

WYOMING DEPARTMENT OF TRANSPORTATION

REQUEST FOR INTERCHANGE MODIFICATION  
FOR  
INTERSTATE 80 AT ROUNDTOP ROAD

Project No. NH-I080-06(191)  
New Interchange at I-80 MP: 357.67  
Laramie County, Wyoming

WYDOT Systems Planning  
January 10, 2005



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**REQUEST FOR INTERCHANGE MODIFICATION**  
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**Introduction**

The intent of WYDOT project NH-I080-06(191) is to develop an interchange on Interstate 80 at Roundtop Road, milepost 357.67. The new access point would provide access to proposed light industrial, commercial and low density residential developments. This project was initiated based on recommendations for the transportation infrastructure in the *West Cheyenne Land Use and Infrastructure Plan* ("West Cheyenne Plan", published December 2002, by the Cheyenne MPO), and development information provided by the Cheyenne-Laramie County Corporation for Economic Development (LEADS) and the Swan Development Corporation.

WYO 222/Roundtop Road is currently grade separated at I-80, and designated North Fort Access Road north of the interstate, and South Fort Access Road south of the interstate. The corridor is designated as Roundtop Road between Happy Jack Road and Horse Creek Road. In order to reduce confusion, the West Cheyenne Plan recommends the entire length be re-named Roundtop Road, and the Cheyenne MPO has formally recommended that the Laramie County Commissioners take this action. This document will use Roundtop Road as the roadway's designation.

The purpose of this document is to address issues for FHWA's Policy Statement for new or revised access points to the Interstate system. The following presents FHWA's policy on access modifications to the Interstate system, and WYDOT's responses to each item. TEA-21's planning factors [1203(f)] will also be addressed throughout the document.

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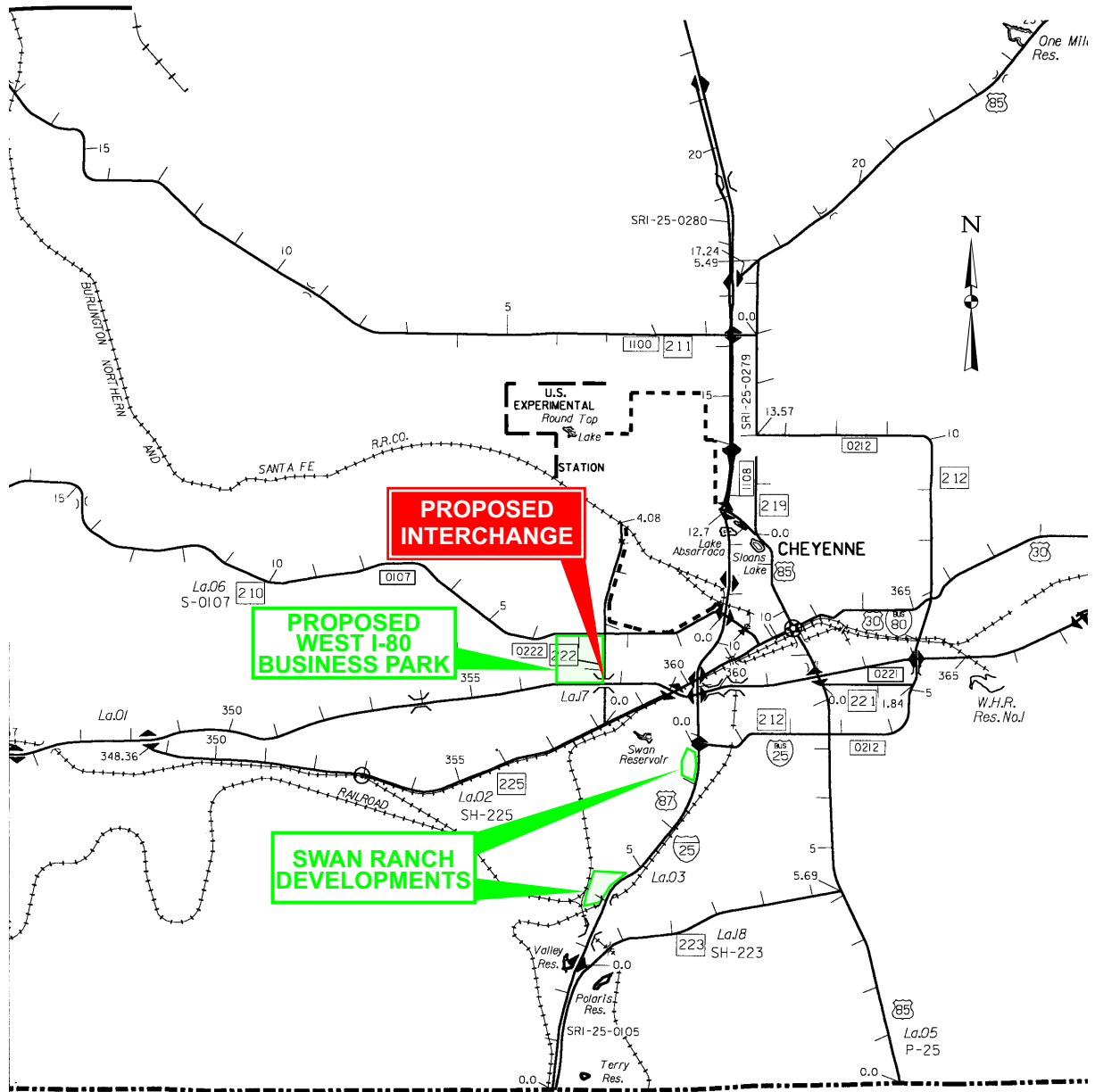
## **Background**

The I-80 Roundtop interchange proposal (Figure 1) was first introduced in 1994 through a Cheyenne Area Interstate Interchange Report prepared by WYDOT Planning, and re-evaluated in the West Cheyenne Plan in 2002. The West Cheyenne Plan was initiated by the Cheyenne Metropolitan Planning Organization (MPO) as part of a larger effort to update the 1992 Cheyenne Area Development Plan with a series of sub-area plans. The primary objective of this transportation plan is to address the circulation needs for the West Cheyenne planning area. This analysis included the freeway interchange system evaluation and the determination of future circulation needs for West Cheyenne. A consultant team led by LSA Associates, Inc. was retained to prepare the Plan. The process involved an examination of existing infrastructure and conditions, the preparation of a vision for land use and transportation in the region, a determination of infrastructure needs in the area, and, finally, the development of a specific action plan to address the needs and achieve the vision. A driving effort behind the West Cheyenne Plan was that the isolated character and lack of a developed roadway system in western Cheyenne had resulted in lack of development in the area. Man-made barriers such as F.E. Warren Air Force Base and I-25 have limited east-west transportation movements in the region.

As part of this overall work effort, three conceptual interchange locations were examined as to their importance and potential to accommodate growth the West Cheyenne Study Area. As part of the alternatives development and public input process, three interchange locations were proposed for analysis. Two of these interchanges were suggested along I-80, one at WYO 222/Roundtop Road west of I-25 (milepost 357.67) and the other at Parsley Boulevard east of I-25 (milepost 360.78). One additional interchange was recommended for consideration along I-25 south of the College Drive interchange, unofficially referred to as the Speer interchange near milepost 3.85. The analyses were based upon forecast traffic volumes developed by the Wyoming Department of Transportation, coupled with Federal Highway Administration (FHWA) interchange evaluation criteria. Based on this preliminary analysis, two of the three candidate interchanges were identified as being critical to serving the future needs and overall development of the West Cheyenne Study Area. These included the I-80/North WYO 222/Roundtop Road Interchange and the I-25 Speer Interchange. The I-80 Roundtop interchange was identified as being the highest priority interchange for the West Cheyenne Study area as it would provide direct access to the commercial, industrial and residential uses within the study area and minimize impacts to the existing circulation system, particularly Happy Jack Road. Because forecast traffic demand was relatively low and social impacts relatively high, the I-80/Parsley Interchange was not recommended for the study area within the next twenty years.

The nearest interchanges adjacent to the proposed I-80 Roundtop interchange are Otto Road at MP 348.36 (west of the proposed point of access), and West Lincolnway at milepost 359.08 (east of the proposed point of access). The proposed I-80 Roundtop Road interchange and the West I-80 Business Park development is 9.31 miles from the

# Figure 1 Proposed Interchange Location, Developments, & Regional Transportation Network



Otto Road Interchange and 1.41 miles from the Lincolnway Interchange (See Figure 2). In general, the existing roadways adequately serve the lower density uses that exist in the West Cheyenne planning area. There is, however, a lack of connecting roadways between various quadrants of the planning area, which are separated by the I-25 and I-80 freeways. As an example, there are no direct, efficient connections between the area to the northwest of I-25 and I-80 with the area to the southwest of I-25 and I-80 without extensive internal travel. This impact will become even more pronounced as land use in the planning area intensifies due to the development.

Advantages of the proposed interchange will be safer and more efficient access and egress from planned developments, convenient access to WYO 210/Happy Jack Road from I-80, interstate access and egress for the Dyna-Nobel chemical plant and Dixon Brothers Trucking, and another access to divert traffic off of I-80 during road closures. The proposed interchange would benefit the regional transportation system by providing safer and more efficient clearing of vehicular traffic from the interstate system during road closures, and access to facilities for those vehicles displaced during winter storm events. Also, with proposed developments planned in close proximity to both Union Pacific and the Burlington Northern Santa Fe Railroads, there is strong potential to enhance intermodal connectivity in the region. The regional economy will be improved by providing ready and efficient access for future industrial and commercial developments.

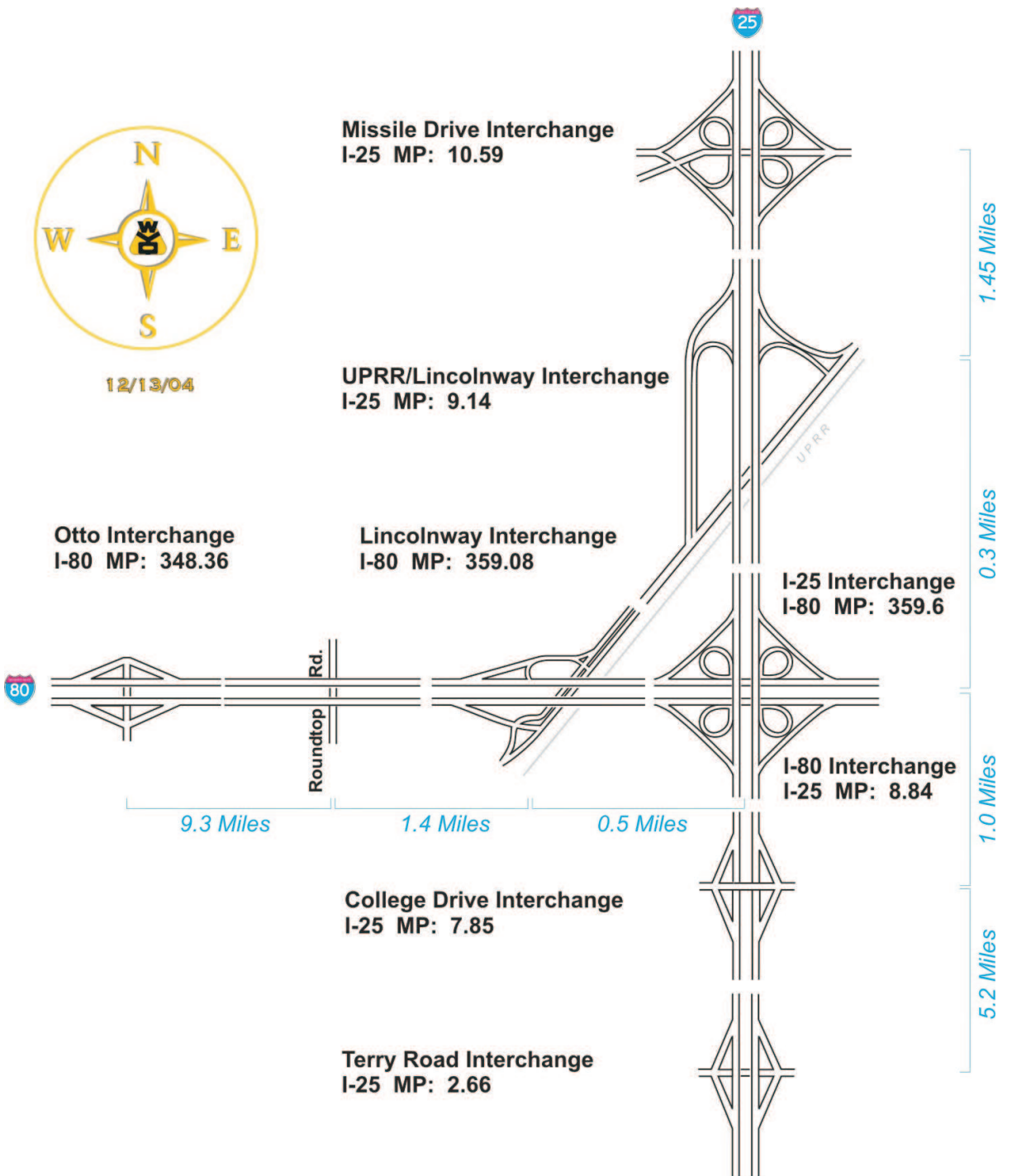
Although much of the analysis involved with the proposed I-80 Roundtop interchange was done in conjunction with the proposed I-25 Speer interchange, this document will address the approval of the I-80 Roundtop proposal only.

