PAVEMENT MANAGEMENT PLAN

PREPARED FOR:
TOWN OF ODESSA, WASHINGTON

Prepared by:

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December 2016

Project No. 30448.003.04

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INTRODUCTION

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INTRODUCTION

The Town of Odessa currently has approximately 8.4 miles of asphalt surfaced streets, and approximately 0.5 miles of graveled roads excluding the state highways. The asphalt roadway surfaces vary in age, type of surfacing, and condition. The Town also benefits from 2.5 miles of state highway that is laid through the Town.

The Town annually completes a Six-Year Street Plan in accordance with RCW 35.77.010 and 36.81.121. The Street Plan is adopted by Town Council after an appropriate public hearing. The adopted Plan is submitted to Washington State Department of Transportation (*WSDOT*) for inclusion into the Statewide Transportation Improvement Program (*STIP*). Any projects that are anticipated to receive federal funding from the Federal Highway Administration (*FHWA*) or state funding from the Transportation Improvement Board (*TIB*) must be listed on the Town's Six-Year Street Plan. The Plan identifies street and pedestrian facilities, and other transportation projects the Town anticipates completing over the subsequent six-year period.

To assist the Town in prioritizing transportation projects and providing rehabilitation/reconstruction methods and costs for these projects, the Town solicited funds from QUADCO, their regional transportation planning organization, and set aside funding from its general fund to complete this Transportation Plan.

The general work for this plan involved collecting traffic count data, developing an inventory of the Town's roadways, identifying and evaluating the City's storm drainage deficiencies, and developing a capital improvement plan. Pavement Condition Ratings (PCRs) developed by WSTIB staff were utilized in the street evaluation. This Plan contains all of the WSDOT elements for a simplified pavement management system for smaller agencies (*less than 22,500 population*). The traffic count data was collected using a Metro Count Traffic counter.

With input from Town Staff and council, a prioritization schedule has been developed. This schedule utilizes five separate criteria:

1. Pavement Condition
2. Traffic Generators
3. Average Daily Traffic (*ADT*)
4. Underground Infrastructure Condition
5. Non-Town Funding Eligibility

These factors were calculated for each roadway segment proposed for improvement and, along with general input from the Town Council and staff, a prioritized list of projects was completed in Chapter 8 of this document.

There are many improvement methods and strategies that are discussed in Chapter 6. WSTIB has been emphasizing full depth reclamation as an alternative to standard reconstruction for TIB funded projects and that rehabilitation strategy has been analyzed and included as an improvement option. Also considered includes chip sealing, overlays, and full reconstruction.

The sidewalk improvements needed throughout town were identified in the Americans with

Disabilities Act Evaluation and Mitigation Plan and are not included in this document. The ADA plan identified several sidewalk improvement projects that the City prioritized and has included in previous Six year Transportation Improvement Plans.

As there is very little gravel roadway within the Town, gravel roadway improvement was not considered within this document.

CHAPTER 2

EXISTING ROAD INVENTORY

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EXISTING ROAD INVENTORY

STREET SYSTEM INVENTORY

One of the first steps in developing this Pavement Management Plan was to inventory the existing streets in Odessa's network and to review TIB scores and ratings for the entire City and determine if additional scoring and rating was necessary.

Using Right-of-Way maps, plat maps, and a field reconnaissance conducted by Century West Engineering, Town street maps were assembled. These street maps, combined with street inventory data provided by TIB, show the type of roadway surface, street classification and traffic generator information, traffic count information, and a brief history of past street improvements. Copies of these maps have been enclosed as Exhibits in the report.

SIDEWALK CONDITIONS

Sidewalk condition ratings were not included in the scope of work for this plan. The Town previously completed an Americans with Disabilities Act Evaluation and Mitigation Plan which analyzed the sidewalks in town and made recommendations for sidewalk improvement projects. For sidewalk related questions, please refer to the ADA Evaluation and Mitigation Plan.

TRAFFIC COUNTS

To help the Town develop a rehabilitation strategy, it is best to know which streets have the most traffic, which helps to determine which roads should receive maintenance first. The traffic count data can also be used to help develop proposed pavement sections for both Arterials and Local Access roads. Traffic counts were conducted on several locations throughout the Town using a Metro Count air-hose type automated traffic counter. Traffic count data was collected at three different locations in the Town. The average daily traffic counts were collected for at least three days where possible, and the data is summarized in the table below. It is important to mention that the method of traffic counts that was used does not account for any seasonal variations in traffic flow, which can have significant impacts on streets that are used for harvest traffic or school traffic.

Table 2-1
Traffic Count Data

Traffic Count Locations	Traffic Generator	Average Daily Traffic (*ADT*)	Dates of Count
3rd Avenue between 4th and 5th Street	Residential/Hospital/Care Center	104	5/26/16 – 6/2/16
Fairway Street between 3rd and 4th Avenue	Residential/School	243*	8/3/16 – 8/8/16
Marjorie between 4th and 5th Street	Residential	34	7/25/16 – 8/3/16

** Likely to experience seasonal variations.*

RECENT IMPROVEMENT PROJECTS

The Town of Odessa has completed several road improvement and sidewalk projects in recent years.

4th Avenue was reconstructed from Alder to 1st Street. Grant funding was received from the Washington State Transportation Improvement Board (*TIB*).

5th Avenue was also reconstructed from Alder Street to Birch Street. Grant funding for this project was also provided by WSTIB as well as WSDOT STP funds. These roads are still in excellent condition.

The Town did some chip sealing along 1st Street and 2nd Street in 2012 and along Birch Street and Duck Lake Road in 2010 with funds from TIB. These roads still show a PCR above 70.

The Town has completed several self funded major patching projects for various roadways in the Town including Fairway Street, 3rd Avenue, and Marjorie Avenue. These patching projects were intended to preserve the life of the pavement and were not anticipated to be a long term solution.

The Town also received TIB funding for a sidewalk project along 1st Street from 4th Avenue to Marjorie Avenue. This project provides a vital link between the schools and the Central Business District and Town Park.

The Town also routinely fills potholes as they develop and completes large patch areas with Town maintenance staff to try and preserve the life of pavements but many of the roadways in town are at the end of their useful life and are showing signs of wear and age.

CHAPTER 3

STORM DRAINAGE

CHAPTER 3
STORM DRAINAGE

DRAINAGE DEFICIENCIES

Century West surveyed the City's paved streets following a rain event to determine the location and significance of storm drainage deficiencies. Poor drainage is a major cause of premature failure of street surfacing and should be addressed where practical.

Century West primarily observed isolated ponding issues scattered throughout the town with a higher occurrence in the central business district.The most common ponding issues occurred along flowlines in the middle of asphalt where the grade was inadequate to convey the runoff to drainage facilities. Drainage facilities were also frequently absent at these locations.

NRCS soil survey data indicates that most soils within the Town do not provide adequate infiltration rates to accommodate drywells. However, it did indicate that they might be feasible in the western portion of the Town with proper field investigations. Percolation tests should be performed to verify adequate infiltration performance prior to installation.

In the central portion of the Town, there are limited storm drainage facilities that appear to drain to the creek or to drywells. A centralized storm sewer system can provide an efficient and effective method for disposing of stormwater. However, provisions must be made to protect the creek water quality by preventing sediment and oils from vehicles from entering the creek.

The locations of the major deficiencies identified during the field survey are shown in Figure 3-1 in Appendix 7.

COMMON DEFICIENCIES

Figure 3-1 identifies locations where stormwater drainage is deficient. Below are examples of common deficiencies throughout the City.

First St – North of SR28

This section of roadway is not crowned. Drainage follows flow lines in the asphalt. However, the grade is inadequate to convey the water to inlets at the intersections.

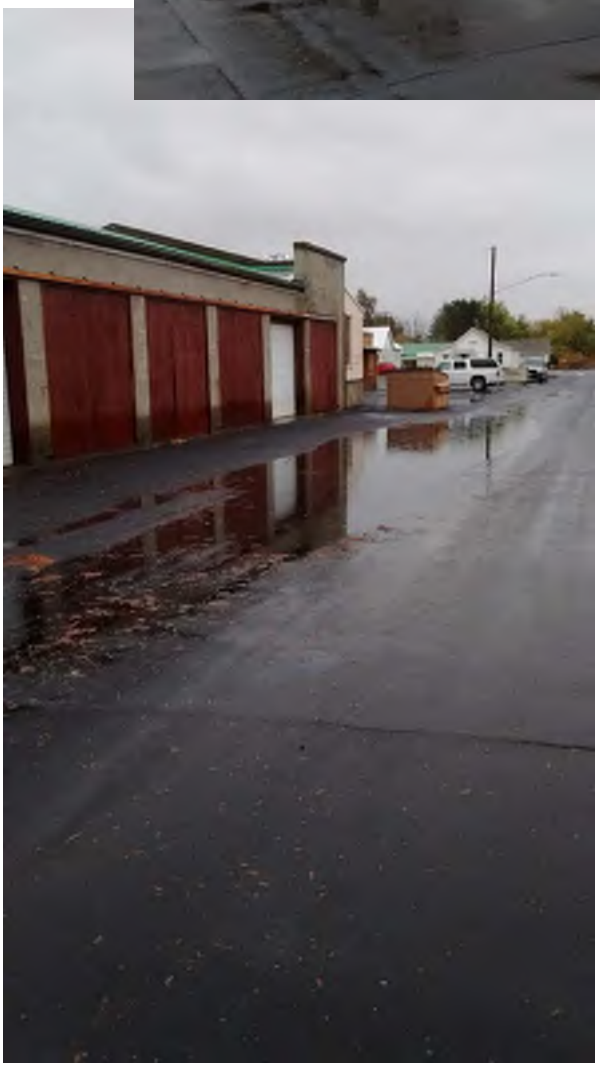
First St – Looking North

First St – Looking South

2nd Ave – East of Division St

2nd Ave- Looking Northeast

Ponding in roadway due to inadequate grade and no drainage facilities present.



2nd Ave – Looking East

Division St @ Alley between 1st Ave and 2nd Ave.

Division St – Looking North

Division St – Looking West

SR28 – South Side West of 5th St

Previous pavement overlays have altered the grade of the gutter and created a low point for water to pond. No drainage facilities were observed near this area.

SR28 – Looking West

2nd Ave & 6th St – South West Corner

No drainage facilities observed at low point

2nd Ave – Looking East

Amende St – West of 7th St

Amende St – Looking Southwest

Amende St – Looking Northwest

CHAPTER 4

PAVEMENT CONDITION RATINGS *(PCR)*

CHAPTER 4
PAVEMENT CONDITION RATING (*PCR*)

Method of Determination

The Town of Odessa's street system was evaluated by the Washington State Transportation Improvement Board in August 2014. Century West reevaluated and spot checked several roads in the City to determine if ratings listed on the TIB website were still accurate. We found their listed ratings correspond well to the ratings we determined during our inspection. The WSDOT Pavement Surface Rating Manual was used as a guide to identify and assess the severity of the common types of pavement distress.

The Street Wise manual uses five of the twelve indicators identified in the rating manual. These are Alligator Cracking, Longitudinal Cracking, Transverse Cracks, Raveling and Patching. The Street Wise manual focuses on these indicators for simplicity in non-computerized evaluations. Other indicators are rutting, bleeding, corrugation and waves, sags and humps, block cracking, pavement edge condition, and crack seal condition.

The extent of each type of pavement distress was measured, and the severity classified into three categories: Low, Medium and High. Alligator Cracking and Longitudinal Cracking were measured in linear feet. Transverse cracks were counted, and Raveling and Patching were measured in square feet. The extent of each pavement distress was converted into a percentage of the total street segment area and listed on the PCR form.

Using the measured extent and severity, the tables provided in the Appendix of the Street Wise manual were used to assign a PCR value to each street segment. The four reference sheets for determining the PCR are titled as follows: Low Severity Alligator cracking, Medium Severity Alligator Cracking, High Severity Alligator Cracking, and PCR Tables for Individual Distresses. The last table is only used if alligator cracking is not present or else it is the only type of pavement distress present in the street segment.

If alligator cracking is present, the reviewer refers to the reference sheet for the severity of alligator cracking (*Low, Medium, or High*). Next, they cross reference it with the extent and severity of the next most predominant pavement distress. The other pavement distress may be more or less severe than the alligator cracking, or another type of pavement distress may not be present at all in this particular segment.

The following is an example of the information gathered from the visual inspection and how it is used to determine the PCR.

Example:
20% of a street segment has medium severity alligator cracking, 10% low severity alligator cracking, 5% medium severity transverse cracking, and 15% of the segment exhibited high severity raveling. To determine the PCR, the following steps would be taken:

1) Identify the most predominant severity of alligator cracking, and the most predominant severity of the other four pavement distresses. In this example, the 20% medium severity alligator cracking and the 15% high severity raveling would be used to determine the PCR. The other pavement distresses are not used.
2) Refer to the reference sheet for Medium Alligator Cracking in the Street Wise manual.

3) Locate the table for 10% to 25% Medium Severity Alligator Cracking.
4) Find the column for High Severity Raveling and cross reference it with the row for 10% to 25%.
5) The table would list a PCR rating of 20 for this street segment.

If only one type of pavement distress is present, locate the table for that type of distress. Use the appropriate column for the severity and the row for the extent of the distress to determine the PCR.

Discussion of Rating Philosophy

Each type of pavement distress evaluated is an indicator of the current pavement condition. This condition can be used to determine the street surface's remaining life expectancy. Some signs of pavement distress are more critical than others. For example, transverse cracks are typically considered a minor problem. However, severe alligator cracking can indicate rapid deterioration of the street segment if it is not repaired promptly.

WSDOT has developed a relative weight in the PCR ratings based on over thirty years of highway maintenance experience. The PCR rating tables reflect that experience. The following is a summary of the indicators used for TIB's evaluation:

Alligator cracking: Alligator cracking is called such because it resembles the pattern on an alligator skin. It is generally located within the wheel path of the travel lanes and is caused by traffic loads. Alligator cracking is typically a sign of the base course and/or subgrade failing and starts as longitudinal cracks. Alligator cracking can be a serious problem and lead to rapid deterioration of the street.

High Severity Longitudinal Cracking

Longitudinal Cracking:
Longitudinal cracks are the predecessors of alligator cracking. They form in the travel lanes in areas of repeated loadings and run parallel to the traffic flow. They are typically the result of failure of the base course. However, they can form along the centerline of the road or at the edge of the travel lane due to construction paving joints.

Medium Severity Transverse Crack

Transverse Cracking: Transverse cracks run perpendicular to the travel lanes. They can be caused by surface shrinkage due to low temperatures or asphalt hardening. Transverse cracks are typically considered a minor problem, but they can lead to more serious problems if allowed to deteriorate. The cracks allow water to penetrate the street surface. This water can cause subgrade material to migrate and contaminate the base course, or during freezing conditions can cause frost heaving and crack expansion, which can lead to potholes.

Raveling: Raveling occurs when the aggregate rock becomes dislodged from the asphalt binder. This results in the loss of the wearing surface and the exposed binder can cause loss of surface traction.

Medium Severity Raveling

Patching: While patching is considered a repair to the pavement to address other distress indicators, it is still an indicator of problems with the pavement structure. WSDOT includes this indicator because if the patches were ignored in the evaluation, the problems that needed the patch in the first place would be overlooked. This might cause more pavement distress in the future. Patching might be described as the band-aid approach to problems that require stitches or surgery.

Medium Severity Patching

CHAPTER 5

PRIORITIZATION OF NEEDS

CHAPTER 5
PRIORITIZATION OF NEEDS

METHODOLOGY

Funding for street improvements through the Town's annual budget is extremely limited. In the perfect situation the Town would have sufficient funds to repair any and all streets that need repairs on an annual basis. The reality, however is that due to limited funding, the Town only has enough money to complete a small portion of the needed repairs during any given calendar year. To help the Town determine which streets should receive the available funding, we needed to develop a system to prioritize the streets for maintenance and repair.

There are several factors that should be included to create an effective street rating system. These include the street condition (*PCR*), usage (traffic counts), street classification or route type (*arterial, bus route, etc.*), the impact to the local economy by considering routes used to get to local businesses, and ability to leverage non-town funding.

PRIORITIZATION RANKING

Each street segment was evaluated based on a Pavement Condition Rating (*PCR*), traffic generator status, traffic counts, and business development transportation needs. Each of the aforementioned items was assigned a relative weight based upon its importance within the community in providing for transportation needs and the confidence in the validity of the assigned ranking.

The first and highest relative weighted criteria is the Pavement Condition Ratings (*PCRs*), which are setup on a sliding scale. Streets that have a high PCR and are in good to excellent condition are not assigned any point because these streets will require little or no repair work. Starting with the streets in fair condition we start assigning points, with the streets in worse condition getting more points. In general the biggest jump for scoring is from 0 points for excellent streets to 40 points for fair streets and then five additional points for every condition worse than fair. This large jump in points is in place because if preventative maintenance is expended when a road is still in fair condition, a larger expenditure may be avoided later. The more a road is allowed to deteriorate, the higher the cost it will be to rehabilitate or reconstruct. So in essence the scoring system is setup to protect the Town's current investment in street surfacing.

The second most important ranking condition is the traffic generators associated with each street segment. Major routes such as arterials, truck routes, and school bus routes were assigned high relative weights. Streets serving important buildings such as Town Hall, the Community Center and businesses were also assigned higher point values. The streets that serve these establishments are extremely important to the community and have higher traffic volumes the local access streets.

The third ranking condition is the Average Daily Traffic (*ADT*) counts. The ADT was given fewer points (*up to 10*) partly because it is closely related to the traffic generators on the street. A higher score would have given an unfair advantage to arterials. The point scale assigned is based upon the frequency that the street is used, with higher traffic streets benefiting more citizens in Odessa.

The fourth ranking criterion is the economic impacts of the existing road. Points were assigned to roads that serve a business or development. Higher points were given for existing businesses and developments because it is important to maintain the existing businesses to keep the Town economically healthy. It is important to note that this rating system does not provide for new street extensions to businesses or developments, but rather improves the existing streets that would be utilized by those developments. Any new street extensions are the responsibility of the individual developers. Appendix 7 shows how the streets in the Town scored.

The final ranking criterion is the ability to leverage funding for the project. The Town's street funds are not sufficient to cover the cost of basic annual maintenance much less major reconstruction and rehabilitation projects. Outside funding sources are necessary for making major street improvement projects a reality. Based on this need, points are assigned to each block based upon the ability to obtain Non-Town funding for the projects. Typical matching requirements from major funding agencies include 0-5% for state TIB and 13.5% for federal STP.

TABLE 5-1
STREET SEGMENT PRIORITIZATION

CRITERIA	RELATIVE WEIGHT
PCR	***50 points max***
Gravel	40
0 – 24	50
25 – 49	45
50 – 74	40
75 – 100	0
TRAFFIC GENERATOR ROUTE	***20 points max.***
Truck Route	20
School Bus Route	20
Public Bldg.	10
Business	10
Park	8
Multi-Family Unit	5
Church	5
Local Access	0
ADT	***10 points max.***
≥500	10
200 – 499	5
1 – 199	0
ECONOMIC IMPACTS	***10 points max.***
Business/Development Need	0 to 10
FUNDING ELIGIBILITY	***10 points max.***
95-100% Non-Town Funds	10
85-94% Non-Town Funds	8
50-84% Non-Town Funds	5
<50% Non-Town Funds	0
TOTAL POSSIBLE POINTS	**100**

CHAPTER 6

PAVEMENT REHABILITATION STRATEGIES

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PAVEMENT REHABILITATION STRATEGIES

POTENTIAL STRATEGIES

The following discussion covers several different maintenance and rehabilitation methods that can be used on specific types of pavement distress situations.

