RESOLUTION NO. 2013-006 TBD

A RESOLUTION OF THE GOVERNING BOARD OF THE ARLINGTON TRANSPORTATION BENEFIT DISTRICT OF THE CITY OF ARLINGTON, WASHINGTON, ADOPTING THE CITY OF ARLINGTON PAVEMENT MANAGEMENT PLAN

WHEREAS, the City of Arlington directed development of a Pavement Management Plan including a Pavement Condition Index Study; and

WHEREAS, the Board finds that it is in the best interests of the Board and the residents of the Arlington Transportation Benefit District for the Board to formally adopt a Pavement Management Plan to guide the work of the District; and

NOW, THEREFORE, BE IT RESOLVED, that the Transportation Benefit District Board adopts the City of Arlington Pavement Management Plan, a true copy of which is attached hereto as Exhibit "A".

PASSED by the Board of the Arlington Transportation Benefit District, Arlington, Washington at a regular open public meeting thereof held on this 2nd day of December, 2013.

ARLINGTON TRANSPORTATION BENEFIT DISTRICT

Barb Tolbert

Barb Tolbert, Chairperson

ATTEST:

Kristin Banfield

Kristin Banfield, Clerk of the Board

APPROVED AS TO FORM:

Steve Peiffle, Board Attorney

Pavement Management Program

2013

SCJ ALLIANCE
CONSULTING SERVICES

Executive Summary

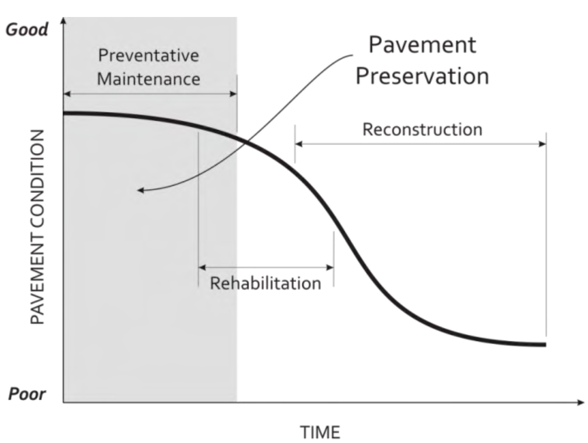
The City of Arlington's street system infrastructure is its largest asset by far, with a value of several hundred million dollars. The pavement infrastructure alone is worth almost $50 million based on reconstruction costs. To preserve the community's investment and develop an efficient and effective program for pavement preservation and reconstruction, the City of Arlington is implementing a **Pavement Management Program** that will balance maintenance of good streets with the replacement of failing streets to maximize the life of this infrastructure investment. With the Pavement Management Program, pavement preservation projects are selected based on the financial consequences of delaying a project and on the condition of the pavement.

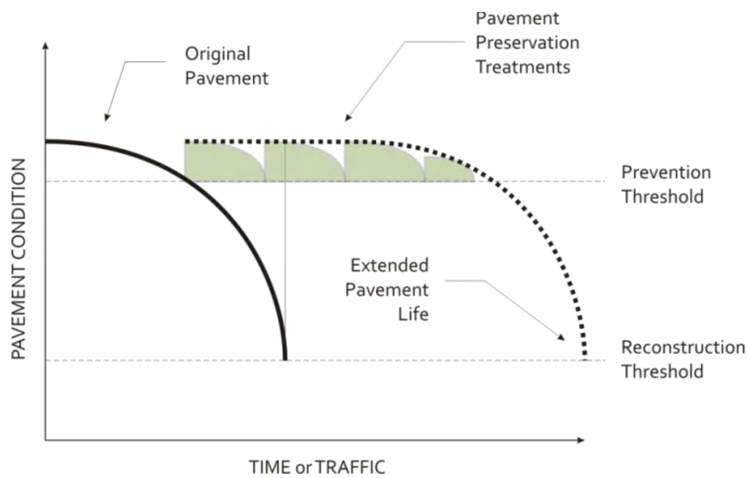
Pavement preservation projects are selected based on the financial consequences of delaying a project and on the condition of the pavement.

The City of Arlington's Pavement Management Program provides:

- An inventory of all roadway surfaces owned and maintained by the City.
- Current pavement conditions for all public streets and a list of the locations requiring maintenance, rehabilitation or reconstruction.
- A recommended treatment plan based on cost-effectiveness.
- Anticipated pavement maintenance costs to include in the City's Capital Improvement Plan.

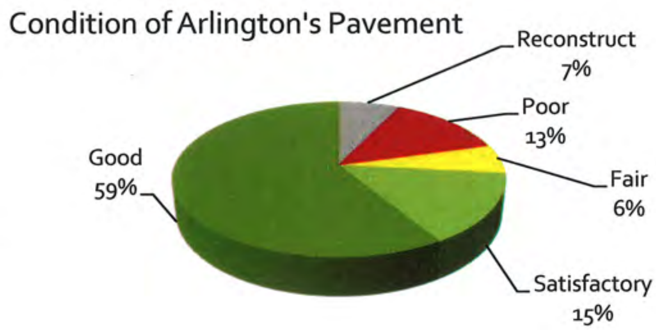
The concept of proper pavement management is to apply appropriate pavement preservation to maintain streets in good condition when treatment options are relatively inexpensive. Proper and timely application and investment in pavement preservation greatly minimizes the larger costs associated with pavement reconstruction. This concept is illustrated in the two charts below, where pavement preservation techniques are shown to extend the life of pavement over time, stretching scarce public resources.





Pavement Condition

The pavement condition ratings output by the *Cartegraph* software are summarized in the chart at right. The majority of roadway infrastructure in the City of Arlington fell into the "Good" category, meaning little to no maintenance is needed at this time. Only about 7% of roadway segments fell into the "Reconstruct" category, but there are significant costs associated with rehabilitating a roadway in this condition.



Pavement Treatment Costs

The pavement condition data was coupled with estimates for pavement treatment costs to obtain a cost per square yard estimate to preserve or reconstruct the pavement of all roads in the City of Arlington system. These costs are summarized in the table below. (Note that the cost estimates account for engineering and project management, but are strictly limited to pavement preservation and reconstruction; no sidewalk, curb, gutter or stormwater improvements are included.)

COST BY FUNCTIONAL CLASSIFICATION

CLASSIFICATION	PRESERVATION COST	AREA (SQYD)	RECONSTRUCTION COST	AREA (SQYD)	TOTAL COSTS
MAJOR ARTERIAL	$96,394	15,897	$0	0	$96,394
MINOR ARTERIAL	$173,544	39,657	$372,426	24,043	$545,969
COLLECTOR	$196,794	70,184	$919,988	70,183	$1,116,781
LOCAL	$530,045	210,335	$3,329,917	86,044	$3,859,961
TOTAL	**$996,777**	**336,073**	**$4,622,331**	**180,270**	**$5,619,105**

Prepared by Eric S. Johnston, PE
Principal Transportation Engineer

SCJ Alliance Project Reference Number: 00698-02

Certification

The technical material and data contained in this document were prepared for the City of Arlington under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by Eric S. Johnston, PE
Principal Transportation Engineer

SCJ Alliance Project Reference
Number: 00698-02

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November 2013

Project Reference

SCJ Alliance Project Reference Number: 00698-02

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APPENDICES

1.0 Definitions

Terminology in the paving industry is not always consistent or clear to those unfamiliar with pavement management. Likewise, jurisdictions may use similar terms interchangeably. For the purposes of this report and the City of Arlington's Pavement Management Program, the following definitions will be used.

ASPHALT EMULSION A mixture of asphalt, water, and a small amount of an emulsifying agent. These components are blended in a colloid mill which shears the asphalt into tiny droplets. The emulsifier is a surface-active agent that keeps the asphalt droplets in a stable suspension and controls the breaking time. The result is a liquid product with a consistency ranging from that of milk to heavy cream, which can be used in cold processes for road construction and maintenance.

ASPHALT OVERLAY Asphalt overlays for pavement preservation generally consist of a thin overlay of asphalt directly onto the existing roadway. The asphalt is typically applied at a thickness of ≤ 1 ½" and is not intended to structurally strengthen the pavement but instead to provide a new road wearing surface and address other functional problems as part of a pavement preservation strategy.

CAPE SEAL A pavement preservation treatment consisting of chip seal application followed by a slurry seal application. After the chip seal process has been completed, slurry seal is typically applied within 48 hours to hold the chip material in place and to provide a smoother texture for the final product.

CHIP SEAL A pavement preservation technology that applies a new wearing surface over an existing asphalt paved roadway. It generally consists of applying an asphalt emulsion which is then immediately covered by a layer of uniformly sized stone chips, the asphalt emulsion helps provide a waterproof membrane to repel moisture from entering the sub-grade and adds elasticity to prevent reflective cracking from showing through the new surface.

CRACK SEAL is the practice of sealing pavement cracks to prevent water from seeping into pavement and causing further deterioration. While this practice is normally considered regular street maintenance, it is incorporated with pavement preservation as a means to ready a street for pavement preservation.

GRIND AND OVERLAY (ALSO KNOWN AS MILL AND FILL) is a pavement preservation technology whereby an existing pavement wearing surface is ground down, or milled, up to 1 ½" and then a new layer of asphalt is applied as an overlay.

FOG SEAL is a pavement preservation treatment consisting of the application of a slow-setting asphalt emulsion diluted with water. A fog seal will cover small cracks and surface voids, reduce raveling, and serves a wearing course to protect against the elements and UV degradation.

LANE-MILE is a measure of roadway consisting of one lane of street, one mile long, regardless of lane width. A standard residential street, one mile long, would be two lane-miles.

MICROSURFACING is a pavement preservation technology that consists of application of a mixture containing dense-graded aggregate, polymer modified asphalt emulsion, water, mineral fillers and other additives onto a clean road surface. Microsurfacing is similar to slurry seal except that the asphalt mix allows microsurfacing to cure more quickly and be applied thicker than a slurry seal. Microsurfacing is also stronger and more durable than slurry seal.

PAVEMENT CONDITION INDEX (PCI) is a pavement rating scale (0-100) with 100 representing a new street. 75% of the pavement life is expended by PCI 60.

PAVEMENT CONDITION RATING (PCR) is the category PCIs are divided into. This Pavement Management Program uses five categories consisting of Good, Satisfactory, Poor, Fail, and Reconstruct.

PAVEMENT PRESERVATION refers to extending pavement life; enhancing pavement performance; ensuring cost-effectiveness; and reducing user delays through the use of various treatments and technologies designed to extend the useful life of a paved road surface. Preventive maintenance is part of a pavement management strategy of cost-effective treatments to an existing roadway and its components that preserves the system, retards future deterioration, and maintains or improves functional condition of the system without increasing structural capacity.

RECONSTRUCTION is the complete rebuilding of a street, including the full removal of the asphalt road surface and, possibly, the removal of the aggregate base layers. The subgrade is recompacted and regraded and a new asphalt road surface installed.

SLURRY SEAL is a mix of sand-sized aggregate, emulsion and mineral fillers mixed cold and directly applied onto a clean road surface. A slurry seal restores a uniform texture and color, provides a new wearing surface, and seals pavements. Slurry seal aggregates come in three sizes or grades, designated as I, II or III.

2.0 Strategic Pavement Management

The City of Arlington's street system infrastructure is its largest asset by far, with a value of several hundred millions. The importance of a reliable transportation system is readily apparent, providing for the movement of people and goods throughout the City and to connections beyond the city limits. Quality of life in the City of Arlington and the economic vitality of the businesses in the City are directly related to a viable well-functioning street system. Maintaining this street network is therefore one of the City's highest priorities.

Strategic Pavement Management is an approach that is a planned strategy of cost-effective treatments to an existing roadway and its components that preserves the system, retards future deterioration, and maintains or improves functional condition of the system. The City of Arlington is implementing this Pavement Management Program that will balance pavement preservation of good streets with the replacement of failing streets. What makes this program different from traditional thinking is that *the selection of pavement maintenance projects is based on the financial consequences of delaying a project rather than based on the condition of the pavement*. The reasons behind this and the processes used to implement this strategy are detailed below.

Objectives of the Pavement Management Program

This Pavement Management Program (PMP) provides a plan of action for the City on how to improve the condition of its current road system and how to institute a program to provide regular preservation on roads to maximize their useful life. The approach entails collection of data on the existing condition of the street infrastructure system, evaluation of the data collected, and identification and scheduling of the appropriate treatment – preservation maintenance or reconstruction. This is not a one-time effort, but rather an on-going program requiring regular updates. An effective PMP will allow the City to maintain its street system at an acceptable level (as defined by the City) and minimize the expense of street reconstruction and preventive maintenance. The PMP will also allow the City to compete for state or federal funds.

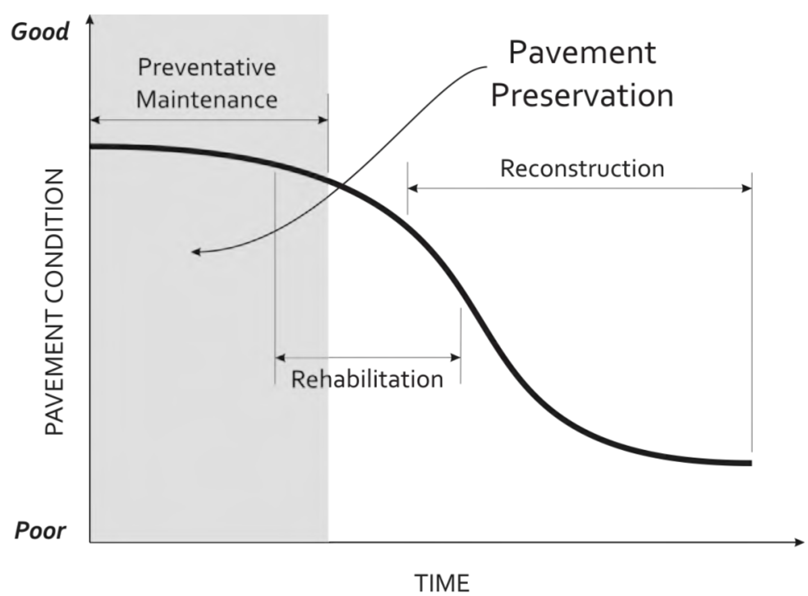


Figure 1 Pavement Preservation

The City of Arlington's Pavement Management Program will provide City staff with:

- An inventory of all roadway surfaces owned and maintained by the City.
- Current pavement conditions for all public streets and a list of the locations requiring preservation or reconstruction.
- A recommended pavement preservation treatment plan based on cost-effectiveness.
- Anticipated pavement maintenance costs to include in the City's Capital Improvement Plan.

