

STATE OF OREGON

INTEROFFICE MEMO

**Department of Transportation
Transportation Development Division**

Mill Creek Office Park
555 13th Street NE Suite 2
Salem, Oregon 97301-4178
(503) 986-4110 FAX (503) 986-4174

File Code:

Date: May 25, 2005

**TO: Fern Valley Interchange CAC
Fern Valley Interchange PDT**

**FROM: Christina Fera-Thomas, Transportation Analyst
Peter L. Schuytema, P.E., Senior Transportation Analyst
Transportation Planning Analysis Unit**

**SUBJECT: Technical Memorandum #2: Fern Valley Interchange Existing
Conditions**

The purpose of this document is to present the existing conditions for the Fern Valley Interchange Phase 2 project. Included are the analysis results for base year 2004 and future year 2030 for no-build conditions. Future year results show the conditions for 2030 if no improvements to the Fern Valley Interchange and Fern Valley Road were made.

Today, standing queues are seen along the majority of Fern Valley Road. The northbound off ramp queue extends all the way back to the diverge point with Interstate 5. Queuing on OR 99 is minimal in 2004. The Interstate 5 ramp terminal intersections and the intersection of Fern Valley Road and North Phoenix Road are either at or over capacity. In 2030 these conditions still exist, but worsen in many areas. Queuing becomes a problem along OR 99 by 2030. In 2030, the majority of the intersections are over standard, as are some sections of Interstate 5.

Background

Continued growth in Phoenix and surrounding areas is causing increasing congestion at the Fern Valley Interchange. The current interchange does not meet design standards. Visibility is limited due to the steepness of the inclines of the overpass. The sight distance between the Interstate 5 off-ramps and the Fern Valley Road overpass is substandard. In addition, there are no sidewalks or bike lanes. The Fern Valley Road Bridge that crosses Bear Creek is a narrow 2-lane structure that is more than 50 years old. It is structurally and functionally deficient.

The 2004 No-Build scenario represents the conditions of the transportation system as they existed in 2004. Figures 3-6 show the existing lane configurations. OR 99, Rogue Valley Highway 63, between South Stage Road and 1st Street is a District-level four-lane highway, with a functional class of principal arterial. Interstate 5 in this area is also four lanes. Fern Valley Road between OR 99 and North Phoenix Road is a two-lane minor arterial. North Phoenix Road a two-lane collector.

The 2030 No-Build scenario represents the current conditions of the system. The only difference between 2004 and 2030 scenarios is the change of Cheryl Lane to a right in right out configuration as seen in Figure 10.

Volume Development

The 2004 30th Highest Hour Volumes used in this analysis were developed using 14-hour manual counts. Figures 1 and 2 show the location and date of the 16 intersection counts, Petro driveway counts, and the straightaway count on Interstate 5 south of Fern Valley Interchange. Counts were taken in either March or October of 2004, with the exception of the count at Fern Valley Road and North Phoenix/South Phoenix Road. This count was taken in June of 2003.

The peak hour for the study area was found to be 4:00 to 5:00 pm. The 30th Highest Hour Volume occurs in the month of July. The counts were seasonally adjusted to 30th Highest Hour Volumes using two local Automatic Traffic Recorders (ATR). The Talent ATR, #15-014, was used for counts on OR 99, Fern Valley Road, N. Phoenix/S. Phoenix Road, and the Fern Valley Interchange on-ramps. The Medford Viaduct ATR, #15-019, was used to adjust the counts at the Fern Valley off-ramps and for Interstate 5.

A growth factor was developed for the Fern Valley Road and N. Phoenix/S. Phoenix Road count. This factor was developed using the future historical volumes based on the Transportation Volume Tables (TVT) to adjust the 2003 volumes to 2004. The adjusted volumes were then balanced between the intersections. Figures 3-6 show the 2004 30th Highest Hour No-Build Volumes.

In order to create future year 2030 volumes, the Rogue Valley Council of Governments (RVCOG) Model was used. The procedure used to develop the volumes comes from the National Cooperative Highway Research Council (NCHRP) Report 255. Model base and future year volumes are compared to develop a relative difference between scenarios. This difference was applied to the existing 2004 volumes to arrive at the 2030 volumes used in the analysis. The 2030 Future No-Build Volumes are shown in Figures 7-10.

Crash History

The text below provides a summary of the crash history for both the I-5 Fern Valley Interchange and OR 99 from South Stage Road to 1st Street. Detailed information on the crash history can be found in Tables 1 and 2 of the appendix.

I-5 Fern Valley Interchange

The majority of the crashes are occurring at the ramp terminal intersections. Rear-end collisions are caused by motorists following too close or traveling too fast on the ramps and Fern Valley Road. Limiting or increasing street access spacing, adding turn lanes, or medians might reduce these collisions. Turning movement collisions are being caused by motorists taking improper gaps in the traffic stream, to get onto the ramps. Heavy traffic is limiting available gaps. Changing the signal phasing to allow protected turns or adding turn lanes might help conditions. The crashes on Interstate 5 do not follow any particular pattern.

The number of crashes increased over the five year period with a large jump in 2003. This increase may be a result of the installation of the traffic signals at the ramp terminals. This section of I-5 is not a SPIS (Safety Priority Index System) site and the crash rate is less than the statewide primary urban freeway rate.

There was total of 40 crashes in this area between 1999 and 2003.

- No fatal crashes
- 35% injury crashes
- 65% property damage only crashes
- 68% occurred in clear dry daylight conditions
- 65% (26) are on Fern Valley Road and the ramp connections
- 40% (16) are rear-end collisions
- 20% (8) are turn movement related
- 15% (6) are fixed object collisions

OR 99 - South Stage Road to 1st Street

The crashes in this section are typical for the existing conditions. The offset driveways and close intersection spacing create numerous conflict points. Long queues cause an increase in rear end collisions.

A large portion of the crashes are either turning movement related or rear end collisions. The turning movement collisions are caused by drivers taking improper gaps in the traffic. Appropriate gaps are limited due to heavy traffic combined with closely spaced streets and access points. Some countermeasures might be to close and/or consolidate driveways and install a raised median from Cheryl Lane to Bolz Lane to prevent left turns. The rear-end collisions are occurring throughout the project area on OR 99 especially near the traffic signals. Lowering the speed limit, making the signal more visible by removing distractions, and increasing intersection and access point spacing may help minimize these collisions.

There were a total of 12 crashes at South Stage Road. The majority of them were rear-end collisions and turn movement crashes. This was also the case for the seven crashes at Bolz Lane. Cheryl Lane had a total of 17 crashes, most caused by motorists taking improper gaps resulting in turning movement collisions. Fern Valley Road has the largest number of crashes with a total of 39. Most of these either rear-end or turn movement collisions. The turning movement to/from the Ray's Food Place Driveway is the most problematic. The crashes throughout the couplet area were mainly a result of improper turn movements and the use of improper gaps.

The number of crashes is relatively consistent over the five year period, varying between 25 and 30 crashes per year. This section of OR 99 between the north city limits and Bolz Lane is a SPIS (Safety Priority Index System) site. In addition, the crash rate for this section is more than double the 2003 statewide urban principal arterial rate. All other sections within the project area are below the statewide average.

There were a total of 143 crashes between South Stage Road and 1st Street on OR99 between the years 1999-2003

- 2 fatal crashes
- 50% injury crashes
- 50% property damage only crashes
- 62% occurred in clear dry daylight conditions
- 45% (64) are turning movement collisions
- 38% (53) are rear-end collisions

There were a total of seven crashes that involved pedestrians. These crashes were generally the result of people attempting to cross midblock, especially in the section between South Stage Road and Fern Valley Road. There is no good location between the signals to cross, and being that they are more than a mile apart it is not convenient to walk to the nearest signal. The installation of a signal at Northridge Terrace might provide a good location for pedestrians to cross. A signal here might also help lower the number of rear end collisions by decreasing the distance between signals.

There were two fatal crashes. One was between the intersections of S stage Road and Glenwood Road caused by pedestrian attempting to cross OR 99 midblock. The other was a fixed collision resulting in a fatality at northbound OR 99 and 1st Street. The motorist was driving at an unsafe speed and lost control of the vehicle.

Preliminary Signal Warrants

Preliminary Signal Warrant criteria was analyzed for all of the unsignalized intersections included in the study area. Preliminary Signal Warrants are from the Manual of Uniform Traffic Control Devices (MUTCD) Warrant #1 Case A and B. Case A and B deal primarily with high volumes on the minor street and high volumes on the major street respectively. None of the study area intersections meet Preliminary Signal Warrants in 2004 or 2030.

Evaluation Criteria

When evaluating maximum acceptable Volume to Capacity (v/c) Ratios, the 1999 Oregon Highway Plan (OHP) mobility standards for a Metropolitan Planning Organization (MPO) area were used. The maximum acceptable v/c ratio for Interstate 5 is 0.80. For the ramp terminals the v/c ratio should not exceed 0.85. Fern Valley Rd, OR 99, and all other local roads have a maximum acceptable v/c ratio of 0.90. A v/c ratio of 1.0 represents an intersection that is at capacity.

In addition to v/c ratios, 95th percentile queue lengths were also obtained to better understand the operation of the system. Excessively long queues are often seen in areas where v/c ratios exceed standards.

Analysis Results

No Build - 2004

The Interstate 5 ramp terminal intersections and the intersection of Fern Valley Road and North Phoenix Road exceed the maximum acceptable v/c ratios. At Fern Valley and N. Phoenix Road, the v/c ratio is 1.84, well over capacity. This high v/c is caused by northbound left turning vehicles being unable to find appropriate gaps in traffic. The north and south ramp terminal intersections have v/c ratios of 1.06 and 0.99 respectively. The problem is the same for both intersections. Fern Valley Road is at capacity which will cause long delays for vehicles trying to make left turns onto the on-ramps. There are no left turn bays, and even with permitted/protected signal phasing, there is too much through volume and it is difficult for motorists to find gaps to turn in the heavy stream of traffic. All other intersections within the project area are operating within mobility standards.

Queuing is also an issue on Fern Valley Road. Standing queues are seen along the majority of the facility, some actually spilling into adjacent intersections. The northbound off ramp queue extends all the way back to the diverge point with Interstate 5. Queuing on OR 99 is minimal in 2004. Queue lengths and v/c ratios for all intersections within the project area can be seen in figures 11-14.

No Build – 2030

All the problems that existed in 2004 are still seen in 2030 but have gotten worse. Half of the intersections within the project area are now over standard, many over capacity. The intersections of Fern Valley Road with OR 99, N. Phoenix Road, and the two ramp terminal intersections, all have a v/c over 1.0. Volume to capacity ratios are also over standard on OR 99 at S. Stage Road, Glenwood Road, and Northridge Terrace. Southbound OR 99 and 1st Street exceeds standards with a v/c of 0.98. On Interstate 5, the southbound on-ramp merge point, southbound and northbound off-ramp diverge point and the southbound on-ramp merge point have v/c ratios over 0.80.

By 2030, the entire study area system is not functioning properly. The queuing on Fern Valley Road now spills onto the connecting roadways. The northbound and southbound off-ramp queues now extend back onto Interstate 5. The southbound queue at N. Phoenix Road has gotten excessively long. Since Fern Valley Road is far over capacity, northbound queues on OR 99 can be seen extending all the way south of 1st Street. North of Fern Valley Road, Glenwood Road and Northridge Terrace are also experiencing excessive queues. Figures 15-18 show queues and v/c ratios for No-Build 2030.

Next Steps

The next step is to analyze the alternatives that have been forwarded by the Project Development Team (PDT) and the Citizen's Advisory Committee (CAC). Volumes will be created for each alternative, and the v/c ratios at the major intersections will be analyzed. The purpose of this analysis will be to compare the alternatives in hopes to eliminate some of them prior to going into detailed analysis.