***Crack Seal*:** Crack sealing involves applying a strip of liquid crack sealant along traverse and longitudinal cracks in the pavement. Crack sealing helps to seal the asphalt and prevent water from penetrating into the subgrade and causing further damage. Crack sealing is not a feasible maintenance method if the pavement is experiencing severe cracking or other signs of subgrade failure.

Bituminous Surface Treatments (BST):

Chip Seals

The Chip Seal is one of the most common forms of rehabilitation used in the surrounding counties and cities. A Chip Seal "seals" the surface to prevent water penetration and gives the street segment a new wearing course. It does not substantially increase the structural strength of the pavement section. Therefore, it does not work well where the street is experiencing subgrade or base failures. A Chip Seal works best for streets that have low to moderate cracking or raveling. Existing cracks usually "reflect" through the new chip seal in two to three years, requiring additional maintenance. This can be somewhat reduced by sealing cracks prior to applying the chip seal.

Fog Seal (Seal Coat)

Another type of BST is the fog seal (a.k.a. seal coat). The fog seal is the application of a dilute asphalt emulsion without an aggregate cover. The fog seal is used to help seal a chip seal or pavement surface. It can be used to seal a surface to prevent raveling under traffic and surface water penetration. It does not improve the structural strength of the pavement nor does it provide a new wearing surface. The fog seal is typically used in conjunction with a chip seal or ACP overlay and is rarely used as a standalone rehabilitation method.

Overlay: A pavement overlay involves applying a new layer of hot mix asphalt over the existing pavement surface. It does not solve most of the serious problems with the base course or subgrade, but it does strengthen the structure of the pavement section. An overlay is typically 1-2 inches deep with greater depths providing more protection to the existing pavement and more structural strength. Patching or other forms of rehabilitation may be performed to address isolated areas with more severe pavement distresses prior to the overlay.

A common problem with a pavement overlay is that if cracks in the original pavement section are not properly treated, they can reflect through to create cracks in the new surface. Another common problem is multiple overlays, which can result in a raised road surface and reduced curb exposure. To avoid the raised roadway, agencies can grind down the asphalt and/or feather the edges of the overlay, but this adds cost and the asphalt grindings must be removed and hauled to a disposal site. Overlays also do not solve drainage problems and can actually create new drainage problems.

Paving Crew of Reconstructed Road

Reconstruction: Traditional reconstruction is the replacement of the existing roadbed and asphalt. It is typically saved for the streets in the worst condition based upon the Pavement Condition Rating (PCR) values. Roads in need of reconstruction often are experiencing subgrade, base, or severe pavement failure where rehabilitation methods are no longer effective. It returns the roadway to a "new" condition and substantially reduces short term maintenance requirements.

Reconstruction is also performed when major improvements are needed to address the current needs of the traveling public. These improvements may include widening the roadway, horizontal and/or vertical alignment changes, safety enhancements, adding vehicle capacity or improving the structural strength for increased traffic loads.

Full Depth Reclamation (FDR)/Cement Treated Base (CTB):

Full Depth Reclamation with Cement Treated Base is an innovative reconstruction strategy that has become more widely adopted in recent years. This reconstruction method recycles the existing pavement section in place, thereby reducing the use of new materials. During the recycling process, the existing pavement and base rock are pulverized, shaped and

compacted. Cement and water are mixed into the pulverized material to create a cement strengthened layer that serves as the base for a new asphalt layer.

Pulverizing of existing pavement

The process reduces construction time and can achieve large cost savings compared to traditional reconstruction. It is best suited when no major changes to the vertical and horizontal alignment are required. An FDR/CTB project has an expected design life comparable to a traditional reconstruction.

The use of FDR without CTB can be a lower cost solution for local access streets. CTB is needed to provide adequate structural strength on arterials and other streets with higher traffic volumes and truck traffic. However, FDR with only a pavement overlay or chip seal can be a cost-effective solution for local access streets with light traffic in need of significant improvements. Traditional reconstruction is often cost-prohibitive in these situations for agencies with limited resources. FDR can produce a durable finished roadway at a significantly reduced cost.

DETERMINATION OF IMPROVEMENT TYPES

The PCR ratings discussed in Chapter 4 have been used to determine an appropriate rehabilitation method for the streets in need of repair. To give a general outline of which rehabilitation method is appropriate, the PCR ratings were divided into four groups.

Group 1 represents the road segments with a PCR between 75 and 100. These roads are in good to excellent condition and have likely been rehabilitated or reconstructed in the last 10 years or so. They do not require any major rehabilitation at this time. If any cracks are evident in streets within this group, they should be sealed to prevent further damage.

Group 2 represents the road segments with a PCR between 50 and 74. These roads are in fair condition and require minor repairs and improvements such as overlay or chip seal.

Group 3 represents the road segments with a PCR between 25 and 49. These roads are in poor condition, but an overlay may still be viable if completed quickly. Most of these road sections will need rehabilitation or reconstruction to fix the damage.

Group 4 represents the road segments with a PCR below 25. These segments are in poor condition and will require complete rehabilitation or reconstruction.

The timing of the rehabilitation or reconstruction will be determined by the ratings outlined and described in Chapter 6 and the funding available.

COSTS

One of the primary uses for this plan is to help the Town determine the most efficient use for any available street improvement funding.

Appendix 1 of this plan includes detailed cost estimates for the projects identified for the 6-year Street Improvement Plan period.

PAVEMENT SECTIONS &SOILS EVALUATION

To help the Town develop appropriate rehabilitation strategies, we evaluated existing soils data to develop approximate pavement sections that can be used to estimate construction costs for future projects.

In general, the predominant native soils in Odessa are classified by the Natural Resources Conservation Service (*NRCS*) as Stratford gravelly silt loam, Roloff-Bakeoven-Rock outcrop complex, Esquatzel silt loam and Beckley fine sandy loam. They are generally moderate to weak and may not be well suited for road beds. The NRSC soil survey describes the soils as Very Limited to Somewhat Limited for road construction. They are susceptible to frost action and care should be exercised during design to ensure an adequate structural section for constructing roads. Detailed information about the soil types present in the City is included in Appendix 4.

To assist in estimating pavement sections for future road improvements, soil samples were collected to determine the R-Value of the soil using the AASHTO T 190 method. The R-Value is a measure of the soil strength. The soils information was then used in conjunction with the traffic count information to develop guidelines for suitable pavement sections.

Soil samples collected from tests pits yielded an R-Value of 65which usually indicates a medium strength material that is well suited for road construction. However, the susceptibility to frost heave should also be considered in the design, which may require a case-by-case evaluation of site specific conditions. A layer of appropriate imported borrow material may be necessary to minimize frost heave.

To help determine the typical pavement sections, an online computer model from Pavia Systems called PaveXpress was used along with the soils and traffic data that were collected in the field. The PaveXpress program uses the American Association of State Highway and Transportation Officials (*AASHTO*) 1993 flexible pavement design methodology to calculate the required road section. The AASHTO design methodology is the industry standard and is the required design procedure for most areas in eastern Washington. The program requires the

user to input several design parameters such as traffic and vehicle information, road reliability and design life, and soils strength to name a few.

As discussed above we have an R-Value for the City of 65 that was determined using a soil sample taken in the field. The R-Value of 65 is relatively high for this area and would generally imply that the existing subgrade is satisfactory and a moderate pavement section will be required to meet the traffic loads.

Typical pavement sections were determined for an arterial and local access street using traffic count information collected for this plan. A safety factor of 3was applied in the R-Value to accommodate seasonal variations in the soil conditions and variability due to frost heave susceptibility. Copies of the calculations are included in Appendix 6 and summarized below in Table 6-1.

Table 6-1

Road Classification	Base Course (inches)	HMA (Inches)
Arterial	8	3.50
Local Access	6	2.50

CHAPTER 7

IMPROVEMENT PROGRAM

CHAPTER 7
IMPROVEMENT PROGRAM

DEVELOPMENT OF PROJECTS

As discussed earlier in the report each individual block of paved Town streets have been evaluated and assigned a general priority number or score. To develop the most economical and effective improvement program the street segments have been grouped into logical projects including adjacent blocks with similar priority ratings. The improvement program is intended to help the Town develop a realistic program for improving the existing roads as well as serve as a guide for developing and implementing 6-Year Street Improvement Plans.

The rehabilitation methods and general ratings are discussed in Chapter 6. In general, street segments with a PCR below 50 are scheduled for rehabilitation or reconstruction, and streets with a PCR between 50 and 74 are scheduled for a pavement overlay of some kind.

The WSDOT Streetwise manual recommends updating the PCR ratings for each street segment on an annual or biannual basis, but given the availability of Town staff and budget it is more likely to rely on TIB to update their PCR ratings and use their data. It is important to keep track of the current road conditions, because over the course of the 6-year plan the roads will continue to deteriorate and streets that only needed a chip seal or overlay at the start of cycle may need more extensive repairs once funding is actually available.

Over the years, the Town will start to develop a history of PCR values for each street segment. This history can be used to provide useful information on what is happening with the street. For example, drastic drops in the PCR value could mean that there are drainage or subgrade issues or an increase in traffic.

The Town recognizes that one of the most important steps they can take is to maintain the existing pavement before it becomes too old or damaged to utilize maintenance and preservation techniques to extend the life. To develop a long-term strategy for pavement maintenance and preservation, the Town's streets were mapped with the TIB PCR rating identified. The streets were divided into 8 geographic areas with generally the same square footage of asphalt to be preserved. In discussions with Lincoln County maintenance staff, it was determined that Lincoln County can do approximately 140,000 sf of chip seal work for approximately $30,000. This figure represented an annual investment for the Town to plan or budget for to provide an 8-year, cyclic improvement program for all streets within the Town. The map in Figure 7-1 identifies the areas and schedule of the town's towns streets and priorities for maintenance projects.

There are several ways for the Town to pay for the annual street improvements. The City could opt to do any or all of the following:

- Run a voter authorized street bond to raise the funds with a property tax increase
    - According to the Lincoln County Assessor, Odessa has approximately $39M in assessed value in the City limits. To raise $30,000 for a street bond, the additional tax would need to be approximately $0.75 per $1000 of assessed value. A property worth $100,000 would see a property tax increase of $75 per year. Also per the Assessors website, Odessa's levy rate is has the lowest property tax levy in Lincoln County.
- Run a voter approved sales tax increase

    - According to Washington State Department of Revenue reports, the Town of Odessa recorded approximately $10.7M in taxable sales in 2015. To accumulate $30,000 per year in sales tax revenues, the Town would need to raise the sales tax rate from the current 7.7% rate to approximately 8.0%. Other surrounding communities in Lincoln County have the same sales tax rate of 7.7% for comparison.
- Apply to TIB for preservation funds on an annual basis
    - The City can make applications to the Washington State Transportation Improvement Board for funds to complete the chip seal program. The application process is competitive on an annual basis with no guarantee that the program will continue from year to year.
- Divert funds from the Town's General Fund or Street Fund to dedicate to the chipseal/preservation program
    - While coffers are tight, the council can determine prioritization of Town funds to determine if earmarking approximately $30,000 for road preservation is a critical part of the town's funding priorities
- Other funding mechanisms
    - There are other possibilities for funding that haven't been explored. Potential funding sources could be the public works trust fund, WSDOT STP or other occasional funding, and many other potential loan programs

In addition to the chip seal program, there are 4 streets in Odessa that are in need of reconstruction. Fairway Street from 1st Avenue to 8th Avenue, Dobson Road from the bridge east to the corporate boundaries, Marjorie from 3rd Street to 6th Street, and 3rd Avenue from 1st Street to 5th Street. Each of these projects will need major reconstruction projects with a large portion of grant funds. TIB is the best chance of funding for these projects and funding will be pursued on an annual basis to fix these problematic streets.

The projects that are shown in Tables7-1and 7-2 have been developed based upon the Street Segment Prioritization scores discussed in chapter 5 and several public meetings where input and recommendations were received from both Town staff and local residents. Some of the projects developed in this plan may need to be constructed in phases due to the availability of funds. Each year when the Town updates their 6-Year Street plan it is important to pay attention to the available funding and to ensure that each proposed project is appropriately sized to fit within those limits.

The following improvement program is intended to be an ongoing, cyclic improvement schedule that can be updated as necessary. This improvement program covers all of the streets in Odessa and establishes a fairly equal distribution of projects that can be completed easily by Lincoln County maintenance staff on an annual basis. The City will be responsible for pre-leveling, cutout areas and crack sealing for projects that Lincoln County chip seals but the cost for each of these is much more reasonable utilizing Town Maintenance staff and Lincoln County resources to perform road maintenance than hiring an outside contractor. The following table outlines the entire 8 year improvement program:

Table 7-1
Existing Paved Roads
Reconstruction Project Improvement Costs

Year	*Project Description*	*Possible Funding Source*	*Estimated Cost*
2017	Fairway Street (1st Avenue to 8th Avenue)	City / TIB SCPP	$578,000
2018	3rd Avenue (1st Street to 5th Street)	City / TIB SCPP	$857,000
2019	Marjorie Street (3rd Avenue to 5th Avenue)	City / TIB SCPP	$523,000
2020	Dobson Road (Bridge to Corporate Limits)	City / TIB SCPP	$437,000
Total Estimated Capital Expenditures			$2,395,000

The costs listed in the table above include design and construction engineering as well as a contingency. Copies of the details cost estimates for each project are included in the appendix.

Table 7-2
Existing Paved Roads
Chip Seal Program Improvement Cost

(Costs do not include pre-leveling, crack sealing, or cutouts)

Year	*Project Description*	*Possible Funding Source*	*Estimated Cost*
2017	Birch From Creek to EOR 4th Ave From HWY to Alder Elm From 4th Ave to EOR Douglas From 4th Ave to EOR Cedar From 4th Ave to EOR 8th Ave From Fairway to EOR 6th Ave From Fairway to Alder	City/TIB	$45,300
2018	2nd Ave From Alder to EOR Birch From 2nd Ave to HWY Cedar From 2nd Ave to HWY 1st St From HWY to 4th Ave 2nd Ave From Alder to 1st St Division From HWY to 3rd Ave 3rd Ave From Alder to Division	City/TIB	$32,400
2019	1st St From HWY to Roy Marjorie From Alder to Creek Division From HWY to Marjorie 2nd St From HWY to Marjorie	City/TIB	$32,300
2020	Amende From 5th St to Hopp 8th St From Amende to 3rd Ave 3rd Ave From 8th St to Hopp	City/TIB	$11,900
2021	2nd Ave From 2nd St to Hopp 5th St From Hwy to Amende 6th St From Hwy to Amende 7th St From Hwy to Amende	City/TIB	$31,400

2022	May From HWY to EOR Division From May to Railroad Warren From HWY to Division 1st St From HWY to May Birch From HWY to May May From Birch to HWY Warren From Birch to HWY	City/TIB	$33,900
2023	4th St From 1st Ave to 4th Ave 2nd St From 1st Ave to 5th Ave 4th Ave From 2nd St to EOR 4th Ave From Alder to 1st St Division From Creek to Alder 5th Ave From Birch to Division	City/TIB	$44,900
2024	Marjorie From 3rd St to 6th+ St 4th St From Marjorie to 1st Ave 5th St From Marjorie to 1st Ave 6th St From Marjorie to 1st Ave	City/TIB	$15,300
Total Estimated Chip Seal Capital Expenditures			$247,400

APPENDICES

APPENDIX 1

6 – YEAR STREET PLAN COST ESTIMATES

TOWN OF ODESSA
2016 TIB SCAP APPLICATION
3RD AVENUE RECONSTRUCTION PROJECT
PRELIMINARY COST ESTIMATE
August 19, 2016

	DESCRIPTION OF ITEM	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	$60,000.00	$60,000
3	Project Temporary Traffic Control	1	LS	$5,000.00	$5,000
4	SPCC	1	LS	$750.00	$750
5	Clearing and Grubbing	1	LS	$7,500.00	$7,500
6	Sawcut ACP	210	LF	$3.00	$630
7	Geotextile Fabric for Soil Separation	1800	SY	$3.50	$6,300
8	Remove and Replace Unsuitable Material	500	CY	$30.00	$15,000
9	Excavation and Embankment, Incl. Haul	500	CY	$18.00	$9,000
10	Pulverization, 8-inches Thick	6,000	SY	$3.00	$18,000
11	FDR Roadway Excavation , Incl Haul	500	CY	$20.00	$10,000
12	Cement Treated Base, 8-inches Thick	5,550	SY	$4.00	$22,200
13	Portland Cement, Type II	150	TNS	$160.00	$24,000
14	Crushed Surfacing Top Course	1,600	TNS	$28.00	$44,800
15	HMA Cl 1/2", PG 64-28, 0.25-Ft Depth	5,550	S.Y.	$25.00	$138,750
16	Imported Pipe Bedding	250	LF	$5.00	$1,250
17	Trench Safety System	250	LF	$2.00	$500
18	Solid Wall PVC Storm Sewer Pipe - 10-in Diam.	250	LF	$30.00	$7,500
19	Catch Basin Type 1 w/ Metal Frame & Vaned Grate	8	EA	$1,800.00	$14,400
20	Drywell	4	EA	$2,500.00	$10,000
21	Cement Concrete Curb & Gutter	2,900	LF	$30.00	$87,000
22	Cement Concrete Sidewalk	1500	SY	$42.00	$63,000
23	Pedestrian Ramp	10	EA	$1,500.00	$15,000
24	Curb Ramp Detectable Warning Pattern	60	SF	$25.00	$1,500
25	Reinforced Cement Concrete Driveway - 6-inch thick	185	SY	$60.00	$11,100

Sub-Total, Incl Sales Tax		$573,200
Contingency	15.00%	$86,000
	Construction Total	**$659,200**
Design Engineering (15%)	15.00%	$98,880
Construction Engineering (15%)	15.00%	$98,880
TOTAL ESTIMATED PROJECT COST		**$856,960**

Prepared By: Century West Engineering Corp.

Matt Morkert P.E.

Street Segment Estimate for ODESSA

Enter Priority: 1

Street Name: Fairway

Termini: HWY 28 to 8th Avenue

Truck Route: None

Connects to State Highway: Yes

Length in Feet: 2,000 feet

Pavement Width: 26 feet

Sidewalk Placement: Intermittent

Sidewalk Condition: Good

Curb Placement: None

Enter # non-compliant ADA Ramps: 1 ramps

Enter Utility Information

	Enter Age or None	Condition
WATER	30+	Fair
SEWER	16	Good

Describe the proposed segment work below

The road will be reconstructed using FDR construction. The subgrade in this area is very poor and the use of Cement Treated Base will be utilized on this project. No sidewalk work will be included other than upgrading the 1 sidewalk ramp to current standards. Some Stormwater Drainage work is anticipated but will be relatively minor.