Pavement Lifecycle

The asphalt pavement used on City streets typically performs well for the first 10 years of its lifecycle. After 10 years, the pavement begins to deteriorate at a much faster rate. Providing maintenance during the early stages of the pavement lifecycle—such as repairing cracks, seal coating, chip sealing, etc.—is therefore a critical function to maintain streets in a cost-effective manner. These maintenance techniques can protect the substrate and extend the life of the pavement.

As the chart below illustrates, investing in street maintenance early in a roadway's lifecycle is much less expensive than the costly repairs and reconstruction that will be necessary later in the lifecycle.

For the City of Arlington to maximize its investment in the street system, *keeping the streets in a good condition must be a priority*. This means that funding should not first target the streets that are in the worst condition and need to be reconstructed, rather the City must balance the reconstruction needs with providing pavement preservation treatments to the streets still in relatively good condition.

Because the advantages of this strategy are not readily apparent to all citizens, it is imperative that the City of Arlington develop an effective communication plan that explains this prioritization strategy.

Extending the Pavement Lifecycle

The International Slurry Surfacing Association (ISSA) has developed hypothetical cost scenarios to determine the cost of pavement preservation treatments versus the cost of reconstructing an untreated road. Based on the pavement lifecycle curve shown in Figure 1 above, three preservation treatments over a 25-year period at $2/square yard will maintain the pavement in good condition for a total cost of $6/square yard. If the road is left untreated for 12 or more years, the full rehabilitation will cost upwards of $12 to $16/square yard. Figure 2 illustrates this extension of the pavement life. Applying this cost approach to an actual street section in the City of Arlington can provide an estimate of potential cost savings from this pavement management strategy. For example, for Macleod Avenue between E Maple Street and E Division Street (approximately 10,000 square yards of pavement), the cost savings over 25 years amounts to $60,000 - $100,000.

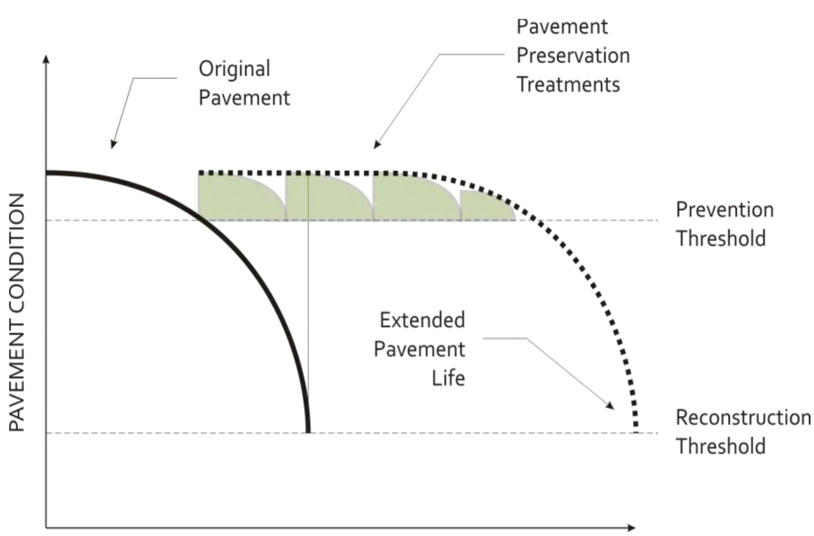


Figure 2 Pavement Life Extension

How Pavement Fails

Pavement is intended to provide an even surface on top of the native soil that allows for vehicle operations in all seasons, allows for a well-defined roadway, and maintains an aesthetically pleasing entry to public and private facilities. It is a commonly held belief that high levels of traffic or heavy vehicles are the primary causes of pavement failure. While these are certainly contributing factors, other factors have a larger impact on the condition of roadway pavement. The main factors contributing to pavement deterioration include:

- ULTRAVIOLET LIGHT. The natural light from the sun contains rays in the ultraviolet spectrum. These rays cause oxidation, resulting in aggregate material emerging through the pavement surface. The surface then exhibits a rough appearance and becomes brittle as cracks develop and the pavement deteriorates.
- VEHICLE FUELS AND LUBRICANTS. Vehicle fuels and lubricants such as gasoline, oil, diesel fuel and jet fuel dissolve the binding agents in asphalt, causing softening and failure.
- WATER. Water in the soil beneath the pavement makes the soil less able to support heavy loads. As the soil leads to the loads exerted on it, the pavement will begin to crack. Once cracks form, water can enter the pavement itself from above and below, worsening the pavement deterioration. This situation is worse where there is considerable freezing and thawing.
- TRAFFIC. Finally, traffic is a contributing factor—especially relative to the factors listed previously. Heavy vehicle traffic is worse, for the reasons described under the water description above.



Pavement Lifespan Extension with Preservation

The timing of the pavement preservation application has a significant influence on the effectiveness of the treatment in prolonging the roadway useful life; therefore, applying the right treatment to the right pavement at the right time is at the core of pavement preservation. PCI provides an excellent indication of the road's overall quality and when preservation or reconstruction treatment is necessary.

TABLE 1. PAVEMENT LIFESPAN EXTENSION

PCI RATING	CONDITION	REMAINING LIFE	WORK OPTIONS
85 to 100	Good	15 to 25 years	Little to no maintenance, fog or rejuvenating seal
70 to 84.99	Satisfactory	12 to 20 years	Routine maintenance, microsurfacing, slurry seal, chip seal, crack seal
60 to 69.99	Fair	10 to 15 years	Double chip seal, cape seal, mill patch
40 to 59.99	Poor	7 to 12 years	Resurface, mill and resurface
0 to 39.99	Reconstruct	0 to 10 years	Reconstruction, rebuild, full depth reclamation

Pavement Condition Index and Pavement Condition Rating

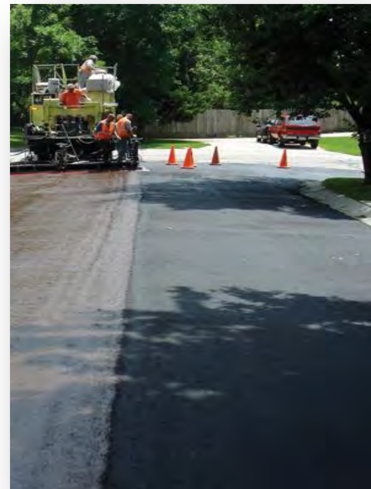
The US Army Corps of Engineers (USACOE) developed a system to rate, score, and index the condition of asphalt and concrete road surfaces; however, Arlington only has asphalt paved roads, which are the focus of the Pavement Management Program. This system was widely accepted by municipalities across the country and, following the development of formal procedures, was adopted by the American Standard and Testing Method (ASTM) as the Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys, method D6443. The Pavement Condition Index (PCI) is now the industry standard for rating pavement conditions. It provides a rational basis for determining the deterioration rate of pavement surfaces based on a pavement condition survey conducted by trained staff.

Pavement condition is typically grouped into general categories referred to as the Pavement Condition Rating (PCR) based on the PCI rating. The categories can vary according to the needs of the jurisdiction rating the pavements, and some jurisdictions use many categories. For the City of Arlington, the following categories have been established: a score of 85 – 100 as Good; 70 – 85 as Satisfactory; 60 – 70 as Fair; 40 – 60 as Poor; and 0 – 40 as Reconstruct.

TABLE 2. CITY OF ARLINGTON
PAVEMENT CONDITION INDEX AND RATING SYSTEM

Pavement Condition Rating (PCR)	Pavement Condition Index (PCI)
Good	85 - 100
Satisfactory	70 - 85
Fair	60 - 70
Poor	40 - 60
Reconstruct	0 - 40

Pavement Preservation Techniques



Pavement preservation is typically divided into two areas: Preventive Maintenance and Reconstruction. *Preventive Maintenance* includes various techniques to repair, rejuvenate and restore the top-most wearing surface of the roadway; it does not typically include any structural strengthening or modifications to the roadway. *Reconstruction* involves a full-depth rebuilding of the roadway. The main goal of Arlington's Pavement Management Program is to develop and implement a systematic plan to improve road condition and maintain road conditions at an acceptable level as efficiently and cost effectively as possible. The key is in maintaining streets and roads in good condition (at a relatively low cost) rather than allowing pavement to deteriorate to the point where extensive rehabilitation or reconstruction becomes necessary. Pavement preservation treatments used by the City of Arlington are described in detail on the following pages.

TABLE 3. PAVEMENT PRESERVATION TREATMENTS

The City has selected the following preservation treatments for preserving paved roadway surfaces.

CRACK SEALING AND PATCHING	Crack sealing and patching are operational maintenance activities that are performed by City Staff. These are typically considered maintenance activities alone; they are not considered pavement preservation activities. When patching and crack sealing are performed in conjunction with placement of a wearing surface (*slurry seal, microsurfacing, chip seal, thin overlay*), then it is considered pavement preservation.
FOG/REJUVENATING SEALS	Fog seals are a mixture of asphalt emulsion and water applied to the asphalt surface of a road, street or highway. The Asphalt Emulsion Manufacturers Association (AEMA) defines a fog seal as "a light spray application of dilute asphalt emulsion used primarily to seal an existing asphalt surface to reduce raveling and enrich dry and weathered surfaces". Fog seals are also useful in chip seal applications to hold chips in place in seal coats. These are referred to as flush coats in California. They can help prevent vehicle damage arising from flying chips. Fog seals can seal hairline cracks. Fog seals are a method of adding asphalt to an existing pavement surface to improve sealing or waterproofing, prevent further stone loss by holding aggregate in place, or simply improve the surface appearance.
SLURRY SEALS	A slurry seal shall consist of a mixture of an emulsified asphalt, mineral aggregate, water, and additives, proportioned, mixed and uniformly spread over a properly prepared surface. The slurry seal is applied as a homogeneous mat, adheres firmly to the prepared surface, and has a skid-resistant texture throughout its service life. Slurry seal is available in three mixture types based on gradation as follows: **Type I (fine).** This type has the finest aggregate gradation (most are smaller than the 2.36 mm sieve) and is used to fill small surface cracks, address moderate surface distresses, and provide a thin covering on the existing pavement that provides protection from the elements. Type I aggregate slurries are sometimes used as a preparatory treatment for HMA overlays or surface treatments. Type I aggregate slurries are generally limited to low traffic areas. **Type II (general).** This type is coarser than a Type I aggregate slurry (it has a maximum aggregate size of 6.4 mm) and is used to: fill surface voids, treat existing pavement that exhibits moderate to severe raveling due to aging and other more severe surface distresses, provide a durable wearing surface, and improve skid resistance. Type II aggregate slurry is the most common type. **Type III (coarse).** This type has the coarsest gradation and is used to treat severe surface defects. Because of its aggregate size, it can be used to fill slight depressions to prevent water ponding and reduce the probability of vehicle hydroplaning. This aggregate gradation provides maximum skid resistance and an improved wearing surface.

TABLE 3. PAVEMENT PRESERVATION TREATMENTS (CONTINUED)

The City has selected the following preservation treatments for preserving paved roadway surfaces.

MICROSURFACING	Microsurfacing is an advanced form of slurry seal that uses the same basic ingredients (emulsified asphalt, water, fine aggregates Type I, II, and III, and mineral filler) and combines them with advanced polymer additives. Microsurfacing is proportioned, mixed and uniformly spread over a properly prepared surface. Microsurfacing is capable of performing in variable thickness cross-sections such as ruts, scratch courses and milled surfaces. Microsurfacing is applied as a homogeneous mat, adheres firmly to the prepared surface, and has a skid-resistant texture throughout its service life. Microsurfacing is a quick-traffic system that allows traffic to return shortly after placement. Normally, these systems are required to accept straight, rolling traffic on a 0.5 in (12.7 mm) thick surface within one hour after placement in specific application conditions.
CHIP SEALS	Chip sealing is the application of a bituminous binder immediately followed by the application of an aggregate – the "chip". The aggregate is then rolled to embed it into the binder with excess chips being swept up after the binder has set. Multiple layers may be placed and various binder and aggregate types (¼", ⅜" or ½") can be used to address specific distress modes or traffic situations. Some of the various chip seal types are: **Single Chip Seal.** A single chip seal is an application of binder followed by an aggregate. This is used as a pavement preservation treatment and provides a new skid resistant wearing surface, arrests raveling, and seals minor cracks. **Multiple Chip Seal (Double Chip Seal).** A double chip seal consists of a spray application of binder, spreading a layer of aggregate, rolling the aggregate for embedment, applying an additional application of binder, spreading another layer of aggregate (approximately half the average least dimension of the base coat aggregate), and rolling once more. Sweeping should be done between applications. This process may be repeated, as necessary, to build up a pavement's edges. Multiple chip seals are used where a harder wearing and longer lasting surface treatment is needed.
THIN PAVEMENT OVERLAYS	A thin pavement overlay is typically less than 2-inches of asphalt placed over an existing (prepared) road surface, or over a road surface that has been milled.

Pavement Preservation Treatment Costs

The City of Arlington has developed Pavement Preservation Treatment Costs per square yard for various pavement rehabilitation treatment technologies; these costs are summarized in Table 4. The costs are based on June 2013 typical construction estimates and are presented to demonstrate the relative cost of each pavement preservation system. These costs were used in this document to derive planning-level construction estimates for pavement preservation costs on a system-wide basis.

TABLE 4. PAVEMENT PRESERVATION TREATMENT COSTS *(COST BASIS JUNE 2013)*

TREATMENT	AVG. COST / SQ YD ($)	PROJECTED LIFE (YEARS)
Fog Seal	0.54	0.5 - 1
Rejuvenating Fog Seal	0.70	1 - 4
Slurry Seal	1.63	3 - 5
RME Slurry Seal	3.75	5 - 9
Microsurfacing	2.10	5 - 10
Fiberized Microsurfacing	2.65	7-12
3/8" Chip Seal	3.75	6 - 9
3/8" Chip Seal with Fog Seal	4.29	7 - 11
1/2" Chip Seal	4.10	7 - 10
1/2" Chip Seal with Fog Seal	4.10	8 - 12
Double Chip Seal	7.75	9 - 15
GTR Chip Seal	4.05	3 - 5
1-1/2" Overlay	9.23	12 - 20
2" Grind and Pave	26.63	20

Notes:

1. Costs are based on a combination of Snohomish County and private contractor estimates.
2. These costs do not include engineering, bid support or project/construction management.

3.0 Existing Conditions

Existing Road System

The City of Arlington's street pavement system is composed of 167 miles of paved surfaces grouped into Arterials, Collectors, Streets and Bike Lanes. For the pavement condition ratings, this system was divided into 3,365 pavement management segments.

