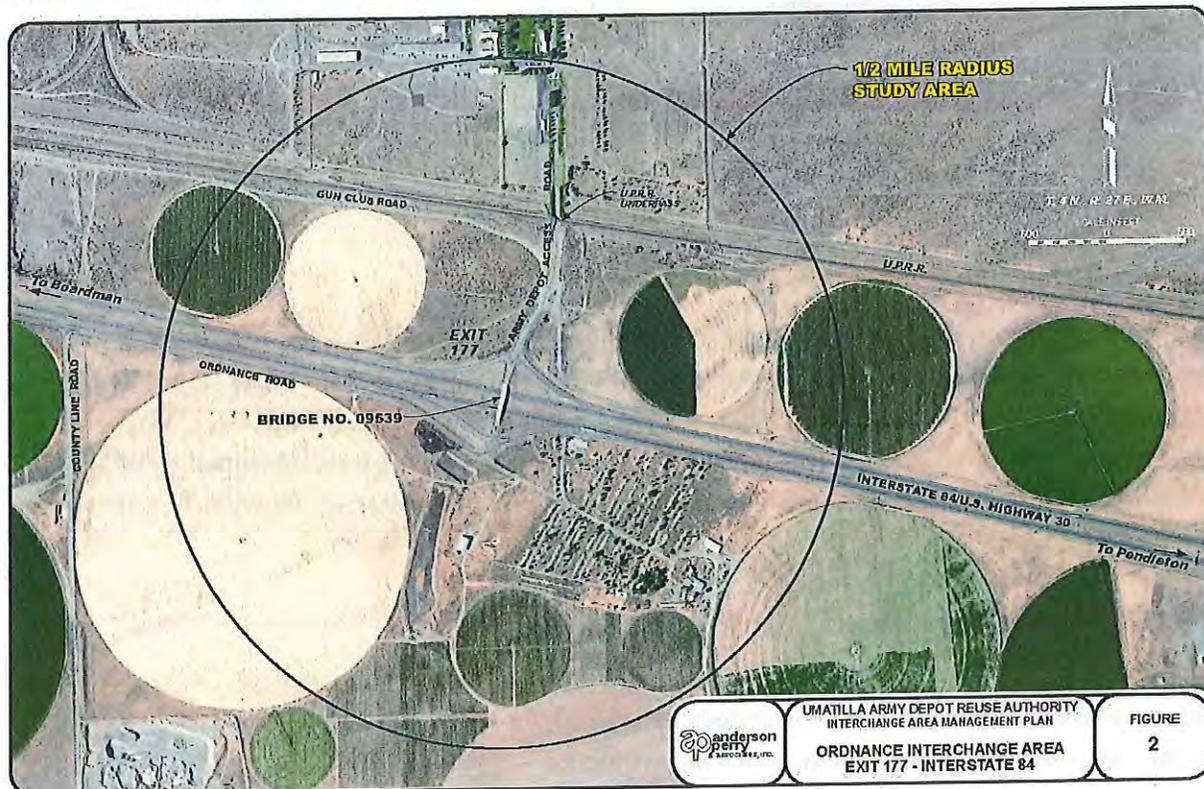


I-84/Umatilla Army Depot Access Road (Exit 177) Interchange

The I-84/Umatilla Army Depot Access Road interchange is located at Exit 177 in Umatilla County. The interchange is a traditional diamond-style interchange. The eastbound ramp terminal intersects Frontage Road/Ordnance Road while the westbound ramp terminal intersects the Umatilla Army Depot Access Road. Both east- and westbound ramp terminals are stop-controlled. The interchange area is shown on Exhibit 4-2.

Exhibit 4-2 - I-84/Umatilla Army Depot Access Road Interchange



Interchange Structure

The I-84/Umatilla Army Depot Access Road overpass is a steel girder structure with a reinforced concrete deck. The structure was last inspected in March 2012. The inspection found large transverse cracks through the deck, spaced at approximately 4 to 6 feet. Rust was also noted on the girders, steel columns, and splice plates. The bridge rail is noted as substandard, which is typical for bridges of this age. Structurally, the bridge is sound and has a sufficiency rating of 96.6. Table 4-4 provides a summary of the structure.

Table 4-4 - I-84/Umatilla Army Depot Access Road Interchange Structure

| | Structure Details |
|-------------------------------|-----------------------|
| Bridge Identification Number | 09539 |
| Year Built | 1967 |
| Last Inspected | March 7, 2012 |
| Lanes | 2 On : 4 Under |
| ADT | 330 |
| Year of ADT | 2010 |
| Number of Main Spans | 5 |
| Structure Length | 284 feet |
| Deck Width | 38.1 feet |
| Vertical Clearance Below Deck | 16.6 feet |
| Design Load/Restrictions | HS 20/No Restrictions |
| Sufficiency Rating | 96.6 |

Ramp Evaluation

All four interchange ramps were evaluated to determine the existing design parameters. This includes the speed change area and the main curve of each ramp. The required speed change lane lengths for both the entrance and exit ramps are based on the existing design speed of the main curve of the ramps. Required exit ramp speed change lane lengths are based on truck traffic exiting the interstate. All design features evaluated are approximate and further investigation must be done to determine actual values.

Existing Eastbound Interchange

The existing conditions of the eastbound entrance and exit ramps are shown on Table 4-5. The eastbound entrance ramp has adequate speed change area for traffic accelerating onto I-84. However, the eastbound exit ramp speed change area does not meet current design standards.

Table 4-5 - I-84/Umatilla Army Depot Access Road Interchange, Eastbound Ramps

| | Approximate Design Speed (mph) | Needed Acceleration Length (feet) | Existing Acceleration Length (feet) | Needed Deceleration Length (feet) | Existing Deceleration Length (feet) |
|---------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| Entrance Ramp | 50* | 750 | 750 | | |
| Exit Ramp | 60* | | | 450 | 400 |

*Approximate

**Values from ODOT Highway Design Manual Chapter 9 Grade Separation & Interchanges

mph = miles per hour

Existing Westbound Interchange

The existing conditions of the westbound entrance and exit ramps are shown in Table 4-6. The westbound entrance ramp has adequate speed change area for traffic accelerating onto I-84. However, the westbound exit ramp speed change area does not meet current design standards.

Table 4-6 - I-84/Paterson Ferry Road Interchange, Westbound Ramps

| | Approximate Design Speed (mph) | Needed Acceleration Length (feet) | Existing Acceleration Length (feet) | Needed Deceleration Length (feet) | Existing Deceleration Length (feet) |
|---------------|--------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| Entrance Ramp | 55* | 750 | 800 | | |
| Exit Ramp | 55* | | | 450 | 350 |

*Approximate

**Values from ODOT Highway Design Manual Chapter 9 Grade Separation & Interchanges
 mph = miles per hour

Roadways Served

Umatilla Army Depot Access Road

Army Depot Access Road connects the main entrance of the Umatilla Army Depot to I-84 at exit 177. It is a paved two-lane roadway that has an underpass located approximately one-quarter mile from the interchange. The underpass carries two lanes of traffic and 4-foot sidewalks on each side of the road underneath the Union Pacific Railroad and has a 15-foot vertical clearance and a 30-foot horizontal clearance. Additionally, this road provides access to Gun Club Lane and several parcels of exclusive farm land located directly south of the Umatilla Army Depot.

ODOT owns the access road within the immediate vicinity of the interchange ramp terminals while Umatilla County owns the road up to the Union Pacific Railroad underpass. From there, the road is considered to be part of the Umatilla Army Depot.

Gun Club Lane

Gun Club Lane is a gravel road that connects to the Umatilla Army Depot Access Road. The road provides access to the local gun club as well as rock quarries and agricultural fields. The road is a local Umatilla County roadway that parallels both I-84 to the south and Union Pacific Railroad to the north.

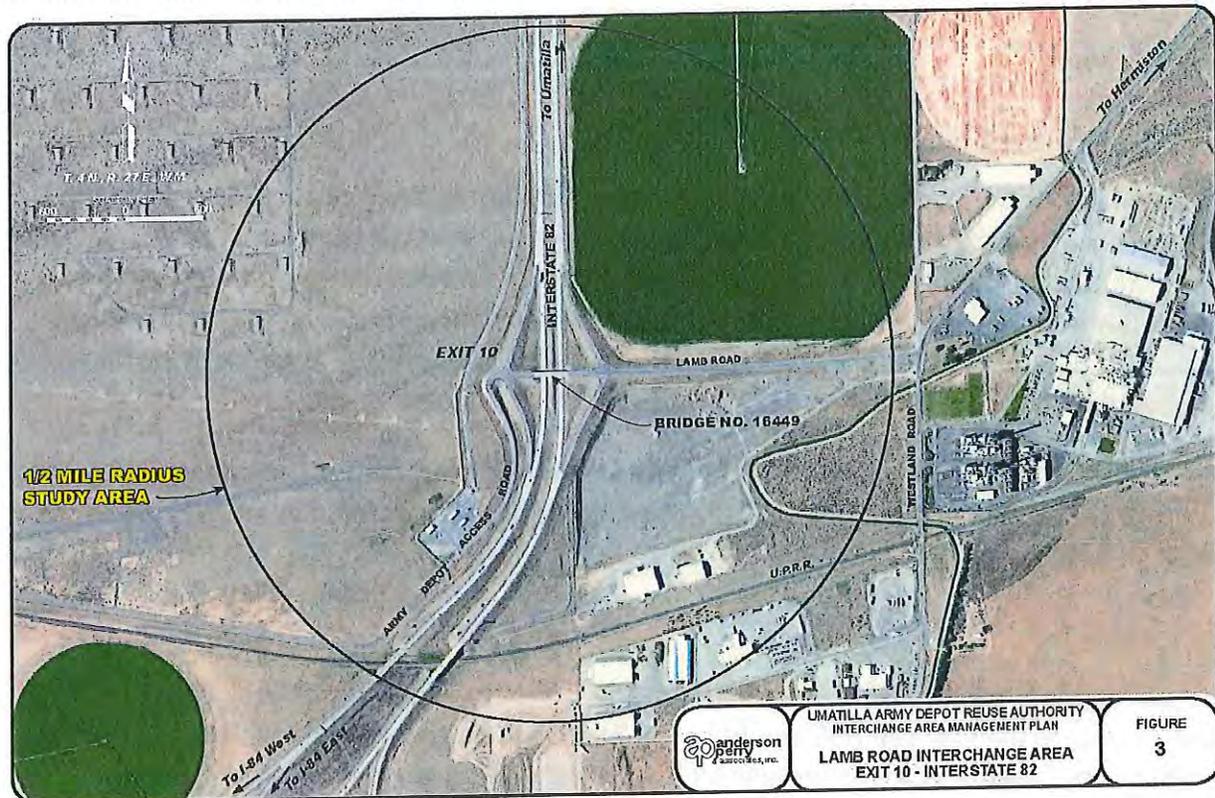
Ordnance Road/Frontage Road

Ordnance Road is a two-lane paved road that offers a connection from Exit 177 to County Line Road, Poleline Road, and Paterson Ferry Road to the west. The Umatilla County roadway runs east-west, parallel to I-84, and is classified as a Rural Major Collector. Ordnance Road has several small accesses to agricultural fields.

I-82 / Lamb Road (Exit 10) Interchange

The I-82/Lamb Road interchange is located at Exit 10 in Umatilla County and provides accessibility to industrial areas as well as the City of Hermiston. The interchange is a diamond-style interchange, with access from both east- and westbound lanes. The east- and westbound off-ramps enter onto Lamb Road. Both east- and westbound off-ramps are stop-controlled. The interchange area is shown on Exhibit 4-3.

Exhibit 4-3 - I-82/Lamb Road Interchange



Interchange Structure.

The I-82/Lamb Road interchange is a prestressed concrete girder structure with reinforced concrete columns, abutments, and deck. The overpass carries two lanes of Lamb Road over I-82. The structure was last inspected in September 2013. The inspection noted that, though there was slight cracking in the deck, it was minimal overall and there was also minor cracking in the abutment and pier caps. Structurally, the overpass is sound with a sufficiency rating of 95.6. Table 4-7 provides a summary of the structure.

Table 4-7 - I-82/Lamb Road Interchange Structure

| | Structure Details |
|-------------------------------|-----------------------|
| Bridge Identification Number | 16449 |
| Year Built | 1985 |
| Last Inspected | September 25, 2013 |
| Lanes | 2 On : 4 Under |
| ADT | 1,800 |
| Year of ADT | 2010 |
| Number of Main Spans | 2 |
| Structure Length | 262 feet |
| Deck Width | 39.2 feet |
| Vertical Clearance Below Deck | 16.9 feet |
| Design Load/Restrictions | HS 25/No Restrictions |
| Sufficiency Rating | 95.6 |

Roadways Served

Lamb Road

Lamb Road is a two-lane paved road that provides access from Exit 10 to the Umatilla Army Depot to the west and Westland Road to the east. Lamb Road is a Umatilla County roadway and is classified as a Rural Major Collector.

Umatilla Army Depot East Gate Access Road

The Umatilla Army Depot East Gate Access Road is a two-lane paved road that provides access from Lamb Road/ Exit 10 at I-82 to the southeast entrance of the Depot.

I-82

I-82 is a four-lane Interstate Highway that runs north-south through Umatilla County between I-84 and the Washington State line. I-82 is part of the National Highway System and is designated in the Oregon Highway Plan as an Interstate Highway, Freight Route, and Truck Route. I-82 connects I-84 and I-90 and provides the primary freight and passenger car route between the Seattle-Tacoma metropolitan area and the Boise, Idaho and Salt Lake City, Utah metropolitan areas.

I-84

I-84 is a four-lane Interstate Highway that runs east-west through Morrow and Umatilla Counties. Like I-82, I-84 is part of the National Highway System and is designated in the Oregon Highway Plan as an Interstate Highway, Freight Route, and Truck Route. I-84 is the primate east-west highway in the State of Oregon and connects the Portland metropolitan area to the Boise, Idaho metropolitan areas.

A summation of all study area roadways and their characteristics is provided in Table 4-8.

Table 4-8 - Existing Transportation Facilities and Roadway Designations

| Interchange | Roadway | Roadway Ownership/ Functional Classification | Cross-Section | Posted Speed (MPH) | Side-walks, Bike Lanes, On Street Parking |
|---|------------------------------------|--|------------------|-----------------------|---|
| I-84/Paterson Ferry Road Interchange | I-84 | ODOT - <i>Interstate Highway</i> | 4-Lanes | 65 | - |
| | Paterson Ferry Road | Morrow County - <i>Rural Major Collector</i> | 2-Lanes | Not Posted | None |
| | Frontage Road | Morrow County - <i>Rural Major Collector</i> | 2-Lanes | Not Posted | None |
| I-84/ Army Depot Access Road | I-84 | ODOT - <i>Interstate Highway</i> | 4-Lanes | 65 | - |
| | Umatilla Army Depot Access Road | Umatilla County - <i>Local Road</i> | 2-Lanes | Not Posted | None |
| | Gun Club Lane | Umatilla County - <i>Local Road</i> | 2-Lanes (gravel) | Not Posted | None |
| | Frontage Road/ Ordnance Road | Umatilla County - <i>Rural Major Collector</i> | 2-Lanes | Not Posted | None |
| I-82/ Lamb Road | I-82 | ODOT - <i>Interstate Highway</i> | 4-Lanes | 65 | None |
| | Lamb Road | Umatilla County - <i>Rural Major Collector</i> | 2-Lanes | 55 | None |
| | Umatilla Army Depot Access Road | Private | 2-Lanes | Not Posted | None |

*ODOT highway classifications are from the 1999 Oregon Highway Plan (Reference 1) and County roadway classifications are from the Umatilla and Morrow County Transportation System Plans (Reference 2 and 3)

Rail Facilities

The Union Pacific rail line extends through the IMSA along the southernmost boundary of the Umatilla Army Depot. This Class I line-haul freight line connects to the City of Portland to the west and the City of Boise to the east. The rail line is grade separated over the Umatilla Army Depot Access Road, but has at-grade crossings at Paterson Ferry Road and Westland Road.

EXISTING TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Eight study intersections in and around the IMSA we identified in coordination with ODOT, Umatilla County, and Morrow County. The study intersections are:

- I-84 EB Ramp Terminal / Paterson Ferry Road / Frontage Road
- I-84 WB Ramp Terminal / Paterson Ferry Road
- I-84 EB Ramp Terminal / Umatilla Army Depot Access Road
- I-84 WB Ramp Terminal / Umatilla Army Depot Access Road
- Umatilla Army Depot Access Road / Gun Club Lane
- I-82 SB Ramp Terminal / Lamb Road
- I-82 NB Ramp Terminal / Lamb Road
- Westland Road / Lamb Road

Traffic counts were collected at the study intersections in October 2013 from 6-9 a.m. and from 3-6 p.m. All counts are shown in 5-minute intervals and include vehicular turning movements, pedestrian movements, and bicycles (although no pedestrians or bicyclist were observed). Table 4-9 summarizes the traffic count time periods.

Table 4-9 - Traffic Count Summary

| Intersection | Count Date | Intersection | Count Date |
|--|----------------------------------|---|----------------------------------|
| ODOT Intersections | | County Intersections | |
| I-84 EB Ramp Terminal/ Army Depot Access Road | AM: 10/30/2013 PM: 10/29/2013 | Army Depot Access Road / Gun Club Lane | AM: 10/30/2013 PM: 10/29/2013 |
| I-84 WB Ramp Terminal/ Army Depot Access Road | AM: 10/30/2013 PM: 10/29/2013 | Westland Road/ Lamb Road | 10/16/2013 |
| I-82 SB Ramp Terminal/ Lamb Road | 10/16/2013 | | |
| I-82 NB Ramp Terminal/ Lamb Road | 10/16/2013 | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road | 10/16/2013 | | |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | 10/16/2013 | | |

¹NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound

Peak Hour Development

Traffic volumes were reviewed for the three interchange areas to determine the one-hour system peak periods for the operation analysis. A system peak period was identified for both the weekday a.m. and p.m. peak periods. The weekday a.m. peak hour was found to be 6:05 – 7:05 a.m. The weekday p.m. peak hour was found to be 4:30 – 5:30 p.m.

Intersection Operational Standards

ODOT uses volume-to-capacity (V/C) ratio standards to assess intersection operations. Table 6 of the *Oregon Highway Plan* (OHP, Reference 1) and Table 10-2 of the *Oregon Highway Design Manual* (HDM, Reference 4) provide maximum volume-to-capacity ratios for all signalized and unsignalized intersections outside the Metro area. The OHP ratios are used to assist in the planning phase identifying future system deficiencies, while the HDM ratios are used to establish a 20-year design life solution that correct previously identified deficiencies. The ODOT controlled intersections within the study area include the interchange ramp terminals on I-82 and I-84, which are designated as Interstate Highways outside of a Metropolitan Planning Organization (MPO).

The applicable performance standard for Umatilla County intersections, as defined in Umatilla County's *2002 Transportation System Plan* (TSP) (Reference 2), is LOS E or better. The state highway mobility target as set forth by ODOT in the *Oregon Highway Plan* (Reference 1) for the study intersections at the freeway ramp terminals is a maximum volume-to-capacity ratio of 0.70.

No study intersections, other than the I-84/Paterson Ferry ramp terminals which are subject to ODOT's operational standards, are located in Morrow County. Table 4-10 summarizes the intersection performance standards for the study intersections.

Table 4-10 - Intersection Performance Standards

| Intersection | Traffic Control ¹ | OHP Standard | HDM Standard | Umatilla County Standard |
|---|------------------------------|--------------|--------------|--------------------------|
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| I-84 EB Ramp Terminal/ Army Depot Access Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| I-84 WB Ramp Terminal/ Army Depot Access Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| Army Depot Access Road / Gun Club Lane | TWSC | - | - | LOS E |
| I-82 SB Ramp Terminal/ Lamb Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| I-82 NB Ramp Terminal/ Lamb Road | TWSC | v/c < 0.70 | v/c < 0.60 | - |
| Westland Road/ Lamb Road | TWSC | - | - | LOS E |

¹TWSC: Two-way stop-controlled (unsignalized)

Seasonal Adjustment Factor

30th Highest Hour Volumes (30 HV) for the study intersections were calculated based on the traffic counts collected in October of 2013 and the application of a seasonal adjustment factor. The Oregon Department of Transportation Analysis Procedures Manual (Reference 5) identifies three methods for identifying seasonal adjustment factors. All three methods are informed by information provided by Automatic Traffic Recorders (ATR) located in select locations throughout the State Highway System that

collect traffic data 24-hours a day/365 days a year. Each method was evaluated to determine the most appropriate for the study area.

The I-84 and I-82 ramps serve rural roads and are more heavily impacted by local traffic patterns than interstate traffic patterns. For this reasons the Seasonal Trend Table Method was determined to be the most appropriate method to develop 30 HVs for the ramp terminals and other study intersections. The results of the evaluations are summarized below.

Seasonal Trend Method

The Seasonal Trend Method uses average values from the ODOT ATR Characteristic Table for each seasonal traffic trend. For the Umatilla Subarea, the agriculture seasonal traffic trend values were used to derive 30 HV volumes. Table 4-11 summarizes the average values for seasonal traffic trends during the count times and the peak period as provided in the ODOT Seasonal Trend Table.

Table 4-11: Seasonal Trend Table

| Trend | 15-Oct | 1-Nov | Peak Period Seasonal Factor |
|--------------|--------|--------|-----------------------------|
| Agricultural | 0.9263 | 0.9984 | 0.7981 |

Based on the data in Table 3, the traffic counts at all other study intersections were adjusted by the following factors, depending on count date:

- Counts taken 10/16/2013
 - $\frac{\text{Traffic Counts (15-October)}}{\text{Peak Period Seasonal Factor}} = \frac{0.9263}{0.7981} = 1.16$

- Counts taken 10/29/2013 & 10/30/2013
 - $\frac{\text{Traffic Counts (1-November)}}{\text{Peak Period Seasonal Factor}} = \frac{0.9984}{0.7981} = 1.25$

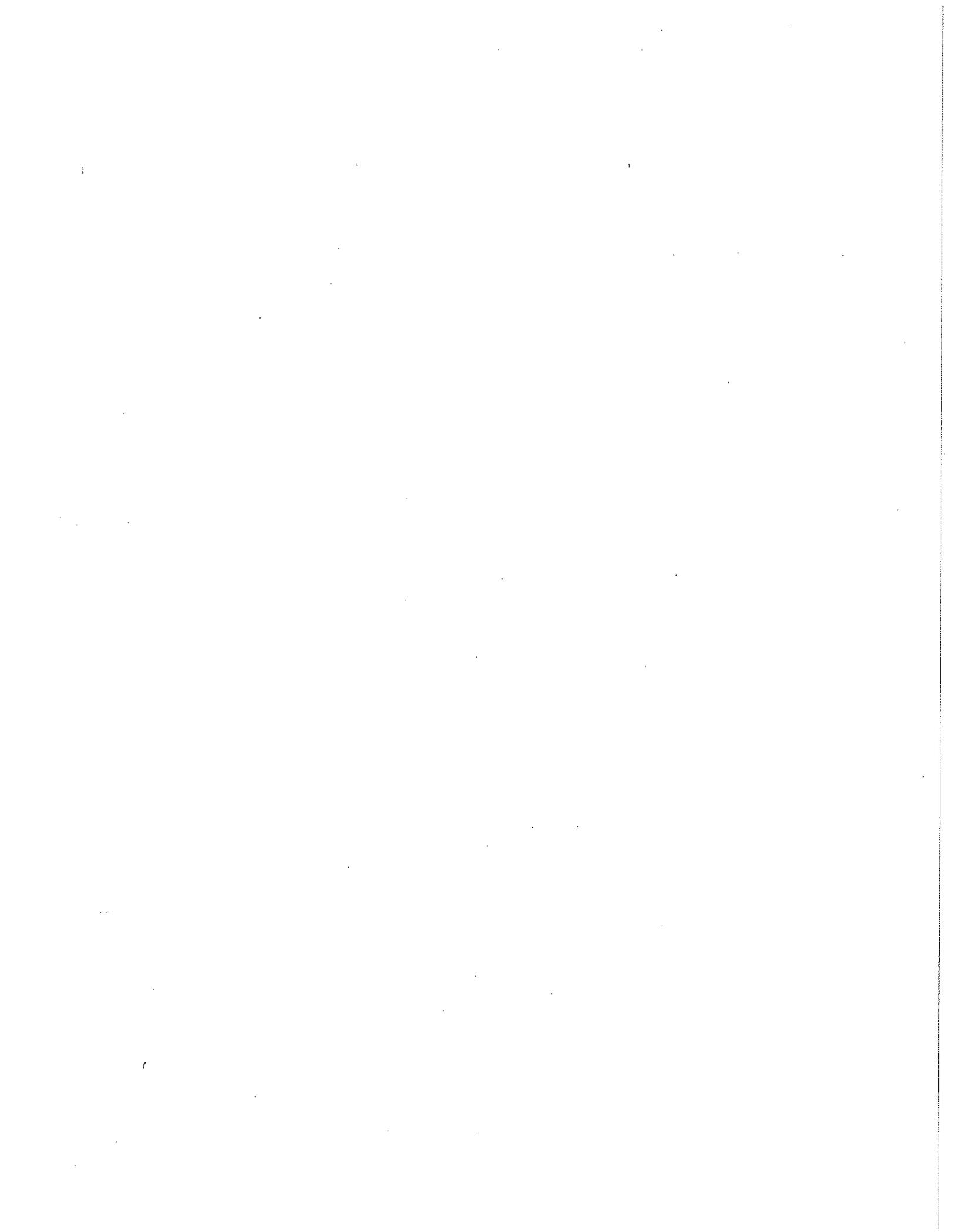
Study Intersection Operations Analysis

Intersection level-of-service (LOS) and volume-to-capacity (v/c) ratios were calculated for each of the study intersections based on the appropriate ODOT traffic operations procedures.

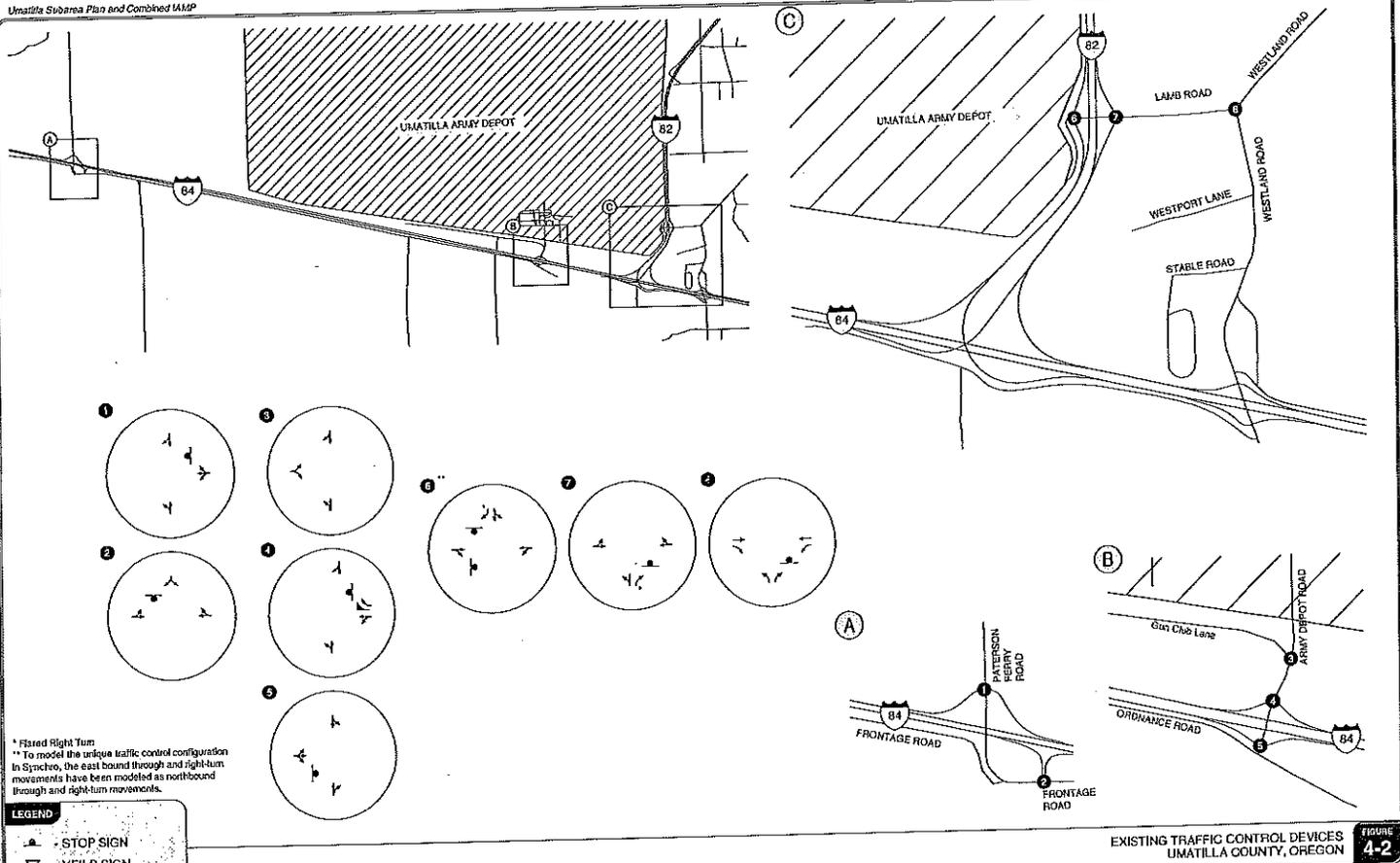
Figures 4-2 through 4-4 show the existing lane configurations, traffic control, and operational analysis results of the study intersections during the weekday a.m. and p.m. peak hours. As summarized in Table 4-12, all study intersections were observed to operate acceptably during the weekday a.m. and p.m. peak hours.

Table 4-12 - Existing Traffic Operations Summary

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|--|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.03 | A | 0.02 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.09 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Access Road | A | 0.02 | A | 0.02 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Access Road | A | 0.03 | A | 0.02 | v/c < 0.70 | Yes |
| Army Depot Access Road / Gun Club Lane | A | 0.01 | A | 0.01 | LOS E | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | C | 0.27 | B | 0.03 | v/c < 0.70 | Yes |
| I-82 NB Ramp Terminal/ Lamb Road | A | 0.06 | B | 0.38 | v/c < 0.70 | Yes |
| Westland Road/ Lamb Road | B | 0.04 | B | 0.13 | LOS E | Yes |

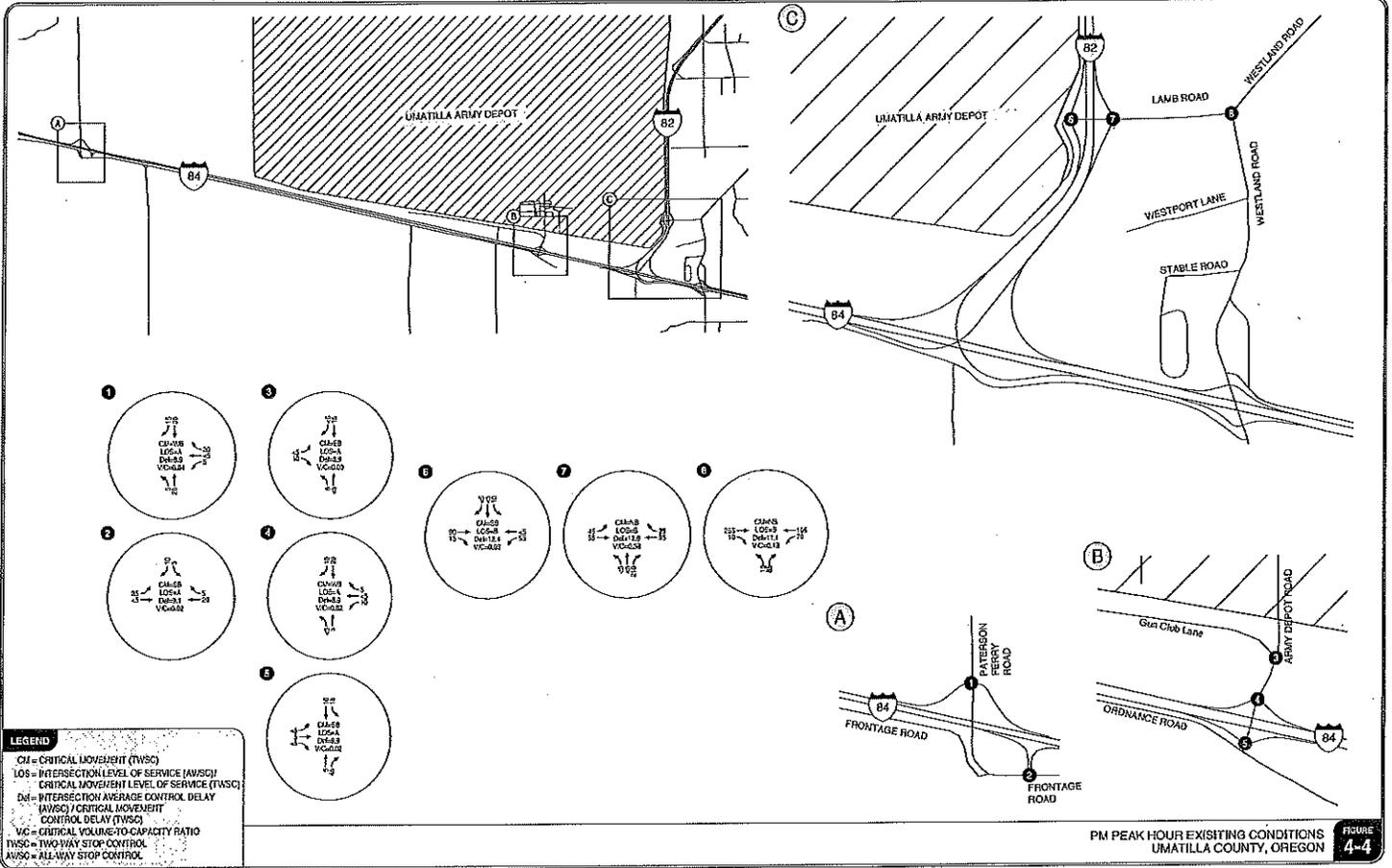


Umatilla Subarea Plan and Combined IAMP



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* Flared Right Turn
 ** To model the unique traffic control configuration in Synchro, the east bound through and right turn movements have been modeled as northbound through and right-turn movements.



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TRAFFIC SAFETY

The crash histories at the study area intersections and along the Lamb Road were reviewed in an effort to identify potential safety issues. Crash records were obtained from ODOT for the five-year period from January 1, 2008 through December 31, 2012. Table 4-13 contains the summary of the reported non-interstate mainline crashes.

Table 4-13 - Summary of Reported Crashes, Study Intersections and Interchange Ramp Terminals

| Intersection | Collision Type | | | | Severity | | | Total |
|--|----------------|---------|-------|-------|------------------|--------|-------|-------|
| | Rear-End | Turning | Angle | Other | PDO ¹ | Injury | Fatal | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road | - | - | - | 1 | 1 | - | - | 1 |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | - | - | - | - | - | - | - | - |
| I-84 EB Ramp Terminal/ Army Depot Access Road | - | - | - | 1 | - | 1 | - | - |
| I-84 WB Ramp Terminal/ Army Depot Access Road | - | - | - | - | - | - | - | - |
| Army Depot Access Road / Gun Club Lane | - | - | - | - | - | - | - | - |
| I-82 SB Ramp Terminal/ Lamb Road | 1 | - | - | - | - | 1 | - | 1 |
| I-82 NB Ramp Terminal/ Lamb Road | - | - | - | - | - | - | - | - |
| Westland Road/ Lamb Road | 1 | 1 | - | - | 2 | - | - | 2 |
| Lamb Road Segment from Westland Road to NB I-82 Ramps | 1 | - | - | - | 1 | - | - | 1 |

¹Property Damage Only

As shown in Table 4-13, there have been no more than two crashes at any study intersection or on segments between study intersections over the most recent 5-year analysis period. As such, there are no distinguishable patterns of intersection-related crashes to suggest further investigation is needed.

Crashes on I-84 and I-82 within the IMSA were also reviewed in an effort to identify potential safety issues on the freeway segments near the study interchange ramp terminals. Again, crash records were obtained from ODOT for the five-year period from January 1, 2008 through December 31, 2012. Table 4-14 contains the summary of reported interstate crashes.