A preliminary plat has been developed for a proposed West I-80 Business Park at I-80 and WYO 222/Rountop Road. The development would consist of over 600 acres of light industrial and commercial business lots averaging 29 acres each. A major residential development has also been proposed and approved by the City of Cheyenne for the northeast quadrant of Happy Jack Road and WYO 222/Rountop Road. In addition, Swan Development Corporation has immediate plans to plat and build infrastructure for land adjoining the Flying J truck stop located in the southwest quadrant of the I-25 College Drive interchange.

WYDOT has reasonable certainty that the Swan Development is now committed and underway for the Veta Tracts, and it's inherent truck movements will inevitably begin to spill into the already congested I-25 College Drive interchange. If the I-80 Roundtop Interchange is constructed, the proposed service road and connection could alleviate bottlenecks at the already congested I-25 College Drive interchange by permitting direct truck access onto I-80. Again , WYDOT anticipates a significant portion of this traffic to be regional or interstate traffic, rather than local.

In addition to the West Cheyenne Infrastructure Plan, WYDOT Systems Planning has conducted in-house studies through traffic modeling to determine if this interchange would be warranted by future traffic. The results of the modeling determine that the

### Figure 2 Existing Configuration



trips generated from the proposed developments will most safely and efficiently be served by the addition of the proposed interchange.

***FHWA Policy: #1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.***

Design Year Transportation Network Comparisons:

Traffic Based on Projected Growth

Traffic volumes for existing interchanges were derived by the WYDOT Planning Program Transportation Surveys section. The traffic volumes used for the proposed Roundtop Interchange were developed through the WYDOT Systems Planning Program and the Cheyenne MPO. The projected numbers are a product of WYDOT's traffic model, generated by information gathered from land use, socioeconomic studies, as well as growth and traffic movement scenarios. Socio-economic data was also collected by

Systems Planning via phone conversations with the director of Cheyenne LEADS.

Although WYDOT believes that the socio-economic projections provided by the MPO are overly-optimistic, it can be reasonably assumed that their outlook represents a buildout scenario (herein referred to as a "high-growth scenario"). WYDOT re-calculated the projections based on a more reasonable growth scenario representing 1¼% growth compounded annually (herein referred to as a "low-growth scenario"). WYDOT Planning chose 1¼% based on two decades of one percent growth, taking into account the two percent growth in the last two years. 1¼% growth provides a reasonable expectation for the planning horizon. From the information gathered, WYDOT ran traffic scenarios for base year, high and low growth projections for existing plus committed roadway network, both with and without the proposed I-80 Roundtop Road Interchange.

The Cheyenne MPO has agreed that their numbers do not reflect the true growth in the design year for the study area, and by letter has agreed to adopt WYDOT's "low-growth" scenario for the purposes of this study.

Level of Service Analysis:

Existing Transportation Network

WYDOT analysis performed using Highway Capacity Analysis Program (HCS 2000) identified no current deficiencies in the safety, efficiency and operation of the regional interstate system and regional roadway network. HCS analysis run against the existing network showed the following:



Roadway	Limits	LOS
WYO 210/Happy Jack Road	WYO 222/Roundtop Road to FE Warren Air Force Base	C
WYO 225/Otto Road	I-80 Otto Interchange to US 30/W. Lincolnway	A
I-80	WYO 225/Otto Road to to US 30/W. Lincolnway	A
WYO 222/Roundtop Road	WYO 210/Happy Jack Road to WYO 225/Otto Road	A
I-80 Lincolnway Interchange	Ramp EB-off	A
I-80 Lincolnway Interchange	Ramp WB-on	A

Figure 3 shows current traffic volumes in the study area; Figure 4 shows current Level of Service for the study area.

Level of Service Analysis:

20 Year Existing Plus Committed Network (Without Roundtop Interchange)

WYDOT analysis performed using Highway Capacity Analysis Program (HCS 2000) determined a system deficiency and significant decrease in level of service on WYO 210/Happy Jack Road. WYO 210/Happy Jack Road functions at LOS E from WYO 222/Roundtop Road to the entrance gate at FE Warren Air Force Base. The LOS E is expected near year 15 year of the design horizon. There were no other deficiencies identified that compromised safety, efficiency and operation of the regional interstate system and regional roadway network.

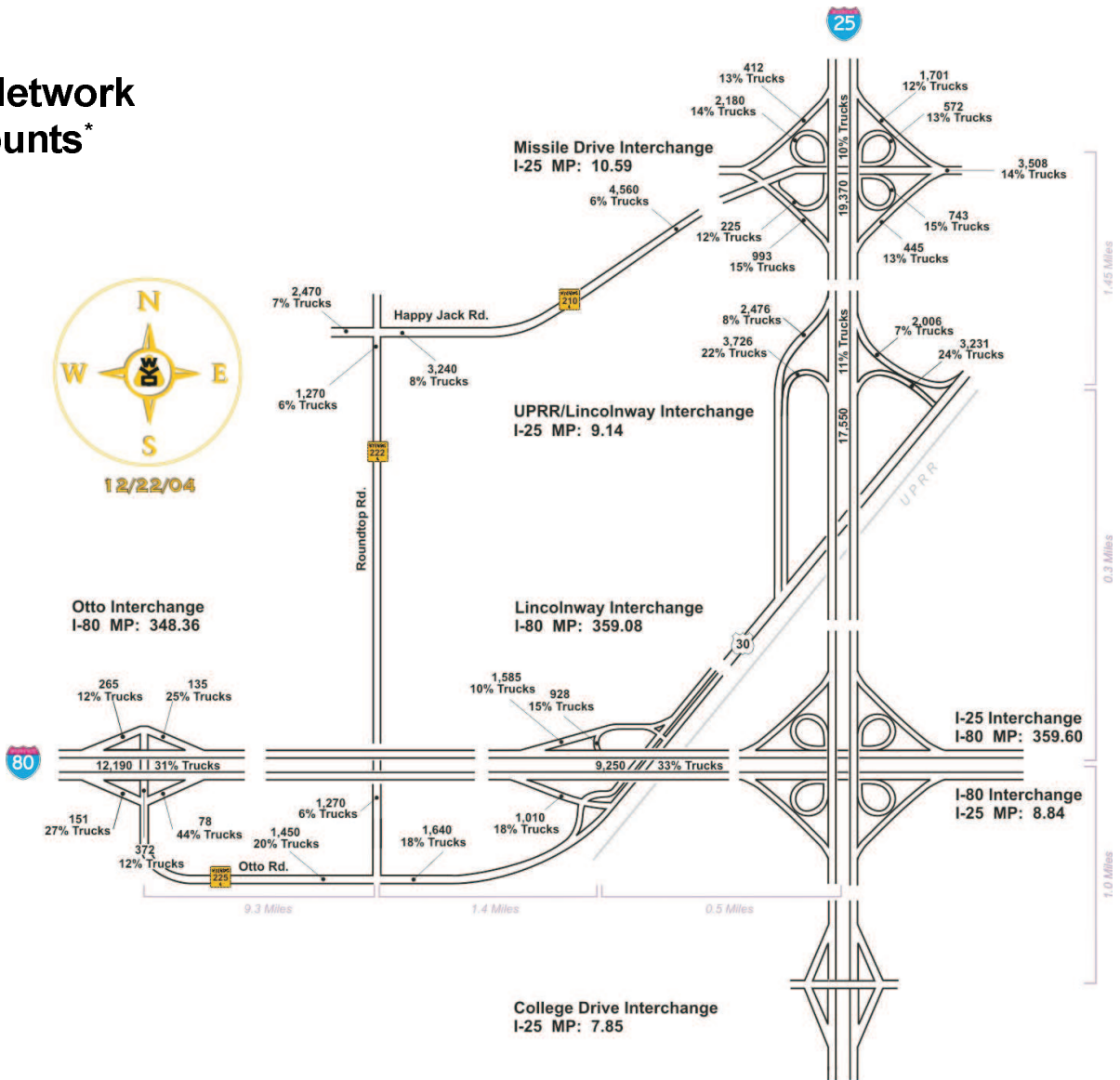
HCS analysis run against the 20 Year Existing Plus Committed Network without the proposed Roundtop Interchange showed the following:

Roadway	Limits	LOS
WYO 210/Happy Jack Road	WYO 222/Roundtop Road to FE Warren Air Force Base	E
WYO 225/Otto Road	I-80 Otto Interchange to WYO 222/Roundtop Road	A
WYO 225/Otto Road	WYO 222/Roundtop Road to US 30/W. Lincolnway	C
I-80	WYO 225/Otto Road to to US 30/W. Lincolnway	A
WYO 222/Roundtop Road	WYO 210/Happy Jack Road to WYO 225/Otto Road	B
I-80 Lincolnway Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp WB-on	B

Figure 5 shows 20 year Existing Plus Committed Network traffic volumes in the study area (without Roundtop Interchange), and Figure 6 shows projected Level of Service based on those values.