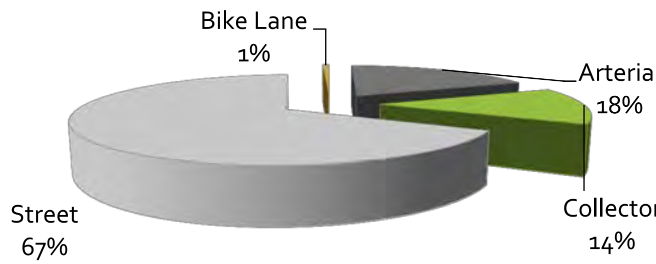


Figure 3 Existing Road Type Breakdown

TABLE 5. STREET INVENTORY

CLASSIFICATION	CENTER LINE MILES	LANE MILES	% OF LANE MILES
ARTERIAL (MAJOR & MINOR)	11	31	18.6%
COLLECTOR	11	23	13.8%
STREET (RESIDENTIAL & GENERAL)	56	112	67.0%
BIKE LANE (5' WIDE)	2.5	1	0.6%
TOTAL	80.5	167	100%

The total value of the **street pavement** in the City of Arlington can be represented by its reconstruction value. A planning level-estimate of the Arlington pavement infrastructure reconstruction value is presented in the table below. This estimate is based on an approximate $40 per square yard or $281,600 per lane mile for asphalt concrete pavement reconstruction. Because of the narrower width of bike lanes, these costs were estimated at half that of the wider vehicle lanes. *(Note that this estimate does not include sidewalks, curbs, gutters, ADA ramps or other auxiliary elements of the roadway.)*

Based on this cost estimate, the reconstruction value of the City of Arlington's street system is just over $47 million (*note: the cost of reconstruction should not be confused with the cost of construction – reconstructing an existing roadway is approximately 1/5 the cost of new construction*).

TABLE 6. STREET SYSTEM RECONSTRUCTION VALUE

CLASSIFICATION	LANE MILES	RECONSTRUCTION VALUE
ARTERIAL (MAJOR & MINOR)	31	$8,729,600
COLLECTOR	23	$6,476,800
STREET (RESIDENTIAL & GENERAL)	112	$31,539,200
BIKE LANE (5' WIDE)	1	$281,600
TOTAL	167	$47,027,200

2013 Pavement Condition Assessment Summary

A pavement condition assessment of the City of Arlington's street system was conducted in November and December of 2012 by VPR Services, Inc. to evaluate the existing surface condition of each pavement segment. This assessment included the following elements:

- A **Visual Survey** was completed of all City streets. Data on the type and extent of pavement distresses were collected by segment. Typically, a segment of roadway extends from one intersection to the next.
- **Pavement Distresses** were categorized as detailed in the following section. Distresses include cracking, buckling, patching and fatigue.
- A **Pavement Condition Index** (PCI) rating was calculated for each segment through the *Cartegraph* software.

What is a Pavement Condition Assessment?

The Pavement Condition Index (PCI) is a numerical rating of pavement condition with a rating of 100 for new road construction and 0 for a gravel road. Through use over time, the condition of all pavement will degrade and, based on the extent of degradation, either need preservation or reconstruction. The PCI provides a numerical measure that allows an agency to determine current road conditions and the best strategy to preserve the roads.

The PCI has a maximum value of 100; this value is reduced based on calculated deductions for the distresses measured in the pavement. This procedure is completed by trained personnel (the Rater) who first identify a road segment to rate and measure; this is called the pavement sample. Knowing the sample length, width and area, the Rater then measures the distresses and their severity in accordance with the PCI calculation process (ref ASTM D6433). The total amount of distress measured in the road segment is then deducted from 100 to obtain the PCI for the pavement sample.

Designation: D 6433 – 07

Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys[1]

A more in-depth description of the PCI calculation process is summarized below, and a copy of the ASTM D 6433 standard is included in the appendix:

1. Distress measurements for a sample are summed by distress and severity.
    a. A sample can have multiple distresses and a variety of severities (high, moderate or low).
    b. Each severity of the distress is summed for the sample as a separate measurement.
2. The density of each distress and severity measurement is calculated by dividing by the total sample area.

3. Using the density, the distress, and the severity, the deduct values are found in the 'Deduct Values for Asphalt' rating curves in ASTM D 6433 – 07.
4. If all of the deduct values are greater than 2, then the number of allowable deduct values are calculated (no more than 10 deduct values may be used for a sample). If the deduct values are all less than 2 or only one is determined to be 2, they are simply summed up and the sum is subtracted from 100 to generate the PCI.
5. For those samples that have deduct values greater than 2, a mathematical iteration is used to reduce the allowed deducts to 2 – this process forms a table of deduct values. The first record of the table is all the deduct values ranked from largest to smallest. The second record ranks all the deduct values from largest to smallest with the smallest one reduced to the value of 2. The third line shows the deduct values from larges to smallest with the last two values reduced to the value of 2. The table is continued until the last record where only the largest value is not 2.
6. Each line of the table is summed for total deduct value. Each total deduct value is then 'corrected' using the 'Total Deduct Value' graph in ASTM D 6433 – 07.
7. The highest 'corrected' deduct total is taken from the table and subtracted from 100 for the PCI for the sample.

The City of Arlington uses the *Cartegraph* operations management system to track resources, maintain assets and manage workflow. *Cartegraph* has the ability to manage a pavement database and has several pavement distress types in its *Asphalt Concrete (AC) Distress Library*. Each of these distress types can be rated in severity as LOW, MODERATE or HIGH. The distresses captured in the City of Arlington's 2012 pavement survey are summarized below.

TABLE 7. ***CARTEGRAPH*** **ASPHALT CONCRETE DISTRESS TYPES**

DISTRESS	CATEGORY	DESCRIPTION*
AC BUMPS & SAGS	Surface Defects	Bumps are small localized, upward displacements of the pavement surface.
AC EDGE CRACKING	Cracking	Crescent-shaped cracks of fairly continuous cracks which intersect the pavement edge and are located within 2 ft of the pavement edge, adjacent to the shoulder.
AC RUTTING	Surface Deformation	A rut is a surface depression in the wheel paths. Pavement uplift may occur along the sides of the rut, but, in many instances, ruts are noticeable only after a rainfall when the paths are filled with water.
AC LINEAR CRACKING	Cracking	Longitudinal cracks are parallel to the pavement's centerline or lay down direction.
AC RAVELING & WEATHERING	Surface Defects	Raveling and weathering are the wearing away of the pavement surface due to a loss of asphalt or tar binder and dislodged aggregate particles.
AC PATCHING	Patching and Potholes	A patch is an area of pavement that has been replaced with new material to repair the existing pavement. A patch is considered a defect no matter how well it appears to perform.
AC FATIGUE (ALLIGATOR) CRACKING	Cracking	Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading.

*Descriptions are taken from the *Cartegraph Asphalt Concrete (AC) Distress Library*. For a more complete description and photos, see Appendix A.

The extents of the distress types identified in the visual survey of the City of Arlington's street system are summarized in the table and charts below.

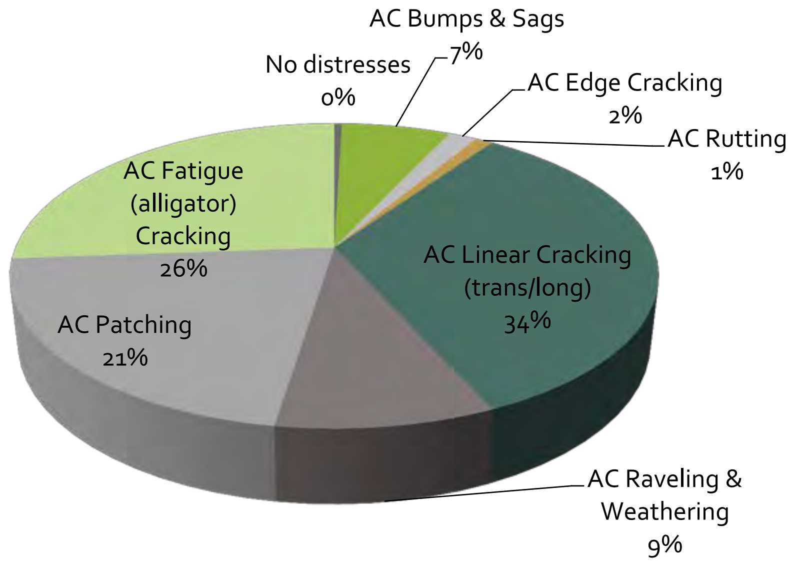


Figure 4 Exhibited Pavement Distresses

TABLE 8. SEGMENTS EXHIBITING PAVEMENT DISTRESS BY TYPE

DISTRESS	NONE	LOW	MEDIUM	HIGH	TOTAL	%
NO DISTRESSES	15				**15**	0.45%
AC BUMPS & SAGS		169	42	8	**219**	6.51%
AC EDGE CRACKING		54	2	1	**57**	1.69%
AC RUTTING		30	4		**34**	1.01%
AC LINEAR CRACKING		664	332	134	**1,130**	33.58%
AC RAVELING & WEATHERING		227	64	19	**310**	9.21%
AC PATCHING		532	153	35	**720**	21.40%
AC FATIGUE (ALLIGATOR) CRACKING		360	330	190	**880**	26.15%
TOTAL DISTRESSES EXHIBITED	**15**	**2,036**	**927**	**387**	**3,365**	100.00%

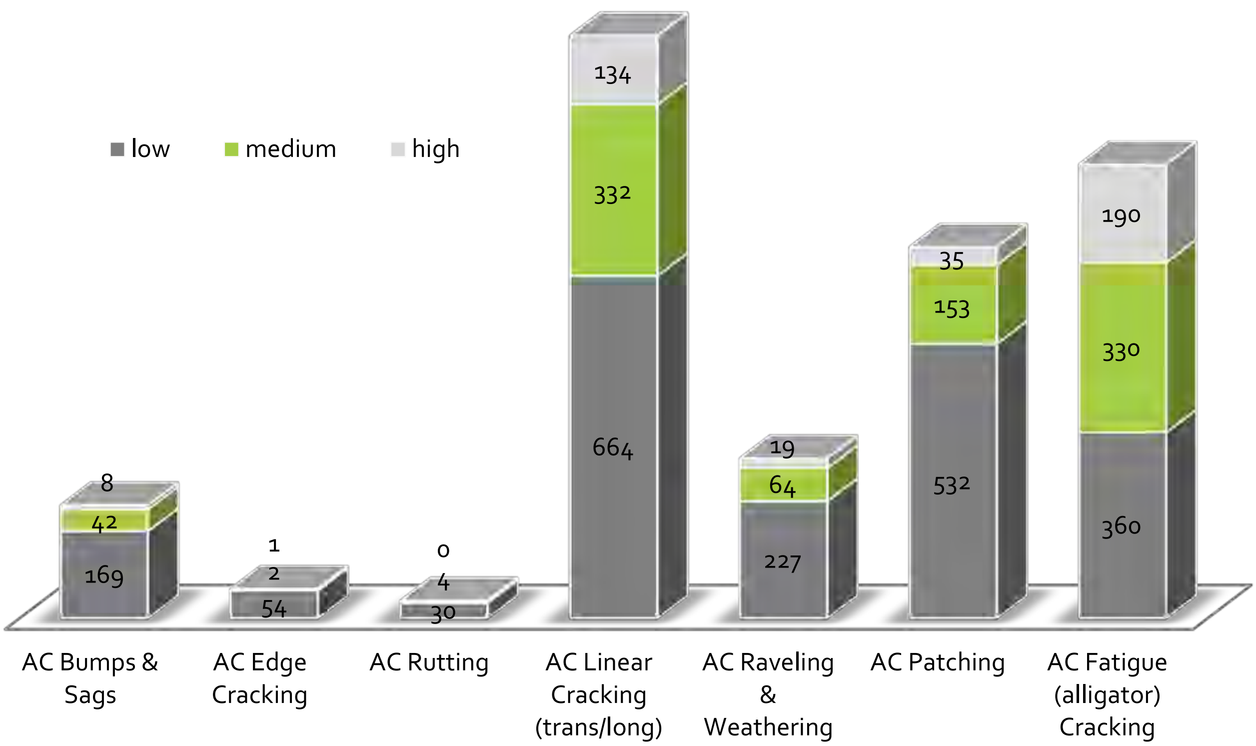


Figure 5 Segments Exhibiting Pavement Distress by Type and Severity

Pavement Condition Ratings

The pavement condition ratings output by the *Cartegraph* software are summarized in the chart below. The majority of roadway infrastructure (measured in lane-miles) in the City of Arlington fell into the "Good" category, meaning little to no maintenance is needed at this time. Only about 7% of roadway segments fell below into "Reconstruct," but there are significant costs associated with rehabilitating a roadway in this condition. These roadways are shown on a map in Appendix B. Ratings for each segment are included in Appendix C (by PCI) and Appendix D (by segment name).

