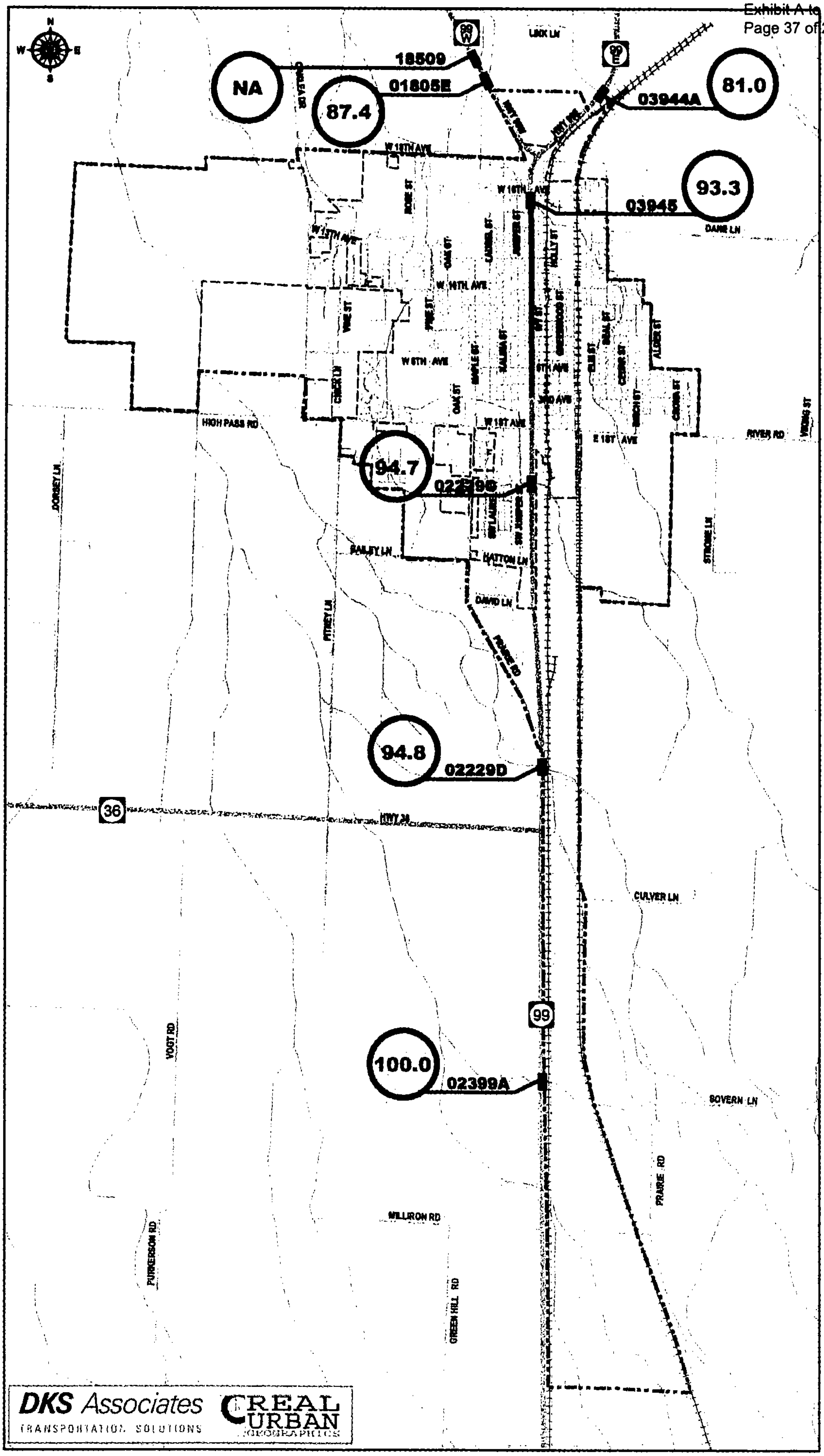

OR 99

Junction City

Refinement Plan

FIGURE 2-7

Existing OR 99 Pavement & Bridge Conditions

Legend

- BRIDGE
- PAVEMENT CONDITION RATED "GOOD"
- PAVEMENT CONDITION RATED "VERY GOOD"
- # = BRIDGE SUFFICIENCY RATING
- X = BRIDGE ID NUMBER
- NA = RATING NOT AVAILABLE
- CONDITION NOT DEFICIENT
- ROAD
- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

0 1,000 2,000 4,000 Feet

Highway Access

ODOT maintains access management spacing standards for all highways under its jurisdiction that identify the minimum required separation between adjacent approaches to a highway (on the same side of the highway). These standards vary depending on the management objectives for the highway, the posted speeds, and the character of the surrounding land uses. Because the study area passes through both urban and rural areas and maintains several posted speed changes, the access management spacing standards for the study highways will vary. Table 2-1 breaks the study area into different zones characterized by changes in access management spacing standards. The locations of the zone boundaries are delineated in the series of Figures 2-8A through 2-8D.

Table 2-1: Study Area Access Management Spacing Standards

Zone	Highway Segment	Classification	Segment Designation	Urban Rural	Posted Speed	Access Spacing Standard
1	OR 99W: MP 108.32 - 108.50	Regional Hwy	Other	Rural*	55 mph	990 ft.
2	OR 99W: MP 108.50 - 108.70	Regional Hwy	Other	Urban	45 mph	750 ft.
3	OR 99W/99: MP 108.70 - 109.83	Regional Hwy	Other	Urban	30 mph	425 ft.
4	OR 99: MP 109.83 - 110.04	Regional Hwy	Other	Urban	45 mph	750 ft.
5	OR 99: MP 110.04 - 111.27	Regional Hwy	Other	Urban	55 mph	990 ft.
6	OR 99E: MP 31.78 - 32.07	Regional Hwy	Other	Rural	55 mph	990 ft.
7	OR 99E: MP 32.07 - 32.29	Regional Hwy	Other	Rural*	45 mph	750 ft.
8	OR 99E: MP 32.29 - 32.46	Regional Hwy	Other	Urban	30 mph	425 ft.

* Segment lies in both Urban and Rural areas, but spacing standard is not impacted.

A physical inventory of existing approaches to OR 99W, OR 99E, and OR 99 was collected through the study area, with descriptive information recorded for each approach indicating the approach's location, how the approach has been constructed and how it is currently being used. This physical inventory was compiled into Table A.1, which has been included in the appendix to this memorandum. Additional investigation regarding property access rights, including a search of approach permits issued in the study corridor and right of way research conducted was performed, with results documented in Table A.2 (also included in appendix). To compliment the physical inventory, a graphical display of individual approach locations along the highway is shown in the series of Figures 2-8A through 2-8D.

Using this information, a comparison of existing conditions to ODOT's access management spacing standards was made to evaluate areas needing improvement. Tables 2-2A and 2-2B provide the results of this investigation, displaying the number of approaches found in the zones identified above for each side of the study highways and comparing the average approach spacing per section to the applicable access management spacing standard. While this level of analysis can not be used to identify potential improvements to approach spacing, it does reflect the degree to which the spacing standards are being met and provides an indication of the extent of improvements needed. The rightmost column in the table indicates the approximate number of driveway or public street approaches that would be allowed to fully comply with access spacing standards. Because this type of analysis does not account for access spacing between zone boundaries, the actual numbers shown are not as important as the magnitudes of differences between the actual number of approaches and the number that would be allowed according to the spacing standards.

Table 2-2A: OR 99W/99E Existing Southbound (west side of highway) Approach Spacing

Zone	Number of Approaches	Segment Length (ft.)	Average Approach Spacing (ft.)		Number of Approaches Able to Meet Standard
			Actual	Standard	
1	1	950	950	990	1*
2	1	1,055	1,055	750	1
3	40	5,965	150	425	14
4	5	1,110	220	750	1
5	27	6,500	240	990	6
6	7	1,530	220	990	1
7	2	1,160	580	750	1
8	1	900	900	425	2
Totals	89	19,170	-	-	27

* Segment Length is shorter than Spacing Standard

Table 2-2B: OR 99W/99E Existing Northbound (east side of highway) Approach Spacing

Zone	Number of Approaches	Segment Length (ft.)	Average Approach Spacing (ft.)		Number of Approaches Able to Meet Standard
			Actual	Standard	
1	1	950	950	990	1*
2	0	1,055	1,055	750	1
3	44	5,965	135	425	14
4	0	1,110	1,110	750	1
5	8	6,500	815	990	6
6	3	1,530	510	990	1
7	1	1,160	1,160	750	1
8	1	900	900	425	2
Totals	58	19,170	-	-	27

* Segment Length is shorter than Spacing Standard

These tables show that in zones 1, 2, 7, and 8 (segments of OR 99W and OR 99E north of the junction), there are relatively few existing approaches and that the applicable access management spacing standards are currently met or are very close to being met. However, in zone 6, which is the northern segment of OR 99E in the study area, existing access density increases.

South of the junction of OR 99W and OR 99E, access density increases substantially, with average approach spacing in zone 3 (OR 99W/99E junction to south of 1st Avenue) dropping below 200 feet. Of course, it should be acknowledged that the approach counts include public street intersections and that this zone spans the downtown area where the public street grid creates city blocks of approximately 300 feet in length. Therefore, even if all private approaches were removed, the average approach spacing would still be only slightly greater than 300 feet.

Zones 4 and 5 (south of 1st Avenue to OR 36) represent a transition from the densely developed zone 3 area to more of a highway commercial/semi-rural area where posted speeds have increased to 45 and 55 mph and public street intersection spacing has increased significantly. On the west side of the highway, access density continues to be relatively high, but on the east side, the presence of the railroad tracks limits access opportunities.

Legend

- UGB
- Approach
- Approach Number
- Access Control
- Tax Lot
- Z# Access Management Zone Boundary and Number