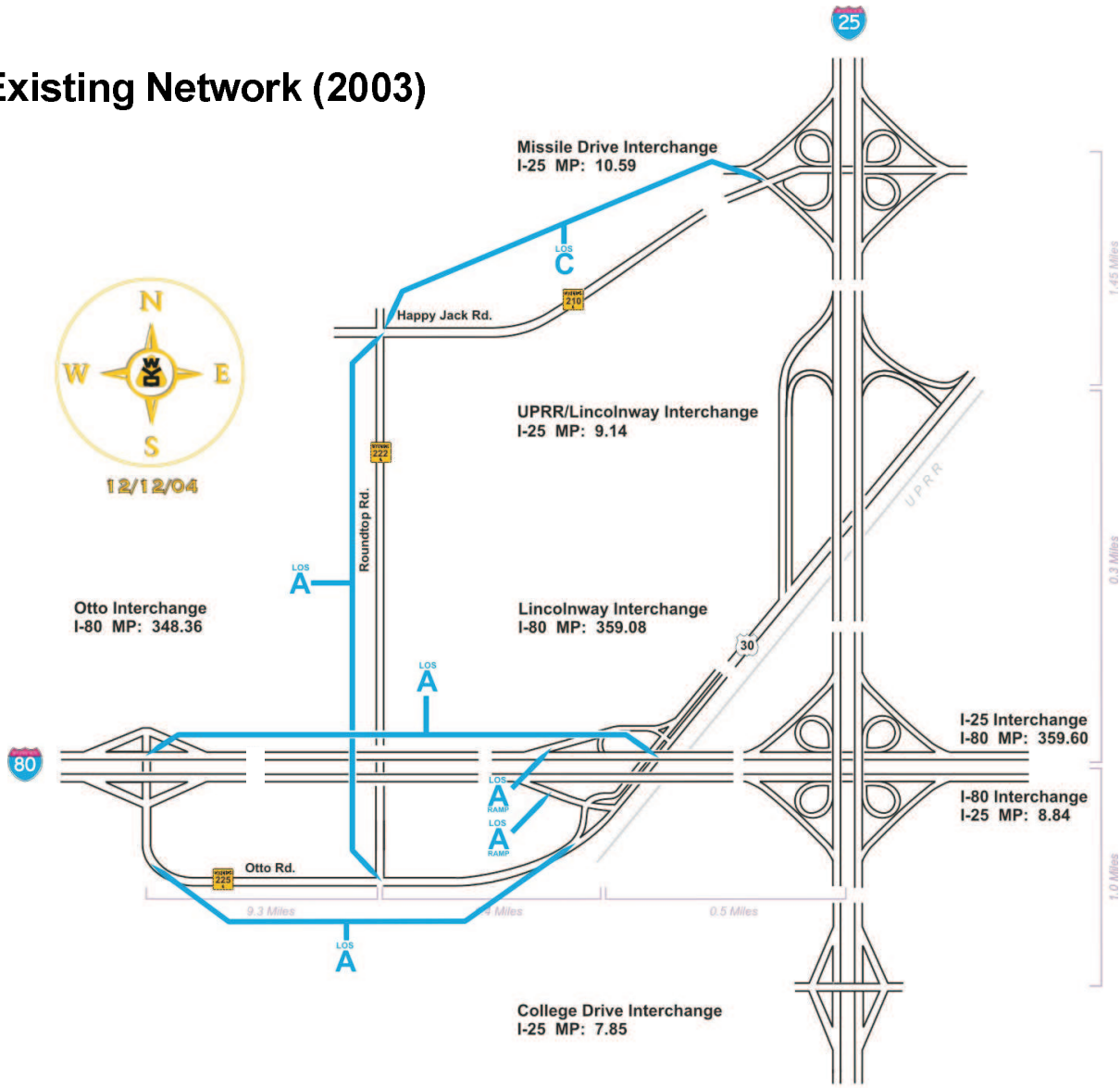
**Figure 3**  
**Traffic on Existing Network**  
**2002/2003 Traffic Counts\***

\* Source: WYDOT Transportation Surveys.



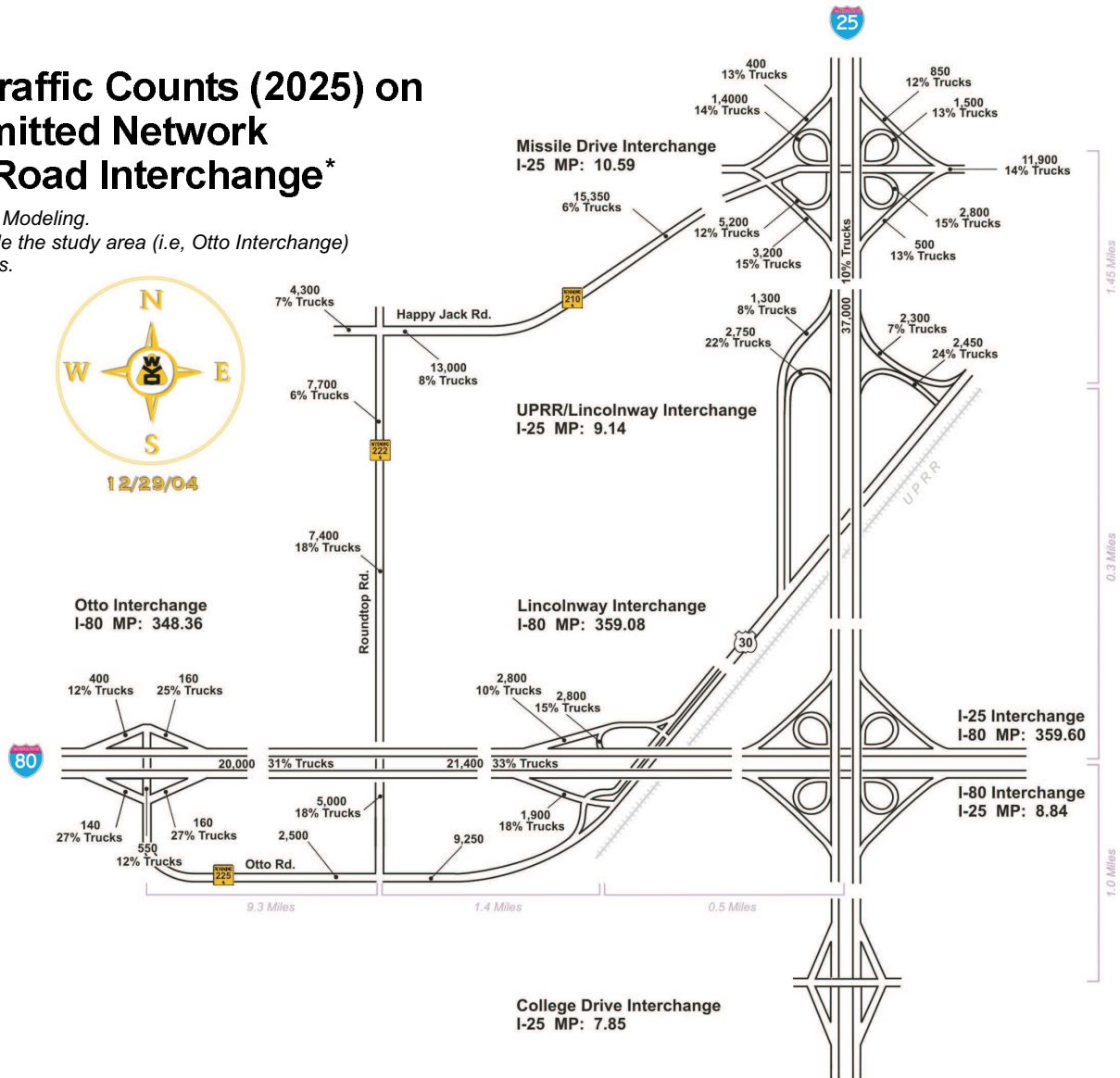
**Figure 4  
Level of Service on Existing Network (2003)**

Roadway	Limits	LOS
WYO 210 Happy Jack Rd.	WYO 222/Roundtop to FEWAFB	C
WYO 225 Otto Road	I-80 Otto Interchange to US 30/W. Lincolnway	A
I-80	WYO 225/Otto Rd to US 30/W. Lincolnway	A
WYO 222 Roundtop Rd	WYO 210/Happy Jack to WYO 225/Otto Rd.	A
I-80 Lincolnway Interchange	Ramp EB-off	A
I-80 Lincolnway Interchange	Ramp WB-on	A



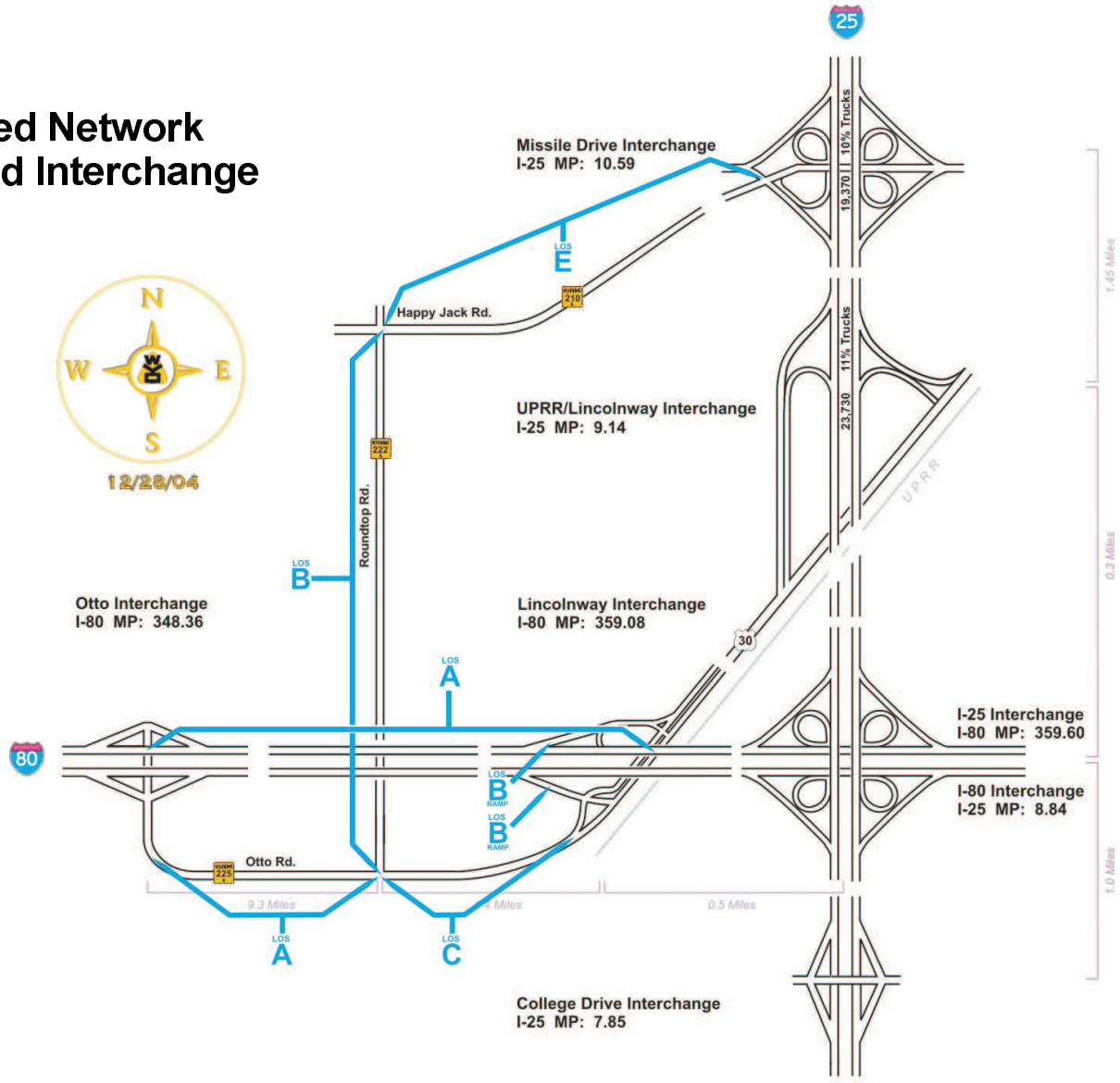
**Figure 5**  
**Projected 20 Year Traffic Counts (2025) on**  
**Existing Plus Committed Network**  
**Without Roundtop Road Interchange\***

\* Traffic volumes are by WYDOT Traffic Modeling.  
 Estimated future traffic volumes outside the study area (i.e. Otto Interchange) are by WYDOT Transportation Surveys.



**Figure 6**  
**Level of Service on**  
**Existing Plus Committed Network**  
**Without Roundtop Road Interchange**

Roadway	Limits	LOS
WYO 210 Happy Jack Rd.	WYO 222/Roundtop to FEWAFB	E
WYO 225 Otto Road	I-80 Otto Interchange to WYO 222/Roundtop	A
WYO 225 Otto Road	WYO 222/Roundtop to US 30/W. Lincolnway	C
I-80	WYO 225/Otto Rd to US 30/W. Lincolnway	A
WYO 222 Roundtop Rd	WYO 210/Happy Jack to WYO 225/Otto Rd.	B
I-80 Lincolnway Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp WB-on	B

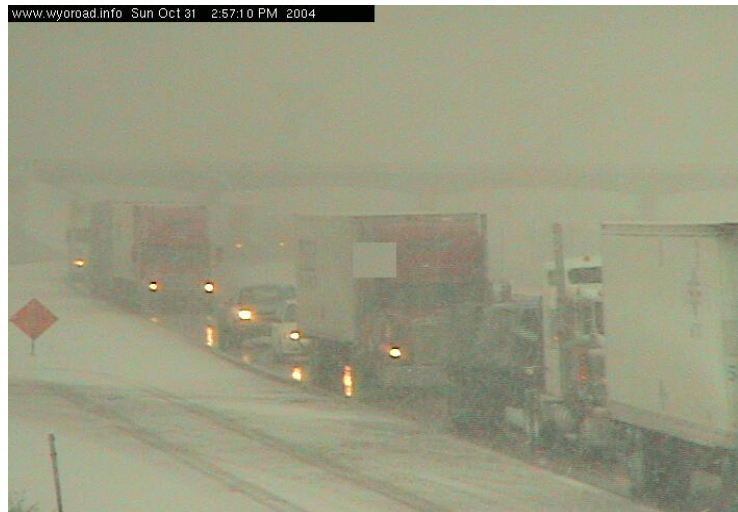


### Road Closure Traffic

A road closure gate and crossover for turning are currently located west of this proposed interchange location.