Engineer's Estimate

Registered Engineer Signature

Design Engineering	Construction Engineering	Contract Cost	Contingency	TOTAL
66,500	66,500	369,830	75,000	577,830

Item	Description	Units	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$40,000.00	$40,000.00
2	Project Temporary Traffic Control	LS	1	$5,000.00	$5,000.00
3	SPCC	LS	1	$750.00	$750.00
4	Clearing and Grubbing	LS	1	$2,500.00	$2,500.00
5	Sawcut ACP	LF	210	$3.00	$630.00
6	Remove and Replace Unsuitable Material	CY	1,500	$30.00	$45,000.00
7	Excavation and Embankment, Incl. Haul	CY	1,000	$18.00	$18,000.00
8	Pulverization, 8-inches Thick	SY	6,000	$3.00	$18,000.00
9	FDR Roadway Excavation , Incl Haul	CY	800	$20.00	$16,000.00
10	Cement Treated Base, 8-inches Thick	SY	6,000	$4.00	$24,000.00
11	Portland Cement, Type II	TNS	150	$160.00	$24,000.00
12	Crushed Surfacing Top Course	TNS	1,400	$26.00	$36,400.00
13	HMA Cl 1/2", PG 64-28, 0.17-Ft Depth, Misc. Areas	S.Y.	200	$25.00	$5,000.00
14	HMA Cl 1/2", PG 64-28, 0.25-Ft Depth	S.Y.	6,000	$20.00	$120,000.00
15	Imported Pipe Bedding	LF	200	$5.00	$1,000.00
16	Trench Safety System	LF	200	$2.00	$400.00
17	Solid Wall PVC Storm Sewer Pipe - 10-in Diam.	LF	200	$30.00	$6,000.00
18	Catch Basin Type 1 w/ Metal Frame & Vaned Grate	EA	3	$1,800.00	$5,400.00
19	Curb Ramp Detectable Warning Pattern	SF	10	$25.00	$250.00
20	Cement Concrete Curb Ramp	EA	1	$1,500.00	$1,500.00
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Street Segment Estimate for ODESSA

Enter Priority: 2

Street Name: Marjorie

Termini: East of 4th Street to West of 6th Street

Truck Route	None	Sidewalk Placement	Intermittent
Connects to State Highway	No	Sidewalk Condition	Fair
Length in Feet	1,500 feet	Curb Placement	Intermittent
Pavement Width	26 feet	Enter # non-compliant ADA Ramps	7 ramps

Enter Utility Information

	Enter Age or None	Condition		Enter Age or None	Condition
WATER	30	Fair	SEWER	15	Good

Describe the proposed segment work below

Segment will be pulverized and FDR will be used to rebuild the street segment. Street has gravel shoulders and no curb adjacent to the street so pulverization, FDR and repaving should be relatively problem free.

Engineer's Estimate

Registered Engineer Signature: 

Design Engineering	Construction Engineering	Contract Cost	Contingency	TOTAL
60,000	60,000	335,295	67,000	522,295

Item	Description	Units	Quantity	Unit Price	Amount
1	Mobilization	LS	1	$40,000.00	$40,000.00
2	Project Temporary Traffic Control	LS	1	$5,000.00	$5,000.00
3	SPCC	LS	1	$750.00	$750.00
4	Clearing and Grubbing	LS	1	$2,500.00	$2,500.00
5	Sawcut ACP	LF	90	$3.00	$270.00
6	Remove and Replace Unsuitable Material	CY	1,500	$30.00	$45,000.00
7	Excavation and Embankment, Incl. Haul	CY	1,500	$18.00	$27,000.00
8	Pulverization, 8-inches Thick	SY	4,500	$3.00	$13,500.00
9	FDR Roadway Excavation , Incl Haul	CY	750	$20.00	$15,000.00
10	Cement Treated Base, 8-inches Thick	SY	4,500	$4.00	$18,000.00
11	Portland Cement, Type II	TNS	120	$160.00	$19,200.00
12	Crushed Surfacing Top Course	TNS	1,000	$26.00	$26,000.00
13	HMA Cl 1/2", PG 64-28, 0.17-Ft Depth, Misc. Areas	S.Y.	250	$25.00	$6,250.00
14	HMA Cl 1/2", PG 64-28, 0.25-Ft Depth	S.Y.	4,500	$20.00	$90,000.00
15	Imported Pipe Bedding	LF	200	$5.00	$1,000.00
16	Trench Safety System	LF	200	$2.00	$400.00
17	Solid Wall PVC Storm Sewer Pipe - 10-in Diam.	LF	200	$30.00	$6,000.00
18	Catch Basin Type 1 w/ Metal Frame & Vaned Grate	EA	6	$1,800.00	$10,800.00
19	Curb Ramp Detectable Warning Pattern	SF	45	$25.00	$1,125.00
20	Cement Concrete Curb Ramp	EA	5	$1,500.00	$7,500.00
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Group	Street Name	From	To	Length	Width	Area	Maintenance Cost	Priority	Maintenance Type
	3rd Ave	1st St	5th St	1800	34	61200		1	Reconstruct
	Fairway	HWY	8th Ave	8500	26	221000		1	Reconstruct
	Railroad	Birch	Division	1200	25	30000		1	Reconstruct
	Marjorie	3rd St	6th+ St	1600	26	41600			
	4th St	Marjorie	1st Ave	300	30	9000		1	Overlay
	5th St	Marjorie	1st Ave	300	26	7800			
	6th St	Marjorie	1st Ave	300	38	11400			
	4th Ave	1st St	2nd St	550	48	26400			
	1st St	4th Ave	5th Ave	450	25	11250		1	Overlay
	5th Ave	2nd St	EOR	550	48	26400			
	4th St	1st Ave	4th Ave	925	48	44400			
	2nd St	1st Ave	5th Ave	1500	32	48000			
2024	4th Ave	2nd St	EOR	1700	24	40800	$ 44,842.66	2	Chip Seal
	4th Ave	Alder	1st St	700	36	25200			
	Division	Creek	Alder	900	30	27000			
	5th Ave	Birch	Division	900	22	19800			
	2nd Ave	Alder	EOR	1300	24	31200			
	Birch	2nd Ave	HWY	300	26	7800			
	Cedar	2nd Ave	HWY	200	26	5200			
2018	1st St	HWY	4th Ave	950	42	39900	$ 32,364.51	2	Chip Seal
	2nd Ave	Alder	1st St	700	48	33600			
	Division	HWY	3rd Ave	550	40	22000			
	3rd Ave	Alder	Division	350	24	8400			
	Birch	Creek	EOR	1000	24	24000			
	4th Ave	HWY	Alder	2400	36	86400			
	Elm	4th Ave	EOR	250	30	7500			
2017	Douglas	4th Ave	EOR	250	28	7000	$ 45,246.90	2	Chip Seal
	Cedar	4th Ave	EOR	250	23	5750			
	8th Ave	Fairway	EOR	1500	26	39000			
	6th Ave	Fairway	Alder	1700	22	37400			
	Amende	5th St	Hopp	1700	32	54400			
2020	8th St	Amende	3rd Ave	130	50	6500	$ 11,888.11	3	Chip Seal
	3rd Ave	8th St	Hopp	400	32	12800			
	May	HWY	EOR	2300	24	55200			
	Division	May	Railroad	800	26	20800			
	Warren	HWY	Division	300	25	7500			
2023	1st St	HWY	May	400	26	10400	$ 33,817.74	3	Chip Seal
	Birch	HWY	May	1300	32	41600			
	May	Birch	HWY	350	30	10500			
	Warren	Birch	HWY	350	25	8750			
	1st St	HWY	Roy	1000	54	54000			
2019	Marjorie	Alder	Creek	1300	50	65000	$ 32,298.95	3	Chip Seal
	Division	HWY	Marjorie	450	44	19800			
	2nd St	HWY	Marjorie	300	30	9000			
	2nd Ave	2nd St	Hopp	2800	32	89600			
2021	5th St	Hwy	Amende	450	38	17100	$ 31,381.12	4	Chip Seal
	6th St	Hwy	Amende	450	38	17100			
	7th St	Hwy	Amende	450	44	19800			

APPENDIX 2

PAVEMENT CONDITION RATINGS

Transportation Improvement Board
Street Inventory

ODESSA

Agency No **872**

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED

Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
1ST AVE (SR 28) WC/L to CEDAR ST	YES	32 feet 1,300 feet			**ACP** 2014	
1ST AVE (SR 28) CEDAR ST to BIRCH ST	YES	60 feet 400 feet		100% Good	**ACP** 2014	
1ST AVE (SR 28) BIRCH ST to 1ST ST	YES	60 feet 1,100 feet	100% Good	100% Good	**ACP** 2014	
1ST AVE (SR 28) 1ST ST to N 2ND ST	YES	60 feet 400 feet	100% Good	100% Good	**ACP** 2014	
1ST AVE (SR 28) N 2ND ST to S 2ND ST	YES	24 feet 165 feet	100% Good	100% Good	**ACP** 2014	
1ST AVE (SR 28) S 2ND ST to 6TH ST	YES	60 feet 1,600 feet	100% Good	100% Good	**ACP** 2014	
1ST AVE (SR 28) 6TH ST to 7TH ST	YES	60 feet 465 feet	50% Good	100% Good	**ACP** 2014	
1ST AVE (SR 28) 7TH ST to EC/L	YES	28 feet 250 feet			**ACP** 2014	
1ST ST 5TH AVE to 4TH AVE		25 feet 325 feet	100% Poor	40% Fair	**ACP** 2014	**44** ▪ 13-24% Medium **Chip Seal**
1ST ST 4TH AVE to 3RD AVE		42 feet 350 feet	100% Good	100% Good	**ACP** 2014	**72** ▪ None **Chip Seal**
1ST ST 3RD AVE to 2ND AVE		42 feet 325 feet	100% Fair	50% Fair	**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
1ST ST 2ND AVE to 1ST AVE (SR 28)		42 feet 300 feet	100% Good	100% Fair	**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
1ST ST 1ST AVE (SR 28) to MARJORIE AVE		54 feet 300 feet		100% Good	**ACP** 2014	**64** ▪ None **Chip Seal**
1ST ST RAILROAD AVE to DUCK LAKE RD		20 feet 450 feet			**Unsurfaced** 2014	
1ST ST DUCK LAKE RD to SR 21		26 feet 400 feet			**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
2ND AVE W END to CEDAR ST		20 feet 550 feet	30% Fair		**ACP** 2014	**40** ▪ None **Overlay**
2ND AVE CEDAR ST to BIRCH ST		24 feet 385 feet			**ACP** 2014	**54** ▪ 1-12% Medium **Chip Seal**
2ND AVE BIRCH ST to ALDER ST (SR 21)		24 feet 350 feet		25% Poor	**ACP** 2014	**63** ▪ 13-24% Low **Chip Seal**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
2ND AVE ALDER ST (SR 21) to DIVISION ST		48 feet 350 feet		100% Good	**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
2ND AVE DIVISION ST to 1ST ST		48 feet 365 feet			**ACP** 2014	**72** ▪ None **Chip Seal**
2ND AVE 2ND ST to 4TH ST		32 feet 675 feet	30% Fair	40% Fair	**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
2ND AVE 4TH ST to 5TH ST		32 feet 450 feet	100% Fair	100% Good	**ACP** 2014	**63** ▪ 1-12% Low **Chip Seal**
2ND AVE 5TH ST to 6TH ST		32 feet 450 feet	100% Good	100% Good	**ACP** 2014	**77** ▪ None **Chip Seal**
2ND AVE 6TH ST to 7TH ST		32 feet 450 feet	100% Good	100% Good	**ACP** 2014	**77** ▪ None **Chip Seal**
2ND AVE 7TH ST to HOPP RD		32 feet 700 feet	80% Good	80% Fair	**ACP** 2014	**68** ▪ None **Chip Seal**
2ND ST S END to 5TH AVE		24 feet 200 feet	100% Good		**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
2ND ST 5TH AVE to 4TH AVE		24 feet 335 feet	100% Good		**ACP** 2014	**77** ▪ None **Chip Seal**
2ND ST 4TH AVE to 3RD AVE		32 feet 375 feet	100% Good	100% Good	**ACP** 2014	**86** ▪ None **Chip Seal**
2ND ST 3RD AVE to 2ND AVE		32 feet 285 feet	100% Fair	100% Good	**ACP** 2014	**77** ▪ None **Chip Seal**
2ND ST 2ND AVE to 1ST AVE (SR 28)		32 feet 300 feet	100% Good	100% Fair	**ACP** 2014	**81** ▪ None **Chip Seal**
2ND ST 1ST AVE (SR 28) to MARJORIE AVE		30 feet 325 feet	100% Good		**ACP** 2014	**86** ▪ None **Chip Seal**
2ND ST MARJORIE AVE to N END		30 feet 150 feet	80% Good		**ACP** 2014	**86** ▪ None **Chip Seal**
3RD AVE ALDER ST (SR 21) to DIVISION ST		24 feet 335 feet	100% Good		**ACP** 2014	**77** ▪ None **Chip Seal**
3RD AVE 1ST ST to 2ND ST		44 feet 575 feet	100% Fair	100% Good	**ACP** 2014	**59** ▪ 1-12% Low **Chip Seal**
3RD AVE 2ND ST to 4TH ST		32 feet 685 feet	100% Good	100% Good	**ACP** 2014	**44** ▪ 1-12% Low **Overlay**
3RD AVE 4TH ST to 5TH ST		32 feet 525 feet	50% Good	100% Fair	**ACP** 2014	**41** ▪ 1-12% Medium **Overlay**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
3RD AVE 8TH ST to HOPP RD		32 feet 400 feet			**ACP** 2014	**40** ▪ 13-24% Medium **Overlay**
3RD ST 1ST AVE (SR 28) to MARJORIE AVE		18 feet 365 feet			**Unsurfaced** 2014	
4TH AVE SR 28 to FAIRWAY ST		24 feet 700 feet			**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
4TH AVE FAIRWAY ST to ELM ST		36 feet 325 feet	100% Good		**ACP** 2014	**68** ▪ None **Chip Seal**
4TH AVE ELM ST to DOUGLAS ST		36 feet 300 feet	100% Fair		**ACP** 2014	**72** ▪ None **Chip Seal**
4TH AVE DOUGLAS ST to CEDAR ST		36 feet 300 feet	100% Fair		**ACP** 2014	**72** ▪ None **Chip Seal**
4TH AVE CEDAR ST to BIRCH ST		36 feet 365 feet	100% Good	100% Good	**ACP** 2014	**72** ▪ None **Chip Seal**
4TH AVE BIRCH ST to ALDER ST (SR 21)		36 feet 350 feet	100% Fair	100% Fair	**ACP** 2014	**72** ▪ None **Chip Seal**
4TH AVE ALDER ST (SR 21) to DIVISION ST		28 feet 350 feet	100% Good	100% Good	**ACP** 2014	**100** ▪ None No Treatment
4TH AVE DIVISION ST to 1ST ST		28 feet 350 feet	100% Good	100% Good	**ACP** 2016	**100** ▪ None No Treatment
4TH AVE 1ST ST to 1ST ST		28 feet 200 feet	100% Good	100% Fair	**ACP** 2014	**52** ▪ 13-24% Low **Chip Seal**
4TH AVE 1ST ST to 2ND ST		48 feet 375 feet	100% Good	100% Good	**ACP** 2014	**59** ▪ 25-49% Low **Chip Seal**
4TH AVE 2ND ST to 4TH ST		24 feet 700 feet			**ACP** 2014	**77** ▪ None **Chip Seal**
4TH AVE 4TH ST to E END		24 feet 1,050 feet			**ACP** 2014	**77** ▪ None **Chip Seal**
4TH ST 4TH AVE to 3RD AVE		30 feet 325 feet	100% Good	50% Good	**ACP** 2014	**72** ▪ None **Chip Seal**
4TH ST 3RD AVE to 2ND AVE		48 feet 315 feet	100% Fair	100% Good	**ACP** 2014	**52** ▪ 1-12% Medium **Chip Seal**
4TH ST 2ND AVE to 1ST AVE (SR 28)		48 feet 300 feet	100% Poor	100% Poor	**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
4TH ST 1ST AVE (SR 28) to MARJORIE AVE		30 feet 315 feet	100% Poor	100% Poor	**ACP** 2014	**63** ▪ 13-24% Low **Chip Seal**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
5TH AVE W OF BIRCH ST to ALDER ST (SR 21)		22 feet 550 feet	100% Poor	100% Poor	**ACP** 2014	**36** ▪ 13-24% Medium **Overlay**
5TH AVE ALDER ST (SR 21) to DIVISION ST		22 feet 350 feet	50% Good	50% Good	**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
5TH AVE W OF 1ST ST to 1ST ST		48 feet 250 feet	100% Fair	100% Good	**ACP** 2014	**48** ▪ 1-12% Medium **Overlay**
5TH AVE 1ST ST to 2ND ST		48 feet 350 feet	50% Good	100% Good	**ACP** 2014	**44** ▪ 1-12% Medium **Overlay**
5TH ST AMENDE DR to 2ND AVE		38 feet 150 feet	100% Good	100% Good	**ACP** 2014	**90** ▪ None No Treatment
5TH ST 2ND AVE to 1ST AVE (SR 28)		38 feet 300 feet	100% Good	100% Fair	**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
5TH ST 1ST AVE (SR 28) to MARJORIE AVE		26 feet 300 feet	100% Good	80% Fair	**ACP** 2014	**59** ▪ 1-12% Low **Chip Seal**
6TH AVE FAIRWAY ST to ALDER ST (SR 21)		22 feet 1,725 feet			**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
6TH AVE (SR 21) SC/L to ALDER ST (SR 21)	YES	28 feet 1,150 feet			**ACP** 2014	
6TH ST AMENDE DR to 2ND AVE		31 feet 150 feet	100% Good		**ACP** 2014	**68** ▪ 13-24% Low **Chip Seal**
6TH ST 2ND AVE to 1ST AVE (SR 28)		38 feet 300 feet	100% Good	50% Good	**ACP** 2014	**81** ▪ None **Chip Seal**
6TH ST 1ST AVE (SR 28) to MARJORIE AVE		38 feet 300 feet	100% Fair	100% Fair	**ACP** 2014	**48** ▪ None **Overlay**
7TH ST AMENDE DR to 2ND AVE		44 feet 175 feet		100% Good	**ACP** 2014	**72** ▪ 13-24% Low **Chip Seal**
7TH ST 2ND AVE to 1ST AVE (SR 28)		44 feet 300 feet	50% Good	100% Good	**ACP** 2014	**60** ▪ None **Chip Seal**
8TH AVE FAIRWAY to E END		26 feet 1,500 feet			**ACP** 2014	**48** ▪ 1-12% Low **Overlay**
8TH ST 3RD AVE to AMENDE DR		50 feet 135 feet			**ACP** 2014	**52** ▪ 13-24% Low **Chip Seal**
ALDER ST (SR 21) 6TH AVE (SR 21) to 4TH AVE	YES	30 feet 900 feet	100% Good	100% Good	**ACP** 2014	
ALDER ST (SR 21) 4TH AVE to 1ST AVE (SR 28)	YES	54 feet 950 feet	100% Good	100% Good	**ACP** 2014	