If there are any questions or comments, please contact me at 503-986-4119.

cc: Dorothy Upton, Transportation Planning Analysis Unit
File

APPENDIX

Table 1: Fern Valley I-5 Mainline & Interchange Crash Summary

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
11/01/99	24.00	CLR DRY DUNL	NONC	PDO	Violation of Basic Rule, other improper action
09/27/00	24.00	CLR DRY DAY	SS-O	PDO	Improper lane use, ran into ditch
12/21/00	24.00	FOG DRY DUNL	PED	INJ B	Inattentive driver and a pedestrian in roadway
05/23/02	24.17	CLR DRY DUNL	NONC	INJ B	Driver fell asleep
08/26/03	24.30	CLR DRY DAY	FIX	PDO	Driving too fast, not paying attention; and hit guard rail
04/18/00	24.40	CLDY DRY DAY	FIX	INJ B	Driver physically ill, hit guard rail
01/07/99	24.50	CLDY DRY DAY	REAR	INJ B	Improper lane, failure to yield
05/09/99	24.58	CLR DRY DUNL	FIX	PDO	Driving under the influence, hit sign
07/01/00	25.00	CLR DRY DAY	NONC	INJ A	Driving under the influence
04/12/03	25.00	RAIN WET DAY	SS-O	PDO	Improper lane change
05/21/00	C24.35 Pear Tree	CLR DRY DAY	REAR	INJ B	Following too closely
02/12/02	C24.13 North Phoenix	CLR DRY DAY	ANGL	INJ C	Driving too fast, lost control, hit truck
07/06/99	C24.36 North Phoenix	CLR DRY DAY	TURN	PDO	Improper turn, truck cut corner
03/05/03	C24.36 North Phoenix	CLR DRY DAY	FIX	PDO	Driver distracted; ran off road and overturned
07/24/00	C24.34 SB off-ramp	CLR DRY DAY	FIX	PDO	Driving too fast, lost control, ran into ditch
12/08/00	C24.34 SB off-ramp	CLDY DRY DAY	REAR	INJ B	Following too closely

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
09/25/01	C24.34 SB off-ramp	CLR DRY DAY	REAR	INJ C	Following too closely, hit vehicle waiting to turn left
06/29/02	C24.34 SB off-ramp	CLR DRY DAY	TURN	PDO	Failure to yield while turning left
10/15/02	C24.34 SB off-ramp	CLR DRY DAY	REAR	INJ C	Following too closely
05/28/03	C24.34 SB off-ramp	CLR DRY DAY	TURN	PDO	Disregarded signal; improper turn
06/09/99	C24.85 SB off-ramp	CLR DRY DAY	REAR	PDO	Driving too fast
04/05/01	C24.85 SB off-ramp	CLR DRY DAY	REAR	INJ C	Following too closely
01/17/03	C24.85 SB off-ramp	CLR DRY DAY	REAR	PDO	Following too closely
06/23/00	C24.34 Fern Valley	CLR DRY DAY	FIX	PDO	Too fast, avoiding previous crash, hit guardrail
01/07/00	C24.35 Fern Valley	CLR DRY DUNL	REAR	PDO	Driving too fast
09/25/01	C24.35 Fern Valley	RAIN WET DAY	REAR	PDO	Violation of Basic Rule, Driving too fast
05/18/03	C24.39 Fern Valley	CLR DRY DAY	REAR	PDO	Following too closely
08/08/03	C24.40 Fern Valley	CLR DRY DAY	REAR	PDO	Following too closely
05/07/03	C24.45 Fern Valley	CLR DRY DAY	BACK	PDO	Improper backing up
04/26/01	C24.49 Fern Valley	CLR DRY DAY	REAR	INJ A	Driving too fast
05/28/03	C24.26 NB off-ramp	CLR DRY DAY	REAR	PDO	Inadequate brakes
02/04/03	C24.34 NB off-ramp	CLR DRY DLIT	HEAD	INJ B	Wrong way on one way
02/09/00	C24.36 NB off-ramp	CLR DRY DAY	TURN	PDO	Right turn from wrong lane

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
07/03/02	C24.36 NB off-ramp	CLR DRY DAY	SS-O	PDO	Improper lane, other improper action
07/12/02	C24.36 NB off-ramp	CLR DRY DAY	REAR	INJ B	Other improper action
09/10/03	C24.36 NB off-ramp	CLR DRY DAY	REAR	PDO	Following too closely
01/24/03	C24.47 NB off- ramp	RAIN WET DAY	TURN	INJ B	Failure to yield right-of-way
12/25/03	C24.47 NB off- ramp	RAIN WET DAY	TURN	PDO	Disregarded signal
04/05/01	C24.48 NB on-ramp	CLDY DRY DAY	TURN	PDO	Improper left turn in traffic (improper gap taken)
10/22/03	C24.55 NB off- ramp	CLR DRY DAY	TURN	INJ C	Improper left turn in front of traffic

¹CLR – Clear; CLDY – Cloudy; DUNL – Dark Unlit; DLIT – Dark-Lit; UNK - Unknown

²ANGL – Angle Collision; FIX – Fixed Object Collision; PED – Pedestrian Collision; NONC – Non – Collision; SS-O- Side-swipe Overtaking; REAR – Rear-end Collision; TURN – Turning Collision.

³PDO – Property Damage Only; INJ A – Severe Injury; INJ B – Moderate Injury; INJ C- Minor Injury

Table 2: OR 99 Crash Summary

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
02/13/02	9.7	CLR DRY DAY	REAR	PDO	Other improper action
12/12/00	9.77	UNK WET DARK	REAR	INJ C	Other improper action
02/13/02	9.78	CLR DRY DUSK	REAR	PDO	Improper lane change
09/01/99	9.79 S. Stage	CLR DRY DAY	REAR	PDO	Excessive Speed
1/28/00	9.79 S. Stage	CLR UNK DAY	REAR	INJ C	Driver distracted; excessive speed
07/04/00	9.79 S. Stage	CLDY DRY DAY	TURN	PDO	Disregarded signal
10/09/01	9.79 S. Stage	CLR DRY DAY	TURN	PDO	Disregarded signal
11/05/02	9.79 S. Stage	CLR DRY DAY	TURN	INJ C	Improper left turn in traffic
12/06/02	9.79 S. Stage	FOG FRY DLIT	TURN	INJ B	Disregarded signal
05/21/03	9.79 S. Stage	CLR DRY DAY	TURN	INJ C	Disregarded signal
12/30/03	9.79 S. Stage	CLDY DRY DAY	REAR	PDO	Following too closely
11/24/03	9.80	CLDY DRY DAY	REAR	INJ C	Following too closely; excessive speed
10/05/01	9.81	CLR DRY DAY	SS-O	PDO	Improper overtaking
01/16/99	9.85	CLR DRY DAY	REAR	PDO	Following too closely
07/21/00	10.00	CLR DRY DAY	TURN	PDO	Disregarded signal
02/06/02	10.00	CLDY DRY DARK	PED	FAT	Crossing between intersections

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
02/17/03	10.00	RAIN WET DAY	REAR	INJ B/C	Driver physically ill; rear ended vehicle being towed
06/09/01	10.18	CLD DRY DAY	TURN	INJ C	Failure to yield right-of-way
03/10/99	10.19	CLR DRY DAY	PED	INJ B	Crossing between intersections
03/28/99	10.23 Glenwood	CLR DRY DAY	REAR	INJ C	Following too closely
04/19/01	10.24	CLD WET DAY	REAR	INJ C	Following too closely
04/16/02	10.24	CLD DRY DAY	ANGL	INJ C	Disregarded stop sign
03/05/01	10.30	RAIN WET DAY	REAR	PDO	Other improper driving
01/02/99	10.31	FOG WET DARK	TURN	INJ C	Failure to yield right-of-way; left turn from driveway
12/13/03	10.36	CLDY WET DARK	TURN	PDO	Failure to yield right-of-way
09/28/99	10.42	CLR DRY DAY	TURN	INJ B	Failure to yield right-of-way
2/17/99	10.48	CLR DRY DAY	TURN	INJ C	Failure to yield right-of-way; entering driveway
10/11/01	10.48	RAIN WEST DARK	REAR	INJ B	Following too closely; excessive speed
05/15/01	10.50	CLDY DRY DAY	REAR	INJ C	Improper turn entering driveway
09/15/03	10.57	CLR DRY DAY	REAR	INJ C	Improper stop; following too closely
01/27/99	10.58 Northridge	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way
08/23/99	10.58 Northridge	CLR DRY DAY	TURN	INJ C	Failure to yield right-of-way; entering from driveway
10/31/02	10.58 Northridge	CLR DRY DUSK	TURN	INJ A/B	Failure to yield right-of-way

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
03/10/03	10.58 Northridge	CLR DRY DAY	REAR	PDO	Improper stop; following too closely
07/25/03	10.58 Northridge	CLR DRY DAY	TURN	INJ B	Failure to yield right-of-way; cyclist
10/28/03	10.58 Northridge	CLR DRY DAY	TURN	INJ C	Failure to yield right-of-way
10/23/02	10.63	CLR DRY DAY	REAR	PDO	Following too closely
06/28/01	10.75	CLR DRY DUSK	REAR	INJ C	Following too closely
06/04/99	10.80	CLR DRY DAY	REAR	PDO	Failed to stop; inadequate or no brakes
06/09/03	10.86	CLR DRY DAY	TURN	INJ C	Failure to yield right-of-way
1/11/99	10.87	CLR DRY DARK	TURN	PDO	Excessive speed
12/05/99	10.88	CLR DRY DLIT	TURN	PDO	Improper left turn in front of traffic
11/30/03	10.88	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way
12/03/03	10.88	CLDY DRY DLIT	TURN	PDO	Improper turning maneuver; driving on wrong side of road.
12/02/00	10.89	FOG WET DARK	FIX	PDO	Speed too fast for conditions
11/19/01	10.89	RAIN WET DAY	REAR	PDO	Other improper action
09/18/03	10.89	CLR DRY DAY	REAR	INJ C	Following too closely
02/26/02	10.98	CLR DRY DAY	REAR	PDO	Following too closely; excessive speed
06/02/99	11.11 Cheryl	CLR DRY DAY	TURN	PDO	Improper left turn entering driveway
07/19/99	11.11 Cheryl	CLR DRY DAY	REAR	INJ C	Improper stop and following too closely

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
09/24/99	11.11 Cheryl	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way; exiting left from driveway
02/04/00	11.11 Cheryl	CLDY DRY DAY	TURN	PDO	Improper left turn
05/10/00	11.11 Cheryl	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane
03/15/01	11.11 Cheryl	CLDY DRY DUSK	REAR	INJ C	Following too closely
03/17/01	11.11 Cheryl	RAIN WET DAY	ANGL	INJ C	Failure to yield right-of-way
09/14/01	11.11 Cheryl	CLR DRY DAY	ANGL	PDO	Failure to yield right-of-way
10/09/02	11.11 Cheryl	CLR DRY DAY	TURN	INJ A	Obscured vehicle; failure to yield right-of-way
11/04/02	11.11 Cheryl	CLR DRY DLIT	ANGL	PDO	Failure to yield right-of-way
05/14/03	11.11 Cheryl	CLR DRY DAY	TURN	INJ A/B/C	Failure to yield right-of-way; entering highway
11/20/03	11.11 Cheryl	RAIN WET DUSK	TURN	PDO	Failure to yield right-of-way
02/20/02	11.12	CLR DRY DAY	REAR	PDO	Driver distracted; excessive speed
02/07/03	11.12	CLR DRY DAY	TURN	INJ C	Improper left turn from drive way
05/07/03	11.12	CLR DRY DAY	REAR	INJ B/C	Following too close
09/04/03	11.12	CLR DRY DAY	TURN	PDO	Failed to avoid stopped vehicle
11/15/03	11.12	CLR DRY DAY	REAR	INJ C	Following too closely
02/12/99	11.13	CLDY DRY DAY	REAR	INJ C	Following too closely
01/21/00	11.13	RAIN WET DUNL	REAR	PDO	Improper lane; failure to yield right-of-way

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
02/18/00	11.13	CLR DRY DAY	REAR	PDO	Following too closely
01/31/01	11.13	CLR DRY DAY	REAR	PDO	Other improper action
12/09/01	11.13	RAIN WET DAY	REAR	INJ C	Following too closely
09/08/02	11.13	CLR DRY DAY	REAR	PDO	Following too closely
12/04/02	11.13	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way; exiting left from driveway
12/12/02	11.13	CLDY DRY DLIT	REAR	PDO	Distracted driver; other improper action
08/08/03	11.13	CLR DRY DLIT	TURN	PDO	Improper turn from wrong lane; entering driveway
7/31/99	11.14 Fern Valley	CLR DRY DAY	REAR	PDO	Other improper action
01/22/00	11.14 Fern Valley	CLDY DRY DAY	ANGL	PDO	Disregarded signal
02/01/00	11.14 Fern Valley	CLR DRY DAY	REAR	PDO	Other improper action
2/18/00	11.14 Fern Valley	CLR DRY DAY	REAR	PDO	Following too closely
03/10/00	11.14 Fern Valley	CLDY DRY DAY	TURN	INJ B	Left in traffic entering driveway; failure to yield right-of way
05/04/00	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Right turn from wrong lane; following too closely
01/30/01	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Left turn in traffic; failure to yield right-of-way
03/06/01	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Improper left turn in traffic
05/02/01	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Disregarded signal
06/28/01	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
06/30/01	11.14 Fern Valley	CLR DRY DAY	TURN	INJ C	Improper left turn in traffic
11/06/01	11.14 Fern Valley	CLR DRY DAY	TURN	PDO	Disregarded signal
01/16/02	11.14 Fern Valley	CLR DRY DAY	PED	INJ C	Failure to yield right-of-way
01/17/02	11.14 Fern Valley	CLR DRY DLIT	BACK	PDO	Improper backing
02/24/02	11.14 Fern Valley	CLR DRY DLIT	TURN	PDO	Distracted driver; other improper action
02/28/02	11.14 Fern Valley	CLR DRY DLIT	TURN	PDO	Failure to yield right-of-way exiting driveway
06/10/02	11.14 Fern Valley	CLR DRY DAY	TURN	INJ C	Improper left turn in traffic
09/05/02	11.14 Fern Valley	CLR DRY DAY	TURN	INJ C	Improper left turn in traffic
09/27/02	11.14 Fern Valley	CLR DRY DAY	REAR	INJ C	Following too closely
10/08/02	11.14 Fern Valley	CLR DRY DAY	REAR	INJ B	Following too closely
11/17/02	11.14 Fern Valley	CLR DRY DAY	REAR	INJ B	Driving under the influence
12/11/02	11.14 Fern Valley	RAIN WET DLIT	TURN	PDO	Improper left turn in traffic
05/20/03	11.14 Fern Valley	CLR DRY DLIT	REAR	INJ B	Following to closely
07/31/99	11.15 Fern Valley	CLR DRY DAY	REAR	PDO	Other improper action
08/25/99	11.15 Fern Valley	CLR DRY DAY	TURN	INJ B	Left turn in traffic entering driveway; failure to yield right-of-way
06/14/00	11.15 Fern Valley	CLR DRY DAY	REAR	INJ C	Other improper action
01/15/02	11.15 Fern Valley	CLR DRY DUSK	REAR	PDO	Other improper action