DKS Associates
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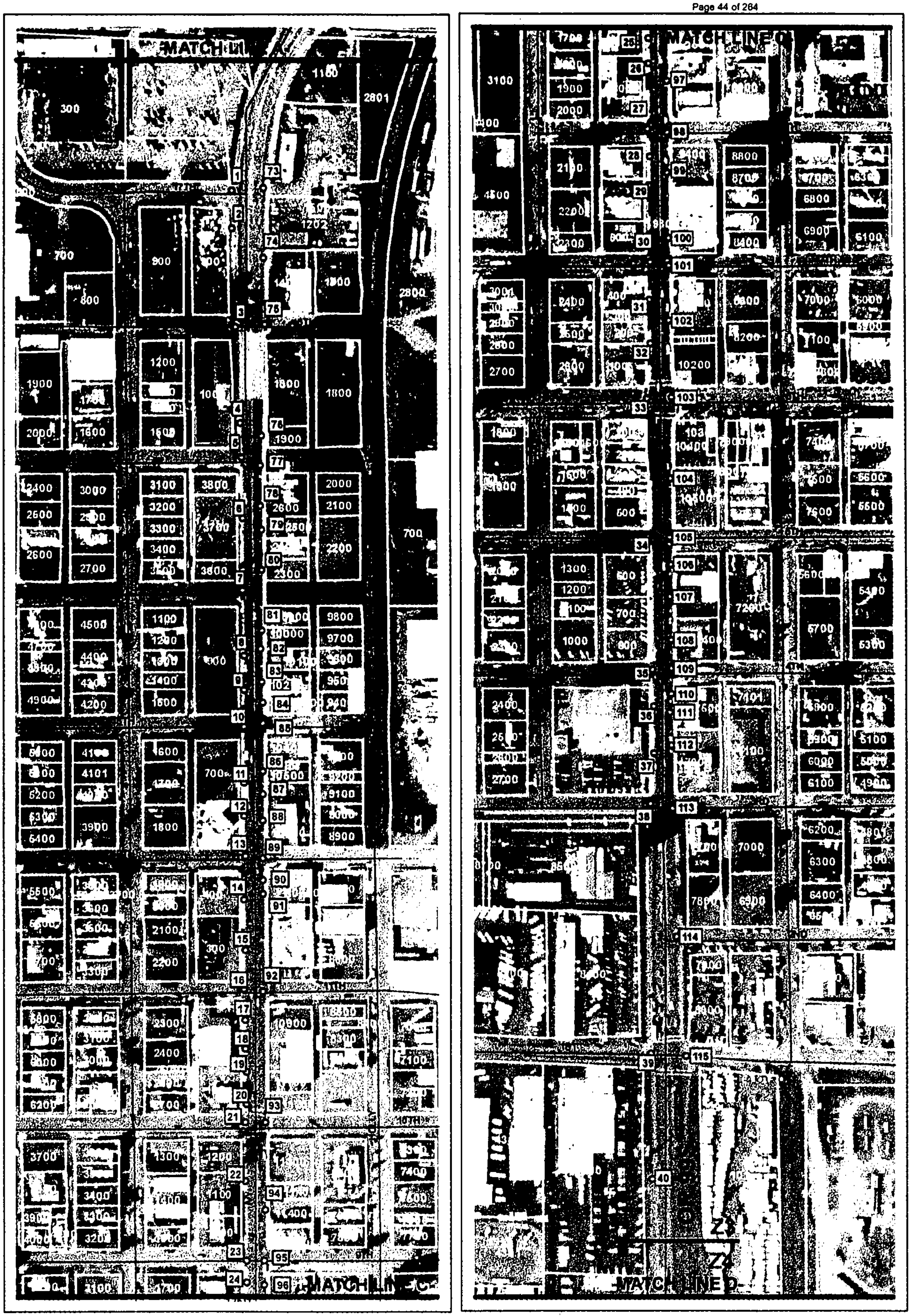
200 100 0 200 Feet

FIGURE 2-8A
Existing Approach Locations



Legend

UGB
Access Control
Approach
Tax Lot
Approach Number
Access Management Zone Boundary and Number

N W E S

DKS *Associates*
TRANSPORTATION SOLUTIONS

200 100 0 200 Feet

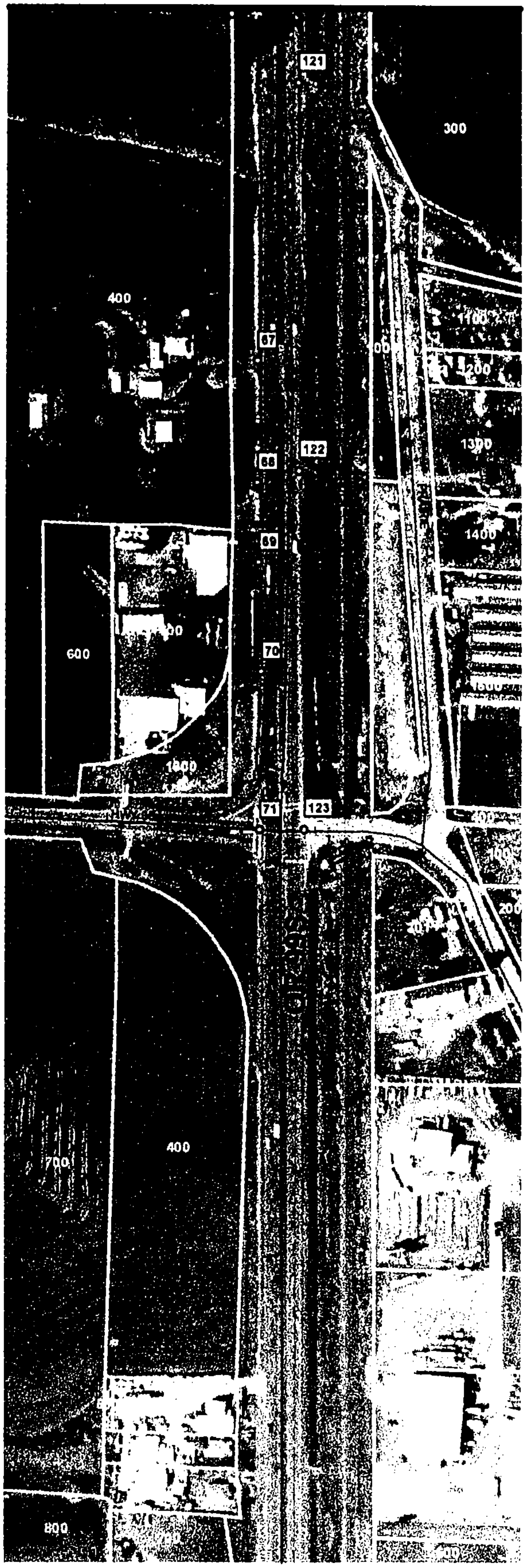
FIGURE 2-8B
Existing Approach Locations

Legend
UGB
Tax Lot
Approach
Access Management Zone Boundary and Number
Approach Number

DKS Associates
TRANSPORTATION SOLUTIONS

200 100 0 200 Feet

FIGURE 2-8C
Existing Approach Locations



Legend
UGB
Tax Lot
Approach
Access Management Zone Boundary and Number
Approach Number

N W E S

DKS Associates
TRANSPORTATION SOLUTIONS

200 100 0 200 Feet

FIGURE 2-8D
Existing Approach Locations

Safety Analysis

The last five years (2001 – 2005) of available crash data for the OR 99 study corridor was obtained from ODOT to analyze current conditions. To identify potential deficiencies, crash rates for sections of OR 99 were compared to statewide average crash rates for similar facilities. Sections experiencing higher crash rates than the statewide average were investigated further to see if crash patterns could be mitigated through countermeasure implementation.

Crash rates identifying the number of crashes per million vehicle-miles traveled for specified sections of OR 99, as well as statewide average crash rates for various facility types, were obtained from ODOT's *2005 State Highway Crash Rate Tables*[1]. Highway sections analyzed in these tables are categorized by area type and functional classification to provide a basis for comparison between various facilities. For this analysis, OR 99 was classified as a non-freeway principal arterial, and the study corridor was separated into "Rural City" and "Rural Area" categories. Predetermined highway sections within these categories are provided in the crash rate tables with crash rates calculated for each section, as well as for groups of contiguous sections within the same area type. The reported crash rates through the OR 99 corridor are shown in Tables 2-3 and 2-4.

Rural Area Sections

Within the study corridor, there are two areas that fall under the Rural Area category: the section of OR 99E north of the city limits and the section of OR 99 from the southern city limits to OR 36. Crash rates for each of these sections are listed below in Table 2-3, which shows the crash rates experienced on the OR 99E section north of the city limits to have been consistently below the statewide average crash rates over the last five years. In 2001 and 2005, the crash rate experienced on the section from the south city limits to OR 36 were much lower than the statewide average, but in 2003 and 2004, they increased dramatically and were significantly higher than the statewide average.

Table 2-3: OR 99 5-year Crash Rate Comparison for Statewide Rural Areas

Section Limits (Milepoints)	Section Description	Crashes per Million Vehicles 2005	2004	2003	2002	2001
	Statewide Average Rate	0.68	0.62	0.72	0.72	0.85
29.09 – 32.32	OR 99E: Harrisburg – Junction City	0.30	0.60	0.20	-	0.30
110.39 – 111.27	OR 99: J.C. South City Limits – OR 36	0.38	**1.58**	**1.23**	-	0.37

Note: Bold type indicates the crash rate is greater than the statewide average.

Taking a closer look at the section between the south city limits and OR 36, it was found that out of a total of 20 crashes occurring over the five-year period, seven happened in 2003 and nine happened in 2004. In the following year, only two crashes occurred. In the years with high amounts of crashes (2003 and 2004), no correlation was found between crashes and time of day, day of week, crash type, weather conditions, or lighting conditions. However, it was noticed that

[1] *2005 State Highway Crash Rate Tables (August 2006).* Retrieved August 24, 2006, from Oregon Dept. of Transportation Web site: http://www.oregon.gov/ODOT/TD/TDATA/car/CAR_Publications.shtml

in 2003, all crashes occurred in the months of February, September, and October, while in 2004 all crashes occurred between October and December. Given that no other trend was noticed and that crashes were infrequent in 2001 and 2002 and dropped again in 2005, no action is needed at this time. However, crash rates over the next couple of years should be monitored to see if an increase occurs again. Furthermore, the fact that this segment is less than one mile long could be an indication that crash frequencies are being over-exaggerated.

Rural City Section

The "Rural City" section of the study area includes OR 99 between the north and south city limits. As shown in Table 2-4, the crash rates experienced on this segment have been much higher than the statewide average crash rate for similar facilities during each of the last five years. In fact, the crash rates experienced more closely resemble those found in urban cities within the state.

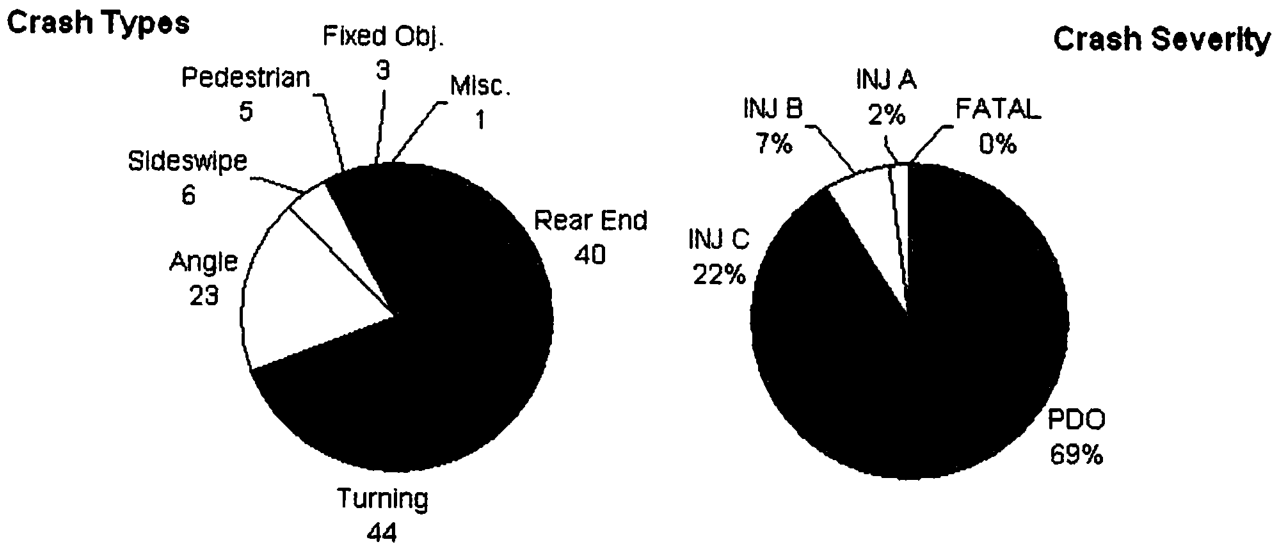
Table 2-4: OR 99 5-year Crash Rate Comparison for Statewide Rural Cities

Section Limits (Milepoints)	Section Description	Crashes per Million Vehicles 2005	2004	2003	2002	2001
	Statewide Average Rate	0.90	0.99	1.28	1.16	1.70
108.68 – 110.38	OR 99E: N. City Limits to S. City Limits	**2.54**	**2.06**	**3.05**	**2.29**	**2.40**

Note: Bold type indicates the crash rate is greater than the statewide average.