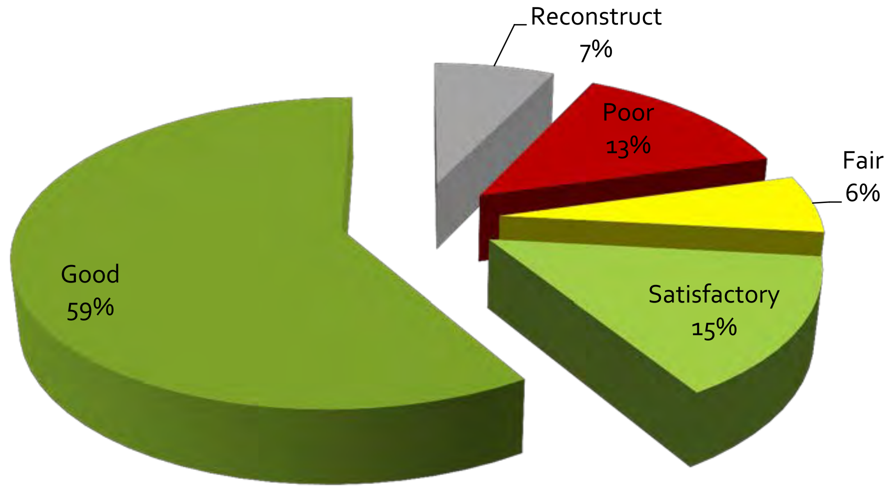


Figure 6 Pavement Condition by Percent of Lane-Miles

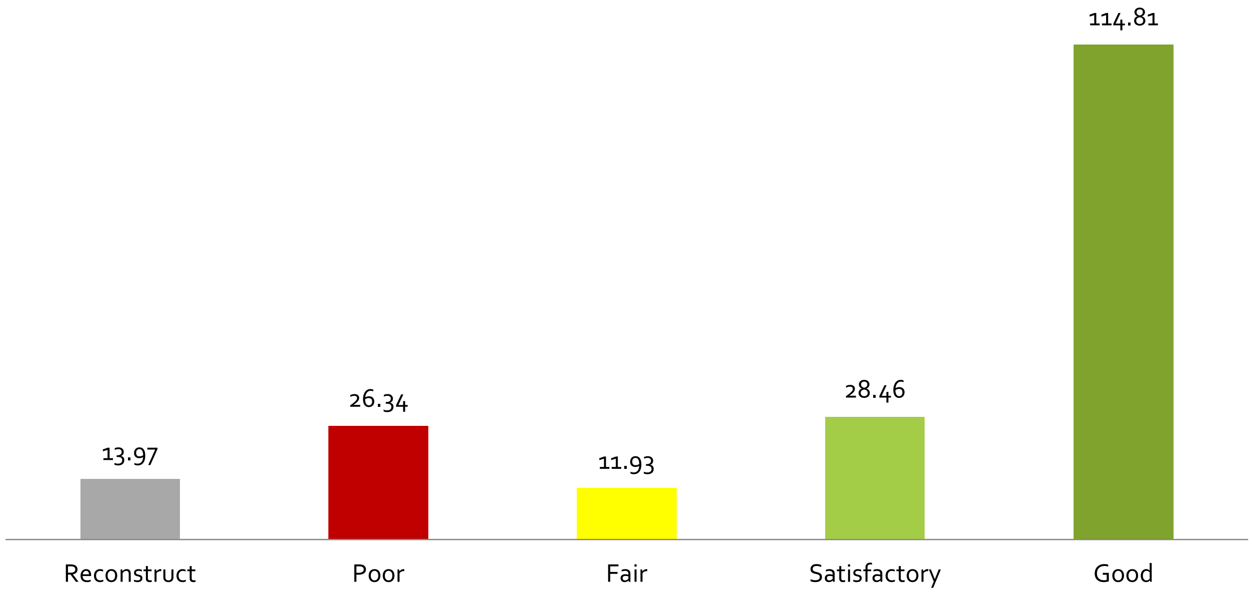


Figure 7 Lane-Miles of Roadway by Condition

Estimated 10-Year Pavement Treatment Costs

The pavement condition assessment also collected data on the length and width of the roadway segments in the inventory. This data was coupled with estimates for pavement treatment costs to obtain a cost per square yard estimate to reconstruct or repair the pavement of all roads in the City of Arlington system. These costs are summarized in the table and graph below. The cost estimates below are inflated to account for engineering/bidding support (10%) and to account for project and construction management (10%). These estimates are strictly limited to pavement preservation and pavement reconstruction; no sidewalk, curb, gutter or stormwater improvements are included.

TABLE 9. COST BY FUNCTIONAL CLASSIFICATION

CLASSIFICATION	PRESERVATION COST	AREA (SQYD)	RECONSTRUCTION COST	AREA (SQYD)	TOTAL COSTS
MAJOR ARTERIAL	$96,394	15,897	$0	0	$96,394
MINOR ARTERIAL	$173,544	39,657	$372,426	24,043	$545,969
COLLECTOR	$196,794	70,184	$919,988	70,183	$1,116,781
LOCAL	$530,045	210,335	$3,329,917	86,044	$3,859,961
TOTAL	**$996,777**	**336,073**	**$4,622,331**	**180,270**	**$5,619,105**

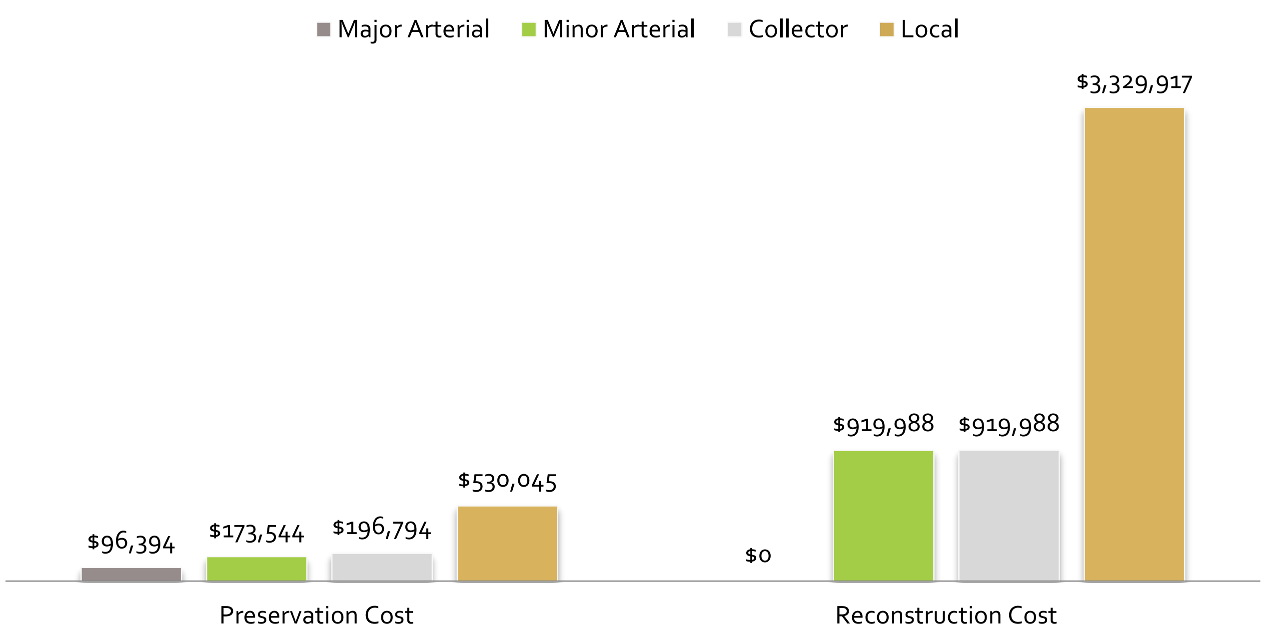


Figure 8 Preservation and Reconstruction Cost by Functional Classification

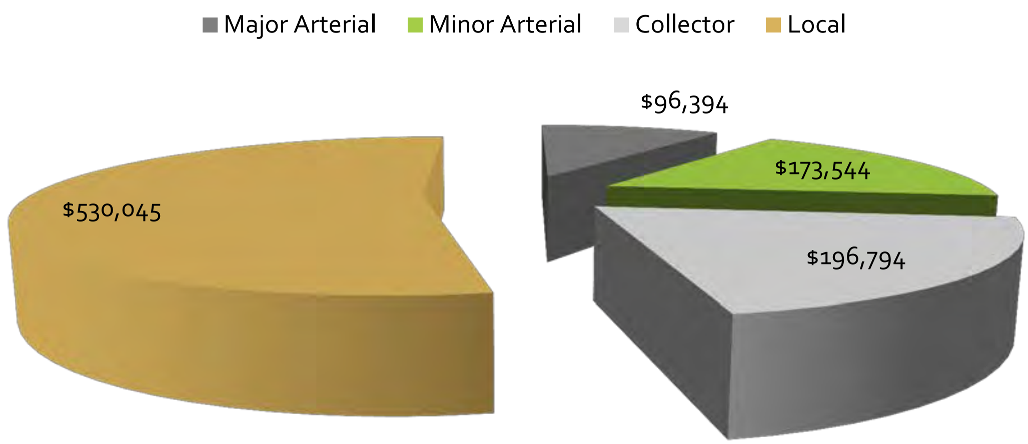


Figure 9 Preservation Cost by Functional Classification

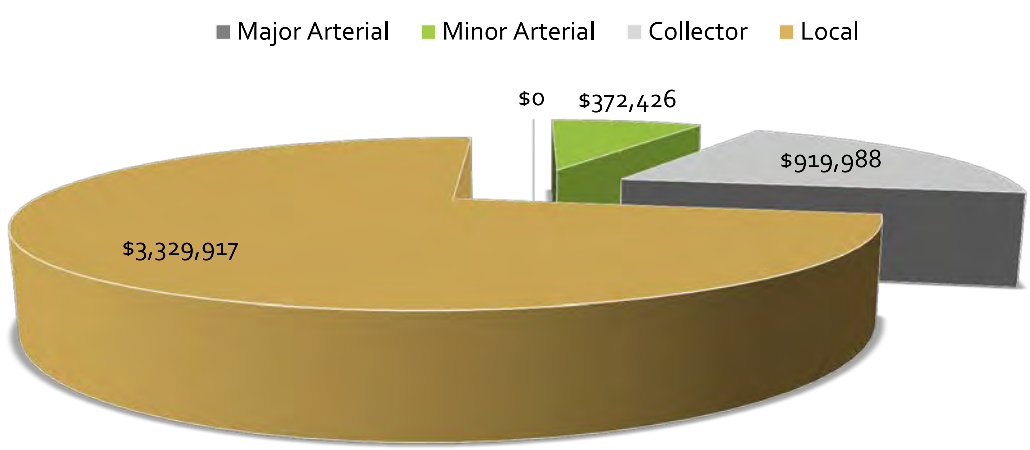


Figure 10 Reconstruction Cost by Functional Classification

4.0 Implementation

Pavement Preservation Goals and Policies

In April 2013 the City of Arlington created a Transportation Benefit District (TBD) specifically for the immediate and long term preservation of the City's road system. The TBD Board of Directors established the Goals and Policies to be used when developing an annual Pavement Preservation Workplan.

1. The City will continue to use the Pavement Condition Index (PCI) as the primary gauge for establishing a road's overall condition.

2. The City will strive to have roadways maintain the following minimal PCI rating per functional classification:

Functional Classification	**Avg Recommended PCI Rating**
Arterial – Principal	80
Arterial – Minor	70
Collector	70
Residential/minor	60

3. The TBD Board of Directors acknowledges that the following pavement preservation technologies are acceptable treatment for Arlington roads:

    - Full depth pothole repair and strategic pavement replacement
    - Fog Seal and Rejuvenating Fog Seal
    - Slurry Seal
    - Microsurfacing and Fiberized Microsurfacing
    - 1/4" Chip Seal (optional with Fog Seal)
    - 3/8" Chip Seal (optional with Fog Seal)
    - 1/2" Chip Seal (optional with Fog Seal)
    - Double Chip Seal
    - GTR Chip Seal
    - 1-1/2" Overlay
    - 2" Grind and Pave (reconstruction)

4. To maximize TBD investment, all roadways below a PCI rating of 40 will be reconstructed. The level and extent of reconstruction is to be determined by an engineering study of the road.

5. Priority will be given to arterial roads, followed by collector roads, and then followed by residential/minor roads.

6. Priority will be given to roads that are still able to be preserved over roads that need reconstruction.

7. Priority will be given to roads with high average daily traffic (ADT) count.

8. The TBD will approve an annual pavement preservation plan, detailing which roads are to be preserved and/or reconstructed no later than October of the preceding year of when the plan is to be implemented.
9. All roads contained within the annual pavement preservation plan must be fully investigated and engineered to assure that the road is capable of continued service before application of any road preservation or reconstruction.

Development of an Annual Pavement Preservation Workplan

In October of every year, the City will prepare and present to the TBD Board of Directors an Annual Pavement Preservation Workplan summarizing the streets to be preserved in the coming year and approximate range of costs. The Workplan has two primary purposes:

- Identification of Streets and Road to be Preserved – The Pavement Preservation Workplan will identify what streets and roads will have pavement preservation in the coming year, the anticipated type of treatment, and a preliminary budget for the proposed preservation work. Development of this plan will be an iterative process between staff and the TBD Board. The actual type of preservation selected and the preliminary cost estimate may differ from the data contained in the final Engineering Analysis and Bid Documents.
- Preparation of Annual TBD Budget – The Pavement Preservation Workplan will contain a preliminary cost estimate for design, construction, and construction management of the coming year's pavement preservation projects; this cost estimate will serve as a basis for developing a budget for the TBD.

Engineering Analysis and Bid Documents

Once a Workplan has been approved by the TBD Board, staff will begin work contracting with a consulting firm to perform necessary engineering analysis and prepare bid documents. The work associated with the Engineering Analysis and Bid Documents includes:

- Site Visit – City Staff will perform a site visit with the consultant(s) to view the road segments identified for preservation. A visual inspection will be performed noting aspects such as road surface defects, road structural defects, road PCI rating, etc.
- ADT Count – Staff will perform Average Daily Traffic (ADT) counts to measure the amount and type of vehicle traffic on the road segments.
- Road Structural Testing – The consultant will perform structural tests *(pressure plate-deflection measurement, pavement coring, etc.)* on the road segment to determine the underlying strength of the road segments and their ability for continued service with resurfacing.
- Selection of Pavement Preservation Methods – Consultant will use data from visual inspection, ADT measurement and structural assessment to determine the appropriate preservation and anticipated pavement life extension.
- Bid Documents – Prepare bid documents for preservation work following WSDOT format.

Construction Bidding and Award

Staff will present the completed Annual Pavement Preservation bid package to the TBD Board for their concurrence and authorization to advertise for bid. The project will be advertised on the MRSC Small Works Roster and direct mailed to local area pavement preservation companies. Staff will monitor the bidding, respond to inquiries, issue addendums, and publicly open the sealed bids on the posted date. The bids will be reviewed and the lowest qualified bid presented to the TBD Board for authorization to award.

Staff will coordinate execution of the contract and issue Notice to Proceed to the contractor. A preconstruction meeting will be held prior to the commencement of work.

Construction Inspection and Testing

Staff will contract with a geotechnical testing and inspection firm to review submittals, test materials, and inspect placement of the pavement preservation treatment for compliance with specifications.