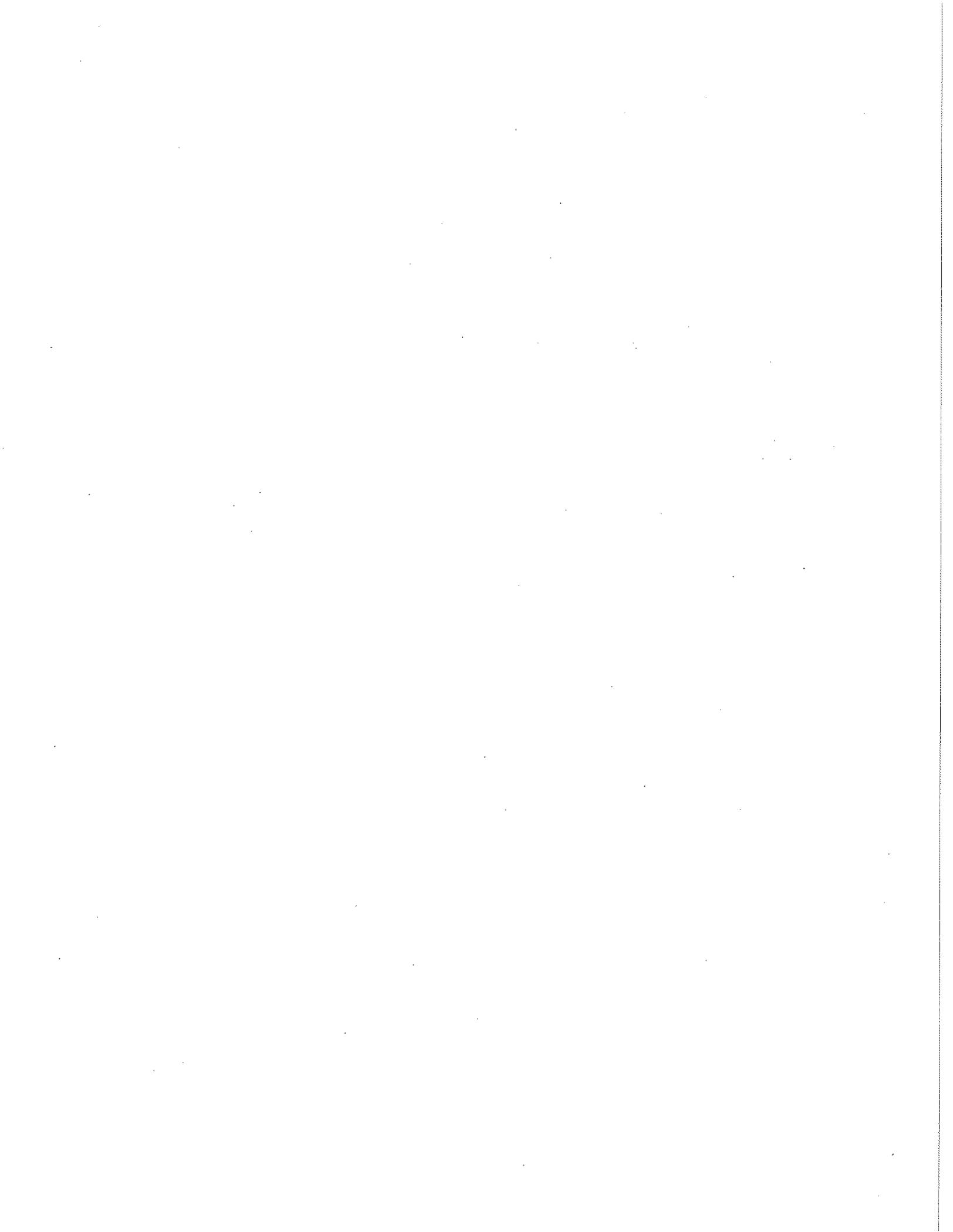


Table 4-14 - Summary of Reported Crashes, Interstate Mainline (In the Vicinity of Ramps)

| Segment | Collision Type | | | | Severity | | | Snow or Ice Related | Total |
|---|----------------|------------|----------|--------------|------------------|--------|-------|---------------------|-------|
| | Rear-End | Side Swipe | Overturn | Fixed Object | PDO ¹ | Injury | Fatal | | |
| I-84 EB near Paterson Ferry Road Ramps | 1 | 1 | 1 | 1 | 2 | 2 | - | 2 | 4 |
| I-84 WB near Paterson Ferry Road Ramps | 1 | 1 | 2 | - | 3 | 1 | - | 2 | 4 |
| I-84 EB near Army Depot Access Road Ramps | - | - | 3 | - | 1 | 2 | - | 2 | 3 |
| I-84 WB near Army Depot Access Road Ramps | - | 1 | 4 | 3 | 4 | 4 | - | 4 | 8 |
| I-82 NB near Lamb Road Ramps | - | - | 1 | 2 | 2 | 1 | - | 1 | 3 |
| I-82 SB near Lamb Road Ramps | 1 | - | 5 | 3 | 6 | 4 | - | 6 | 9 |

¹Property Damage Only

As shown in Table 4-14, on average over the most recent 5-year analysis period, less than two crashes occurred per year on any of the freeway segments located near the study area. These crashes were primarily single vehicle incidents, with only 5 of 31 reported crashes involving multiple vehicles. Over half of the total crashes, and 12 of the 16 overturn crashes, occurred during snowy or icy conditions. 20 of the 31 crashes list speed or driving too fast as a contributing cause of the crash; 5 crashes list fatigue as a contributing cause of the crash.

EXISTING ROADWAY ACCESS CONDITIONS

Oregon Administrative Rule 734, Division 51 and the Oregon Highway Plan (OHP) identify ODOT's access management standards within the vicinity of interchanges. Based on an outright application of the standards, no full public or private access is allowed within 1,320 feet (¼ mile) from the ramp terminals.

Existing roadway access conditions have been inventoried for all interchange crossroads within ¼ mile of the respective interchange ramp terminal. This inventory was conducted by the project team and is summarized in Table 4-15.

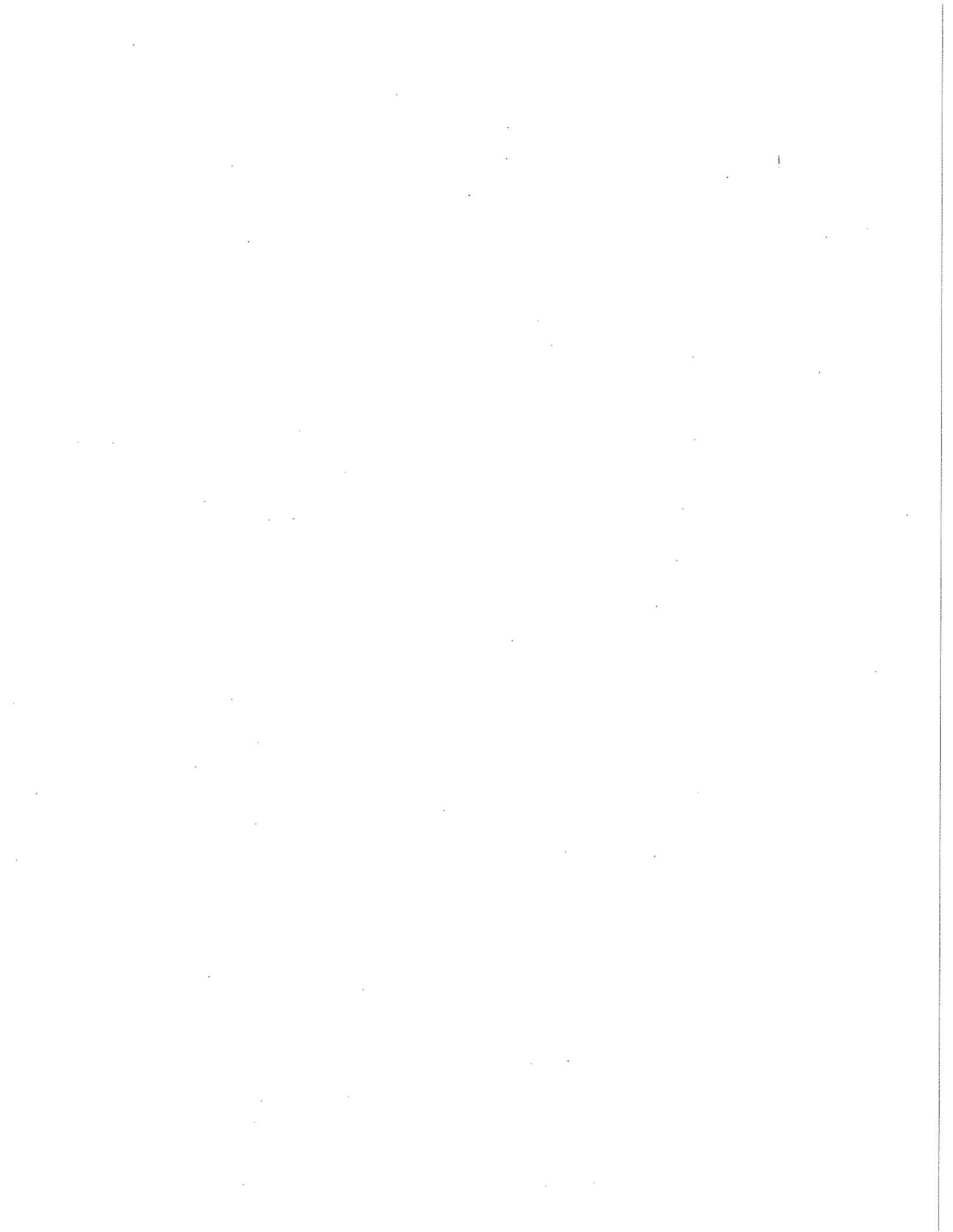
Table 4-15 - Interchange Cross Road Public/Private Access Inventory

| Roadway | Approach Type | Side of Roadway | Type of Use Served |
|---|---|-----------------|---------------------------|
| I-84/Paterson Ferry Road Interchange | | | |
| Paterson Ferry Road | Private (1,155' north of I-84/Westbound Paterson Ferry Road ramp terminal) | East | Rural Industrial Business |
| Paterson Ferry Road | Private (1,230' north of I-84/Westbound Paterson Ferry Road ramp terminal) | West | Farm/Field Access |
| Paterson Ferry Road | Public (665' west of I-84/EB Paterson Ferry Road ramp terminal) | South | Frontage Lane |
| I-84/Umatilla Army Depot Access Road Interchange | | | |
| Umatilla Army Depot Access Road | Private (450' north of the I-84/Westbound Umatilla Army Depot Access Road ramp terminal) | East | Farm/Field Access |
| Umatilla Army Depot Access Road | Public (450' north of the I-84/Westbound Umatilla Army Depot Access Road ramp terminal) | West | Gun Club Lane |
| Ordnance Road/Frontage Road | Private (130' south of the I-84/Eastbound Umatilla Army Depot Access Road ramp terminal) | South | Farm/Field Access |
| Ordnance Road/Frontage Road | Private (1,240' south of the I-84/Eastbound Umatilla Army Depot Access Road ramp terminal) | South | Farm/Field Access |

REFERENCES

1. Oregon Department of Transportation. *1999 Oregon Highway Plan*. 1999.
2. David Evans and Associates. *Umatilla County Transportation System Plan*. 2002.
3. CTS Engineers. *Morrow County 2005 Transportation System Plan*. 2005.
4. Oregon Department of Transportation *Oregon Highway Design Manual*. 2006.
5. Oregon Department of Transportation. *Analysis Procedures Manual*. 2006.

Appendix F
Technical Memorandum #5:
Environmental Research



Mason, Bruce & Girard, Inc.

707 SW Washington Street, Suite 1300
Portland, OR 97205-3530

MEMORANDUM

DATE: February 5, 2014

TO: Matt Hughart, Kittelson & Associates, Inc.

FROM: Alexis Casey and Kate Parker, MB&G

SUBJECT: Technical Memorandum #5: Environmental Research
Umatilla Army Depot Combined IAMP: I-82/Lamb Road Interchange, I-84/Umatilla Army Depot Access Road Interchange and I-84/Paterson Ferry Road Interchange
Morrow and Umatilla Counties

1.0 INTRODUCTION

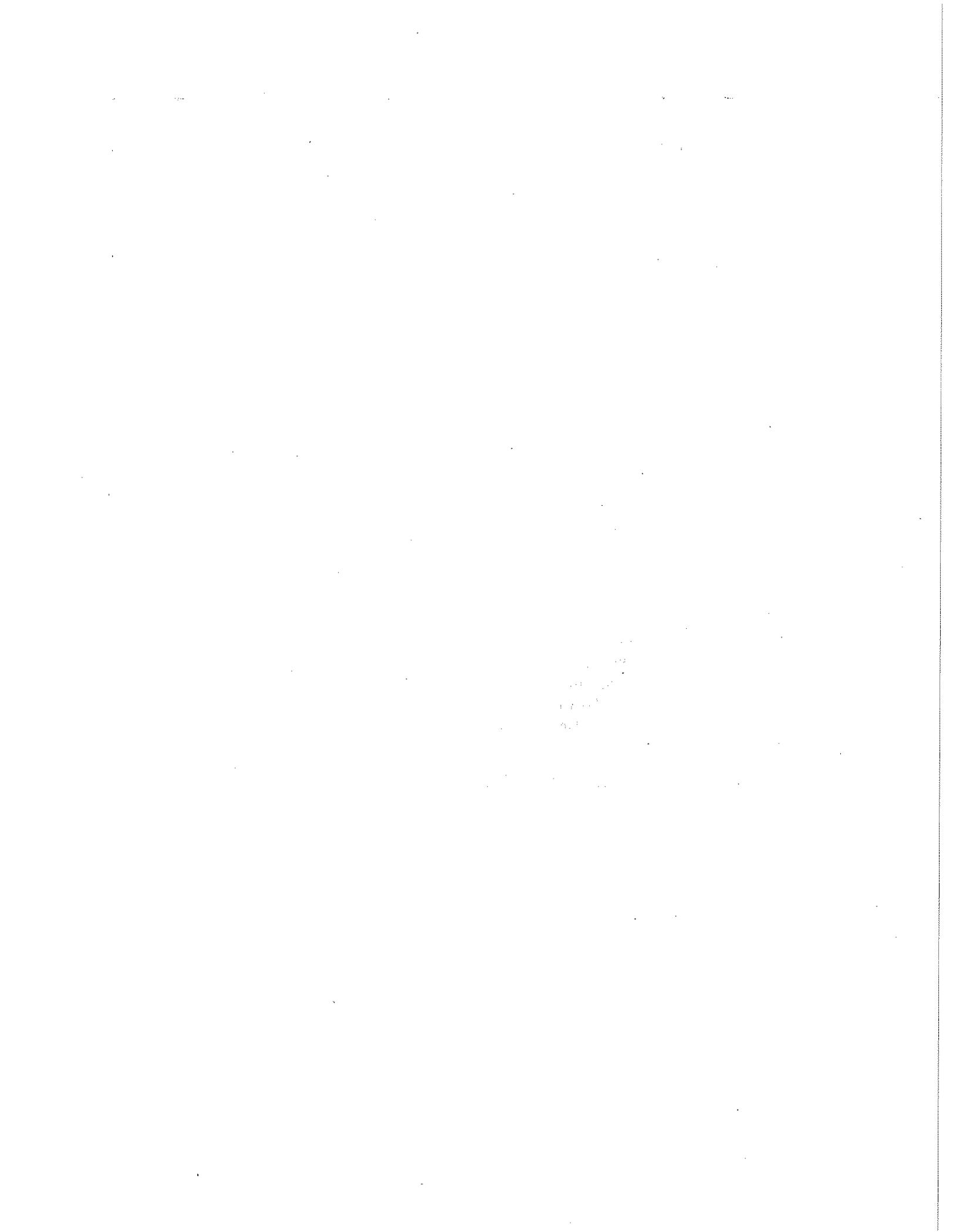
This Technical Memorandum (TM) summarizes available baseline biological, wetland, and water quality information for lands within the vicinity of the I-82/Lamb Road interchange (I-82 Exit 10), I-84/Umatilla Army Depot Access Road interchange (I-84 Exit 177) and I-84/Paterson Ferry Road interchange (I-84 Exit 171) in Morrow and Umatilla Counties, Oregon. It has been prepared in support of the Umatilla Chemical Depot Reuse Authority's (UMADRA) Umatilla Army Chemical Depot (UMCD) Combined Interchange Area Management Plan (IAMP) and Transportation System Subarea Plan Project (Project). This TM also describes natural resource permits and clearances that may be necessary for implementation of the Project. Existing baseline data has been reviewed and compiled in this TM to summarize the environmental character of the Project area, and to help the design team develop alternatives that avoid and/or minimize environmental impacts associated with the Project.

1.1 Purpose

The purpose of this Project is to plan for long-term traffic needs for the redevelopment of the UMCD by identifying and addressing potential access, infrastructure, and land use regulations affecting the three interchanges that currently serve, or have the potential to serve, the UMCD (I-82/Lamb Road interchange, I-84/Umatilla Army Depot Access Road interchange and I-84/Paterson Ferry Road interchange). This TM will support the IAMP being prepared in accordance with Oregon Administrative Rule 734-051.

1.2 Area of Potential Impact (API)

For the purposes of this TM, the API for the Project encompasses the I-82/Lamb Road interchange, I-84/Umatilla Army Depot Access Road interchange and I-84/Paterson Ferry Road interchange. The I-82 Lamb Road interchange and I-84/Umatilla Army Depot Access Road



interchange are located within unincorporated Umatilla County. The I-84/Paterson Ferry Road interchange is located within unincorporated Morrow County (Figure 1).

Topography within the API is relatively flat and slopes gently to the north, toward the Columbia River. The elevation of the API ranges from approximately 590 to 605 feet above mean sea level (msl) within the I-82/Lamb Road interchange area, 575 to 605 feet above msl within the I-84/Umatilla Army Depot Access Road interchange area, and 480 to 500 feet above msl within the I-84/Paterson Ferry Road Interchange area (Google Earth 2013).

The API has experienced alterations to the natural landscape resulting from the construction of I-84 and I-82, from the operation and maintenance of the UMCD, and ongoing adjacent agricultural practices. Extensive irrigation practices have been in use for decades on agricultural lands within the API. The majority of the native vegetation has been removed within the API.

No waterbodies are located within the API; however, the Westland F Canal, a concrete-lined irrigation channel operated by the Westland Irrigation District is located 0.3 mile east of the I-82/Lamb Road interchange and flows north (Figure 1). The Umatilla River is located approximately 1 mile east of the I-82/Lamb Road interchange. The West Extension Irrigation Canal (Boardman Canal) also flows approximately 2 miles north of the I-84/Paterson Ferry Road interchange. The Columbia River is located approximately 6.6 mile north of the I-84/Paterson Ferry Road interchange, approximately 7.7 miles north of the I-84/Umatilla Army Depot Access Road interchange, and approximately 6.9 miles north of the I-82/Lamb Road interchange.

Land use within the API consists of highway and secondary roadways, as well as the UMCD. Adjacent land use is primarily agricultural, with some industrial development.

2.0 METHODS

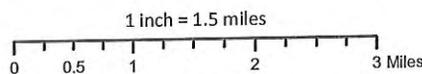
The following sections of this report summarize baseline biological, wetland, and water quality data collected for the API and describe potential natural resource permits and clearances required to complete the Project based upon a review of existing database information and a cursory site investigation conducted by Mason, Bruce & Girard, Inc. (MB&G) on October 28 and 29, 2013. This site investigation was conducted mainly from the roadways, although portions of the northwest quadrant of the I-84/Paterson Ferry Road interchange API were surveyed on foot.

MB&G categorized vegetation communities within the API following Johnson and O'Neil's Wildlife-Habitat Relationships in Oregon and Washington classification system (O'Neil *et al.* 2001). These communities were digitized using aerial photos.



Figure 1.
Umatilla Army Chemical Depot Combined IAMP and Transportation System Subarea Plan
Environmental Research API and Vicinity Map

-  Area of Potential Impact (API)
-  Streams
-  Counties



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Figure1_Vicinity_Final_JM.mxd 2/6/2014

Potential presence of sensitive species within the API was researched prior to the site investigation using a query of the Oregon Biodiversity Information Center database (ORBIC) (ORBIC 2013), the U.S. Fish and Wildlife Service (USFWS) list of Federally Listed, Proposed, Candidate Species and Species of Concern under the Jurisdiction of the Fish and Wildlife Service Which May Occur within Morrow and Umatilla Counties, Oregon (USFWS 2013a), and a query of the StreamNet database (StreamNet 2013). Oregon Department of Fish and Wildlife (ODFW) biologists were also consulted regarding potential presence of state-listed species within the API (Kirsch 2013). Potential habitat for sensitive species within the API was documented during the October 28 and 29, 2013 site investigation.

Noxious weeds that occur on the Oregon Department of Agriculture's (ODA) Noxious Weed Policy and Classification System (ODA 2013) were also reviewed prior to the site investigation. Any noxious weeds observed during the site investigation were recorded.

Potential jurisdictional wetlands and waters were identified prior to the site investigation using aerial photographs (Google Earth 2013), Oregon Wetland Assessment Protocol (ORWAP) and National Wetland Inventory (NWI) mapping (OSU 2013, USFWS 2013b), the Soil Survey of Morrow County, Oregon (Holser 1983), and the Soil Survey of Umatilla County, Oregon (Johnson and Makinson 1988). An Oregon Department of State Lands (DSL) database search for previous wetland delineations within the API was also conducted (Heather Howard, pers. comm., Wetlands Support Assistant, Department of State Lands, November 14, 2013). General Land Office (GLO) survey mapping was utilized to determine if any historic streams were present within the API (University of Oregon Libraries 2013).

Receiving waterbodies for the API were reviewed using the Oregon Department of Environmental Quality's (DEQ) Water Quality Assessment Database (DEQ 2013a). The Lower Umatilla Basin Groundwater Management Area Action Plan and 2013 Evaluation of Action Plan Success were reviewed (DEQ 1997, DEQ 2013b) as was the Oregon Water Resource Department report on Ground Water Supplies in the Umatilla Basin (OWRD 2003).

3.0 EXISTING ENVIRONMENTAL RESOURCES

3.1 Biological Resources

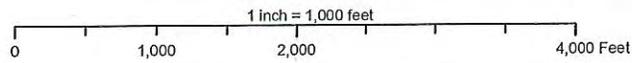
3.1.1 Wildlife-Habitat Communities

The API addressed in this TM contains one general wildlife-habitat community: urban & mixed environs (Figures 2a, 2b and 2c). Two other wildlife-habitat communities, shrub steppe and agriculture, pastures and mixed environs, are located adjacent to the API. The following paragraphs describe each wildlife-habitat community in further detail.



Figure 2a.
 Wildlife-Habitat Communities
 I-82/Lamb Road Interchange
 Umatilla County, Oregon

-  Area of Potential Impact (API)
-  Urban and Mixed Environs
-  National Wetland Inventory Wetlands



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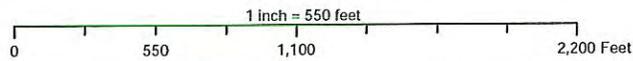
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Figure 2b.
Wildlife-Habitat Communities
I-84/Umatilla Army Depot Access Road Interchange
Umatilla County, Oregon

-  Area of Potential Impact (API)
-  Urban and Mixed Environs
-  National Wetland Inventory Wetlands



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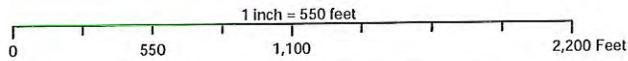
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Figure 2c.
 Wildlife-Habitat Communities
 I-84/Paterson Ferry Road Interchange
 Morrow County, Oregon

-  Area of Potential Impact (API)
-  Urban and Mixed Environs
-  Potential Field Assessed Wetland



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The I-82/Lamb Road interchange, I-84/Umatilla Army Depot Access Road interchange, and I-84/Paterson Ferry Road interchanges are comprised entirely of the urban & mixed environs wildlife-habitat community that is associated with I-84 and I-82. Vegetation within this community is a mix of non-native and native species associated with roadside development. The urban & mixed environs community with the API contains approximately 60% impervious surface cover.

The shrub-steppe wildlife-habitat community is located in the immediate vicinity of the project API, including portions of the UMCD. It is dominated by non-native cheat grass (*Bromus tectorum*). Because the shrub-steppe community was the least disturbed wildlife-habitat community within the vicinity of the API, individual plant species observed in the adjacent shrub-steppe community were recorded during the site investigation and are listed in Table 1. This table does not constitute a complete inventory of plant species within this community, but is presented to convey the general species composition observed during the site investigation. Black-billed magpies (*Pica pica*), American kestrel (*Falco sparverius*), and western meadowlarks (*Sternella neglecta*) were also observed in this area during the site investigation.

The agriculture, pastures and mixed environs wildlife-habitat community is also located outside the project API but in the immediate vicinity. Areas utilized for agriculture outside the API are irrigated for cultivated crops and are also used for tree plantations.

Table 1. Typical Shrub-Steppe Community Vegetation within the Project API

| Scientific Name | Common Name | Native Status ¹ |
|------------------------------------|--------------------|----------------------------|
| <i>Achillea millefolium</i> | Common yarrow | Native |
| <i>Bromus tectorum</i> | Cheat grass | Introduced |
| <i>Cichorium intybus</i> | Chicory | Introduced |
| <i>Chrysothamnus nauseosus</i> | Gray rabbitbrush | Native |
| <i>Chrysothamnus viscidiflorus</i> | Green rabbitbrush | Native |
| <i>Lactuca serriola</i> | Prickly lettuce | Introduced |
| <i>Opuntia polyacantha</i> | Plains pricklypear | Native |
| <i>Poa bulbosa</i> | Bulbous bluegrass | Introduced |
| <i>Purshia tridentata</i> | Bitterbrush | Native |
| <i>Salsola kali</i> | Russian thistle | Introduced |
| <i>Taeniatherum caput-medusae</i> | Medusahead | Introduced |
| <i>Wyethia mollis</i> | Woolly mule-ears | Native |

¹ Source Natural Resource Conservation Service Plants National Database (<http://plants.usda.gov/index.html>)

3.1.2 Threatened and Endangered Species

Data from the USFWS, StreamNet, ODA, and ORBIC focused on a 2-mile radius of the Project API indicated that three wildlife and fisheries species that are listed as threatened or endangered under the federal and state Endangered Species Acts (ESA) have the potential to occur within the vicinity of the API (USFWS 2013a, StreamNet 2013, ODA 2013, ORBIC 2013). A listing of these species, including their federal and state status and whether critical habitat is designated, is shown in Table 2. No listed plant species were identified during the records review or site investigation.

Table 2. Threatened and Endangered Species with the Potential to Occur Within the Vicinity of the API*

| Scientific Name | Common Name | Federal Status | State Status | Critical Habitat? | Habitat |
|-------------------------------|---|----------------|--------------|--|--|
| <i>Oncorhynchus mykiss</i> | Steelhead (Middle Columbia River DPS, spring run) | T | SV | Yes, within the Umatilla River (east of project API) | Umatilla River |
| <i>Salvelinus confluentus</i> | Bull trout (Umatilla SMU) | T | SC | Yes, within the Umatilla River (east of project API) | Umatilla River |
| <i>Urocyon washingtoni</i> | Washington ground squirrel | C | E | No | Sagebrush grassland in silty loam soils, particularly soils in the Warden series |

E= Endangered; T=Threatened; C=Candidate; SV=Sensitive Vulnerable; SC=Species Critical

DPS=Distinct Population Segment; SMU=Species Management Unit

* The Columbia River is located outside the vicinity of the API.

Although habitat for steelhead and bull trout does not exist within the Project API, these species inhabit the Umatilla River located east of the API. Steelhead and bull trout are included in this TM due to the potential for indirect impacts to these species from contaminants contained in stormwater runoff flowing from proposed interchange improvements. It should also be noted that additional listed fish species utilize the Columbia River located north of the API for migration.

The Project API does not include shrub-steppe habitat, which is the preferred habitat for Washington ground squirrels, but this wildlife-habitat community is prevalent in the immediate vicinity. Surveys for Washington ground squirrels have been conducted on the UMCD and no Washington ground squirrels have been detected (M. Kirsch, pers. comm. 2013; Canestorp 2008). However, ODFW indicated that because this species has been found elsewhere in Umatilla County and there is shrub-steppe habitat present in the vicinity of the API (including portions of the UMCD), further investigations may be needed within the API to positively rule out the presence of Washington ground squirrels (Kirsch 1996).

ODFW indicated that the UMCD supports other shrub-steppe obligate species including long-billed curlews (*Numenius americanus*), loggerhead shrikes (*Lanius ludovicianus*), and western burrowing owls (*Athene cunicularia hypogea*) (Mark Kirsch, pers. comm. 2013). These three species and a number of other reptiles, amphibians, birds, mammals, and plants were included on a list of faunal and floral species of special concern potentially found on the UMCD as part of the Integrated Natural Resources Management Plan (October 2007 through September 2012) for

the UMCD (Canestorp 2008). However, these species are not listed as threatened or endangered under the Federal or State Endangered Species Act.

3.1.3 Noxious Weeds

Thirty ODA-listed weed species occur within Umatilla County (Umatilla County 2013) (Appendix B) and 21 ODA-listed weed species occur in Morrow County (Weedmapper 2011) (Appendix B). During the October 28 and 29, 2013 site investigation, MB&G biologists observed rush skeletonweed (*Chondrilla juncea*) and an unidentified knapweed species (*Centaurea* sp.) in close proximity to the API. These species are listed on the ODA noxious weed list (ODA 2013). Due to the timing of the site investigation outside the optimal blooming period for noxious weeds, not all weed species or populations may have been identified. In addition, only small portions of the API were traversed on foot, which likely further limited identification of weed species or populations. A complete noxious weed survey within the project footprint would be required during later design phases of the project to comply with Oregon Department of Transportation (ODOT) requirements.

3.2 Wetlands and Waters Resources

No wetlands or waters were mapped within the project API (USFWS 2013b, OSU 2013) and no wetlands or waters were identified within the API during the October 2013 site investigation. MB&G identified one potential palustrine emergent (PEM)/palustrine scrub-shrub (PSS) wetland northwest of and outside the I-84/Paterson Ferry Road interchange API (Figure 2c). This wetland is not identified on NWI or ORWAP mapping. In the vicinity of the I-84/Umatilla Army Depot Access Road interchange API, three palustrine unconsolidated bottom, artificially excavated (PUBx) wetlands were identified on NWI mapping south of and outside of the project API (OSU 2013, USFWS 2013b) (Figure 2b). MB&G confirmed the presence of these features outside the API during the field investigation.

No previous wetland delineations that had received concurrence from the DSL have been conducted within the API (H. Howard, pers. comm. 2013). The Boardman Canal, which is north and outside the I-84/Paterson Ferry Road interchange API, does not appear on the 1870 GLO survey, but is shown as an irrigation canal on the 1940 GLO survey (University of Oregon Libraries 2013). The Westland F Canal, which is east and outside the I-82/Lamb Road interchange API, does not appear on the 1875 GLO survey, but is shown as an irrigation canal on the 1941 GLO survey (University of Oregon Libraries 2013). No historic streams are mapped on the GLO surveys within the API.

3.3 Water Quality Resources

Water quality parameters and standards have been established by the DEQ to protect the beneficial uses of Oregon's waterways. The API is bisected by the Umatilla and Mid Columbia Lake Wallula 4th level Hydrologic Unit Code (HUC) watersheds (HUCs 17070103 and 17070101, respectively). The Umatilla River is the receiving waterbody for the eastern portion of the API and waters from both watersheds ultimately flow to the Columbia River.

Development, agricultural activities, and industrial and commercial uses have affected the water quality within the Umatilla and Columbia Rivers. As such, the DEQ has listed the segment of the Umatilla River located east of the API as a 303(d) water quality-limited water body because it does not meet water quality standards for iron or manganese; it has an approved total maximum daily load (TMDL) for ammonia, fecal coliform, temperature, and turbidity (Table 3) (DEQ 2013b). The DEQ has also listed the segment of the Columbia River located north of the API as a 303(d) water quality-limited waterbody because it does not meet water quality standards for pH and temperature. In addition, the segment of the Columbia River located north of the API has an approved TMDL for dioxin and total dissolved gas (Table 4) (DEQ 2013b).

Table 3. Water Quality Parameters for the Umatilla River (RM 0 to 32.1)

| Parameter | Listing Status | Season | Listing Date |
|----------------|----------------|---------------|--------------|
| Ammonia | TMDL approved | Year round | 2004 |
| Fecal coliform | TMDL approved | Summer | 2002 |
| Iron | 303(d) listed | Year round | 2004 |
| Manganese | 303(d) listed | Year round | 2004 |
| Temperature | TMDL approved | Summer | 2002 |
| Turbidity | TMDL approved | Spring/Summer | 2002 |

Table 4. Water Quality Parameters for the Columbia River (RM 213.7 to 287.1)

| Parameter | Listing Status | Season | Listing Date |
|---------------------|----------------|--------------------|--------------|
| Dioxin | TMDL approved | N/A | 1998 |
| pH | 303(d) listed | Fall/Winter/Spring | 2004 |
| Temperature | 303(d) listed | Year round | 2004 |
| Total dissolved gas | TMDL approved | Year round | 2002 |

The API is part of the Lower Umatilla Basin Groundwater Management Area (GMA), established by DEQ in 1990 due to elevated nitrate levels detected in groundwater samples. DEQ published an action plan in 1997 that identifies point-source pollutants and plans to reduce groundwater contamination. The major point-source nitrate-nitrogen pollutants in the GMA include irrigated agriculture, food processing water, confined animal feeding operations, domestic sewage where septic systems occur in high densities, and the UMCD's washout lagoons (DEQ 1997). A report evaluating whether groundwater quality was improving in the GMA found that nitrate levels continue to increase, though the rate of increase is lower than in past years (DEQ 2013a).

The API is within Oregon Water Resources Department designated Ordinance Critical Ground Water Areas. The Ordinance Areas include 175 square miles of basalt aquifers near the UMCD (Ordinance Basalt Critical Ground Water Area) and 82 square miles of alluvial aquifers within the UMCD (Ordinance Gravel Critical Ground Water Area). Though new small "exempt uses" of water are allowed, new groundwater rights are not issued for the Ordinance Critical Ground Water Area due to significant ground water overdraft and declines (OWRD 2003, Cornish 2010).

4.0 REGULATORY PERMITTING AND APPROVAL REQUIREMENTS

4.1 Biological Resources

4.1.1 Threatened and Endangered Species

The API does not contain suitable habitat for any federally-listed plant species. A No Effect Memorandum should be prepared to document these findings. However, construction of interchange improvements has the potential to impact state-listed Washington ground squirrel and federally-listed steelhead and bull trout.

Due to the presence of shrub-steppe habitat within the vicinity of the API, additional efforts to document the presence/absence of Washington ground squirrels may be necessary. This additional work may include providing project limits mapping to ODFW biologists to determine if Washington ground squirrel presence is likely.

Although unlikely, if Washington ground squirrels are found to inhabit portions of the API, the project design team should utilize this information to avoid direct impacts to this species, if at all possible. For state-listed ESA species, before a state agency takes, authorizes, or provides financial assistance for actions on state-owned or leased land, or on land where the state holds a recorded easement, the agency must consult with ODFW. This consultation includes determining if a project is consistent with established programs, or if no programs exist, whether the project has the potential to appreciably reduce the likelihood of the survival or recovery of the species. Notification must be provided to ODFW if it is determined that a project has the potential to appreciably reduce the likelihood of the survival or recovery of the species. ODFW typically responds to this notification within 90 days.

Although direct impacts to listed fish species (including steelhead and bull trout) are not expected to result from transportation improvements within the API, increases in impervious surface may cause indirect stormwater impacts to steelhead, bull trout, and other listed migratory fish species downstream of the API in the Columbia River or Umatilla River. Due to these anticipated indirect effects to listed species, a Biological Assessment (BA) or ODOT Programmatic Federal Aid Highway Program (FAHP) ESA compliance Notification may need to be prepared if stormwater from new impervious surfaces and the contributing impervious area is not infiltrated on-site. Upon submittal of the BA to the regulatory agencies, the National Marine Fisheries Service (NMFS) for steelhead and the USFWS for bull trout, a review timeline of 135 business days for a BA with a Likely to Adverse Affect (LAA) effect determination or 45 days to review a BA with a Not Likely to Adversely Affect (NLAA) determination would be required. If the FAHP is used for ESA compliance, Federal Highway Administration (FHWA) or NMFS (depending on the approval requirements) requires between 60 and 120 days for a consistency review.

4.1.2 Oregon Fish Passage Law

It is unlikely that native migratory fish as defined by Oregon's Fish Passage Law currently or historically utilized the API as there are no waterbodies within the API. As such, transportation improvements within the API are likely exempt from providing fish passage in accordance with the Oregon Fish Passage Law. Confirmation with ODFW Fisheries Biologists should be sought to verify this exemption.

4.1.3 Migratory Bird Treaty Act

Nesting migratory birds have the potential to occupy the API due to the suitable habitat provided by the trees and shrubs that were observed during the October 28 and 29, 2013 site investigation. The federal Migratory Bird Treaty Act (MBTA) prevents the take of adult migratory birds, their young, eggs, and all body parts. Take permits are not widely available so preventative measures are recommended to avoid violations of the law. Under this law, adult migratory birds can be deterred from nesting and empty nests can be removed or disturbed, but active nests and attending adults are not to be harassed. Incidental take of migratory birds is typically avoided by activity timing restrictions as well as preventive measures. The only anticipated activity that has the potential to conflict with the MBTA is the clearing of trees or shrubs that may provide nesting habitat for migratory birds. Any vegetation removal (clearing and grubbing) should occur between September 1 and March 1, outside the nesting period for migratory birds.

4.1.4 Noxious Weeds

Based on the October 28 and 29, 2013 site investigation and the review of available information, noxious weed populations are located within the API. As a result, prior to construction of any transportation improvements, a botanical clearance, which will include a detailed noxious weed survey, will need to be conducted during the appropriate blooming period (May-July) for the species listed in Appendix B in order to satisfy ODOT requirements.

The results of the noxious weed surveys should be documented in a Botanical Clearance Report. Noxious weed populations located within the API should be included on project plans and removed prior to construction of proposed improvements. In addition, inspection and cleaning of construction equipment prior to entry into the construction site should be required. Weed seeds can easily become trapped in the tread of tires or within the crevices of heavy machinery, and spread across the API during construction. Weed control should also be required during the one-year post-construction maintenance period to prevent the spread of noxious weeds.

4.2 Wetlands and Waters Resources

Impacts to jurisdictional wetlands and waters are not likely because there are no wetlands or waters located within the API. However, if the API is expanded (especially the I-84/Paterson Ferry Road interchange API to the north or the I-84/Umatilla Army Depot Access Road interchange API to the south), impacts to jurisdictional features could occur. If impacts to jurisdictional wetland and/or waters feature result from the Project, compliance with Section 404 of the Clean Water Act, administered by the U.S. Army Corps of Engineers (ACOE) and the Removal/Fill Law, administered by the DSL would be required. If proposed impacts are less than 50 cubic yards, the DSL will not require a Removal/Fill permit. If proposed impacts are less than 0.5 acre, then the improvements may qualify for the ACOE Nationwide Permit #14, Linear Transportation Projects. If (1) proposed wetland impacts are less than 0.5 acre, (2) the proposed volume impacts to waters of the state are 5,000 cubic yards or less, (3) existing transportation structures are being modified, and (4) mitigation can be provided through payment-in-lieu, then the DSL General Permit (GP) for Certain Transportation-Related Structures may apply to the proposed improvements. If more than 0.5 acre of wetland and/or waters impacts is required, an individual permit will be required from the ACOE and DSL. A wetland/waters delineation and report will be required for proposed improvements to determine accurate wetland/waters locations and dimensions.