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
03/11/02	11.16	RAIN WET DLIT	FIX	PDO	Violation of Basic Rule exiting driveway
10/06/00	11.18	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way; exiting left from driveway
11/14/02	11.18	CLR DRY DAY	PED	INJ C	Pedestrian improperly in roadway
07/15/03	11.21	CLR DRY DAY	REAR	INJ C	Inattention; failed to slow down for stopped vehicle
06/04/99	11.23 Bolz	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way
06/14/00	11.23 Bolz	CLR DRY DAY	TURN	INJ B	Bicycle - Failure to yield right-of-way to vehicle
05/02/01	11.23 Bolz	CLDY DRY DAY	TURN	PDO	Cut corner; improper left turn
09/21/01	11.23 Bolz	CLR DRY DAY	TURN	INJ B	Failure to yield right-of-way to bicycle
03/10/03	11.24 Bolz	CLR DRY DAY	ANGL	PDO	Failure to yield right-of-way
10/14/03	11.28	CLR DRY DAY	REAR	PDO	Following too closely
04/13/99	11.30	CLR DRY DAY	REAR	INJ B	Driver distracted by cell phone; other improper action
02/01/00	11.34	CLR DRY DAY	TURN	PDO	Left turn in traffic entering driveway; failure to yield right-of-way
10/20/00	11.36	RAIN WET DAY	REAR	INJ B	Distracted driver; other improper action
6/22/03	11.36	CLR DRY DAY	TURN	PDO	Failure to yield right-of-way
12/10/03	11.36	CLDY WET DLIT	PED	INJ A	Other improper action
11/29/00	11.37	RAIN WET DLIT	REAR	INJ C	Failure to yield right-of-way
4/26/99	11.38	CLR DRY DAY	REAR	INJ C	Other improper action

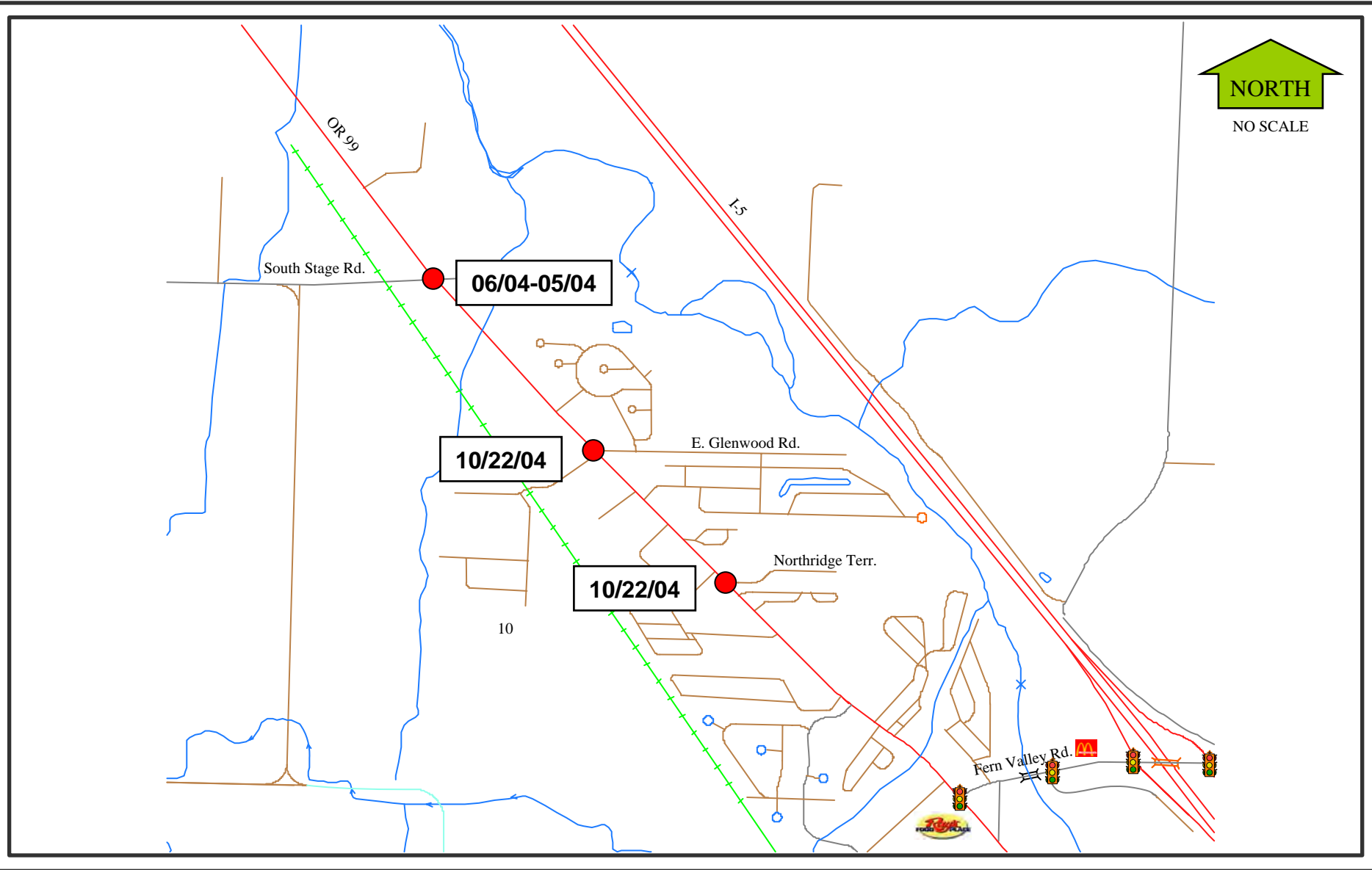
Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
9/22/99	11.38	CLR DRY DAY	REAR	INJ B	Excessive speed
11/30/99	11.38	CLR DRY DAY	TURN	PDO	Fail to use turn signal
02/28/01	11.38	CLDY DRY DAY	PED	INJ B	Failure to yield right-of-way
04/06/99	11.39	CLR DRY DAY	REAR	PDO	Following too closely
06/19/99	11.47 4 th St SB 99	CLR DRY DAY	ANGL	INJ C	Failure to yield right-of-way
04/26/00	11.47 4 th St SB 99	CLR DRY DLIT	TURN	INJ B	Improper turn from wrong lane
07/01/00	11.47 4 th St SB 99	CLR DRY DAY	ANGL	INJ A/C	Failed to stop at stop sign
10/23/00	11.47 4 th St SB 99	CLR DRY DAY	TURN	PDO	Improper turn in front of oncoming traffic
03/09/01	11.49 4 th St SB 99	CLR DRY DAY	ANJ	INJ B	Failure to yield right-of-way
05/31/01	11.49 4 th St SB 99	CLR DRY DAY	PED	INJ B	Disregarded flagger; hit worker
11/17/03	11.45 4 th St NB 99	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane; entering driveway
06/24/02	11.49 4 th St NB 99	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane
01/19/99	11.50 4 th St NB 99	CLDY WET DAY	TURN	PDO	Failure to yield right-of-way
09/12/01	11.50 4 th St NB 99	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane
09/08/03	11.51	CLR DRY DAY	SS-O	PDO	Improper lane change
02/02/03	11.53	CLR WET UNK	REAR	INJ B	Failed to maintain line; driver distracted
08/19/01	11.65	CLR DRY DAY	TURN	PDO	Improper turn; hit parked vehicle

Date	Milepoint/ Location	Weather/ Surface/ Light ¹	Type ²	Severity ³	Error and/or Cause
05/07/99	11.66 1 st St SB 99	CLR DRY DAY	SS-O	PDO	Improper lane change
04/18/99	11.67 1 st St SB 99	CLDY DRY DAY	ANGL	PDO	Failure to yield right-of-way
06/14/00	11.67 1 st St SB 99	CLR DRY DAY	ANGL	PDO	Failure to yield right-of-way
06/13/01	11.67 1 st St SB 99	CLR DRY DUSK	TURN	INJ C	Improper turn from wrong lane
11/24/01	11.67 1 st St SB 99	RAIN WET DUSK	ANGL	PDO	Improper turn from wrong lane
11/13/02	11.67 1 st St SB 99	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane
04/10/01	11.69 1 st St NB 99	CLDY DRY DAY	FIX	FAT	Excessive speed for conditions; lost control
09/16/00	11.70 1 st St NB 99	CLR DRY DAY	TURN	PDO	Improper turn from wrong lane

¹CLR – Clear; CLDY – Cloudy; DUNL – Dark Unlit; DLIT – Dark-Lit; UNK - Unknown

²ANGL – Angle Collision; BACK – Backing Collision; FIX – Fixed Object Collision; HEAD – Head-on Collision; SS-M- Side-swipe Meeting; REAR – Rear-end Collision; TURN – Turning Collision.

³PDO – Property Damage Only; INJ A – Severe Injury; INJ B – Moderate Injury; INJ C- Minor Injury



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange – Count Locations and dates

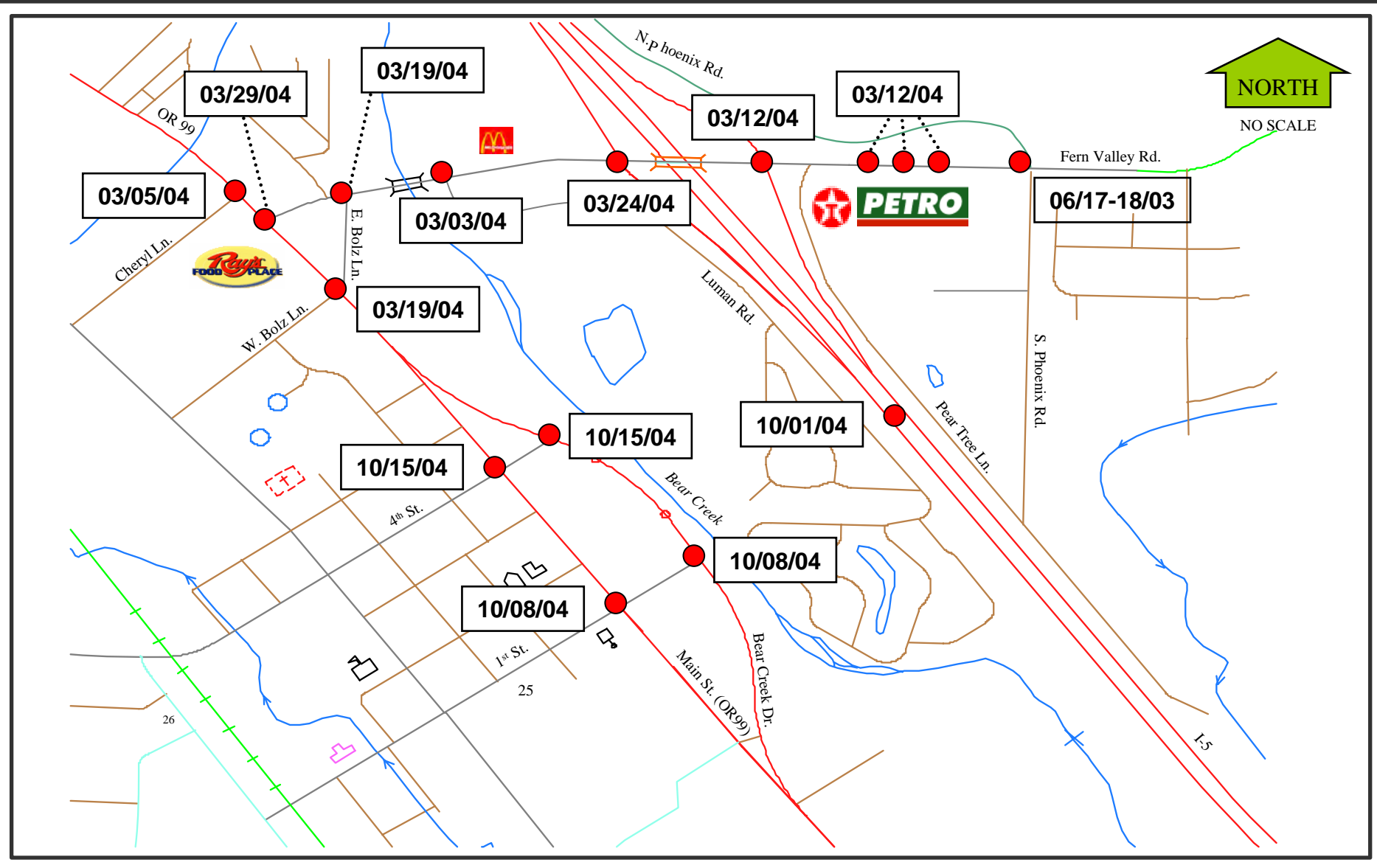
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 5/25/2005