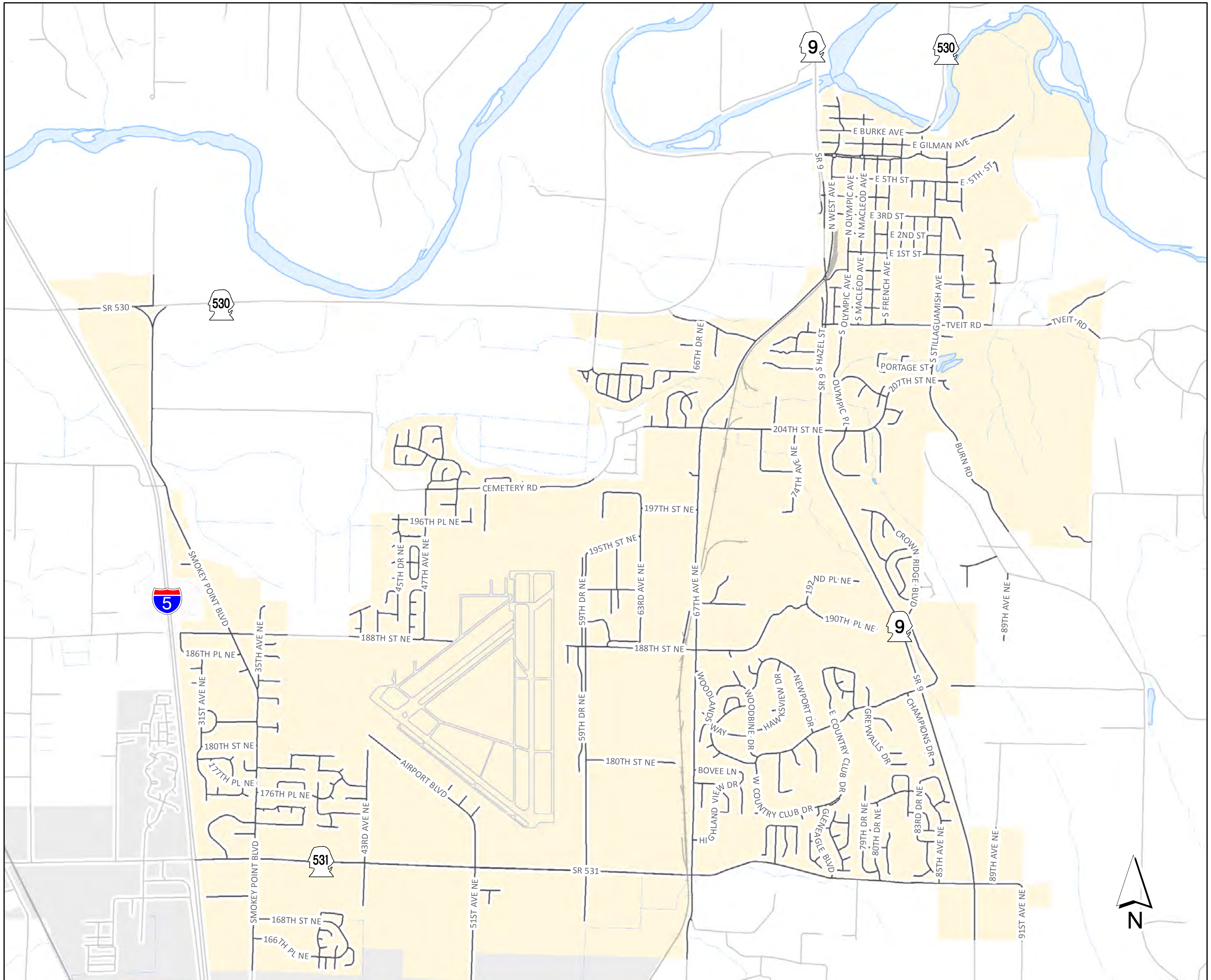
Post-Construction Report

Following completion and acceptance of the year's pavement preservation, staff will prepare a report to the TBD Board that contains the following information:

- Road Preservation Project Summary – A summary of costs and schedule for the engineering Analysis and bid Documents, Construction, and Construction Management & Testing.
- Road Segment Detail Report – A list of road segments preserved during the current construction season, the square yards per segment, the preservation method applied, and associated costs per segment.
- Preservation Maps – A Current Pavement Preservation map showing roads preserved during the current construction season and an updated Master Pavement Preservation map showing the original failing road segments and segments preserved to date.
- Asset Management Summary Report – A *Cartegraph* report summarizing the City's overall pavement condition index rating pre-construction and post-construction.

Appendix A

Pavement Management Program Maps



City of Arlington
Figure 1

Arlington Street Map

Legend

Arlington Roads

Arlington City Limits

Marysville City Limits

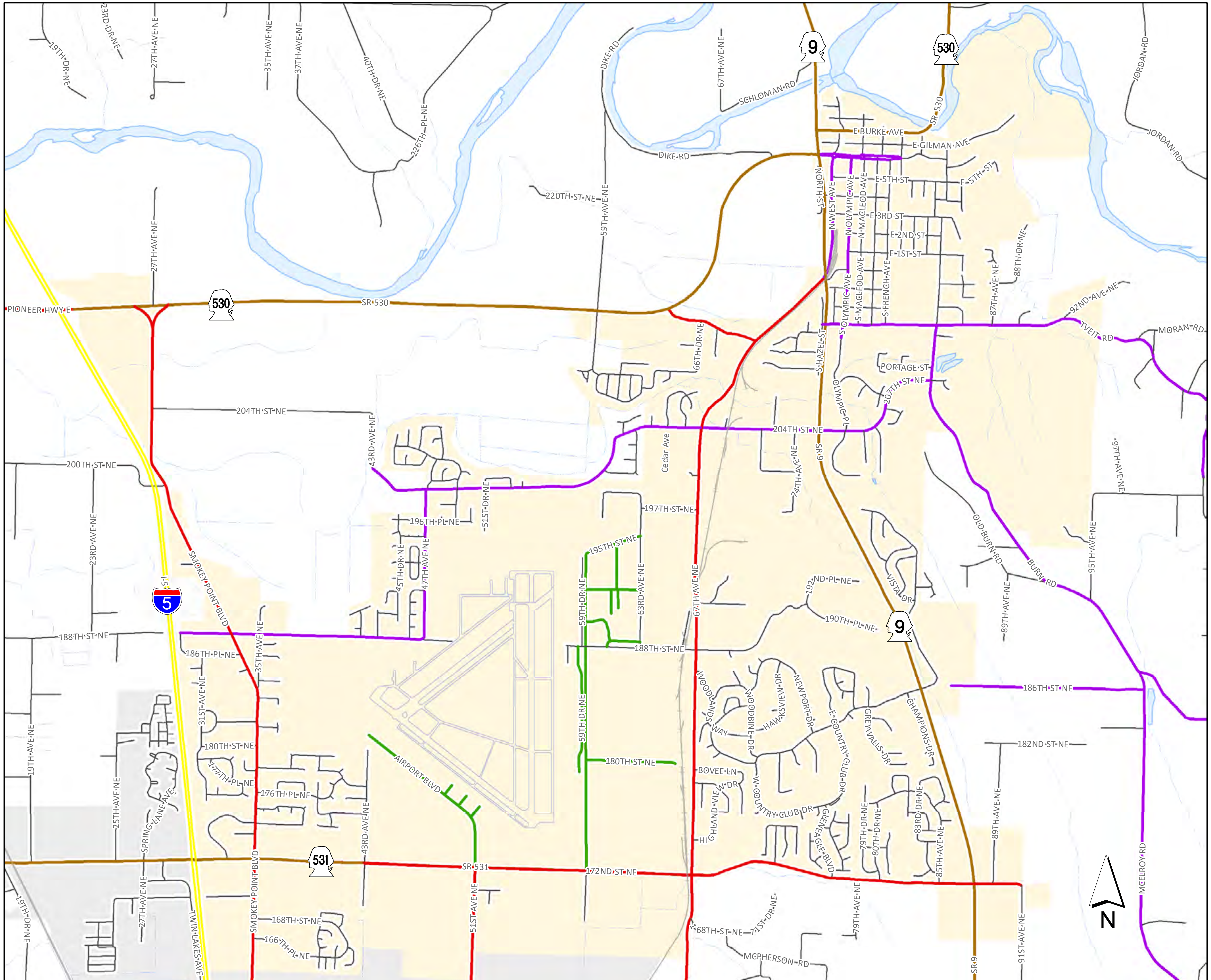
Streams and waterbodies courtesy of Snohomish County Dept of Information Systems, December 2009.

Scale:
1 in = 2,333 feet

Date:
08/28/2013

File:
Fig1StreetMap11X17_13.mxd

Drawn by:
kdh



City of Arlington
Figure 2

Arlington Roadway Functional Classification

Legend

- State Highway
- State Route
- Arterial
- Collector
- Private roads maintained by City
- Streets
- Arlington City Limits
- Marysville City Limits

Streams and waterbodies courtesy of Snohomish County Dept of Information Systems, December 2009.

Scale:
1 in = 2,333 feet

Date:
08/28/2013

File:
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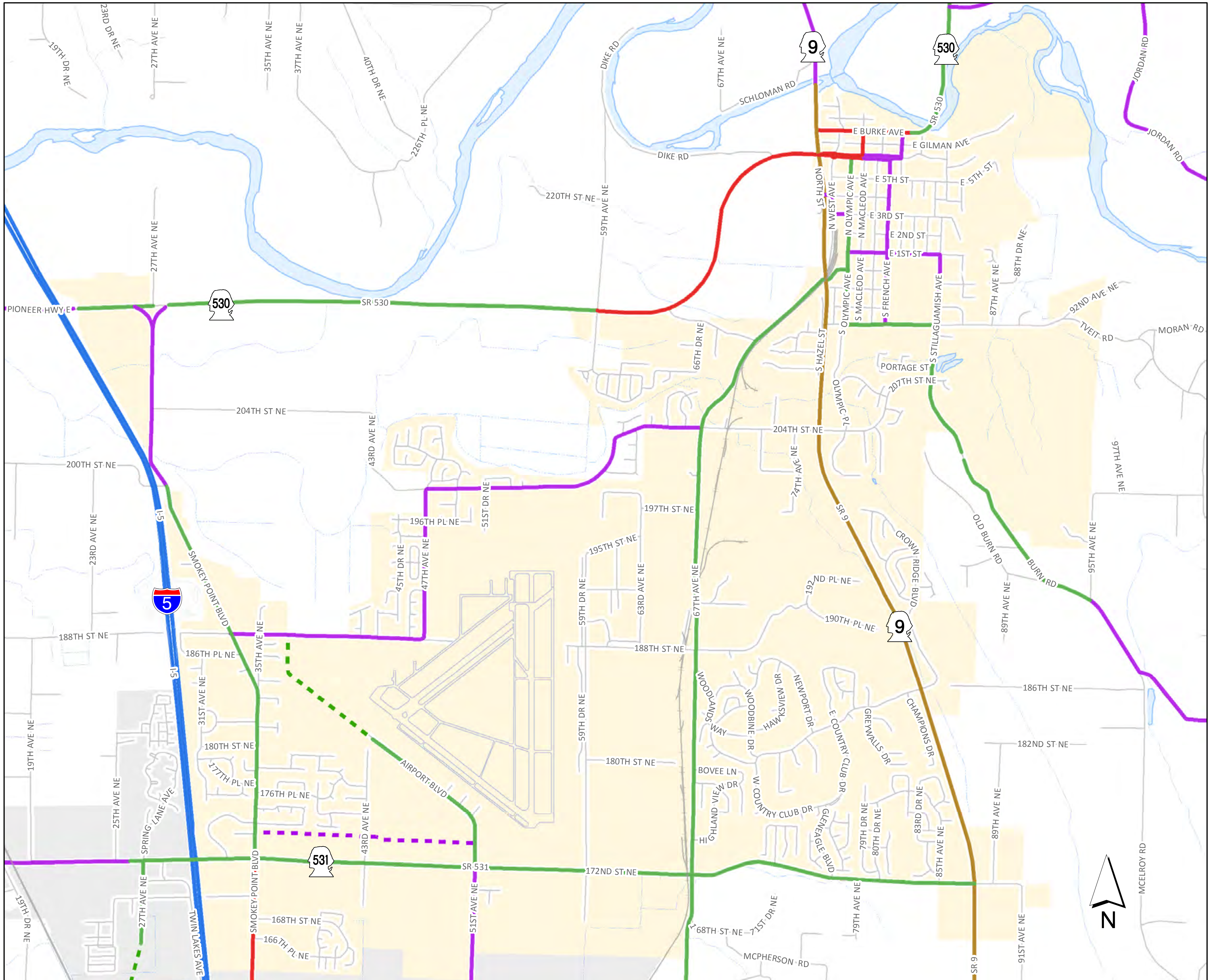


City of Arlington
Figure 3

WSDOT Functional Classification

Legend

- Interstate
- State Route
- Arterial
- Minor arterial
- Collector
- Minor collector
- Future minor arterial
- Future collector
- Arlington City Limits
- Marysville City Limits

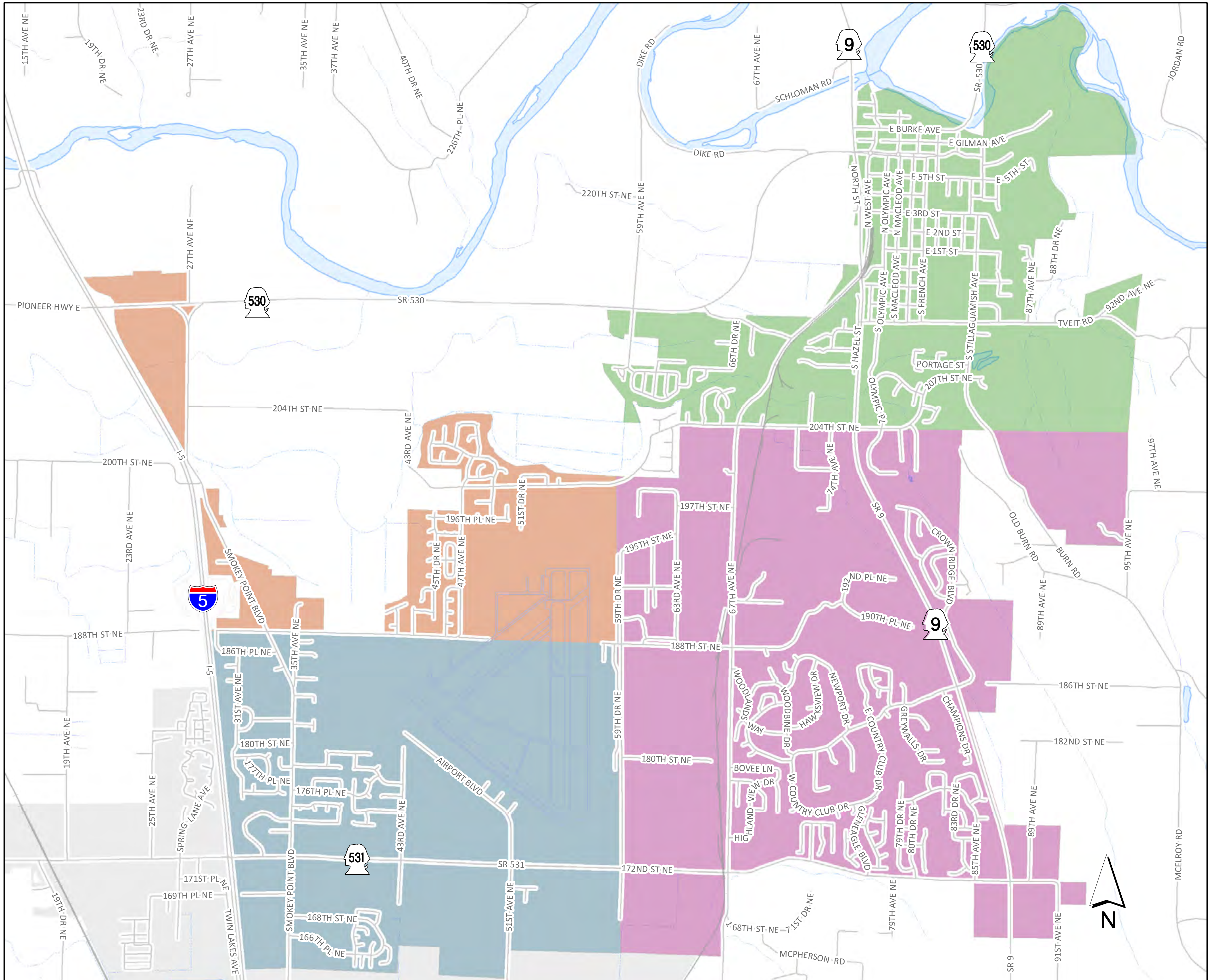
Streams and waterbodies courtesy of Snohomish County Dept of Information Systems, December 2009.