Construction of an interchange at this location will allow WYDOT to relocate the road closure point for west bound I-80 closer to the proposed interchange. A dynamic message sign has now been placed just east of the interchange to provide closure information as well as other pertinent traveler information.

These new facilities will improve safety and traffic operations during westbound I-80 closures.



*Relocation of the I-80 road closure gate and removal of the turnaround will provide for safer traffic operations during road closures.*

### Effect on the Existing Transportation Network

A primary concern is whether the existing transportation network, consisting primarily of WYO 210/Happy Jack Road and WYO 225/Otto Road, could handle trips generated out of the proposed West I-80 Business Park. By the design year, WYO 210/Happy Jack Road would function at LOS E without the proposed interchange. Otto Road and Happy Jack Road could initially handle the additional trips (in the construction year) with their current acceptable level of service and moderate traffic volumes. However, the additional trips are less than desirable for several reasons:

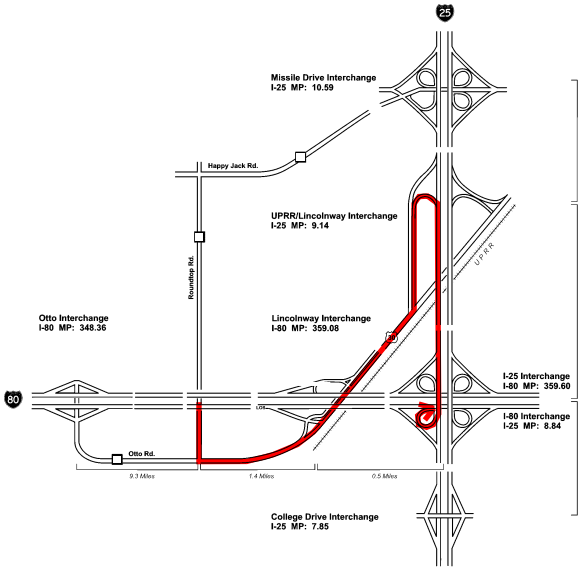
1. Out of direction travel for access and egress to the West I-80 Business Park and interstate is in conflict with FHWA's Planning factors of the "increasing of mobility of freight operations" and "promotion of energy conservation". An in-house evaluation by WYDOT Planning showing out of direction travel as follows (see also Figure 7):

<b>Accessing</b>	<b>Miles</b>
I-80 Eastbound from WYO 222/Roundtop Road	2.2 miles
I-80 Westbound from WYO 222/Roundtop Road	4.0 miles
WYO 222/Roundtop Road from Westbound I-80	1.6 miles
WYO 222/Roundtop Road from Eastbound I-80	1.1 miles

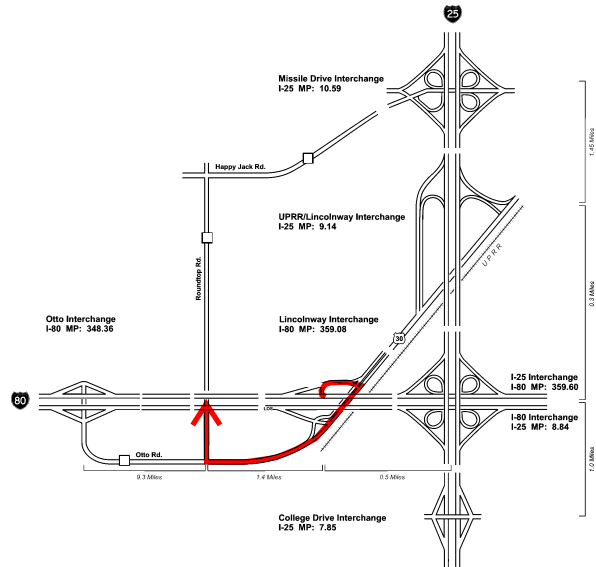
The out-of-direction travel would be most costly for commercial vehicles in the forms of fuel consumption and increased delay for goods movement. In addition, considerable time delay is associated with the out of direction travel for non-

# Figure 7 Out of Direction Travel\*

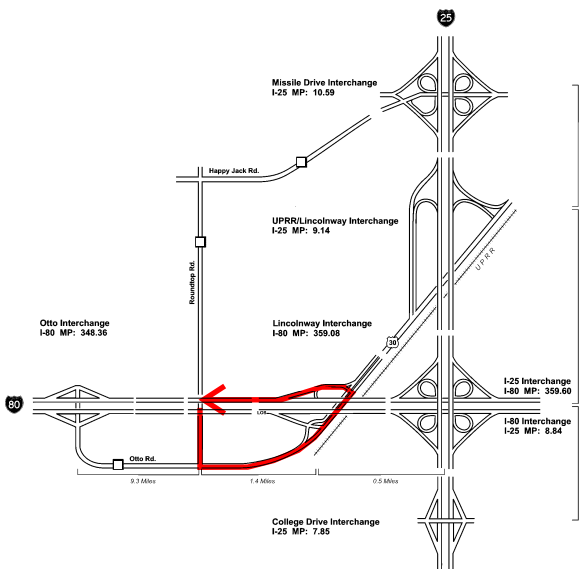
\* Total of out of direction travel distance minus direct travel distance.



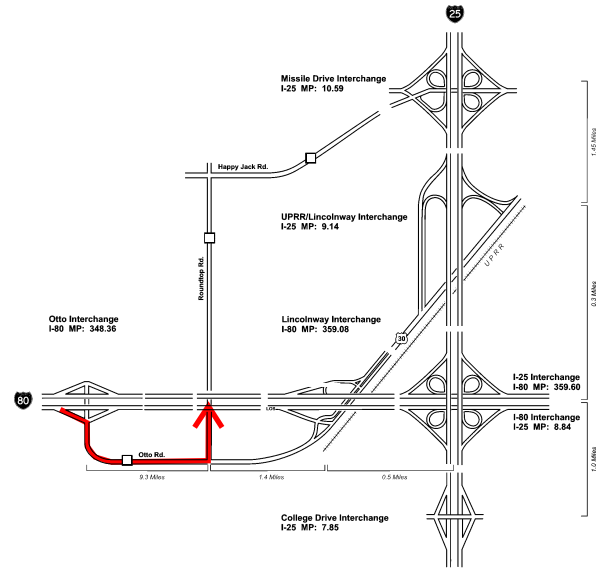
**TO ACCESS EB I-80 FROM ROUNDTOP RD.  
2.2 ADDITIONAL MILES TRAVELED**



**TO ACCESS ROUNDTOP RD. FROM WB I-80  
1.6 ADDITIONAL MILES TRAVELED**



**TO ACCESS WB I-80 FROM ROUNDTOP RD.  
4.0 ADDITIONAL MILES TRAVELED**



**TO ACCESS ROUNDTOP RD. FROM EB I-80  
1.1 ADDITIONAL MILES TRAVELED**

commercial trips. Speed limits on WYO 225/Otto Road are 65 mph, and 45 mph on West Lincolnway from west of the I-80 off ramp to its interchange with I-25.

2. WYDOT should be proactive in addressing the escalating freight volumes on our state's highway system by directing as much truck traffic as possible directly on to the interstate system and minimizing unnecessary trips into municipal limits. Diverting freight from a potential interstate connection onto the urban roadway system will lead to additional congestion, safety, and environmental concerns.

3. The existing network would not permit direct access to the interstate system, hindering further economic development. Industry would be less likely to relocate to, or expand development on the premises without the new interchange which would provide safe and efficient access to the interstate system.

4. The existing roadways are not designed for consistent and regularly heavy truck traffic, leading to more frequent and costly maintenance and reconstruction.

5. The WYO 222/Roundtop Road intersection with WYO 210/Happy Jack Road is used primarily for access to residential development north of the intersection. It would be desirable to limit truck-passenger vehicle conflicts at this location. In addition, noise impacts generated by the truck traffic would likely affect the residential developments to the north and along WYO 210/Happy Jack Road (in conflict with TEA-21's planning factor to protect and enhance the environment).

6. Traffic generated from Swan Development Corporation's inevitable Veta Tract development adjacent to the I-25 College Drive interchange will feed into the proposed point of access.

***FHWA Policy: 2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.***

For these reasons, it is not economically or environmentally desirable to reconstruct existing facilities to accommodate design year traffic associated with development along WYO 222/Roundtop Road. Out of direction travel for freight providers as well as passenger travel will lead to additional fuel costs, delayed travel times, and additional congestion on urban roadways. Two of TEA-21's planning factors [1203(f)] to be considered in the planning process are to "protect and enhance the environment, promote energy conservation..."; and to "promote efficient system management and operation". The new point of access is the best alternative to accommodate design year growth for the area.



***FHWA Policy: 3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.***

### Location

The location for the interchange was determined through analysis in the West Cheyenne Plan, published December 2002, by the Cheyenne MPO. Of three potential locations proposed for review, the I-80 Parsley Boulevard location has the potential for minor improvements to location circulation, but the impacts to the existing developments would be significant. The I-25 Speer location (between College Drive and Terry Ranch Road) could become the catalyst necessary to create growth opportunities in the southern portion of the city (which has already been identified as a potential area for growth), yet the benefits to local and regional traffic will not be seen in the short term.

The I-80 Roundtop Road location was the leading candidate and recommended alternative for short-term improvements due to its positive impact on regional transportation. WYDOT considers the improvements associated with the road closure gate to be a significant safety benefit to regional transportation and to employees and users of the impending development. In addition, the development of the I-80 Roundtop interchange is well within the vision of WYDOT's practice to promote inter-connectivity of the

state highway system. The City of Cheyenne is very interested in the benefits of providing access to I-80 at this location for economic development.

### Interchange Geometry

In the West Cheyenne Plan, four different options were investigated for the I-80 WYO 222/Roundtop Road location. Of these the diamond configurations met the most design, safety and financial feasibility objectives and would permit the interchange to expand appropriately as properties adjacent the interchange are developed. In addition to the diamond configurations, a Single Point Urban Interchange (SPUI) and modern roundabout design were also considered. The key components of the SPUI configurations allow them to handle large volumes of traffic due to their ability to maintain consistent coordination through the use of a single signal. The SPUI interchange would require a significant reconstruction of the overpass and approach lanes and would be very expensive. Only the Single Point Urban Interchange (SPUI) and "Widened" options discussed in the West Cheyenne Plan would see the level of benefits necessary to meet discussed objectives and future capacity needs. Each of these options opens up the area and creates a high capacity system that meets long-term growth projections. However, each of these configurations requires complete reconstruction of the interstate structures and disruption during construction would be extensive to both local and regional users. Therefore WYDOT's Project Development Program designed the proposed diamond interchange, taking into consideration the most cost feasible option that would not compromise level of service or public safety.

The diamond configuration (Figure 8) has been designed with a “footprint” for high capacity and expansion as the area begins to grow. The existing crossing of WYO 222/Roundtop Road under I-80 would provide sufficient width to accommodate projected design year traffic associated with the interstate connection. The improvement would require the addition of conventional diamond interchange ramps and traffic control where the ramps intersect with WYO 222/Roundtop Road. The ramps should be separated with sufficient distance to allow WYO 222/Roundtop Road to be widened to accommodate a center left turn lane. Because freeway bridge structure replacement is not required, the cost for this interchange is not deemed expensive, based upon typical interchange standards. In the short term, the existing bridge structures can be left in place (meeting the lateral clearance requirements due to slower speeds) and only modified slightly to gain additional vertical clearance (see Figure 9). The existing structures are in good condition and received a Sufficiency Rating of 96.58 during the last inspection (March 27, 2002). Additional right-of-way will be purchased for the interchange, and construction will involve typical grading and surfacing work. The use of this configuration will provide enhanced performance and function with minimal environmental and social impacts to the surrounding areas. It also presents an opportunity to enhance the visual entry way to the area.