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
ALDER ST (SR 21) 1ST AVE to MARJORIE AVE	YES	54 feet 315 feet		100% Good	**ACP** 2014	
ALDER ST (SR 21) MARJORIE AVE to 1ST ST	YES	28 feet 1,925 feet		100% Good	**ACP** 2014	
ALDER ST (SR 21) 1ST ST to NC/L	YES	28 feet 600 feet			**ACP** 2014	
ALICE AVE W END to BIRCH ST		24 feet 400 feet			**Unsurfaced** 2014	
AMENDE DR 5TH ST to 6TH ST		32 feet 475 feet		50% Good	**ACP** 2014	**68** ▪ None **Chip Seal**
AMENDE DR 6TH ST to 7TH ST		34 feet 475 feet			**ACP** 2014	**72** ▪ None **Chip Seal**
AMENDE DR 7TH ST to 8TH ST		32 feet 425 feet		80% Good	**ACP** 2014	**72** ▪ None **Chip Seal**
AMENDE DR 8TH ST to HOPP RD		24 feet 365 feet			**ACP** 2014	**56** ▪ None **Chip Seal**
BIRCH ST S END to 5TH AVE		24 feet 350 feet	60% Fair	100% Fair	**ACP** 2014	**68** ▪ None **Chip Seal**
BIRCH ST 5TH AVE to 4TH AVE		24 feet 365 feet	100% Good		**ACP** 2014	**80** ▪ None **Chip Seal**
BIRCH ST 4TH AVE to N END		24 feet 285 feet	100% Good	100% Fair	**ACP** 2014	**72** ▪ None **Chip Seal**
BIRCH ST 2ND AVE to 1ST AVE (SR 28)		26 feet 250 feet			**ACP** 2014	**63** ▪ 1-12% Medium **Chip Seal**
BIRCH ST 1ST AVE (SR 28) to RAILROAD AVE		24 feet 415 feet			**ACP** 2014	**77** ▪ 1-12% Low **Chip Seal**
BIRCH ST RAILROAD AVE to ALICE AVE		32 feet 225 feet			**ACP** 2014	**86** ▪ None **Chip Seal**
BIRCH ST ALICE AVE to WARREN ST		32 feet 275 feet			**ACP** 2014	**86** ▪ None **Chip Seal**
BIRCH ST WARREN ST to MAY AVE		32 feet 375 feet			**ACP** 2014	**81** ▪ None **Chip Seal**
CEDAR ST 4TH AVE to N END		23 feet 299 feet	100% Good	80% Good	**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
CEDAR ST 2ND AVE to 1ST AVE (SR 28)		26 feet 225 feet	80% Fair		**ACP** 2014	**36** ▪ 25-49% Medium **Full Depth Reclamation**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
DIVISION ST 6TH AVE (SR 21) to PAVT START		20 feet 325 feet			**Unsurfaced** 2014	**46** ▪ 13-24% Medium **Chip Seal**
DIVISION ST PAVT START to 5TH AVE		24 feet 250 feet	100% Poor	20% Good	**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
DIVISION ST 5TH AVE to 4TH AVE		32 feet 350 feet	100% Good	50% Good	**ACP** 2014	**81** ▪ None **Chip Seal**
DIVISION ST 4TH AVE to NORTH END - CRAB		54 feet 200 feet	100% Good	100% Good	**ACP** 2014	**77** ▪ None **Chip Seal**
DIVISION ST 3RD AVE to 2ND AVE		36 feet 300 feet	100% Good	100% Good	**ACP** 2014	**81** ▪ None **Chip Seal**
DIVISION ST 2ND AVE to FIRST AVE (SR 28)		44 feet 250 feet	100% Fair	100% Fair	**ACP** 2014	**77** ▪ None **Chip Seal**
DIVISION ST FIRST AVE (SR 28) to N/O MAJORIE		44 feet 400 feet	80% Fair	80% Fair	**ACP** 2014	**59** ▪ None **Chip Seal**
DIVISION ST S/O RAILROAD AVE to WARREN AVE		26 feet 300 feet	90% Good	90% Good	**ACP** 2014	**63** ▪ None **Chip Seal**
DIVISION ST WARREN AVE to MAY AVE		26 feet 365 feet	100% Good	100% Fair	**ACP** 2014	**54** ▪ 1-12% Medium **Chip Seal**
DIVISION ST MAY AVE to NORTH END		24 feet 200 feet	100% Fair	100% Fair	**ACP** 2014	**68** ▪ None **Chip Seal**
DOBSON RD 1ST AVE (SR 28) to PAVT CHANGE		28 feet 750 feet			**ACP** 2014	**90** ▪ None No Treatment
DOBSON RD PAVT CHANGE to EC/L		22 feet 900 feet			**ACP** 2014	**40** ▪ 13-24% Medium **Overlay**
DOUGLAS ST 4TH AVE to N END		28 feet 300 feet		70% Good	**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
DUCK LAKE RD 1ST ST to EC/L		26 feet 1,325 feet			**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
ELM ST 4TH AVE to PAVT END		30 feet 235 feet			**ACP** 2014	**72** ▪ None **Chip Seal**
ELM ST PAVT END to FAIRWAY ST		14 feet 400 feet			**Unsurfaced** 2014	**81** ▪ None **Chip Seal**
FAIRWAY ST 8TH AVE to 6TH AVE		20 feet 385 feet			**ACP** 2014	**54** ▪ 1-12% Medium **Chip Seal**
FAIRWAY ST 6TH AVE to 4TH AVE		20 feet 925 feet			**ACP** 2014	**41** ▪ 25-49% Medium **Full Depth Reclamation**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED
Treatment **GREEN** – Ideal; **ORANGE** - Conditional

Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
FAIRWAY ST 4TH AVE to 1ST AVE (SR 28)		26 feet 565 feet			**ACP** 2014	**50** ▪ 13-24% Medium **Chip Seal**
HOPP RD 3RD AVE to AMENDE DR		22 feet 175 feet			**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
HOPP RD AMENDE DR to SR 28		22 feet 225 feet			**ACP** 2014	**72** ▪ 1-12% Low **Chip Seal**
MARJORIE AVE ALDER ST (SR 21) to DIVISION ST		26 feet 350 feet			**ACP** 2014	**81** ▪ None **Chip Seal**
MARJORIE AVE DIVISION ST to 1ST ST		30 feet 365 feet		100% Fair	**ACP** 2014	**68** ▪ None **Chip Seal**
MARJORIE AVE 1ST ST to 2ND ST		50 feet 375 feet	100% Good	100% Good	**ACP** 2014	**54** ▪ 50-74% Low **Chip Seal**
MARJORIE AVE 2ND ST to E END		50 feet 285 feet		100% Fair	**ACP** 2014	**54** ▪ 1-12% Medium **Chip Seal**
MARJORIE AVE 3RD ST to 4TH ST		26 feet 300 feet			**ACP** 2014	**48** ▪ 1-12% Low **Overlay**
MARJORIE AVE 4TH ST to 5TH ST		26 feet 435 feet		100% Good	**ACP** 2014	**44** ▪ 1-12% Low **Overlay**
MARJORIE AVE 5TH ST to 6TH ST		26 feet 450 feet		100% Good	**ACP** 2014	**52** ▪ 1-12% Low **Chip Seal**
MARJORIE AVE 6TH ST to E END		26 feet 265 feet	60% Good		**ACP** 2014	**44** ▪ None **Overlay**
MAY AVE BIRCH ST to ALDER ST (SR 21)		30 feet 375 feet			**ACP** 2014	**77** ▪ None **Chip Seal**
MAY AVE ALDER ST (SR 21) to DIVISION ST		24 feet 350 feet			**ACP** 2014	**81** ▪ None **Chip Seal**
MAY AVE DIVISION ST to 1ST ST		20 feet 375 feet	50% Poor		**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**
RAILROAD AVE BIRCH ST to ALDER ST (SR 21)		30 feet 385 feet			**ACP** 2014	**44** ▪ 75-100% Low **Overlay**
RAILROAD AVE ALDER ST (SR 21) to DIVISION ST		30 feet 375 feet			**ACP** 2014	**48** ▪ 50-74% Low **Overlay**
RAILROAD AVE N DIVISION ST to 1ST ST		24 feet 400 feet			**Unsurfaced** 2014	
ROY AVE MARJORIE AVE to N END		28 feet 835 feet			**ACP** 2014	**77** ▪ None **Chip Seal**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

Transportation Improvement Board

Street Inventory

ODESSA

Agency No **872**

PAVEMENT CONDITION RATING (PCR) SCALE - 100 EXCELLENT to **0** TOTALLY DETERIORATED

Treatment **GREEN** – Ideal; **ORANGE** - Conditional

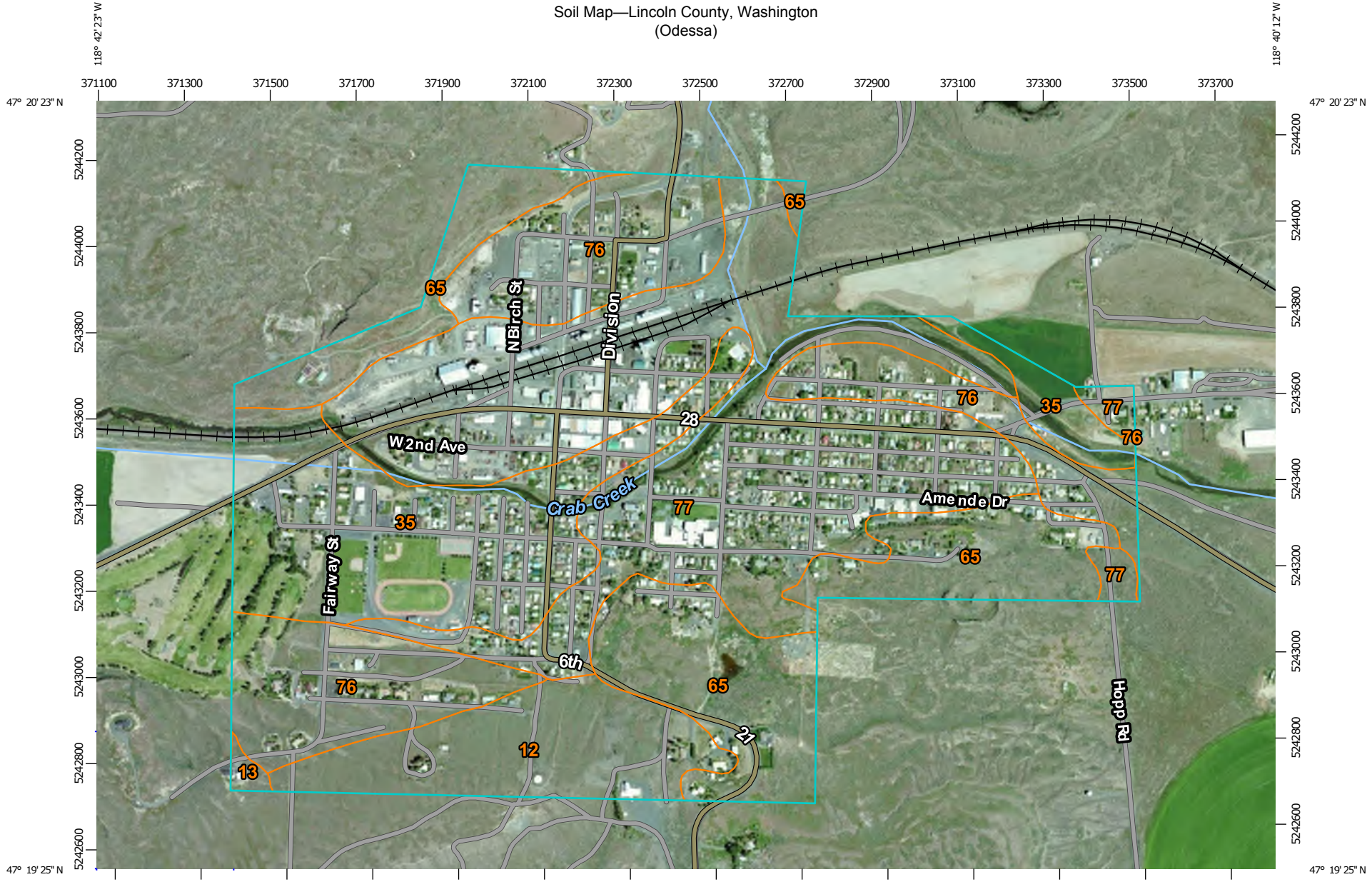
Street Section	State Hwy	Width Length	Sidewalk Percent of Length Condition LEFT	Sidewalk Percent of Length Condition RIGHT	Surfacing Review Year	Pavement Condition Rating Alligator Percent Indicated Treatment
WARREN ST BIRCH ST to ALDER ST (SR 21)		25 feet 350 feet			**ACP** 2014	**81** ▪ None **Chip Seal**
WARREN ST ALDER ST (SR 21) to DIVISION ST		25 feet 335 feet			**ACP** 2014	**68** ▪ 1-12% Low **Chip Seal**

State Highways & Unsurfaced Streets do not have Pavement Condition Ratings

APPENDIX 3

SOILS INFORMATION

Soil Map—Lincoln County, Washington
(Odessa)



Map Scale: 1:12,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Lincoln County, Washington (WA043)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
12	Beckley fine sandy loam, 0 to 7 percent slopes	47.6	8.7%
13	Beckley fine sandy loam, 25 to 55 percent slopes	1.8	0.3%
35	Esquatzel silt loam	99.1	18.1%
65	Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes	99.5	18.2%
76	Strat very cobbly silt loam, 3 to 25 percent slopes	103.2	18.9%
77	Stratford gravelly silt loam, 0 to 15 percent slopes	196.4	35.9%
Totals for Area of Interest		**547.7**	**100.0%**

Lincoln County, Washington

12—Beckley fine sandy loam, 0 to 7 percent slopes

Map Unit Setting

National map unit symbol: 29d3
Elevation: 1,400 to 2,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 135 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Beckley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beckley

Setting

Landform: Terraces
Parent material: Outwash

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 24 inches: sandy loam
H3 - 24 to 60 inches: coarse sand

Properties and qualities

Slope: 0 to 7 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: COOL LOAMY 10-16 PZ (R008XY103WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Lincoln County, Washington

13—Beckley fine sandy loam, 25 to 55 percent slopes

Map Unit Setting

National map unit symbol: 29d4
Elevation: 1,400 to 2,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 135 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Beckley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beckley

Setting

Landform: Terraces
Parent material: Outwash

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 24 inches: sandy loam
H3 - 24 to 60 inches: coarse sand

Properties and qualities

Slope: 25 to 55 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: SANDY 10-16 PZ (R008XY501WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Lincoln County, Washington

35—Esquatzel silt loam

Map Unit Setting

National map unit symbol: 29dx
Elevation: 300 to 2,900 feet
Mean annual precipitation: 6 to 12 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Esquatzel and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Esquatzel

Setting

Landform: Depressions
Parent material: Alluvium from loess

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: LOAMY BOTTOM 6-10 PZ (R007XY402WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Lincoln County, Washington

65—Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 29fz
Elevation: 200 to 2,600 feet
Mean annual precipitation: 9 to 18 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 100 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Roloff and similar soils: 40 percent
Bakeoven and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Roloff

Setting

Landform: Plateaus
Parent material: Loess over residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 15 inches: silt loam
H3 - 15 to 23 inches: silt loam
H4 - 23 to 27 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: LOAMY 10-16 PZ (R008XY102WA)

Description of Bakeoven

Setting

Landform: Plateaus
Parent material: Loess over residuum weathered from basalt

Typical profile

H1 - 0 to 2 inches: very cobbly loam
H2 - 2 to 5 inches: very cobbly loam
H3 - 5 to 9 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 7 percent
Depth to restrictive feature: 4 to 10 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: VERY SHALLOW 10-16 PZ (R008XY301WA)

Description of Rock Outcrop

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Emdent

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: ALKALI BOTTOM 16-24 PZ (R009XY401WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Lincoln County, Washington

76—Strat very cobbly silt loam, 3 to 25 percent slopes

Map Unit Setting

National map unit symbol: 29gc
Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Strat and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Strat

Setting

Landform: Escarpments, outwash plains
Parent material: Glacial outwash

Typical profile

H1 - 0 to 9 inches: very cobbly silt loam
H2 - 9 to 22 inches: very gravelly loam
H3 - 22 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 3 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: STONY 10-16 PZ (R008XY202WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Lincoln County, Washington

77—Stratford gravelly silt loam, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 29gd
Elevation: 500 to 1,700 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Stratford and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stratford

Setting

Landform: Outwash plains, outwash terraces
Parent material: Glacial outwash mixed with loess

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 24 inches: gravelly loam
H3 - 24 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

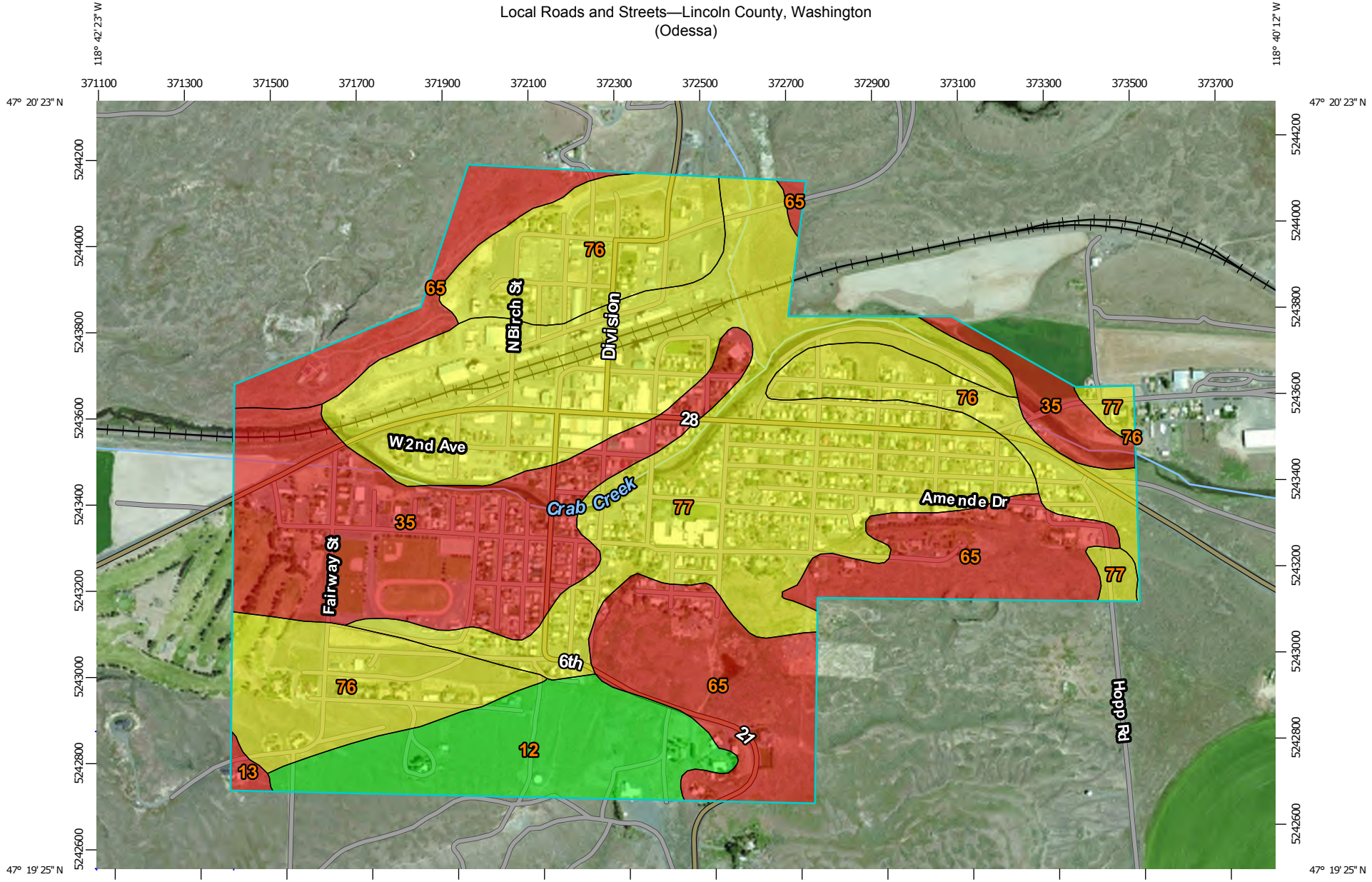
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: LOAMY 10-16 PZ (R008XY102WA)