By examining individual crashes within this area for the five-year period, it was noted that out a total of 122 crashes, 44 (36%) were related to turning movements and 40 (33%) were related to rear end collisions. Furthermore, the four-lane section with no turning lanes that was previously described between 15th Avenue and 3rd Avenue accounts for 44% of this distance, but experienced a disproportionate 77% of the section's crashes. Given the types of crashes and the environment in which they are occurring, it appears that the lack of turning lanes and high number of access points within the city limits may be major contributors to the high crash frequency within this corridor. Figure 2-9 provides further information on crash types and crash severities documented within the city limits on OR 99.

Figure 2-9: OR 99 Crashes within Junction City Limits



As shown in Figure 2-9, there were also five crashes on OR 99 within the city limits involving pedestrians. These crashes have been investigated further and are detailed in Table 2-5.

Table 2-5: Pedestrian Crashes on OR 99 within the City Limits

Crash Number	Location	Severity	Age of Ped.	Ped. Crossing Direction	Cause / Error
1	MP 109.16 (north of 11th Ave.)	Injury C	70	East to West (crossing OR 99)	Pedestrian crossed between intersections.
2	MP 109.47 (6th Ave.)	Injury C	63	West to East (crossing OR 99)	Auto (traveling east to south) failed to yield right-of-way to pedestrian.
3*	MP 109.47 (6th Ave.)	Injury A Injury A	52 52	East to West (crossing OR 99)	Auto (traveling east to south) failed to yield right-of-way to pedestrian.
4	MP 109.75 (north of 1st Ave.)	Injury A	42	unknown (crossing OR 99)	unknown
5	MP 109.76 (1st Ave.)	Injury C	unknown	East to West (crossing OR 99)	Auto (traveling west to north) failed to yield right-of-way to pedestrian.

* Crash involved 2 pedestrians.

According to this information, all pedestrian-related crashes involved attempted crossings of OR 99. In most cases, it appears the cause of the crash was the driver failing to yield the right-of-way to the pedestrian.

Intersection Analysis

Crash rates at study intersections were calculated to identify problem areas in need of mitigation. Because the total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to determine if the number of crashes occurring should be considered high. Using this technique, a crash rate of 1.0 MEV or greater is commonly used to identify when further investigation is warranted. As shown in Table 2-6, crash rates calculated at all study intersections are well below this threshold, indicating the frequency of crashes occurring is normal for the volume of traffic served.

Table 2-6: Study Intersection Crash Rates (MEV)

Intersection	Crash Rate
OR 99W @ OR 99E	0.03
OR 99 @ 10th Ave.	0.51
OR 99 @ 6th Ave.	0.34
OR 99 @ 1st Ave.	0.16
OR 99 @ Prairie Rd.	0.00
OR 99 @ OR 36	0.08

SPIS Ratings

This analysis was supplemented by reviewing ODOT's Safety Priority Index System listing for locations in the study corridor ranked among the state's top 10% of hazardous locations. The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways. The SPIS score is based on three years of crash data and considers crash frequency, crash rate, and crash severity. ODOT bases its SPIS on 0.10-mile segments to account for variances in how crash locations are reported. This information is a general comparison of the overall safety of the highway based on crash information for all sections throughout the state.

According to ODOT's 2005 SPIS ratings, the intersection on OR 99 at 6th Avenue is the only location within the study area with a rating within the top 10%. In the last five years, a total of 15 crashes occurred at this intersection, with seven of them happening in the year 2003. No more than three crashes occurred in any of the remaining four years. Considering that the SPIS rating may be inflated due to one bad year that has been followed by two years with very few crashes and that a traffic signal was recently installed in 2003, conditions at this location are expected to improve.

Operational Analysis

To assess the highway's ability to adequately accommodate travel demand under existing conditions, traffic volume counts were obtained and used along with other inventory data including intersection geometrics and traffic controls to analyze the performance of study intersections. The methodology used and results obtained are described below.

Traffic Volumes

At the north end of the study area, average daily traffic volumes experienced on OR 99W and OR 99E are approximately 6,000 and 8,100 vehicles, respectively. Through the remainder of the study corridor to the south, daily traffic volumes range from 15,500 to 16,200 vehicles. Heavy vehicles are estimated to make up approximately 15% of the daily traffic volumes, but during the weekday peak hour they drop to approximately 4%.

For the analysis of study intersection performance, ODOT supplied 16-hour manual classification counts taken in November 2005. From these six intersections, a common weekday peak hour was selected between 5:00 and 6:00 p.m. Because transportation improvements are typically designed for the 30th highest hour (30 HV) of traffic volumes experienced within the year, a seasonal factor was applied to the November counts obtained to better represent volumes seen during that time. Because there are no Automatic Traffic Recorder (ATR) stations within the study corridor to provide reliable annual traffic data, ODOT's 2005 Seasonal Trend Table[2] was used to develop a seasonal factor. The Seasonal Trend Table, developed by ODOT's Transportation Planning Analysis Unit, was constructed by averaging seasonal trend groupings from all ATRs across the state. To emulate seasonal peak volumes on OR 99 through Junction City, data from this table for ATRs on highways characterized by summer peaks and commuting between cities were averaged. The resulting factors increased the November counts by 16 to 20%, depending on the time of the month in which the counts were collected.

In addition, a growth factor of 2.2% per year was applied to the counts collected in 2005 to reflect volumes that would be present in 2006, which was the selected base year for this study. The growth rate was obtained through ODOT's Primary 2024 Future Volume Table,[3] which uses historic growth trends to project future highway traffic volumes. This growth rate also results in similar growth on the crossing local streets as seen in the Junction City Transportation System Plan (March 2000, LCOG).

The 30HV traffic volumes developed for 2006 at study intersections are displayed in Figure 2-10. These volumes have also been balanced to show a reasonable amount of variation in inflows and outflows between adjacent intersections given the number of opportunities for vehicles to enter or exit the highway, as some counts were not collected during the same day.

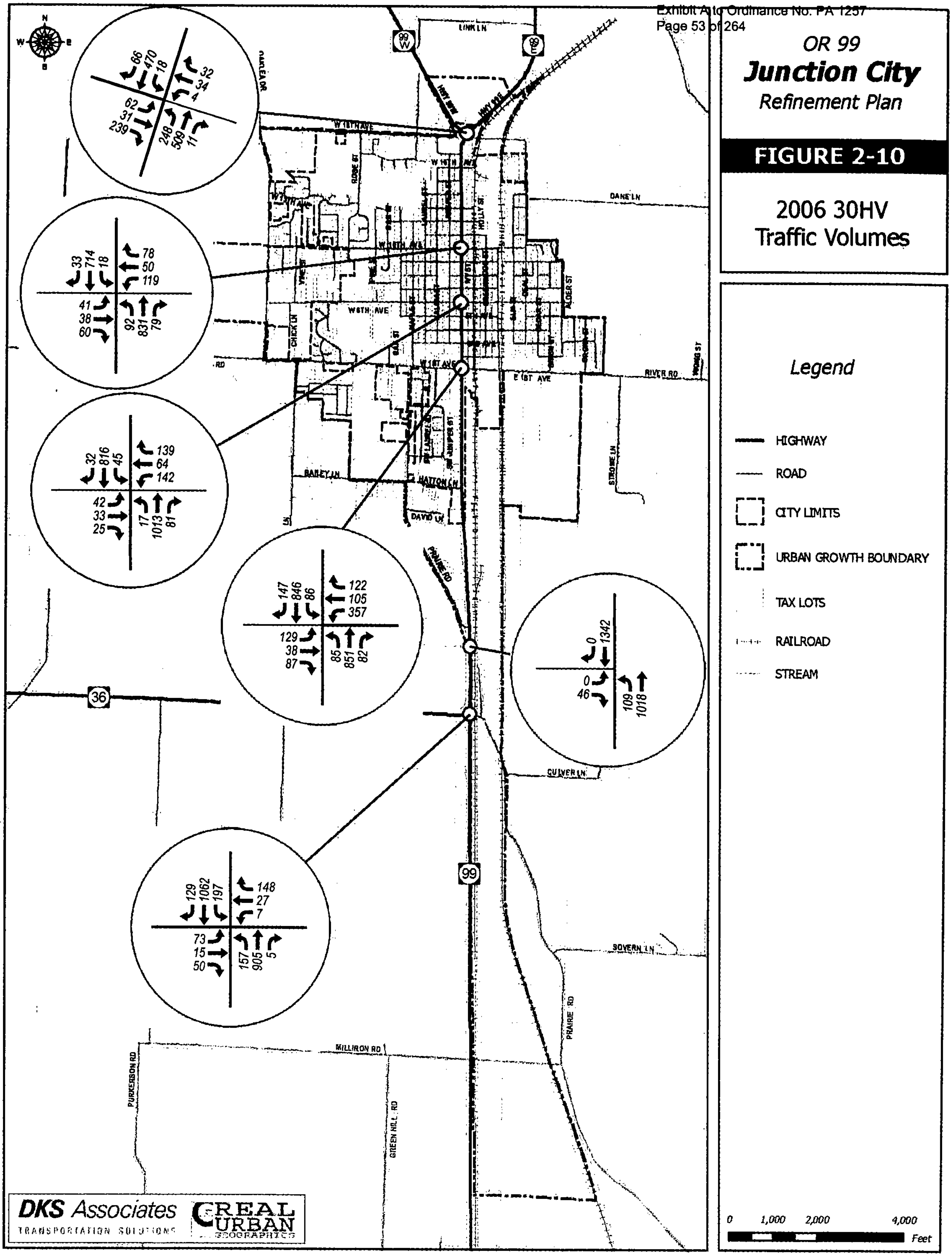
[2] *2005 Seasonal Trend Table.* Retrieved July 5, 2006, from Oregon Dept. of Transportation Web site: http://www.oregon.gov/ODOT/TD/TP/TADR.shtml

[3] *Primary 2024 Future Volume Table.* Retrieved June 30, 2006, from Oregon Dept. of Transportation Web site: http://www.oregon.gov/ODOT/TD/TP/TADR.shtml

OR 99
Junction City
Refinement Plan

FIGURE 2-10

2006 30HV Traffic Volumes



Capacity Analysis

All study intersections are located along OR 99 which is under ODOT jurisdiction. For this reason, all intersections are subject to ODOT's mobility standards as outlined in the 1999 Oregon Highway Plan[4] (OHP). ODOT's mobility standards are based on volume-to-capacity (v/c) ratios, which are comparisons of the actual volume using the intersection (or a particular movement) to the maximum volume that could be served. A v/c ratio greater than 1.0 would indicate that there is more demand for the intersection than can be provided, which often results in long queues at the approaches.

The OHP requires that different v/c thresholds be met for each classification of highway, reflecting the management objectives for that type of facility. Through the study area, OR 99 is classified as a regional highway and lies within the UGB of Junction City, which is a member of the Lane Council of Governments. In addition, this section of highway was classified as a freight route by the Oregon Transportation Commission through an amendment to the OHP adopted in August 2005. Considering these factors, Table 6 in the OHP shows that all study intersections must maintain a v/c ratio no greater than 0.85 to comply with adopted mobility standards. Because the intersection with Prairie Road is unsignalized, the movements that are stop-controlled or must yield right of way may dictate whether the intersection can operate safely and efficiently. Therefore, according to the OHP, a mobility standard requiring a v/c ratio of 0.90 or lower for those movements shall be applied. The applicable mobility standard for each intersection is repeated in Table 2-7.