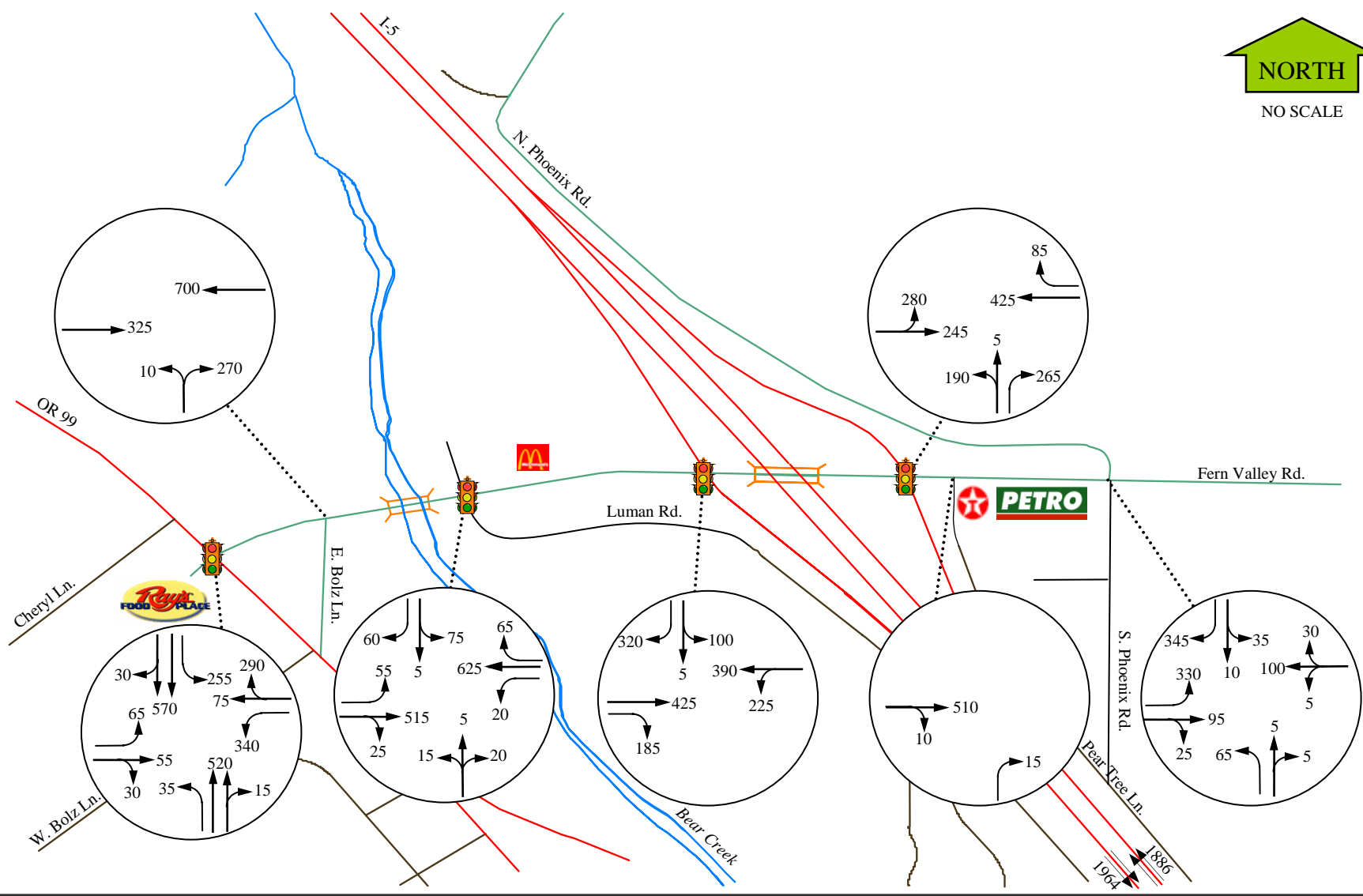
Rev. By: P. Schuytema PE

FIGURE 1



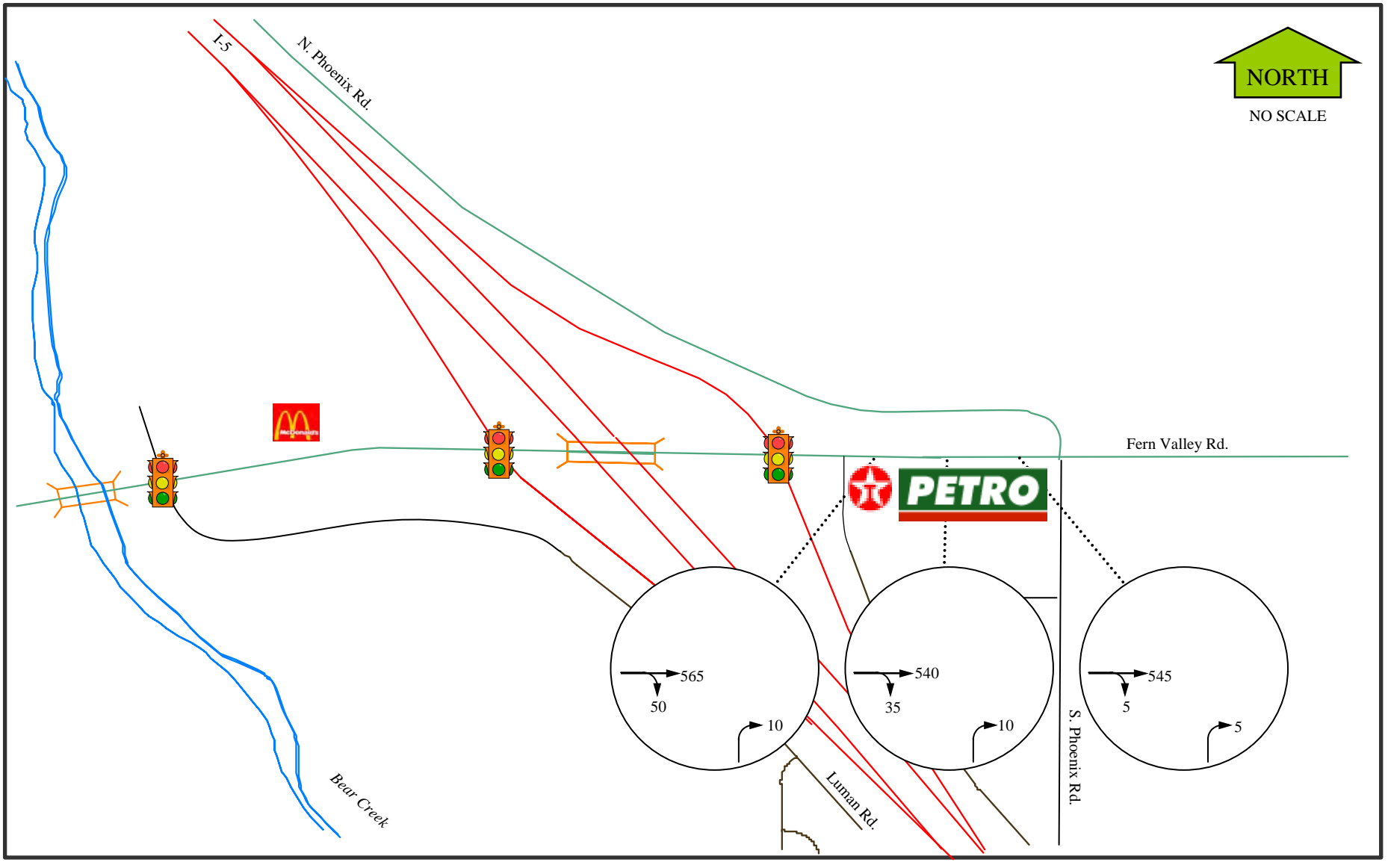


NO SCALE





NO SCALE



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2004 30th Highest Hour No-Build Volumes

File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

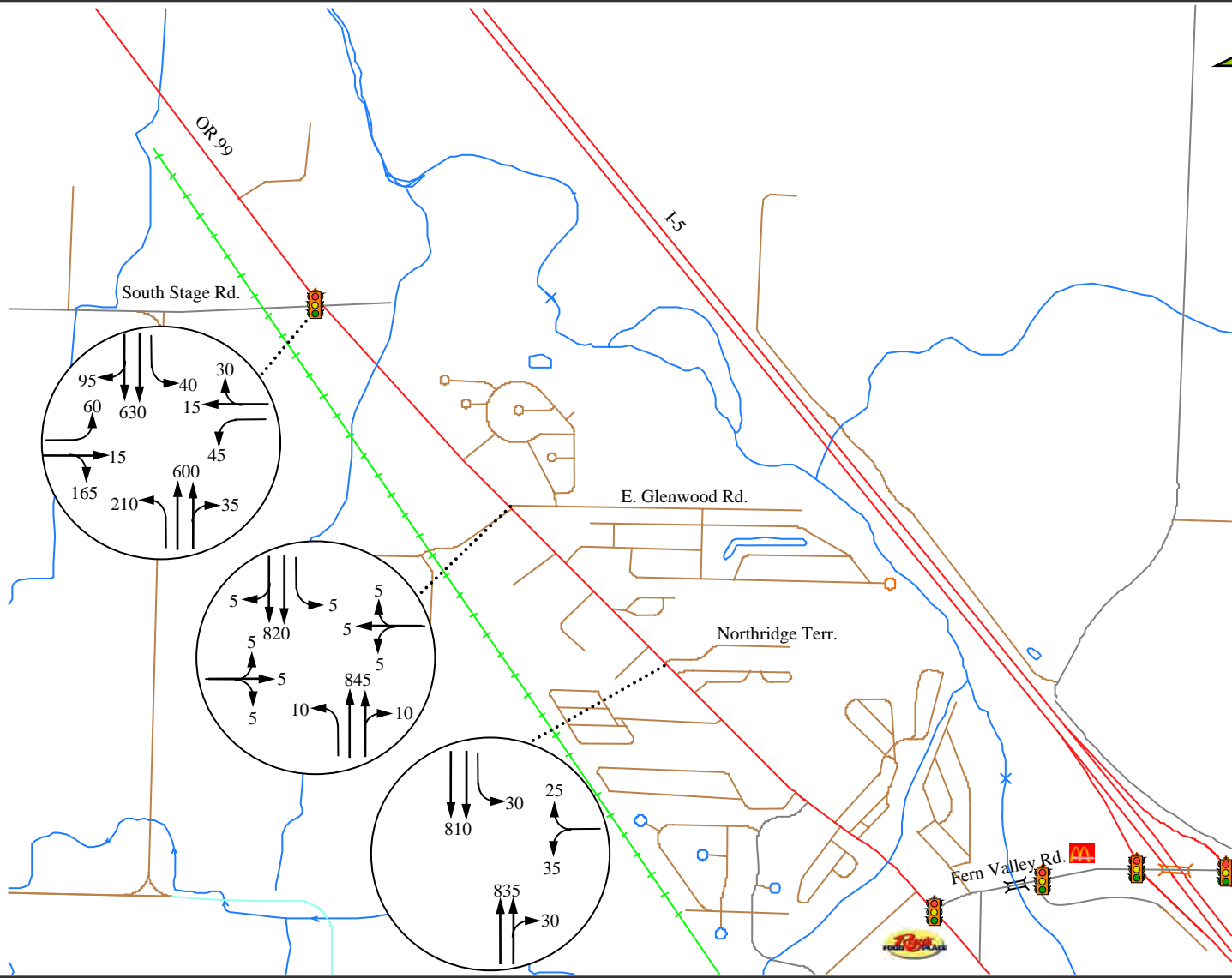
Date : 1/07/2005

Rev. By: P. Schuytema PE

FIGURE 4



NO SCALE



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2004 30th Highest Hour No-Build Volumes