Scale: 1 in = 2,333 feet

Date: 08/28/2013

File: Fig3WSDOTFuncClass11X17_13.mxd

Drawn by: kdh



City of Arlington
Figure 4

Arlington Pavement Focus Areas

Legend

Pavement Focus Areas

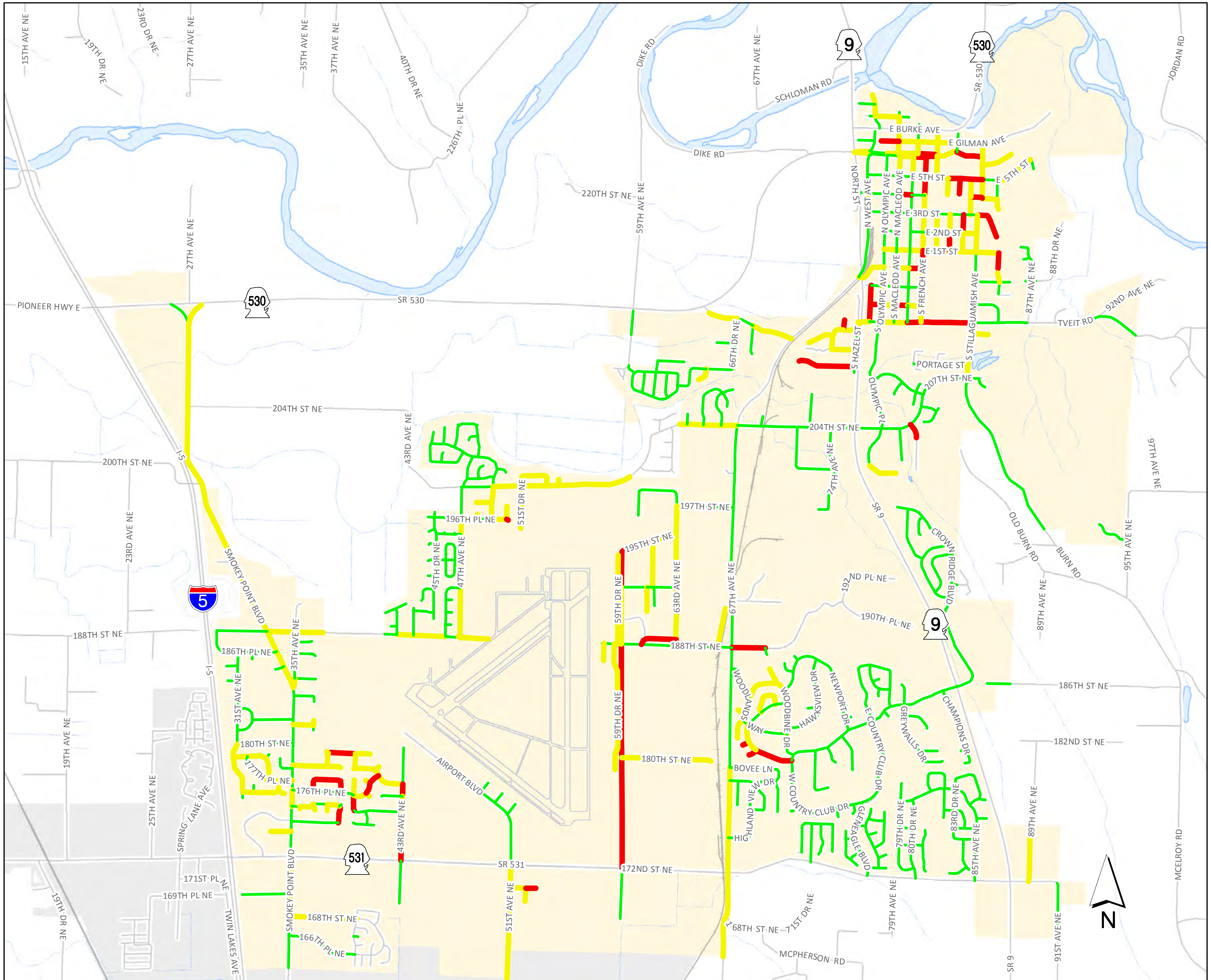
- Northeast
- Northwest
- Southeast
- Southwest
- Marysville City Limits

Streams and waterbodies courtesy of Snohomish County Dept of Information Systems, December 2009.

Scale:	1 in = 2,333 feet
Date:	08/28/2013
File:	Fig4FocusArea11X17_13.mxd
Drawn by:	kdh

City of Arlington
Figure 5

City Road Condition Index



Legend

Road Conditions

- Reconstruction (Estimated 0 to 40 PCI)
- Preservation (Estimated 40 to 85 PCI)
- No Action
- Marysville City Limits

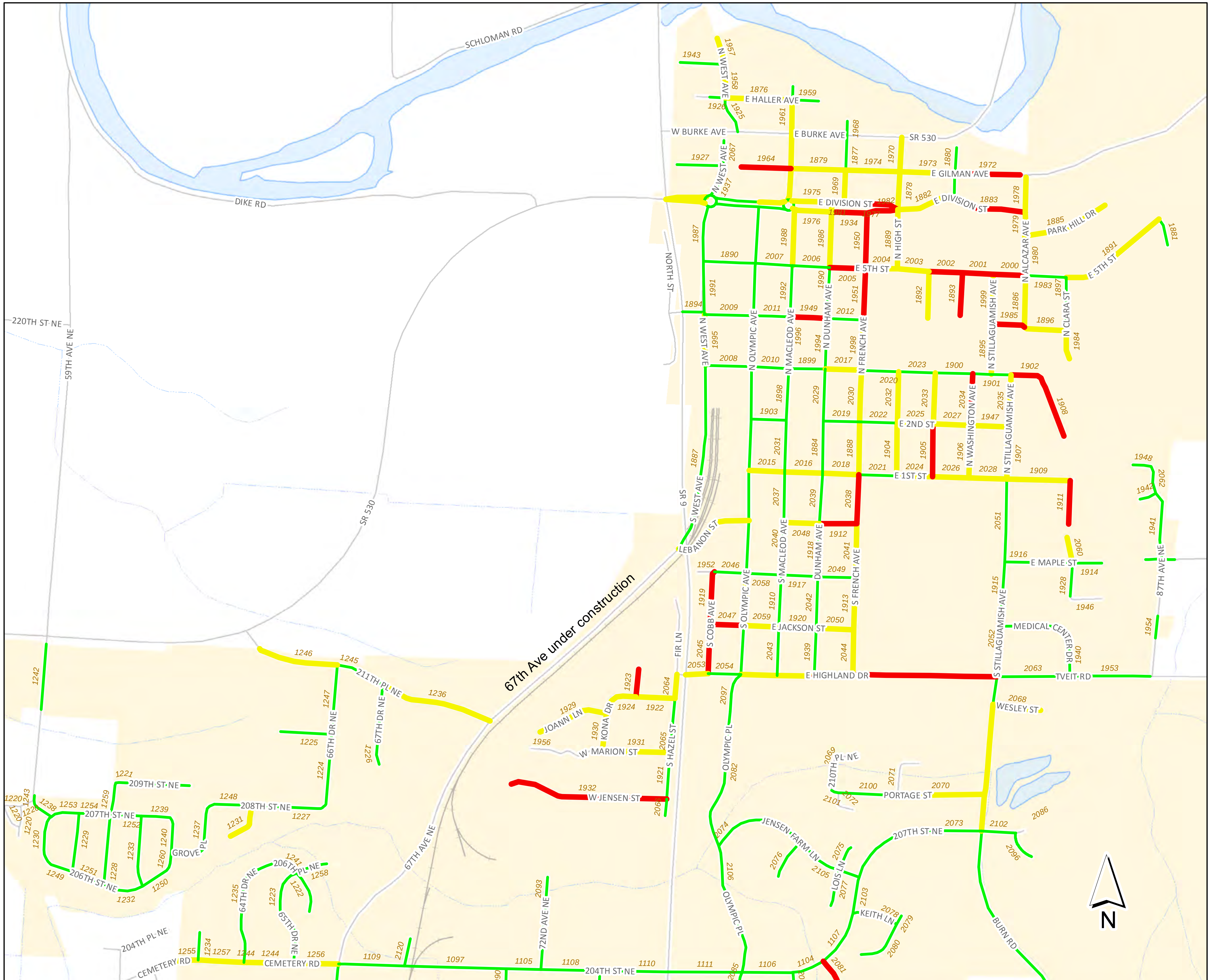
Streams and waterbodies courtesy of Snohomish County Dept of Information Systems, December 2009.

Scale: 1 in = 2,333 feet

Date: 08/28/2013

File: Fig5CityRoadCon11X17_13.mxd

Drawn by: kdh



City of Arlington
Figure 6

City Road Condition Index
Northeast Section

Legend

Road Conditions

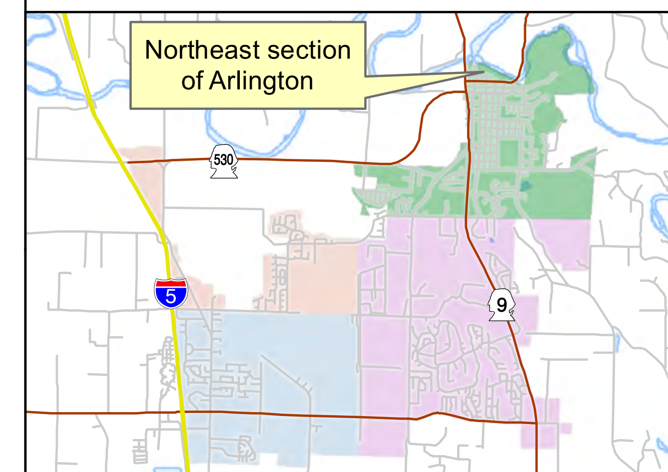
Reconstruction (Estimated 0 to 40 PCI)

Preservation (Estimated 40 to 85 PCI)

No Action

Segments labeled by ID#

Marysville City Limits



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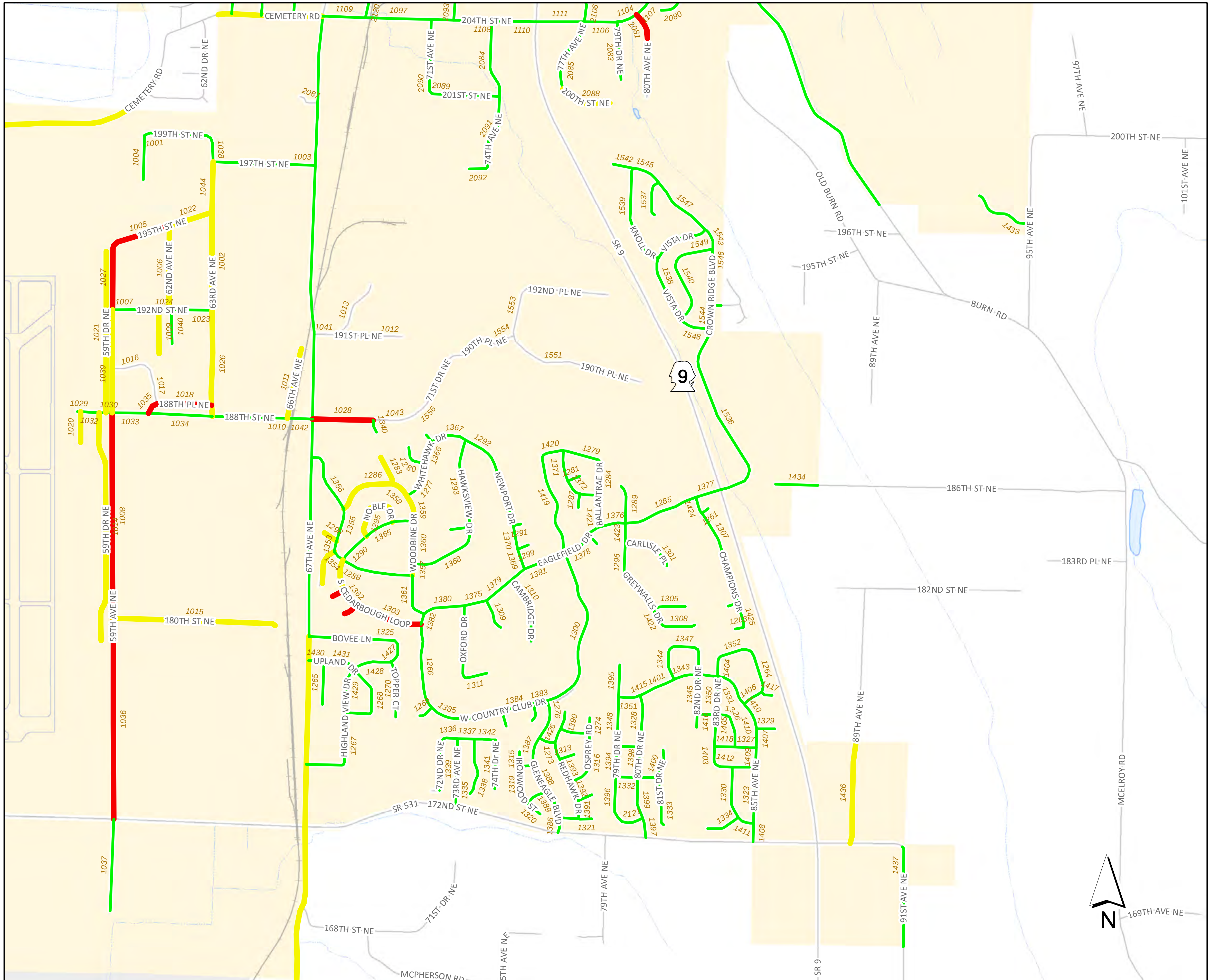