The ACOE and DSL will require compensatory mitigation for permanent impacts to wetlands/waters of the U.S. and State. The API is not located within a wetland mitigation bank service area or an in-lieu fee bank service area, therefore, alternative forms of mitigation, including payment-in-lieu (for DSL-jurisdictional impacts only) or on- or off-site wetland creation, enhancement, or restoration, will need to be considered if such impacts occur. Minimal on-site locations for wetland creation are available within the API or adjacent to the API, as the hydrology sources are limited and the majority of the API is located within ODOT right-of-way, which is regularly maintained (i.e., mowed). If on- or off-site mitigation is proposed, the DSL and ACOE will require a compensatory wetland mitigation plan.

4.3 Water Quality Resources

There are no 303(d) listed or TMDL-approved waters located within the API. However, stormwater runoff from the Project may eventually flow into the Umatilla and Columbia Rivers, which are 303(d) listed and have approved TMDLs. Consequently, plans should be developed to prevent untreated stormwater generated from within the API from eventually being discharged into the Umatilla and Columbia Rivers.

The DEQ's 401 Water Quality Certification (WQC) process will be triggered if an ACOE permit is required. If the 401 WQC process is triggered, a Stormwater Management Plan (SWMP) will need to be prepared and will need to be approved by the DEQ.

If construction activities disturb more than one acre of land, a National Pollutant Discharge Elimination System (NPDES) 1200-C permit from DEQ will be required per Section 402 of the CWA. This permit requires that the applicant prepare an Erosion and Sediment Control Plan which utilizes approved Best Management Practices to prevent erosion and control sediment runoff from the construction site. In addition, the permit requires the applicant to inspect and maintain erosion controls to ensure they are working properly.

The Lower Umatilla Groundwater Management Area Action Plan has not identified transportation development infrastructure as a contributing factor to elevated nitrate levels in the groundwater (DEQ 1997). However, if any dewatering would be required for transportation improvements due to elevated groundwater levels, the disposed water will need to be infiltrated onsite and not introduced to a wetland or other surface water. Disposal authorization would be required from DEQ through a special letter permit or letter from DEQ, depending on the volume of water removed and the duration of the dewatering activity (P. Richerson, pers. comm. 2011).

If water is needed for short-term construction purposes or for long-term water use (i.e., landscape irrigation), a limited license or water right, respectively, will be required from the OWRD. Groundwater withdrawals will not be allowed for transportation improvements within the Ordinance Critical Groundwater Areas. If municipal water sources are utilized, no additional permitting will be required (T. Justus, pers. comm. 2011).

4.4 Regulatory Summary

Table 5 provides details regarding the applicable natural resource permits, approvals, and clearances likely needed for transportation improvements proposed in the IAMP.

Table 5. Summary of Applicable Permits, Approvals, and Clearances for implementation of the UMCD Combined IAMP and Transportation System Subarea Plan

| Type of Permit / Approval/ Clearance | Issuing Agency | Permit / Approval / Clearance | Estimated Approval Timeline (after submittal) |
|---|----------------|---|--|
| ESA Consultation for federally- listed fish species | NMFS USFWS | FAHP Notification or Biological Opinion | 60-120 days (FAHP) 45 days (NLAA) 135 days (LAA) |
| ESA Consultation for state-listed wildlife species | ODFW | ODFW Project Approval | 90 days |
| Migratory Bird Treaty Act Compliance for tree clearing | ODOT | None (if trees and shrubs are removed outside MBTA nesting period of March 1 – September 1) | N/A |
| Noxious Weed Clearance | ODOT | Botanical Clearance Report | N/A |
| Wetland Delineation Report Letter of Concurrence | DSL | Wetland/Waters Delineation Report approval | 120 days |
| Wetland Delineation Jurisdictional Determination (only if API is expanded) | ACOE | Wetland/Waters Delineation Report approval | 60 days |
| Wetland/Waters Removal/Fill Permit (only if API is expanded) | DSL | Joint Permit Application approval | GP: 40 days after Wetland/Waters Delineation Report concurrence Individual Permit: 120 days |
| Wetland/Waters Section 404 Clean Water Act Permit (only if API is expanded) | ACOE | Joint Permit Application approval | Nationwide permit: 75 days, Individual permit: 120 days |
| Section 401 Clean Water Act Certification (only if API is expanded) | DEQ | 401 Water Quality Certification | Up to 1 year |
| Section 402 Clean Water Act Certification | DEQ | 1200-C | 30 days |
| Dewatering disposal approval | DEQ | Special letter permit or letter from DEQ | Several weeks to several months |
| Water rights | WRD | Limited license or water right | 30 days to 1 year |

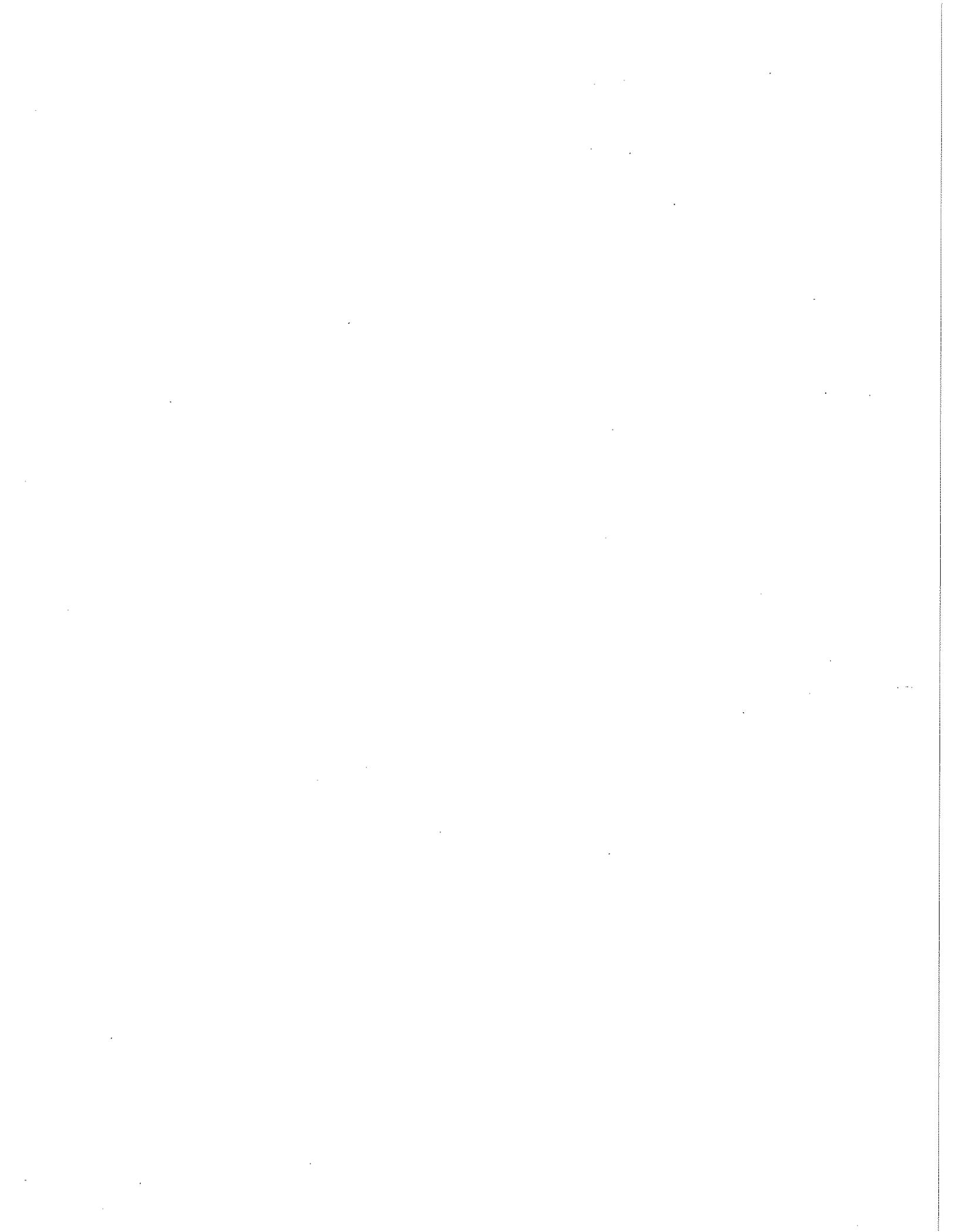
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Appendix A

Representative Photographs of Area of Potential Impact



1



2

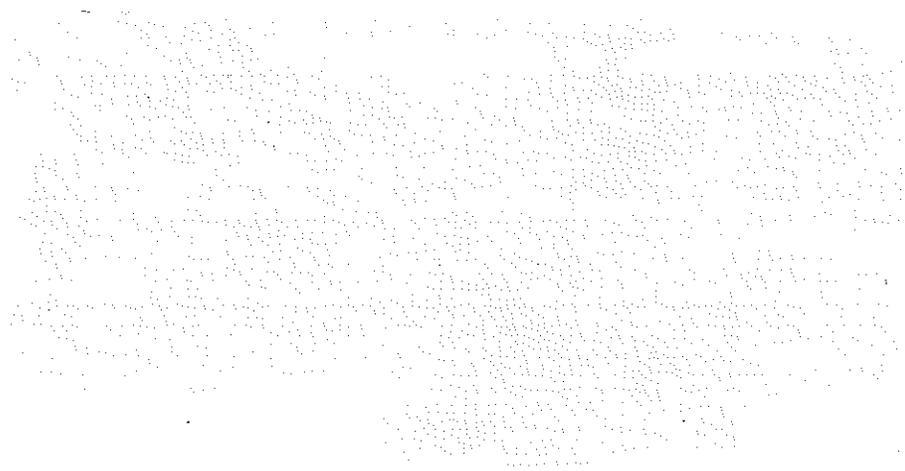
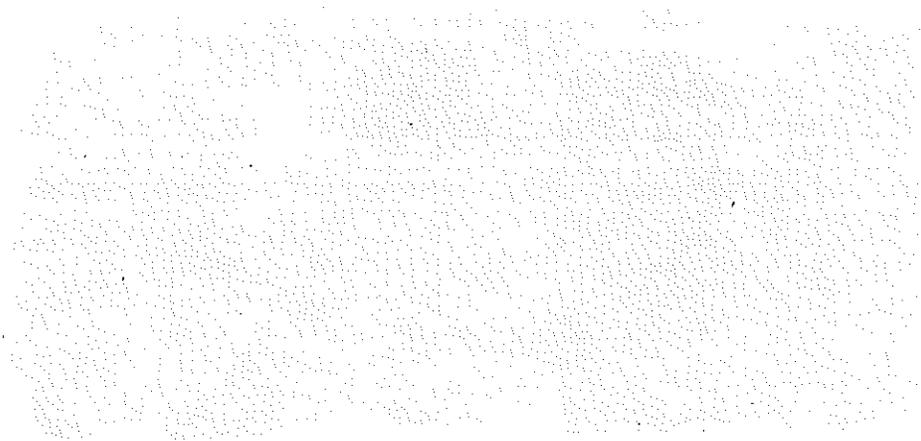


MB&G

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October 28, 2013

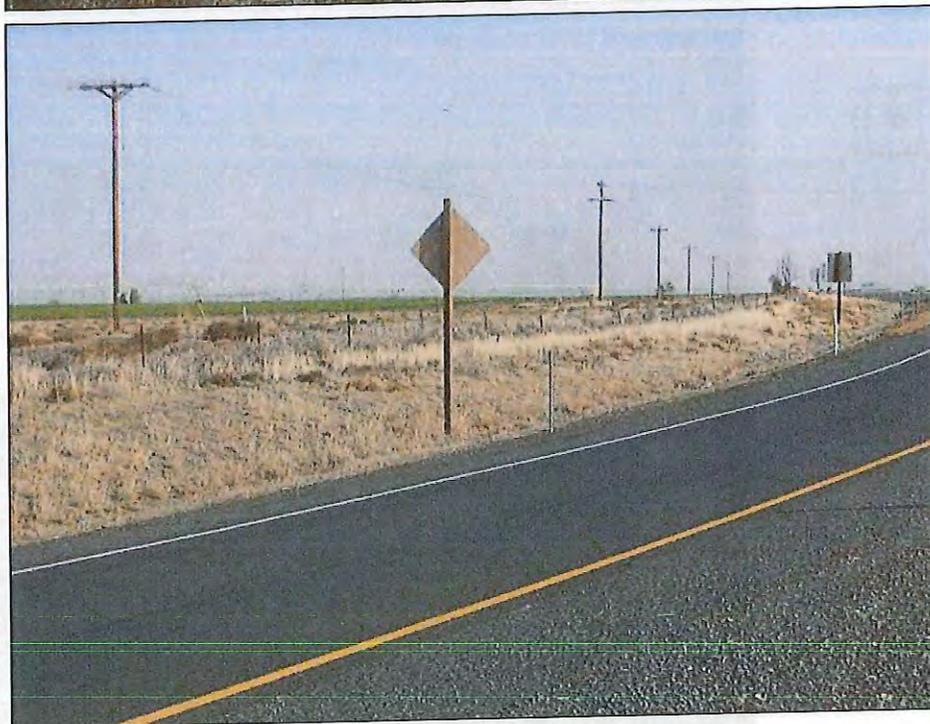
1. View to the southeast of the I-84/Paterson Ferry Road Area of Potential Impact (API) showing the urban & mixed environs wildlife-habitat community.
2. View to the southwest of the I-84/Paterson Ferry Road Interchange showing the urban & mixed environs wildlife-habitat community.



3



4



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Girard, Inc.

October 28, 2013

3. View to the southwest of the I-84/Umatilla Army Depot Access Road API showing the urban & mixed environs wildlife-habitat community.
4. View to the northeast of the westbound off ramp of the I-84/Umatilla Army Depot Access Road API, which is comprised of the urban & mixed environs wildlife-habitat community. Irrigated agriculture can be seen in the background of the photograph outside the API.

5



6



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October 28, 2013

5. View to the southwest of the I-82/Lamb Road API showing the urban & mixed environs wildlife-habitat community. The Umatilla Chemical Depot (UMCD) can be seen at the right of the photograph behind the fence.
6. View to the southeast of the I-82/Lamb Road API showing the urban & mixed environs wildlife-habitat community.

Appendix B

Noxious Weed Lists for Umatilla and Morrow Counties



ODA-listed Noxious Weeds Occurring in Umatilla County.

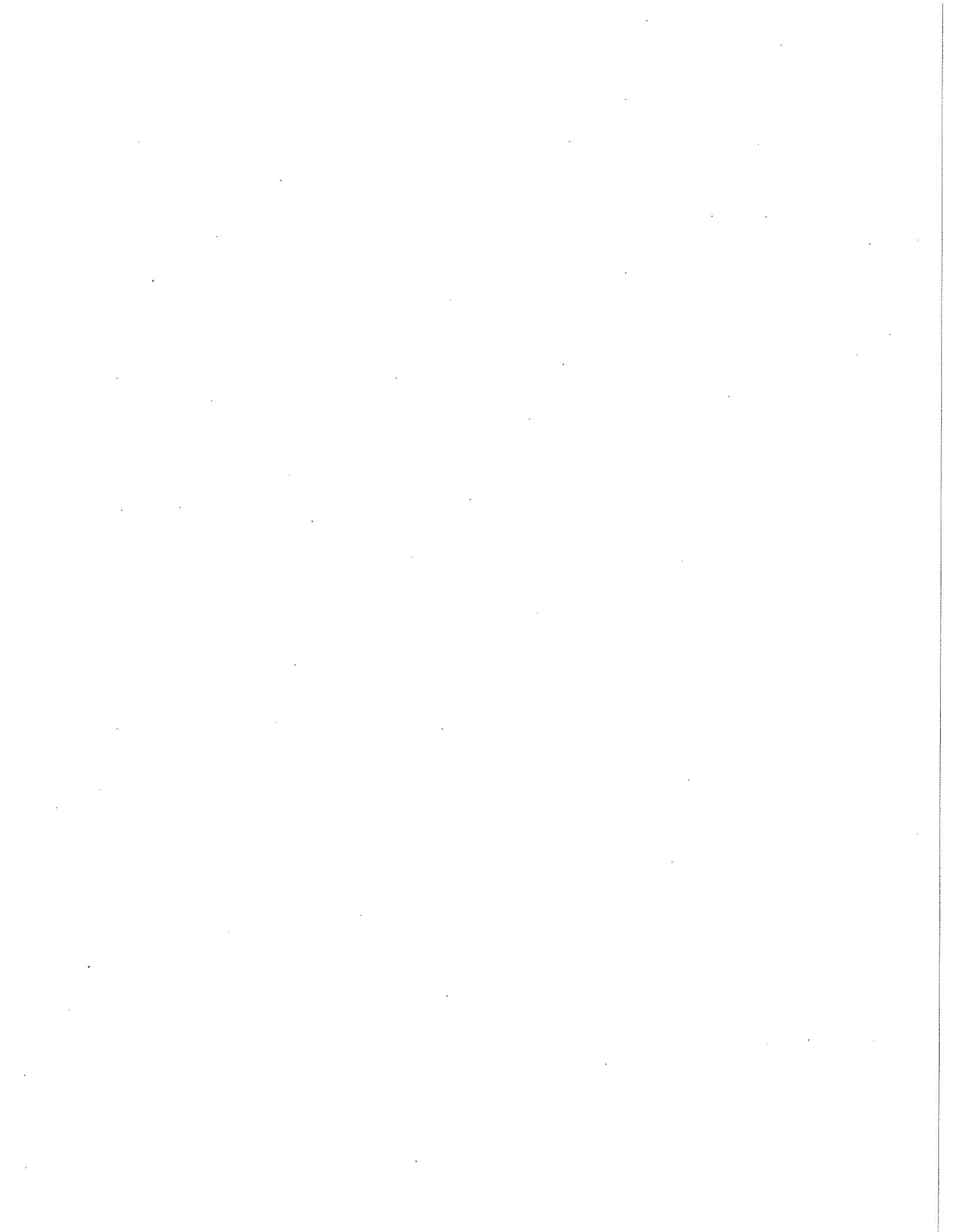
| Scientific Name | Common Name | ODA Classification |
|---|-----------------------|---------------------------|
| <i>Acroptilon repens</i> | Russian knapweed | B |
| <i>Aegilops cylindrical</i> | Jointed goatgrass | B |
| <i>Agropyron repens</i> | Quackgrass | B |
| <i>Alhagi pseudalhagi</i> | Camelthorn | A |
| <i>Ambrosia artemisiifolia</i> | Ragweed | B |
| <i>Cannabis sativa</i> | Marijuana | A |
| <i>Cardaria draba</i> | Hoary cress | B |
| <i>Carduus nutans</i> | Musk thistle | B |
| <i>Centaurea calcitrapa</i> | Purple starthistle | A |
| <i>Centaurea diffusa</i> | Diffuse knapweed | B |
| <i>Centaurea jacea</i> xc. <i>Nigra</i> | Meadow knapweed | A |
| <i>Centaurea maculosa</i> | Spotted knapweed | A |
| <i>Centaurea solstitialis</i> | Yellow starthistle | B |
| <i>Chondrilla juncea</i> | Rush skeletonweed | A |
| <i>Cirsium arvense</i> | Canada thistle | B |
| <i>Cuscuta pentagona</i> | Dodder | B |
| <i>Echium vulgare</i> | Viper's bugloss | B |
| <i>Euphorbia esula</i> | Leafy spurge | A |
| <i>Hypericum perforatum</i> | St. Johnswort | B |
| <i>Kochia scoparia</i> | Kochia | B |
| <i>Lepidium latifolium</i> | Perennial pepperweed | B |
| <i>Linaria dalmatica</i> | Dalmation toadflax | B |
| <i>Lythrum salicaria</i> | Purple loosestrife | A |
| <i>Onopordum acanthium</i> | Scotch thistle | B |
| <i>Roripa sylvestris</i> | Creeping yellow cress | A |
| <i>Secale cereal</i> | Cereal rye | B |
| <i>Senecio jacobaea</i> | Tansy ragwort | A |
| <i>Sorghum halepense</i> | Johnsongrass | B |
| <i>Sphaerophysa salsula</i> | Austrian peaweed | B |
| <i>Tribulus terrestris</i> | Puncturevine | B |

Source: 2013 Umatilla County Noxious Weed list. Available at URL:

<http://www.co.umatilla.or.us/road/weedlist.html>

Note: Per ORS.570.505-570.600, the list of noxious weeds in Umatilla County above was adopted from the 2003 Umatilla County Noxious Weed Control List. The weeds listed are those on the 2003 Oregon State Department of Agriculture list currently found growing or known to have grown previously in Umatilla County.

A= a weed of known economic importance which occurs in the state/county in small enough infestations to make eradication/containment possible; or is not known to occur, but its presence in neighboring states/county make future occurrence in Oregon seem imminent. B=a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties.



ODA-listed Noxious Weeds Occurring in Morrow County, Oregon

| Scientific Name | Common Name | ODA Classification |
|-------------------------------|------------------------------|--------------------|
| <i>Acroptilon repens</i> | Russian knapweed | B |
| <i>Aegilops cylindrica</i> | Jointed goatgrass | B |
| <i>Avena fatua</i> | Wild oats | B |
| <i>Cardaria draba</i> | White top (Hoary cress) | A |
| <i>Cardus nutans</i> | Musk thistle | A |
| <i>Centaurea diffusa</i> | Diffuse knapweed | B |
| <i>Centaurea maculosa</i> | Spotted knapweed | B |
| <i>Centaurea solstitialis</i> | Yellow starthistle | A |
| <i>Chondrilla juncea</i> | Rush skeletonweed | A |
| <i>Cirsium arvense</i> | Canada thistle | B |
| <i>Conium maculatum</i> | Poison hemlock | B |
| <i>Convolvulus arvensis</i> | Field bindweed | B |
| <i>Crupina vulgaris</i> | Common crupina | A |
| <i>Cuscuta</i> spp. | Field dodder | B |
| <i>Cynoglossum officinale</i> | Houndstongue | A |
| <i>Elymus caput-meduseae</i> | Medusahead rye | B |
| <i>Euphorbia esula</i> | Leafy spurge | A |
| <i>Hemizonia pungens</i> | Spikeweed | A |
| <i>Hypericum perforatum</i> | St. Johnswort (Klamath weed) | B |
| <i>Kochia scoparia</i> | Kochia | B |
| <i>Linaria dalmatica</i> | Dalmatian toadflax | A |
| <i>Linaria vulgaris</i> | Yellow toadflax | A |
| <i>Lythrum salicaria</i> | Purple loosestrife | A |
| <i>Onopordum acanthium</i> | Scotch thistle | A |
| <i>Salvia aethiopsis</i> | Mediterranean sage | A |
| <i>Secale cereal</i> | Cereal rye | B |
| <i>Senecio jacobaea</i> | Tansy ragwort | A |
| <i>Sonchus arvensis</i> | Perennial sowthistle | B |
| <i>Sorghum halepense</i> | Johnsongrass | B |
| <i>Tribulus terrestris</i> | Puncturevine | B |

Source: Morrow County Weed Board 1999.

A= a weed of known economic importance which occurs in the state/county in small enough infestations to make eradication/containment possible; or is not known to occur, but its presence in neighboring states/county make future occurrence in Oregon seem imminent; control of 'A' listed weeds is mandated by Morrow County Ordinance. B=a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties. Morrow County Ordinance recommends control of these species.

Appendix G
Technical Memorandum #6:
Future Land Use and Forecast
Travel Demand



TECHNICAL MEMORANDUM #6 – FINAL

Umatilla Army Depot Combined IAMP and Transportation System Subarea Plan

Future Land Use and Forecast Travel Demand

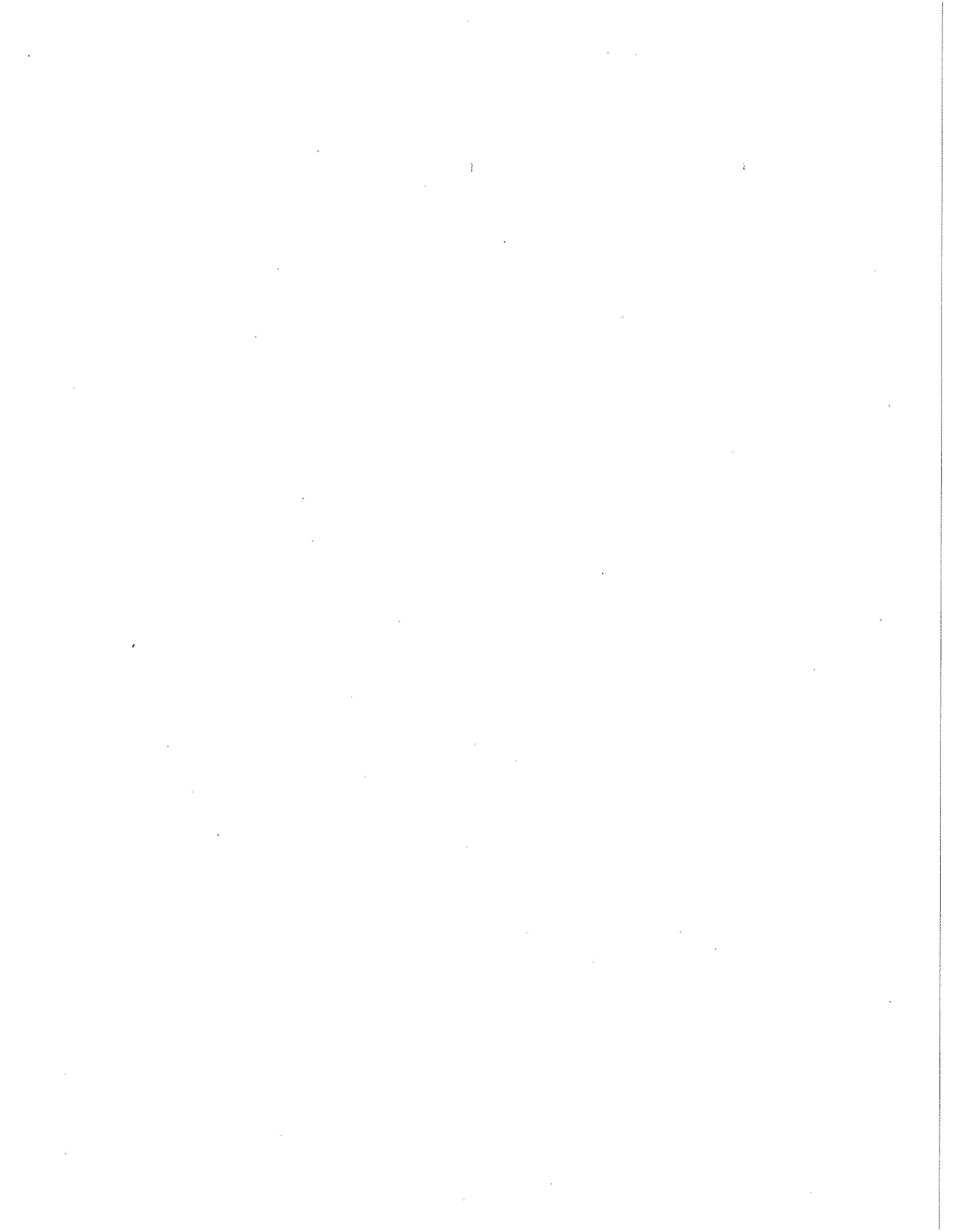
Date: February 21, 2014 Project #:13848
To: Don Chance, Technical/Public Advisory Committee (TPAC)
From: Matt Hughart, AICP; Pat Marnell; Marc Butorac, P.E., P.T.O.E – Kittelson & Associates, Inc.
Frank Angelo and Darci Rudzinski, AICP - Angelo Planning Group

The purpose of this memorandum is to document the 20-year forecast land use conditions and traffic operations associated with the Umatilla Army Depot Combined IAMP and Transportation System Subarea Plan.

OVERVIEW

The analysis of future land uses within the Interchange Management Study Area (IMSA) was focused on areas that are expected to have new activity, new development, or redevelopment potential that would generate traffic at the three study interchanges. These areas of new traffic generating potential are likely to include the following:

- An on-going Oregon National Guard (ORNG) training base located on 7,500-acres of the existing Umatilla Army Depot site.
- Growth associated with the planned 3,150-acre Port Industrial/Depot Industrial development zones. This section includes the approximately 3,150 acres within the Umatilla Army Depot site that is expected to be zoned for industrial/employment uses (by both Morrow and Umatilla Counties) to implement the Umatilla Army Depot Land Use Study prepared in 2013.
- Continued growth associated with the Westland Road Exception Area. The Exception Area in the southeast corner of the IMSA already has significant existing development – FedEx distribution center, Lamb Weston food processing plant, Americold Building, and the Hermiston Generating Company Power Plant and Substation. There are additional undeveloped parcels, approximately 138 acres, including those designated for highway tourist uses that can be realistically assumed to be developed over the next 20 years.
- Continued regional growth within both Morrow and Umatilla Counties outside the IMSA, including growth in the incorporated cities of Irrigon and Hermiston.



FUTURE LAND USE

The Umatilla Army Depot (Depot) is a unique facility and land use in the State of Oregon. Established more than seventy years ago by the U.S. Army, the Depot site encompasses approximately 17,000 acres spanning Morrow and Umatilla Counties. In 1940 the Army selected the site in northeastern Oregon that became the Depot. Ten months (January to October 1941), 7,000 workers, and thirty-five million dollars later the prairie site was transformed into a complex of warehouses, munitions storage bunkers, shops and office buildings connected by a web of roads and railroad tracks. The Depot opened in 1941 with the mission to store, maintain and transfer a variety of military items, from blankets to ammunition. The Depot has supported multiple war efforts, including the Korean Conflict, Vietnam, Grenada, Panama, Operation Desert Shield, and Operation Desert Storm. Besides its conventional ammunition and general supply missions, the Depot was assigned a new mission in 1962 – receiving and storing chemical ammunition. Between 1962 and 1969, the Depot received various types of chemical ammunitions as one of six Army installations in the U.S. that stored chemical weapons.

In the mid-1980's, Congress directed the Army to dispose of the nation's aging chemical weapons stockpile. In 1988, the Umatilla Army Depot was placed on the Department of Defense Base Realignment and Closure (BRAC) list to review the future of the facility. It was decided that the base would remain open until the chemical stockpile at the Depot was destroyed. To accommodate this mission, the Umatilla Chemical Disposal Facility (UMCDF) was constructed in the northeastern portion of the site and destruction of the chemical ammunitions stored at the Depot took place from 2004 to 2012. The 2005 BRAC round of announcements has the Umatilla Army Depot scheduled for closure after the incineration facility has completed its mission (including decontamination, decommissioning, and closure) in about 2014.

Representatives of Morrow and Umatilla Counties, Morrow and Umatilla Port Districts, the Confederated Tribes of the Umatilla Indian Reservation, and numerous state and local agencies have been involved with planning for future uses of the Depot for more than twenty years. On May 14, 2013 the Umatilla Army Depot Local Reuse Authority (LRA) endorsed an economic development and land use strategy to transition the Depot away from military operations towards a more comprehensive use of the property. This strategy has consistently emphasized three overarching goals for future use of the site:

- Military Reuse (accommodating the needs and plans of the ORNG)
- Wildlife Habitat/Environmental Preservation (with a special emphasis on the shrub-steppe habitat)
- Economic Development (job creation)

The recently completed Land Use Analysis provided the Draft planning and zoning implementation approach for the Depot known as the Depot Plan District zoning. The Land Use Analysis was subject to a rigorous review by both Morrow and Umatilla Counties. While Morrow and Umatilla Counties have not formally adopted the Depot Plan District zoning, adoption is expected to occur in early 2014. Therefore,

for future planning purposes it is appropriate to use the zoning endorsed by the LRA. Figure 6-1 provides a graphical breakdown of the draft Depot Plan District showing the military reuse (ORNG), wildlife habitat/environment preservation, and industrial zones endorsed by the LRA. Table 6-1 shows the total gross acreage by zoning district.

Figure 6-1 - Depot Plan District Draft Zoning Map

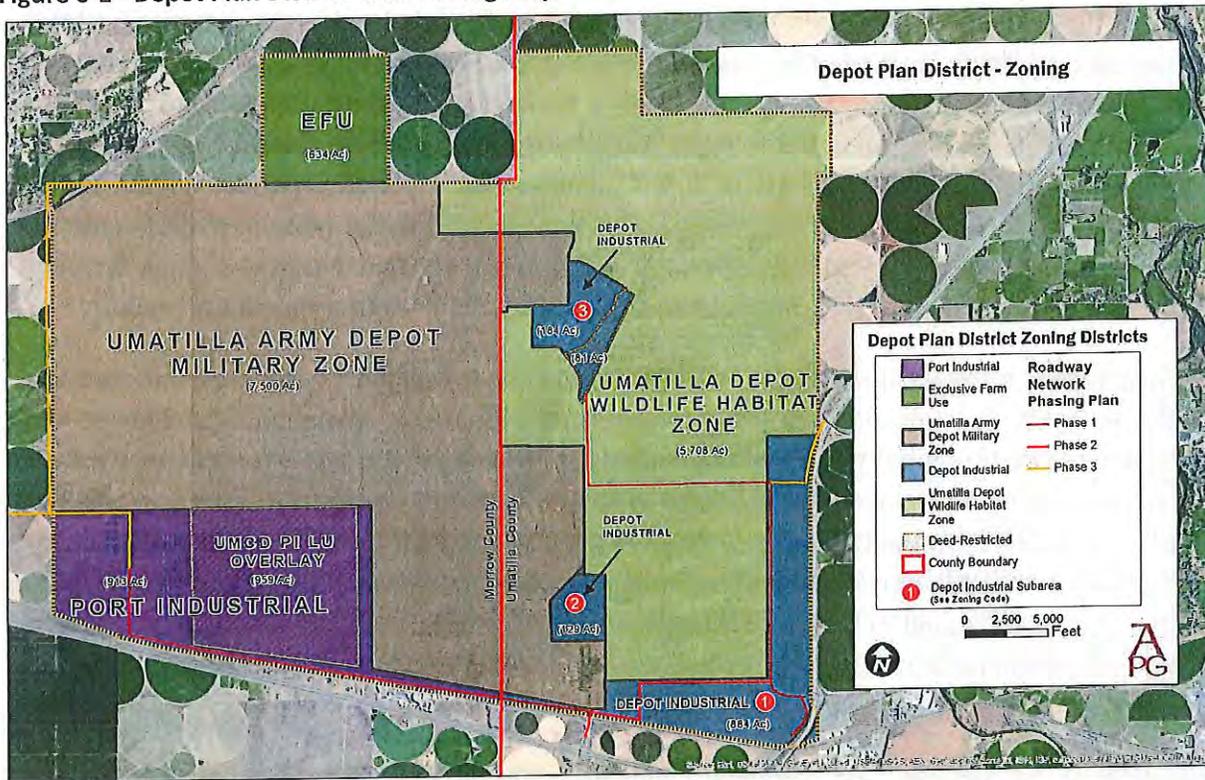


Table 6-1 - Depot Plan District Breakdown

| Plan District Designation | Acres (% of District) | Proposed Zoning |
|------------------------------|-----------------------|--|
| Umatilla Army Depot Military | 7,500 (44%) | None, pending decisions by each County on whether to zone the Military/Oregon National Guard portion of the Depot. |
| Wildlife Habitat | 5,678 (33%) | None, pending decisions on ownership of the Habitat area. |
| Industrial (Morrow County) | 1,872 (11%) | Port Industrial (existing zoning district) |
| Industrial (Umatilla County) | 1,278 (8%) | Depot Industrial (new zoning district) |
| Agriculture (Morrow County) | 634 (4%) | Exclusive Farm Use (existing zoning district) |

The following sections of this memorandum outline the assumptions and future land use/traffic conditions that are anticipated to result from this future vision of the Umatilla Army Depot and the key areas surrounding the Depot.

Assumed Planned Uses on the Umatilla Army Depot Site

Oregon National Guard (ORNG)

As shown in Figure 6-1, the ORNG is planning to utilize over 7,500 acres¹ of the Umatilla Army Depot for a variety of uses. For the purposes of the IAMP study, it has been assumed in consultation with ORNG officials that the future uses will require staffing needs comparable to what has been outlined in the June 2012 *Site Development Plan for the ORNG Umatilla Training Center* document. Although the exact details of the future operation are still being worked out, it is understood that the ORNG will move its Regional Training Institute that is currently located on the Western Oregon University campus in Monmouth, Oregon to the Umatilla Army Depot site. In addition to the Regional Training Institute, the site will also include a future readiness center, tenant units, and training facilities to support other military units from throughout the state.

With these identified future ORNG uses on the Umatilla Army Depot site, it is recognized that associated daily traffic volumes will likely change compared to current conditions on the Umatilla Army Depot site. The Future Traffic Conditions section of this memorandum outlines the anticipated traffic conditions associated with these uses.

Port Industrial/Depot Industrial Development

Four future land use/employment scenarios for growth were prepared for each subarea within the Depot Plan District based on the zoning pattern that was endorsed by the LRA in May 2013. They were developed to provide a range of possible outcomes and to enable an evaluation of potential future needs within the IAMP work. Initially, two scenarios were explored that represented a reasonable "build-out" of the Depot area and a percentage (65%) of full build out, which assumed a more modest pace of growth. These two scenarios were developed in consultation with staff from both counties and input from the Port of Morrow and Port of Umatilla. These scenarios, while consistent with local economic development aspirations, reflected a total number of square feet that appeared high given the historical pattern and rate of growth in the area. As well, the assumptions underlying Scenarios #1 and #2 were not consistent with the findings of the consultant team developing the Operations and Infrastructure Analysis and Business Operation Plan for the Depot. Based on further input, growth scenarios #3 and #4 were developed using less aggressive assumptions that better reflected the rural character of the area, the distance from population centers, and historical growth trends. Scenario #3 still assumes approximately 75,000 square feet of employment is developed each year within the Depot Plan District, over the twenty-year planning horizon. Scenario #4 reflects a "slower growth" outcome, assuming approximately 50,000 square feet is developed every year over the planning horizon.