To perform the intersection capacity analysis, all study intersections were modeled in Synchro and analyzed using Highway Capacity Manual[5] (HCM) methodology. Intersections were analyzed using the 30HV volumes, lane configurations, and traffic controls previously described, along with signal timing data provided by ODOT. The capacity analysis worksheets have been included in the appendix for reference.

As shown in Table 2-7, all study intersections currently comply with ODOT's mobility standards, with the exception of the intersection on OR 99 at 1st Avenue. According to the signal timing sheets provided by ODOT, this intersection is currently programmed to run on a fixed cycle length. The signal timing for this intersection, as well as others within this corridor, may be revisited under the future year analysis to see if adequate mitigation can be provided without requiring high-cost capacity improvements.

Also, it should be noted that while the stop-controlled and yielding movements on the intersection of OR 99/Prairie Road are shown have very low v/c ratios, the southbound through movements are experiencing a v/c ratio of 0.58 (mobility standard for this movement would be 0.85). While operations on stop-controlled and yielding movements often degrade faster than other movements as intersection volumes increase, this southbound through movement will need to be evaluated again during the future year analysis to ensure adequate operations are being maintained.

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[4] *1999 Oregon Highway Plan* – August 2005 Amendment, Oregon Department of Transportation, 2005.
[5] 2000 Highway Capacity Manual, Transportation Research Board, Washington DC, 2003.

Table 2-7: 2006 30HV Existing Intersection Performance

Study Intersection	Intersection Performance			Mobility Standard
	Delay	LOS	V/C	V/C
Traffic Signal Control				
OR 99E & OR 99	15.9	B	0.59	0.85
10th Avenue & OR 99	11.9	B	0.71	0.85
6th Avenue & OR 99	11.3	B	0.64	0.85
1st Avenue & OR 99	33.4	C	**0.88**	0.85
OR 36 & OR 99	23.3	C	0.72	0.85
STOP Sign Control				
Prairie Road & OR 99	16.6	B/C	0.17*	0.90

LOS Level of service

"A/A" refers to level of service of left turning traffic from major street and the average level of service of traffic turning from the minor street onto the major street.

Delay Average vehicle delay in seconds for all movements at signalized and four-way stop intersections. Minor street delay in seconds at unsignalized intersections.

V/C Volume to capacity ratio of the intersection.

* critical v/c for OR 99/Prairie Rd is on northbound left turn.

Black background and bold type indicates mobility standard is not met.

Sub-Area Conceptual Access Plan

As previously noted, there are lands bounded by the BNSF and UPRR railroads from 1st Avenue to the southern urban growth boundary, including the entire future prison site, which may be difficult to develop due to the inaccessibility of the individual properties resulting from the presence of the railroads. These properties are zoned for industrial development, but are currently developed with a mix of industrial and agricultural uses that are being served through a combination of private and public railroad crossings. As these properties attempt to redevelop, the existing means of access may not be adequate to serve the new uses or restrictions on existing railroad crossings may not allow for continued use. Therefore, to facilitate the development of this area, a conceptual access plan will be developed to guide the construction of future roads and railroad crossings.

Figure 2-11 displays the sub-area bounded by the railroad tracks and the locations of existing access points serving all properties within it. The access points shown include both public and private crossings, many of which would not remain after redevelopment of this area. The goal of the conceptual access plan will be to provide access to all properties within this area, while reducing the number of rail crossings as much as possible. Developing new public streets and taking advantage of existing public rail crossings will be key elements of this plan.

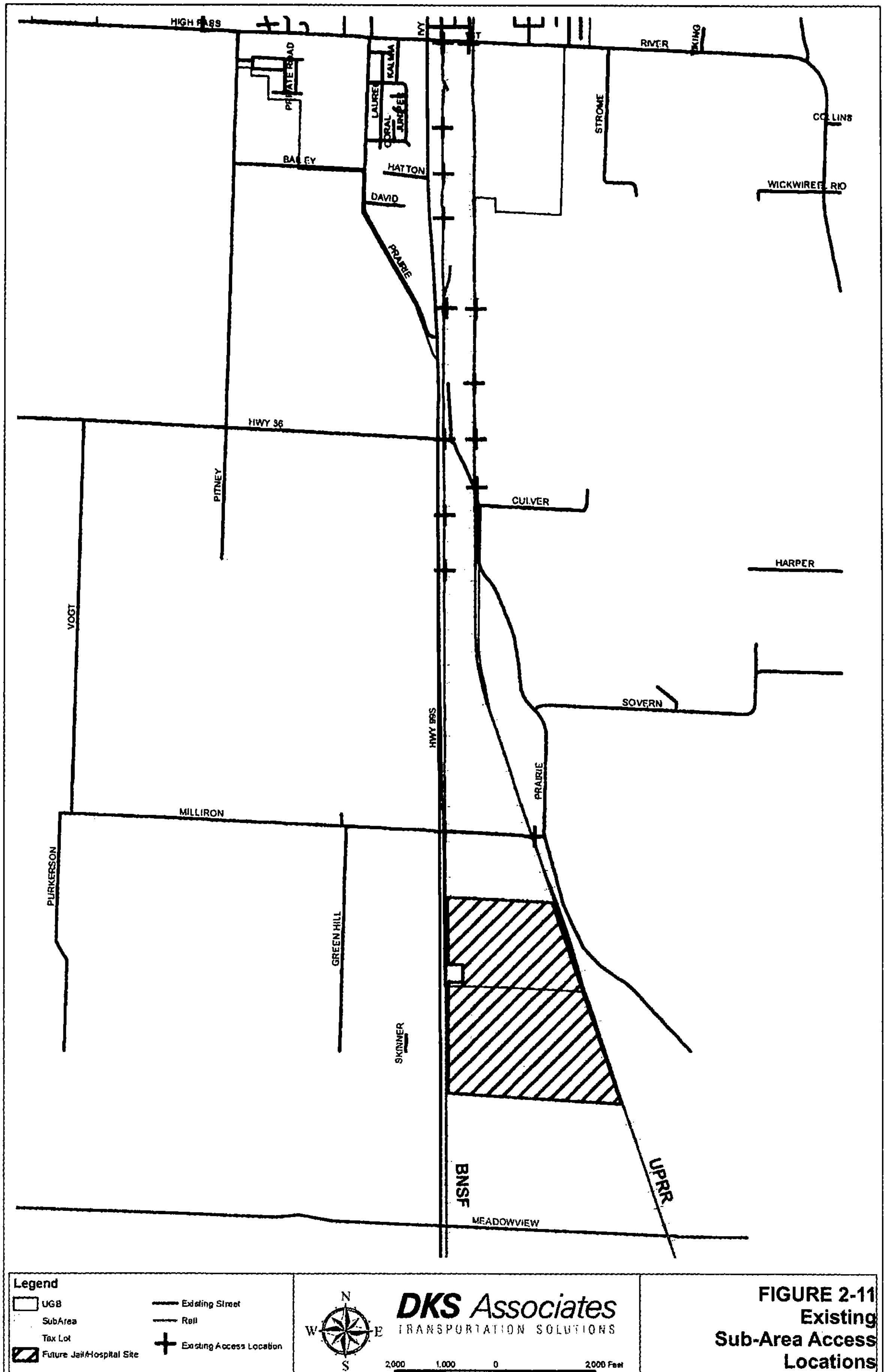


FIGURE 2-11
Existing Sub-Area Access Locations

Chapter 3
No Build Case Operational Analysis

The purpose of this chapter is to analyze future operating conditions in 2026 through the study corridor assuming only currently committed transportation improvements are in place. This effort will require forecasting future traffic volumes using the Junction City transportation demand model created by LCOG and using them along with operational and geometric data collected for existing conditions to assess operations on OR 99 at the study intersections. This analysis will be used in later stages of the project to identify needed improvements and to develop an implementation strategy.

Future Traffic Volumes

To develop design hour volumes for the year 2026, LCOG created a transportation demand model for Junction City that included a base year scenario for the year 2006 and a future year scenario for the year 2026. Using the volume assignments from these two scenarios, a post-processing technique recommended in NCHRP Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*[1] was employed to forecast design hour volumes. In essence, this methodology applies the growth found to occur between base year and future year scenarios and applies a portion of it to actual traffic count data, accounting for time that has already passed between the base year scenario and the date of the collected counts. Because in this case the base year of the model is the same as the year of the actual traffic counts taken (plus one year of growth that was previously added), the entire increment of growth between the base and future scenarios could be applied.

The degree of growth experienced on study area streets is illustrated in Figure 3-1, which displays a model plot of the difference in forecasted traffic volumes between the base year (2006) scenario and the future year (2026) scenario, with red links showing positive growth and green links showing negative growth. It should be noted when looking at this plot that the fat green links seen do not represent negative growth, but are actually locations where links that were present in the base year scenario were removed or relocated in the future year scenario.

[1] *Highway Traffic Data for Urbanized Area Project Planning and Design*, National Cooperative Highway Research Program, Report 255, TRB, Washington D.C., 1982.

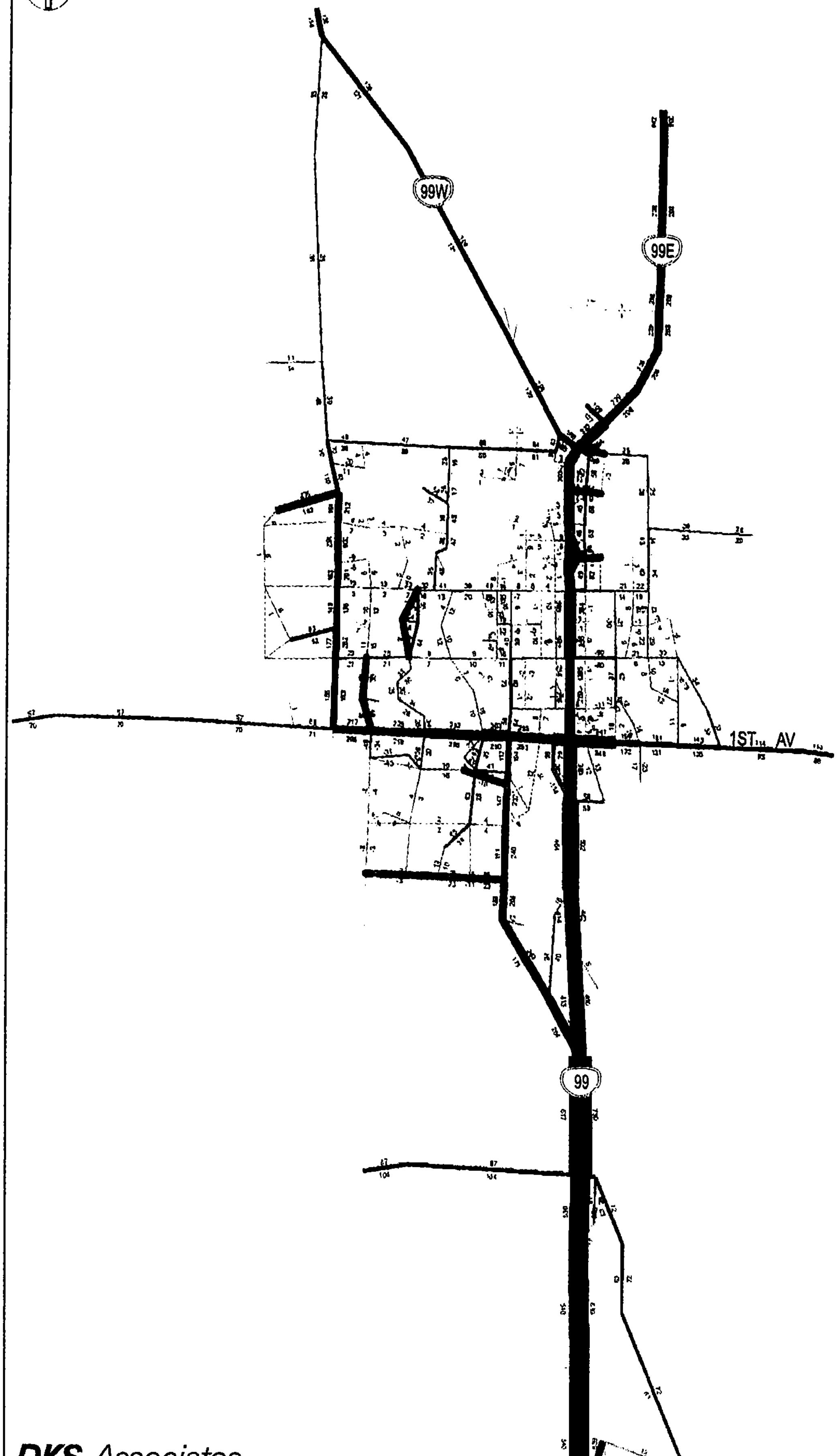
OR 99

Junction City

Refinement Plan

FIGURE 3-1

Junction City Model Difference Plot (2026-2006)