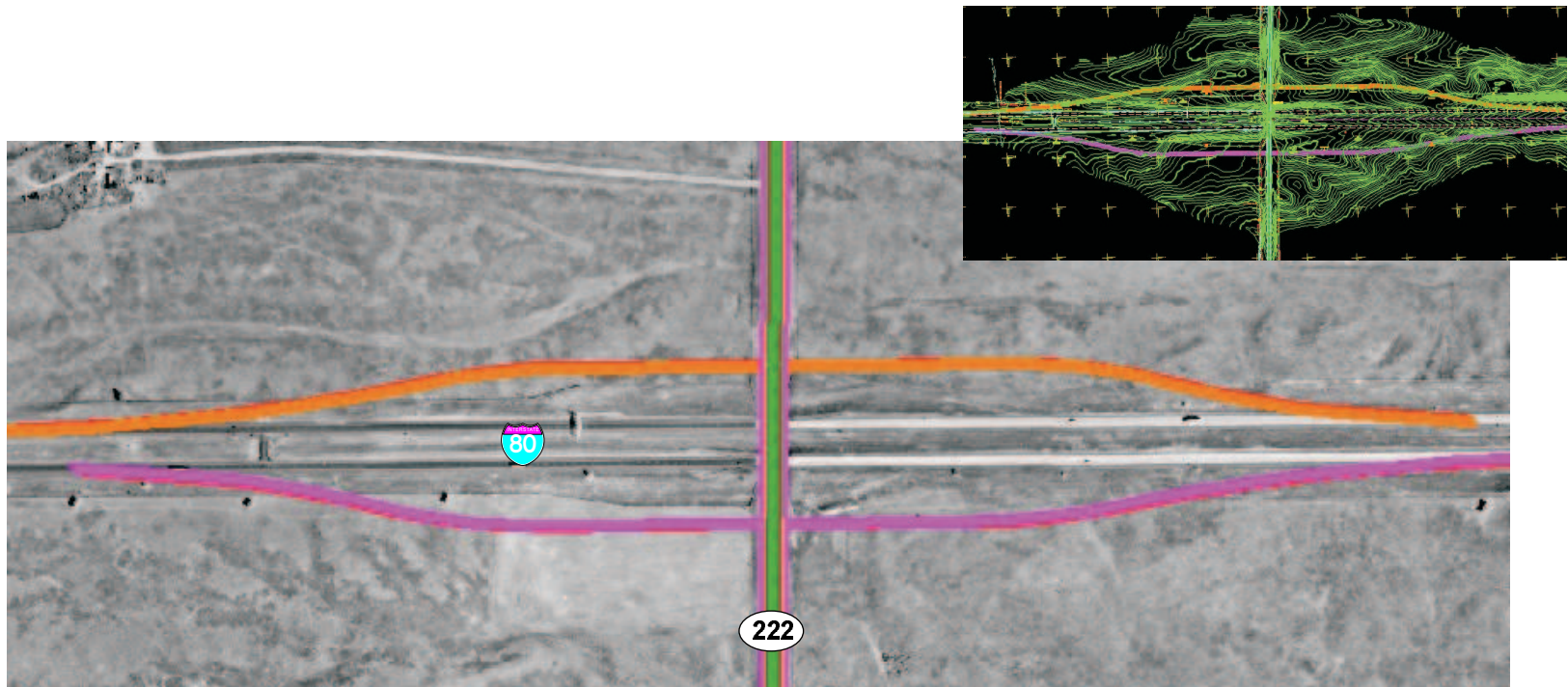
TSM improvements are not needed due to the high Level of Service of I-80 at the proposed site. However, WYDOT has recently agreed to add a continuous third lane on I-80 eastbound between the Lincolnway and proposed Roundtop interchanges which will enhance the mobility of freight in the area and minimize the impact of weaving movements.

#### Safety Analysis

The proposed interchange location, configuration, and geometry have been evaluated to address safety elements and promote a safe highway/interchange design. This evaluation uses research completed by FHWA on Safety Effectiveness of Highway Design Features, Volume IV: INTERCHANGES, dated November 1992 (Publication No. FHWA-RD-91-047). The proposed interchange was evaluated for interchange spacing, type of interchange including ramp locations, and geometric features.

Interchange location has been selected to provide for adequate interchange spacing between the proposed interchange and the adjacent I-80 interchanges at MP359.08 and MP348.36. Adequate interchange spacing has been shown to decrease crash rates. The interchange configuration as a full diamond supports decreased crash rates and the use of right-hand entrance and exit ramps have consistently lower crash rates than any other configuration. Interchange geometry provides for flat horizontal curves at the controlling ramp curves at both the entrance to mainline Interstate or at departure from mainline Interstate; these curves are currently designed at 60-65 MPH. Ramp grades are currently set at a maximum grade of 2.32%, well below ramp grades shown to increase crash rates. Acceleration and deceleration lane lengths have been established to meet or exceed AASHTO design standards, and a continuous

**Figure 8**  
**Diamond Interchange Configuration for I-80 and Roundtop Road**



### Figure 9 WYO 222/Roundtop Road at I-80



Looking North



Looking South

acceleration/deceleration lane will be constructed for East-bound I-80. The proposed interchange will be designed and constructed to meet or exceed AASHTO design standards.

Based on this analysis, the proposed interchange has been located and designed to address safety elements that have been shown to lower potential crash rates, and promote a safe highway/interchange design.

Level of Service Analysis:

20 Year Existing Plus Committed Network With Roundtop Interchange

WYDOT analysis performed using HCS 2000 on the 20 Year Existing Plus Committed Network with Roundtop Interchange determined a minor system deficiency and decrease in level of service on WYO 210/Happy Jack Road on the section from WYO 222/Roundtop Road to FE Warren Air Force Base. A Level of Service D would occur primarily at the FE Warren gate location, but may be resolved with signalization at the gate. The LOS D would manifest itself late in the design horizon, and improvements would not be necessary until that time (year 2025). However, capacity improvements would be required much sooner without the proposed interchange.

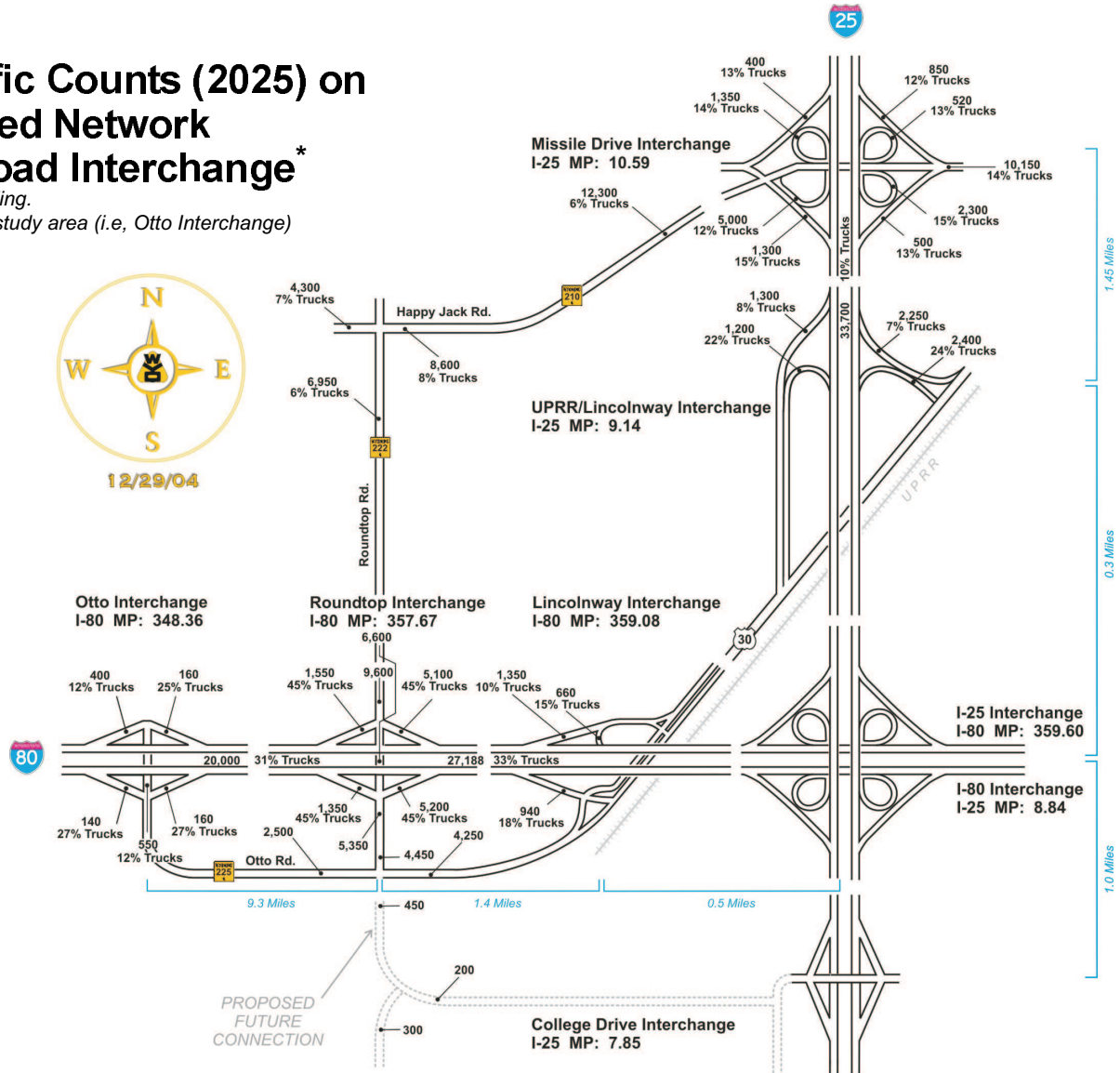
HCS analysis run against the 20 Year Existing Plus Committed Network with the proposed Roundtop Interchange showed the following:

<b>Roadway</b>	<b>Limits</b>	<b>LOS</b>
WYO 210/Happy Jack Road	WYO 222/Roundtop Road to FE Warren Air Force Base	D
WYO 225/Otto Road	I-80 Otto Interchange to WYO 222/Roundtop Road	A
WYO 225/Otto Road	WYO 222/Roundtop Road to US 30/W. Lincolnway	A
I-80	WYO 225/Otto Road to WYO 222/Roundtop Road	A
I-80	WYO 222/Roundtop Road to US 30/W. Lincolnway	B
WYO 222/Roundtop Road	WYO 210/Happy Jack Road to I-80	C
WYO 222/Roundtop Road	I-80 to WYO 225/Otto Road	B
I-80 Roundtop Interchange	Ramp EB-on	C
I-80 Roundtop Interchange	Ramp WB-off	B
I-80 Roundtop Interchange	Ramp WB-on	B
I-80 Roundtop Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp WB-on	B

Figure 10 shows 20 year Existing Plus Committed Network traffic volumes in the study area with Roundtop Interchange, and Figure 11 shows projected Level of Service based on those values.

**Figure 10**  
**Projected 20 Year Traffic Counts (2025) on**  
**Existing Plus Committed Network**  
**Including Roundtop Road Interchange\***

\* Traffic volumes are by WYDOT Traffic Modeling.  
 Estimated future traffic volumes outside the study area (i.e., Otto Interchange) are by WYDOT Transportation Surveys.