¹ Federal regulations allow for an approximately 7,500 acres site to be used in on-going military training.

The four future growth scenarios were shared and discussed at the January TPAC meeting and Public Workshop. Based on careful consultation with the team developing the Operations and Infrastructure Analysis and Business Operation Plan and review by county and Port representatives, it was determined that only Scenarios #3 and #4 are reasonable approximations of possible growth scenarios within the 20-year time horizon. Therefore, Scenarios #3 ("Strong Growth") and #4 ("Moderate Growth") are included in this assessment of future growth and will be used to forecast the impacts of future development on the transportation system.

The following sections present a summary of the two employment forecasts to 2035 (the end of the IAMP planning horizon) in Morrow County and Umatilla County respectively. *Appendix A presents the detailed development assumptions that are associated with each of the employment forecasts that are summarized in tables below.*

Morrow County – Port Industrial Zone

As shown in Figure 6-1, the LRA has recommended designating and zoning the 1,872 acres in the Morrow County exception area for Port Industrial use. "Port-related industrial uses" are those uses permitted outright or conditionally under Section 3.073, Port Industrial (PI) Zone of the Morrow County Zoning Ordinance. Uses authorized in the PI zone include, but are not limited to, port-related chemical and metal industrial uses; manufacturing, refining, processing or assembly of any agricultural, mining or industrial product; power generating and utility facilities; ship building and repair; rail loop and spur dependent uses; and effluent disposal of industrial wastes and agricultural activities in conjunction therewith. Authorized uses also include manufacturing, warehousing, packaging, processing, compounding, constructing, treatment, assembly, storage, testing, finishing, refinishing, repair, and wholesale sale and distribution of products, and any other industrial use authorized by ORS 777.250.

Figure 6-2 shows an expanded view of the PI area in Morrow County. Of the total 1,872 acres, 959 acres will be subject to a limited use overlay, which will only allow the use of the existing structures (igloos). The reuse of existing structures, allowed under the limited use overlay, may encourage a minor amount of future job growth in the area. The remaining 913 acres (730 net developable acres) are available for immediate future development.

Because there is the potential for the limited use overlay to be removed over the next 20 years, the Strong Growth scenario will account for development of the total 1,872 acres and the Moderate Growth scenario will account for only the 913 acres not subject to the limited use overlay.

Discussions with Morrow County and Port of Morrow representatives indicate that the developable PI area is best suited for rail-related warehouse and storage uses. These uses are typically not labor intensive and, therefore, will not generate large numbers of jobs. However, the site's locational advantages and very large, flat developable area, makes an attractive location for these uses. The 2035 employment forecasts for the PI area are summarized in Table 6-2.

Figure 6-2- Morrow County Port Industrial Zone

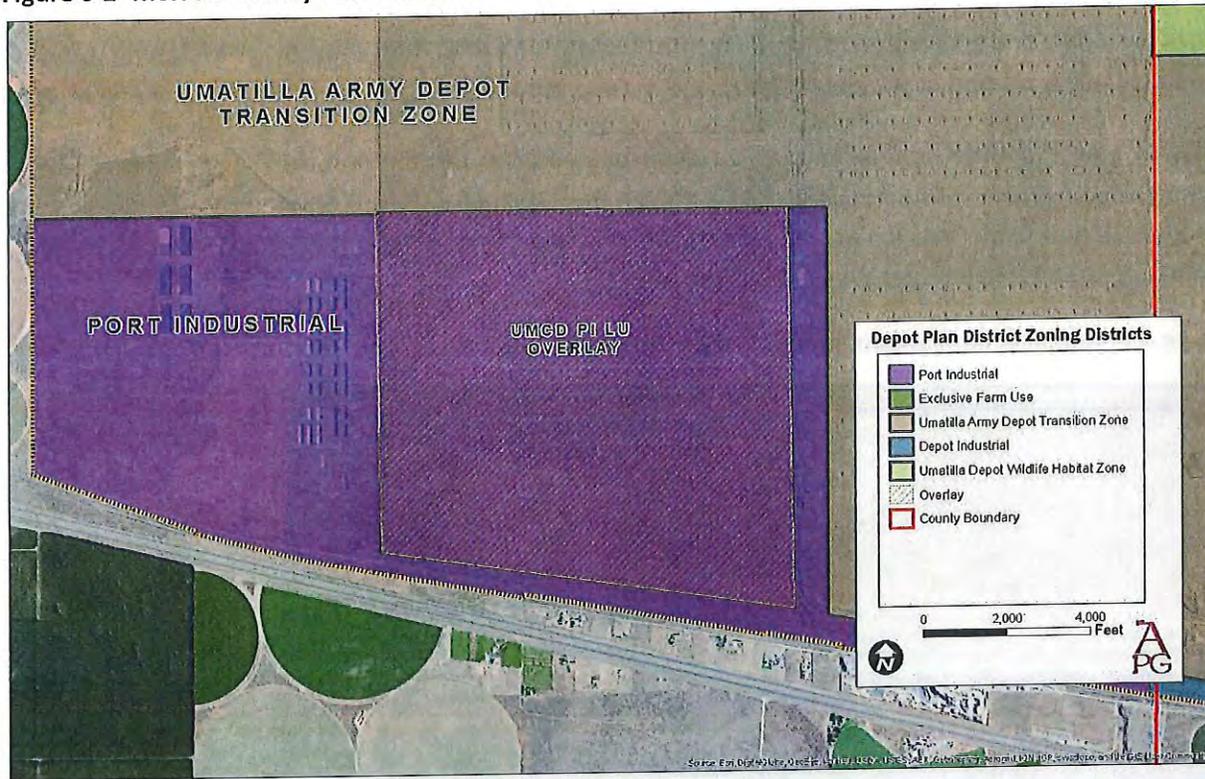


Table 6-2 - Morrow County Port Industrial Zone: Future (2035) Development Summary

| | Gross / Net Acres | Total Square Feet | Total Employees |
|--|-------------------|-------------------|-----------------|
| 2035 Strong Growth Scenario | | | |
| Port Industrial | 913 / 730 acres | 477,243 SF | 159 |
| Port Industrial (With Out Limited Use Overlay) | 959 / 767 acres | 501,288 | 167 |
| Total | | 978,531 SF | 326 |
| 2035 Moderate Growth Scenario | | | |
| Port Industrial | 913 / 730 acres | 318,162 SF | 106 |
| Port Industrial (With Limited Use Overlay) | 959 acres | n/a | n/a |
| Total | | 318,162 SF | 106 |

Umatilla County – Depot Industrial Zone

As shown on Figure 6-1, there are three discrete subareas identified for industrial development in the Umatilla County portion of the Depot Plan District. Descriptions of these subareas are provided below.

Subarea 1 encompasses approximately 884 undeveloped acres located in the southeast corner of the Umatilla Army Depot at the junction of I-82 and I-84. As shown on Figure 6-3, the proposed L-shaped configuration of this exception area will provide immediate access to the interstate system via existing interchanges to I-82 on the east and I-84 on the south.

Figure 6-3 - Umatilla County Depot Industrial Zone: Subarea 1 & 2



Subarea 1 is recognized as the key opportunity site for industrial development and is considered one of the best sites for distribution/warehouse/logistics uses in the region and the state for the following reasons:

- Unique location at the confluence of two interstate freeways. There are only seven locations in Oregon where interstate freeways/connecting loop freeways intersect – and six of them are in the Willamette Valley with surrounding lands largely developed.
- Immediate accessibility to existing interchanges to each freeway.
- The two interstate highways adjoining this area serve a large, multi-regional and multi state area and provide direct freighting opportunities for intensive levels of industrial development. As such, the interstate facilities can support industrial activities far beyond

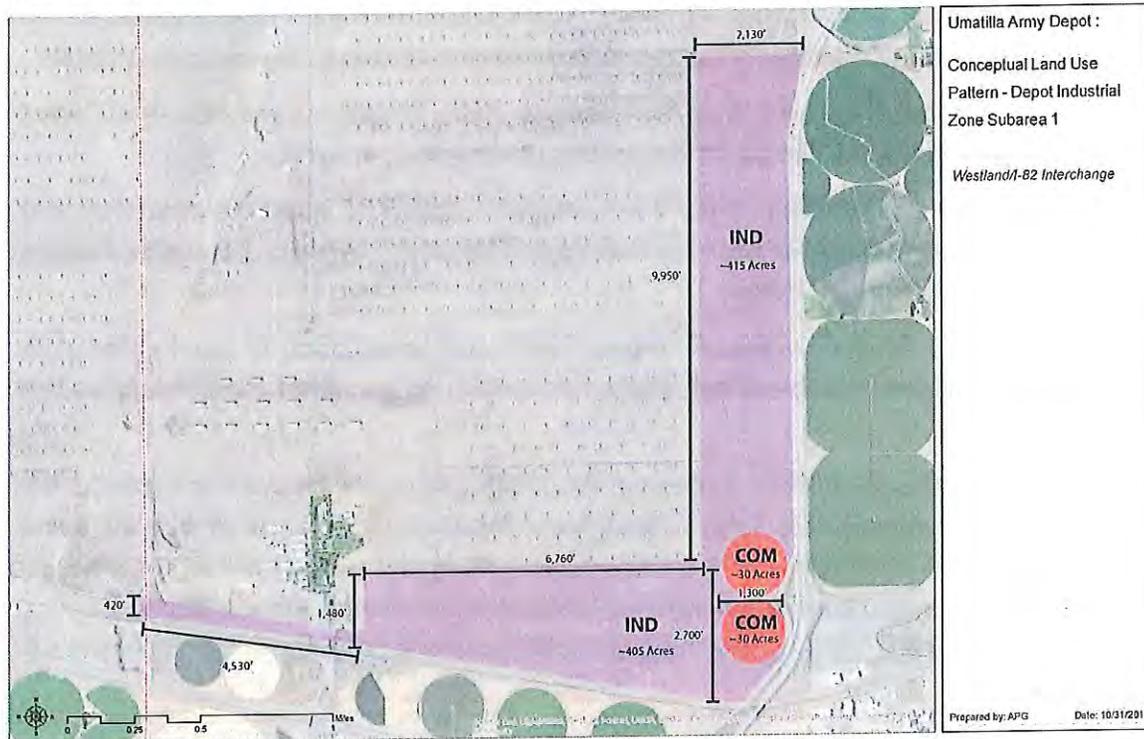
what would commonly be found in a rural area. The highways serving this area serve an area extending from Seattle, Vancouver BC and Spokane to the north to Portland to the west, Boise and Salt Lake City to the east, and northern California to the south via US 395.

- Large, level site with more than 800 acres under a single ownership – the largest undeveloped site at the junction of two interstate freeways in Oregon.
- Proximity and accessibility to other transportation modes to support industrial uses and freight movement, including UP rail facilities and the nearby Hinkle yard, and Port shipping facilities on the Columbia River.
- Proximity to nearby communities (Hermiston, Umatilla, Boardman, and Irrigon) with available residential land, housing and other services to support industrial jobs at this location.

Subarea 1 is intended to accommodate a range of distribution/commerce uses that can maximize the economic development potential of a large, unique site located at the junction of two interstate freeways. With immediate accessibility to interchanges to I-84 on the south and I-82 on the east, Subarea 1 is intended primarily for land-intensive freight related uses that can take advantage of easy truck access on and off the interstate system and avoid traffic congestion and other community impacts within urban areas.

Because of its accessibility and visibility, a maximum of 5 percent of the net developable acreage within the Depot Industrial Zone (excluding the restricted area of Subarea 3) may be allocated to retail and service uses. The retail uses must be located in Subarea 1. A draft development concept for the industrial / commercial land use pattern in Subarea 1 of the Depot Industrial zone is shown in Figure 6-4. Future commercial uses in this subarea may include sales and personal service oriented uses, in addition to highway tourist oriented uses which are also allowed in this zone. Because of the locational advantages and size of this site, there is the potential that these commercial activities may be more intense than what could be accommodated east of I-82. However, in contrast to the exception area, growth may be slowed somewhat by the lack of infrastructure and allied or support business in the immediate area. Future planning associated with the Business Operation Plan that is being developed for the Depot site will provide a more refined development concept for this area.

Figure 6-4 - Umatilla County Depot Industrial Zone: Subarea 1 Conceptual Land Use



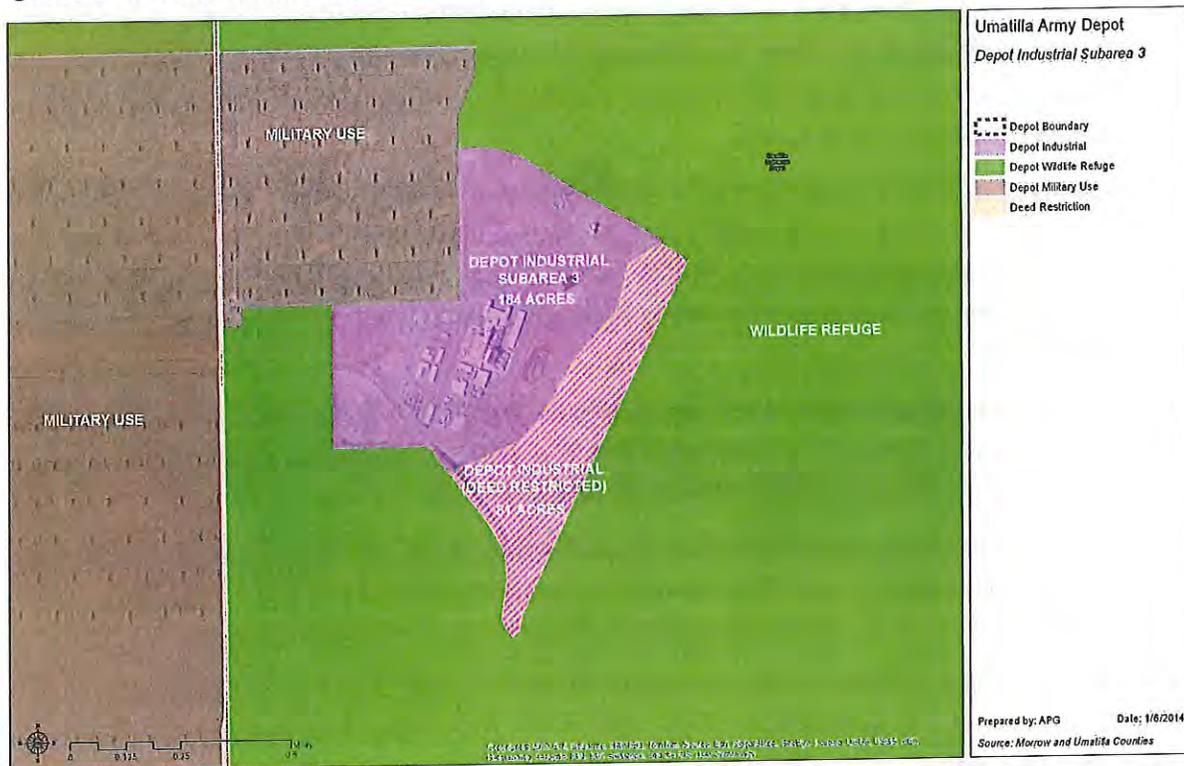
Subarea 2 encompasses 129 acres (see Figure 6-3). There are currently eight brick warehouses (Series 400 Magazine Buildings) within the boundary of Subarea 2. Each warehouse building is 11,227 square feet. The buildings were designed and constructed according to military base structural standards in the early 1940's. Some of these warehouses have been refurbished and are used for storage.

Subarea 2 is intended to accommodate general storage, warehouse and distribution uses that can largely utilize existing buildings and facilities in this subarea. Access to Subarea 2 is only available through the secured main gate and entry to the Administration Area that will be transferred to the Oregon National Guard. Therefore, the range of permitted and conditional industrial uses for Subarea 2 is more limited and future development opportunities are constrained. This entry road connects with I-84 via the existing Army Depot interchange.

The American Red Cross currently uses at least five concrete igloos on the Depot site for storage of emergency supplies. The Red Cross has been coordinating with the LRA and intends to consolidate and expand this use into storage warehouse(s) located in Subarea 2. The Red Cross is working with Oregon Emergency Management and the Federal Emergency Management Agency to make sure enough emergency supplies and trained volunteers are in place. By utilizing existing warehouse(s) in Subarea 2 for storage of emergency supplies, the Red Cross also has opportunities to partner with the Oregon National Guard to load and transport supplies in the event of an emergency or natural disaster.

Subarea 3 includes a total of 265 acres. As shown on Figure 6-5, approximately 81 acres of Subarea 3 (Coyote Coulee) will be subject to deed restrictions that limit land disturbance. The soils and topography in the coulee are not suitable for agriculture, but the area is valuable for wildlife habitat. It has been included in the proposed exception and Depot Industrial zone boundary because it falls within the area subject to on-going monitoring as a condition of the DEQ permit for the UMCDF. Therefore, the LRA – in consultation with the Confederated Tribes – has determined that the 81 acre “restricted area” should be consolidated with the Depot Industrial parcel rather than the designated Wildlife Habitat area, even though it will not be available for industrial development under the deed restriction.

Figure 6-5 - Umatilla County Depot Industrial Zone: Subarea 3



Subarea 3 is intended to accommodate a range of general industrial uses that can leverage the substantial and recent investment in buildings, infrastructure and other site improvements constructed to support the UMCDF mission. The UMCDF site and Subarea 3 are the most recently and intensively developed areas on the entire Umatilla Army Depot site. The structures were all constructed within the last ten years and there has been a recent and significant investment in infrastructure, including but not limited to electric power facilities, natural gas and communication facilities. More than 1,000 employees worked at the UMCDF as the stockpiled chemical weapons were incinerated. The incinerator building has since been demolished as a condition of the DEQ permit. Even with this large building removed, the remaining infrastructure and other improvements constructed to support the UMCDF make Subarea 3 very attractive for future industrial uses.

Once the Army has completed all the required decommissioning and closure activities at the UMCDF, Subarea 3 is anticipated to be available as a part of the overall "economic development" transfer of Depot property to the LRA and transition to new urban industrial uses. Because of the infrastructure and its relative isolation, the UMCDF site has been identified as an area that is uniquely attractive for specific industrial uses, including but not limited to data centers. The local region has already exhibited success in the recruitment of data center development, such as the Amazon facilities on Port of Morrow and Port of Umatilla properties.

General site requirements for data centers are as follows:

- Access to current and future power sources: Data centers require significant amounts of power, as well as high quality transmission. Any power failures are highly costly. Access to more than one power grid improves marketability. Stability and affordability of future power pricing is also essential.
- Natural risk: Data centers will not locate in areas susceptible to natural disaster. This limits the marketability of some areas in the country, most notably hurricane risk in the Gulf States and Southeastern Seaboard, and tornado risk in the Great Plain States. The primary natural risks in the Morrow/Umatilla County region are drought, range fires and volcanic ash fallout.
- Cooling and climate: Data centers generate heat, and cooling is an essential function of the facility. Data centers are increasingly being attracted to moderate desert climates, where systems are being designed to capture cool nighttime air.
- Security: Data centers typically want to be inconspicuous. Further, regulations sometimes require that data is physically stored in the region from which it is collected. Data centers require low levels of visibility, and prefer a buffered site with some isolation.

Umatilla County finds that Subarea 3 is an appropriate and suitable area for future development of data center(s) in addition to other industrial uses that would find the above physical development characteristics attractive.

Based on the above subarea characteristics, 2035 employment forecasts have been prepared and are summarized in Table 6-3.

Table 6-3 - Umatilla County Depot Industrial Zone: Future (2035) Development Summary

| | Gross / Net Acres | Total Square Feet | Total Employees |
|---|-------------------|-------------------|-----------------|
| 2035 Strong Growth Scenario | | | |
| Depot Industrial Subarea 1 | 824 / 659 acres | 574,295 SF | 287 |
| Depot Commercial Subarea 1 | 60 / 48 acres | 313,632 SF | 627 |
| Depot Industrial Subarea 2 | 129 / 103 acres | n/a | n/a |
| Depot Industrial Subarea 3 | 184 / 147 acres | 160,301 SF | 160 |
| Depot Industrial Subarea 3 (Restricted) | 81 acres | n/a | n/a |
| Total | | 1,048,228 | 1,075 |
| 2035 Moderate Growth Scenario | | | |
| Depot Industrial Subarea 1 | 824 / 659 acres | 430,721 SF | 215 |
| Depot Commercial Subarea 1 | 60 / 48 acres | 209,088 SF | 418 |
| Depot Industrial Subarea 2 | 129 / 103 acres | n/a | n/a |
| Depot Industrial Subarea 3 | 184 / 147 acres | 128,241 SF | 128 |
| Depot Industrial Subarea 3 (Restricted) | 81 acres | n/a | n/a |
| Total | | 768,050 | 762 |

Wildlife Portion of Depot Plan District

An approximately 5,700-acre area within the Depot Plan District (see Figure 6-1) will be set aside as a Wildlife Refuge and will be protected in the future through zoning restrictions. At this point, the property has not been zoned and remains in federal ownership. Application of zoning to the Wildlife Refuge is pending and will be based on a determination of ultimate ownership. For purposes of the IAMP planning process, no employment growth or traffic-generating activity is forecast for this area.

Westland Road Exception Area

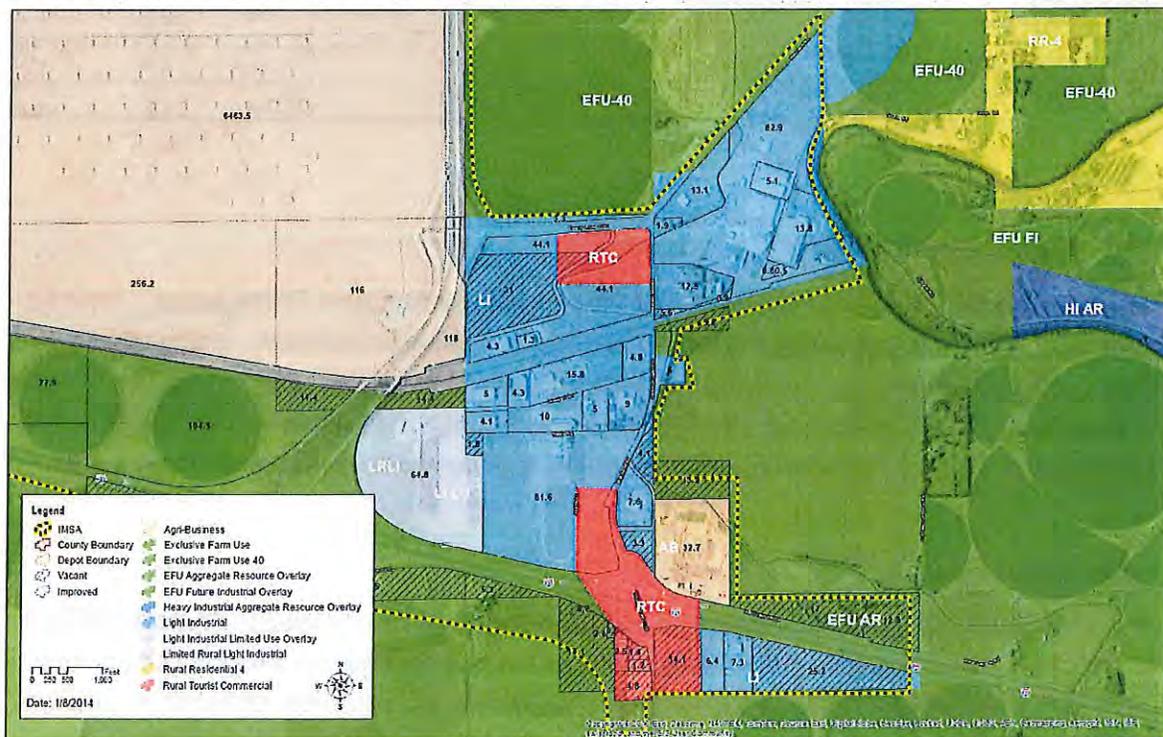
Outside of the areas of the Depot identified for future industrial and commercial, the most significant development opportunities are around the Westland Road/I-84 Interchange. Located in close proximity to the I-84 and I-82 freeways, this area already has developed with a number of urban scale uses, including an approximately 100,000 square-foot FedEx warehouse and distribution facility; a 25,000 square-foot UPS distribution facility; 350,000 square-foot Lamb Weston Food Processing plant; 160,000 square-foot Americold building; and approximately 180,000 square-foot Hermiston Generating Company Power Plant and Substation. In addition to these existing uses, a number of other planned facilities are likely to be built in the near-term including a new truck/travel center located in the northwest quadrant of the I-84/Westland Road interchange and a potential future power generating facility.

Employment forecasts were prepared for the Westland Road Exception area based on a pattern of existing uses already sited in the vicinity of the I-84 interchange and the amount of vacant land available for future development. Unlike the Depot Plan District Area, which is largely a "blank slate" for future development, the area in the vicinity of the Westland Road/I-84 interchange has an

established and emerging pattern of development and future growth is expected to be similar in use and intensity. For this reason, only a 100% “build-out” scenario is presented to illustrate future employment in this area. Development assumptions are summarized below and outlined in Table 6-4.

To the west of the Fed-Ex truck-freight distribution center there are approximately 30-acres of vacant land zoned Limited Rural Light Industrial. Consistent with the underlying zoning shown in Figure 6-6 and existing uses in the area, future uses on this land could include light manufacturing, storage and freight-related businesses. Due to this parcel’s proximity to the existing freight-distribution center, it is assumed that future development on this site will be an expansion of warehouse or freight distribution uses.

Figure 6-6 - Umatilla County Exception Area Zoning



Approximately 39 acres of Light Industrial with frontage along Westland Road or in close proximity to this roadway are vacant and assumed to develop within the planning horizon. South of I-84, there are approximately 25 acres of vacant industrial zoned land. Similar to uses anticipated for future Umatilla Depot Industrial areas that have good access to I-82 and I-84, it is assumed that Light Industrial areas in the expectation area will develop with land intensive freight-related uses.

There are also approximately 60-acres of Rural Tourist Commercial in the vicinity of the Westland Road/I-84 interchange, the location of which is shown in Figure 6-6. A truck stop has already been approved for the commercial area directly north of I-84, west of Westland Road. Commercial land further north, closer to the I-82/Lamb Road Interchange, is vacant and the assumption is that this area will develop with a mixture of retail and service commercial.

South of the interchange, parcels zoned for Rural Tourist Commercial are vacant, with the exception of the Shell gas station located on a 2.5 acre parcel. Based on the location of these parcels and their good visibility from I-84 and access via the Westland Road Interchange, assumptions for future growth in this area include additional service commercial, a hotel/motel and a restaurant.

Table 6-4 Westland Road Exception Area: Build-Out (2035) Summary

| Umatilla County | Gross / Net Acres | Total Square Feet | Total Employees |
|---|-------------------|-------------------|-----------------|
| Limited Rural Light Industrial | 30 / 24 | 104,544 | 35 |
| Light Industrial | 64.2 / 51 | 223,724 | 112 |
| Rural Tourist Commercial: | | | |
| Lodging and Restaurant (S. of I-84) | 14.1 / 11 | 73,704 | 74 |
| Service (S. of I-84) | 7.4 / 6 | 38,681 | 39 |
| Retail and Service (N. of I-84, at Lamb Road) | 22 / 18 | 114,998 | 115 |
| Total | 137.7 / 110 | 555,651 | 374 |

FUTURE TRAFFIC CONDITIONS

Based on the noted potential levels of development and redevelopment in the IMSA, and factoring in regional growth from outside the IMSA, future year 2035 traffic conditions were estimated along the study area interchanges, roadways, and intersections. In order to more accurately assess the impacts of potential long-term redevelopment on the Umatilla Army Depot site, the future traffic conditions analysis was prepared for the following iterations:

- Year 2035 Background Traffic Conditions – includes estimates for local and regional traffic growth but does not include anticipated growth due to reuse/redevelopment of the Umatilla Army Depot site.
- Year 2035 Total Traffic Conditions - includes estimates for local, regional, and Umatilla Army Depot reuse/redevelopment traffic growth.

Year 2035 Background Traffic

Year 2035 “Background” traffic volume forecasts do not include traffic growth from reuse/redevelopment of the Umatilla Army Depot as outlined in the earlier sections of this memorandum. Instead, this scenario isolates the impacts of continued local and regional growth in and around the IMSA at the study area interchanges and intersections. The year 2035 “Background” scenario was developed based on the currently adopted Morrow and Umatilla County comprehensive plans and assumptions regarding continued local and regional through traffic growth. The remainder of this section describes the methodology and assumptions used to develop year 2035 background traffic forecasts.

2035 Background Traffic Growth

As described in the Existing Land Use and Existing Traffic Conditions memorandum, the characteristics and service area of each study interchange are unique. For this reason, different methodologies were used to estimate 2035 background traffic growth at each interchange as outlined in the sections below.

I-84/Paterson Ferry Road Interchange

The I-84/Paterson Ferry Road Interchange primarily serves agricultural land consisting of field crops, poplar tree farms, and dairy farms. It also serves a saw mill, quarrying operations, and a small amount of isolated industrial use. Due to the predominately rural character of the interchange service area, the I-84/Paterson Ferry Road interchange is not anticipated to experience significant regional traffic growth. Instead, Morrow County staff anticipates some continued growth with the poplar tree farms and associated saw mill, a potential new veneer plant, and expansion of existing dairy farms. To conservatively account for this growth potential, the existing traffic volumes at key interchange ramp terminal movements were doubled during the weekday a.m. and p.m. peak hours.

I-84/Umatilla Army Depot Interchange

The I-84/Umatilla Army Depot Interchange primarily serves as the main access to the Umatilla Army Depot and secondarily serves as an access to the agricultural land on the south side of I-84. As the "Background" traffic conditions is assuming no growth or change to the Umatilla Army Depot and the agricultural lands south of I-84 are not anticipated to change, no traffic growth modifications are assumed under 2035 background conditions.

I-82/Lamb Road Interchange

Of the three study interchanges, the I-82/Lamb Road interchange has the greatest potential to experience significant regional and local growth. Regional growth is likely to come in the form of anticipated traffic volume increases along the I-82 corridor and growth within the City of Hermiston. To capture regional growth at the I-82/Lamb Road interchange terminals and adjacent Lamb Road intersections, an annual growth rate of 1.0 percent was applied. This growth rate is consistent with other recent traffic studies conducted in the vicinity of the Westland Road interchange.

In addition to regional growth, the I-82/Lamb Road interchange will likely experience a more significant amount of growth associated with continued buildout of the Westland Road Exception Area. In the Westland Road Expectation Area, there are currently two planned developments; a truck stop/travel center and a power generating station² located along segments of Westland Road. Following a review of the traffic impact studies for these two near-term projects, the estimated net new trips were added to the growth-adjusted (regional) I-82/Lamb Road traffic volumes.

Lastly, it is recognized that that the Westland Road Exception Area has the potential for further infill over the next 20 years as outlined in Table 6-4. To account for this long-term infill growth, commercial trips were estimated using the ITE manual Trip Generation while industrial trips were estimated using an industrial-related trip rate calculation based on existing Exception area uses. *Detailed calculations of these trip rates are summarized in Appendix B.* The resulting net new weekday a.m. and p.m. peak hour trips were then distributed to the study area intersections based on existing and anticipated travel patterns.

Year 2035 Background Traffic Operations

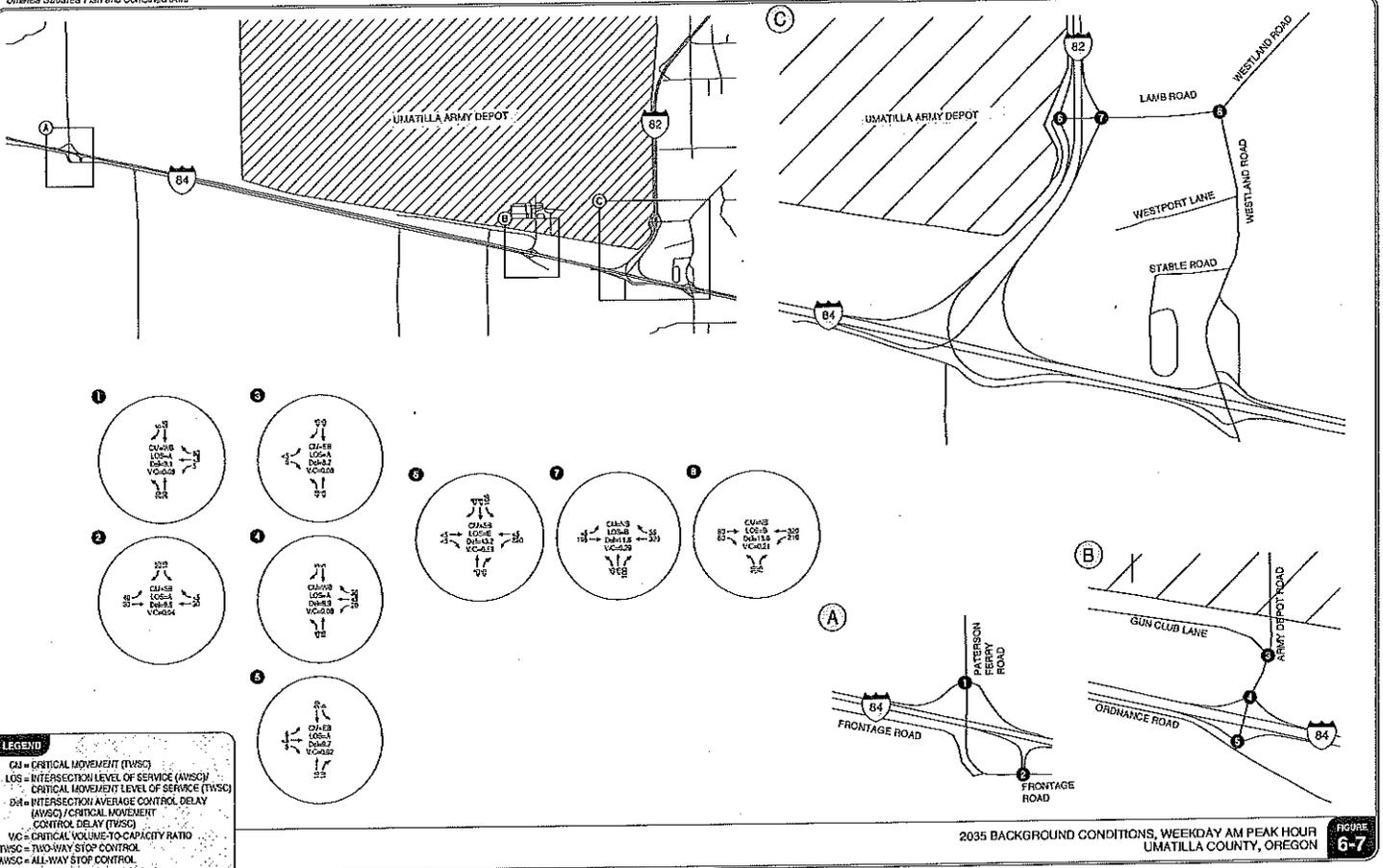
Future year 2035 Background weekday a.m. and p.m. peak hour traffic volumes were determined by applying the noted growth rates, in-process traffic volumes, and infill trip generation estimates to the

² Umatilla County has approved the truck stop development project located on Westland Road and it has been assumed that it will be constructed within the 20-year planning horizon. The power generating plant is still in the early planning and approval phases and has not yet been formally approved by Umatilla County. However, for conservative purposes, the anticipated traffic associated with the power generating plant has been included given its likely impact on long-term traffic volumes at the I-82/Lamb Road interchange.

existing study network. The resulting year 2035 weekday a.m. and p.m. peak hour traffic volumes are shown in Figures 6-7 and 6-8, respectively. As summarized in Table 6-5, all of the interchange ramp terminals and study intersections are forecast to continue to operate at acceptable standards.