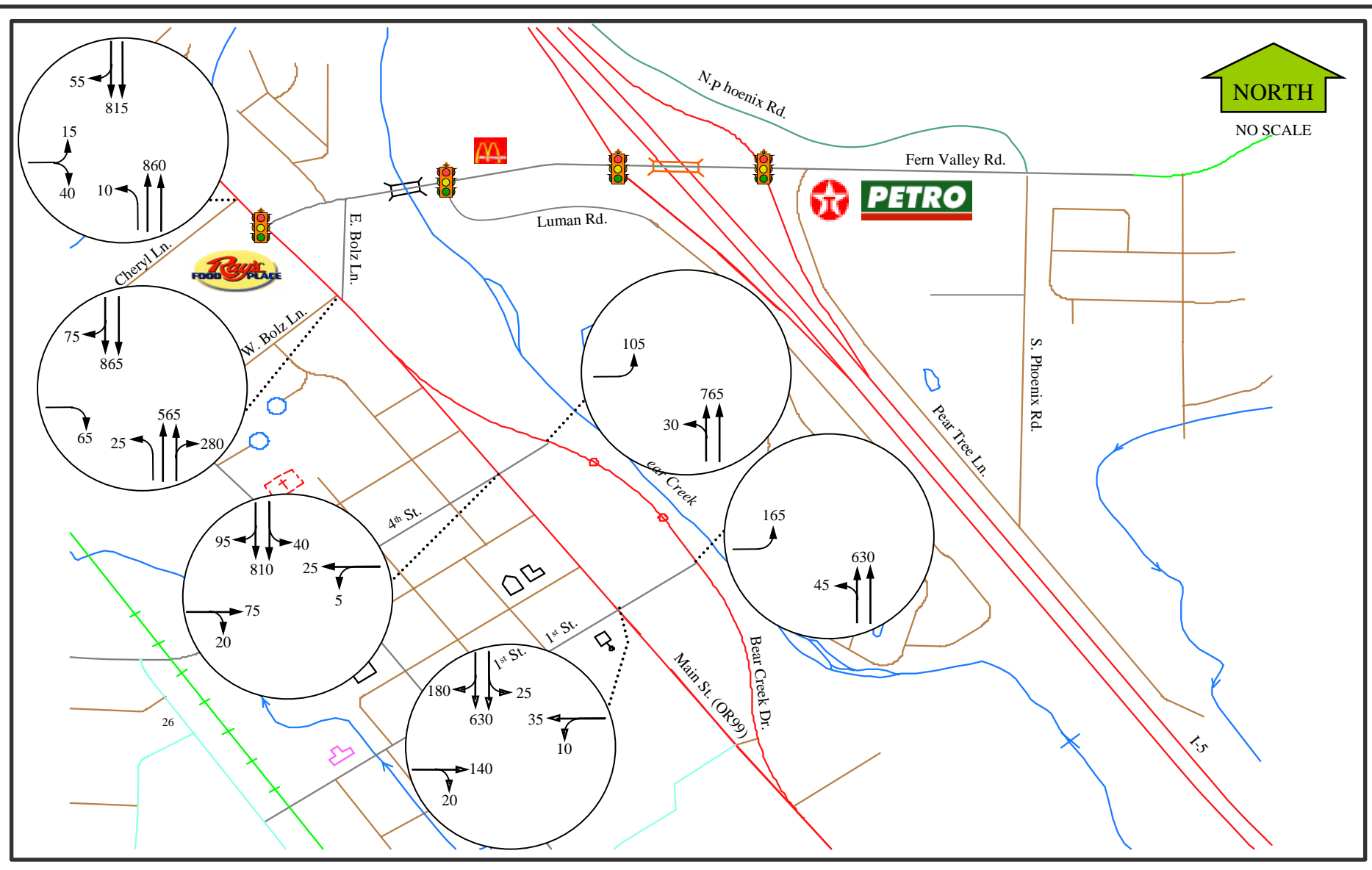
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 1/07/2005

Rev. By: P. Schuytema PE

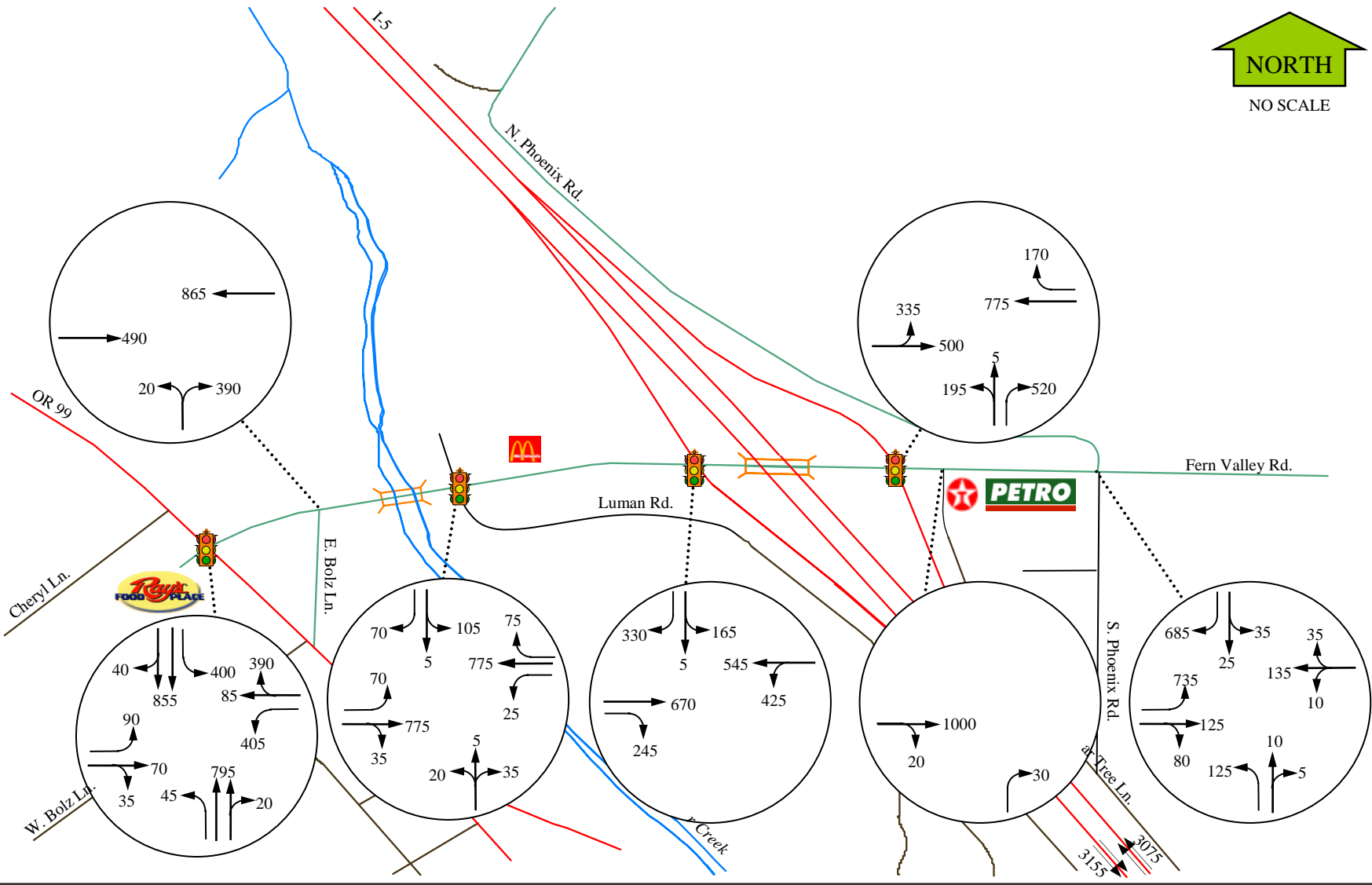
FIGURE 5



NO SCALE

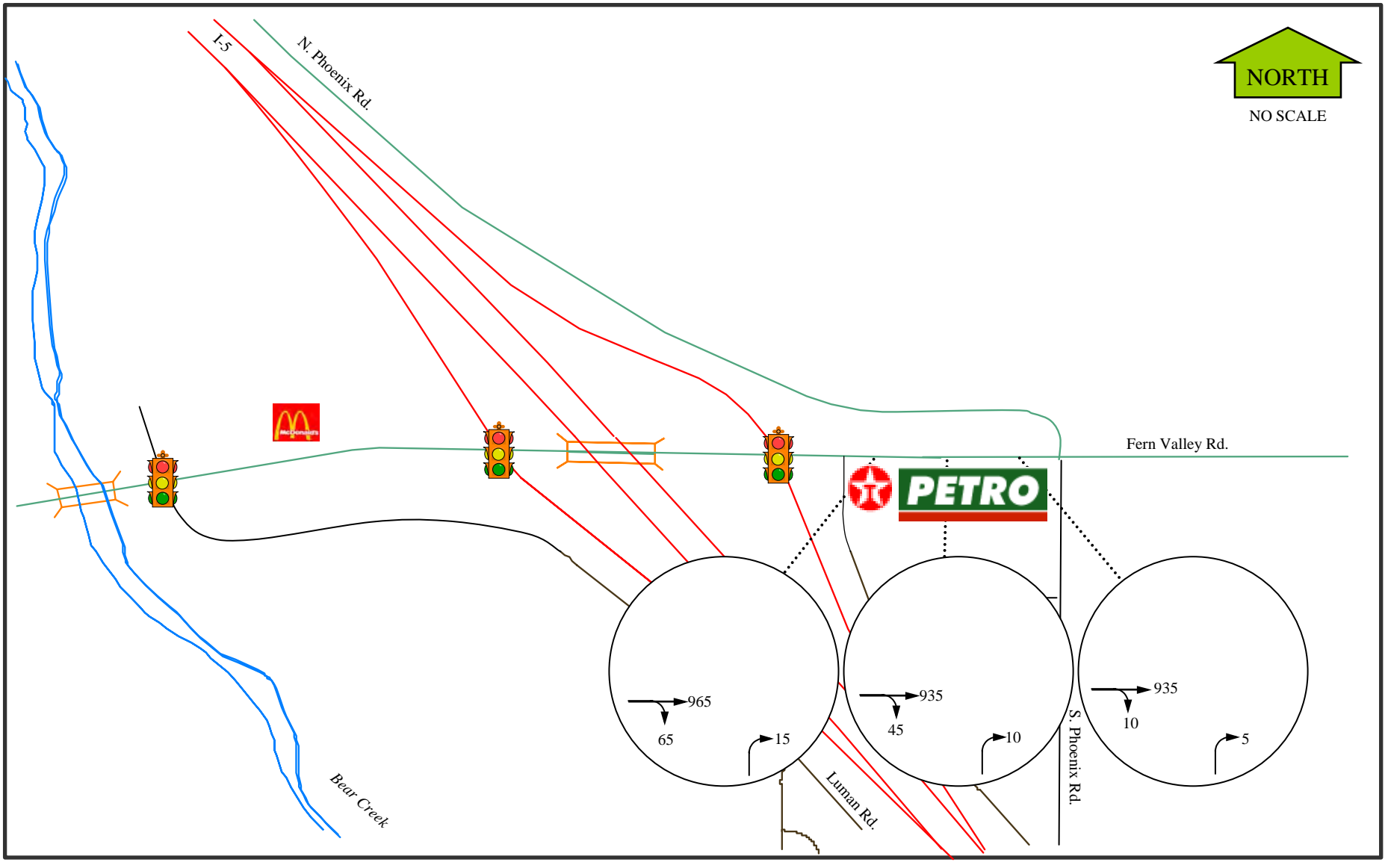


NO SCALE





NO SCALE



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2030 Future No-Build Volumes