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By taking the growth found to occur between the base year and future year scenarios on each turning movement at study intersections and applying it to the 2006 30th highest hour volumes previously developed, design hour volumes for the year 2026 were obtained. In a few cases where volumes decreased, it was assumed the primary cause was related to trip shifts due to system capacity improvements or changes in land use between the base and future years. Therefore, to keep a conservative forecast, these movements were assumed to experience no growth rather than negative growth. These volumes are displayed in Figure 3-2.

Compared to the 30th highest hour volumes under existing conditions, most of the growth on OR 99 through the study area occurs at the northern and southern ends of the city. To the north of 18th Avenue, OR 99W and OR 99E grow 49% and 53%, respectively. Then from 18th Avenue to Prairie Road, growth drops to approximately 34%. South of Prairie Road, growth on OR 99 increases again to approximately 55%.

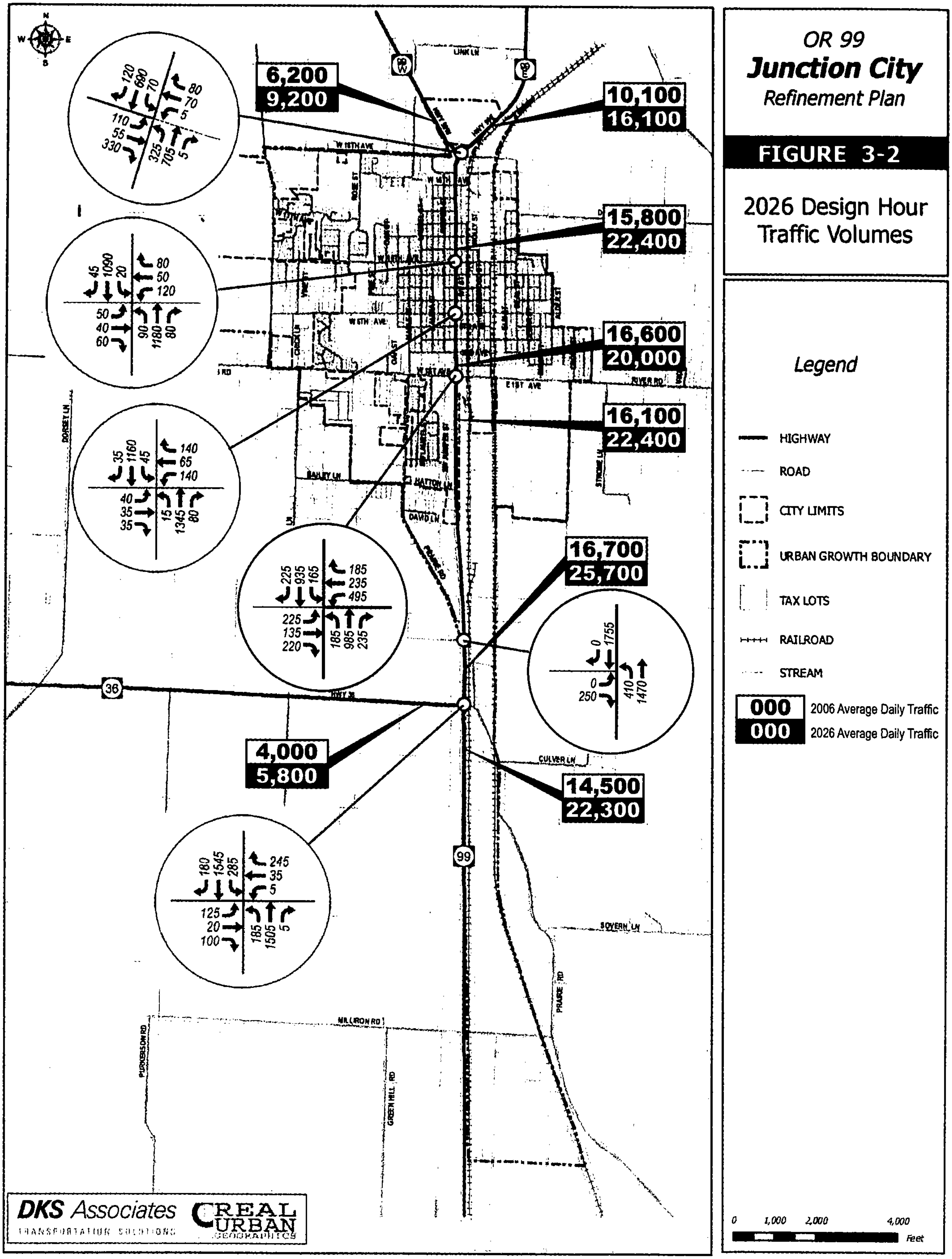
Using the model developed by LCOG, trips along OR 99 through Junction City were tracked to determine the percentage of highway users that are only passing through versus those that begin or end their trip somewhere within the city. From this analysis it was found that in 2026, approximately 38% of the traffic on OR 99 through Junction City will be through traffic. Furthermore, it is anticipated that approximately 75% of the through trips will arrive from or depart to OR 99E, with the remaining 25% using OR 99W.

Future Traffic Operations

Intersection Capacity

Using the 2026 design hour volumes developed, study intersections were analyzed to evaluate future operating conditions. Because there are no planned transportation improvements along OR 99 through the study area, the same Synchro model that was used to analyze existing conditions was used for this analysis, with no modifications made to signal timing or phasing or to intersection geometry. The results of this analysis are summarized in Table 3-1, which compares key measures of effectiveness including delay, level of service (LOS), and volume-to-capacity (v/c) ratios for each intersection under 2006 and 2026 conditions. Because the analysis of future conditions assumes a no-build condition, the mobility standards from the 1999 Oregon Highway Plan, which were applicable to existing conditions, continue to be the appropriate means for determining adequacy of operations.

As shown in Table 3-1, the growth in traffic volumes through the OR 99 corridor will increase congestion at all intersections, with four of the six study intersections failing to meet mobility standards and the intersections at 1st Avenue and OR 36 operating over capacity.



OR 99
Junction City
Refinement Plan

FIGURE 3-2

2026 Design Hour Traffic Volumes

Table 3-1: 2026 Design Hour Operations - No Build Condition

Study Intersection	2006 Performance			2026 Performance			Mobility Standard
	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	v/c
Traffic Signal Control							
OR 99W & OR 99E	15.9	B	0.59	21.9	C	0.74	0.85
OR 99 & 10th Ave.	11.9	B	0.71	13.5	B	**0.87**	0.85
OR 99 & 6th Ave.	11.3	B	0.64	11.9	B	0.73	0.85
OR 99 & 1st Ave.	33.4	C	**0.88**	>80.0	F	**>1.0**	0.85
OR 99 & OR 36	23.3	C	0.72	58.2	E	**>1.0**	0.85
Stop Sign Control							
OR 99 & Prairie Rd.	16.6	B/C	0.17*	>60.0	C/F	**0.96****	0.90

Notes: LOS (Level of Service)

"A/A" refers to level of service of left turning traffic from major street and the average level of service of traffic turning from the minor street onto the major street.

Delay — Average vehicle delay in seconds for all movements at signalized and four-way stop intersections. Minor street delay in seconds at unsignalized intersections.

v/c — Volume to capacity ratio of the intersection.

* critical v/c for OR 99/Prairie Rd in 2006 is on northbound left turn.

** critical v/c for OR 99/Prairie Rd in 2026 is on eastbound right turn.

Black background and bold type indicates mobility standard is not met.

To gauge the approximate duration of congestion that would be experienced in 2026, traffic volume profiles over a 16-hour period were created using counts collected under existing conditions. To project future volumes for all hours in this profile, the growth found to occur between the future design hour and the same hour under existing conditions was applied to volumes measured during all hours under existing conditions. For this evaluation, the point on OR 99 at 1st Avenue was selected, as it maintains some of the highest traffic volumes in the study corridor and represents a key bottleneck in the system.

Figures 3-3 and 3-4 present the hourly volume profiles on OR 99 under both existing and future conditions for the northbound and southbound directions of travel, respectively. To indicate when congested conditions would occur, a capacity ceiling was overlaid on these charts using adjusted (not ideal) saturation flow rates and actuated green times from the capacity analysis of the OR 99 intersection at 1st Avenue during the 2026 design hour (representing a v/c = 1.0). It should be recognized when considering this information that when traffic volumes exceed capacity the actual duration of congestion may be longer than shown because of the time needed for the system to recover from the "breakdown" that has occurred.