**Figure 11**  
**Level of Service on**  
**Existing Plus Committed Network**  
**With Roundtop Road Interchange**

Roadway	Limits	LOS
WYO 210 Happy Jack Rd.	WYO 222/Roundtop to FEWAFB	D
WYO 225 Otto Road	WYO 222/Roundtop to US 30/W. Lincolnway	A
WYO 225 Otto Road	I-80 Otto Interchange to WYO 222/Roundtop Rd.	A
I-80	WYO 225/Otto Rd to WYO 222/Roundtop Rd.	A
I-80	WYO 222/Roundtop to US 30/W. Lincolnway	B
WYO 222 Roundtop Rd.	WYO 210/Happy Jack Rd. to I-80	C
WYO 222 Roundtop Rd.	I-80 to WYO 225/Otto Rd.	B
I-80 Roundtop Interchange	Ramp EB-on	C
I-80 Roundtop Interchange	Ramp WB-off	B
I-80 Roundtop Interchange	Ramp WB-on	B
I-80 Roundtop Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp EB-off	B
I-80 Lincolnway Interchange	Ramp WB-on	B

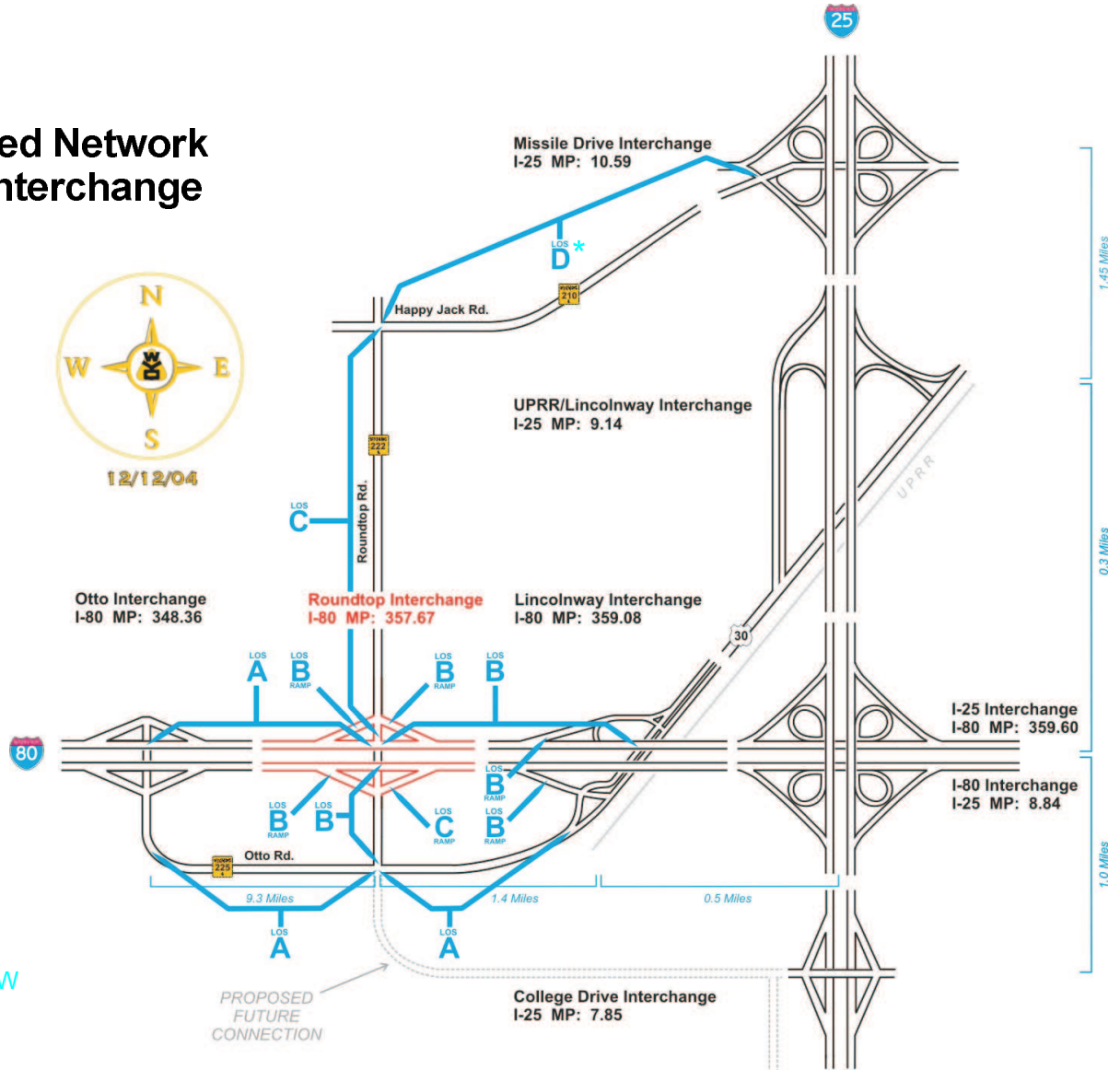


Figure 12 shows a comparison of the base year LOS against LOS for the 20 year Existing Plus Committed Network with and without the proposed Roundtop Interchange.

A HCS Weaving Operations Analysis showed LOS B for the eastbound off-ramp and westbound on-ramp for the I-80 West Lincolnway Interchange, as well as the eastbound on-ramp for the proposed Roundtop interchange. The westbound off-ramp for the proposed interchange functioned at LOS C. There were no other deficiencies identified that compromised safety, efficiency and operation of the regional interstate system and roadway network.

***FHWA Policy: 4. The proposed access connects to a public road only and will provide for all traffic movements. Less than full interchanges for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.***

#### Connection

The proposed interchange would connect to the state highway system. The I-80 WYO 222/Roundtop location is one of only two locations in the state where a state highway crosses an interstate without a direct connection. With the construction of this interchange, efficient access would be available to the proposed industrial and residential area. Also, the interchange would give truckers improved access to Dyna-Nobel, Dixon Brothers Trucking, and F.E. Warren Air Force Base. During closures of Happy Jack Road (WYO 210) or I-80, this interchange would provide access to alternate routes.

The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System and built according to AASHTO

standards and WYDOT's standard specifications.

***FHWA Policy: 5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.***

#### West Cheyenne Plan Adoption




















The proposed interchange is consistent with the local and regional land use and transportation plans outlined in the West Cheyenne Infrastructure Plan. The West Cheyenne Infrastructure Plan was adopted by the City of Cheyenne on Feb. 24, 2003. Laramie County adopted the plan on March 4, 2003. Figure 13 shows the adopted future roadway network.

#### WYDOT's Long Range Plan

According to 23 CFR §450.200, WYDOT is required to carry out a continuing, comprehensive, and intermodal statewide transportation planning process, including the development of a statewide transportation plan and transportation improvement program, that facilitates the efficient, economic movement of people and goods



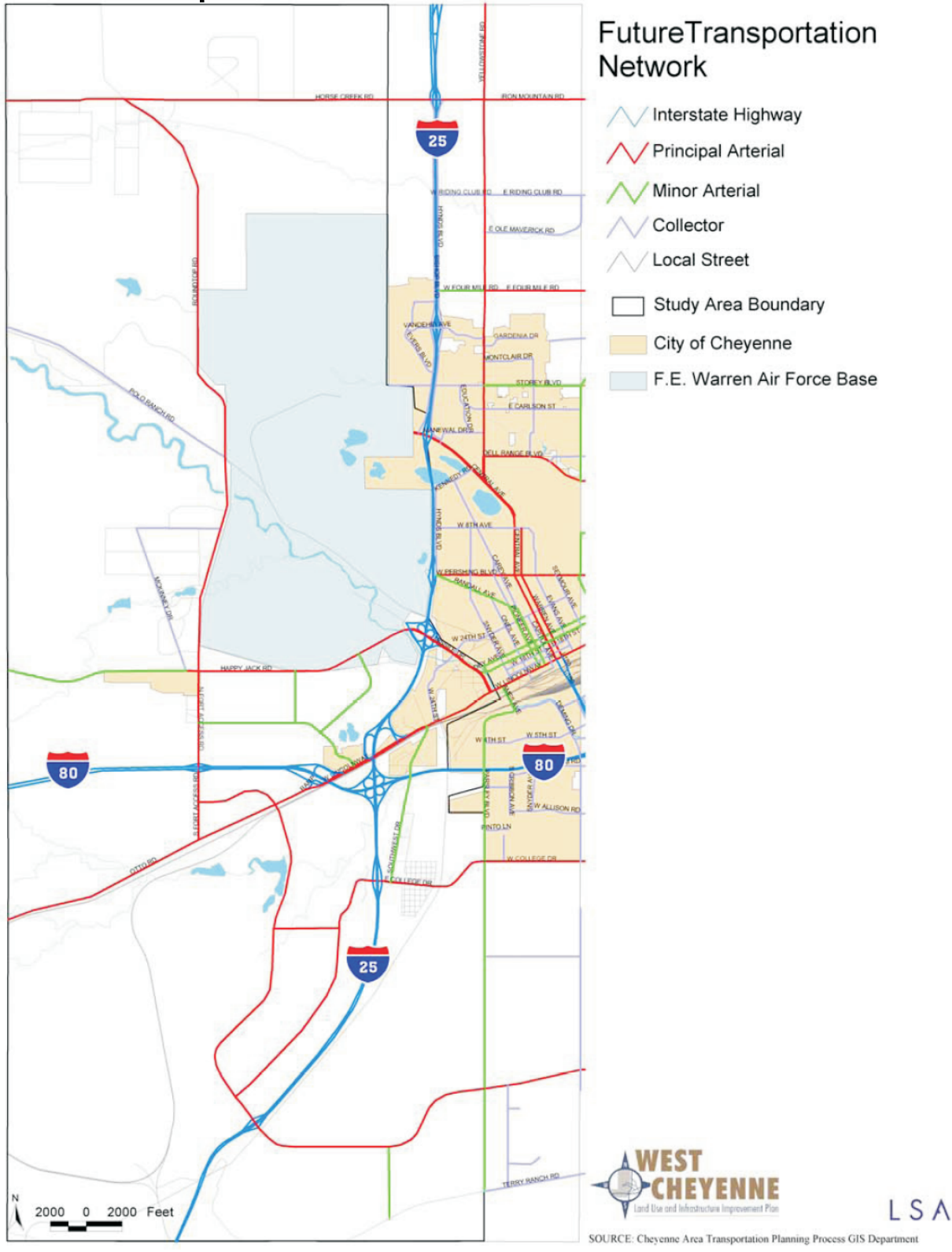
**Figure 12  
Level of Service Analysis**

Road		To/From	LOS		
			Existing	20 Year E+C	20 Year E+C & Roundtop
 Happy Jack Rd.		WYO 222/Roundtop Rd. to FEWAFB	C	E	D
 Otto Road		WYO 222/Roundtop to US 30/W. Lincolnway	A	C	A
 Otto Road		I-80 Otto Interchange to WYO 222/Roundtop Rd.	A	A	A
 I-80		WYO 225/Otto Rd to WYO 222/Roundtop Rd.	A	A	A
 I-80		WYO 222/Roundtop Rd. to US 30/W. Lincolnway			B
 Roundtop Rd		WYO 210/Happy Jack Rd. to I-80	A	C	C
 Roundtop Rd		I-80 to WYO 225/Otto Rd.		B	B
 Roundtop Rd. Interchange		EB On-Ramp			C
 Roundtop Rd. Interchange		WB Off-Ramp			B
 Roundtop Rd. Interchange		EB Off-Ramp			B
 Roundtop Rd. Interchange		WB On-Ramp			B
 W. Lincolnway Interchange		EB Off-Ramp	A	B	B
 W. Lincolnway Interchange		WB On-Ramp	A	B	B

NOTE:

E+C = Existing Plus Committed Roadway Network

### Figure 13 20 Year Adopted Network



in all areas of the State. WYDOT developed a Statewide Long-range Transportation Plan in 1995 and is in the process of updating this plan and making it more policy based. The proposed interchange *location* is therefore not part of WYDOT's Long Range Plan per se since the plan is policy (not project) based. However, the proposed interchange is fully in line with the vision of the Long-range Transportation Plan, WYDOT's goals, public involvement philosophy, congestion strategy, and connection between transportation infrastructure with economic development.