File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

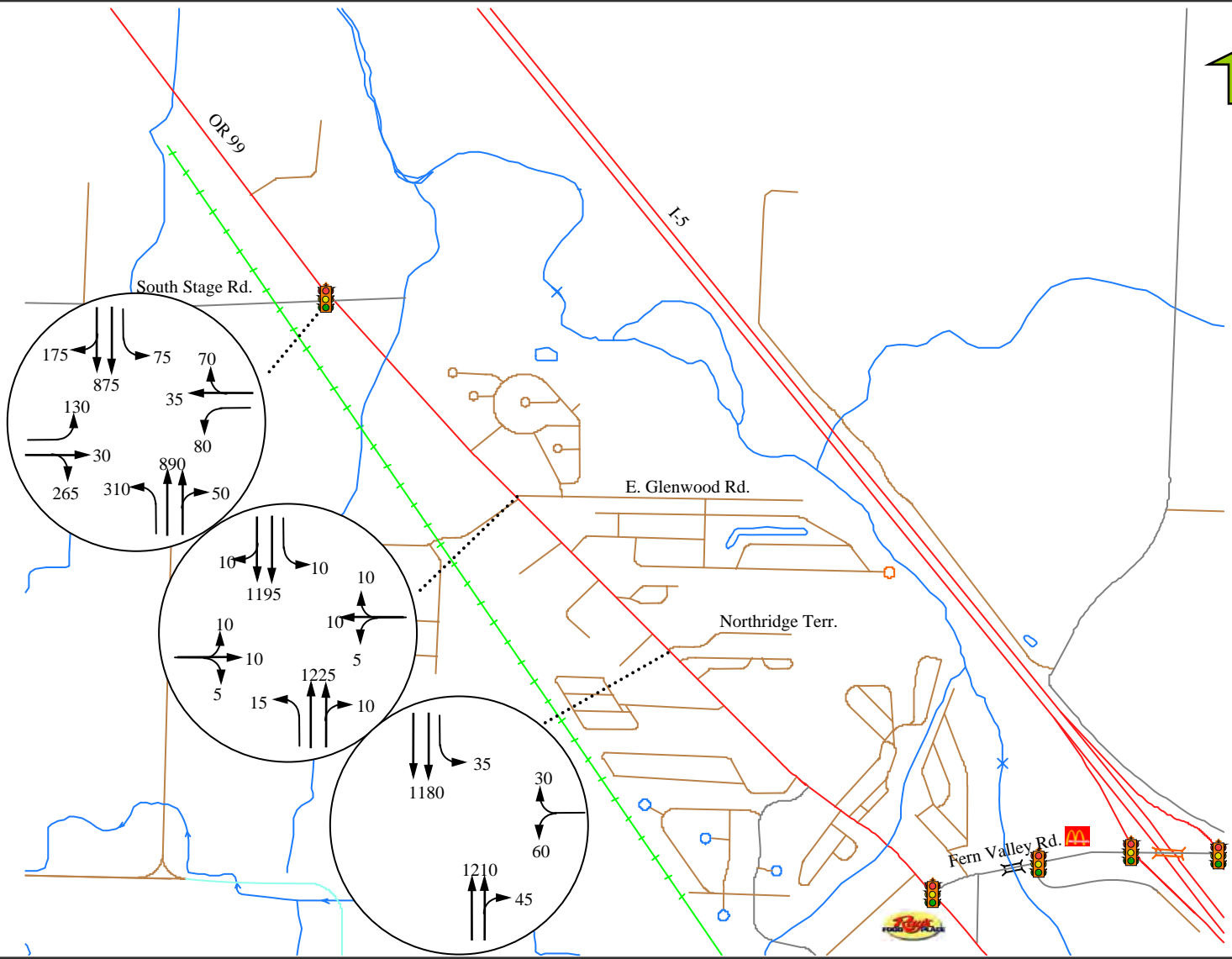
Date : 5/10/2005

Rev. By: P. Schuytema PE

FIGURE 8



NO SCALE



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2030 Future No-Build Volumes

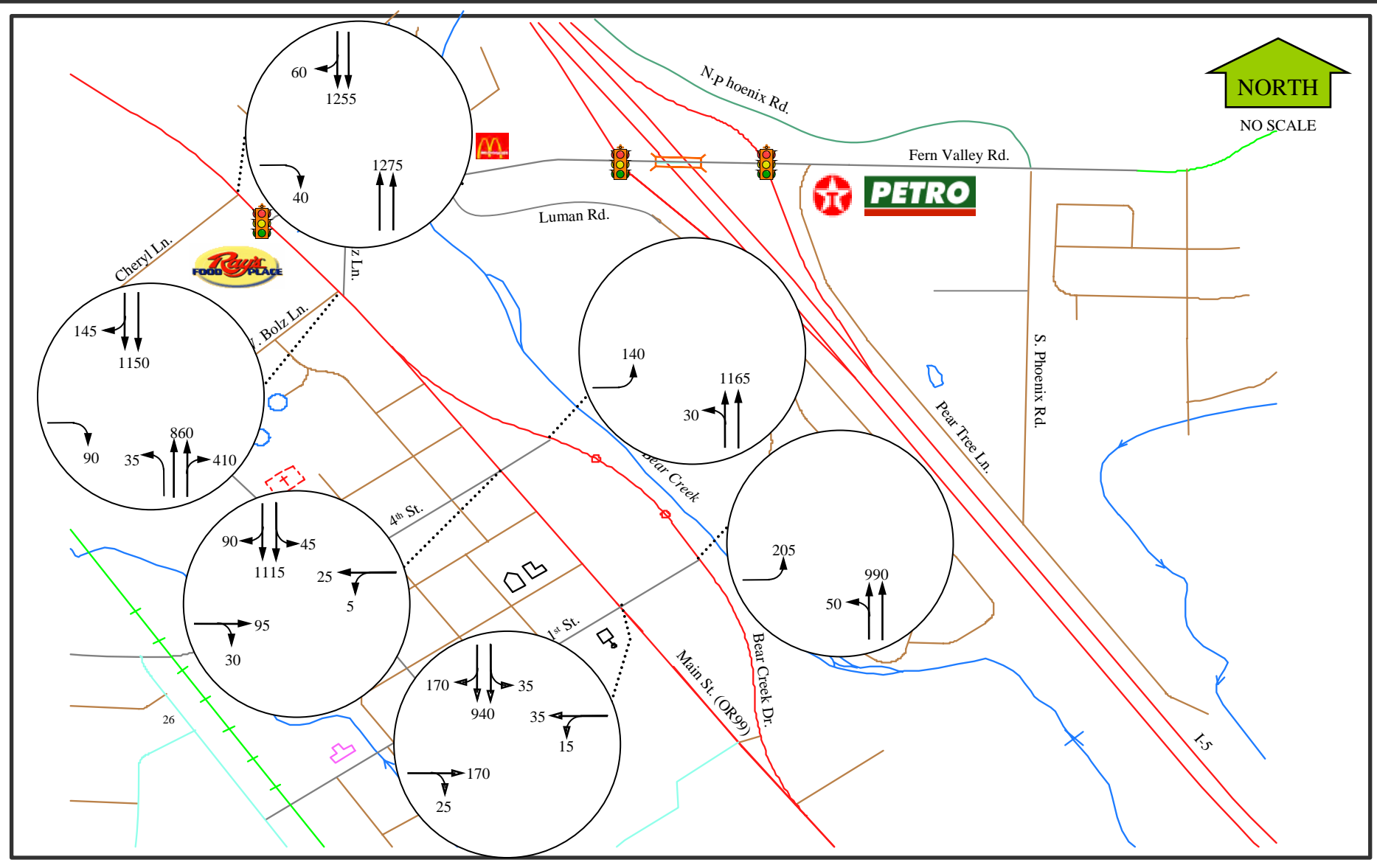
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 5/10/2005

Rev. By: P. Schuytema PE

FIGURE 9



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2030 Future No-Build Volumes

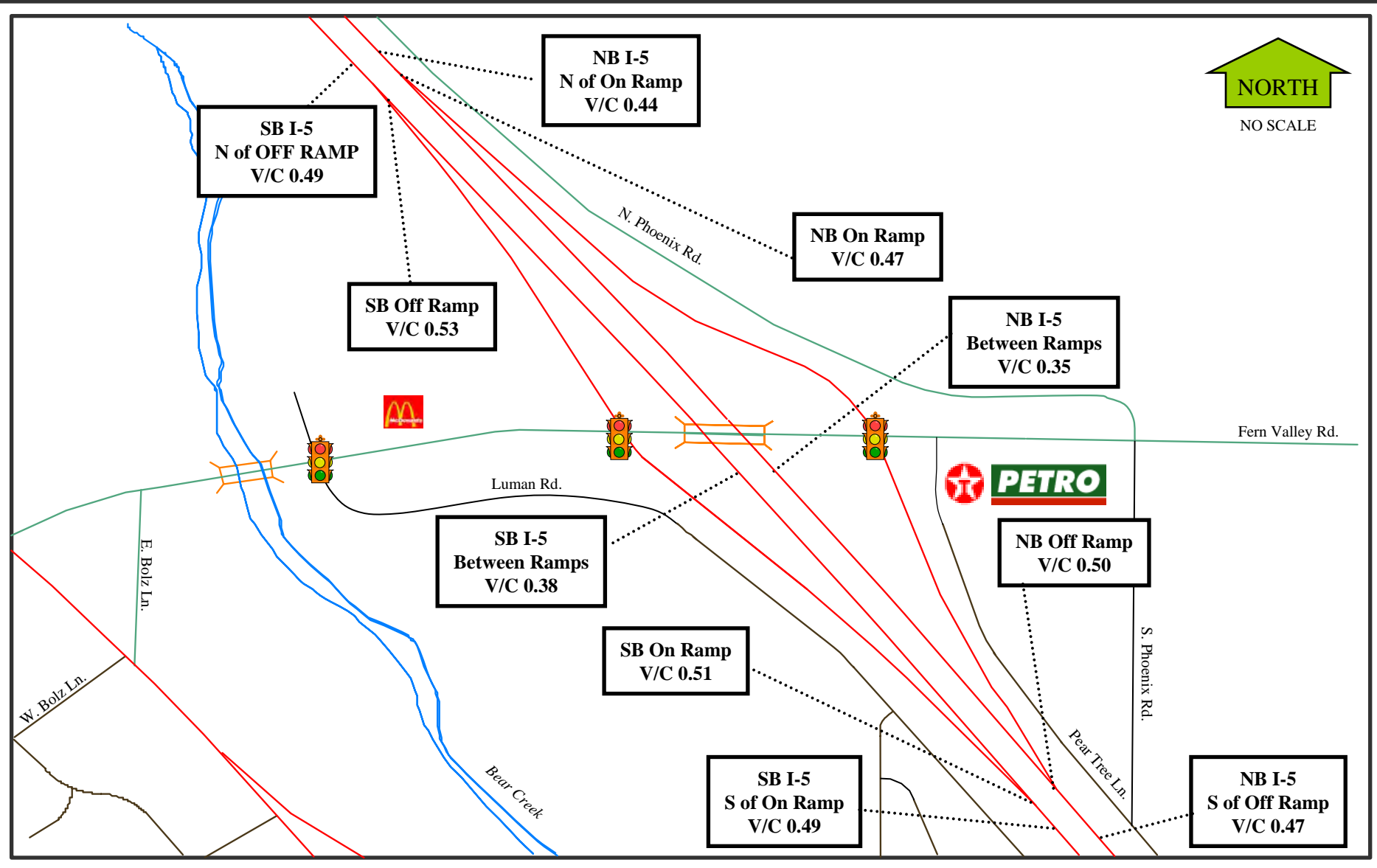
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 5/10/2005

Rev. By: P. Schuytema PE

FIGURE 10



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2004 30th Highest Hour No-Build V/C Ratios