Table 6-5 - 2035 Background Traffic Operations Summary

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.04 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.08 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Access Road | A | 0.02 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Access Road | A | 0.07 | A | 0.02 | v/c < 0.70 | Yes |
| Army Depot Access Road / Gun Club Lane | A | 0.08 | A | 0.02 | LOS E | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | E | 0.59 | B | 0.11 | v/c < 0.70 | Yes |
| I-82 NB Ramp Terminal/ Lamb Road | B | 0.29 | C | 0.54 | v/c < 0.70 | Yes |
| Westland Road/ Lamb Road | B | 0.21 | B | 0.24 | LOS E | Yes |



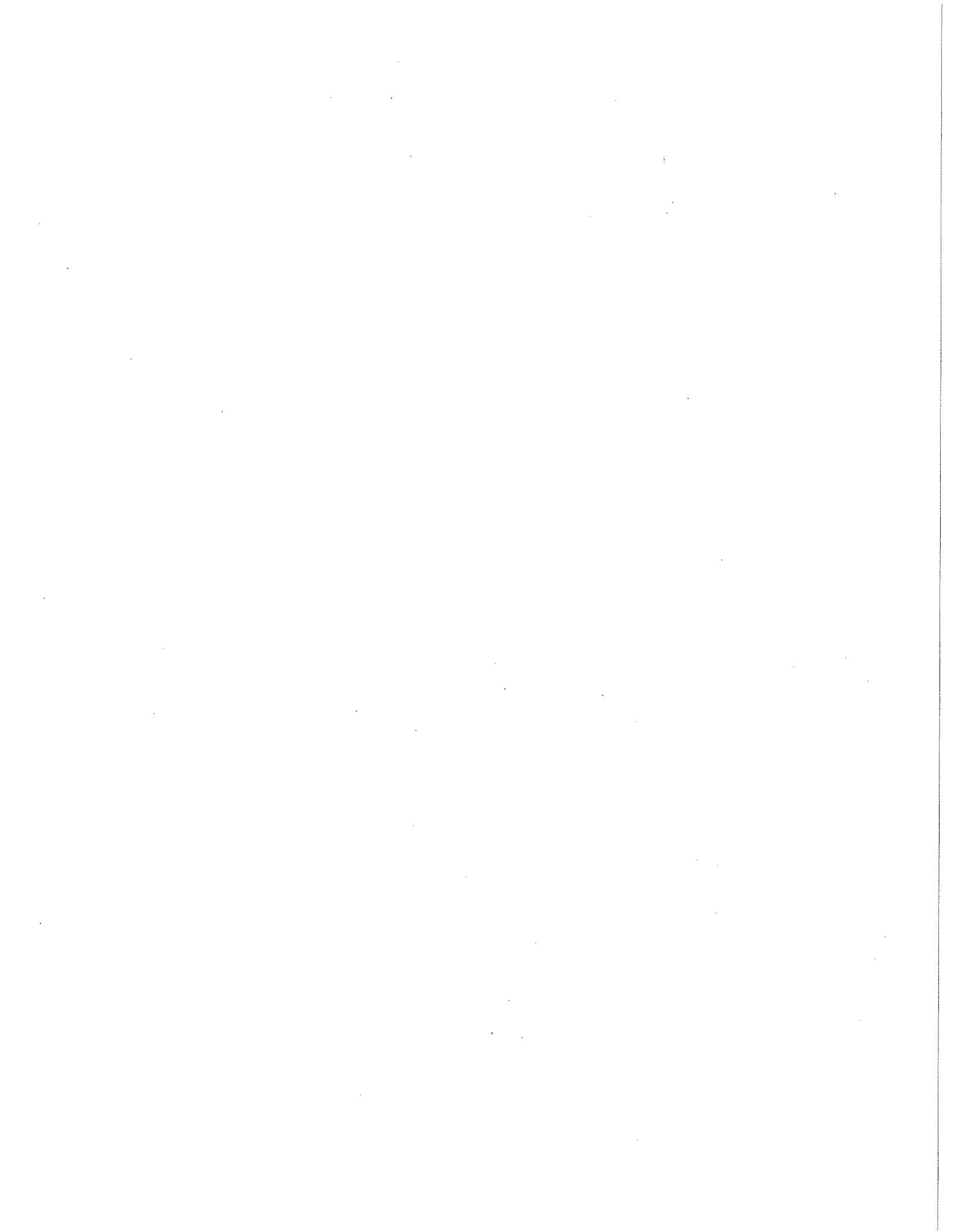
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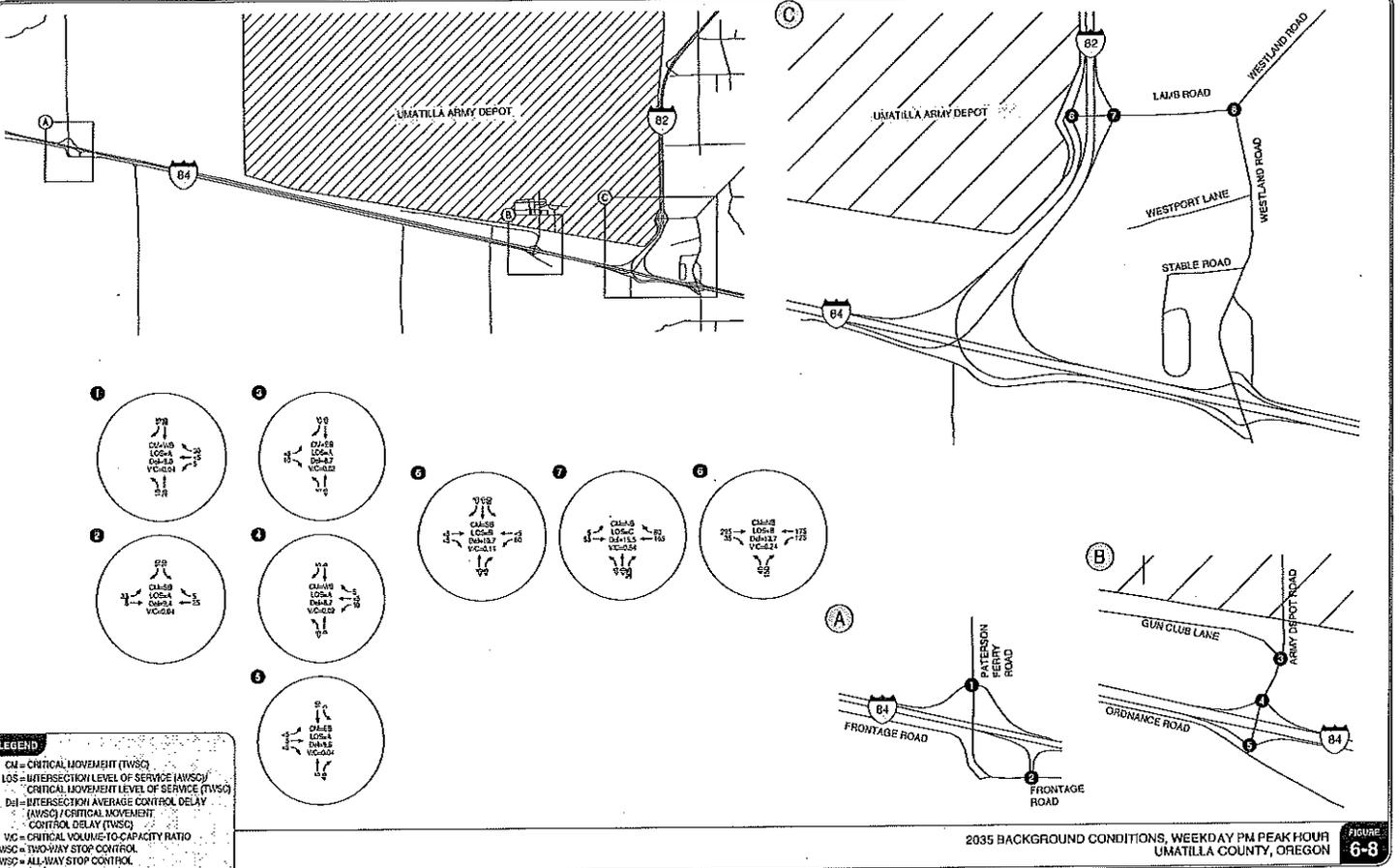
LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (AWSC)
- CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- DCR = INTERSECTION AVERAGE CONTROL DELAY (AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- VC = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

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2035 BACKGROUND CONDITIONS, WEEKDAY AM PEAK HOUR
 UMATILLA COUNTY, OREGON FIGURE 6-7





2035 BACKGROUND CONDITIONS, WEEKDAY PM PEAK HOUR
UMATILLA COUNTY, OREGON

FIGURE 6-8

LEGEND
 CM = CRITICAL MOVEMENT (TVSC)
 LOS = INTERSECTION LEVEL OF SERVICE (AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TVSC)
 Del = INTERSECTION AVERAGE CONTROL DELAY (AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TVSC)
 VC = CRITICAL VOLUME-TO-CAPACITY RATIO
 TVSC = TWO-WAY STOP CONTROL
 AWSC = ALL-WAY STOP CONTROL

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Year 2035 Total Traffic Scenario

Year 2035 "Total" traffic volume forecasts include all of the traffic growth estimates from the "Background" scenario and the traffic growth estimates from the anticipated reuse/redevelopment of the Umatilla Army Depot. This includes anticipated traffic growth from the ORNG and Port Industrial/Depot Industrial zones. The remainder of this section describes the methodology and assumptions used to develop year 2035 total traffic forecasts.

Oregon National Guard Use

As previously stated, the ORNG is planning to move its Regional Training Institute that is currently located on the Western Oregon University campus in Monmouth, Oregon to the Umatilla Army Depot site. In addition to the Regional Training Institute, the site will also include a future readiness center, tenant units, and training facilities to support other military units from throughout the state. The specific details associated with this vision are still being refined, however for the purposes of the IAMP study, it has been assumed in consultation with ORNG officials that the future uses will be comparable to what has been outlined in the *June 2012 Site Development Plan for the ORNG Umatilla Training Center* document. Anticipated staffing plans were derived from this document and a resulting trip generation profile was developed. *Appendix B contains the detailed trip generation calculations.* The resulting net new weekday a.m. and p.m. peak hour trips were then distributed to the I-84/Umatilla Army Depot interchange based on existing and anticipated travel patterns.

Morrow County – Port Industrial Zone

Table 6-2 assumes that the Morrow County Port Industrial Zone will have up to 1,495 net developable acres to accommodate a variety of industrial related uses. Table 6-2 shows the anticipated 2035 development square footage under the strong and moderate growth scenarios. For the purposes of this study, it has been assumed that this potential development will include large warehouse/storage facilities. Using the High Cube/Warehouse land use from the ITE publication, *Trip Generation*, weekday a.m. and p.m. peak hour trips were generated and distributed to the I-84/Umatilla Army Depot interchange. *Appendix B contains the detailed trip generation calculations.*

Umatilla County – Depot Industrial Zone

Subarea 1 encompasses approximately 884 undeveloped acres located in the southeast corner of the Umatilla Army Depot at the junction of I-82 and I-84. As shown in Table 6-3, it is assumed that this area will have approximately 659 acres of distribution/warehouse/logistics uses and approximately 48-acres of service commercial and highway oriented retail uses. Table 6-3 shows the anticipated 2035 development square footages under the strong and moderate growth scenarios. To account for this development potential, industrial related trips were estimated using an industrial-related trip rate calculation based on existing Westland Road Exception area uses.

As previously noted, the commercial-related uses are likely to include sales and personal service oriented uses, in addition to highway tourist oriented uses. For the purposes of this study, it has been assumed that this will include a factory outlet mall, a truck stop, gas station, several fast-food restaurants, and a motel. The ITE manual, Trip Generation, was then used to develop a trip generation profile for these commercial-related uses. *Detailed calculations of these trip rates are summarized in Appendix B.* The resulting net new weekday a.m. and p.m. peak hour trips were then distributed to both the I-84/Umatilla Army Depot and I-82/Lamb Road interchanges.

Subarea 3 includes a total of 265 acres and is intended to accommodate a range of general industrial uses that can leverage the substantial and recent investment in buildings, infrastructure and other site improvements constructed to support the UMCDF mission. For the purposes of this IAMP study, Subarea 3 has been assumed to accommodate a large data center. Based on studies at other data centers in Oregon and California, a trip generation rate for this use was estimated and the resulting weekday a.m. and p.m. peak hour trips were distributed primarily to the I-84/Lamb Road interchange. *Detailed trip generation calculations are included in Appendix B.*

Year 2035 Total Traffic Operations

Future year 2035 Total weekday a.m. and p.m. peak hour traffic volumes were determined by adding the noted ORNG, Port Industrial, and Depot Industrial related volumes to the background traffic volumes with trips routed through the study intersections and interchanges based on their anticipated origins and destination. The resulting year 2035 weekday a.m. and p.m. peak hour traffic conditions are shown in Figures 6-9 and 6-10 for the strong growth build out scenario. Table 6-6 summarizes the operations at the interchange ramp terminals and study intersections.

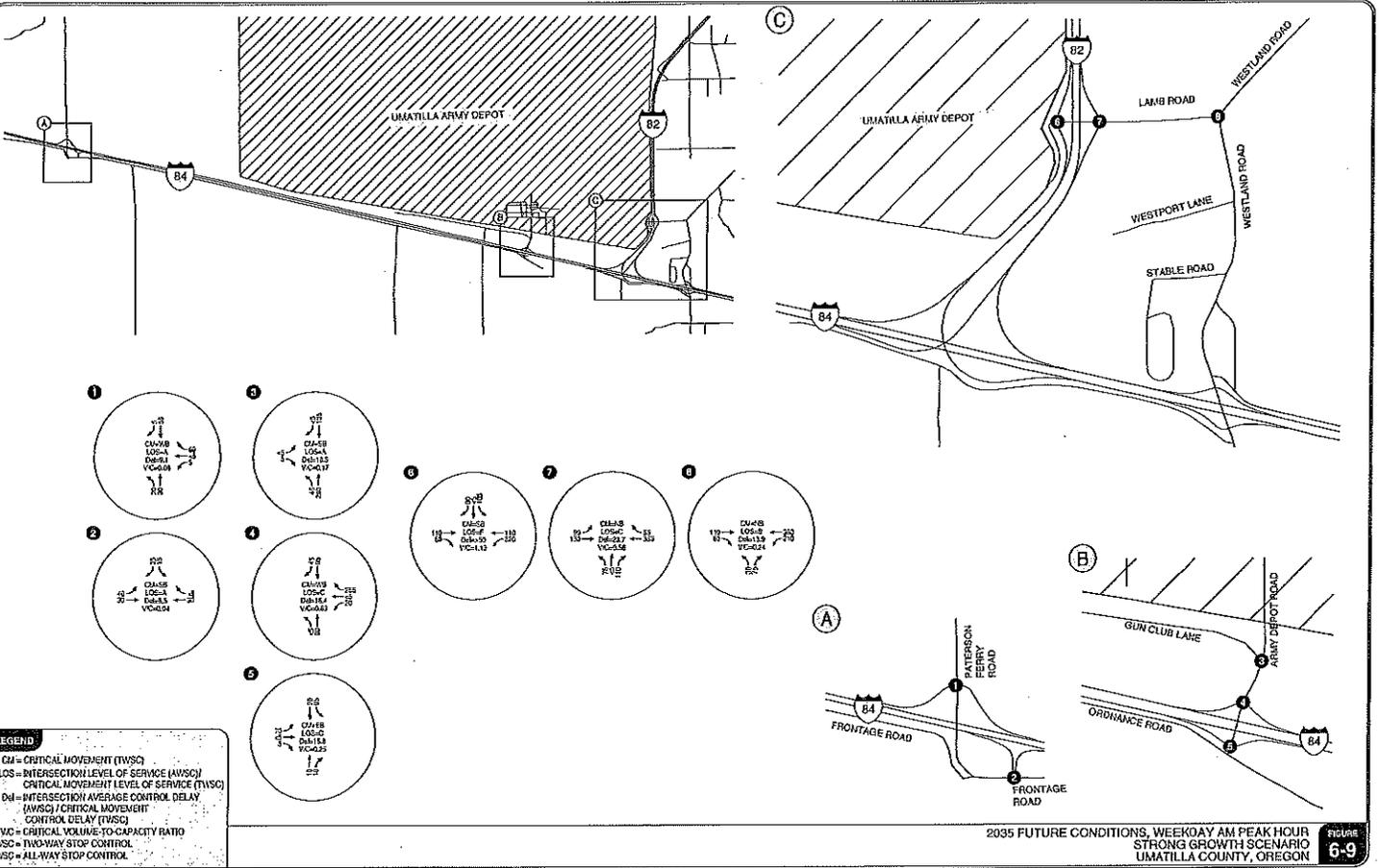
Table 6-6 - 2035 Total Traffic Operations Summary (Strong Growth Scenario)

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.04 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.08 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Access Road | C | 0.25 | C | 0.23 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Access Road | C | 0.63 | B | 0.20 | v/c < 0.70 | Yes |
| Army Depot Access Road / Gun Club Lane | A | 0.17 | A | 0.19 | LOS E | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | 1.13 | C | 0.52 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.56 | F | 0.94 | v/c < 0.70 | No |
| Westland Road/ Lamb Road | B | 0.24 | C | 0.28 | LOS E | Yes |

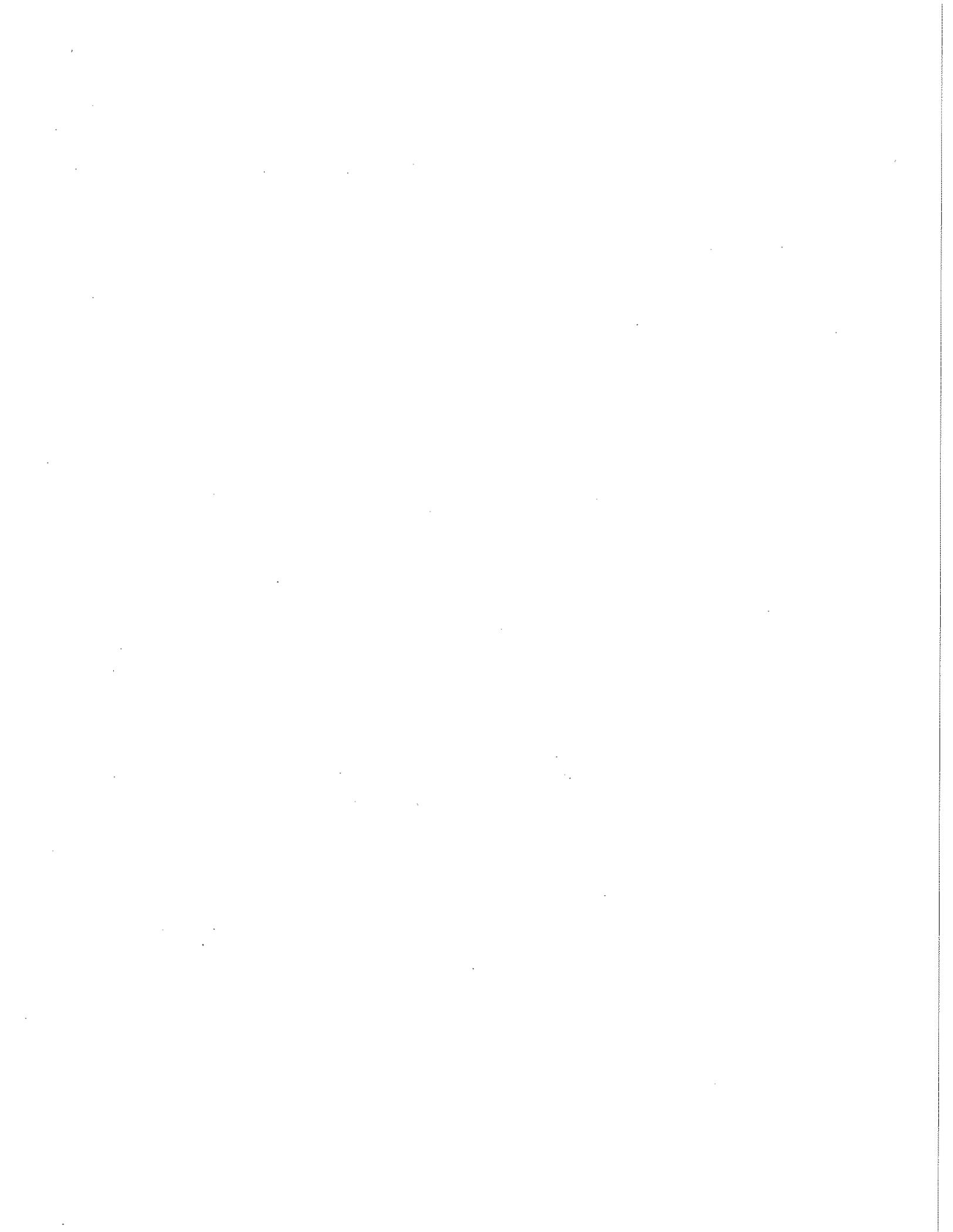
As shown in Table 6-6, the following intersections are forecast to operate with high levels of delay or operate above capacity:

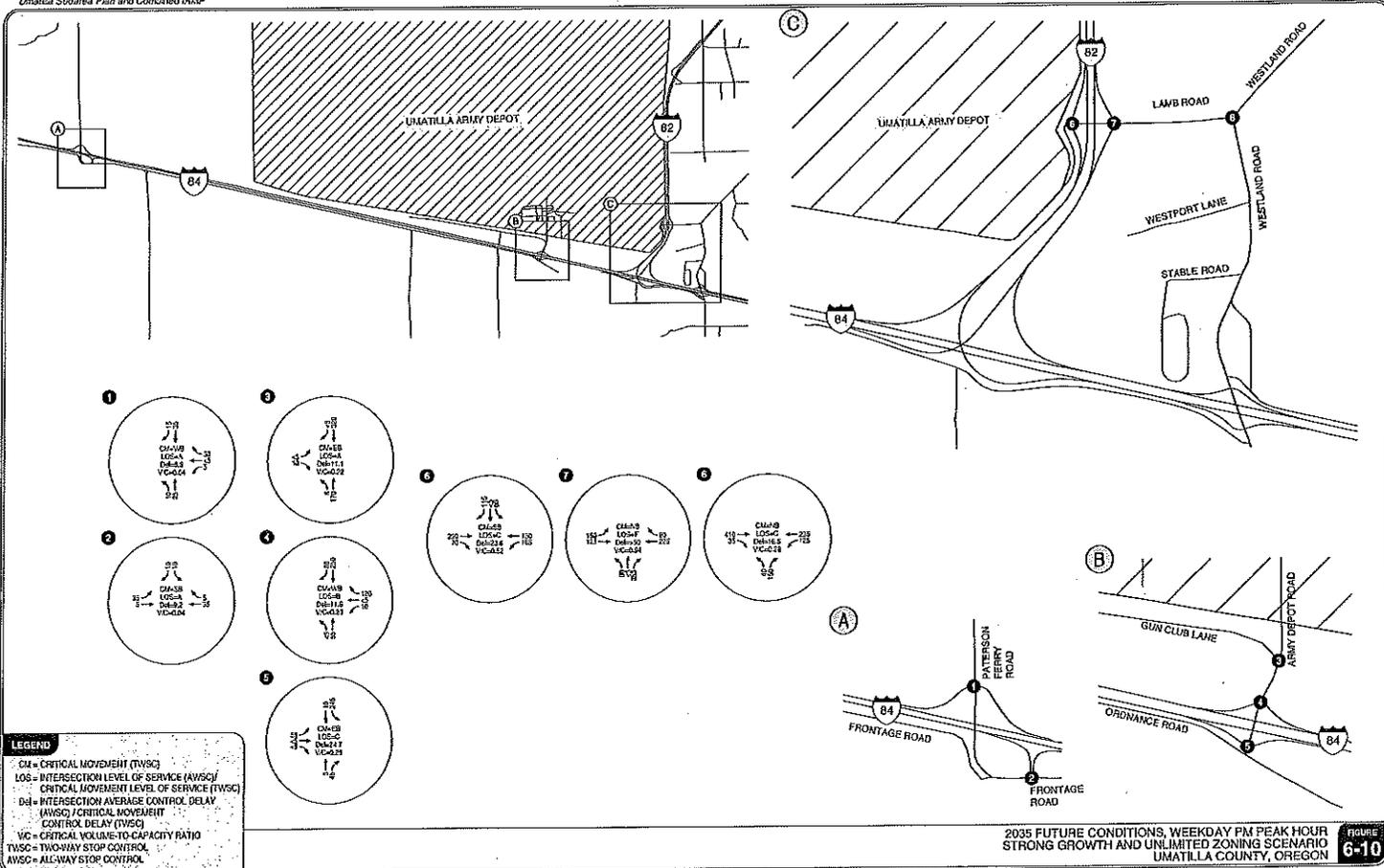
- I-82 SB Ramp Terminal/Lamb Road
- I-82 NB Ramp Terminal/Lamb Road

These findings demonstrate that the assumed level of Umatilla Army Depot reuse/redevelopment at the strong growth level will require capacity and infrastructure improvements at the I-84/Umatilla Army Depot and I-82/Lamb Road intersections.



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LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (AWSC)/
CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Dd = INTERSECTION AVERAGE CONTROL DELAY
(TWSC); CRITICAL MOVEMENT
CONTROL DELAY (TWSC)
- VC = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

2035 FUTURE CONDITIONS, WEEKDAY PM PEAK HOUR
 STRONG GROWTH AND UNLIMITED ZONING SCENARIO
 UMATILLA COUNTY, OREGON **FIGURE 6-10**

Figures 6-11 and 6-12 show the weekday a.m. and p.m. peak hour traffic conditions for the moderate growth build out scenario. Table 6-7 summarizes the operations at the interchange ramp terminals and study intersections.

Table 6-7 - 2035 Total Traffic Operations Summary (Moderate Growth Scenario)

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.03 | A | 0.03 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.07 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Access Road | B | 0.10 | C | 0.15 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Access Road | B | 0.26 | B | 0.16 | v/c < 0.70 | Yes |
| Army Depot Access Road / Gun Club Lane | A | 0.06 | A | 0.16 | LOS E | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | 0.90 | C | 0.40 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.37 | C | 0.71 | v/c < 0.70 | No |
| Westland Road/ Lamb Road | B | 0.23 | C | 0.28 | LOS E | Yes |

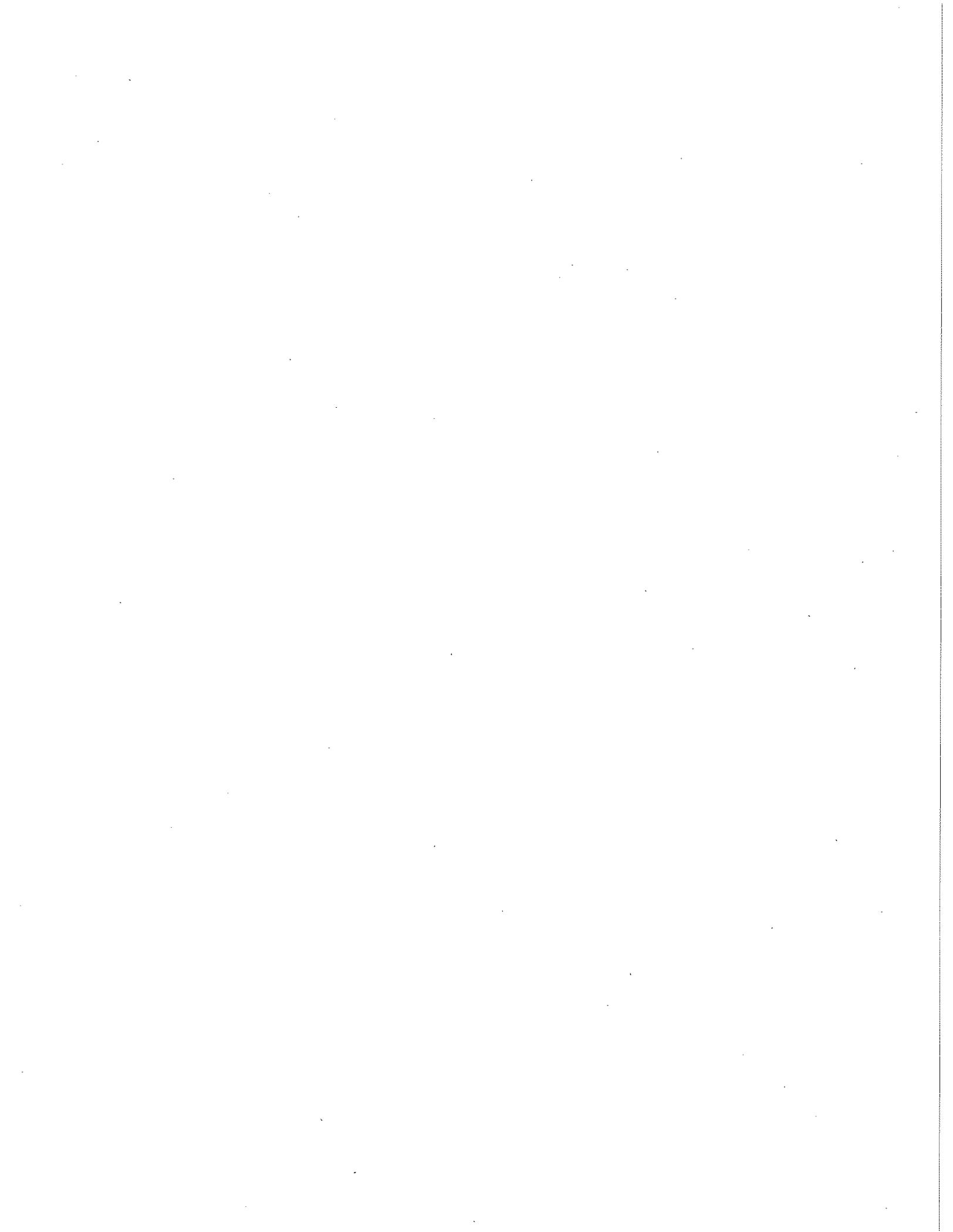
As shown in Table 6-7, the following intersections are forecast to operate with high levels of delay or operate above capacity:

- I-82 SB Ramp Terminal/Lamb Road
- I-82 NB Ramp Terminal/Lamb Road

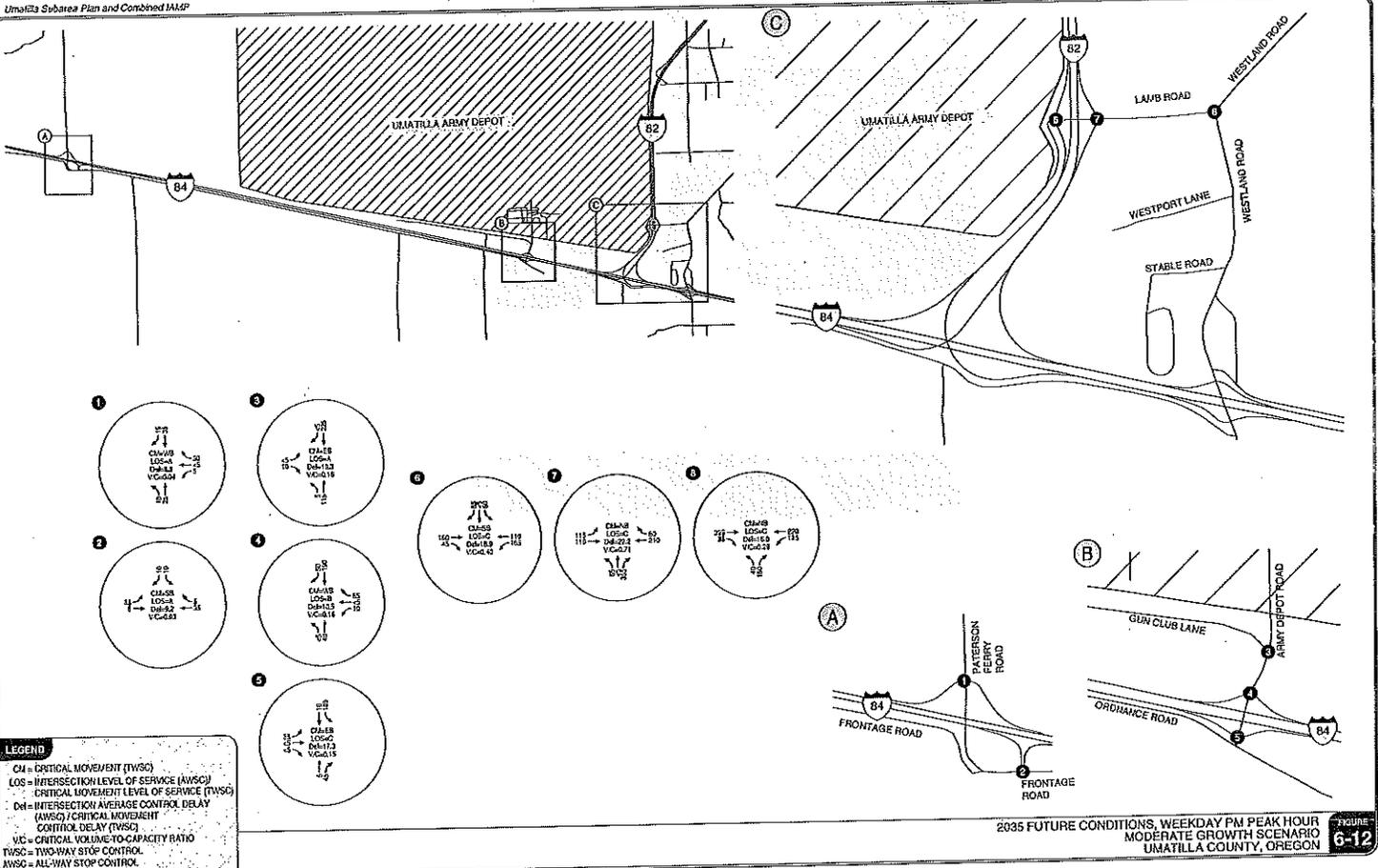
These findings demonstrate that even with under a moderate growth scenario the Umatilla Army Depot, SB I-82/Lamb Road interchange ramp terminal is forecast to operate near or over capacity.

Year 2035 Interstate Operations

In addition to the operations at the ramp terminals, the operations on the interstate highways were analyzed. The section of I-82 between the Lamb Road interchange and I-84 interchange (Figure 6-13) is relatively short and any capacity issues would appear first in this area. A merging and diverging capacity analysis was performed for movements in this area. Table 6-8 displays the results of this analysis for the 2035 total traffic condition with strong growth assumptions; a 2012 analysis is included for comparison.



Umatilla Subarea Plan and Combined IAMP



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Figure 6-13: Merge/Diverge Analysis Area



Table 6-8 Merge/Diverge Analysis, 2035 Strong Growth Scenario

| Area | 2012 v/c | 2035 v/c |
|--------------------------|-------------|-------------|
| <i>NB I-82</i> | | |
| I-82 & Lamb Road Diverge | 0.28 | 0.43 |
| I-82 & I-84 Merge | 0.27 | 0.49 |
| <i>SB I-82</i> | | |
| I-82 & Lamb Road Merge | 0.28 | 0.47 |
| I-82 & I-84 Diverge | 0.28 | 0.49 |

As shown in Table 6-8 the segment of I-82 analyzed has adequate capacity under 2035 total traffic conditions with strong growth assumptions. The segment would also have has adequate capacity for less intensive growth scenarios.

Alternative Routing Scenario

The existing Army Depot interchange was not designed to accommodate large numbers of industrial trips. Specifically, the limited deceleration and acceleration distances on the westbound and eastbound ramps do not meet current design standards. This would inhibit the safe and efficient accommodation of many of today's larger trucks and trailers that would likely access some of the envisioned industrial/warehouse/storage-oriented land uses in the Morrow County Port Industrial Zone. In addition, the Army Depot Access Road passes under an existing railroad bridge with a 15 foot vertical clearance. This low clearance would restrict most oversized vehicles from accessing future reuse areas including some special Oregon National Guard vehicles.

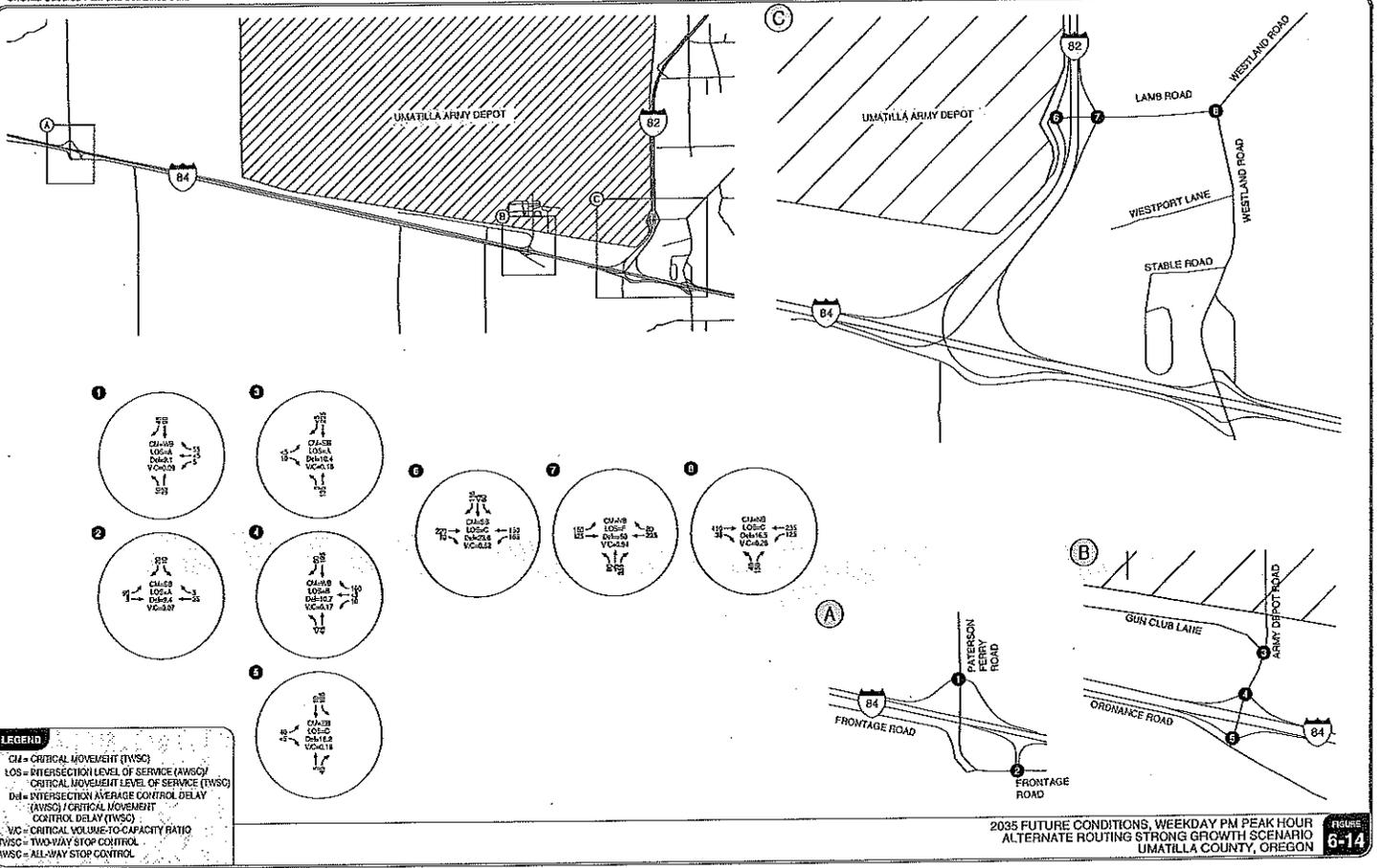
Based on these limitations, an alternative routing scenario was developed that assumes a secondary access to the Morrow County Port Industrial zone via a new roadway that would connect to Paterson Ferry Road. The development of such a roadway would require the acquisition of new right-of-way over the Exclusive Farm Use (EFU) land between Paterson Ferry Road and the western boundary of the UMCD site.