City of Arlington
Figure 7

City Road Condition Index

Southeast Section

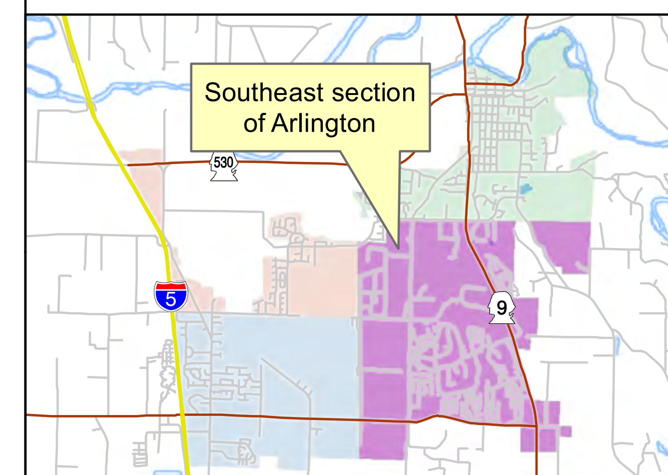
Legend

Road Conditions

- Reconstruction (Estimated 0 to 40 PCI)
- Preservation (Estimated 40 to 85 PCI)
- No Action

Segments labeled by ID#

Marysville City Limits



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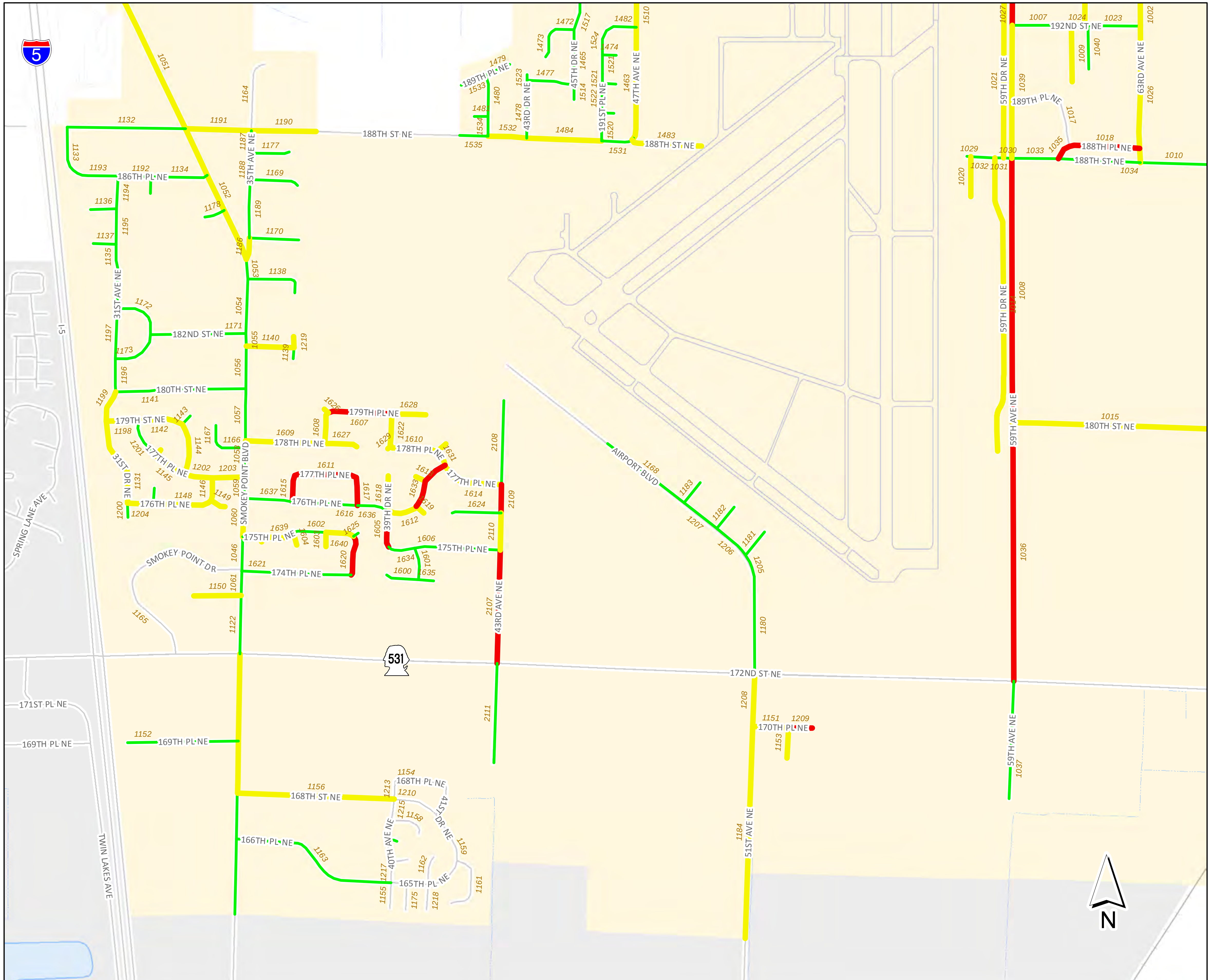


City of Arlington
Figure 8

City Road Condition Index
Southwest Section

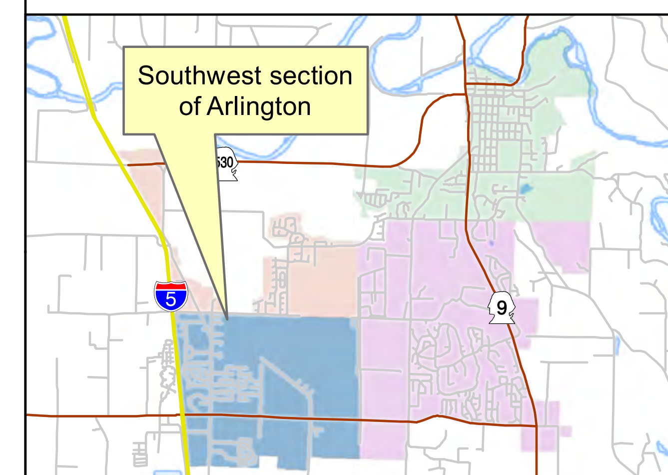
Legend

Road Conditions

- Reconstruction (Estimated 0 to 40 PCI)
- Preservation (Estimated 40 to 85 PCI)
- No Action

Segments labeled by ID#

Marysville City Limits



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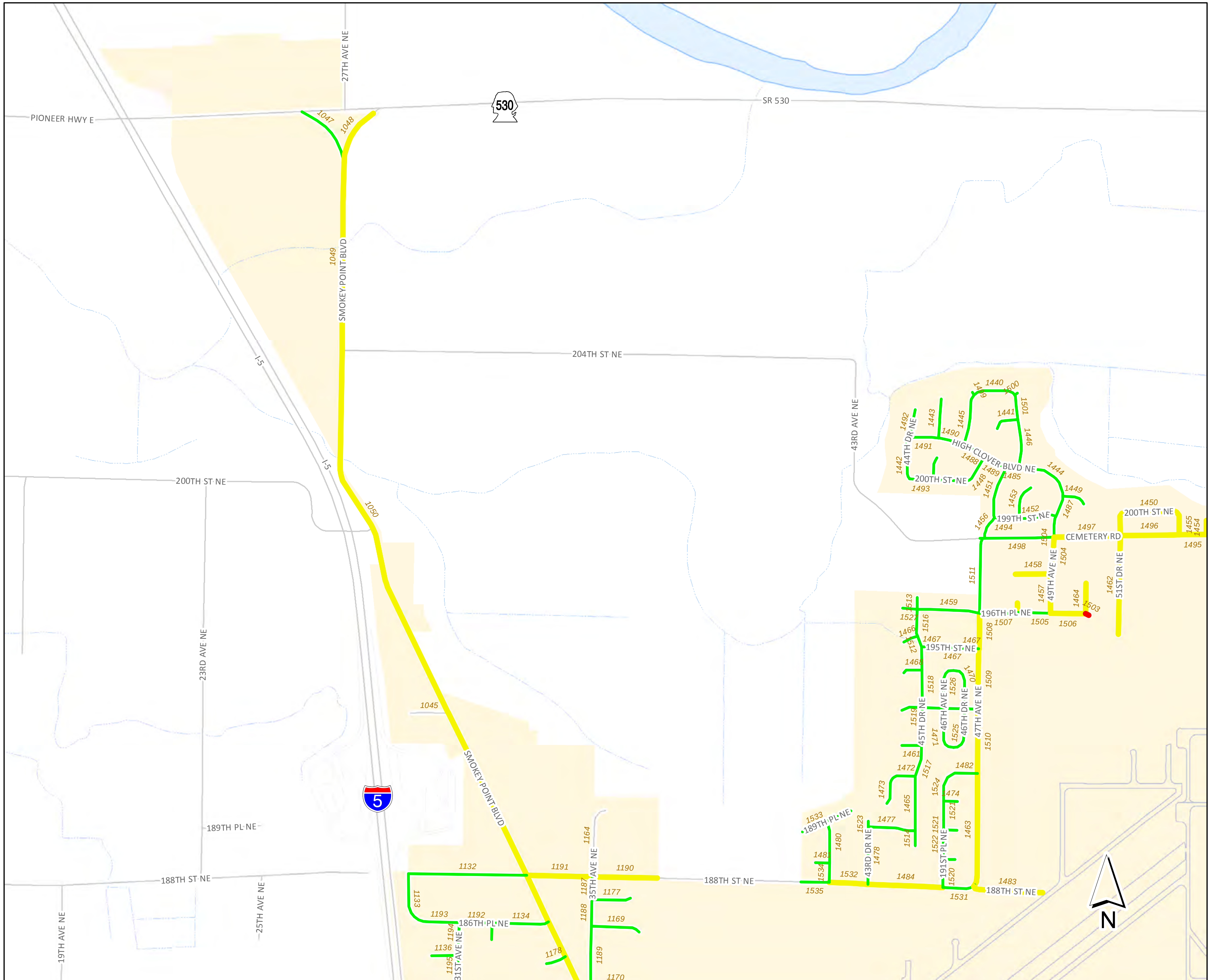


City of Arlington
Figure 9

City Road Condition Index
Northwest Section

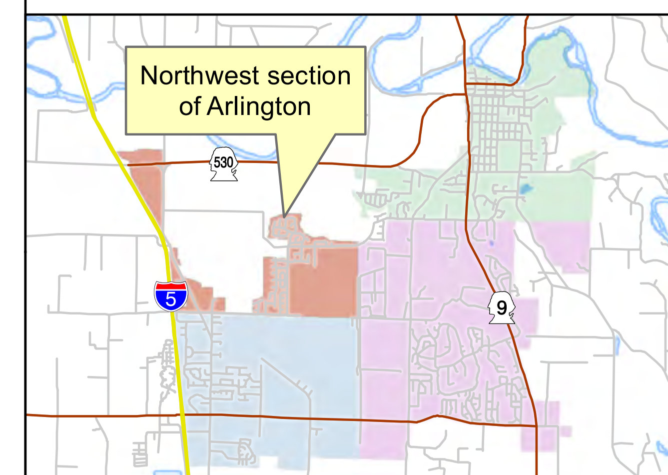
Legend

Road Conditions

- Reconstruction (Estimated 0 to 40 PCI)
- Preservation (Estimated 40 to 85 PCI)
- No Action

Segments labeled by ID#

- Marysville City Limits



Scale: 1 in = 1,000 feet

Date: 08/28/2013

File: Fig9NWRoadCon11X17_13.mxd

Drawn by: kdh

Appendix B

Cartegraph Pavement Module Summary

Cartègraph

PAVEMENTview and PAVEMENTview Plus Calculation Overview

DOCUMENT HISTORY

01/06/2012 Initial release.

Technical Support
877.647.3050
support@cartegraph.com
www.cartegraph.com

Table of Contents

About Inspections

Inspections provides a way to better manage your organization's assets by planning and predicting.

Cartegraph inspections determine the performance or Overall Condition Index (OCI) of an asset over its life cycle and the estimated deterioration of each condition category for the asset.

The inspection data entered provides the OCI and the event activities dictate the deterioration curve.

Each Cartegraph asset contains a child recordset to hold inspection records. The inspection results for Signs and Markings are stored in the child recordset. For all other assets, the Condition Category grandchild recordset contains the inspection results.

Condition Categories list the attributes inspected. For example, Storm Pipe connections and debris are Condition Categories. The Condition Category library contains the attribute weight used to calculate the OCI. The relationship between the numeric index value and the descriptive rating is a child recordset of the Condition Category library. Once the Condition Categories and Ratings are established for each asset the OCR can be determined.

The results of the Condition Category inspection can be input as:

- **Index**—an objective, numeric value.
- **Rating**—a subjective description such as Good, Fair, or Poor.

PAVEMENT*view* Inspection Index Settings Overview

TO CUSTOMIZE THE SETTINGS USED TO EVALUATE THE CURRENT CONDITIONS OF SEGMENTS:

1. Set Functional Classifications.
2. Set Minimum Condition.
3. Set Conditions, Rankings and Impacts.
4. Set Distresses.
5. Set Corrected Deduct Values.
6. Set Performance.
7. Set Prediction Group. determine the deterioration curve used to predict the remaining life of a segment. Records are selected for membership in a prediction group based on the contents of a filter. Normally these filters select records based on the segment pavement classification.
8. Record inspections and evaluate current conditions.
    - Inspection results
    - Detailed distress observations
    - Distress index calculation (optional)
    - OCI calculation (optional)
    - Recalculate inspection indexes (optional)
9. Predict future performance.
10. Generate reports and review data.

About Functional Classifications

The data in this library characterizes the pavement segment based on its physical attributes such as lane, shoulder, right-of-way, and the type of traffic it carries. For example, Arterial and Residential.

AASHTO classes are listed in this library and used to calculate an ESAL value for the road segment.

Add segment priority data to new functional classifications for PAVEMENT*view* Plus to calculate priority. This value is used during PAVEMENT*view* Plus analysis to prioritize the work to be performed. Normally, the segment priority is the only value in this table that is changed.