Figure 3-3: OR 99 Congestion Profile - Northbound

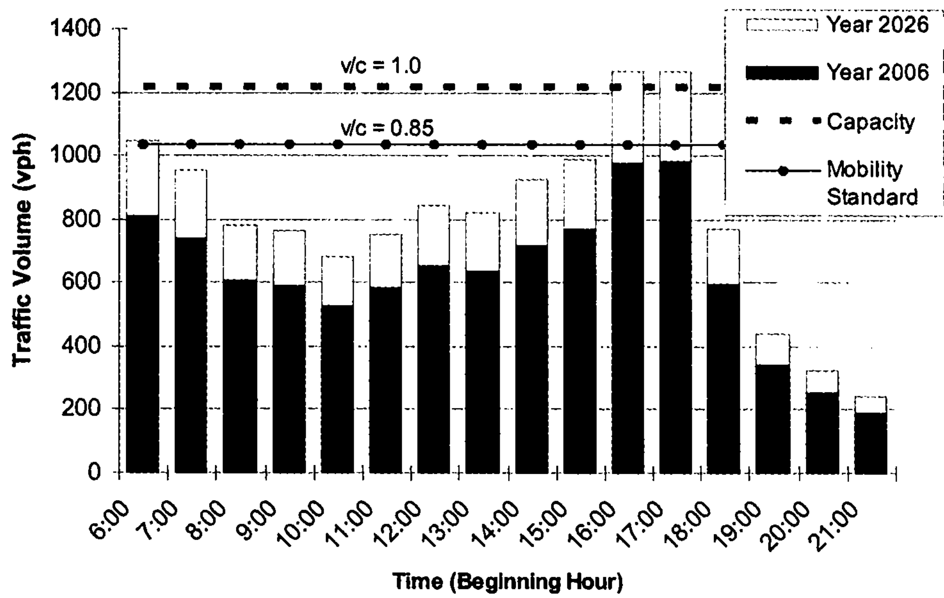
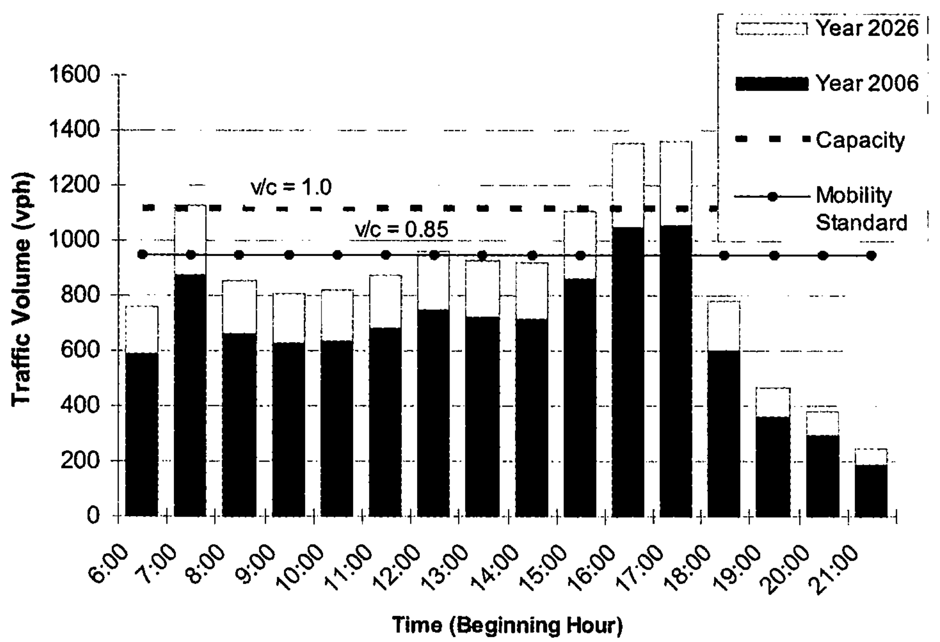


Figure 3-4: OR 99 Congestion Profile - Southbound



As shown in these figures, in both directions of travel the p.m. peak period currently experiences higher traffic volumes than the a.m. peak period, with two continuous hours between 4:00 and 6:00 p.m. where volumes are nearly identical. Assuming this trend continues through 2026, there will be at least a two-hour period, beginning at approximately 4:00 p.m., where traffic demands will exceed system capacity (v/c > 1.0). Also of note is that in the southbound direction, the a.m. peak hour volume will also exceed capacity, although only by a small degree.

An additional line was overlaid on these charts to also indicate approximately how many hours of the day would experience conditions that failed to meet ODOT's mobility standards. From Figure 3-4 is it seen that the peak hour that was previously identified as failing to meet mobility standards under existing conditions may actually be two hours long or more. However, in the future, there will be at least 3 hours during the p.m. period where conditions fail to meet mobility standards and potentially 2 hours in the a.m. period, in addition to several midday hours approaching the standard as well.

Vehicle Queuing

Under congested conditions, long vehicle queues will form along the highway. Between 15th Avenue and 3rd Avenue, OR 99 would be particularly sensitive to this because no separate turn lanes are present to move turning vehicles out of the way of through traffic. To get a better understanding of future traffic operations in 2026, an analysis of vehicle queues at study intersection approaches was performed to supplement the capacity analysis. Because of the level of congestion forecast to occur, SimTraffic was used to calculate vehicle queues rather than relying on Synchro. Figure 3-5 presents the calculated 95th percentile vehicle queues for each intersection movement and compares it to the amount of available queue storage, with movements experiencing queues that can not be contained within available storage highlighted.

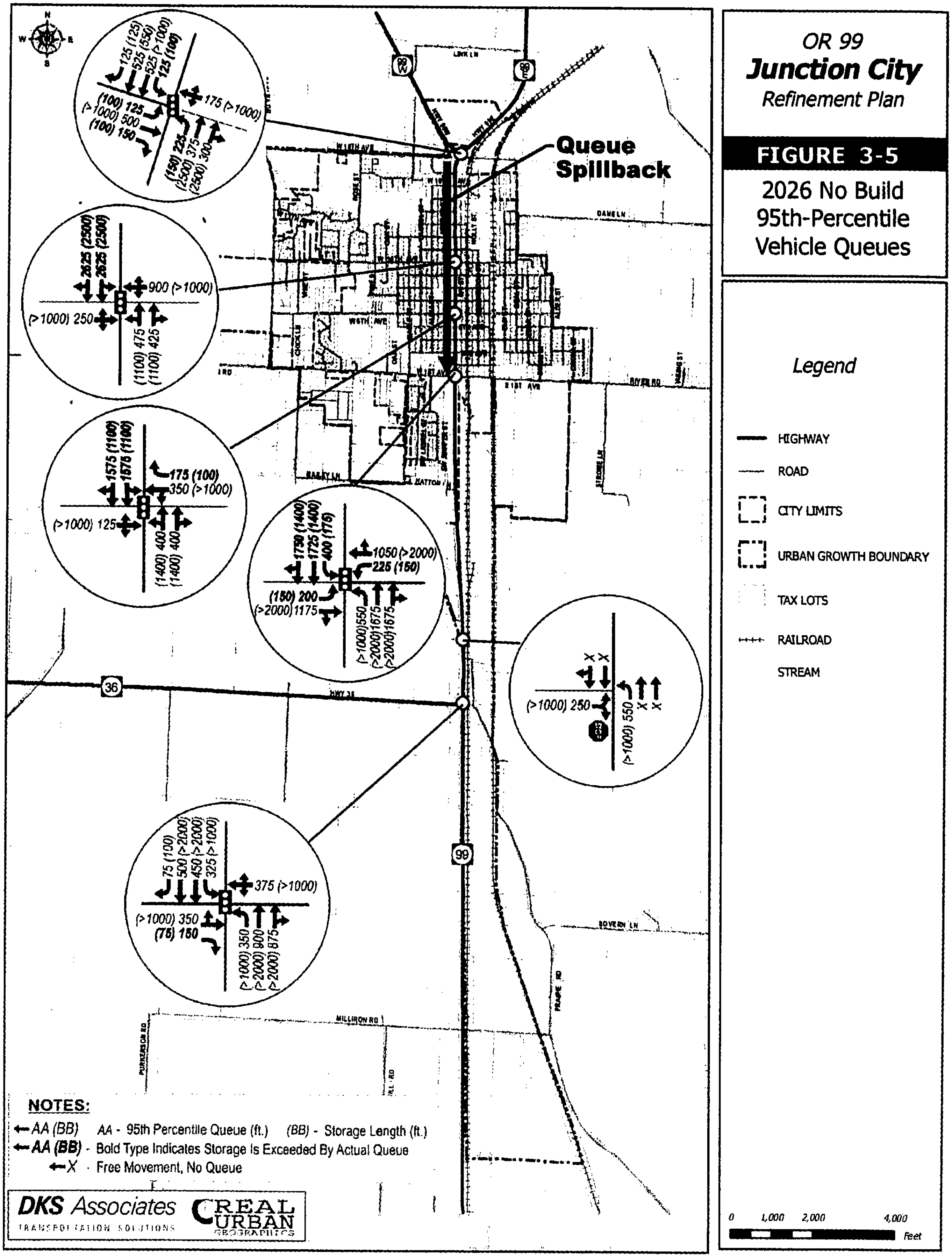
To support the information presented in Figure 3-5, further descriptions of areas where excessive queues were found are provided below.

OR 99W at OR 99E

- The eastbound through queue on OR 99W spills back through the intersection with Juniper Street.

OR 99 at 10th Avenue

- The southbound queue on OR 99 spills back through the intersection with OR 99W/OR 99E.
- The westbound queue on 10th Avenue spills back beyond the UPRR tracks.
- The eastbound queue on 10th Avenue spills back through the intersection with Juniper Street.
- The northbound queue on OR 99 spills back through the intersection with 9th Avenue.


OR 99
Junction City
Refinement Plan
FIGURE 3-5
2026 No Build
95th-Percentile
Vehicle Queues
Queue Spillback
Legend
HIGHWAY
ROAD
CITY LIMITS
URBAN GROWTH BOUNDARY
TAX LOTS
RAILROAD
STREAM
0 1,000 2,000 4,000 Feet
NOTES:
AA (BB) AA - 95th Percentile Queue (ft.) (BB) - Storage Length (ft.)
AA (BB) - Bold Type Indicates Storage Is Exceeded By Actual Queue
X - Free Movement, No Queue
DKS Associates
TRANSPORTATION SOLUTIONS
REAL URBAN GEOGRAPHICS

<u>OR 99 at 6th Avenue</u>

- The southbound queue on OR 99 spills back through the intersection with 10th Avenue.
- The westbound queue on 6th Avenue spills back through the intersection with Holly Street.
- The northbound queue on OR 99 spills back through the intersection with 5th Avenue.

<u>OR 99 at 1st Avenue</u>

- The southbound queue on OR 99 spills back through the intersection with 6th Avenue.
- The westbound queue on 1st Avenue spills back beyond the UPRR tracks.
- The eastbound queue on 1st Avenue spills back through the intersection with Prairie Road.

<u>OR 99 at OR 36</u>

- The westbound queue on Prairie Road spills back beyond the BNSF tracks.

Traffic Progression

Under the signal timing plans currently in use at the study intersections, only the traffic signals at 10th Avenue, 6th Avenue, and 1st Avenue are maintaining common cycle lengths and are running in coordination, providing a bandwidth of 32 seconds in the northbound direction and 23 seconds in the southbound direction. With the intersections of OR 99W at OR 99E and OR 99 at OR 36 being approximately ½ mile and 1 ½ miles away, respectively, including them as part of this coordinated system of signals may provide little benefit. Time-space diagrams have been included in the appendix.

Chapter 4
Problem Statement, Evaluation Criteria, and Technical Rating Methods

The purpose of this chapter is to define the problem statement for the project to focus alternatives development, as well as evaluation criteria and technical rating methods to use for alternatives screening.

Problem Statement

Through the analysis of existing and future (2026) conditions through the OR 99 corridor, a number of deficiencies were identified, as well as constraints that must be addressed when developing improvement alternatives. Through the 20-year planning period, OR 99 will experience a significantly higher traffic demand than the current infrastructure can handle. With no capacity enhancements made, high levels of congestion will be experienced for at least 3 hours during the weekday p.m. peak period, including vehicle queues in the southbound direction that will block intersections from 1st Avenue through the OR 99W/OR 99E split. Over a third of this demand will only be passing through with no origin or destination within the City.

The increased congestion experienced in 2026 will also intensify problems noted under existing conditions, such as the need for bike lanes along OR 99 and improved pedestrian crossing opportunities in the section between OR 99W and 10th Avenue and the section between 1st Avenue and OR 36. Furthermore, it is anticipated that the already high crash frequency potentially related to the high access density and lack of turn lanes will continue to rise.