To test the operational impacts of such a scenario, the trips generated by the assumed Port Industrial zone under the strong growth scenario were rerouted to the I-84/Paterson Ferry Road interchange. The resulting 2035 weekday a.m. and p.m. peak hour traffic conditions are shown in Figures 6-14 and 6-15 for the strong growth build out scenario. Table 6-9 summarizes the operations at the interchange ramp terminals and study intersections.

Table 6-9 - 2035 Total Traffic Operations Summary (Alternative Routing - Strong Growth Scenario)

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.08 | A | 0.07 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.16 | A | 0.09 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Road | B | 0.13 | C | 0.16 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Road | B | 0.47 | B | 0.17 | v/c < 0.70 | Yes |
| Army Depot Road / Gun Club Lane | A | 0.15 | A | 0.18 | LOS E | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | 1.13 | C | 0.52 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.56 | F | 0.94 | v/c < 0.70 | No |
| Westland Road/ Lamb Road | B | 0.24 | C | 0.28 | LOS E | Yes |

As shown in Table 6-9, the Paterson Ferry Road and Army Depot Access Road intersections are forecast to operate acceptably under the alternative routing scenario. No trips were rerouted to or from the



2035 FUTURE CONDITIONS, WEEKDAY PM PEAK HOUR
 ALTERNATE ROUTING STRONG GROWTH SCENARIO
 UMATILLA COUNTY, OREGON

Map020112847 - Umatilla Subarea Plan and Combined IAMP - Map020112847_P021.dwg Jul 21, 2014 - 4:04pm - pman01 Layout File: Strong Growth Scenario

Lamb Road interchange and the I-82 SB Ramp Terminal/Lamb Road and I-82 SB Ramp Terminal/Lamb Road intersections are forecast to operate with high levels of delay or operate above capacity.

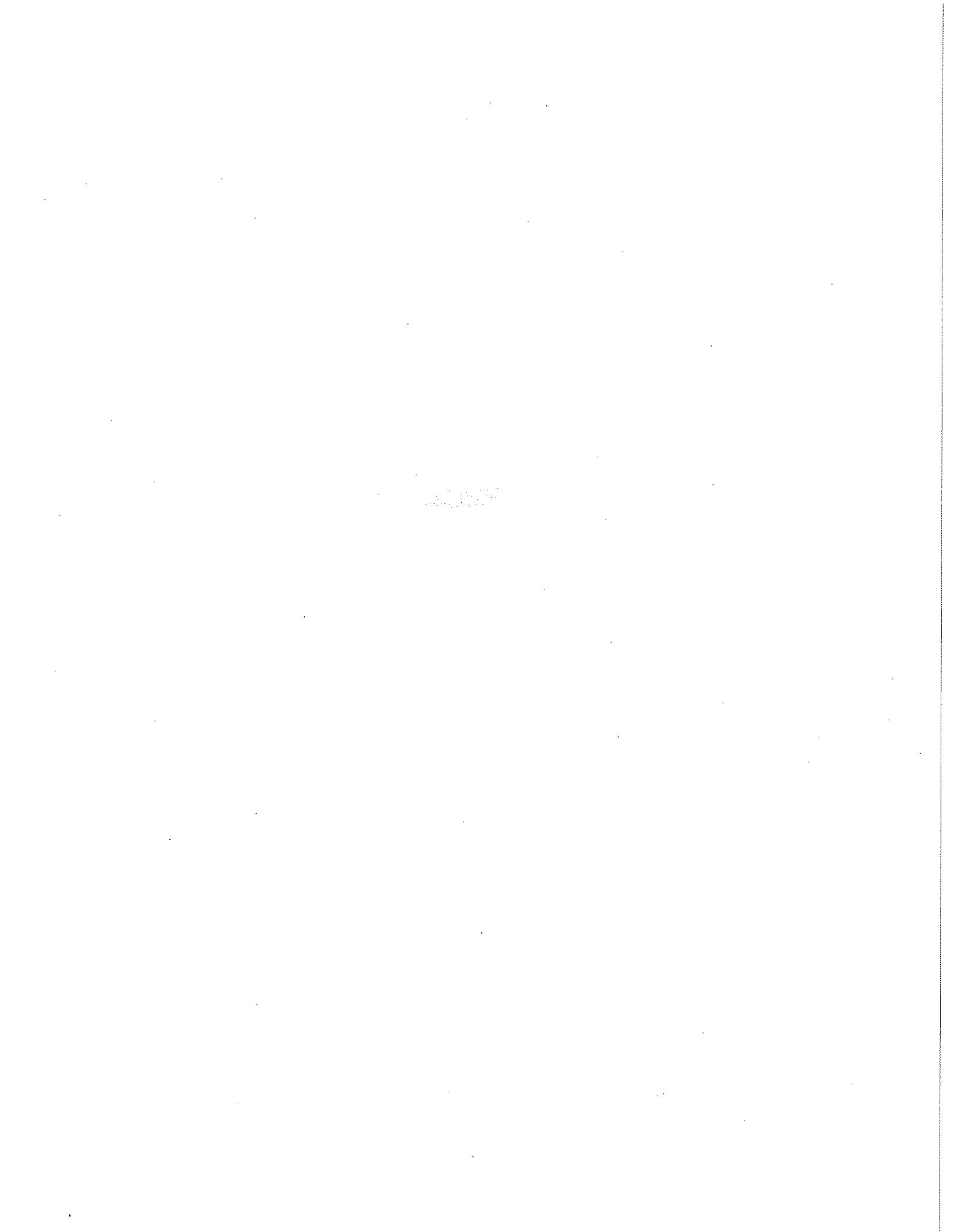
If the alternate routing assumptions were applied to the moderate growth scenario the Paterson Ferry Road and Army Depot Access Road intersections would continue to operate acceptably and the I-82 SB Ramp Terminal/Lamb Road and I-82 SB Ramp Terminal/Lamb Road intersections would operate with high levels of delay or operate above capacity.

In addition to the operations at the ramp terminals and intersections a merging and diverging capacity analysis was performed for the I-84/Paterson Ferry Road Interchange under the alternative routing scenario. Table 6-10 displays the results of this analysis for the 2035 alternative routing scenario with strong growth assumptions.

**Table 6-10 Paterson Ferry Interchange Merge/Diverge Analysis,
Alternate Routing Scenario, 2035 Strong Growth Scenario**

| Area | v/c |
|----------------------------------|------|
| EB I-84 & Paterson Ferry Diverge | 0.32 |
| EB I-84 & Paterson Ferry Merge | 0.27 |
| WB I-84 & Paterson Ferry Diverge | 0.26 |
| WB I-84 & Paterson Ferry Merge | 0.25 |

These findings demonstrate that the re-routing of the trips generated by the Morrow County Port Industrial Zone via an assumed new connection to Paterson Ferry Road would not require capacity improvements at the I-84/Paterson Ferry Road interchange.



Appendix A Detailed Land Use Calculations



Table A-1: Morrow County Depot Industrial Zone Future (2035) Development Summary

| | Total Acres | Net Acres @ 0.8 | FAR | Total SF | 65% of Build Out | Employees /SF | Total Employees |
|---|-------------|-----------------|-------|----------|------------------|---------------|-----------------|
| 2035 Build-Out Scenario | | | | | | | |
| Port Industrial | 913 | 730.0 | 0.025 | 795,406 | n/a | 3000 | 265 |
| Port Industrial - Restricted (No Employment Forecast) | 959 | n/a | n/a | n/a | n/a | n/a | n/a |
| Total: | | | | 795,406 | | | 265 |
| 65% of Build-Out Scenario | | | | | | | |
| Port Industrial | 913 | 730.0 | 0.025 | 795,406 | 516,750 | 3000 | 172 |
| Port Industrial - Restricted (No Employment Forecast) | 959 | n/a | n/a | n/a | n/a | n/a | n/a |
| Total: | | | | 795,406 | 516,750 | | 172 |

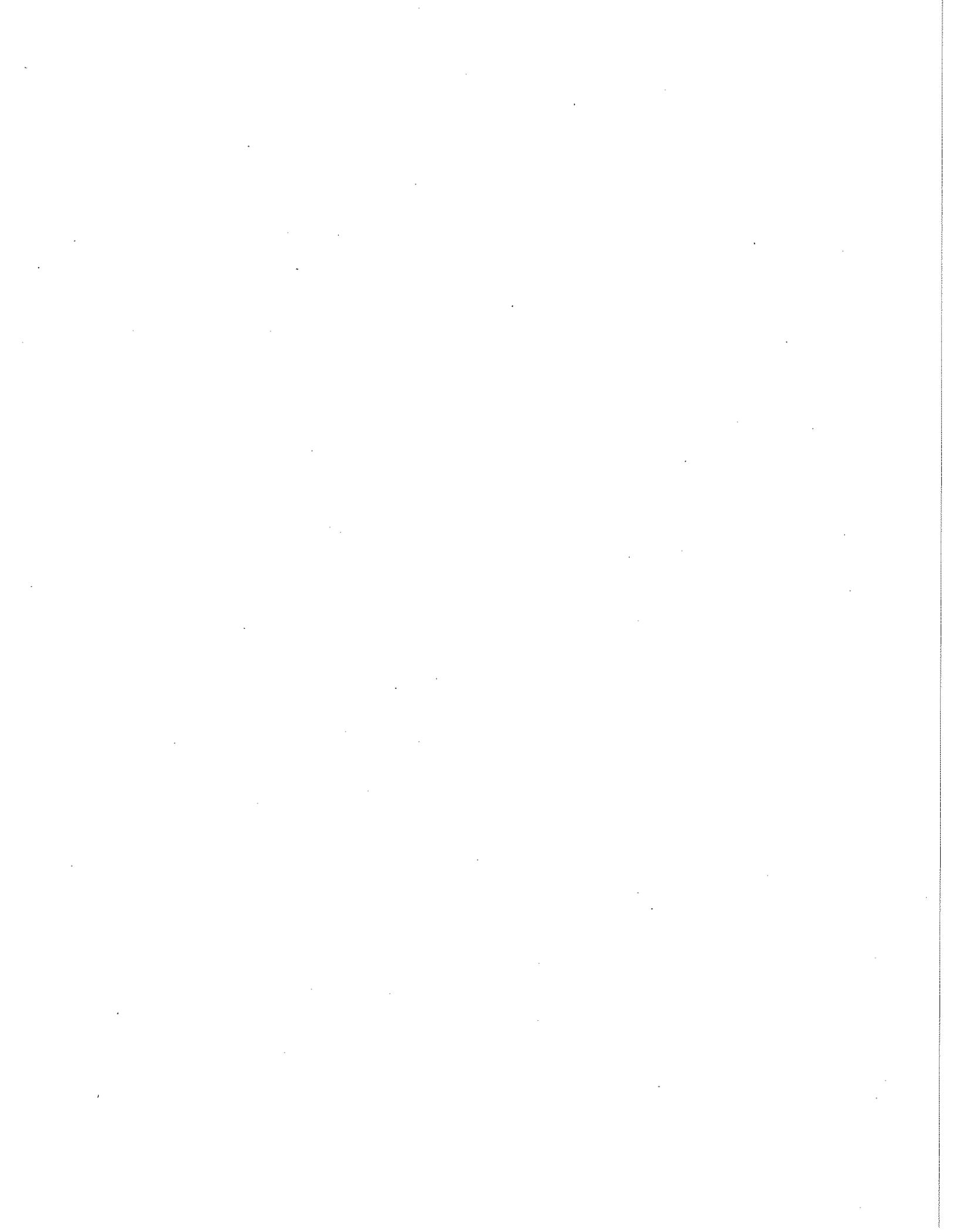


Table A-2: Umatilla County Depot Industrial Zone Future (2035) Development Summary

| | Total Acres | Net Acres @ 0.8 | FAR | Total SF | 65% of Build Out | Employees / SF | Total Employees |
|---|--------------------|------------------------|------------|-----------------|-------------------------|-----------------------|------------------------|
| 2035 Build-Out Scenario | | | | | | | |
| Depot Industrial 1 Employment | 824 | 659 | 0.05 | 1,435,738 | n/a | 2000 | 718 |
| Depot Industrial 1 Commercial | 60 | 48 | 0.25 | 522,720 | n/a | 500 | 1045 |
| Depot Industrial 2 Employment - (Red Cross Site - No Employment Forecast) | 129 | n/a | n/a | n/a | | n/a | n/a |
| Depot Industrial 3 Employment -(Demil Site) | 184 | 147 | 0.025 | 160,301 | n/a | 1000 | 160 |
| Depot Industrial 3 - Restricted (No Employment Forecast) | 81 | n/a | n/a | n/a | n/a | n/a | n/a |
| Total: | | | | 2,223,303 | | | 1,923 |
| 65% of Build-Out Scenario | | | | | | | |
| Umatilla Co. – Depot Industrial Zone | Total Acres | Net Acres @ 0.8 | FAR | Total SF | 65% of Build Out | Employees / SF | Total Employees |
| Depot Industrial 1 Employment | 824 | 659 | 0.05 | 1,435,738 | 933,229 | 2000 | 467 |
| Depot Industrial 1 Commercial | 60 | 48 | 0.25 | 522,720 | 339,768 | 500 | 680 |

Table A-2 continued...

| | | | | | | | |
|--|-----|-----|-------|------------------|------------------|------|--------------|
| Depot Industrial 2 Employment - (Red Cross Site - No Employment Forecast) | 129 | n/a | n/a | n/a | n/a | n/a | n/a |
| Depot Industrial 3 Employment -(Demil Site) | 184 | 147 | 0.025 | 160,301 | 104,196 | 1000 | 104 |
| Depot Industrial 3 - Restricted (No Employment Forecast) | 81 | n/a | n/a | n/a | n/a | n/a | n/a |
| Total: | | | | 2,223,303 | 1,377,193 | | 1,251 |

Table A-3: Umatilla County Westland Exception Area Build-Out (2035) Summary

| | Total Acres | Net Acres @ 0.8 | FAR | Total SF | Employees / SF | Total Employees |
|---|--------------|--------------------|------|----------------|-------------------|--------------------|
| Limited Rural Light Industrial | 30.0 | 24.0 | 0.1 | 104,544 | 3000 | 35 |
| Light Industrial | 64.2 | 51.0 | 0.1 | 223,724 | 2000 | 112 |
| Rural Tourist Commercial Lodging/Restaurant (South of I-84) | 14.1 | 11.0 | 0.25 | 122,839 | 1000 | 123 |
| Rural Tourist Commercial Service (South of I-84) | 7.4 | 6.0 | 0.25 | 64,469 | 1000 | 64 |
| Retail and Service (North of I-84 @ Lamb Rd) | 22.0 | 18.0 | 0.25 | 191,664 | 1000 | 192 |
| Total: | 137.7 | 110.0 | | 707,240 | | 526 |

Appendix B Detail Trip Generation
Calculations

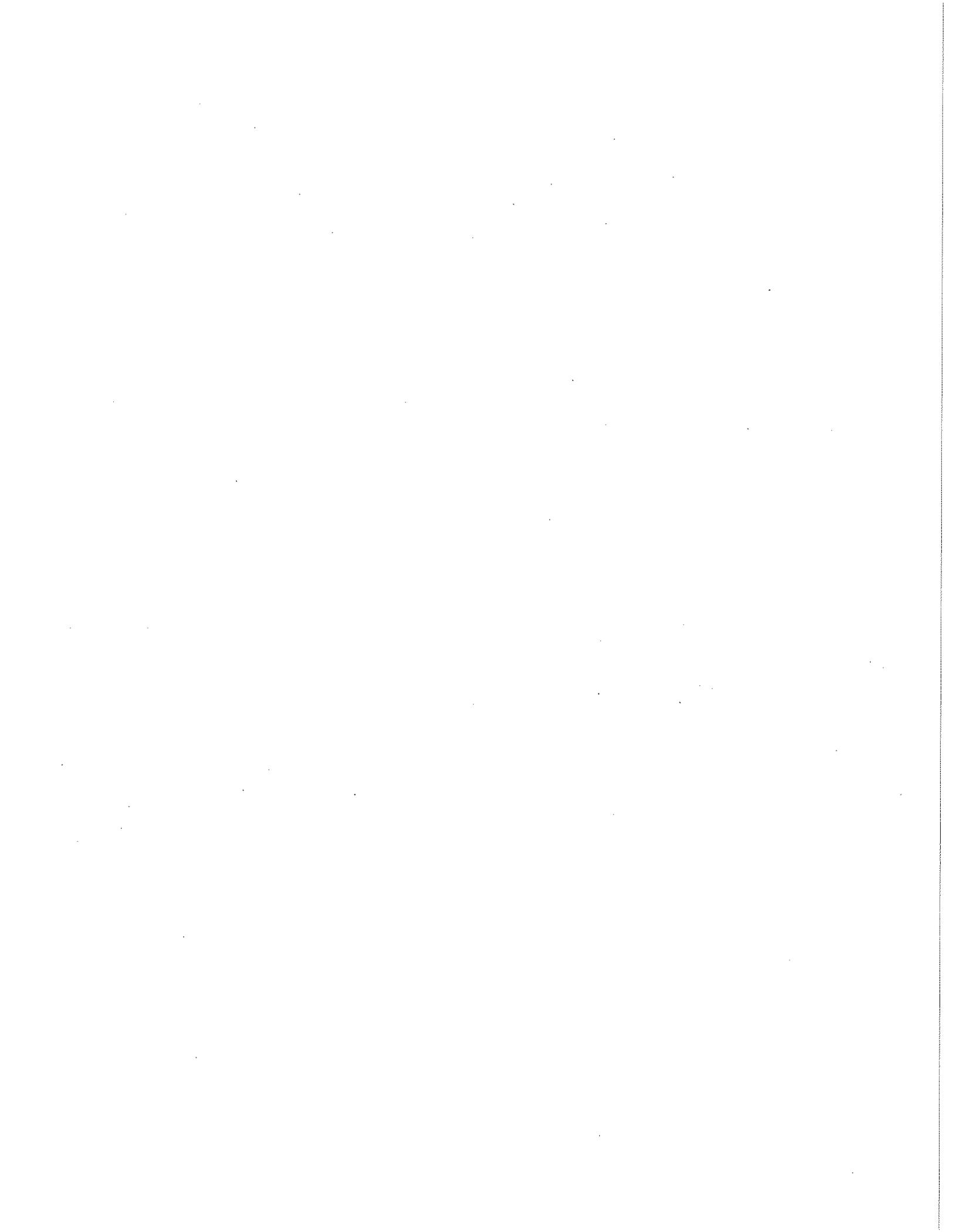


Table B-1: Westland Exception Area Trip Generation

| Land Use | ITE Code | Size | Weekday AM Peak Hour Trips | | | Weekday PM Peak Hour Trips | | |
|---|---|-----------------|----------------------------|------------|------------|----------------------------|------------|------------|
| | | | Total | In | Out | Total | In | Out |
| Westland Exception Area - Industrial | | | | | | | | |
| Industrial and Warehouse Uses | Rate Base on Existing Developments ¹ | 137,000 Sq. Ft. | 20 | 10 | 10 | 45 | 25 | 20 |
| Westland Exception Area - Commercial | | | | | | | | |
| Motel | 320 | 134 Rooms | 85 | 50 | 35 | 80 | 40 | 40 |
| Gas Station with Convince Market | 945 | 12 Pumps | 120 | 60 | 60 | 160 | 80 | 80 |
| Net New Trips | | | 225 | 120 | 105 | 285 | 145 | 140 |

1 A local industrial and warehouse trip generation rate was calculated based on the developed portion of the Westland Exception Area located north of I-84, south of the rail road tracks, east I-82, and west of Westland Road. Aerial photography was used to calculate the square footage of the buildings occupying this area. Using traffic counts obtained in October 2013, an a.m. peak hour trip generation rate of 0.14 trips per 1000 sq. ft. of buildings was calculated; a p.m. peak hour trip generation of 0.33 trips per 1000 sq. ft. of buildings was calculated.

Table B-2: Oregon National Guard Trip Generation¹

| ORNG Use | Weekday AM Peak Hour Trips | | | Weekday PM Peak Hour Trips | | |
|---|----------------------------|------------|-----------|----------------------------|-----------|------------|
| | Total | In | Out | Total | In | Out |
| Training Site Detachment ORNG Joint Force Headquarter Training Site | 55 | 50 | 5 | 55 | 5 | 50 |
| Regional Training Institute | 22 | 20 | 2 | 22 | 2 | 20 |
| Tactical Unmanned System Platoon | 16 | 15 | 1 | 16 | 1 | 15 |
| Unit Equipment Training Site | 27 | 25 | 2 | 27 | 2 | 25 |
| Site Security Personal | 10 | 5 | 5 | 10 | 5 | 5 |
| Exchange Retail/Fuel Service | - | Internal | Internal | - | Internal | Internal |
| Net New Trips | 130 | 115 | 15 | 130 | 15 | 115 |

Table B-3: Port Industrial Zone Trip Generation

| Land Use | ITE Code | Size | Weekday AM Peak Hour Trips | | | Weekday PM Peak Hour Trips | | |
|---|----------|-----------------|----------------------------|-----------|-----------|----------------------------|-----------|-----------|
| | | | Total | In | Out | Total | In | Out |
| High Cube Warehouse / Distribution Center (Unrestricted Port Industrial Zone) | 152 | 477,243 Sq. Ft. | 70 | 40 | 25 | 160 | 15 | 40 |
| High Cube Warehouse / Distribution Center (Restricted Port Industrial Zone) | 152 | 501,288 Sq. Ft. | 70 | 45 | 30 | 60 | 20 | 40 |
| Net New Trips | | | 140 | 85 | 55 | 115 | 35 | 80 |

1944

1945

1946

1947

Table B-4: Depot Industrial Zone Trip Generation

| Land Use | ITE Code | Size | Weekday AM Peak Hour Trips | | | Weekday PM Peak Hour Trips | | |
|---------------------------------------|--|-----------------|----------------------------|------------|------------|----------------------------|------------|------------|
| | | | Total | In | Out | Total | In | Out |
| Depot Industrial - Sub Area 1 | | | | | | | | |
| Depot Industrial - Sub Area 1 | Rate Base on Existing Developments ¹ | 516,866 Sq. Ft. | 80 | 50 | 30 | 190 | 100 | 90 |
| Depot Commercial - Sub Area 1 | | | | | | | | |
| Motel | 320 | 80 Rooms | 50 | 30 | 20 | 50 | 25 | 25 |
| Gas Station with Convince Market | 945 | 8 Pumps | 80 | 40 | 40 | 120 | 60 | 60 |
| Truck Stop | 950 | 11,400 Sq. Ft. | 155 | 80 | 75 | 155 | 75 | 80 |
| Factory Outlet Center | 823 | 60,000 Sq. Ft. | 40 | 30 | 10 | 135 | 60 | 75 |
| .1 Fast Food Restaurant W/ Drive Thru | 934 | 3500 Sq. Ft. | 115 | 60 | 55 | 185 | 90 | 95 |
| Depot Industrial - Sub Area 2 | | | | | | | | |
| Restricted Use | -- | -- | -- | -- | -- | -- | -- | -- |
| Depot Industrial - Sub Area 3 | | | | | | | | |
| Data Center | Rate based on other data centers in Oregon and California ² | 160,000 Sq. Ft. | 40 | 20 | 20 | 40 | 10 | 30 |
| Net New Trips | | | 560 | 310 | 250 | 875 | 420 | 455 |

¹ A local industrial and warehouse trip generation rate was calculated based on the developed portion of the Westland Exception Area located north of I-84, south of the rail road tracks, east I-82, and west of Westland Road. Aerial photography was used to calculate the square footage of the buildings occupying this area. Using traffic counts obtained in October 2013, an a.m. peak hour trip generation rate of 0.14 trips per 1000 sq. ft. of buildings was calculated; a p.m. peak hour trip generation of 0.33 trips per 1000 sq. ft. of buildings was calculated.

²A trip generation rate and facility size for a data center was estimated based on prior work performed by Kittelson and Associates examining the trip generation of data centers in Oregon and California.

Appendix H
Technical Memorandum #7:
Interchange Area Concept
Development and Alternatives
Analysis



TECHNICAL MEMORANDUM #7

Umatilla Army Depot Combined IAMP and Transportation System Subarea Plan

Interchange Area Concept Development and Alternatives Analysis

Date: August 1, 2014 Project #:13848
 To: TPAC
 From: Matt Hughart, AICP, Pat Marnell, Marc Butorac, P.E., P.T.O.E.

This memorandum documents the development and evaluation of interchange form concepts for the Umatilla Army Depot IAMP study area interchanges. This memorandum includes:

- Review of 2035 Background and Total Traffic Operations
- Overview of the process used to develop initial concepts
- Qualitative assessment of initial concepts and preliminary recommendation for refinement

REVIEW OF 2035 BACKGROUND TRAFFIC CONDITIONS

As documented in Technical Memorandum #6, a future year 2035 “Background” traffic operations analysis was prepared for the three study interchanges. This forecast scenario assumes continued local and regional traffic growth (based on the currently adopted Morrow and Umatilla County comprehensive plans and traffic growth to/from the Westland Road Exception Area and surrounding population centers), but does not include traffic growth from assumed reuse/redevelopment of the Umatilla Army Depot. The results of this analysis are summarized in Table 7-1 and indicate that all of the study interchanges are forecast to continue to operate within acceptable mobility targets.

Table 7-1 - 2035 Background Traffic Operations Summary

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Mobility Target | Meets Standard? |
|---|----------------------|------|----------------------|------|-----------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.04 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.08 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Road | A | 0.02 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Road | A | 0.07 | A | 0.02 | v/c < 0.70 | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | E | 0.59 | B | 0.11 | v/c < 0.70 | Yes |
| I-82 NB Ramp Terminal/ Lamb Road | B | 0.29 | C | 0.54 | v/c < 0.70 | Yes |

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It highlights the importance of using reliable sources and ensuring the accuracy of the information gathered.

3. The third part of the document focuses on the interpretation and analysis of the collected data. It discusses the various statistical and analytical tools used to identify trends and patterns in the data.

4. The fourth part of the document discusses the implications of the findings and the potential impact of the research. It highlights the need for further research and the importance of sharing the results with the relevant stakeholders.

Based on the results of this analysis, all of the interchange ramp terminals are forecast to have sufficient long-term capacity (in their existing form) to accommodate local and regional traffic growth assuming the Umatilla Army Depot property experiences no reuse or intensification of current uses. Given that Morrow County, Umatilla County, and ODOT have no identified improvement projects at these interchanges, these findings suggest that all three interchanges can continue to provide adequate capacity for future "Background" traffic growth without any major operational improvements.

REVIEW OF 2035 TOTAL TRAFFIC CONDITIONS

Technical Memorandum #6 also summarizes Year 2035 "Total" traffic operations analyses for the study interchanges. This forecast scenario includes all of the traffic growth from the "Background" scenario and the estimated traffic growth from the anticipated reuse/redevelopment of the Umatilla Army Depot (Oregon National Guard, Morrow County Port Industrial zone, and Umatilla County Depot Industrial zones). Recognizing the potential for variability in long-term growth on the Umatilla Army Depot site, "Strong", "Moderate", and "Strong (w/alternative Morrow County Port Industrial routing to Paterson Ferry Road)" growth scenarios were analyzed as defined and documented in Technical Memorandum #6. The results of this analysis are summarized in Table 7-2.

Table 7-2 - 2035 Total Traffic Operations Summary

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| Strong Growth Scenario | | | | | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.04 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.08 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Road | B | 0.25 | C | 0.23 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Road | B | 0.63 | B | 0.20 | v/c < 0.70 | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | 1.13 | C | 0.52 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.56 | F | 0.94 | v/c < 0.70 | No |
| Moderate Growth Scenario | | | | | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.03 | A | 0.03 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.07 | A | 0.04 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Road | B | 0.10 | C | 0.15 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Road | B | 0.26 | B | 0.16 | v/c < 0.70 | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | .90 | C | 0.40 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.37 | C | 0.71 | v/c < 0.70 | No |

| Intersection | Weekday AM Peak Hour | | Weekday PM Peak Hour | | Standard | Meets Standard? |
|---|----------------------|------|----------------------|------|------------|-----------------|
| | LOS | V/C | LOS | V/C | | |
| Strong Growth Scenario (with alternative Morrow County Port Industrial routing to Paterson Ferry Road) | | | | | | |
| I-84 EB Ramp Terminal/ Paterson Ferry Road/Frontage Road | A | 0.08 | A | 0.07 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Paterson Ferry Road | A | 0.16 | A | 0.09 | v/c < 0.70 | Yes |
| I-84 EB Ramp Terminal/ Army Depot Road | B | 0.13 | C | 0.16 | v/c < 0.70 | Yes |
| I-84 WB Ramp Terminal/ Army Depot Road | B | 0.47 | B | 0.17 | v/c < 0.70 | Yes |
| I-82 SB Ramp Terminal/ Lamb Road | F | 1.13 | C | 0.52 | v/c < 0.70 | No |
| I-82 NB Ramp Terminal/ Lamb Road | C | 0.56 | F | 0.94 | v/c < 0.70 | No |

Review of I-84/Patterson Ferry Road Interchange Operations

As shown in Table 7-2, the I-84/Patterson Ferry Road interchange is forecast to operate with sufficient capacity under 2035 total traffic conditions, even when considering the potential increase in vehicle and truck trips from the alternative Port Industrial routing scenario. This is due to relatively minimal traffic volumes and the predominately rural character of the interchange service area. As such, no capacity-related improvements are likely to be needed at this interchange within the 2035 horizon year of the Umatilla Army Depot IAMP. Instead, any long-term improvement plans will need to focus primarily on geometric enhancements to the freeway ramps to potentially accommodate increased Port Industrial Zone generated truck trips. This includes lengthening the ramps to provide a longer deceleration zone on the westbound and eastbound off-ramps.

Review of I-82/Lamb Road Interchange Operations

As summarized in Table 7-2, both the northbound and southbound I-82/Lamb Road ramp terminals are forecast to operate either over capacity or exceed the 0.70 mobility target with inclusion of assumed traffic growth from either the "Strong" or "Moderate" growth scenarios. In addition, a 95th percentile queuing analysis found that estimated vehicle queues on the I-82/NB Lamb Road off-ramp are forecast to exceed the storage capacity under the "Strong" growth scenario.

Coupled with these long-term "Total" traffic operations findings, a review of the overall interchange form indicates that it has several substandard features that would need to be addressed before it could safely and efficiently accommodate any level of reuse/redevelopment on the Army Depot site. These features include:

- The access road that serves the Army Depot site from the interchange is a two-lane roadway with a tight geometry/layout that cannot adequately accommodate large trucks and significant increases in freeway-oriented traffic volumes. At any level of

reuse/redevelopment of the Army Depot site, this access road would need to be completely rebuilt and aligned to the interchange in a manner that would better meet the needs of freeway oriented industrial and commercial traffic.

- The NB and SB ramps all intersect the Lamb Road crossroad at large skew angles. These skew angles are not problematic under existing and “Background” traffic conditions given the orientation of traffic patterns and lack of conflicting traffic volumes to/from the Army Depot site. However, these large skew angles would need to be adjusted to accommodate the increased presence of freeway oriented truck and oversized vehicle traffic to/from the Army Depot site.
- Both the NB and SB ramp terminals have single-lane off-ramp approaches. These single-lane off-ramps are sufficient to accommodate existing and 2035 “Background” traffic conditions given the orientation of traffic patterns. However, the off-ramps would need to be widened to include separate left- and through/right-turn lanes at the ramp terminals to accommodate anticipated vehicle queues and turning movements.

Potential for Development /Land Use Phasing

Based on the I-82/Lamb Road interchange form review, it can be concluded that some basic interchange improvements (Army Depot access road reconstruction/realignment, interchange ramp skew angles, and off-ramp widening) would be needed to ensure that the I-82/Lamb Road interchange could safely and efficiently accommodate the various levels of traffic generated from the assumed reuse/redevelopment of the Army Depot site. In addition, the 2035 “Total” traffic operations findings indicate that the interchange ramp terminals will not have sufficient long-term capacity to handle the estimated increases in site-generated traffic under both the “Strong” and “Moderate” growth scenarios. As such, additional capacity-based enhancements will likely be needed at the ramp terminals.

Although physical improvements such as signalization, ramp terminal widening, and roundabouts are a few ways to mitigate the noted ramp terminal capacity deficiencies, development and land use phasing on the Army Depot site can also be used to keep traffic growth at levels that wouldn’t require some of these added forms of physical capacity-enhancing mitigation. In recognition that the I-82/Lamb Road interchange still has some additional capacity under the 2035 “Background” traffic scenario, an operations analysis was performed to roughly determine when either the mobility targets or vehicle queuing parameters would be exceeded at the I-82/Lamb Road interchange terminals when “phasing” reuse/redevelopment of the Army Depot site. As shown in Table 7-3, it was found that the I-82/Lamb Road interchange could roughly accommodate approximately 422,000 square feet of industrial/commercial development (or approximately 55% of the “Moderate” growth scenario) before

additional capacity-based mitigation at the ramp terminals would be needed¹. The traffic operations results are summarized in Figure 7-1.

Table 7-3 - Comparison of "Strong", "Moderate", and "Phased Land Use" Growth Scenarios

| | Gross / Net Acres | Total Square Feet | Total Employees |
|--------------------------------------|-------------------|-------------------|-----------------|
| 2035 Strong Growth Scenario | 3150/1687 | 1,525,471 SF | 1,233 |
| 2035 Moderate Growth Scenario | 3150/1687 | 768,050 SF | 867 |
| 2035 Phased Land Use Growth Scenario | 3150/1687 | 422,428 SF | 476 |

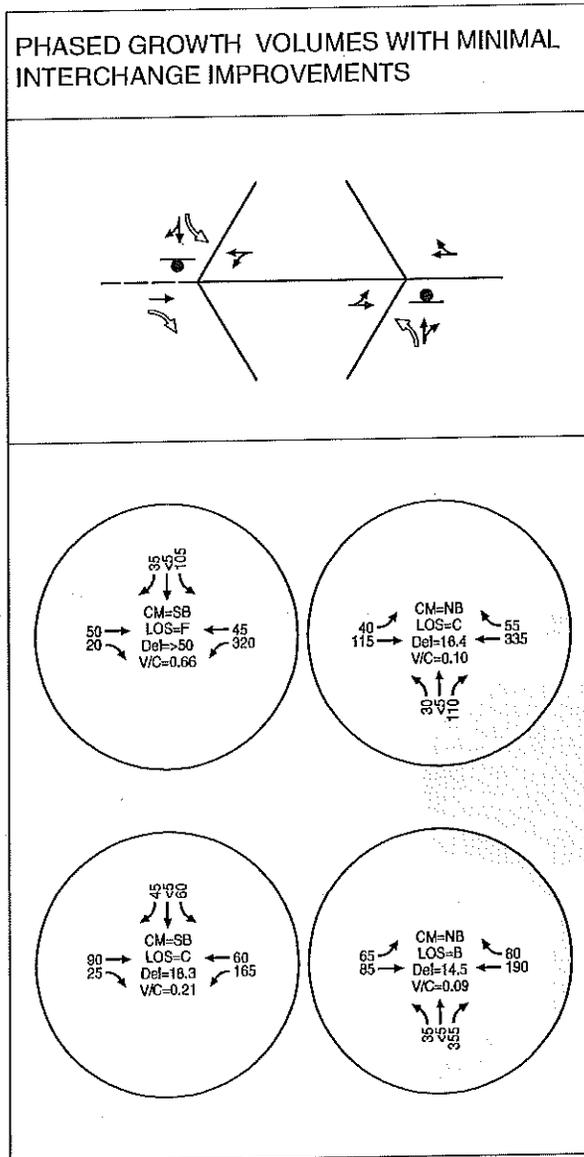
As demonstrated by this analysis, there is additional capacity beyond the 2035 "Background" traffic conditions to allow some level of reuse/redevelopment on the Army Depot site without requiring the additional levels of capacity enhancing mitigation at the interchange ramp terminals¹. However, as documented in Table 7-3, this amount of development is significantly less than what the envisioned land use plans would allow.

Review of I-84/Army Depot Access Road Operations

As summarized in Table 7-2, the I-84/Army Depot Access Road interchange is forecast to operate with sufficient capacity under 2035 total traffic conditions. As such, no capacity-related improvements are likely to be needed at this interchange within the 2035 horizon year of the Umatilla Army Depot IAMP.

A review of the overall interchange form indicates that it has several substandard features that may need to be addressed based on how the Army Depot site is reused and redeveloped. In particular, both the eastbound and westbound on/off ramps have substandard deceleration and acceleration lanes. These acceleration and deceleration lanes are not sufficient to safely and efficiently accommodate increased quantities of large industrial and freeway-oriented truck traffic. However, if the interchange was primarily limited to typical/daily Oregon National Guard (ORNG) use (primarily passenger cars but not including large trucks and oversized vehicles), the interchange ramps would likely not need to be modified. With the vertical clearance limitation of the adjacent Union Pacific Railroad underpass, most oversized vehicle and truck access will naturally have to utilize alternative access points such as the I-82/Lamb Road interchange or arrive via rail access. As such, any long-term improvement plans will need to focus primarily on local roadway connectivity and access management planning as it relates to the adjacent interchange property access points and county roadways such as Gun Club Lane.

¹ Assuming reconstruction/realignment of the Army Depot access road, realignment of the interchange ramps to eliminate the skew angles, and a widening of the NB and SB off-ramps to include separate left- and through/right-turn lanes.



