sidewalk improves pedestrian LOS to C or better everywhere EXCEPT

- Pine Street/Biddle Rd
- Table Rock Rd
- Crater Lake Highway
- Vilas Rd (in Build scenarios)

Separated Multi-Use Paths are recommended

Analysis Results

Overall Simulation Measures of Effectiveness (MOE)

	No Build		Tight Diamond		Roundabout	
Measure	**Best**	**Worst**	**Best**	**Worst**	**Best**	**Worst**
Overall average network speed (mph)	S0T2	NBNM	S5T2	S2T1/2	S5T2R	S3T1R
Overall network travel time (hr)	S0T2	NBNM	S5T2	S2T1	S5T2R	S3T1R
Overall delay (vehicle-hours)	S0T2	NBNM	S5T2	S5T1	S5T2R	S3T1R
Overall number of stops	NBNM	S0T2	S5T2	S3T1	S5T2R	S2T2R

S0T2: No Build Tier 2
S5T2: Tight Diamond, Full Build, 4 Lane Vilas Rd, Tier 2
S5T2R: Roundabout, Full Build, 4 Lane Vilas Rd, Tier 2

Conclusions

Overall No Build Scenarios Comparison

Measure	NBNM	S0T1	S0T2
Number of locations over standards[2]	**8**	4	3
Number of locations over capacity[3]	**8**	1	2
Number of turn storage bays blocked more than 50% of the peak hour	12	5	6
Number of intersections blocked by queues	2	0	0
Overall average network speed (mph)	14	19	21
Overall network travel time (hr)	1,600	1,200	1,100
Overall delay (vehicle-hours)	1,000	600	500
Overall number of stops	20,200	21,400	22,500
Number of predicted crashes[4]	**83.7**	70.3	68.5
Number of segments with MMLOS worse than D	**54**	14	14

Conclusions

Viable Scenarios

Measure	S0T1	S0T2	S2T1	S5T1	S1T2	S2T2	S3T2	S5T2
Total number of Worst	0	0	**8**	1	1	**3**	0	0
Total number of 2nd Worst	2	1	**2**	2	3	**4**	3	1
Total number of 2nd Best	2	4	0	2	0	1	2	2
Total number of Best	4	5	0	1	1	0	0	5
Overall Score:	4	8	-10	0	-3	-6	-1	6

POSITIVE OVERALL SCORES (high to low)

1st S0T2: No-Build, Tier 2 Projects
2nd S5T2: Full Build, 4-lane Vilas Road, Tier 2 Projects
3rd S0T1: No-Build, Tier 1 Projects
4th S5T1: Full Build, 4-lane Vilas Road, Tier 1 Projects

Conclusions

Summary

- No mitigation = extensive queueing and congestion throughout the network
- Roundabout and 2-Lane Vilas Rd Scenarios are NOT VIABLE

Assume completion of intersection mitigations used in analysis

- No Build – JTA Build, 2-lane Vilas Rd, Tier 2 Projects
  - Lowest crash frequency
  - Shortest overall network travel time
  - Low intersection and turning bay blocking
- Build – Full Build, 4-lane Vilas Rd, Tier 2 Projects


Thank you
Questions?