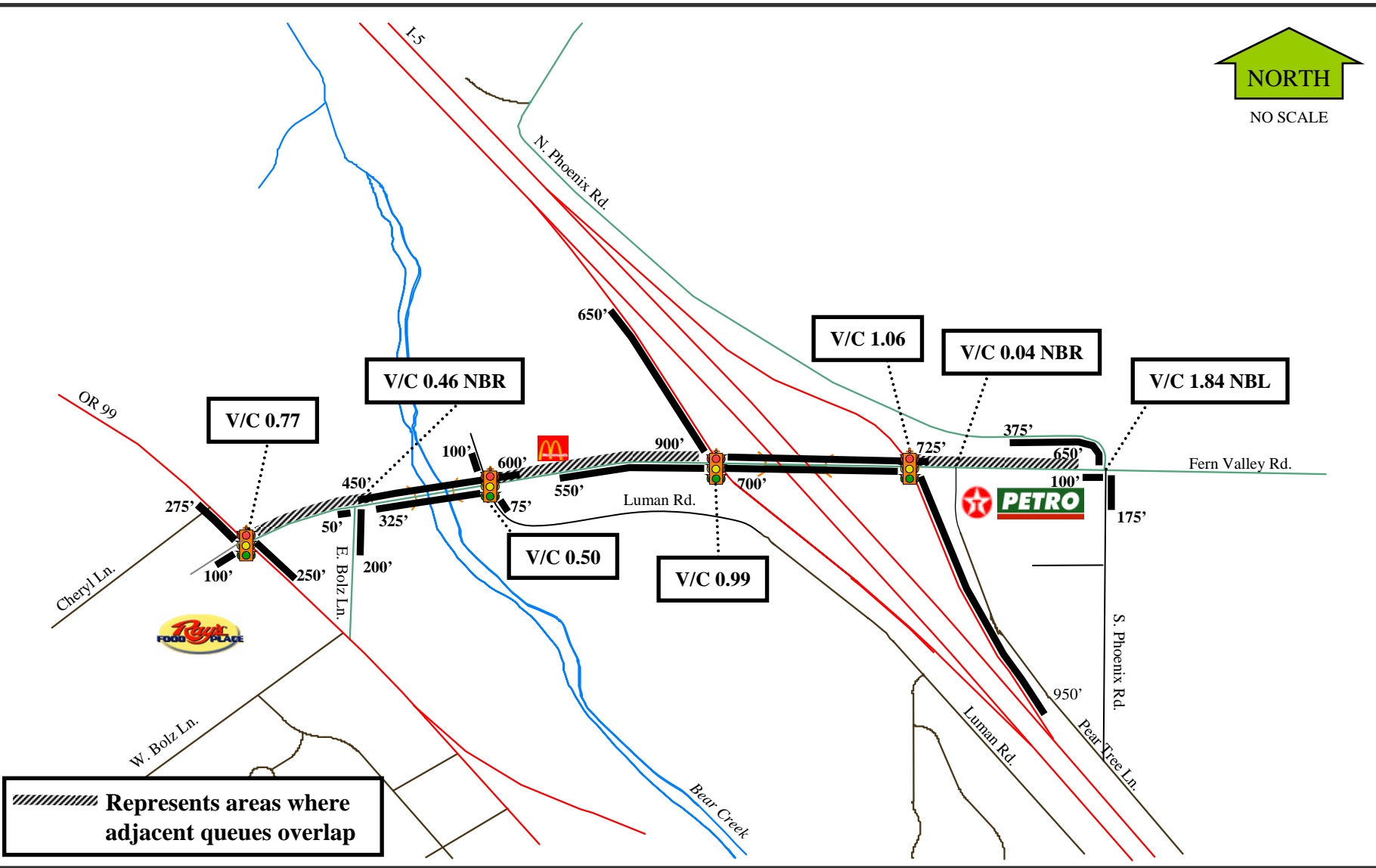
File : Fern Valley.ppt
Date : 2/25/2005

Prepared By: C. Fera-Thomas
Rev. By: P. Schuytema PE

FIGURE 11



NO SCALE



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2004 30th Highest Hour No-Build Queues and V/C ratios

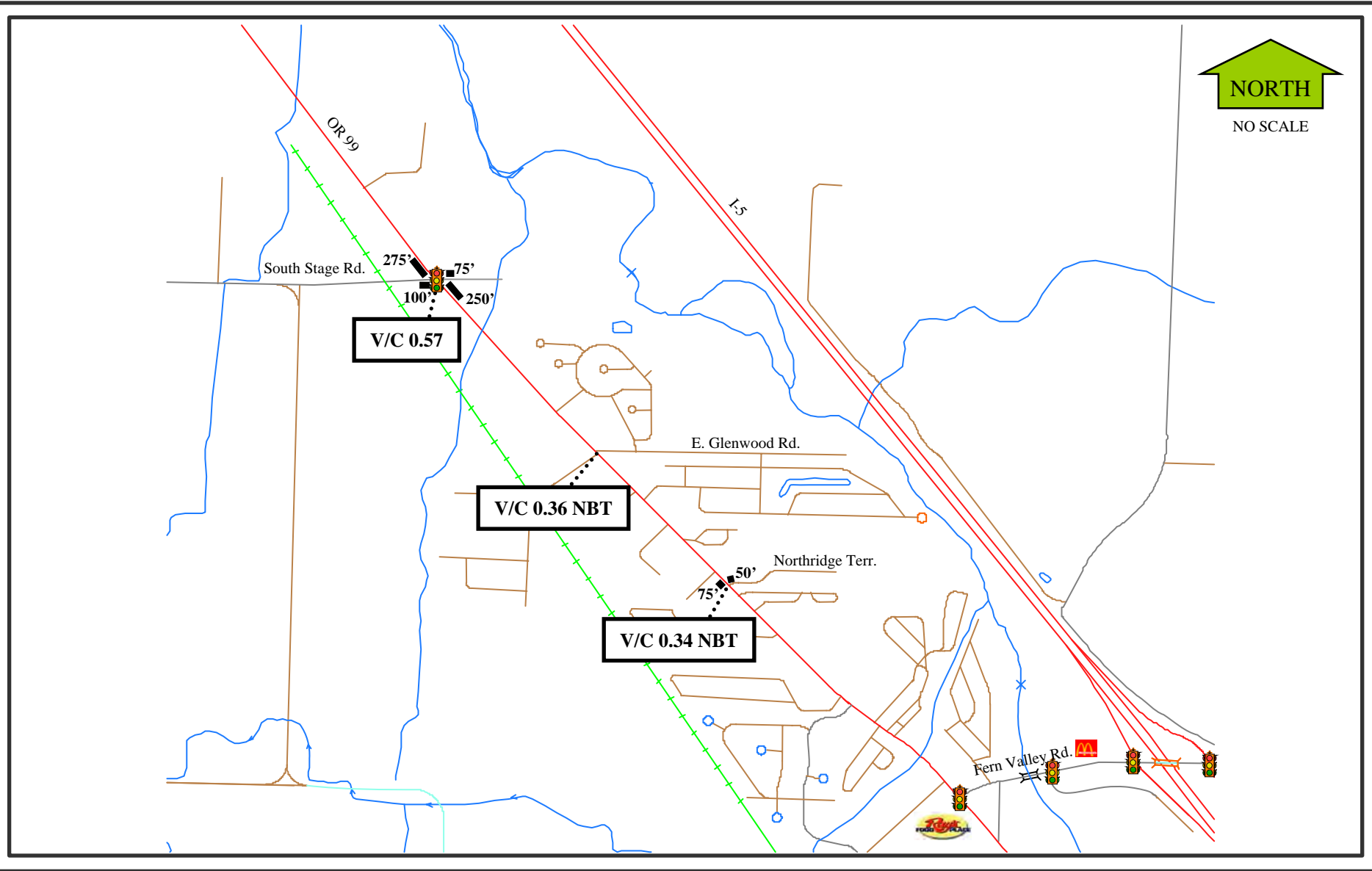
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 2/25/2005

Rev. By: P. Schuytema PE

FIGURE 12



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange - 2004 30th Highest Hour No-Build Queues and V/C ratios