Data Source Information

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Local Roads and Streets—Lincoln County, Washington
(Odessa)



Map Scale: 1:12,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Local Roads and Streets

Local Roads and Streets— Summary by Map Unit — Lincoln County, Washington (WA043)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
12	Beckley fine sandy loam, 0 to 7 percent slopes	Not limited	Beckley (100%)		47.6	8.7%
13	Beckley fine sandy loam, 25 to 55 percent slopes	Very limited	Beckley (100%)	Slope (1.00)	1.8	0.3%
35	Esquatzel silt loam	Very limited	Esquatzel (100%)	Frost action (1.00)	99.1	18.1%
65	Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes	Very limited	Roloff (40%)	Frost action (1.00)	99.5	18.2%
				Depth to hard bedrock (0.95)		
			Bakeoven (25%)	Depth to hard bedrock (1.00)		
				Low strength (1.00)		
				Large stones (0.60)		
				Frost action (0.50)		
			Emdent (5%)	Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
76	Strat very cobbly silt loam, 3 to 25 percent slopes	Somewhat limited	Strat (100%)	Slope (0.96)	103.2	18.9%
				Frost action (0.50)		
77	Stratford gravelly silt loam, 0 to 15 percent slopes	Somewhat limited	Stratford (100%)	Frost action (0.50)	196.4	35.9%
Totals for Area of Interest					**547.7**	**100.0%**

Local Roads and Streets— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Somewhat limited	299.6	54.7%
Very limited	200.4	36.6%

Local Roads and Streets— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Not limited	47.6	8.7%
Totals for Area of Interest	**547.7**	**100.0%**

Description

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

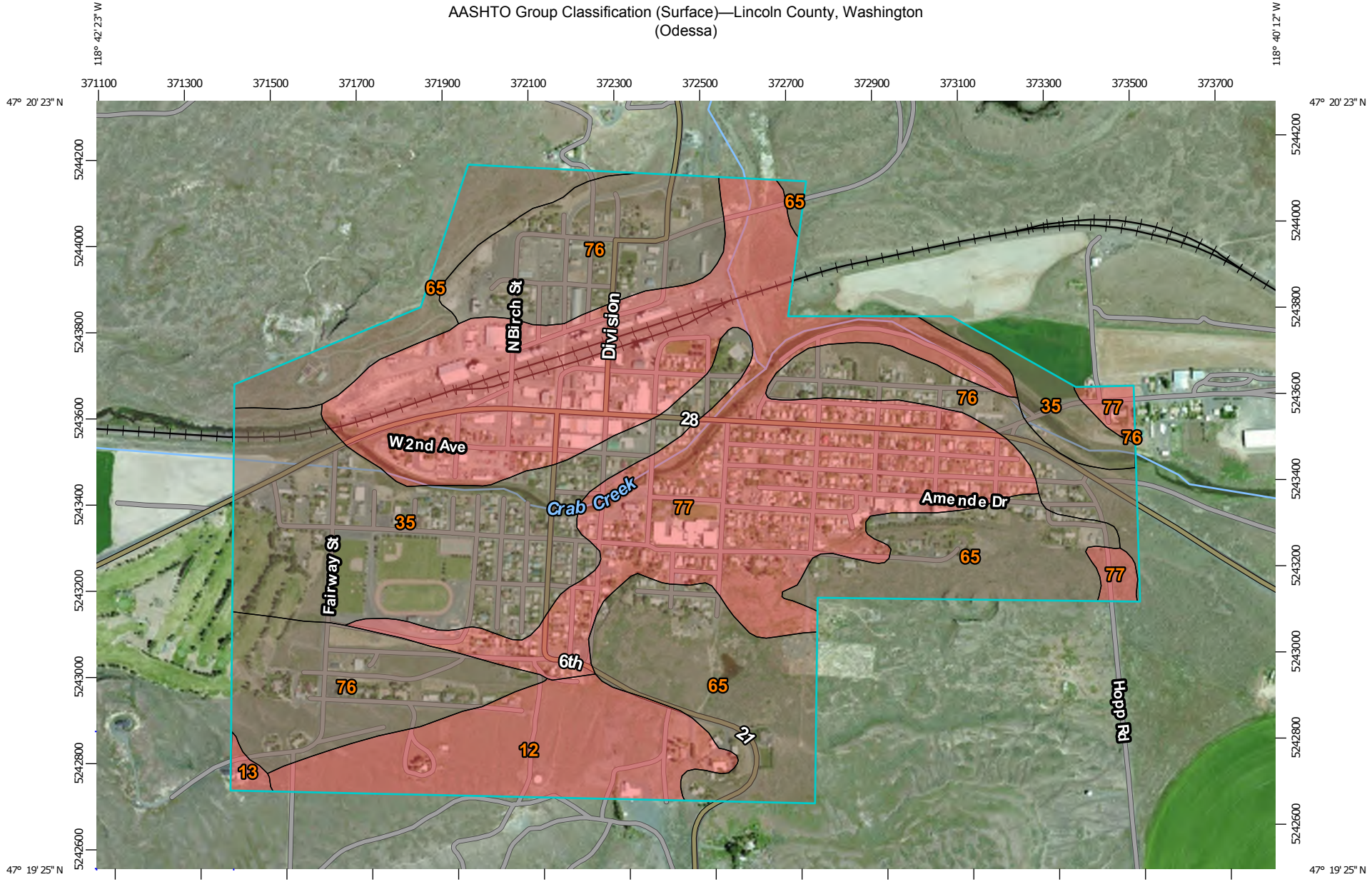
Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

AASHTO Group Classification (Surface)—Lincoln County, Washington
(Odessa)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Lines
- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Points
- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

AASHTO Group Classification (Surface)

AASHTO Group Classification (Surface)— Summary by Map Unit — Lincoln County, Washington (WA043)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
12	Beckley fine sandy loam, 0 to 7 percent slopes	A-2	47.6	8.7%
13	Beckley fine sandy loam, 25 to 55 percent slopes	A-2	1.8	0.3%
35	Esquatzel silt loam	A-4	99.1	18.1%
65	Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes	A-4	99.5	18.2%
76	Strat very cobbly silt loam, 3 to 25 percent slopes	A-4	103.2	18.9%
77	Stratford gravelly silt loam, 0 to 15 percent slopes	A-2	196.4	35.9%
Totals for Area of Interest			**547.7**	**100.0%**

Description

AASHTO group classification is a system that classifies soils specifically for geotechnical engineering purposes that are related to highway and airfield construction. It is based on particle-size distribution and Atterberg limits, such as liquid limit and plasticity index. This classification system is covered in AASHTO Standard No. M 145-82. The classification is based on that portion of the soil that is smaller than 3 inches in diameter.

The AASHTO classification system has two general classifications: (i) granular materials having 35 percent or less, by weight, particles smaller than 0.074 mm in diameter and (ii) silt-clay materials having more than 35 percent, by weight, particles smaller than 0.074 mm in diameter. These two divisions are further subdivided into seven main group classifications, plus eight subgroups, for a total of fifteen for mineral soils. Another class for organic soils is used.

For each soil horizon in the database one or more AASHTO Group Classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

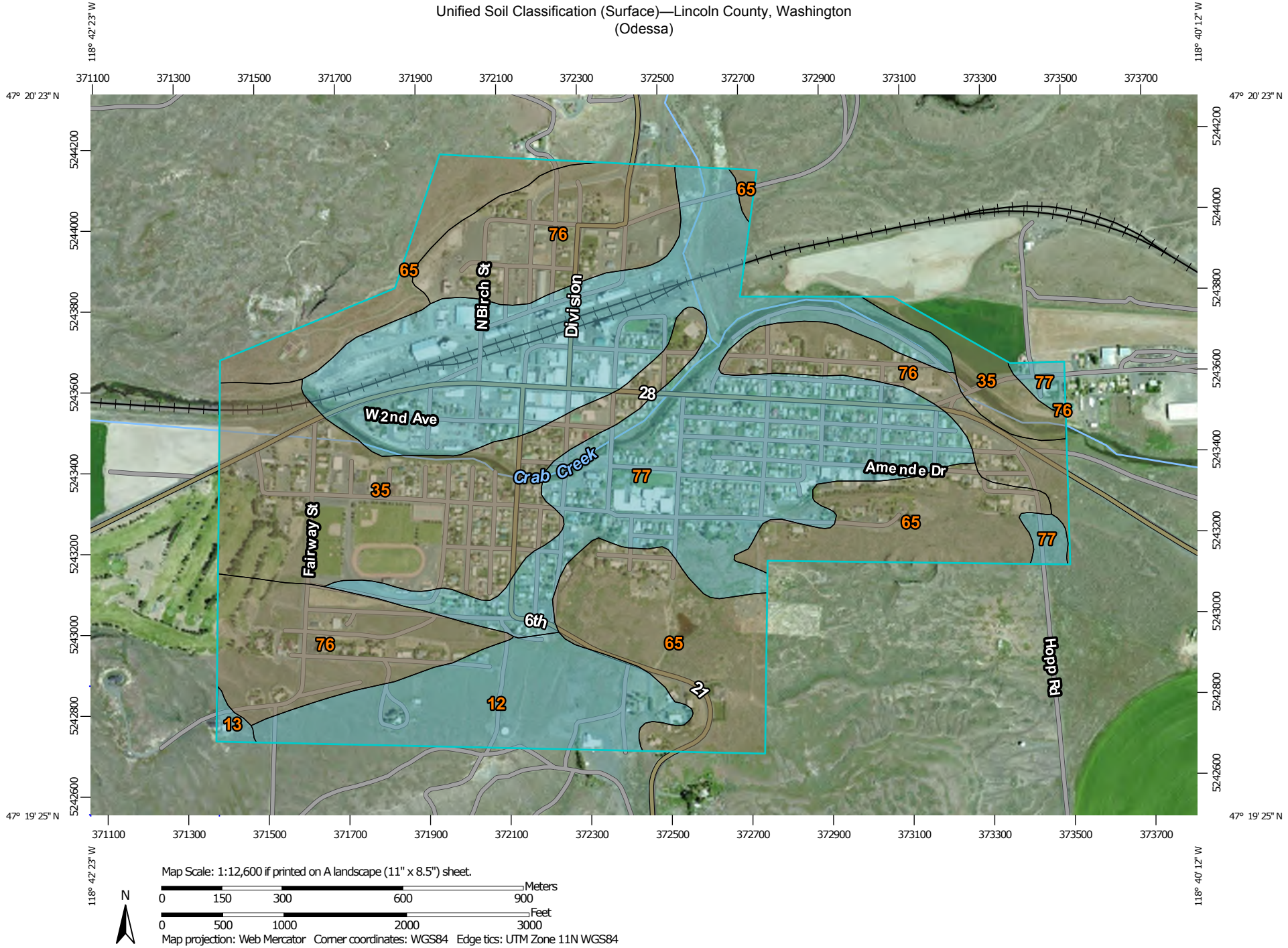
For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Unified Soil Classification (Surface)—Lincoln County, Washington
(Odessa)



Map Scale: 1:12,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- CH
- CL
- CL-A (proposed)
- CL-K (proposed)
- CL-ML
- CL-O (proposed)
- CL-T (proposed)
- GC
- GC-GM
- GM
- GP
- GP-GC
- GP-GM
- GW
- GW-GC
- GW-GM
- MH
- MH-A (proposed)
- MH-K (proposed)
- MH-O (proposed)
- MH-T (proposed)
- ML
- ML-A (proposed)
- ML-K (proposed)
- ML-O (proposed)
- ML-T (proposed)
- OH
- OH-T (proposed)
- OL
- PT
- SC
- SC-SM
- SM
- SP
- SP-SC
- SP-SM
- SW
- SW-SC
- SW-SM
- Not rated or not available

Soil Rating Lines

- CH
- CL
- CL-A (proposed)
- CL-K (proposed)
- CL-ML
- CL-O (proposed)
- CL-T (proposed)
- GC
- GC-GM
- GM
- GP
- GP-GC
- GP-GM
- GW
- GW-GC
- GW-GM
- MH
- MH-A (proposed)
- MH-K (proposed)
- MH-O (proposed)
- MH-T (proposed)
- ML
- ML-A (proposed)
- ML-K (proposed)
- ML-O (proposed)
- ML-T (proposed)
- OH
- OH-T (proposed)
- OL
- PT
- SC
- SC-SM
- SM
- SP
- SP-SC
- SP-SM
- SW
- SW-SC
- SW-SM
- Not rated or not available

Soil Rating Points

- CH
- CL
- CL-A (proposed)
- CL-K (proposed)
- CL-ML
- CL-O (proposed)
- CL-T (proposed)
- GC
- GC-GM
- GM
- GP
- GP-GC
- GP-GM
- GW
- GW-GC
- GW-GM
- MH
- MH-A (proposed)
- MH-K (proposed)
- MH-O (proposed)
- MH-T (proposed)
- ML
- ML-A (proposed)
- ML-K (proposed)
- ML-O (proposed)
- ML-T (proposed)
- OH
- OH-T (proposed)
- OL
- PT
- SC
- SC-SM
- SM
- SP
- SP-SC
- SP-SM
- SW
- SW-SC
- SW-SM
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails

MAP INFORMATION

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Unified Soil Classification (Surface)

Unified Soil Classification (Surface)— Summary by Map Unit — Lincoln County, Washington (WA043)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
12	Beckley fine sandy loam, 0 to 7 percent slopes	SM	47.6	8.7%
13	Beckley fine sandy loam, 25 to 55 percent slopes	SM	1.8	0.3%
35	Esquatzel silt loam	ML	99.1	18.1%
65	Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes	ML	99.5	18.2%
76	Strat very cobbly silt loam, 3 to 25 percent slopes	ML	103.2	18.9%
77	Stratford gravelly silt loam, 0 to 15 percent slopes	SM	196.4	35.9%
Totals for Area of Interest			**547.7**	**100.0%**

Description

The Unified soil classification system classifies mineral and organic mineral soils for engineering purposes on the basis of particle-size characteristics, liquid limit, and plasticity index. It identifies three major soil divisions: (i) coarse-grained soils having less than 50 percent, by weight, particles smaller than 0.074 mm in diameter; (ii) fine-grained soils having 50 percent or more, by weight, particles smaller than 0.074 mm in diameter; and (iii) highly organic soils that demonstrate certain organic characteristics. These divisions are further subdivided into a total of 15 basic soil groups. The major soil divisions and basic soil groups are determined on the basis of estimated or measured values for grain-size distribution and Atterberg limits. ASTM D 2487 shows the criteria chart used for classifying soil in the Unified system and the 15 basic soil groups of the system and the plasticity chart for the Unified system.

The various groupings of this classification correlate in a general way with the engineering behavior of soils. This correlation provides a useful first step in any field or laboratory investigation for engineering purposes. It can serve to make some general interpretations relating to probable performance of the soil for engineering uses.

For each soil horizon in the database one or more Unified soil classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

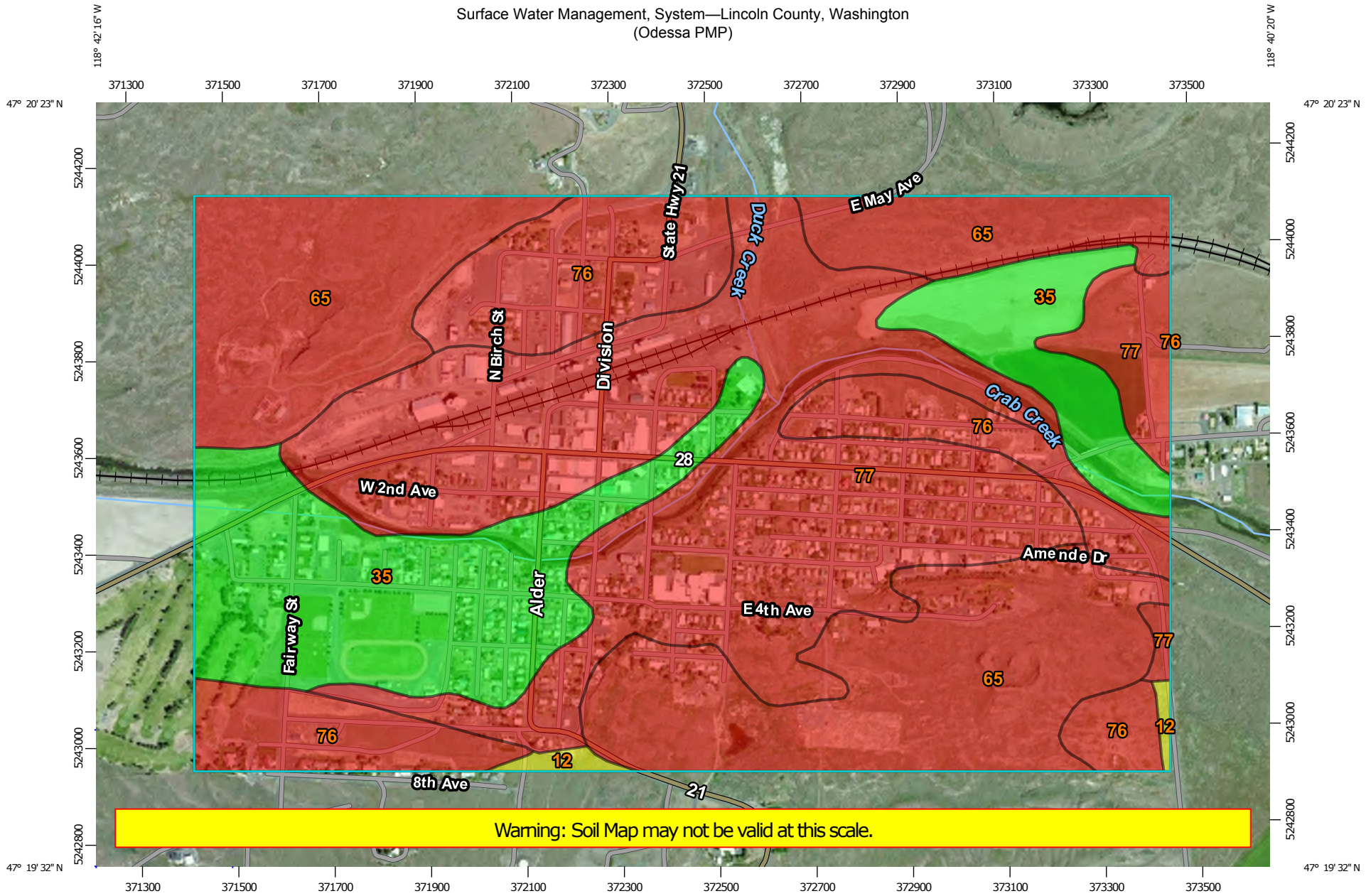
For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Surface Water Management, System—Lincoln County, Washington
(Odessa PMP)



Map Scale: 1:11,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County, Washington
Survey Area Data: Version 11, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Surface Water Management, System

Surface Water Management, System— Summary by Map Unit — Lincoln County, Washington (WA043)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
12	Beckley fine sandy loam, 0 to 7 percent slopes	Somewhat limited	Beckley (100%)	Slope (0.22)	3.4	0.6%
				Water Erosion (0.04)		
35	Esquatzel silt loam	Not limited	Esquatzel (100%)		114.5	19.1%
65	Roloff-Bakeoven-Rock outcrop complex, 0 to 15 percent slopes	Very limited	Roloff (40%)	Water Erosion (1.00)	175.5	29.3%
				Depth to bedrock (1.00)		
				Slope (1.00)		
			Bakeoven (25%)	Depth to bedrock (1.00)		
				Large rock fragments (1.00)		
				Slope (0.22)		
			Emdent (5%)	Excess Sodium (1.00)		
				Excess Salt (0.06)		
76	Strat very cobbly silt loam, 3 to 25 percent slopes	Very limited	Strat (100%)	Large rock fragments (1.00)	90.2	15.1%
				Slope (1.00)		
				Water Erosion (0.98)		
77	Stratford gravelly silt loam, 0 to 15 percent slopes	Very limited	Stratford (100%)	Water Erosion (1.00)	214.8	35.9%
				Slope (1.00)		
Totals for Area of Interest					**598.3**	**100.0%**

Surface Water Management, System— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Very limited	480.4	80.3%
Not limited	114.5	19.1%
Somewhat limited	3.4	0.6%
Totals for Area of Interest	**598.3**	**100.0%**

Description

The ratings for Surface Water Management, System are based on the soil properties that affect the capacity of the soil to convey surface water across the landscape. Factors affecting the system installation and performance are considered. Water conveyances include graded ditches, grassed waterways, terraces, and diversions. The ratings are for soils in their natural condition and do not consider present land use. The properties that affect the surface system performance include depth to bedrock, saturated hydraulic conductivity, depth to cemented pan, slope, flooding, ponding, large stone content, sodicity, surface water erosion, and gypsum content.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as that listed for the map unit. The percent composition of each component in a particular map unit is given so that the user will realize the percentage of each map unit that has the specified rating.