H:\profile\13946 - Umatilla Subarea Plan and Combined IAMP\dwg\figs\13946_Fig002.3.dwg Mar 20, 2014 - 3:12pm - pmamell Layout Tab: Phased

| LEGEND | | |
|---|-----------------------|------------|
| CM = CRITICAL MOVEMENT (TWSC) | EXISTING ROADWAY | STOP SIGN |
| LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC) | NEW/IMPROVED ROADWAY | SIGNAL |
| Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC) | EXISTING MOVEMENT | ROUNDABOUT |
| V/C = CRITICAL VOLUME-TO-CAPACITY RATIO | NEW/IMPROVED MOVEMENT | |
| TWSC = TWO-WAY STOP CONTROL | | |
| AWSC = ALL-WAY STOP CONTROL | | |

LAMB ROAD OPERATIONS WITH PHASED GROWTH UMATILLA, OREGON **FIGURE 7-1**

CONCEPT DEVELOPMENT PROCESS AND INITIAL CONCEPTS

Based on the results of the 2035 "Total" traffic operations, the project team developed a number of interchange reconfiguration concepts that would potentially mitigate the noted interchange form, capacity, or queuing deficiencies at the interchanges. The following summarizes the respective concepts.

I-82/Lamb Road Interchange

To address these geometric concerns and the noted operational deficiencies, eight separate interchange improvement concepts were developed for the I-82/Lamb Road interchange. Simple single-line sketches of each concept are summarized in Table 7-4 along with a narrative that describes the various improvement components.

Table 7-4 - I-82/Lamb Road Interchange Improvement Concepts

| Concept | Description of Improvements Included in Each Concept |
|---|---|
| <p>Concept L1 – No Interchange Improvements</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Maintains existing on- and off-ramp length and traffic control. <p>→With noted improvements, this concept can only reasonably accommodate 2035 Background traffic conditions.</p> |
| <p>Concept L2 – Minimally Improved Diamond</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Widens the northbound and southbound off-ramps to include separate left- and shared through/right-turn lanes. • Maintains the existing stop control at the ramp terminals. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions and the Phased growth scenario.</p> |

| Concept | Description of Improvements Included in Each Concept |
|---|--|
| <p>Concept L3 – Minimally Improved Diamond with Partial Signalization</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Widens the northbound and southbound off-ramps to include separate left- and shared through/right-turn lanes. • Signalizes the southbound ramp terminal. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.</p> |
| <p>Concept L4 – Improved Diamond with a Widened Lamb Road Cross Road</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Widens the northbound and southbound off-ramps to include separate left- and shared through/right-turn lanes. • Widens the Lamb Road cross road to three-lanes (includes a widened Lamb Road overpass). <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions and the Phased growth scenario.</p> |
| <p>Concept L5 - Improved Diamond with a Widened Lamb Road Cross Road and Partial Signalization</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Widens the northbound and southbound off-ramps to include separate left- and shared through/right-turn lanes. • Widens the Lamb Road cross road to three-lanes (includes a widened Lamb Road overpass). • Signalizes the southbound ramp terminal. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.</p> |

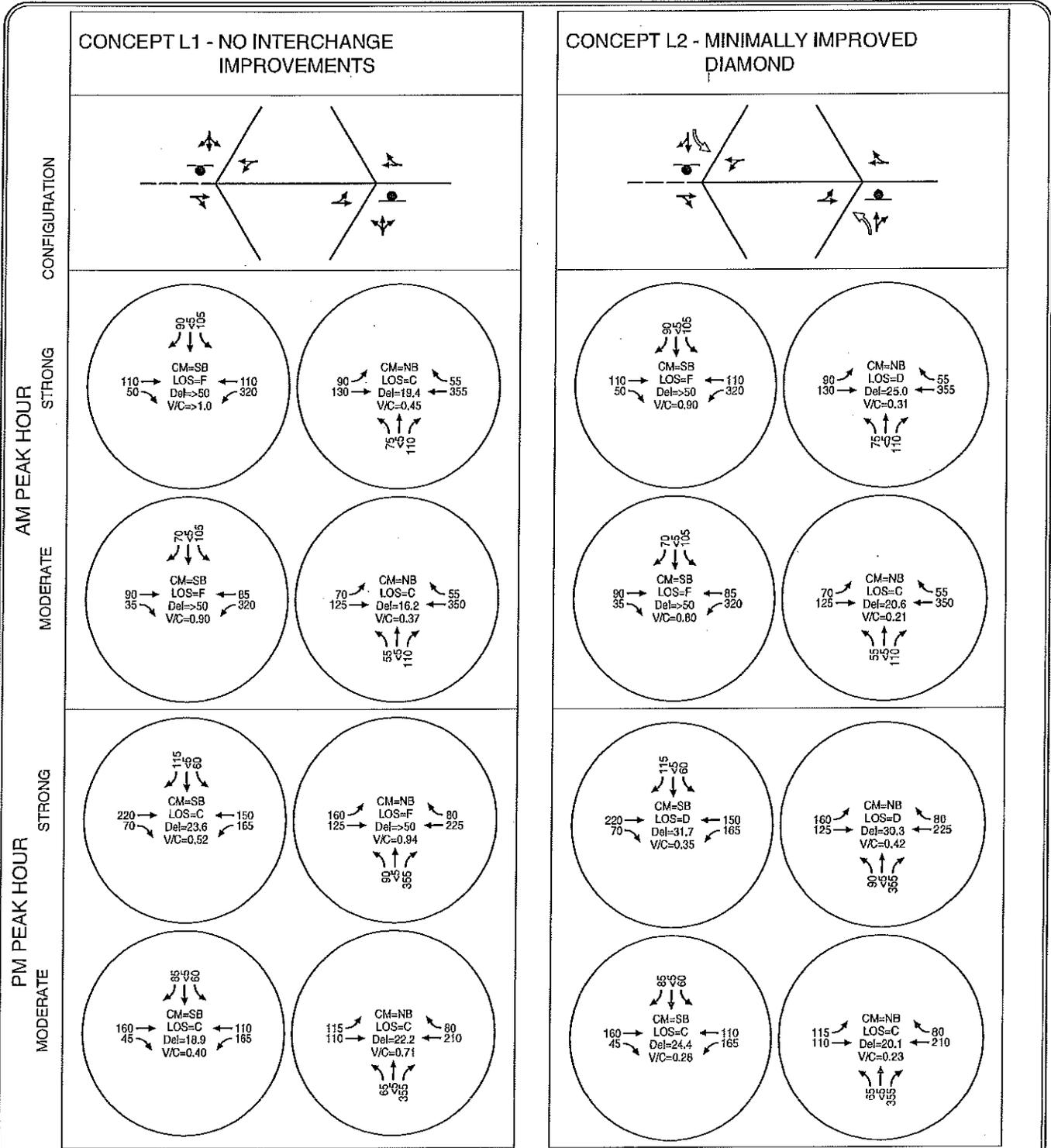
| Concept | Description of Improvements Included in Each Concept |
|--|---|
| <p>Concept L6 - Improved Diamond with Roundabout at the SB Ramp Terminal</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Widens the northbound off-ramp to include separate left- and shared through/right-turn lanes. • Installs a roundabout at the southbound ramp terminal. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.</p> |
| <p>Concept L7 - Improved Diamond with Roundabouts at both the SB and NB Ramp Terminals</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound and southbound off-ramps to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Installs a roundabout at the northbound and southbound ramp terminals. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.</p> |
| <p>Concept L8 - Single Quadrant PARCLO A</p>  | <ul style="list-style-type: none"> • Realigns the cross road approach to/from the Army Depot site to better accommodate anticipated industrial and freeway oriented traffic growth. • Lengthens and improves the geometry of the northbound off-ramp to better accommodate a wider range of vehicle types and anticipated vehicle queues. • Installs a looping southbound on-ramp. • Realigns the southbound off-ramp with widening to include a separate left- and right-turn lane. <p>→With noted improvements, this concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.</p> |

Traffic Operations Evaluation of Initial Concepts

As documented in Table 7-4, multiple interchange variations have been developed to accommodate the geometric deficiencies and better serve long-term forecast traffic volumes under the "Strong" and "Moderate" growth scenarios. Figures 7-2 through 7-5 illustrate the forecast traffic volumes and operational results associated with each concept. As shown in the figures, the following conclusions can be drawn:

- Both the NB and SB off-ramps will need to be squared up and widened to provide a separate left and through/right-turn lane at the Lamb Road interchange terminal under any assumed future reuse/redevelopment scenario.
- The NB ramp terminal can operate adequately (when widened as described in the above bullet) as an unsignalized intersection under any assumed future reuse/redevelopment scenario.
- The SB ramp terminal will require long-term traffic control (signalization) or a roundabout under the "Strong" and "Moderate" growth scenarios.
- A single-lane roundabout will provide sufficient long-term capacity at the SB ramp terminal.
- Lamb Road does not need to be widened to three lanes.

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LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

EXISTING ROADWAY:

NEW/IMPROVED ROADWAY:

EXISTING MOVEMENT:

NEW/IMPROVED MOVMENT:

STOP SIGN:

SIGNAL:

ROUNDABOUT:

LAMB ROAD CONCEPTS
L1 & L2
UMATILLA, OREGON

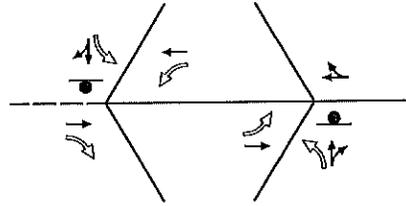
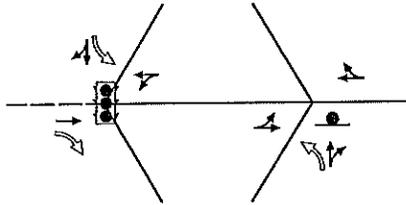
FIGURE 7-2

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CONCEPT L3 - MINIMALLY IMPROVED DIAMOND WITH PARTIAL SIGNALIZATION

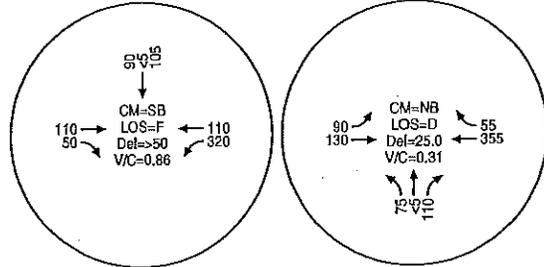
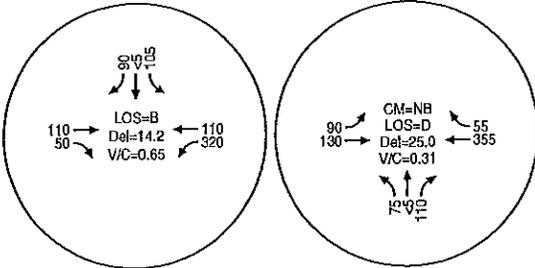
CONCEPT L4 - IMPROVED DIAMOND WITH A WIDENED LAMB ROAD CROSS ROAD

CONFIGURATION

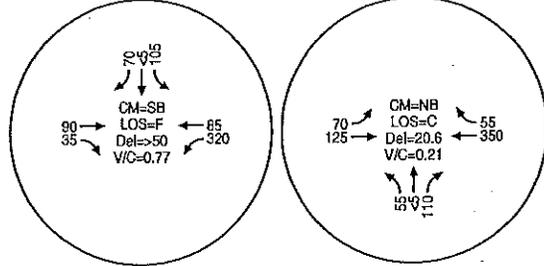
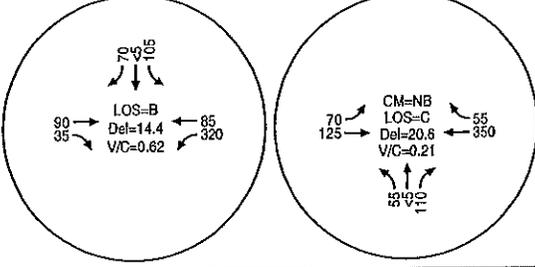


AM PEAK HOUR

STRONG

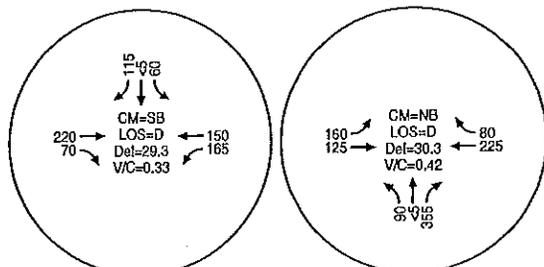
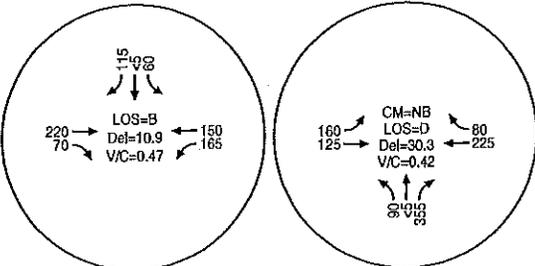


MODERATE

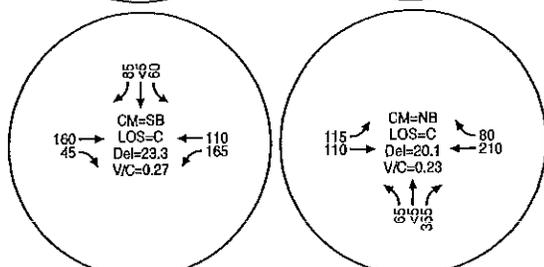
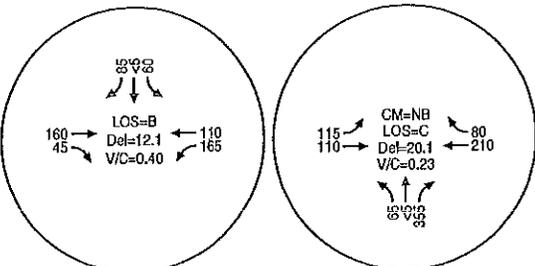


PM PEAK HOUR

STRONG



MODERATE



LEGEND

CM = CRITICAL MOVEMENT (TWSO)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSO)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSO)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
 TWSO = TWO-WAY STOP CONTROL
 AWSC = ALL-WAY STOP CONTROL

EXISTING ROADWAY
 NEW/IMPROVED ROADWAY
 EXISTING MOVEMENT
 NEW/IMPROVED MOVEMENT



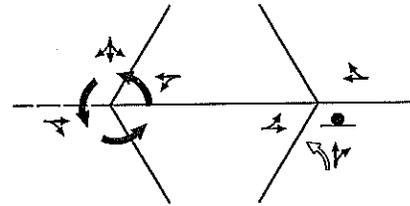
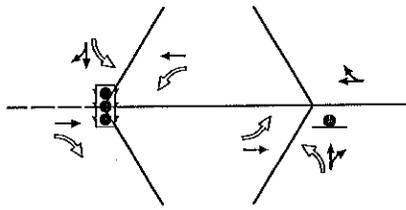
LAMB ROAD CONCEPTS L3 & L4 UMATILLA, OREGON

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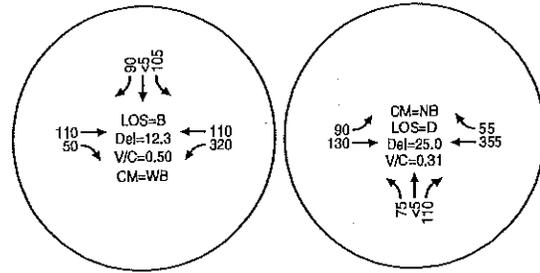
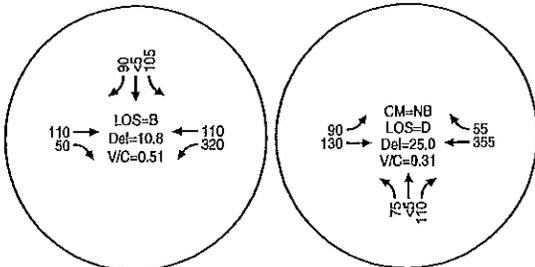
CONCEPT L5 - IMPROVED DIAMOND WITH A WIDENED LAMB ROAD CROSS ROAD & PARTIAL SIGNALIZATION

CONCEPT L6 - IMPROVED DIAMOND WITH ROUNDABOUT AT THE SB RAMP TERMINAL

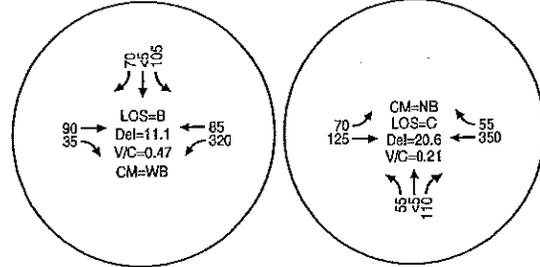
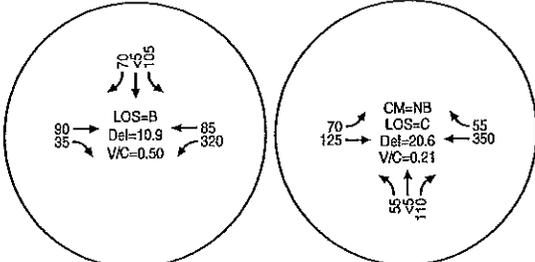
CONFIGURATION



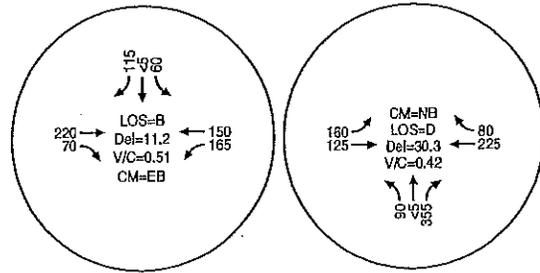
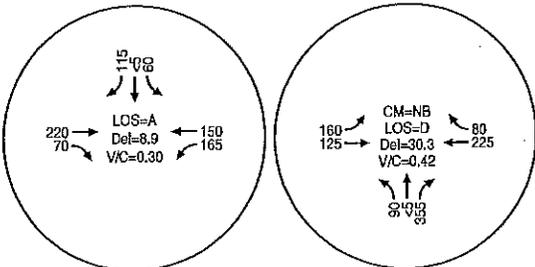
AM PEAK HOUR



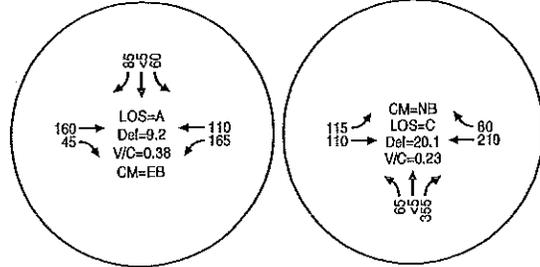
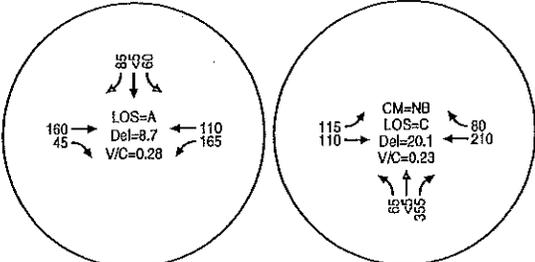
MODERATE



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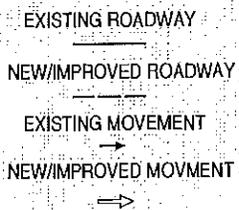


MODERATE



LEGEND

- CM = CRITICAL MOVEMENT (TWS)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWS)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWS)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
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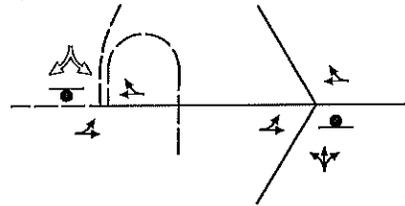
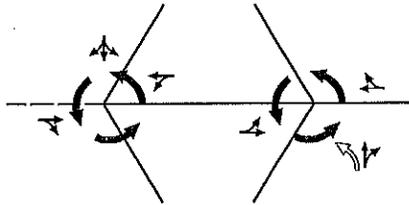


LAMB ROAD CONCEPTS L5 & L6 UMATILLA, OREGON

CONCEPT L6 - IMPROVED DIAMOND WITH ROUNDABOUT AT THE SB AND NB RAMP TERMINALS

CONCEPT L8 - SINGLE QUADRANT PARCLO A

CONFIGURATION

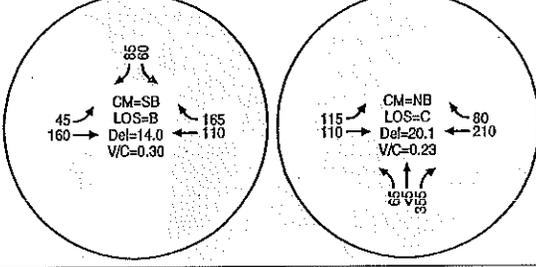
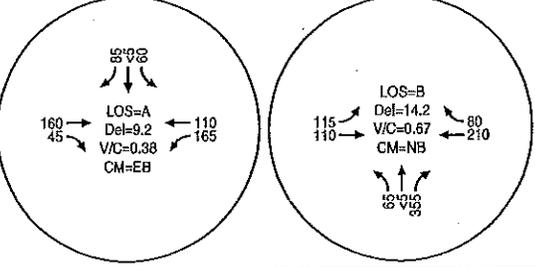
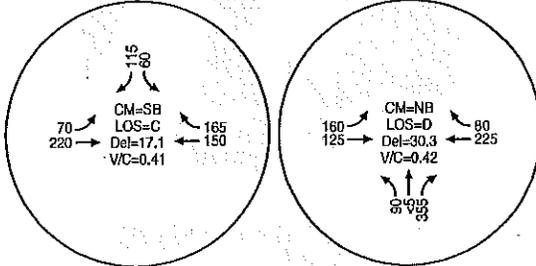
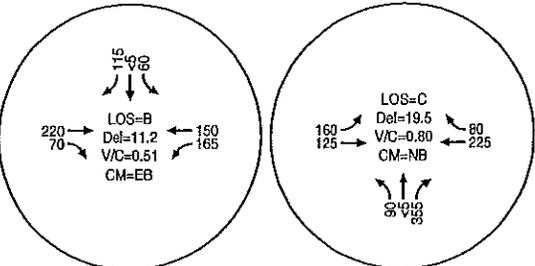
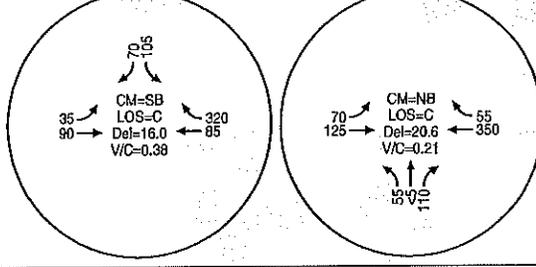
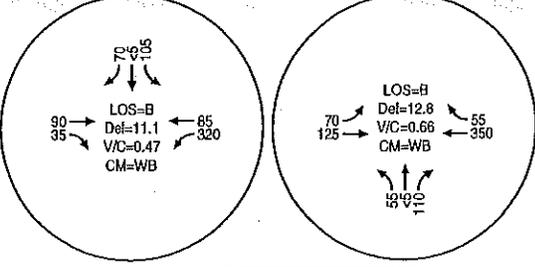
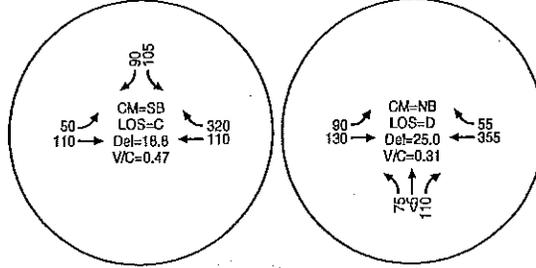
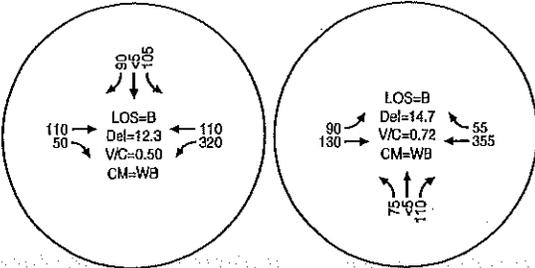


AM PEAK HOUR

MODERATE

PM PEAK HOUR

MODERATE



LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

- EXISTING ROADWAY
- NEW/IMPROVED ROADWAY
- EXISTING MOVEMENT
- NEW/IMPROVED MOVEMENT

- STOP SIGN
- SIGNAL
- ROUNDABOUT

LAMB ROAD CONCEPTS
L7 & L8
UMATILLA, OREGON

FIGURE
7-5

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I-84/ARMY DEPOT ACCESS INTERCHANGE

The I-84/Umatilla Army Depot Access Road interchange was constructed in 1967 to serve as the formal access to the Umatilla Army Depot. The interchange also provides access to Gun Club Lane and Ordnance/Frontage Road. Historically, the interchange has been a low-volume interchange. This is primarily due to fact that the Umatilla Army Depot has multiple points of access, the nearby Union Pacific Railroad underpass has a 15-foot vertical clearance limitation, and the surrounding land uses south of I-84 are rural in character. As such, some of the substandard interchange form characteristics (substandard on- and off-ramp lengths and close spacing of local roadways to the ramp terminals) have not been seen as a significant concern. However, reuse/redevelopment of the Army Depot site will result in changing traffic patterns at this interchange. To address these changing traffic patterns, several improvement concepts have been investigated as outlined in Table 7-5.

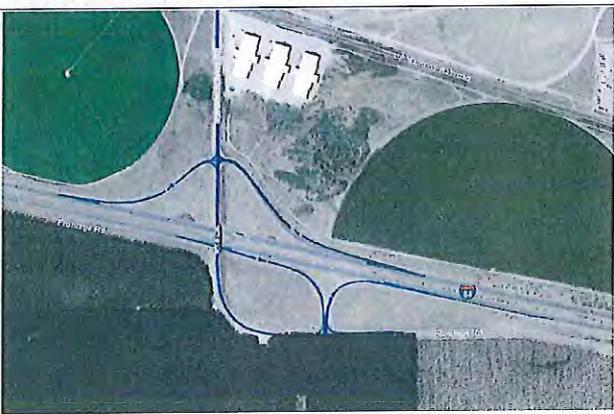
Table 7-5 – I-84/Umatilla Army Depot Access Road Interchange Improvement Concepts

| Concept | Description |
|---|--|
| <p>Concept A1 – No Interchange Improvements</p>  | <ul style="list-style-type: none"> • Maintains the existing on- and off-ramps. • Realigns Gun Club Lane and the opposing farm access road to maximize the distance from the interchange ramp terminal and the railroad underpass. <p>→With noted improvements, this concept can accommodate continued use of the interchange by the ORNG and limited employment-related traffic to/from the reuse/redevelopment of the Army Depot site.</p> |
| <p>Concept A2 – Minimally Improved Diamond</p>  | <ul style="list-style-type: none"> • Lengthens and improves the geometry of the eastbound and westbound on- and off-ramps to address substandard layout and better accommodate a wider range of uses. • Realigns Gun Club Lane and the opposing farm access road to maximize the distance from the interchange ramp terminal and the railroad underpass. <p>→With noted improvements, this concept can accommodate continued use of the interchange by the ORNG and larger amounts of employment-related traffic to/from the reuse/redevelopment of the Army Depot site.</p> |

I-84/Paterson Ferry Road Interchange

The I-84/Paterson Ferry Road interchange was developed into a full interchange in 2001. Since then, the interchange has been a low-volume interchange focusing on providing access to the area agriculture and farming uses. As such, the substandard off-ramp deceleration lengths have not been seen as a significant concern. However, the potential for Port Industrial zone access to Paterson Ferry Road could result in changing traffic patterns at this interchange. To address these changing traffic patterns, several improvement concepts have been investigated as outlined in Table 7-6.

Table 7-6 - I-84/Paterson Ferry Road Interchange Improvement Concepts

| Concept | Description |
|---|--|
| <p>Concept P1 – No Interchange Improvements</p>  | <ul style="list-style-type: none"> Maintains the existing interchange as is. <p>→ Can continue to accommodate projected traffic demand from existing land uses.</p> |
| <p>Concept P2 – Minimally Improved Diamond</p>  | <ul style="list-style-type: none"> Lengthens and improves the geometry of the eastbound and westbound off-ramps to address substandard layout and better accommodate a wider range of uses. <p>→ With noted improvements, this concept can accommodate potential truck and vehicular traffic from the re-routed Port Industrial zone trips via a new connection to Paterson Ferry Road.</p> |

PRELIMINARY QUALITATIVE EVALUATION OF INITIAL CONCEPTS

The consultant team conducted an evaluation and comparison of the initial concepts based on qualitative and quantitative measures. The comparison is intended to identify those concepts that do not have any "fatal flaws" and warrant a more detailed evaluation.

To help determine how to rank each of the concepts according to the evaluation criteria, a scoring system was developed. In essence, each evaluation criterion was assigned a range of numerical values (+2, +1, 0, -1, -2). The concept that achieve each metric better than others receive a "+2", those that do not impact the metric receive a "0", those that underperform compared to other concepts receive a "-2" score, and those that fall in between receive a "+1" or "-1" score. The following list outlines the elements considered in the initial evaluation and aspects of each element that characterized the variations between concepts.

These evaluation criteria were originally documented in Technical Memorandum #1.

- Transportation Operations
 - Geometric Safety
 - Mobility
 - Freight mobility
- Multimodal Accessibility
 - Transit mobility
- Land Use
 - Right-of-way impacts
 - Compatibility with land use
- Economic Development
 - Near-term growth accommodation
 - Long-term growth accommodation
- Environmental, Social, and Equity Factors
 - Environmental impacts
 - Socio-economic impacts
- Accessibility and Connectivity
 - Local roadway connectivity
 - Future access to undeveloped properties
 - Access spacing requirements

- Cost
 - Cost relative to other improvement concepts
- Implementation
 - Impacts to existing and proposed developments
 - Ability to construct in phases

Table 7-7 provides a summary of the preliminary evaluation of initial concepts. Detailed notes regarding the associated scores are provided in Appendix "A".

Table 7-7 - Initial Concept Evaluation and Screening Matrix

| Concept | Transportation Operations | Multimodal Accessibility | Land Use | Economic Development | Enviro, Social, and Equity Factors | Accessibility & Connectivity | Cost | Implementation | Average Score | Recommended for Additional Evaluation? |
|---|---------------------------|--------------------------|----------|----------------------|------------------------------------|------------------------------|------|----------------|---------------|--|
| I-84/Army Depot Road Interchange | | | | | | | | | | |
| A1 | -1 | 0 | 0 | -1 | 0 | 2 | 0 | 0 | 0.00 | Yes |
| A2 | 1 | 0 | 0 | 1 | 0 | 2 | -1 | -1 | 0.25 | Yes |
| I-82/Lanib Road Interchange | | | | | | | | | | |
| L1 | -2 | 0 | 0 | -2 | 0 | 2 | 0 | 0 | -0.25 | No |
| L2 | 0 | 0 | -1 | 1 | 0 | 2 | -1 | 0 | 0.125 | Yes |
| L3 | 2 | 0 | -1 | 2 | 0 | 2 | -1 | 0 | 0.50 | Yes |
| L4 | 0 | 0 | -2 | 1 | 0 | 2 | -2 | -1 | -0.25 | No |
| L5 | 2 | 0 | -2 | 2 | 0 | 2 | -2 | -1 | 0.125 | No |
| L6 | 2 | 0 | -1 | 2 | 0 | 2 | -1 | -1 | 0.375 | Yes |
| L7 | 2 | 0 | -2 | 2 | 0 | 2 | -2 | -2 | 0.00 | No |
| L8 | 2 | 0 | -2 | 2 | 0 | 2 | -2 | -1 | 0.125 | Yes |
| I-84/Paterson Ferry Road | | | | | | | | | | |
| P1 | -1 | 0 | 0 | -1 | 0 | 2 | 0 | 0 | 0.00 | Yes |
| P2 | 1 | 0 | 0 | 1 | 0 | 2 | -1 | 0 | 0.375 | Yes |

Table 7-8 provides information on the primary reason a concept was recommended for elimination and not considered for further evaluation. More detailed notes regarding the associated scores and supplemental to the information provided in Table 7-8 are provided in Appendix "A".

Table 7-8 - Concept Elimination Discussion

| Concept | Primary Reason for Concept Elimination |
|---------|--|
| L1 | Does not address the capacity and vehicle queuing limitations of the NB and SB ramp terminals. |
| L4 | Does not address the capacity limitations at the SB ramp terminal. Widening of Lamb Road and the existing overpass structure to three travel lanes is expensive, impactful, and not necessary to address the capacity and geometric deficiencies of the interchange. |
| L5 | Widening of Lamb Road and the existing overpass structure to three travel lanes is expensive, impactful, and not necessary to address the capacity and geometric deficiencies of the interchange. |
| L7 | A roundabout is not necessary to mitigate forecast traffic conditions at the NB ramp terminal. |

The findings and preliminary conclusions contained within this memorandum will be discussed in greater detail at the March 31, 2014 TPAC meeting.

DETAILED DEVELOPMENT OF SELECTED CONCEPTS

Based on the results of the screening process, more detailed drawings of each concept were prepared as documented in the figures below. Detailed drawings were not prepared for Concepts A-1 and P-1 as they represent No-Build scenarios.

I-84/Army Depot Access Road

As documented in the previous sections, the I-84/Army Depot Access Road interchange can accommodate anticipated growth from the Oregon National Guard and some limited reuse growth without major improvements. However, when considering the potential for accommodating traffic generated by the Port Industrial zone, the improvements shown in Exhibit 1 would be needed.

Exhibit 1 – Refined I-84/Army Depot Access Road Interchange Improvement Alternative



I-82/Lamb Road Interchange

Exhibit 2 - I-82/Lamb Road Interchange Improvements (Signalized SB Ramp Terminal)



Exhibit 3 - I-82/Lamb Road Interchange Improvements (Roundabout SB Ramp Terminal)



Exhibit 4 - I-82/Lamb Road Interchange Improvements (Single Quadrant PARCLO A)

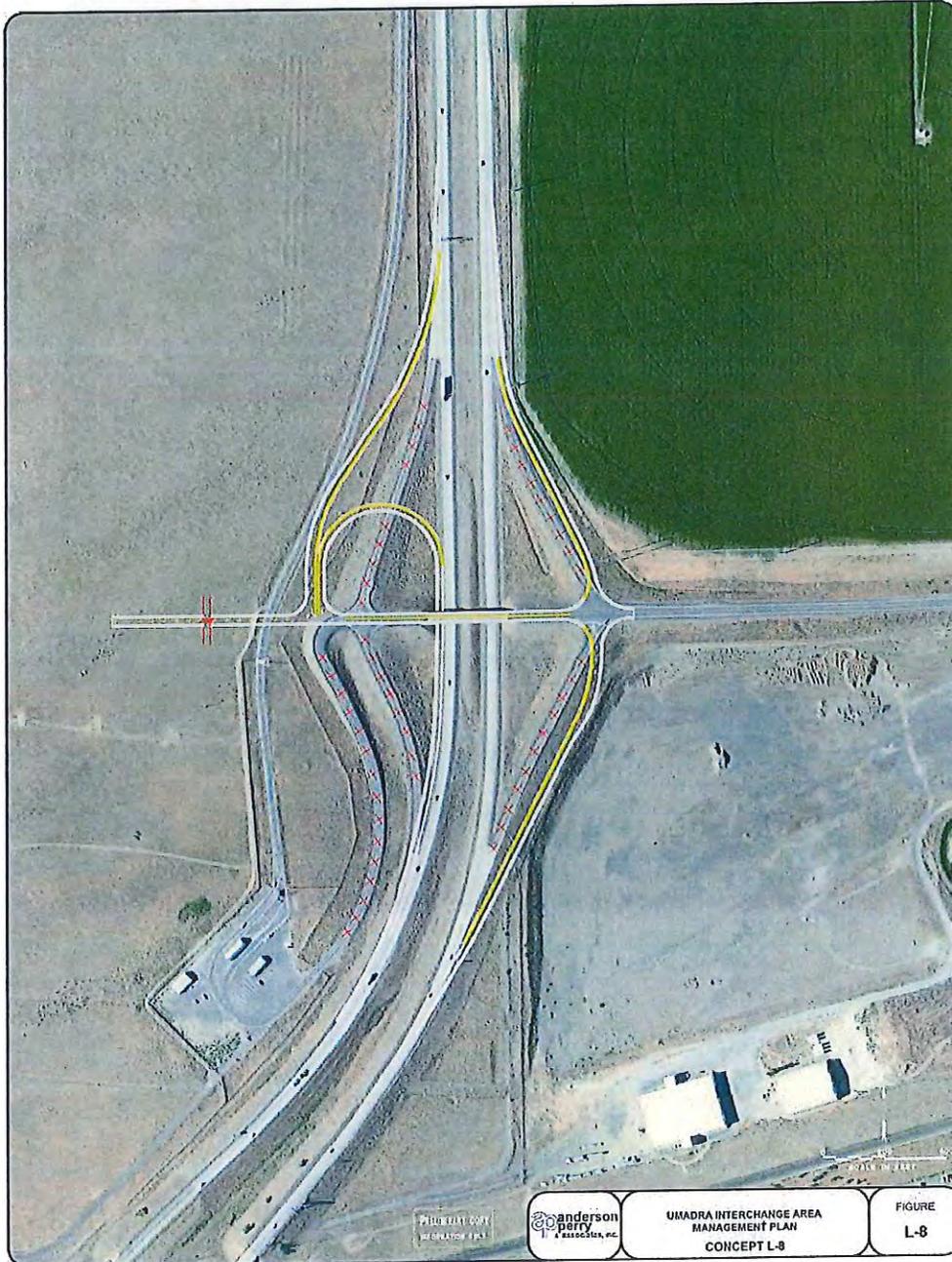


Exhibit 5 - I-84/Paterson Ferry Road Interchange Improvements (Lengthened EB and WB Off-Ramps)



Appendix A Detailed Concept Review



DETAILED CONCEPT REVIEW

This section details the quantitative analysis conducted to evaluate the concepts presented within this memorandum.