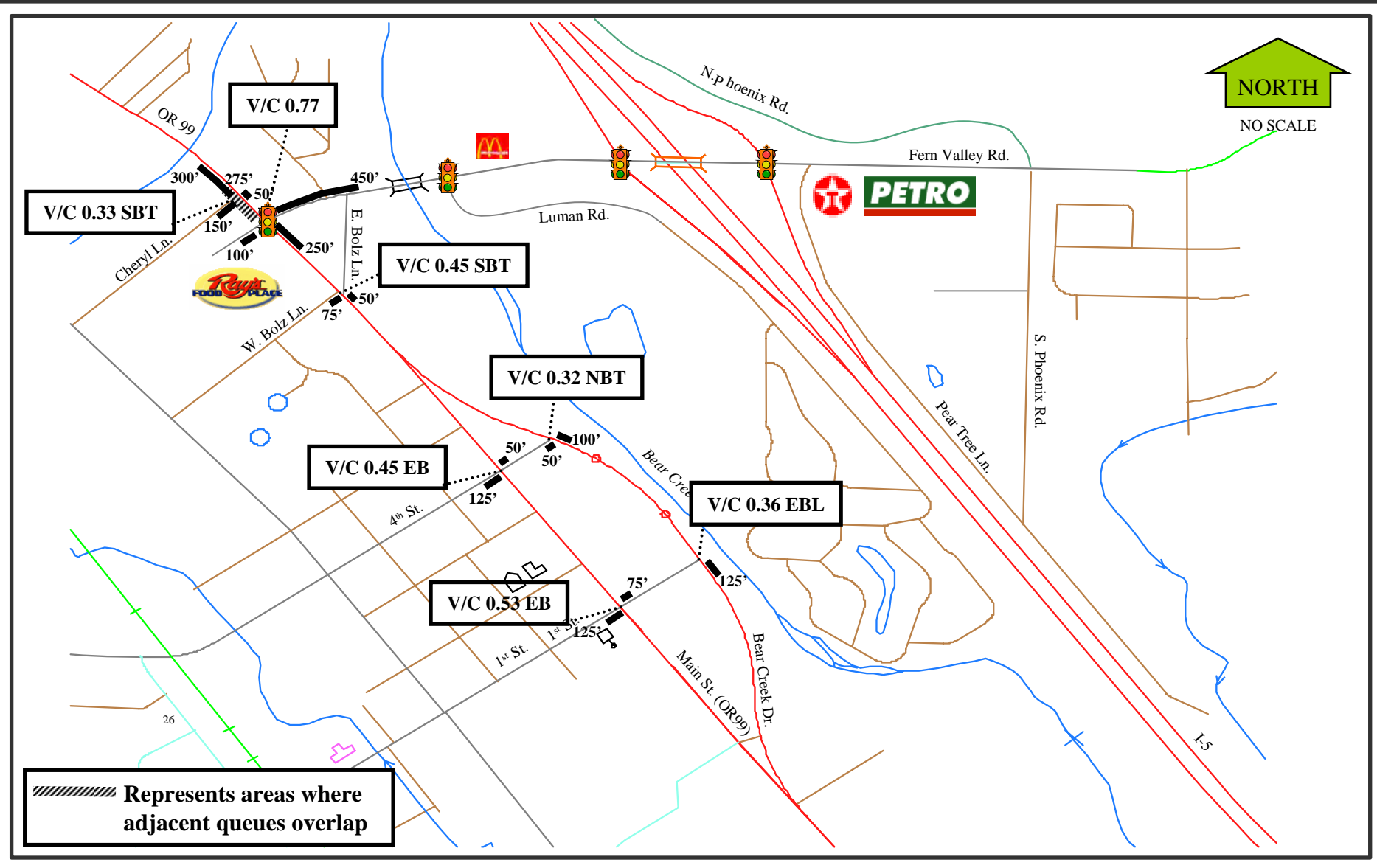
File : Fern Valley.ppt

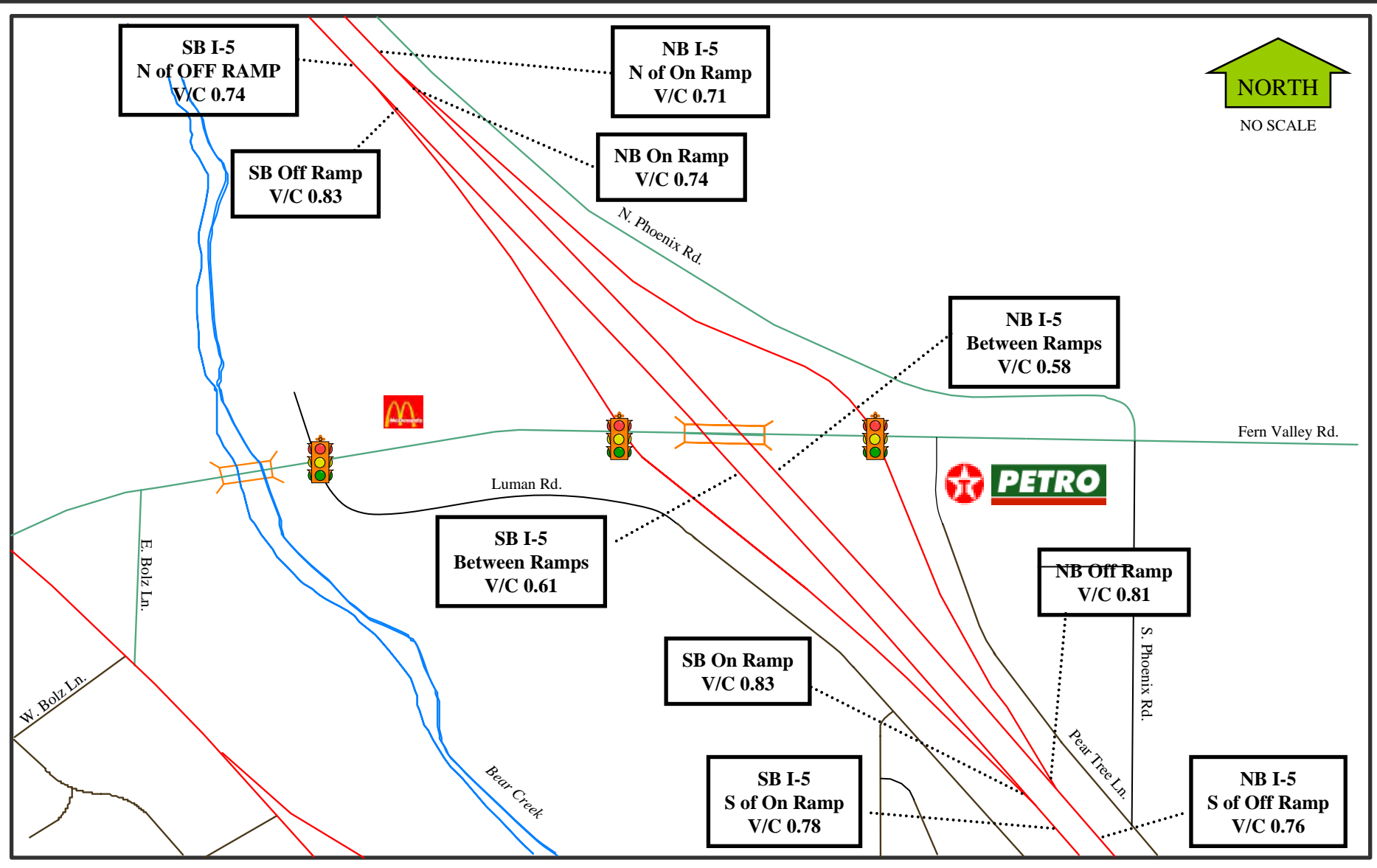
Prepared By: C. Fera-Thomas

Date : 2/25/2005

Rev. By: P. Schuytema PE

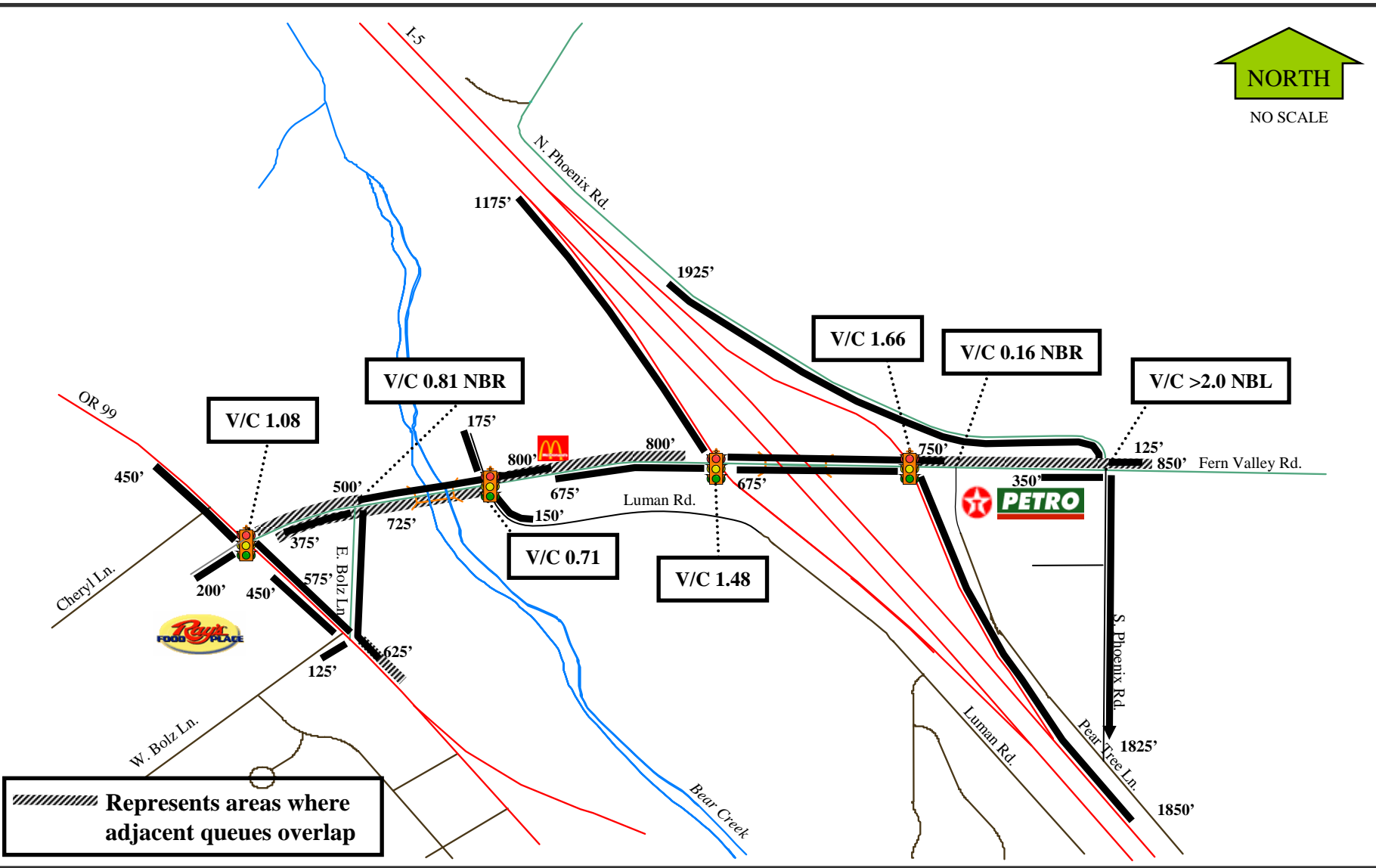
FIGURE 13



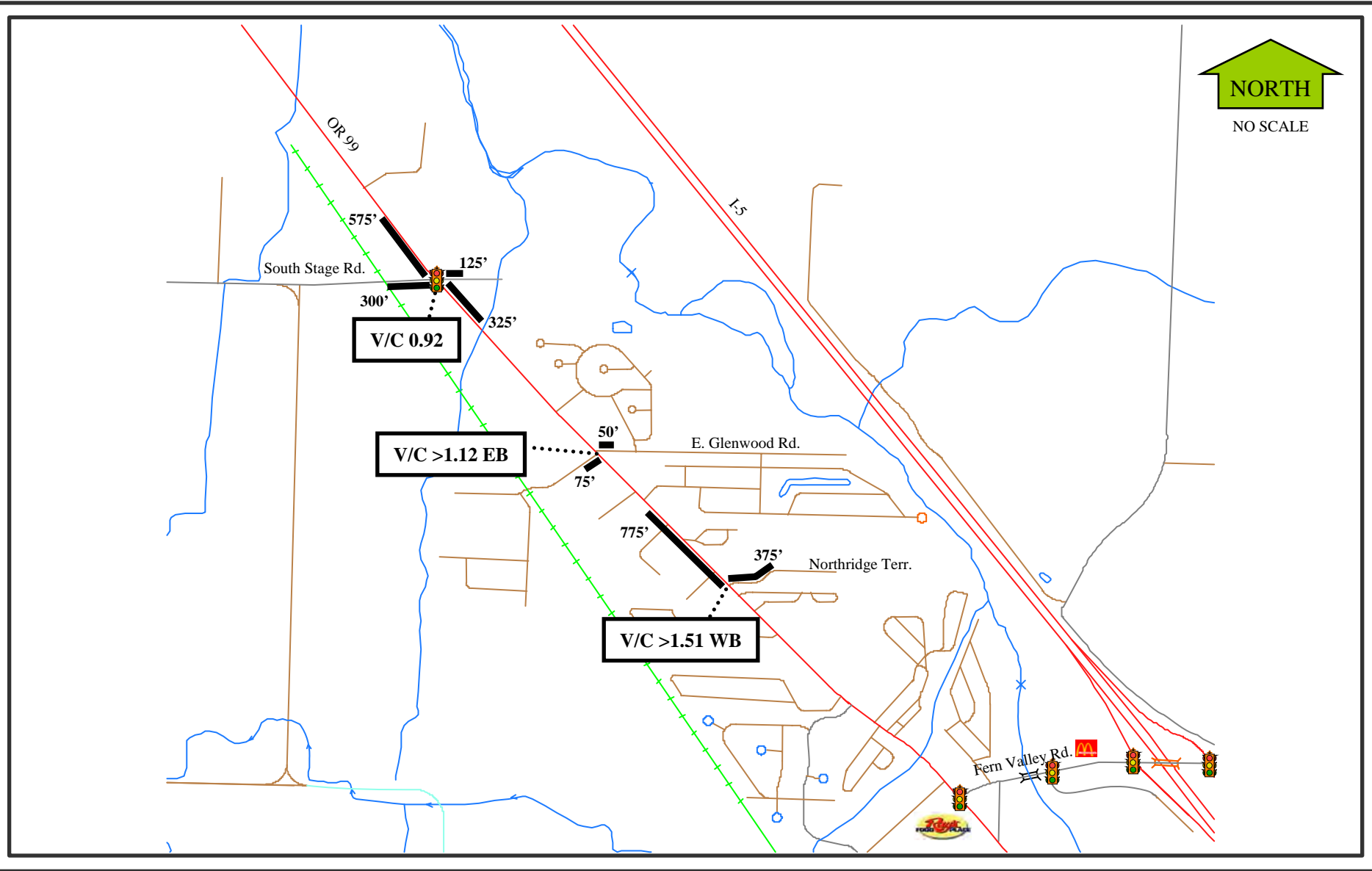




NO SCALE



////// Represents areas where adjacent queues overlap



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange – 2030 Future No-Build V/C Ratios

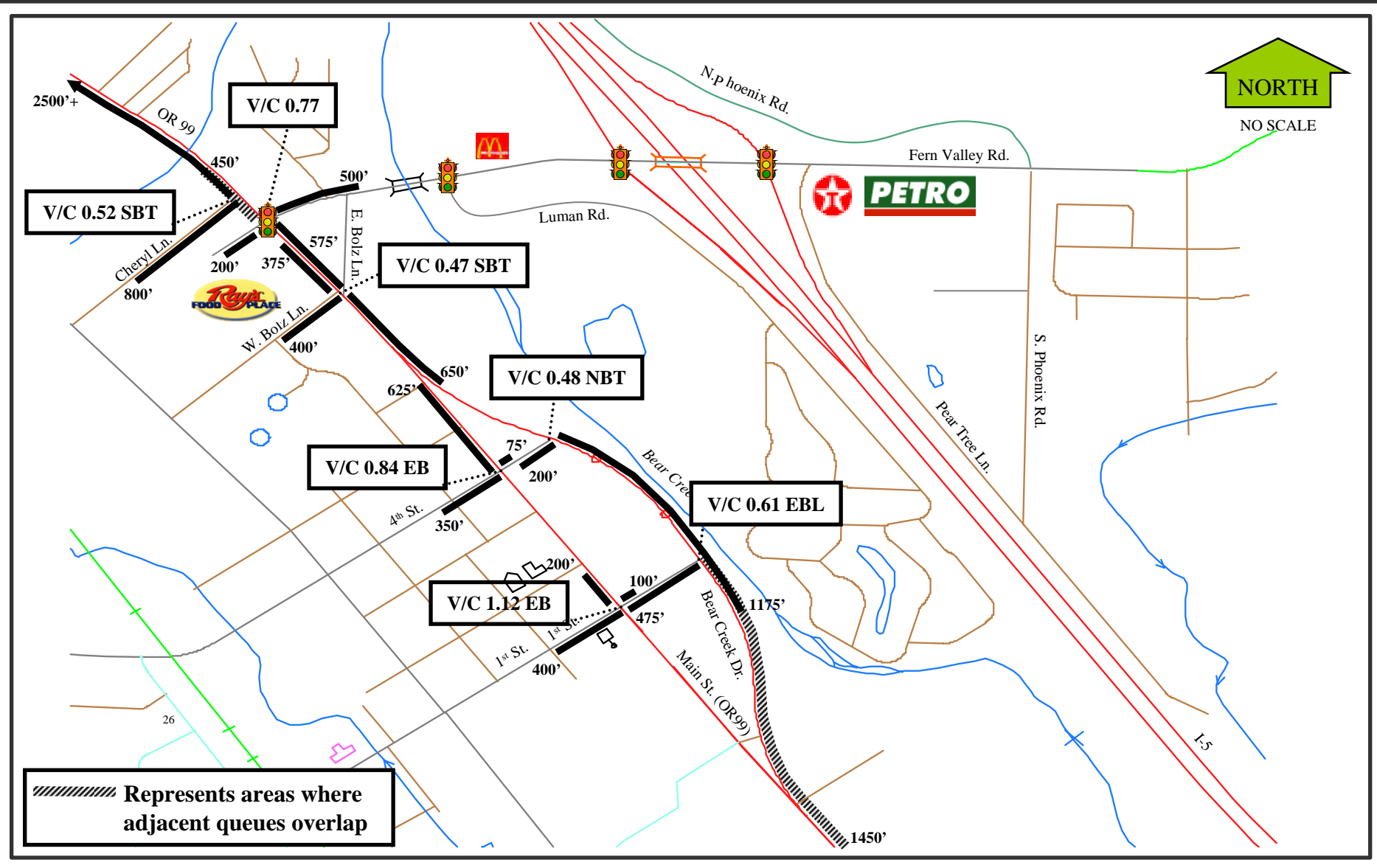
File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 5/12/2005

Rev. By: P. Schuytema PE

FIGURE 17



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Fern Valley Interchange – 2030 Future No-Build V/C Ratios

File : Fern Valley.ppt

Prepared By: C. Fera-Thomas

Date : 5/12/2005

Rev. By: P. Schuytema PE

FIGURE 18