A map unit may have other components with different ratings. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Odessa Pavement Management Plan

Asphalt Cores 5/26/2016

Core No.	Street	Location	Lane	Thickness	Base
1	3rd Ave	4th St to 5th St	East Bound	2"	Crushed Surfacing
2	3rd Ave	2nd St to 4th St	West Bound	1"	BST ?
3	Marjorie	4th St to 5th St	Center	1/2"	Crushed Surfacing
4	Marjorie	5th St to 6th St	East Bound	2 1/2"	Crushed Surfacing
5	Dobson	100' +/- east of bridge	East Bound	2 1/2"	Crushed Surfacing
6	4th St	1st Ave to 2nd Ave	South Bound	4"	Crushed Surfacing
7	4th St	2nd Ave to 3rd Ave	North Bound	2 1/4"	Crushed Surfacing
8	Fairway	3rd Ave to 4th Ave	South Bound	2"	Crushed Surfacing
9	Fairway	4th Ave to 6th Ave	North Bound	3"	Crushed Surfacing
10	Fairway	6th Ave to 8th Ave	North Bound	3 1/2"	Sand
11	2nd Ave	Birch to Alder	West Bound	2"	Crushed Surfacing

R-VALUE AND EXPANSION PRESSURE TEST REPORT

Report Number: 62161049.0001
Service Date: 08/26/16
Report Date: 08/26/16

Terracon
11849 W Executive Dr Ste G
Boise, ID 83713-1944
208-323-9520

Client

Budinger & Associates
Attn: Terri Ballard
1101 North Francer
Spokane Valley, WA 99212

Project

On-Call Laboratory Testing
11849 W Executive Drive
Suite G
Boise, ID 83713
Project Number: 62161049

Requested By: Terri Ballard

Service: Perform R-Value and Expansion Pressure Testing on soil sample provided by Budinger.

Test Method: Samples were performed in general accordance with AASHTO T-190. Material was prepared by the client and visually appeared to be 100% passing No. 4 sieve.

Client Project No.: L16472
Sample Identification: Client Lab No. 16-0697

Test Results: R-Value = 65. See attached laboratory output for additional information.

Additional Comments: A Traffic Index (TI) was not provided. This test report can be revised to include a TI at a later date, if requested.

Services: Perform R-Value and Expansion Pressure testing on client delivered soil samples.

Terracon Rep.: Greg J. Taddicken, P.E.
Reported To: Terri Ballard
Contractor:
Report Distribution:
(1) Budinger & Associates,
tballard@budingerinc.com

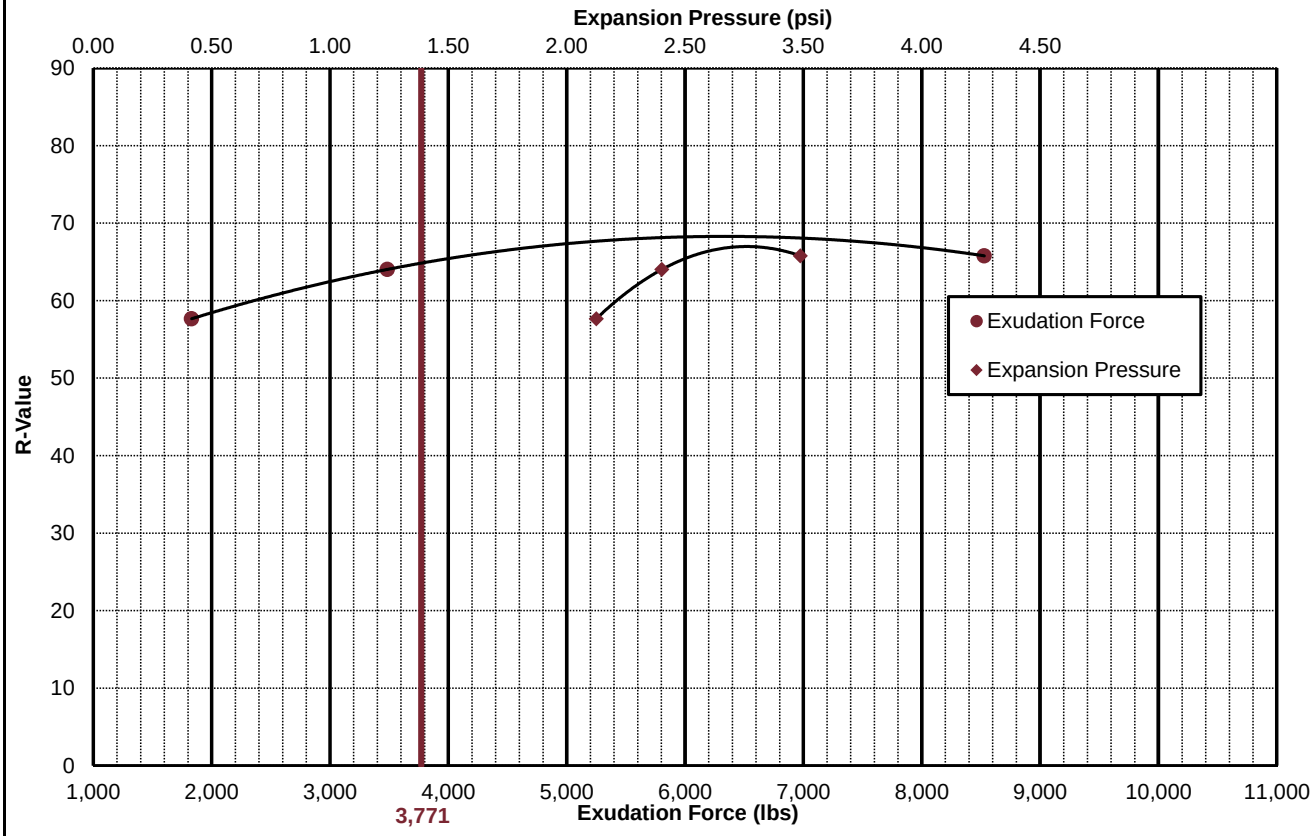
Reviewed By: Greg J. Taddicken, P.E.
Materials Department Manager

R-VALUE & EXPANSION PRESSURE TEST RESULTS

AASHTO T190

Boring ID: N/A	**Depth:** N/A	**Date of Test:** 8/25/2016
Description: Client Laboratory No. 16-0697		

Specimen No.:	**1**	**2**	**3**
Molding Pressure (psi):	250	250	250
Kneading Pressure (psi):	350	350	350
Dry Density (pcf):	91.2	90.8	90.0
Moisture Content (%):	25.0%	23.9%	22.8%
Expansion Pressure (psi):	2.13	2.40	2.99
Horizontal Pressure at 160 psi Vertical Pressure (psi):	44	38	36
Sample Height (in.):	2.50	2.55	2.55
Exudation Force (lbs):	1,831	3,485	8,529
Uncorrected R-Value:	57.7	64.0	65.8
Corrected R-Value:	57.7	64.0	65.8



R-Value at 3,771 lbs Exudation Force: 65

Expansion Pressure: N/A **psi =** N/A **kPa**

Traffic Index: N/A

PROJECT: On-Call Laboratory Testing	Terracon 11849 W. Executive Dr., Suite G Boise Idaho	PROJECT NUMBER: 62161049.0001
SITE: N/A		CLIENT: Budinger and Associates

N:\Lab Forms_Verified Templates\TEMPLATE R-Value Idaho T-8.xlsm

CR6204, 4-14-15, Rev. 1.0

APPENDIX 4

TRAFFIC COUNT DATA

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-195 -- English (ENU)

Datasets:

Site:	**[Odessa] 3rd Avenue between 4th st and 5th st**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 1
Survey Duration:	9:30 Thursday, May 26, 2016 => 11:09 Thursday, June 02, 2016
Zone:	
File:	Odessa02Jun2016.EC1 (Regular)
Identifier:	A769SG1V MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**9:31 Thursday, May 26, 2016 => 11:09 Thursday, June 02, 2016**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	5 - 100 mph.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (ARX)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 621 / 629 (98.73%)

* Thursday, May 26, 2016 - Total=106 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	3	6	12	11	9	14	11	13	4	9	5	3	5	1	
-	-	-	-	-	-	-	-	-	-	0	1	3	4	5	1	2	5	0	2	1	2	1	1	1
-	-	-	-	-	-	-	-	-	-	1	2	4	0	1	2	1	1	3	2	1	0	1	0	0
-	-	-	-	-	-	-	-	-	-	1	2	1	1	3	1	3	6	3	1	3	0	0	3	0
-	-	-	-	-	-	-	-	-	-	0	0	2	4	4	2	8	2	4	0	2	3	1	0	0

PM Peak 1545 - 1645 (17), PM PHF=0.53

* Friday, May 27, 2016 - Total=97, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	1	0	0	1	0	3	7	9	6	5	7	6	3	13	8	6	3	4	7	1	2	2	2	
1	0	0	0	0	0	1	2	1	1	0	2	2	0	1	2	2	0	3	5	0	2	2	2	0
0	0	0	0	1	0	1	3	1	2	2	1	2	2	5	2	2	0	1	1	0	0	0	0	0
0	1	0	0	0	0	1	2	2	0	1	2	2	1	5	3	2	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	5	3	2	2	0	0	2	1	0	2	0	1	1	0	0	0	0

AM Peak 0830 - 0930 (10), AM PHF=0.50 PM Peak 1415 - 1515 (14), PM PHF=0.70

* Saturday, May 28, 2016 - Total=60, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	2	1	0	4	2	5	3	5	3	3	5	3	7	4	6	2	4	1	0	
0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	2	1	3	1	3	0	0	0
0	0	0	0	0	1	0	0	2	2	3	2	1	0	0	3	0	2	3	1	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	2	2	1	2	1	0	0	0	0
0	0	0	0	0	1	0	0	2	0	2	0	3	2	2	1	1	1	1	0	0	1	0	0	0

AM Peak 1000 - 1100 (5), AM PHF=0.42 PM Peak 1430 - 1530 (7), PM PHF=0.58

* Sunday, May 29, 2016 - Total=58, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	0	0	1	0	0	1	6	2	9	4	6	9	7	2	4	2	2	3	0	0	
0	0	0	0	0	0	0	0	0	0	3	0	2	1	0	3	1	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	1	0	0	3	0	2	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2	2	1	1	1	0	1	0	0
0	0	0	0	0	0	1	0	0	1	0	0	2	2	2	3	4	0	0	1	0	1	0	0	0

AM Peak 0930 - 1030 (7), AM PHF=0.58 PM Peak 1200 - 1300 (9), PM PHF=0.75

* Monday, May 30, 2016 - Total=65, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	1	0	0	0	1	2	9	9	7	2	5	4	3	5	4	6	2	1	4	0	0	
0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	2	1	1	0	0	2	0	0	0
0	0	0	1	0	0	0	1	0	0	5	0	0	3	3	2	1	1	3	0	0	1	0	0	0
0	0	0	0	0	0	0	0	1	7	3	3	1	1	2	0	1	1	1	1	1	1	0	0	0
0	0	0	0	0	0	0	0	1	1	1	3	1	0	0	1	1	1	1	1	0	0	0	0	0

AM Peak 0930 - 1030 (13), AM PHF=0.46 PM Peak 1230 - 1330 (6), PM PHF=0.50

* Tuesday, May 31, 2016 - Total=109, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	1	0	0	3	5	4	7	6	5	8	6	9	10	13	3	14	7	6	1	1	0	
0	0	0	0	0	0	0	0	2	3	2	3	2	1	3	5	5	2	2	3	1	1	0	0	0
0	0	0	0	0	0	0	1	0	2	3	1	3	0	3	3	3	0	5	1	2	0	1	0	0
0	0	0	0	0	0	2	1	1	0	0	1	0	2	1	2	2	0	3	2	3	0	0	0	0
0	0	0	1	0	0	1	3	1	2	1	0	3	3	2	0	3	1	4	1	0	0	0	0	0

AM Peak 0715 - 0815 (7), AM PHF=0.58 PM Peak 1815 - 1915 (15), PM PHF=0.75

* Wednesday, June 01, 2016 - Total=107, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	1	0	8	7	6	3	5	6	10	5	5	18	10	8	3	5	2	1	4	0	
0	0	0	0	0	0	2	0	0	0	1	2	4	3	1	9	1	3	0	2	1	0	1	0	0
0	0	0	0	0	0	1	1	4	1	2	0	2	1	2	4	2	2	1	1	0	1	2	0	0
0	0	0	0	1	0	0	1	0	1	1	3	3	0	0	3	3	2	2	1	0	0	0	0	0
0	0	0	0	0	0	5	5	2	1	1	1	2	2	4	1	0	1	1	0	1	0	0		

AM Peak 0730 - 0830 (10), AM PHF=0.50 PM Peak 1445 - 1545 (18), PM PHF=0.50

* Thursday, June 02, 2016 - Total=18 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	1	0	2	9	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
0	0	0	0	1	0	1	1	0	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	2	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	5	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-194 -- English (ENU)

Datasets:

Site:	**[Odessa] 3rd 2& 4th on Fairway**
Direction:	5 - South bound A>B, North bound B>A. **Lane:** 1
Survey Duration:	13:03 Wednesday, August 03, 2016 => 17:40 Monday, August 08, 2016
Zone:	
File:	Odessa08Aug2016.EC1 (Regular)
Identifier:	A769SG1V MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**13:04 Wednesday, August 03, 2016 => 17:40 Monday, August 08, 2016**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	5 - 100 mph.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (ARX)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 1219 / 1220 (99.92%)

* Wednesday, August 03, 2016 - Total=128 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	15	14	14	11	20	13	15	17	3	5	1	
-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	4	1	9	4	5	2	1	2	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	3	6	3	2	3	8	1	1	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	5	3	4	4	3	4	0	1	0	2
-	-	-	-	-	-	-	-	-	-	-	-	-	3	6	2	1	5	3	4	3	1	1	0	0

* Thursday, August 04, 2016 - Total=263, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	0	0	0	2	3	8	17	10	16	21	18	23	15	20	15	16	15	21	17	12	9	1	1	
0	0	0	0	1	1	0	6	1	7	3	10	5	6	6	6	1	6	5	3	3	1	0	0	1
1	0	0	0	0	0	2	4	3	5	8	2	9	2	5	5	2	3	4	5	2	4	0	1	0
2	0	0	0	0	1	2	3	2	2	2	4	6	4	5	1	4	5	6	3	2	3	1	0	1
0	0	0	0	1	1	4	4	4	2	8	2	3	3	4	4	9	1	6	6	5	1	0	0	0

AM Peak 1015 - 1115 (28), AM PHF=0.70 PM Peak 1215 - 1315 (24), PM PHF=0.67

* Friday, August 05, 2016 - Total=222, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	0	2	1	0	3	5	9	11	14	14	15	15	12	20	12	15	10	21	18	10	8	5	0	
1	0	0	0	0	2	0	3	1	4	3	3	2	2	6	2	5	2	3	4	3	2	0	0	0
0	0	1	0	0	0	2	1	2	3	2	4	4	2	6	4	3	3	9	6	1	3	2	0	0
1	0	1	1	0	0	1	4	2	5	2	3	4	2	2	3	2	4	5	4	4	0	2	0	1
0	0	0	0	0	1	2	1	6	2	7	5	5	6	6	3	5	1	4	4	2	3	1	0	1

AM Peak 0845 - 0945 (18), AM PHF=0.75 PM Peak 1815 - 1915 (22), PM PHF=0.61

* Saturday, August 06, 2016 - Total=201, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	1	0	1	1	1	9	9	10	10	12	15	9	10	11	12	16	15	6	21	13	10	2	3	
0	0	0	0	0	0	3	1	4	3	2	3	2	2	3	2	5	7	3	8	2	4	0	2	0
0	0	0	0	0	0	0	3	2	1	2	4	2	3	6	1	3	2	0	1	9	2	1	0	1
1	0	0	1	0	0	2	1	2	3	5	3	2	2	2	6	3	5	2	6	2	1	1	1	3
1	1	0	0	1	1	4	4	2	3	3	5	3	3	0	3	7	1	1	6	0	3	0	0	1

AM Peak 1030 - 1130 (15), AM PHF=0.75 PM Peak 1930 - 2030 (23), PM PHF=0.64

* Sunday, August 07, 2016 - Total=220, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	1	2	0	0	2	5	4	12	15	10	12	11	21	15	13	18	10	19	23	10	7	4	1	
0	0	2	0	0	1	1	0	1	5	4	2	3	5	2	4	5	1	3	6	1	0	3	0	0
1	1	0	0	0	1	1	1	6	2	4	5	4	4	5	5	3	4	4	6	3	5	0	1	0
3	0	0	0	0	0	0	0	2	5	1	3	3	4	4	3	6	2	6	8	4	2	1	0	0
1	0	0	0	0	0	3	3	3	3	1	2	1	7	4	1	4	3	6	3	2	0	0	0	1