Providing the needed capacity to meet future demands will be difficult to achieve within the existing highway corridor. There is not enough right of way in the constrained section between the Flat Creek Bridge and 1st Avenue to accommodate all modes of travel and provide needed turning lanes. However, due to the presence of many buildings that have been constructed very near the highway right of way, widening this section would be very expensive and would have significant impacts on the downtown area. Furthermore, the presence of the railroad tracks to the east of OR 99 will limit opportunities to develop improvement alternatives in that direction, as it is possible that no new at-grade crossings would be allowed.

Accessibility of industrial lands in the south end of the City will also be a challenge, as railroads bound this area to the east and west. Because few rail crossings will be allowed, a comprehensive plan to provide access to all properties within this area will be needed to allow for development to occur in an orderly manner.

Evaluation Criteria and Technical Rating Methods

To rank potential improvement alternatives that will be developed to address the problems discussed above, evaluation criteria were created that are focused on compliance with state and local plans and policies, engineering design requirements, and a desire to minimize environmental and private property impacts. The criteria developed are described below.

Evaluation Criterion	Rating Method
Meets HDM Mobility Standards The effectiveness of new state facilities constructed will be evaluated according to the mobility standards in the Highway Design Manual. Because alternatives that do not meet these standards, but may provide remarkable improvement, could be deemed acceptable, using a pass/fail rating method would not be desirable.	**+ / ✓ / -** + Meets HDM mobility standard. ✓ No effect on mobility. - Mobility is worsened.
Reduces Corridor Through Travel Time Because over one third of all travel along OR 99 will be associated with through travel only and this highway has been designated as a freight route, improving the ability to move traffic through the study area is important. Alternatives that do not improve through travel time should be rated lower.	**+ / ✓ / -** + Reduces through travel time. ✓ No effect on through travel time. - Through travel time is worsened.
Reduces OR 99 intersection queue blockage Under No Build conditions, queue spillback from downstream intersections prohibits many intersections from functioning properly. When queues block upstream intersections, adequate operations can not be achieved. All alternatives considered must be able to manage vehicle queues along OR 99 better than the No Build condition.	**+ / ✓ / -** + Major reduction in queue spillback. ✓ Minor reduction in queue spillback. - No reduction in queue spillback.
Able to meet Design Standards While it is important that proposed alternatives would be able to meet adopted design standards (from the Highway Design Manual for state facilities), there may be situations where the standards can not be met, but it is reasonable to assume a design exception could be obtained. Therefore, using a pass/fail rating method would not be desirable.	**+ / ✓ / -** + Meets design standards. ✓ May require design exception. - Would require significant design exception(s).

Facilitates Pedestrian Crossing of OR 99 Under current conditions, OR 99 acts as a barrier between the east and west sides of town and does not have adequate pedestrian crossing opportunities in some areas of the corridor. Improvement alternatives should address the need to facilitate pedestrian travel.	**+ / ✓ / -** + Improves pedestrian crossings. ✓ No effect on pedestrian crossings. - Degrades pedestrian crossings.
Improves Bicycle Travel There are currently no bike lanes on OR 99 for a considerable distance, forcing bikes to ride in the motor vehicle lanes or discouraging bike travel altogether. Proposed alternatives need to provide for bicycle travel to enhance corridor safety and encourage alternate travel mode use.	**+ / ✓ / -** + Improves bicycle travel. ✓ No effect on bicycle travel. - Degrades bicycle travel.
Reduces Direct Highway Access The high access density along OR 99 should be reduced to help alleviate the current safety problems in the corridor, to provide an environment where traffic can move efficiently, and to make the area more attractive to walking and biking.	**+ / ✓ / -** + Reduces access density. ✓ No effect on access density. - Increases access density.
Reduces Vehicle Conflicts Under current conditions, the high access density and lack of turn lanes between the Flat Creek Bridge and 1st Avenue provide an environment that results in a substantial number of vehicular conflicts that degrade safety and mobility. Reductions in conflicts through access management techniques (reducing the number of driveways, adding turn lanes, installing median barrier, etc...) or other means is essential for achieving adequate operations.	**+ / ✓ / -** + Reduces vehicle conflicts. ✓ No effect on vehicle conflicts. - Increases vehicle conflicts.
Potential Environmental Impacts Environmental impacts, including impacts to natural resources, socioeconomics, and visual impacts should be avoided where possible. While such impacts will not be studied in detail as part of this project, alternatives will be reviewed for potential impacts to known areas of environmental sensitivity (wetlands, haz-mat, parks, cultural/historic resources, etc...).	**+ / ✓ / -** + No known impacts. ✓ Potential for minor impacts. - Significant impacts.

	+ / ✓ / -	
No new at-grade RR crossings Obtaining approval for new at-grade railroad crossings is generally very difficult and commonly requires the simultaneous closure of other existing at-grade crossings. The feasibility of advancing any alternatives that show new at-grade railroad crossings would therefore be questionable.	+	Reduces number of at-grade RR crossings.
	✓	No change in number of at-grade RR crossings.
	-	Increases number of at-grade RR crossings.
Feasible Construction/ Implementation Alternatives that can be constructed or implemented with little impact to traffic flow should be rated higher than those that would require the elimination of travel lanes during construction. Also, alternatives with elements that may not be constructible or implementable should not be pursued.	+	No phasing required.
	✓	Constructible in phases.
	-	Not constructible.
Private Property Impacts Alternatives with no private property impacts would be the most desirable. While private property impacts should be minimized where feasible, impacts that would not require purchasing the entire property and would allow current development to continue operating are preferable.	+	No impacts.
	✓	Requires partial property takes.
	-	Requires total property takes.
Cost-effectiveness Some alternatives may have higher costs associated with them, but may also provide the most improvement for traffic operations. Therefore, the cost alone should not be used to determine if an alternative is desirable from a financial standpoint.	+	Very cost-effective.
	✓	Moderately cost-effective.
	-	Not cost-effective.
Consistent with City Comp Plan/ TSP Alternatives considered should not conflict with adopted policies or planned improvements in the City's Comprehensive Plan or Transportation System Plan (TSP) unless it is reasonable to assume that adopted plans would be amended by the City to remove such conflicts.	+	Consistent with adopted plans.
	✓	Conflicts exist, but could be resolved by City through amendments.
	-	Conflicts exist and City will not amend plans to resolve them.

Criterion	+ / ✓ / -	
Consistent with Junction City Downtown Plan Alternatives considered should not conflict with the objectives and strategies in Junction City's adopted Downtown Plan. Specifically, alternatives should provide improved automobile, pedestrian, and bicycle access and safety throughout the downtown.	+	Consistent with and compliments Downtown Plan.
	✓	Does not compliment Downtown Plan, but is or would be made consistent.
	-	Would conflict with Downtown Plan.

Chapter 5
Alternative Identification and Preliminary Screening

The purpose of this chapter is to identify the preliminary alternatives considered for transportation improvements to address deficiencies noted in the OR 99 corridor under existing and future conditions. The following sections present descriptions, scaled physical layouts, and opportunities and constraints associated with the five preliminary alternatives. Preliminary screening was applied to the alternatives to determine which should be advanced for further consideration.

Alternative Descriptions

Five preliminary alternatives were considered to address the transportation needs in the OR 99 corridor though Junction City. These alternatives address all transportation modes and have a broad range of complexities and cost. The alternatives include:

- Alternative 1: Improve Existing Corridor – Maintain width from Flat Creek Bridge to 3rd Avenue;
- Alternative 2: Improve Existing Corridor with Widening as Needed;
- Alternative 3: Improve Local Facilities;
- Alternative 4: Juniper Street / Ivy Street Couplet[1]; and
- Alternative 5: OR 99 By-pass: OR 99E to OR 36.

A description of each alternative follows.

Alternative 1: Improve Existing Corridor within Available Right-of-way

The first alternative focuses on improvements that can be implemented with limited acquisition of right-of-way. As previously discovered, the four-lane section of OR 99 between the Flat Creek Bridge and 3rd Avenue acts as a major bottleneck in the system with no turn lanes or bike lanes provided. With only 60 feet of right-of-way available in this area and many buildings constructed close to the existing back of sidewalk, there is no ability to widen the highway and add these needed amenities without major property and business impacts.

This proposed alternative would restripe the existing highway, which includes only four through lanes (two in each direction), to include one through lane in each direction, one bike lane in each direction, and a median to allow for left turn lanes where desired. Therefore, the resulting cross-section within the existing 60-foot right-of-way would include:

- 2 travel lanes (12 feet wide each),
- 1 median/left turn lane (14 feet wide),
- 2 bike lanes (5 feet wide each), and
- 2 sidewalks (6 feet wide each).

[1] Alternative 4 includes two options for the southern extents of the couplet. Under Option A the couplet would begin on the southern end approximately 1,000 feet south of 1st Avenue. Under Option B the couplet would extend farther south.

Figure 5-1 shows the extents of the three-lane section of OR 99, as well as the proposed cross-section.

This new cross-section would be achieved by transitioning from the existing five-lane cross-sections to the north and south by dropping a through lane as a right turn in the southbound direction at 17th Avenue, as well as in the northbound direction at 3rd Avenue. The capacity of the roadway could be further improved through implementation of an access management plan and pedestrian refuge islands could be constructed at mid-block locations to improve pedestrian safety and highway crossing opportunities. Pedestrian crossing for the visually impaired could further be enhanced through the provision of audible pedestrian signals at all signalized highway intersections.

While only a preliminary level of analysis that did not include use of the travel demand model was conducted to determine if the above referenced improvements could reasonably be expected to meet mobility standards, it was found that the proposed modification of OR 99 from the Flat Creek Bridge to 3rd Avenue that adds left turn lanes by removing through lanes makes intersection operation worse than in the No Build condition. It is suspected that further analysis would find that without the existing two through lanes in each direction, insufficient capacity would remain to adequately serve highway traffic, resulting in over-capacity conditions on OR 99 and the potential for increased traffic on local streets in the area.

To mitigate poor operations at the OR 99/ 1st Avenue intersection, right turn lanes would be added to all approaches, along with dual left turn lanes on the westbound approach and modifications to the current signal timing and phasing. While the northbound and southbound right turn lanes would fit within available right-of-way, the other improvements to the eastbound and westbound approaches would not, resulting in private property impacts. Furthermore, the additional turn lanes on the westbound approach may require widening of the BNSF railroad crossing. Preliminary analysis results suggest this intersection may operate at a v/c ratio of 0.81 with these improvements in place (mobility standard requires $v/c \leq 0.75$).

Improvements required at the intersection of OR 99/ OR 36 include the construction of a westbound right turn lane, dual eastbound left turn lanes with restriping to create a shared through-right turn lane, signal timing and phasing modifications, and relocating the crosswalk from the north approach to the south approach. Adding the westbound right turn lane would require widening the BNSF railroad crossing, but other improvements would fit within available right-of-way. Preliminary analysis results suggest this intersection may operate at a v/c ratio of 0.84 with these improvements in place (mobility standard requires $v/c \leq 0.75$).

Installing a traffic signal at the three-way intersection on OR 99 at Prairie Road would allow for mobility standards to be met, but may not be a desirable improvement as virtually all turning movements at this intersection are turning left from OR 99 to Prairie Road or turning right from Prairie Road to OR 99. Because of this, it is very unlikely that required warrants for signalization could be met and that signalization would not benefit these turning movements enough to justify the added delay incurred by mainline traffic.

Given that the movement that failed to meet mobility standards was the right turn from Prairie Road, another option for mitigation includes the construction of an acceleration lane from Prairie Road to southbound OR 99, allowing for free right-turn movements. However, with a private driveway that is used by large trucks associated with a light industrial business located on the west side of OR 99 approximately 400 feet south of Prairie Road, an acceleration lane at this location could present a hazard.