I-84/Army Depot Access Interchange

Concept A1 – No Interchange Improvements

Transportation Operations (-1)

- Does not address the substandard on- and off-ramp lengths (-). May not be an issue if truck and oversized vehicle traffic is restricted to other points of access such as the I-82/Lamb Road interchange.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot site.

Land Use (0)

- No right-of-way or property impacts to adjacent properties would occur with this concept.

Economic Development (-1)

- The overall interchange geometrics would not be improved, thereby minimizing the interchange's ability to safely and efficiently accommodate significant levels of long-term industrial and highway-oriented development.

Environmental, Social, and Equity Factors (0)

- The overall interchange geometrics would not be improved, so there would be no environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

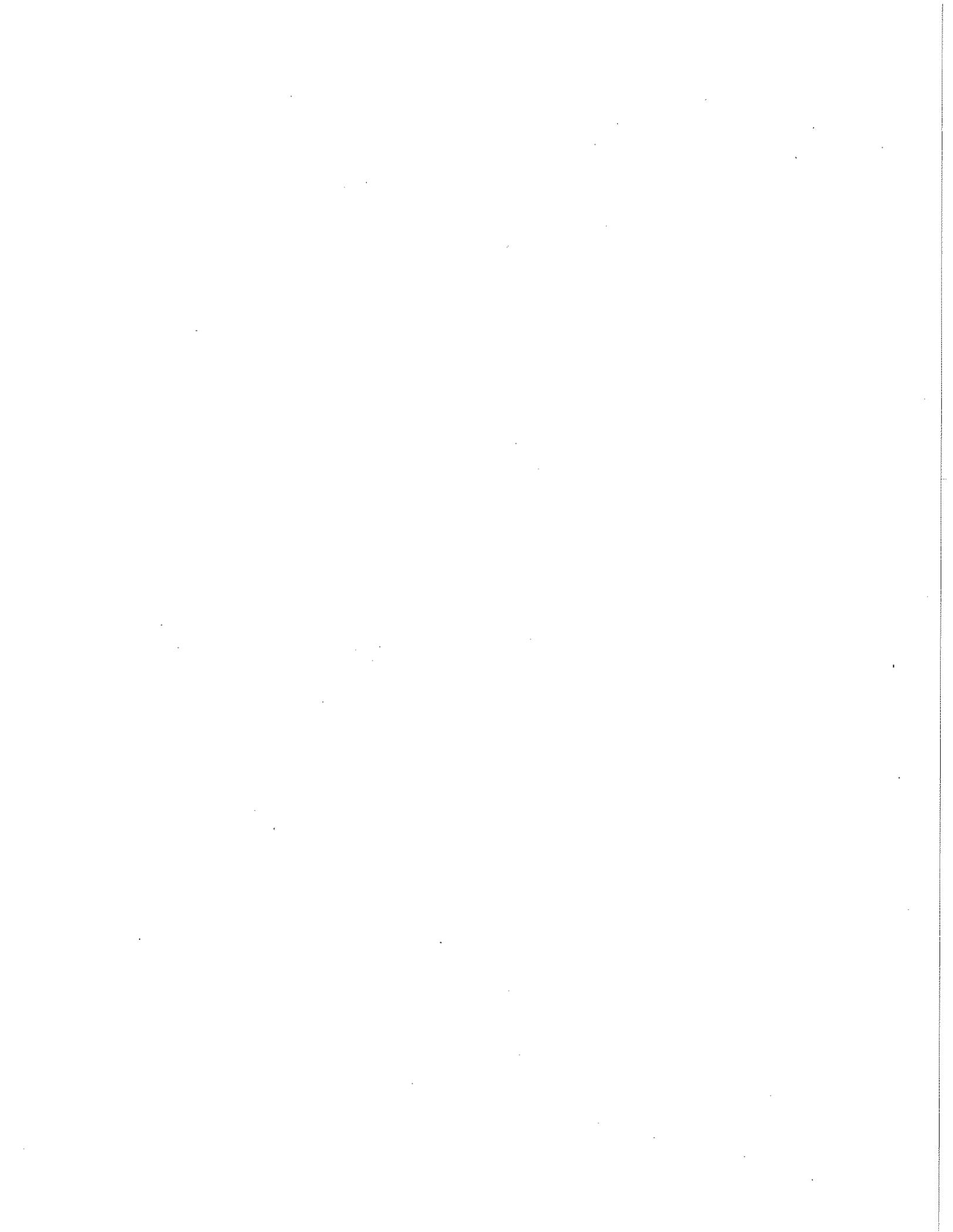
- A more formal access to Gun Club Lane would be created.

Cost (0)

- Least costly concept due to minimal geometric improvements and no property impacts.

Implementation (0)

- No implementation issues.



Concept A2 – Minimally Improved Diamond Interchange

Transportation Operations (+1)

- Lengthens the on- and off-ramps and brings them up to current design standards.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot site.

Land Use (0)

- No right-of-way or property impacts to adjacent properties would occur with this concept.

Economic Development (+1)

- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to safely and efficiently accommodate significant levels of long-term industrial and highway-oriented development.

Environmental, Social, and Equity Factors (0)

- The overall interchange geometrics would not be improved, so there would be no environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- A more formal access to Gun Club Lane would be created.

Cost (-1)

- More costly concept due to lengthening of the on- and off-ramps.

Implementation (-1)

- No implementation issues.

I-84/Paterson Ferry Road Access Interchange

Concept P1 – No Interchange Improvements

Transportation Operations (-1)

- Does not address the substandard off-ramp lengths (-). May not be an issue if there is no Port Industrial access via Paterson Ferry Road.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot site.

Land Use (0)

- No right-of-way or property impacts to adjacent properties would occur with this concept.

Economic Development (-1)

- The overall interchange geometrics would not be improved, thereby minimizing the interchange's ability to safely and efficiently accommodate Port Industrial traffic via the potential Paterson Ferry Road access.

Environmental, Social, and Equity Factors (0)

- The overall interchange geometrics would not be improved, so there would be no environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- Would have no accessibility/connectivity issues.

Cost (0)

- Least costly concept due to no geometric improvements and no property impacts.

Implementation (0)

- No implementation issues.

Concept P2 – Minimally Improved Diamond Interchange

Transportation Operations (+1)

- Lengthens the off-ramps and brings them up to current design standards.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot site.

Land Use (0)

- No right-of-way or property impacts to adjacent properties would occur with this concept.

Economic Development (+1)

- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to more safely and efficiently accommodate potential levels of vehicular and truck traffic generated by a Port Industrial connection to Paterson Ferry Road.

Environmental, Social, and Equity Factors (0)

- The overall interchange geometrics would not be improved, so there would be no environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- Would have no accessibility/connectivity issues.

Cost (-1)

- More costly concept due to lengthening of the off-ramps.

Implementation (0)

- No implementation issues.

I-82/Lamb Road Interchange

Concept L1 – No Interchange Improvements

Transportation Operations (-2)

- This concept can only reasonably accommodate 2035 Background traffic conditions.
- Interchange ramp terminals are forecast to operate over capacity with any significant level of Army Depot reuse/redevelopment. This will create long-term safety and capacity concerns, thereby inhibiting the ability to accommodate long-term traffic and freight growth.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Does not address the large skew angles where the NB and SB off-ramps intersection Lamb Road. The skew angles make it difficult to accommodate large trucks without tracking into adjacent travel lanes.
- Does not address the tangential exit of the NB off-ramp from I-82.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (0)

- No right-of-way or property impacts to adjacent properties outside of the right-of-way needed to accommodate the new crossroad approach to/from Army Depot.

Economic Development (-2)

- The overall interchange geometrics would not be improved, thereby minimizing the interchange's ability to safely and efficiently accommodate significant levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would not be improved, thereby minimizing the ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- The overall interchange geometrics would not be improved, so there would be no environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (0)

- Least costly concept due to minimal geometric improvements and no property impacts.

Implementation (0)

- No implementation issues.

Concept L2 – Minimally Improved Diamond Interchange

Transportation Operations (0)

- The SB Interchange ramp terminal is forecast to operate with high levels of delay under the “Strong” and “Moderate” growth scenarios. This will inhibit the ability to accommodate long-term traffic growth and freight related traffic.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange’s ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-1)

- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

Economic Development (+1)

- The overall interchange geometrics would be improved, thereby furthering the interchange’s ability to accommodate increased levels of long-term industrial and highway-oriented development.

- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles (+).

Environmental, Social, and Equity Factors (0)

- Minor interchange improvements are not anticipated to have environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-1)

- Some costs associated with the geometric improvements to the ramps and crossroad.

Implementation (0)

- No significant implementation issues.

Concept L3 – Minimally Improved Diamond Interchange with Signalization

Transportation Operations (+2)

- This concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.
- Signalization of the SB ramp terminal will improve the safety and efficiency of the interchange and ensure long-term accommodation of traffic growth and freight.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-1)

- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

Economic Development (+2)

- The overall interchange geometrics and traffic control would be improved, thereby ensuring the interchange can adequately accommodate increased levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- Minor interchange improvements are not anticipated to have environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-1)

- Some costs associated with the geometric improvements to the ramps and crossroad.

Implementation (0)

- No significant implementation issues.

Concept L4 – Improved Diamond Interchange with a Widened Lamb Road Cross Road

Transportation Operations (0)

- The SB Interchange ramp terminal is forecast to operate with high levels of delay. This will inhibit the ability to accommodate long-term traffic growth and freight related traffic.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-2)

- A widened Lamb Road cross road to three lanes would may require some right-of-way acquisition to the adjacent undeveloped property to the south.
- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

Economic Development (+1)

- The overall interchange geometrics would be improved, thereby furthering the interchange's ability to accommodate increased levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- Minor interchange improvements are not anticipated to have environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-2)

- Off-ramp realignments, widening of Lamb Road, and a wider overpass bridge would increase the cost of this concept compared to other concepts.

Implementation (-1)

- Minor implementation issues associated with the Lamb Road and overpass widening.

L5 - Improved Diamond Interchange with a Widened Lamb Road Cross Road and Partial Signalization

Transportation Operations (+2)

- This concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.
- Signalization of the SB ramp terminal will improve the safety and efficiency of the interchange and ensure long-term accommodation of traffic growth and freight.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-2)

- A widened Lamb Road cross road to three lanes would may require some right-of-way acquisition to the adjacent undeveloped property to the south.
- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

Economic Development (+2)

- The overall interchange geometrics and traffic control would be improved, thereby ensuring the interchange can adequately accommodate increased levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-2)

- Off-ramp realignments, widening of Lamb Road, and a wider overpass bridge would increase the cost of this concept compared to other concepts.

Implementation (-1)

- Minor implementation issues associated with the Lamb Road and overpass widening.

L6 - Improved Diamond Interchange with a Roundabout at the SB Ramp Terminal

Transportation Operations (+2)

- This concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.
- A roundabout at the SB ramp terminal will improve the safety and efficiency of the interchange and ensure long-term accommodation of traffic growth and freight.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-1)

- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

Economic Development (+2)

- The overall interchange geometrics and traffic control would be improved, thereby ensuring the interchange can adequately accommodate increased levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- Interchange improvements are not anticipated to have environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-1)

- Roundabout cost would be higher than a comparable signalized ramp terminal.

Implementation (-1)

- A roundabout would be harder to construct while maintaining traffic flow through the interchange.

L7 - Improved Diamond Interchange with Roundabouts at both the SB and NB Ramp Terminals

Transportation Operations (+2)

- This concept can accommodate 2035 Background traffic conditions, the Phased, Strong, and Moderate growth scenarios.
- A roundabout at the SB and NB ramp terminal will improve the safety and efficiency of the interchange and ensure long-term accommodation of traffic growth and freight.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersection Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact or preclude potential future transit accessibility to/from or within the Umatilla Army Depot future industrial area.

Land Use (-2)

- A realignment of the northbound off-ramp may require a small amount of right-of-way acquisition to the adjacent undeveloped property in the southeast quadrant of the interchange.

- A roundabout at the NB ramp terminal would likely require some right-of-way acquisition south of Lamb Road and to the undeveloped property in the southeast quadrant of the interchange.

Economic Development (+2)

- The overall interchange geometrics and traffic control would be improved, thereby ensuring the interchange can adequately accommodate increased levels of long-term industrial and highway-oriented development.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- Interchange improvements are not anticipated to have environmental/social/equity impacts to adjacent properties or land uses.

Accessibility and Connectivity (+2)

- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-2)

- Roundabout cost would be higher than a comparable signalized ramp terminal.

Implementation (-2)

- Both roundabouts would be harder to construct while maintaining traffic flow through the interchange.

L8 – Single Quadrant PARCLO A

Transportation Operations (+2)

- The interchange configuration would have sufficient long-term capacity to fully meet the long-term mobility targets of the Highway Design Manual under all growth scenarios.
- New crossroad approach to/from Army Depot would better and more safely accommodate anticipated industrial and freeway oriented traffic growth.
- Addresses the skew angles where the NB and SB off-ramps intersect Lamb Road. This will improve the interchange's ability to safely and efficiently accommodate large trucks.
- Addresses the tangential exit of the NB off-ramp from I-82 and brings it up to existing ODOT guidelines.

- Would increase the length of the SB on-ramp merge.

Multimodal Accessibility (0)

- The interchange configuration does not have an impact on potential future transit accessibility.

Land Use (-2)

- The larger southbound off-ramp and looping on-ramp footprint in the northwest quadrant of the interchange would have a relatively minor impact on future development in the depot site.

Economic Development (+2)

- The economic viability of the future Umatilla Army Depot property and the surrounding Westland Exception Area would be significantly improved by providing reserve long-term capacity at the interchange terminals.
- The overall interchange geometrics would be improved, thereby enhancing the interchange's ability to accommodate the largest range of design vehicles.

Environmental, Social, and Equity Factors (0)

- A realignment of the southbound on/off ramps and northbound off-ramps would impact adjacent properties, but these properties have no known environmental, social, or equity issues associated with them.

Accessibility and Connectivity (+2)

- This concept would not inhibit local street connectivity or prohibit access to nearby properties.
- New crossroad approach to/from Army Depot would significantly enhance access for future industrial/highway oriented uses. This new crossroad approach would meet access spacing requirements.

Cost (-2)

- New SB on- and off-ramps would have a sizable cost compared to other alternatives.

Implementation (-1)

- The construction of this interchange would be a major project with many logistical difficulties.

Appendix I
Interchange Area Management
Plan Implementation

TECHNICAL MEMORANDUM # 7.c - DRAFT

Umatilla Army Depot Combined IAMP and Transportation System Subarea Plan

Interchange Area Management Plan Implementation

Date: May 1, 2014 **Last Revised 7/17/14**
To: TPAC
From: Frank Angelo, Angelo Planning Group
Darci Rudzinski, Angelo Planning Group

Project #:13848

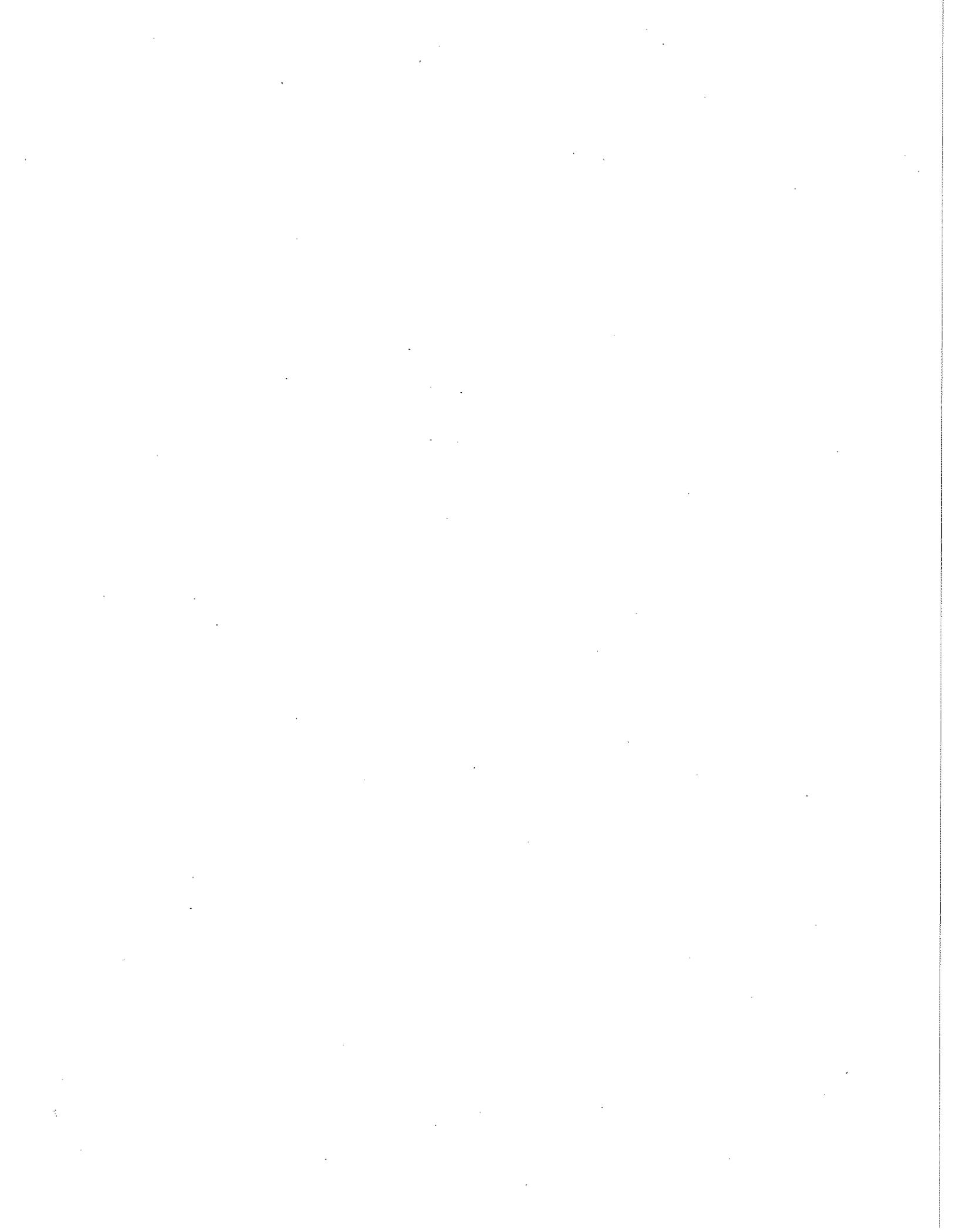
This memorandum documents implementation steps to ensure that the recommendations of the Umatilla Army Depot Combined IAMP ("IAMP") are consistent with the locally adopted policies and land use development requirements for both Umatilla County and Morrow County. This memorandum includes:

- Overview of the State of Oregon regulatory framework governing IAMPs
- Overview of the elements that will need to be adopted as part of Umatilla County and Morrow County's long range planning documents and modifications necessary to the respective development ordinances to implement the IAMP
- Potential financing methods for constructing identified improvements at the I-82/Lamb Road Interchange

The original Technical Memorandum #7.c was developed for TPAC Meeting #4 held in May 2014. This memorandum reflects subsequent updates to possible system development charge (SDC) methodologies. The implementing policy elements of this memo have been updated further and are found in the respective IAMPs developed for the three interchanges.

OVERVIEW OF STATE REGULATORY FRAMEWORK

Development and implementation of IAMPs are guided by Oregon Administrative Rule (OAR) 734-051 and OAR 660-012. OAR 734-051-0155(7) requires that an IAMP be developed no later than the time that an interchange is designed or redesigned. The IAMP must be completed before project construction. OAR 734-051-0155(2) states "prior to adoption by the Oregon Transportation Commission, the Department will work with local governments on any amendments to local comprehensive plans and transportation system plans and local land use and subdivision codes to ensure the proposed... Interchange Area Management Plan is consistent with the local plan and codes."



The Transportation Planning Rule requires that local governments adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors, and sites for their identified functions (OAR 660-012-0045(2))."

To comply with OAR 734-051 and OAR 660-012 and ensure that local land use actions are consistent with the transportation facility planning, the Umatilla Army Depot Combined IAMP and Transportation Subarea Plan contains policy language and development assumptions that are intended to govern planning and future development within the IAMP Management Area. Morrow County and Umatilla County will need to acknowledge policies specific to IAMP Management Area through a formal adoption process. In addition to policy language that supports the objectives of the IAMPs, Morrow County and Umatilla County will need to adopt regulatory language that ensures that future permitted development is compatible with the improvements planned for the interchange. Following the local actions by Morrow County and Umatilla County the Oregon Transportation Commission (OTC) will adopt IAMP as a part of the Oregon Highway Plan (OHP).

PROPOSED IMPLEMENTATION ACTIONS

ODOT, Morrow County and Umatilla County will need to jointly adopt elements of the IAMP. Since the IAMP involves both State and local government authority, some policies will guide ODOT actions and others will guide local government decisions. The OAR governing IAMPs states that ODOT will work with local governments on any amendments to local comprehensive plans and transportation system plans and local land use and subdivision codes to ensure the proposed IAMP is consistent with the local plan and codes, prior to adoption by the Oregon Transportation Commission (OTC) (OAR 734-051-0155(2)).

It is expected that the IAMPs will be made part of the Morrow County and Umatilla County Comprehensive Plans by including them as an amendment to the local Transportation System Plans (TSP). This amendment process will require notification and public hearings pursuant to the local legislative process. Local jurisdictions can adopt the IAMP documents in their entirety by reference into acknowledged TSPs, can prepare an ordinance that more specifically identifies what parts of the IAMPs are being adopted locally and how local plans and ordinances are being modified, or can issue a statement that local plans and ordinances are consistent with the recommendations of the IAMP.

ODOT Region 5 will prepare findings to support adoption of the IAMP on the State's behalf, and the Oregon Transportation Commission (OTC) will deliberate and adopt the final documents as a facility plan and amendments to the Oregon Highway Plan (OHP). The following is a summary of the proposed actions to implement the IAMP.

ODOT:

- The IAMP shall be adopted by the Oregon Transportation Commission as part of the Oregon Highway Plan.

Morrow County:

- Will amend the Transportation System Plan to incorporate the interchange policy statement(s) and recommended transportation improvements.
- Will amend the Comprehensive Plan Map and Zoning Map to include an Interchange Management Area to identify where compliance with the IAMP will be a condition of future development approval.

Umatilla County:

- Will amend the Transportation System Plan to incorporate the interchange policy statement(s) and recommended transportation improvements.
- Will amend the Comprehensive Plan Map and Zoning Map to include an Interchange Management Area to identify where compliance with the IAMP will be a condition of future development approval.
- Will amend the Development Code to require that development and redevelopment proposals within the Interchange Management Area show consistency with the IAMP Access Management Plan (AMP) and recommended improvements as a condition of approval. Amendments will ensure that all proposals for new development within the Umatilla County Industrial Zone-portion of the Depot site area will be reviewed to determine if a need for different interchange improvement phases is triggered. May require amendments to the following:
 - Section 152.018 Access Management and Street Connectivity
 - Section 152.019 Traffic Impact Analysis

FINANCING

As shown in Technical Memorandum #7a, Interchange Area Concept Development and Alternatives Analysis, some basic interchange improvements (Army Depot access road reconstruction/realignment, interchange ramp skew angles, and off-ramp widening) would be needed to ensure that the I-82/Lamb Road interchange could safely and efficiently accommodate the various levels of traffic generated from the assumed reuse/redevelopment of the Army Depot site. In addition, the 2035 "Total" traffic operations findings indicate that the interchange ramp terminals will not have sufficient long-term capacity to handle the estimated increases in assumed site-generated traffic under both the "Strong" and "Moderate" growth scenarios. As such, additional capacity-based enhancements will be needed at the ramp terminals.

While the analysis demonstrates that there is additional capacity beyond the 2035 "Background" traffic conditions to allow some level of reuse/redevelopment on the Army Depot site without requiring the additional levels of capacity, this amount of development is significantly less than what the envisioned

land use plans would allow. Improvements to accommodate "Moderate" and "Strong" growth scenarios include lengthening, changing the geometry, and widening the northbound and southbound off-ramps. The TPAC has carried forward three separate improvement alternatives for the I-82/Lamb Road interchange. These alternatives are:

Concept L2: Minimally Improved Diamond Interchange

- Realigns the cross road approach.
- Lengthens the NB and SB off-ramps.
- Widens the NB and SB off-ramps.
- Maintains the existing stop control.
- Sufficient capacity for Phased Growth Scenario only
- Cost \$3,200,000

Concept L3: Minimally Improved Diamond Interchange with Signalization of the Southbound Ramp Terminal

- Realigns the cross road approach
- Lengthens the NB and SB off-ramps
- Widens the NB and SB off-ramps
- Signalizes the SB ramp terminal
- Sufficient capacity for Moderate and Strong Growth Scenarios
- Cost \$3,500,000

Concept L6: Improved Diamond with Roundabout at the Southbound Ramp Terminal

- Realigns the cross road approach
- Lengthens the NB and SB off-ramps
- Widens the NB off-ramp
- Installs a roundabout at the SB ramp terminal
- Sufficient capacity for Moderate and Strong Growth Scenarios
- Cost \$3,700,000

Based on the needed improvements at the I-82/Lamb Road interchange, local financing mechanisms could be developed that would allow future development to help pay for these needed improvements. Some mechanisms are dependent on securing funding from other public sources such as Federal or State programs. A system development charge (SDC) could also be considered and assigned to future industrial and commercial growth within the Army Depot planning area. The following provides a brief summary of these types of programs.

Grants and Loans

There are a variety of Federal and State grant and loan programs available for transportation financing in Umatilla County. Grants and loans are competitive statewide and many programs require a match from the local jurisdiction as a condition of approval. Most grant and loan programs available for transportation projects are funded and administered through ODOT; programs that have been identified as potentially relevant for Umatilla County are described under Revenue Source in the adopted 2002 Umatilla Transportation System Plan.¹ An update to the Transportation Enhancement Program is described below.

Transportation Enhancement Program

In July 2012, the US Congress passed a new transportation funding bill called Moving Ahead for Progress in the 21st Century or "MAP-21". The new bill took effect on October 1, 2012. MAP-21 did not reauthorize the Transportation Enhancement (TE) Program. Instead, it established a new program called Transportation Alternatives Program (TAP) that includes elements of the former TE program in combination with elements of other programs, and some new activities.

The TE Discretionary Account remains in place through 2015, with \$2 million per year for urgent needs that arise outside the statewide competitive selection process. It remains available for TE-eligible projects until those funds are exhausted, and will then continue for TAP-eligible projects using TAP funds instead of TE.

For 2016-2018, the Discretionary Account has \$1.5 million per year, shared with the Bicycle & Pedestrian "Quick Fix" program that provides funds for immediate needs along the State Highway system.²

System Development Charges

System Development Charges (SDCs) are impact fees charged to new development to help pay for the additional infrastructure capacity needed to serve the development. SDCs are regulated in Oregon by statute. Two types of fees are allowed under state law:

- Reimbursement fees, used to repay existing residents for extra capacity built in advance of growth that benefits future residents; and
- Improvement fees, designed to pay for planned capital improvements needed to serve future development.

¹ www.co.umatilla.or.us/planning/pdf/Umatilla_County_TSP_June_02.pdf

² This description of the changes occurring with the transition to the STIP-Enhance process was adapted from the State of Oregon website <http://www.oregon.gov/ODOT/HWY/LGS/pages/enhancement.aspx>.

SDCs are collected when new building permits are issued. The fees may be collected for transportation systems, as well as for water, sanitary sewer, storm water, and parks. Fees must be established using a rate-setting methodology adopted by the service provider (i.e. the city, county or special district responsible for the service). Fees may be increased periodically based on increases in project costs using procedures outlined in the local ordinance (see ORS 223.304). Transportation SDCs are based on the trip generation of the proposed development. Nonresidential use calculations are based on employee ratios for the type of business or industrial uses; in the case of the I-82/Lamb Road Interchange the trip generation has been determined for both "Moderate" and "Strong" growth scenarios.

A location-based fee, assessed by Umatilla County, is one option for the I-82/Lamb Road Interchange. This approach is particularly appropriate when proposed capital improvements are triggered by and benefit a limited area only and because this type of SDC provides a built-in mechanism for allocating revenues to specific interchange projects (i.e. revenue may only be spent on projects in the area where they are collected). A geographically differentiated sub-area fee is also appropriate where infrastructure costs are higher in newly developing areas, as is the case to the west of the interchange, as opposed to largely developed areas where infrastructure is already in place. This ensures that infill development in other parts of Umatilla County are not unfairly burdened with the cost of helping fund infrastructure on the Depot site.

SDC Methodology

Two examples of applying a SDC to future development on the Depot site were prepared. Both examples are based on trips generated from future development on the Depot site and do not include trips generated from development on surrounding properties such as the Westland Exception Area. Applying the SDC to future development in the Westland Exception Area would spread the costs of future improvements over more trips, thereby reducing the cost per trip. The following examples are provided for illustrative purposes and have relied on information developed at different points in the IAMP planning process. If Umatilla County wished to pursue a SDC as a funding option, additional research and evaluation should occur to fully define the area where the SDC would apply, the resulting number of trips and the level of interchange improvements used to determine the SDC rate.

SDC Based on Full I-82 / Lamb Road Interchange Improvements

The number of daily trips expected to be generated from new commercial and industrial growth from the Depot site at the I-82/Lamb Road Interchange has been determined for both "Moderate" and "Strong" growth scenarios. It is this growth that will trigger the need for additional improvements to the interchange, estimated at up to \$3.7 million, depending on the alternative. A SDC could be adopted that is based on a cost-per-trip basis. Table 7c-1 shows what the fee would be per trip to meet the total

estimated cost of proposed improvements to support the "Strong" growth scenario.³ As well the table shows the result if only a portion of the cost (50% or 25%) was met by the SCD. This "partial SDC" option would assume that other funding sources would pay a portion of the cost of needed improvements at the interchange.

Table 7c-1 – System Development Charge Estimates: Full Improvements

| Development Type | Number of Daily Trips | SDC Cost per Trip | | |
|------------------|-----------------------|---------------------------|--------------------------|--------------------------|
| | | 100% of Improvement Costs | 50% of Improvement Costs | 25% of Improvement Costs |
| Strong Growth | 8,000 | \$800 | \$400 | \$200 |

Table 7c-1 shows estimated total SDC fees for three different sample development types. This table is for illustration purposes only and is intended to give rough estimates of potential, per-user costs, for sample development types. The total SDC cost for each development is based on the total number of daily trips that each use would generate to/from the I-82/Lamb Road intersection from development on the Depot site. These trips are multiplied by the three different cost-per-trip estimates in Table 7c-2, depending on what percentage of the total improvement costs new growth (collectively) would be expected to pay.

Table 7c-2 – System Development Charge Estimates: Development Type Examples: Full Improvements

| Proposed Use | Number of Total Daily Trips through I-82/Lamb Road Interchange | Total SDC Cost | | |
|---------------------------------|--|---------------------------------------|---------------------------------------|--------------------------------------|
| | | 100% of Improvement costs (\$3.7 mil) | 50% of Improvement costs (\$1.85 mil) | 25% of Improvement costs (\$925,000) |
| Fast Food Restaurant (3,500 sf) | 1,040 | \$719,680 | \$359,840 | \$179,920 |
| Data Center (160,000 sf) | 230 | \$159,160 | \$79,580 | \$39,790 |
| Industrial (100,000 sf) | 196 | \$135,632 | \$67,816 | \$33,908 |

³ Since Concept L3: Minimally Improved Diamond Interchange with Signalization, will provide sufficient capacity for both the Moderate and Strong Growth Scenarios, the cost associated with Concept L3 has been used to illustrate a potential SDC.

Targeted SDC Based I-82 / Lamb Road Interchange Improvements

As noted in the Adoption Elements listed above, Umatilla County could consider adoption of a supplemental Transportation System Development Charge (SDC) to finance specific improvements to the I-82 / Lamb Road interchange. The SDC would apply to development on property within the Depot Industrial SDC Area as shown on Exhibit 1. The following provides an approach and methodology to a targeted or location-based SDC the County could consider as it moves forward on implementation of the I-82/Lamb Road IAMP.

As presented in the I-82/Lamb Road IAMP there are near-term improvements at the interchange that should be in place before any large scale development on the property zoned Depot Industrial can move forward on the Depot site. The near-term improvements related to vehicle access to the Depot employment area that will need to be in place to serve new uses are shown on Project A.

Once the reconstruction of the interchange access road is in place, the removal of the existing UMCD access road can take place. This is a critical improvement because the existing road configuration is not desirable or efficient to provide access to an industrial area that trucks and other large vehicles will frequent.

Because the need for the Lamb Road extension improvement projects noted above are the catalyst projects that will permit large scale industrial and employment development to occur on the Depot site, funding these projects is of primary importance. One method of financing the improvements is through a "targeted" or "location-based" System Development Charge (SDC). The SDC would apply to new development on property within the Depot Industrial SDC Area only. SDCs are collected when new building permits are issued. For funding transportation projects, SDCs are based on the trip generation of the proposed development. Fees must be established using a rate-setting methodology adopted by the service provider (i.e. the city, county or special district responsible for the service) and may be increased periodically based on increases in project costs using procedures outlined in the local ordinance (see ORS 223.304).

A location-based fee, assessed by Umatilla County, for the I-82/Lamb Road Interchange is one option. This approach is particularly appropriate because the proposed capital improvements (Lamb Road extension) are triggered by and benefit a limited area only (Depot Industrial property) and because this type of SDC provides a built-in mechanism for allocating revenues to specific interchange projects (i.e. revenue may only be spent on projects in the area where they are collected).

Methodology for Targeted SDC

The number of daily trips expected to be generated from new commercial and industrial growth in the Depot Industrial zone at the I-82/Lamb Road Interchange has been determined for both "Strong" and "Moderate" growth scenarios. It is this growth that will trigger the near-term need for the Lamb Road extension improvements at the interchange noted above. These improvements are estimated to cost \$500,000. A SDC could be adopted by Umatilla County that is based on a cost-per-trip basis from trips

generated from development in the Depot Industrial zone. Tables 2 and 3 below present what the SDC fee would be on a per trip basis to meet the total estimated cost of proposed improvements (\$500,000) to support the "Strong" and "Moderate" growth scenario respectively. The tables also show the result if only half of the cost (50%) was met through SDCs. This "partial SDC" option would assume that other funding sources would pay a portion of the cost of identified critical improvements at the interchange. The SDC methodology to establish the basis for the per trip rate is:

$$\text{Total Improvement Cost} / \text{Total Daily Trips} = \text{Cost Per Trip}$$

Table 2 provides estimates of total SDC fees for four different sample development types that could potentially locate on the Depot Industrial sites, assuming a "Strong" growth forecast. Similarly, Table 5 provides estimates of the application of the Moderate growth SDC on certain types of uses that could potentially locate on the Depot Industrial site. These tables are for illustration purposes only and are intended to give rough estimates of potential, per-user costs, for sample development types under the two different growth scenarios.

Table 2 - System Development Charge Estimates (Strong Growth Forecast): Targeted Improvements

| | Gross / Net Acres | Total Square Feet | Total Daily Trips | Cost per trip 100% of improvement costs (\$500,000) | Cost per trip 50% of improvement costs (\$250,000) |
|---|-------------------|-----------------------|-------------------|---|--|
| Strong Growth – Umatilla County Depot Industrial Area | 824 / 659 acres | 574,295 sf / 718 jobs | 8,340 | \$60 | \$30 |

Table 3 - System Development Charge Estimates (Strong Growth Forecast): Development Type Examples: Targeted Improvements

| Proposed Use | Number of Total Daily Trips | Total SDC Cost | |
|--|-----------------------------|--|---|
| | | 100% of improvement costs (\$500,000) | 50% of improvement costs (\$250,000) |
| Depot Industrial (100,000 sf) | 235 | \$14,100 | \$7,050 |
| Fast Food Restaurant w/Drive-Thru (2,000 sf) | 990 | \$59,400 | \$29,700 |
| Gas Station w/Convenience Market (8 pumps) | 1,300 | \$78,000 | \$39,000 |
| Motel (80 rooms) | 730 | \$43,800 | \$21,900 |

Table 4 - System Development Charge Estimates (Moderate Growth Forecast): Targeted Improvements

| | Gross / Net Acres | Total Square Feet | Total Daily Trips | Cost per trip 100% of improvement costs (\$500,000) | Cost per trip 50% of improvement costs (\$250,000) |
|---|-------------------|------------------------------------|-------------------|---|--|
| Strong Growth – Umatilla County Depot Industrial Area | 824 / 659 acres | 574,295 sf / 467 jobs ⁴ | 6,280 | \$80 | \$40 |

Table 5 - System Development Charge Estimates (Moderate Growth Forecast): Development Type Examples: Targeted Improvements

| Proposed Use | Number of Total Daily Trips | Total SDC Cost | |
|--|-----------------------------|--|---|
| | | 100% of improvement costs (\$500,000) | 50% of improvement costs (\$250,000) |
| Depot Industrial (100,000 sf) | 153 | \$12,240 | \$6,120 |
| Fast Food Restaurant w/Drive-Thru (2,000 sf) | 990 | \$79,400 | \$39,600 |
| Gas Station w/Convenience Market (5 pumps) | 810 | \$64,800 | \$32,400 |
| Motel (54 rooms) | 490 | \$39,400 | \$19,600 |

⁴ Moderate Growth Forecasts assumes employment at 65% of Strong Growth Forecast for Depot Industrial Use

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