AM Peak 0815 - 0915 (16), AM PHF=0.67 PM Peak 1845 - 1945 (26), PM PHF=0.81

* Monday, August 08, 2016 - Total=185 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	1	0	3	0	3	11	11	12	20	14	12	17	16	18	17	15	-	-	-	-	-	-	-	
0	0	0	1	0	0	2	2	4	6	2	4	6	7	3	7	4	4	-	-	-	-	-	-	-
0	0	0	0	0	1	2	4	6	6	1	4	5	3	9	2	2	2	-	-	-	-	-	-	-
0	0	0	0	0	2	1	2	0	3	4	2	3	2	3	5	2	8	-	-	-	-	-	-	-
1	1	0	2	0	0	6	3	2	5	7	2	3	4	3	3	7	-	-	-	-	-	-	-	-

AM Peak 0900 - 1000 (20), AM PHF=0.83

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-192 -- English (ENU)

Datasets:

Site:	**[Odessa] Marjorie between 4th and 5th**
Direction:	6 - West bound A>B, East bound B>A. **Lane:** 1
Survey Duration:	10:34 Monday, July 25, 2016 => 12:22 Wednesday, August 03, 2016
Zone:	
File:	Odessa03Aug2016.EC1 (Regular)
Identifier:	A769SG1V MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**10:35 Monday, July 25, 2016 => 12:22 Wednesday, August 03, 2016**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	5 - 100 mph.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (ARX)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 291 / 298 (97.65%)

* Monday, July 25, 2016 - Total=25 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	2	0	0	3	1	3	1	2	4	3	3	1	2
-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	2	0	0	0	0	2	1	1	0	1	0
-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	3	0	1	1	0	0	1	1	1
-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	1	0	0	1	1	1	1	2	0	0	0

PM Peak 1530 - 1630 (4), PM PHF=0.33

* Tuesday, July 26, 2016 - Total=33, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	0	2	0	0	1	1	7	2	1	3	0	2	2	0	1	2	3	1	2	1	0	0	1	
0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	1	2	0	1	0	0	0	0
1	0	0	0	0	0	0	4	1	0	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0
0	0	0	0	0	0	0	2	0	0	2	0	1	1	0	1	0	0	0	1	0	0	0	0	0
0	0	2	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0

AM Peak 0700 - 0800 (7), AM PHF=0.44 PM Peak 1630 - 1730 (4), PM PHF=0.50

* Wednesday, July 27, 2016 - Total=36, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	2	0	0	0	3	3	5	3	1	2	4	1	1	1	3	1	3	3	0	0	0	
0	0	0	0	0	0	0	0	2	0	1	0	0	1	0	0	0	1	0	0	1	0	0	0	0
0	0	0	2	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0
0	0	0	0	0	0	0	2	1	2	1	0	1	2	0	0	1	1	1	0	1	0	0	0	0
0	0	0	0	0	0	0	1	0	2	0	1	1	0	1	1	0	0	0	2	0	0	0	0	0

AM Peak 0915 - 1015 (6), AM PHF=0.75 PM Peak 1245 - 1345 (5), PM PHF=0.63

* Thursday, July 28, 2016 - Total=39, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	2	1	2	0	0	3	1	3	3	0	5	1	0	4	0	4	6	2	2	0	0	0	
0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	2	0	0	0	0
0	0	0	0	0	0	0	1	1	2	1	0	3	0	0	1	0	2	1	1	0	0	0	0	0
0	0	0	0	0	0	0	1	0	1	2	0	1	1	0	1	0	0	1	1	0	0	0	0	0
0	0	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0

AM Peak 1145 - 1245 (5), AM PHF=0.42 PM Peak 1800 - 1900 (6), PM PHF=0.38

* Friday, July 29, 2016 - Total=44, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	2	0	0	2	2	3	5	3	1	2	2	5	1	2	4	1	0	3	0	2	4	0	
0	0	0	0	0	0	0	0	2	2	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0
0	0	0	0	0	1	0	0	0	0	1	0	0	2	1	1	0	0	0	1	0	0	2	0	0
0	0	2	0	0	0	1	2	1	0	0	1	1	2	0	0	3	1	0	2	0	1	1	0	0
0	0	0	0	0	1	1	1	2	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0

AM Peak 0715 - 0815 (5), AM PHF=0.63 PM Peak 1245 - 1345 (5), PM PHF=0.63

* Saturday, July 30, 2016 - Total=31, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	1	2	0	0	0	1	4	3	1	0	0	0	1	1	0	0	0	3	7	3	2	2	
0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0
0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	1
0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	2	0	0	0	0
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0

AM Peak 0815 - 0915 (5), AM PHF=0.42 PM Peak 2015 - 2115 (8), PM PHF=0.67

* Sunday, July 31, 2016 - Total=18, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	0	2	0	0	0	0	0	1	1	2	1	1	1	1	3	0	1	2	2	0	1	
0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	1	1	0	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0
0	0	0	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0

AM Peak 0400 - 0500 (2), AM PHF=0.25 PM Peak 1645 - 1745 (3), PM PHF=0.38

* Monday, August 01, 2016 - Total=28, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	2	0	0	3	0	0	1	0	1	0	4	1	0	3	2	1	1	4	4	0	1	0	
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0
0	0	2	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	1	1	0	1	0	0
0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	1	2	0	1	1	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0

AM Peak 0445 - 0545 (3), AM PHF=0.38 PM Peak 1200 - 1300 (4), PM PHF=0.33

* Tuesday, August 02, 2016 - Total=22, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	0	0	2	0	0	0	1	1	0	5	1	2	0	0	2	6	1	0	0	1	0	0	0	
0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	2	1	0	0	1	0	0	0	0

AM Peak 1015 - 1115 (6), AM PHF=0.50 PM Peak 1600 - 1700 (6), PM PHF=0.75

*** Wednesday, August 03, 2016 - Total=15 (Incomplete) , 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
0	0	0	2	0	1	3	2	3	0	3	1	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	1	1	0	0	0	9	1	0	-	-	-	-	-	-	-	-	-	-	-
0	0	0	2	0	0	0	1	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	1	0	0	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	1	1	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 5

PAVEMENT DESIGN CALCULATIONS

PaveXpress

Project Information

Project Name	Odessa PMP
Project Description	Arterial - Typical Pavement Section
Estimated Completion Year	2017
State	Washington
Roadway Classification	Local
Pavement Type	New - Asphalt

Design Parameters

Design Period (Years)	20 years
Reliability Level (R)	85 Z_R=-1.037
Combined Standard Error (S0)	0.5
Initial Serviceability Index (pi)	4.2
Terminal Serviceability Index (pt)	2.25
Change in Serviceability (ΔPSI)	1.95

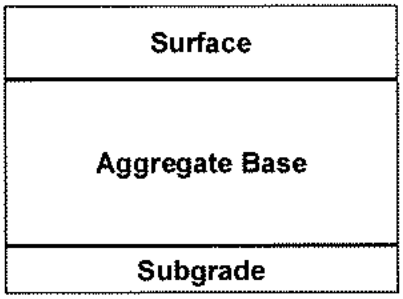
Traffic Data

Completion Year Traffic	55,298
Load Equivalency Factor	0.0645
Completion Year ESALs	4,000
Design Period	20
Future Traffic Growth Rate (%)	2
ESAL Growth Rate (%)	2
Total Design ESALs (W18)	120,000

Pavement Structure

Surface Lifts	None
Base Layers	**Type** **Layer Coef** **Drainage** **Thickness** Aggregate Base 0.14 1 8
Resilient Modulus (MR)	13200 psi

Design Guidance



Required minimum design SN: 1.95

Layer Thicknesses (in)

Surface: 3.50

Aggregate Base: 8.00

Total SN: 2.30

Design Notes

PaveXpress

Project Information

Project Name	Odessa PMP
Project Description	Local Access Typical Pavement Section
Estimated Completion Year	2017
State	Washington
Roadway Classification	Local
Pavement Type	New - Asphalt

Design Parameters

Design Period (Years)	20 years
Reliability Level (R)	75 Z_R=-0.674
Combined Standard Error (S0)	0.5
Initial Serviceability Index (pi)	4.2
Terminal Serviceability Index (pt)	2
Change in Serviceability (ΔPSI)	2.20

Traffic Data

Completion Year Traffic	36,865
Load Equivalency Factor	0.0518
Completion Year ESALs	2,000
Design Period	20
Future Traffic Growth Rate (%)	2
ESAL Growth Rate (%)	2
Total Design ESALs (W18)	60,000

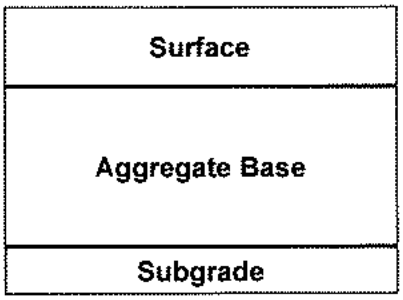
Pavement Structure

Surface Lifts	None
Base Layers	

Type	Layer Coef	Drainage	Thickness
Aggregate Base	0.14	1	6

Resilient Modulus (MR)	13200 psi

Design Guidance



Required minimum design SN: 1.60

Layer Thicknesses (in)

Surface: 3.00

Aggregate Base: 6.00

Total SN: 1.85

Design Notes

APPENDIX 6

PRIORITIZATION RATINGS

Town of Odessa

Small City Street Inventory - Segment Data

Street Name	Termini From	Termini To	PCR Points	Traffic Generator Score	ADT Score	Econ. Impacts	Funding Eligibility Score	Total Points
1ST ST	5TH AVE	4TH AVE	45	0	5	0	5	55
1ST ST	4TH AVE	3RD AVE	40	20	5	10	10	85
1ST ST	3RD AVE	2ND AVE	40	20	5	10	10	85
1ST ST	2ND AVE	1ST AVE (SR 28)	40	20	5	10	10	85
1ST ST	1ST AVE (SR 28)	MARJORIE AVE	40	20	5	10	5	80
1ST ST	RAILROAD AVE	DUCK LAKE RD	40	10	0	10	5	65
1ST ST	DUCK LAKE RD	SR 21	40	0	0	10	5	55
2ND AVE	W END	CEDAR ST	45	0	0	0	5	50
2ND AVE	CEDAR ST	BIRCH ST	40	10	0	10	5	65
2ND AVE	BIRCH ST	ALDER ST (SR 21)	40	10	5	10	5	70
2ND AVE	ALDER ST (SR 21)	DIVISION ST	40	20	5	10	10	85
2ND AVE	DIVISION ST	1ST ST	40	20	5	10	5	80
2ND AVE	2ND ST	4TH ST	40	0	0	0	5	45
2ND AVE	4TH ST	5TH ST	40	0	0	0	5	45
2ND AVE	5TH ST	6TH ST	0	0	0	0	5	5
2ND AVE	6TH ST	7TH ST	0	0	0	0	5	5
2ND AVE	7TH ST	HOPP RD	40	0	0	0	5	45
2ND ST	S END	5TH AVE	40	0	0	0	5	45
2ND ST	5TH AVE	4TH AVE	0	0	0	0	5	5
2ND ST	4TH AVE	3RD AVE	0	20	0	10	10	40
2ND ST	3RD AVE	2ND AVE	0	0	0	10	10	20
2ND ST	2ND AVE	1ST AVE (SR 28)	0	0	5	10	10	25
2ND ST	1ST AVE (SR 28)	MARJORIE AVE	0	8	5	10	10	33
2ND ST	MARJORIE AVE	N END	0	8	0	5	5	18
3RD AVE	ALDER ST (SR 21)	DIVISION ST	0	0	0	0	5	5
3RD AVE	1ST ST	2ND ST	40	10	0	5	5	60
3RD AVE	2ND ST	4TH ST	45	0	0	5	5	55
3RD AVE	4TH ST	5TH ST	45	20	0	10	10	85
3RD AVE	8TH ST	HOPP RD	45	0	0	0	5	50
3RD ST	1ST AVE (SR 28)	MARJORIE AVE	40	0	0	0	5	45
4TH AVE	SR 28	FAIRWAY ST	40	20	5	10	5	80
4TH AVE	FAIRWAY ST	ELM ST	40	8	5	10	10	73
4TH AVE	ELM ST	DOUGLAS ST	40	8	5	5	10	68
4TH AVE	DOUGLAS ST	CEDAR ST	40	8	5	5	10	68
4TH AVE	CEDAR ST	BIRCH ST	40	8	5	5	10	68
4TH AVE	BIRCH ST	ALDER ST (SR 21)	40	0	5	5	10	60
4TH AVE	ALDER ST (SR 21)	DIVISION ST	0	5	5	5	10	25
4TH AVE	DIVISION ST	1ST ST	0	0	5	5	10	20
4TH AVE	1ST ST	1ST ST	40	10	5	5	10	70
4TH AVE	1ST ST	2ND ST	40	10	5	5	10	70

Town of Odessa

Small City Street Inventory - Segment Data

Street Name	Termini From	Termini To	PCR Points	Traffic Generator Score	ADT Score	Econ. Impacts	Funding Eligibility Score	Total Points
4TH AVE	2ND ST	4TH ST	0	0	0	5	5	10
4TH AVE	4TH ST	E END	0	0	0	0	5	5
4TH ST	1ST AVE (SR 28)	MARJORIE AVE	40	0	0	0	5	45
4TH ST	2ND AVE	1ST AVE (SR 28)	40	0	0	0	5	45
4TH ST	3RD AVE	2ND AVE	40	0	0	0	5	45
4TH ST	4TH AVE	3RD AVE	40	0	0	0	5	45
5TH AVE	W OF BIRCH ST	ALDER ST (SR 21)	45	8	0	0	5	58
5TH AVE	ALDER ST (SR 21)	DIVISION ST	40	0	0	0	8	48
5TH AVE	W OF 1ST ST	1ST ST	45	0	0	0	5	50
5TH AVE	1ST ST	2ND ST	45	0	0	0	5	50
5TH ST	AMENDE DR	2ND AVE	0	20	0	10	10	40
5TH ST	2ND AVE	1ST AVE (SR 28)	40	0	0	10	10	60
5TH ST	1ST AVE (SR 28)	MARJORIE AVE	40	0	0	0	5	45
6TH AVE	FAIRWAY ST	ALDER ST (SR 21)	40	0	0	0	5	45
6TH ST	AMENDE DR	2ND AVE	40	5	0	0	5	50
6TH ST	2ND AVE	1ST AVE (SR 28)	0	0	0	0	5	5
6TH ST	1ST AVE (SR 28)	MARJORIE AVE	45	0	0	0	5	50
7TH ST	AMENDE DR	2ND AVE	40	10	0	0	5	55
7TH ST	2ND AVE	1ST AVE (SR 28)	40	0	0	0	5	45
8TH AVE	FAIRWAY	E END	45	0	0	0	5	50
8TH ST	3RD AVE	AMENDE DR	40	0	0	0	5	45
ALICE AVE	W END	BIRCH ST	40	0	0	0	5	45
AMENDE DR	5TH ST	6TH ST	40	20	0	10	5	75
AMENDE DR	6TH ST	7TH ST	40	5	0	0	5	50
AMENDE DR	7TH ST	8TH ST	40	5	0	0	5	50
AMENDE DR	8TH ST	HOPP RD	40	0	0	0	5	45
BIRCH ST	S END	5TH AVE	40	0	0	0	5	45
BIRCH ST	5TH AVE	4TH AVE	0	0	0	0	5	5
BIRCH ST	4TH AVE	N END	40	0	0	0	5	45
BIRCH ST	2ND AVE	1ST AVE (SR 28)	40	10	5	10	10	75
BIRCH ST	1ST AVE (SR 28)	RAILROAD AVE	0	10	5	10	10	35
BIRCH ST	RAILROAD AVE	ALICE AVE	0	20	0	10	10	40
BIRCH ST	ALICE AVE	WARREN ST	0	10	0	10	10	30
BIRCH ST	WARREN ST	MAY AVE	0	10	0	0	5	15
CEDAR ST	4TH AVE	N END	40	8	0	0	5	53
CEDAR ST	2ND AVE	1ST AVE (SR 28)	45	10	0	0	5	60
DIVISION ST	6TH AVE (SR 21)	PAVT START	40	0	0	0	5	45
DIVISION ST	PAVT START	5TH AVE	40	0	0	0	5	45
DIVISION ST	5TH AVE	4TH AVE	0	0	0	0	5	5
DIVISION ST	4TH AVE	NORTH END - CRAB CREEK	0	0	0	0	5	5