#### Coordination with the MPO

§450.210 requires WYDOT to provide for a fully coordinated planning process with the Cheyenne MPO. Public involvement is also to be carried out for the statewide and metropolitan planning processes. In accord to these regulations, WYDOT was actively involved in the steering committee, data collecting, traffic modeling, funding and review process during the formation and final draft of the West Cheyenne Plan which led to the proposal for the Roundtop Interchange. The Cheyenne MPO coordinated guidance from WYDOT to fulfill FHWA requirements during the plan's development.

#### Citizen Input

Citizen involvement was an integral part of the plan's preparation. A 20-member Steering Committee with citizen representatives from the West Cheyenne area, as well as F.E. Warren Air Force Base, WYDOT staff, and City and County staff met throughout the process to provide input and feedback on the plan. In addition to the Steering Committee involvement, two public meetings were held during the preparation of the plan. These meetings were sparsely attended, indicating a lack of public opposition to the proposal. A public hearing was held before the Cheyenne–Laramie County Regional Planning Commission on September 16, 2002. Citizens' input is also routinely obtained through the City/County Regional Planning Commission. Approximately four times a year the City/County Regional Planning Commission meets as the Citizens' Transportation Advisory Committee. The MPO has expanded public access to the planning process through the Internet as the City of Cheyenne and Laramie County have developed Web pages.

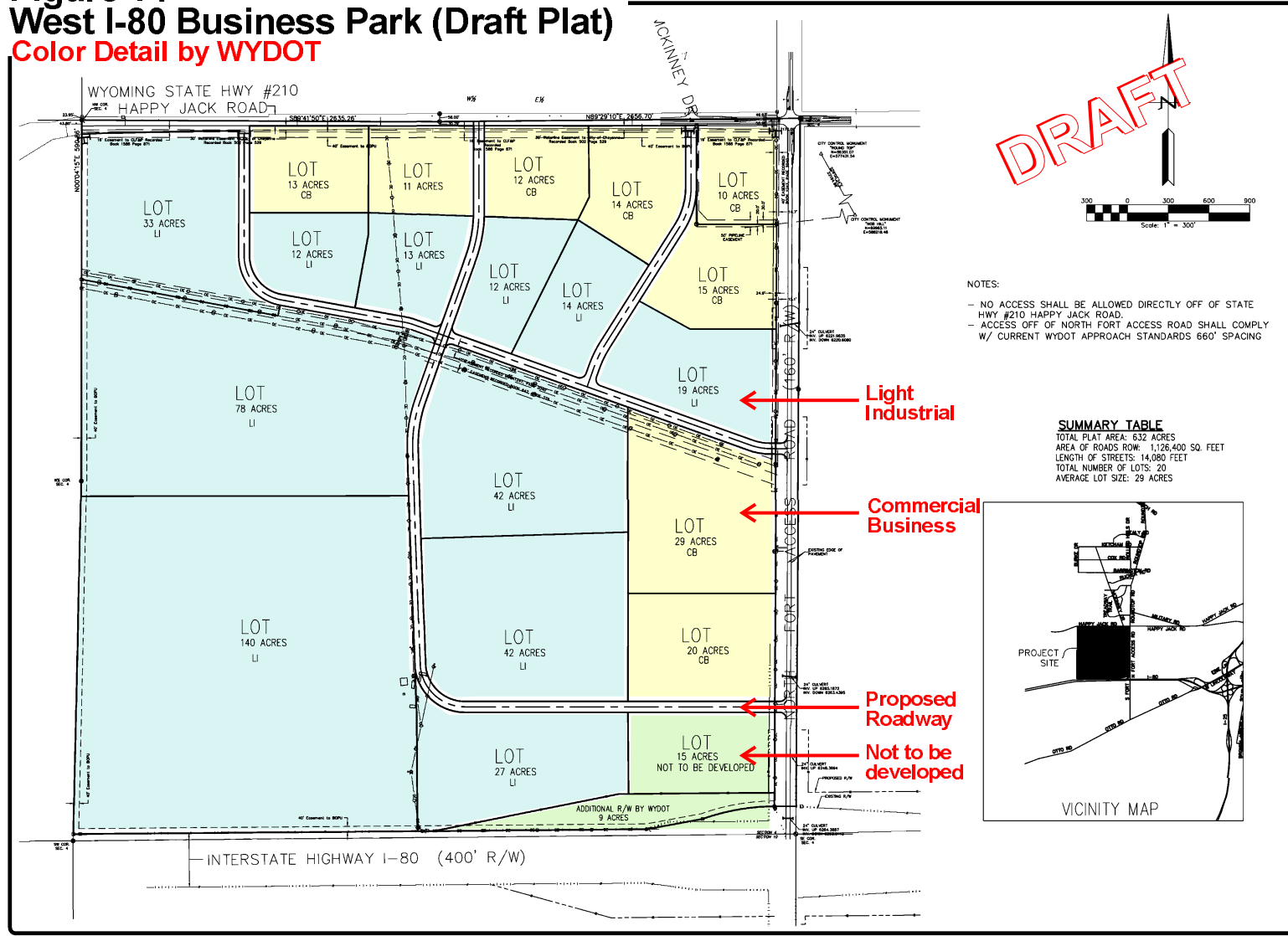
#### Coordination with LEADS and Local Developers

##### West I-80 Business Park Development

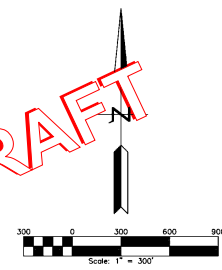
Two of TEA-21's planning factors [1203(f)] to be considered in the planning process are to “support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency” and to “increase the accessibility and mobility options available to people and for freight.” A preliminary plat for the proposed West I-80 Business Park shows over 600 acres of light industrial and commercial business lots averaging 29 acres each (see Figure 14). According to the Cheyenne-Laramie County Corporation for Economic Development (LEADS), an industrial warehouse is considering a location near this proposed interchange. This new business is vital to the economic growth of Cheyenne and Laramie County. In addition, a major residential development also has been proposed and approved by the City of Cheyenne for the northeast quadrant of Happy Jack Road and WYO 222/Roundtop Road. The industrial (warehouse) development would most likely

**Figure 14**  
**West I-80 Business Park (Draft Plat)**  
**Color Detail by WYDOT**

Roundtop Interchange Study, Page 27 of 33



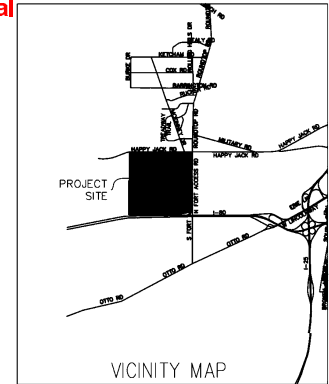
**DRAFT**



- NOTES:
- NO ACCESS SHALL BE ALLOWED DIRECTLY OFF OF STATE HWY #210 HAPPY JACK ROAD.
  - ACCESS OFF OF NORTH FORT ACCESS ROAD SHALL COMPLY W/ CURRENT WYDOT APPROACH STANDARDS 660' SPACING

**SUMMARY TABLE**

TOTAL PLAT AREA:	632 ACRES
AREA OF ROADS ROW:	1,126,400 SQ. FEET
LENGTH OF STREETS:	14,080 FEET
TOTAL NUMBER OF LOTS:	20
AVERAGE LOT SIZE:	29 ACRES



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generate the bulk of its trips as regional and interstate traffic, rather than local traffic. The southwest quadrant of the proposed interchange has been targeted as a candidate for an intermodal facility as well (see Figure 15), supporting TEA-21's planning factor to "enhance the integration and connectivity of the transportation system, across and between modes, for people and freight." The proposed interchange would allow safe and efficient access and egress to the proposed developments. The existing interchanges do not accommodate efficient regional access to the proposed facilities.

#### Veta Tracts Development

Swan Development Corporation has immediate plans to plat and build infrastructure for an area known as the Veta Tracts. Veta Tracts are 20 to 40 acre tracts adjacent the Flying J truck stop located in the southwest quadrant of the I-25 College Drive interchange. Swan is also planning and designing a new service road from College Drive toward the proposed Speer interchange proposed near the 3.85 milepost on I-25. Swan also plans to build a connecting route from the service road to WYO 222/Roundtop Road, directing industrial-based traffic at the proposed new interchange on I-80 at WYO 222/Roundtop Road (see Figure 16). Swan proposes to fund the service road using WYDOT's Industrial Road Program. The road would likely qualify given the proposed industrial nature of the adjoining land. The Swan corridor alignments are practically identical to those found in the West Cheyenne Plan.

#### Other Requirements

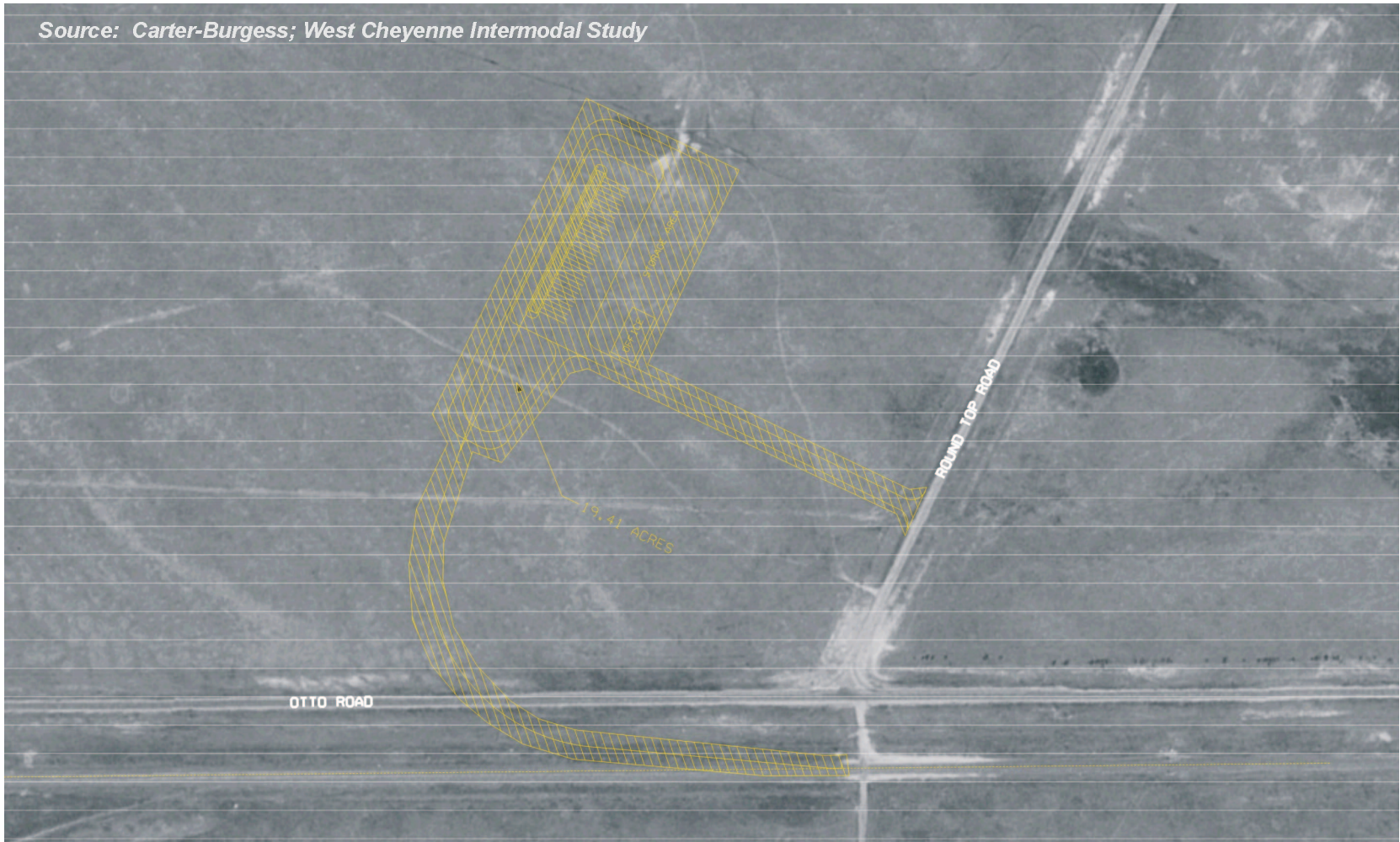
The coordinated efforts utilized to formulate the West Cheyenne Plan should adequately address §450.300, which requires the MPO to have a continuing, cooperative, and comprehensive transportation planning process that results in plans and programs that consider all transportation modes and supports metropolitan community development and social goals. The end result of these plans and programs led to the proposal of an integrated, intermodal transportation system for West Cheyenne that will ultimately facilitate the efficient, economic movement of people and goods.