Alternative 2: Improve Existing Corridor with Widening as Needed

Alternative 2 increases the capacity in the OR 99 corridor by retaining the existing two through lanes in each direction while adding bicycle lanes and a center turn lane through the purchase of additional right-of-way. This would provide needed left turn lanes and bicycle lanes between the Flat Creek Bridge and 3rd Avenue similar to Alternative 1, however it would not be done at the expense of losing existing through lanes. The proposed cross-section for this alternative would require 92 feet of right-of-way (compared to the 60 feet of existing right-of-way) and would include:

- 4 travel lanes (12 feet wide each),
- 1 median/left turn lane (14 feet wide),
- 2 bike lanes (5 feet wide each), and
- 2 sidewalks (10 feet wide each).

While only 6-foot wide sidewalks are required to meet design standards for this facility, 10-foot sidewalks are recommended to provide a more comfortable and attractive walking environment and allow for potential inclusion of street trees, benches, bike racks, trash cans, and other amenities. If the narrower 6-foot sidewalks were constructed, the cross-section would be reduced to 84 feet. Pedestrian travel would be further improved by constructing mid-block refuge islands to aid crossings of OR 99 and pedestrian crossing for the visually impaired could further be enhanced through the provision of audible pedestrian signals at all signalized highway intersections. Figure 5-2 shows the extents of the new five-lane section on OR 99, as well as the proposed cross-section.

As indicated in Figure 5-2, widening the highway to a 92-foot right-of-way width would result in property impacts on both sides of the highway out to 16 feet from the existing back of sidewalk. From a preliminary review of area properties adjacent to OR 99 between the Flat Creek Bridge and 3rd Avenue, it is estimated that this would result in the purchase of approximately 27 businesses (or approximately 50% of area businesses) based on current building locations. If the narrower cross-section including the smaller 6-foot sidewalks were constructed, the number of businesses purchased would only drop to approximately 22 (or approximately 40%).

While only a preliminary level of analysis that did not include use of the travel demand model was conducted to determine if the above referenced improvements could reasonably be expected to meet mobility standards, it is expected that with the improvements made along OR 99, including the northbound and southbound left turn lanes, no other improvements would be necessary at the study intersections of 10th Avenue and 6th Avenue.

Improvements needed at the intersections on OR 99 at 1st Avenue, Prairie Road, and OR 36 are the same as identified in Alternative 1.

Alternative 3: Improve Local Facilities

The third alternative considers improvements that would extend, realign, upgrade and increase the capacity of County roads surrounding the City to enhance connectivity and provide alternative routes to OR 99. Under this alternative, new and upgraded roads would be constructed to County Collector standards, but no new improvements would be included within the OR 99 corridor. In most areas, the roadway upgrades would simply provide wider shoulders (total pavement width of 36 feet), which generally makes a roadway more comfortable for drivers but provides only small capacity benefits. The wider shoulders would also be able to accommodate bicycle traffic. However, it should be noted that where new facilities are proposed that would be located on rural lands, land use approvals are necessary, and a statewide land use Goal 3 (Agriculture) exception could be required unless the area is first brought into the urban growth boundary. The cross-sections of these roadways would include:

- 2 travel lanes (12 feet wide each)
- 2 shoulders (6 feet wide each)

Pitney Lane, a local street, would be improved to collector (with shoulder) standards from OR 36 north to Bailey Lane and would be realigned from Bailey Lane north to intersect with High Pass Road opposite Oaklea Drive. This realignment and upgrade would make Pitney Lane more attractive as an alternate route to OR 99 and would facilitate north-south connectivity by acting as an extension of Oaklea Drive. The realigned section of Pitney Lane would impact rural lands and statewide land use law restricts the level of road improvements that can be constructed on these lands. State land use does permit a certain level of road improvement outside urban growth boundaries if certain criteria are met. Realignment of roads is a permitted use, provided the Transportation Planning Rule (TPR) definition of a realignment is met, and provided improvements do not force a significant change in, or significantly increase the cost of farm and forest practices on the lands.

Prairie Road (east of OR 99) would be realigned to remove the skewed UPRR crossing, and continue north along the east side of the UPRR line. A new east-west roadway would then be constructed to connect Prairie Road to the OR 99/ OR 36 intersection, creating a "T"-intersection with Prairie Road. This would have negligible impact on the BNSF rail crossing, but would require construction of a new UPRR crossing (to replace the old one) just west of the intersection of the new roadway at Prairie Road. As the extension of Prairie Road continues northward, it would veer east, close to the City's urban growth boundary, run over the existing Strome Lane, intersect with River Road, an continue due north until it connects to Dane Lane. This route would further enhance north-south connectivity by providing an alternative to River Road and Lovelake Road that is closer to the urban area, requiring less out-of-direction travel. This route may also provide an attractive alternative to using 1st Avenue for employees of the County Coach facility that want to go southbound on OR 99. Again, as most of these improvements would impact rural lands, a land use permit would at minimum be required, and an exception to statewide land use Goal 3 (Agriculture) may be necessary unless the surrounding area is first brought into the urban growth boundary. In particular, any new road extensions would require a Goal 3 exception unless the area of construction is within the urban growth boundary, or unless it can be proven that the purpose of the road is to reduce local access to or local traffic on a state highway, the road is limited to two travel lanes, and private access and intersections are limited to rural needs or to provide adequate emergency access.

East-side connectivity enhancements that may make the Prairie Road extension and the existing routes along Lovelake Road and River Road more attractive include upgrades of Dane Lane and River Road on the east side of the City. These enhancements would generally include widening to increase shoulder widths, making the roadways more comfortable for motorists and bicycles. Dane Lane would be upgraded from a local street to a collector (with shoulders) from Deal Street to Lovelake Road, while River Road would be improved from OR 99 to Lovelake Road.

Figure 5-3 illustrates the local facility improvements of Alternative 3 described above.

A preliminary analysis of the effectiveness of these improvements was conducted by adding the proposed road extensions to the street network in the transportation demand model developed for the Junction City area. The results showed only about 200 vehicles an hour diverting away from OR 99 to use these upgraded routes.

Alternative 4: Juniper Street / Ivy Street Couplet

Alternative 4 would change the traffic circulation pattern along the OR 99 corridor through much of the City by replacing a section of the existing highway with a couplet system that would accommodate northbound travel only along Ivy Street (OR 99), with southbound travel rerouted to Juniper Street one block to the west. By separating the northbound and southbound traffic onto two streets, turning conflicts at intersections are reduced and additional right-of-way becomes available for capacity and streetscape improvements.

Under this proposal, the north end of the couplet would begin at 17th Avenue where the southbound lanes would shift to the west and align with Juniper Street at the intersection with 16th Avenue. This would require purchasing the property bounded by 17th Avenue, OR 99, 16th Avenue, and Juniper Street and construction of a bridge over Flat Creek. From 16th Avenue, the southbound lanes would travel along the existing Juniper Street corridor to 3rd Avenue, with no need to widen the existing 60-foot right-of-way along Juniper Street.

While the existing alignment of Juniper Street ends at 3rd Avenue, it was decided to carry the southbound lanes south of 1st Avenue, as the intersection of OR 99 at 1st Avenue was previously determined to be a significant bottleneck in the corridor in need of mitigation. Therefore, from 3rd Avenue, the southbound lanes veer further to the west to intersect 1st Avenue opposite Kalmia Street. They then travel down the existing Kalmia Street alignment for approximately 500 feet before turning back to the east to connect with the existing OR 99 alignment approximately 900 feet south of 1st Avenue. Much of this alignment would require purchase of private property. The northbound travel lanes would stay within the existing OR 99 right-of-way through the entire corridor.

In each direction within the couplet, OR 99 will be constructed to fit within the existing 60-foot right-of-ways along Ivy Street and Juniper Street and will include:

- 2 travel lanes (12 feet wide each)
- 1 bike lane (6 feet wide)
- Parallel parking on one side of the highway (8 feet wide)
- 2 sidewalks (11 feet wide each)

Figure 5-4 shows the proposed couplet alignment and an illustration of the proposed highway cross-section. A design speed of 30 mph, which would allow for a posted speed of 25 mph, was maintained for both directions of OR 99. Potential new traffic signal locations shown on Figure 5-4 were assumed for cross streets currently maintaining signals on the existing OR 99 alignment and are not based on needs discovered through actual analysis, which would occur in the next phase of this study.

The improvements proposed as part of this alternative would improve capacity for northbound and southbound travel along OR 99 by retaining two through lanes in each direction and reducing the amount of turning conflicts at highway intersections. The inclusion of parallel parking would supplement existing on-site parking for abutting businesses, which in many cases is very limited today. Also, the inclusion of bike lanes would fill the existing gap in the bike system, allowing for a continuous route along OR 99 through the entire study area. Furthermore, posted speeds, which are 30 mph today, may be able to drop as the new cross-section would communicate to motorists that they are in a downtown environment.

Pedestrian travel would be significantly enhanced by providing wider sidewalks that could be used to accommodate street trees and street furniture such as trash cans, decorative light poles, benches, and bike racks. A buffer between pedestrians and motor vehicle traffic would be created by the bike lanes and parking aisle, making the environment more comfortable for walking. In addition, pedestrian crossings of OR 99 would become easier as people would only be required to cross two lanes of traffic at a time, with vehicles only approaching in one direction. Furthermore, bulb-outs could be constructed at street corners at the ends of the parallel parking aisles to shorten crossing distances and pedestrian crossing for the visually impaired could further be enhanced through the provision of audible pedestrian signals at all signalized highway intersections.

The slower highway speeds and wider sidewalks may also create a more conducive environment for bus stops through the couplet, allowing for direct access to adjacent businesses. The additional sidewalk widths may provide opportunities to supplement bus stops with shelters and benches. While bus pullouts could not be accommodated with the proposed cross-section, there are two alternatives for including them where desired.

The first alternative would be to place the parallel parking and bike lanes side-by-side on the right side of the highway, rather than on opposite sides of the highway as proposed. Where bus pullouts are desired (requiring approximately 10 feet of width), the parking aisle would be eliminated, the bike lane would be reduced to 5 feet wide, and the sidewalk would be reduced to 10 feet wide. While bike lanes and parallel parking aisles are often located side-by-side, especially on two-way roads, separating them as proposed would create a more attractive and safe environment for bicyclists as the danger of being hit with a car door would be eliminated. If this alternative for the inclusion of bus pullouts were selected, this risk would be reintroduced.

The other alternative would be to identify where bus pullouts are likely to be desired in the future, outline where additional right-of-way would be required to accommodate them, and either obtain that right-of-way during construction and build them or require the dedication of that right-of-way from adjacent properties when they redevelop and include the pullout as part of the frontage improvements.

Finally, this alternative would include impacts to private properties along the corridor. While much of the couplet would fit within existing right-of-way, the transitions at the north and south ends will require the purchase of private property. However, as the land surrounding Juniper Street is already zoned for commercial/residential uses, construction of the couplet may induce redevelopment of the Juniper Street corridor and extend activity in the west side of the downtown.

Alternative 4 – Option A: Juniper Street / Ivy Street Couplet with Southern Extension

This modification to the southern end of the Juniper Street/ Ivy Street couplet introduced as Alternative 4 was forwarded to explore opportunities to utilize currently vacant land along the east side of OR 99 between 1st Avenue and Prairie Road. As illustrated in Figure 5-5, this extension would begin at the southern end of original Alternative 4 where the southbound and northbound lanes