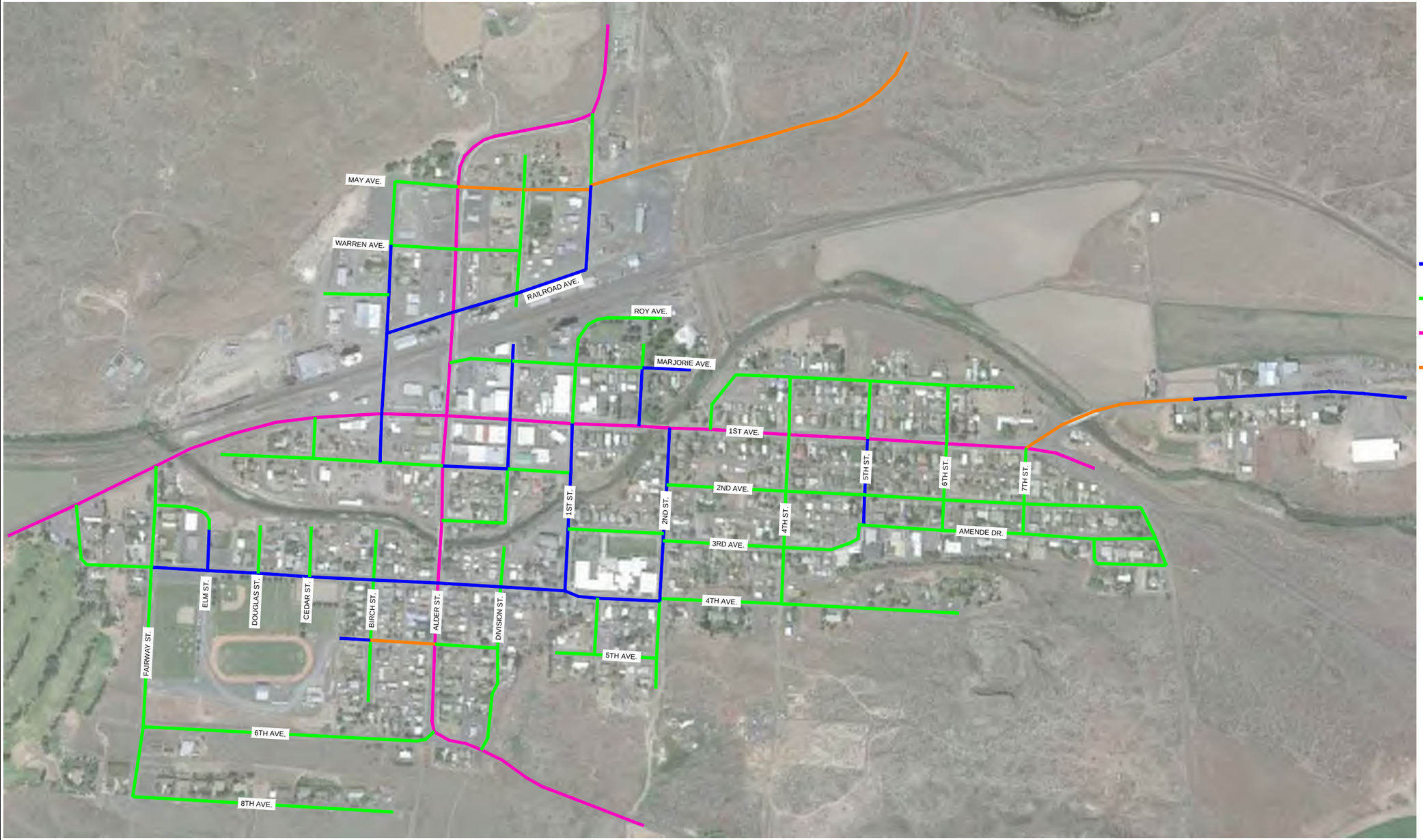
Town of Odessa

Small City Street Inventory - Segment Data

Street Name	Termini From	Termini To	PCR Points	Traffic Generator Score	ADT Score	Econ. Impacts	Funding Eligibility Score	Total Points
DIVISION ST	3RD AVE	2ND AVE	0	0	0	0	5	5
DIVISION ST	2ND AVE	FIRST AVE (SR 28)	0	10	5	10	10	35
DIVISION ST	FIRST AVE (SR 28)	N/O MAJORIE AVE	40	10	5	10	10	75
DIVISION ST	S/O RAILROAD AVE	WARREN AVE	40	10	0	10	5	65
DIVISION ST	WARREN AVE	MAY AVE	40	10	0	5	5	60
DIVISION ST	MAY AVE	NORTH END	40	0	0	5	5	50
DOBSON RD	1ST AVE (SR 28)	PAVT CHANGE	0	0	5	5	5	15
DOBSON RD	PAVT CHANGE	EC/L	45	0	0	0	5	50
DOUGLAS ST	4TH AVE	N END	40	8	0	0	5	53
DUCK LAKE RD	1ST ST	EC/L	40	0	5	0	5	50
ELM ST	4TH AVE	PAVT END	40	10	0	5	5	60
ELM ST	PAVT END	FAIRWAY ST	40	0	0	0	5	45
FAIRWAY ST	8TH AVE	6TH AVE	40	0	0	0	5	45
FAIRWAY ST	6TH AVE	4TH AVE	45	8	0	0	5	58
FAIRWAY ST	4TH AVE	1ST AVE (SR 28)	40	10	5	10	10	75
HOPP RD	3RD AVE	AMENDE DR	40	0	0	0	5	45
HOPP RD	AMENDE DR	SR 28	40	0	0	0	5	45
MARJORIE AVE	ALDER ST (SR 21)	DIVISION ST	0	20	5	10	5	40
MARJORIE AVE	DIVISION ST	1ST ST	40	20	5	10	5	80
MARJORIE AVE	1ST ST	2ND ST	40	20	0	10	5	75
MARJORIE AVE	2ND ST	E END	40	8	0	0	5	53
MARJORIE AVE	3RD ST	4TH ST	45	0	0	0	5	50
MARJORIE AVE	4TH ST	5TH ST	45	0	0	0	5	50
MARJORIE AVE	5TH ST	6TH ST	40	0	0	0	5	45
MARJORIE AVE	6TH ST	E END	45	0	0	0	5	50
MAY AVE	BIRCH ST	ALDER ST (SR 21)	0	10	0	0	5	15
MAY AVE	ALDER ST (SR 21)	DIVISION ST	0	5	0	0	5	10
MAY AVE	DIVISION ST	1ST ST	40	10	0	0	5	55
RAILROAD AVE	BIRCH ST	ALDER ST (SR 21)	45	20	5	10	10	90
RAILROAD AVE	ALDER ST (SR 21)	DIVISION ST	45	20	5	10	10	90
RAILROAD AVE	DIVISION ST	1ST ST	40	20	5	10	10	85
ROY AVE	MARJORIE AVE	N END	0	8	0	0	5	13
WARREN ST	ALDER ST (SR 21)	DIVISION ST	40	10	0	0	5	55
WARREN ST	BIRCH ST	ALDER ST (SR 21)	0	10	0	0	5	15

APPENDIX 7

FIGURES



TIB ARTERIAL

LOCAL ACCESS

STATE HIGHWAY

FEDERAL ARTERIAL

0 600' 1200'

SCALE 1" = 600'

I:\LDD Projects\Odessa - Pavement Management Plan\dwg\STREET CLASSIFICATION.dwg

DSGND BY: BDH	CHCKD BY: BDH	CITY OF ODESSA PAVEMENT MANAGEMENT PLAN CITY STREET MAP STREET CLASSIFICATION
DRWN BY: JJB	SCALE: 1" = 600'	
PROJECT NO: 30448.003.04		

CENTURY WEST ENGINEERING
SPOKANE OFFICE
11707 E. MONTGOMERY DRIVE
SPOKANE VALLEY, WA 99206
509.926.3970
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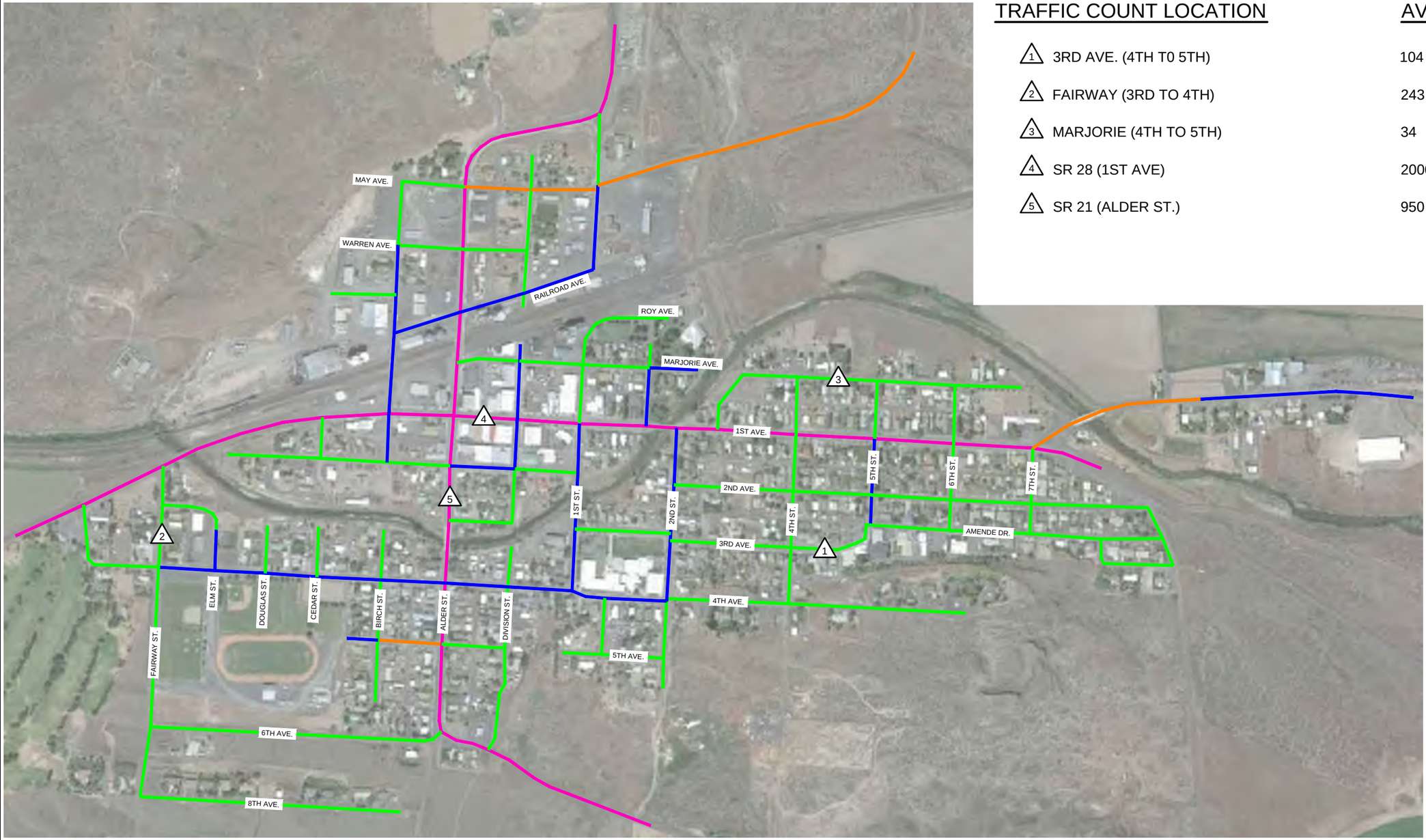
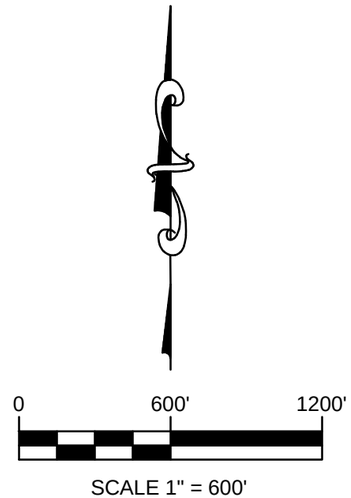
DATE: 10/24/2016 | FIGURE: 1



TRAFFIC COUNT LOCATION

		AVERAGE DAILY TRAFFIC
1	3RD AVE. (4TH T0 5TH)	104
2	FAIRWAY (3RD TO 4TH)	243
3	MARJORIE (4TH TO 5TH)	34
4	SR 28 (1ST AVE)	2000
5	SR 21 (ALDER ST.)	950



SCALE 1" = 600'

DSGND BY: BDH	CHCKD BY: BDH	CITY OF ODESSA PAVEMENT MANAGEMENT PLAN CITY STREET MAP TRAFFIC COUNT LOCATIONS
DRWN BY: JJB	SCALE: 1" = 600'	
PROJECT NO: 30448.003.04		

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DATE: 10/24/2016 | FIGURE: 2

NOTES:

1. NO CROWN ON ROAD
2. NO DRAINAGE FACILITIES
3. INADEQUATE DRAINAGE FACILITIES

0 600' 1200'

SCALE 1" = 600'

DSGND BY: BDH	CHCKD BY: BDH	CITY OF ODESSA PAVEMENT MANAGEMENT PLAN CITY STREET MAP DRAINAGE DEFICIENCES
DRWN BY: JJB	SCALE: 1" = 600'	
PROJECT NO: 30448.003.04		

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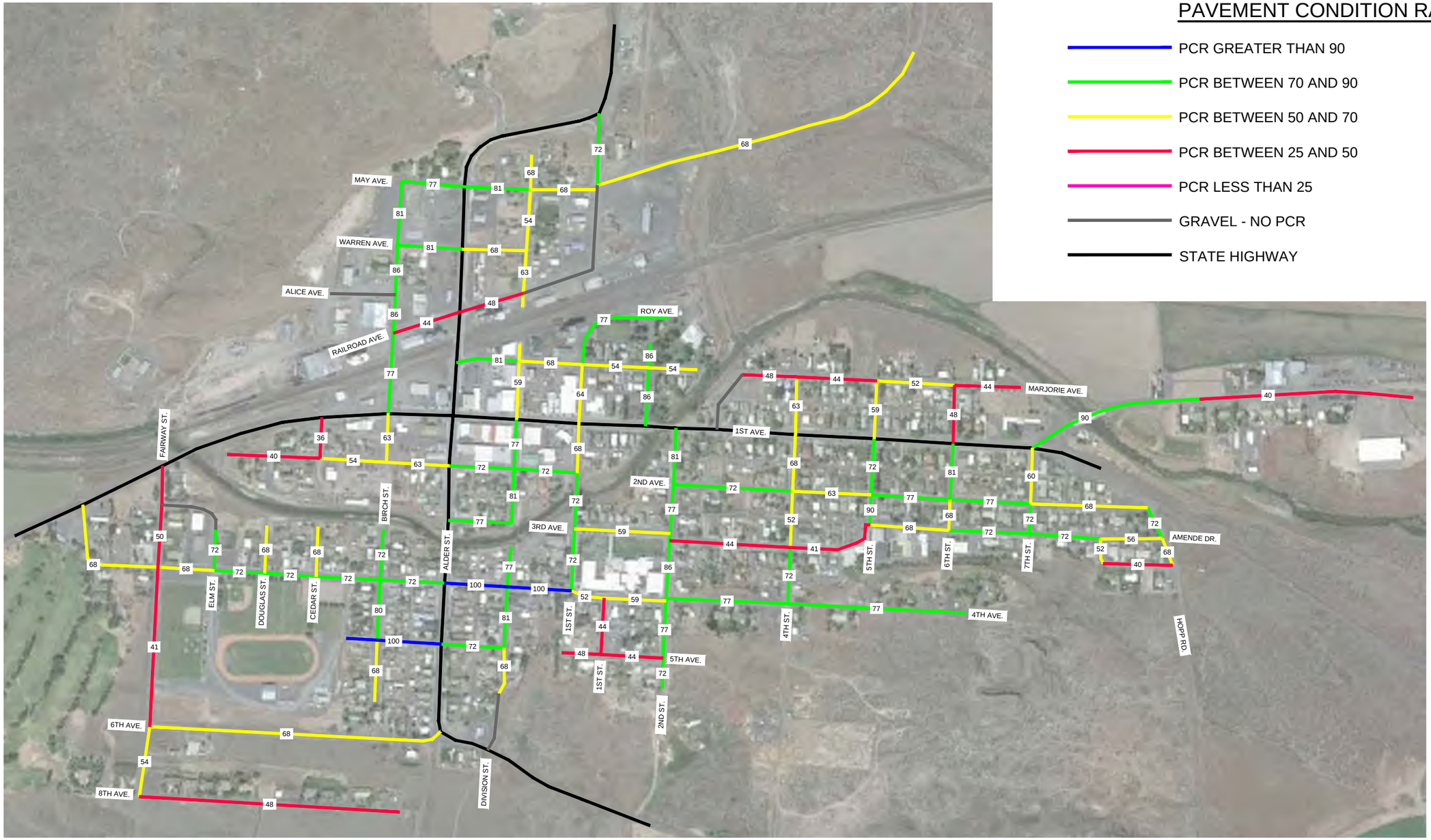
DATE: 10/24/2016 | FIGURE: 3



PAVEMENT CONDITION RATING (PCR)

- PCR GREATER THAN 90
- PCR BETWEEN 70 AND 90
- PCR BETWEEN 50 AND 70
- PCR BETWEEN 25 AND 50
- PCR LESS THAN 25
- GRAVEL - NO PCR
- STATE HIGHWAY

0 600' 1200'

SCALE 1" = 600'

I:\LDD Projects\Odessa - Pavement Management Plan\dwg\PAVEMENT CONDITION RATING.dwg

DSGND BY: BDH	CHCKD BY: BDH
DRWN BY: JJB	SCALE: 1" = 600'
PROJECT NO: 30448.003.04	

CITY OF ODESSA
PAVEMENT MANAGEMENT PLAN
CITY STREET MAP
PAVEMENT CONDITION RATING (PCR)

CENTURY WEST ENGINEERING
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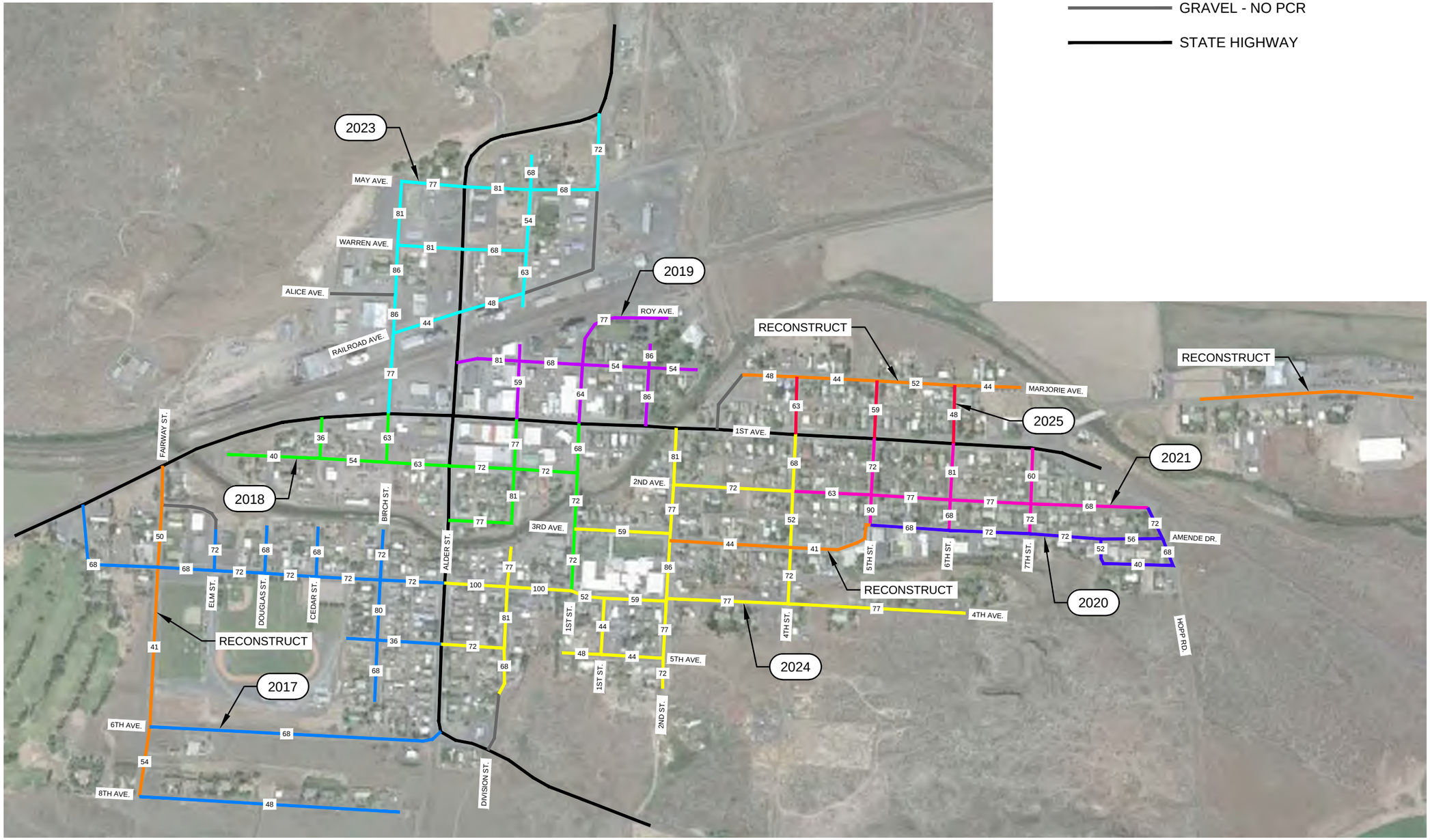
DATE: 10/24/2016 | FIGURE: 4



GRAVEL - NO PCR

STATE HIGHWAY

0 600' 1200'

SCALE 1" = 600'

DSGND BY: BDH	CHCKD BY: BDH	CITY OF ODESSA PAVEMENT MANAGEMENT PLAN CITY STREET MAP PAVEMENT CONDITION RATING (PCR)
DRWN BY: JJB	SCALE: 1" = 600'	
PROJECT NO: 30448.003.04		

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DATE: 10/24/2016 | FIGURE: 5