TEA-21 [1203(f)] consolidated the previous MPO planning factors into several broad areas to be considered in the planning process. This proposal directly supports practically all of them, including: "support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency; increase the accessibility and mobility options available to people and for freight; protect and enhance the environment, promote energy conservation...; enhance the integration and connectivity of the transportation system, across and between modes, for people and freight; and promote efficient system management and operation."

The Transportation conformity requirements of 40 CFR parts 51 and 93 do not apply to this proposed interchange. Laramie County is classified as an attainment area, consistently meeting or exceeding the national primary or secondary National Ambient Air Quality Standards (NAAQS) for air pollutants.

# Figure 15 West I-80 Business Park Southwest Quadrant Intermodal Facility Proposal

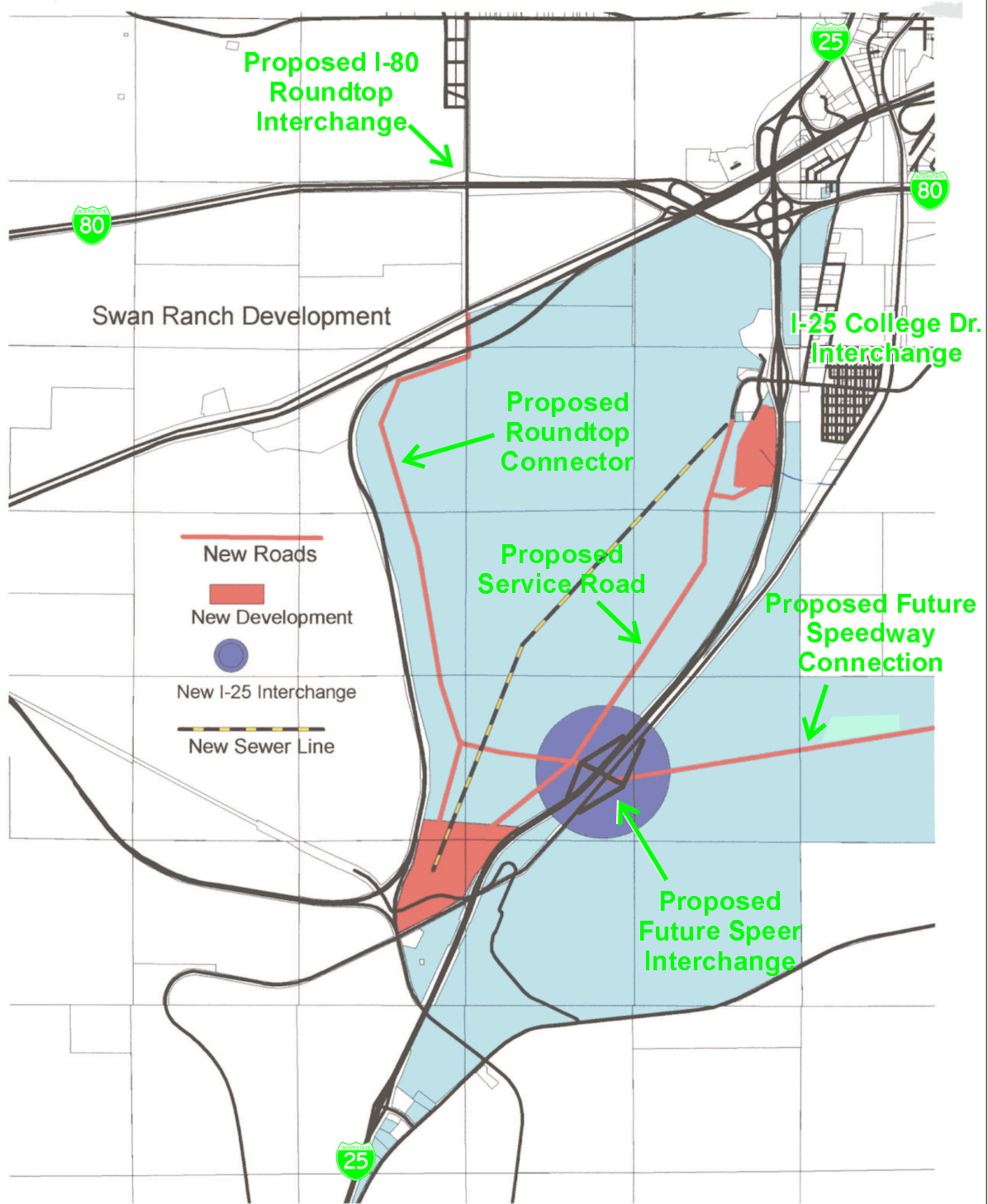
Source: Carter-Burgess; West Cheyenne Intermodal Study



# Figure 16 Swan Ranch (Veta Tracts) Development

As Submitted by Swan

Additions in Green by WYDOT Systems Planning



***FHWA Policy: 6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.***

***FHWA Policy: 7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.***

***FHWA Policy: 8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.***

### Comprehensive Evaluation and Coordination

A comprehensive network study has been achieved by the extensive traffic modeling and level of service analysis by WYDOT, coupled with an extensive analysis from the West Cheyenne Plan. Considerable coordination has taken place with Cheyenne LEADS, the Cheyenne MPO, WYDOT, Laramie County, and landowners next to the proposed interchanges outlined in the West Cheyenne Plan. Land use issues have been taken into consideration with these coordination efforts. The I-80 Roundtop Road interchange is compatible with future points of access, as demonstrated by its connections as shown in the future roadway network. The eventual construction of the I-25 Speer interchange proposal would permit adequate vehicle movements for anticipated development within the region.

With the exception of the Speer Interchange proposal, there are no other interchanges being considered in the Cheyenne metropolitan area or on the I-80 corridor in the design horizon.

### Environmental Impacts

According to the West Cheyenne Infrastructure Study, potential environmental impacts were examined. The data for this evaluation were developed from site observations, environmental data from the Laramie County Comprehensive Plan, and the Wyoming Game and Fish. The two main criteria considered included noise impacts and natural resource impacts. This analysis was limited to the immediate area and based upon existing information. It should be noted that air

quality was also considered but it was determined it would not be an impact for any of the alternatives examined. Air quality, affected by vehicle emissions, are directly related to congestion. Since all proposed interchange improvements would be designed to minimize congestion, the proposed interchange will operate at a high LOS.

Noise impacts also were discussed in the study. Recent noise modeling efforts have found that high volume facilities (carrying over 25,000 vehicle per day at 45-50 mph) will exceed the Federal Highway Administration noise criteria of 67 decibels within approximately 125 feet, based on a "linear" noise source such as a highway. The proposed Roundtop Interchange area was examined in which the number of homes/businesses within the range of 125 to 500 feet were counted. There are no homes or businesses which would be impacted by traffic noise.



During the study, natural resources also were considered. To evaluate the impacts to surrounding natural areas the following resources were analyzed: sensitive species, important large mammal habitat, wetland sensitivity, aquifer sensitivity, water quality, historic heritage and archaeological preservation. To estimate impacts, onsite observations were completed to identify any impacts within 500 feet of the proposed interchange locations. From preliminary observations and data collection, the proposed interchange location would not directly impact environmentally sensitive areas, and none of the resources were affected according the West Cheyenne Plan data collection. The sensitive species that have been identified and analyzed include: Preble's meadow jumping mouse, Swift fox, Mountain plover, Black-tailed prairie dog, and the Black-footed ferret.

The typical habitat for the Preble's meadow jumping mouse is comprised of well developed plains riparian vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source. These riparian areas include a relatively dense combination of grasses, forbs, and shrubs. The mouse is known to regularly range outward into adjacent uplands to feed and hibernate. The critical habitats include the stream plus approximately 120 meters outward on each side. The three streams that were identified in the Cheyenne area include Crow Creek, Goose Creek, and Lone Tree Creek. Lone Tree Creek and Goose Creek are located 6 miles south of Cheyenne. Whereas Crow Creek is within the West Cheyenne study area, it is one mile away from the closest interchange.

The *Spirantes dilubialis*-Sheviak and the *Gsuts Neomexicana* ssp. *coloradensis* are perennial herbs that have been located in Wyoming. Typically they are located along moist to very wet meadows along streams or in abandoned stream meanders. The *Gsuts Neomexicana* has been located on F.E. warren Air Force Base, however neither of these herbs have been observed at the interchange location.

Important large mammal habitats in the West Cheyenne area are home to the Pronghorn Antelope, White-tailed Dear, and Elk. The majority of the West Cheyenne Study area is included in the habitat region; it is not point specific to the interchange locations. The Wyoming Fish and Wildlife provided wetland sensitivity data that illustrated wetland locations in the Cheyenne area. They identified all of the proposed interchange locations in the West Cheyenne Plan to be out of the concerned wetland areas.

Aquifer sensitivity within the West Cheyenne area includes the Happy Jack Wellfield area that has been identified by the Laramie County Wellhead Protection program to protect one of the more important sources of groundwater. This aquifer is not located near any of the proposed interchange locations. With an increase in imperviousness and development comes an impact to local surface water quality. In addition, the construction of this interchange will allow surface water to come in contact with possible contaminants that could be transported to natural bodies of water. However, based on observations and available information, only minimal impacts would be observed in each of the three locations and mitigation of these impacts could be handled with simple/cost effective Best Management Practices.

Historic Heritage and archeological areas identified in the West Cheyenne area include the F.E. Warren Air Force Base, recognized by the National Register of Historic Places and/or a National Landmark. No known historical structures have been identified near any of the interchange area.

WYDOT's Environmental Services Program is in agreement with FHWA to allow for a Categorical Exclusion for this project. The Categorical Exclusion was agreed upon because this proposed interchange consists of a simple construction of ramps. No federally protected environmental resources will be impacted in the area.

The proposed interchange also is being addressed through WYDOT's public involvement process. Several public meetings have been held, and comments have been received. At an open house held July 31, 2004, 18 people attended (14 of which were either WYDOT or other government representatives, or consultants. One comment was received; no voice to opposition for the interchange proposal has been heard in any formal or informal meeting.

### Conclusions

Practically all of TEA-21's MPO planning factors [1203(f)] are directly supported by this proposal, including: "support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency; increase the accessibility and mobility options available to people and for freight; protect and enhance the environment, promote energy conservation...; enhance the integration and connectivity of the transportation system, across and between modes, for people and freight; and promote efficient system management and operation."

It is anticipated that development will occur in West Cheyenne that will increase traffic volumes utilizing the interchange and WYO 222/Roundtop Road. Depending on the nature of the development, truck volumes may also increase. If this occurs, the interchange may warrant upgrading in the future. This will mostly consist of widening WYO 222/Roundtop Road and adding turn lanes. As a result, this would necessitate replacing both the bridges on I-80 to provide longer span lengths. The design of the immediate ramp project will locate the ramp/crossroad intersections far enough apart to allow for future turn lanes and storage of turning vehicles. According to WYDOT policy on full access control of interstates, no approaches will be allowed closer than 600 feet to the ramp/crossroad intersections.

This project is currently scheduled for construction in 2005, but the schedule is subject to change based on availability of funding and shifting priorities. The area adjacent to the proposed interchange is under consideration as a location for a regional warehouse similar in size to the Lowe's Distribution Center. The two proposed interchanges and connecting roadways will improve connectivity of the Cheyenne area transportation system. The proposed improvements associated with the Roundtop Interchange will enhance the effectiveness of the regional transportation system as well.