About Minimum Conditions

The Minimum Condition establishes the point an asset is considered below the minimum acceptable condition—or failure point. The minimum condition applied to a particular asset is based on the contents of the filter stored in the library. Normally selection criteria is based on an organization's needs. Apply additional selection criteria by customizing the filter. Open the dialog box from the **Tools** menu, **Shared Options>Minimum Conditions**.

For SIGN*view* only, signs that do not meet the filter criteria in the grid, the fields at the bottom of the Minimum Condition window determine when a sign in that Minimum Condition group fails.

The minimum condition requirements:

- **Name**—The name of the minimum condition.
- **Index**—Lowest point at which the condition is deemed acceptable. If the index calculation results in a value lower than this, the condition is unacceptable.
- **Rating**—Rating point that corresponds to the lowest point at which the condition is deemed acceptable.
- **Filter**—Criteria used to select assets.
- **Color** (MARKING*view* only)—Lowest color value at which the condition is deemed acceptable.
- RL (MARKING*view* only)—Lowest RL value at which the condition is deemed acceptable.
- **Min Legend Ra** (SIGN*view* only)—Lowest Legend Ra result that meets the filter conditions.
- **Min Background Ra** (SIGN*view* only)—Acceptable minimum Background Ra inspection result that meets the filter conditions.
- **Min Contrast Ratio** (SIGN*view* only)—calculated as Legend Ra divided by Background Ra. The Contrast ratio does not calculate without a Minimum Legend or Minimum Background. If the Background Ra reaches zero, that Contract Ratio curve calculation ends.

About Condition Category Library

- Condition categories are characteristics observed during inspections and used to estimated asset deterioration. The weight indicates the affect of the condition category in the OCI.
- Create Condition Categories if your organization inspects for characteristics not found in the startup data. Assign the new Condition Category a weight for use in OCI Calculations.
- Change Condition Category weights if your organization places more or less emphasis on a particular condition when assessing OCI.
- Impacts and Rankings are child recordsets to this library and are shown in the lower portion of this dialog box.

About Condition Category Rankings

Cartegraph's standard inspection methodology uses Condition Category Rankings to specify the rating scale for each condition category measured during an inspection event.

The index values associated to each condition category rating affect the Overall Condition Rating.

All ratings are stored in the Overall Ratings table.

Setup Condition Category Rankings from the Tools menu, Shared Options>Conditions, Rankings and Impacts.

About PAVEMENT*view* Detailed Distress Observations

The Distresses library data is based on the U.S. Army Corps of Engineers Pavement Maintenance Management System. This data becomes the basis for the calculation of the Distress inspection index used in the overall segment OCI. Use this library of data to view the information and illustrations for detailed distress inspections.

The calculations for the distress condition category and the OCI for the segment are based on the data and methods described in the U.S. Army Corps of Engineers Pavement Maintenance Management System.

NOTE: *The Segment Length and Segment Width must be populated to calculate the distress index.*

Distresses are measured according to the guidelines found in the USACERL Technical Report M-90-05. The data entered represents the percent of the sample affected by the distress:

> Rutting affects 250 ft^2 of a 1000 ft^2 sample. This represents 25 percent of the sample. Do not enter the measurement. Calculate the portion of the segment affected by the distress and enter that value: In this case 250/1000 or 25 for 25 percent.

PAVEMENT*view* Distress Index Calculations

The calculations of the index for the Distress condition category are based on the data and methods described in the U.S. Army Corps of Engineers Pavement Maintenance Management System and ASTM D-6433-03 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys.

For each distress record the deduct points are determined. The contents of the extent and severity fields are interpolated with the deduct points table for that distress. Distress information is stored in the Distresses library.

Continue to enter distress data for the sample.

The total of deduct points is calculated. A count of distresses with deduct value that is greater than 2 is stored as Q.

- If no deduct values or only one deduct value is over 2, then the total deduct value is used to calculate the distress index.
- If there is more than one deduct value >2, then the number of deduct values (m) to use is determined:

    M=(1 + 9/98)(100-Highest individual deduct value)

Q is determined based on the first m deducts. The value for a sample's total Corrected Deduct Value (CDV) and Q value is interpolated on the Corrected Deduct Values table. This number represents the distress index for the sample.

Example

The following information is entered for a sample:

- Distress: AAC Fatigue (alligator) Cracking
- Severity: Low
- Extent: 5 (five percent of the sample is affected with this condition)
- Deduct Points: 25

The following information is entered for a sample:

Distress	Severity	Extent	Deduct Value	Is Deduct Value >2? Yes = 1 (Determine Q)
AAC Fatigue (alligator) Cracking	Moderate	5	25	1
AAC Block Cracking	Low	20	13	1
AAC Edge Cracking	Moderate	0.3	4.75	0
Total Deduct Value			42.75	Q2
Corrected Deduct Value			52.25	

The distress index for the pavement segment is moved to the Inspection form Condition tab, and the OCI is calculated.

About Corrected Deduct Values

The upper portion of the Pavement Classifications\Corrected Deduct Values library shows the various Pavement Classifications. The lower portion displays the Corrected Deduct Values for the selected Pavement Classification. The values in this library are derived from the corrected deduct values found in the USACERL Manual. The Cartegraph library stores 100, the USACERL corrected deduct value.

The total Deduct Value is the sum of the deduct point for all of the distresses in a sample. Q1,Q2,Q3... represent the number of distresses in the sample that have a deduct value over 2.

The value for a samples total Deduct Value and Q value is interpolated on the Corrected Deduct Values table. This number represents the distress index for the sample.

About PAVEMENT*view* Recalculate Inspection Indexes

For each asset in the current filtered set, this action updates the index fields for each record and each record, updates the index field in the distress record in the Segments\Inspections\Survey Categories recordset (viewable on the Inspections form, Condition tab, Inspection Types grid), and updates the OCI for each inspection. The calculations are as follows:

1. For each record in the Distress recordset, the index is being recalculated by looking up the record's extent in the Distress Library\Points data for that distress. If the exact value is not found in the points data, the severity value is interpolated from the severity values for the extents that the distress record's extent falls between. The interpolated severity value is saved in the Index field for the distress record. Interpolation is done straight line using the standard formula y = slope * x + offset, where x is extent, y is severity and slope is (upper severity - lower severity) / (upper extent - lower extent). The severity value is pulled from the severity column corresponding to the reported severity in that distress record.
2. For each parent sample record, the index (a/k/a sample PCI) is recalculated. To do this, the system first calculates the total deduct value by summing the indexes of all child distress records. The actual index for the sample is then calculated by looking up the total deduct value in the Pavement Classification\Corrected Deduct Values data for the pavement class the segment belongs to and finds its corresponding deduct value. Note that although named Corrected Deduct Values (CDV), this recordset actually contains the sample index, in other words 100 - CDV. The field the index is found in depends on the number of distress records with a deduct value greater than 5. For example, if the number of distress records with a deduct value greater than 5 is 4, then the 100 - corrected deduct value is pulled from the Q4 field in the Pavement Classifications\Corrected Deduct Values recordset. As with step 1 above, if the

total deduct value is not found in the recordset, its value is interpolated. If the CDV is less than the highest individual distress index value for the sample (in other words, 100-CDV is >100—the distress record with the lowest distress value), the sample index is then 100—the highest distress index. If there are no distress records with an index value greater than 5 or if values are missing needed to calculate the sample index, the sample index is 100—the total deduct value.

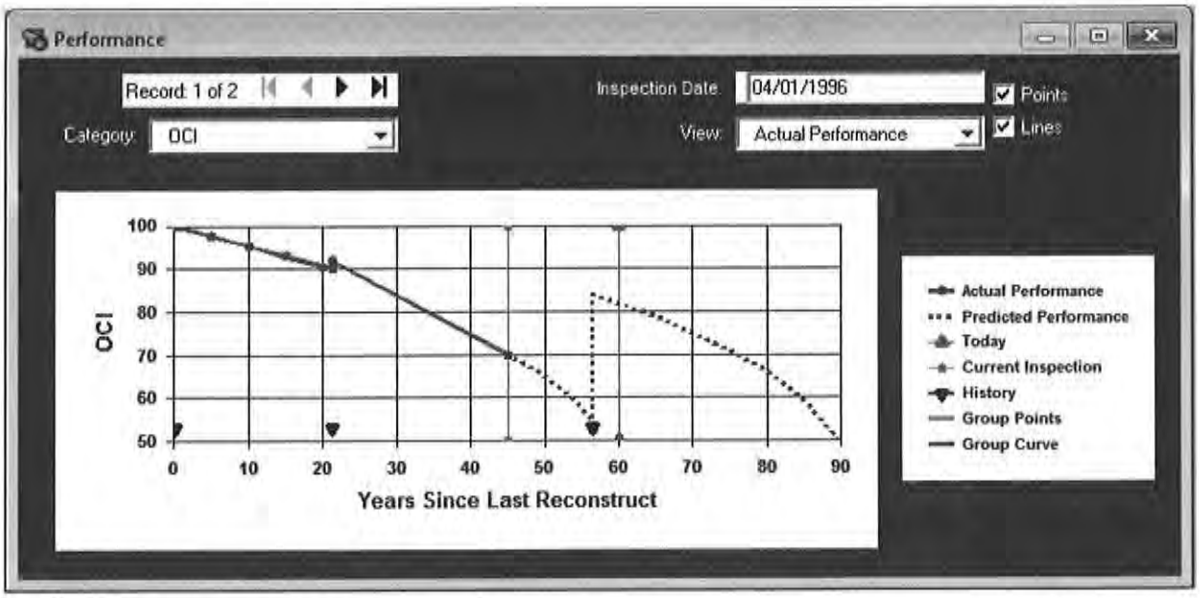
3. For each parent inspection record, the index field in the child Survey Category record for the condition category Distress is calculated using the following Army Corps of Engineers formula: ((N-A)*PCI1+A*PCI2)/N where N equals the total number of sample units in the section, A=the number of additional samples inspected. For example, the number of records in the samples recordset where the type is something other than random. PCI1 is the average PCI of the random samples. For example, the average of the indices of those sample records where the type is random. PCI2 is the average PCI of the additional samples. For example, the average of the indices of those sample records where the type is something other than random. Because there is no one standard way for determining the total number of sample units, our scripts say if the segment width is less than 15 feet, the sample length should be 150 feet. The number of samples therefore being the segment length in feet/150 feet, rounded to the nearest whole number, if the asset width is between 15 and 35 feet, the sample length should be 100 feet and if the segment width is greater than 35 feet, the sample length should be 50 feet.
4. For the same parent inspection record, the OCI is calculated as a weighted average of the conditions found in its Survey Categories child recordset. This uses the same formula as calculating OCI on the Condition form from the Today's Conditions recordset. If either the weight is null or 0 or there is no Survey Category record for a condition category or the index for the condition category in the Survey Category record is null, that condition category is ignored completely when calculating OCI. Its weight is not included in the total weight and any index is not included in the total weighted index.

   NOTE: *Because the Today's Conditions recordset is calculated from the Prediction Group data and from all inspections from the last installation of the asset, not just the most recent inspection, the OCI on the Condition form may differ from the OCI on the Inspection form even where there is only one inspection and that inspection occurred today. This is especially true when only some of the weighted condition categories are included in the most recent inspection. The missing condition categories are aged according to the Prediction Group data, and included in the Condition form OCI. The missing condition categories are excluded from the Inspection form OCI.*

Performance Graph

The performance graph displays the results of the estimated condition calculations for an asset and for the prediction group. You must run Recalculate Estimated Conditions to view the latest data. This chart is shown on the form below. It is also on the Performance report.

The group points and lines are based on the inspections OCIs not the weighted-averages of all the condition categories. For example, if an inspection only has an index listed for one condition category but has multiple condition categories with weights and curves, the OCI on the inspection only reflect the value of the inspected condition category. The actual and predicted curves on the chart, however, take all of the condition categories into account in addition to the inspected condition category.



- **Group Points**—The light blue dots indicate the actual inspection results for all the assets in the prediction group. To hide these points, select Group Points in the View field and clear the Points check box. This information is shown on the last page for each performance group in the Asset Performance Report.
- **Actual Performance**—By default, the actual performance of an asset is shown with a solid red line. This line represents the asset's inspection results.
- **Category**—The value in this field indicates the condition category shown on the graph. In this case the graph represents the OCI of the asset and all assets in the prediction group. Select a different condition category to display on the graph.
- **Current Inspection**—The vertical pink line represents the date the last inspection was performed. This line is shown for each asset page on the Performance Report.
- **Group Curve**—The solid blue line indicates the performance of all assets in the prediction group. To turn this line off, select Group Curve in the View field and clear the Lines check box. This information is shown on the last page for each performance group in the Performance Report.
- **History**—The black triangles represent the dates of completed events entered for the asset. These dates may represent the origin date, replace or reconstruction date, or the date maintenance was performed. These points are shown for each segment page on the Performance Report.
- **Horizontal Scale**—The horizontal or X-axis of the performance graph is used to plot the time of the index. The chart begins in the year the asset was last reconstructed. The termination point of the X-axis depends on the expected life of the other assets in the same prediction group.
- **Impact**—If the asset has an event which improves the condition, it displays in the performance graph.
- **Predicted Performance**—The dotted red line indicates the predicted performance of the asset from the date of the current inspection to the date the segment fails. This line displays for each asset page on the Performance Report.
- **Today**—The vertical green line indicates today's date on the x-axis. This line is shown for each asset page on the Performance Report.
- **Vertical Scale**—The vertical or Y-axis of the performance graph is used to plot the index values for the condition category chosen above. The Y-axis begins ten points below the failure point for the prediction group of the current segment, and ends at 100. The higher the point on the chart, the better the condition of the asset.

- **View**—Use these settings to view the data type indicated. If both the Points and Lines check boxes are cleared, the View data type is hidden.

PAVEMENT*view* Deterioration Models

Deterministic, probabilistic, or other types of models for projecting the future condition of asset elements, components, or the overall structure:

- **Deterministic Deterioration Model**—Determines the condition of a bridge element, component or overall structure given the values of variables believed to influence its deterioration and assuming perfect knowledge of these variables.
- **Empirical Model**—A model derived from field or experimental data which statistically relates some variable to the factors believed to account for the variation in that variable.
- **Markov Chain**—The Markovian approach utilizes transition probabilities that define the probability that an Item will deteriorate from one condition state to another.
- **Probabilistic Deterioration Model**—Estimates the probability or likelihood of different condition levels of a bridge element, component or overall structure on the basis of variables believed to influence its deterioration.

About Deterioration Curves

- Deterioration curves track asset performance for individual condition categories over time.
- The deterioration data is stored in prediction groups. You assign your asset to a prediction group based on the filter.
- The curve is graphed using Index and Years in Service (Age). Set the options on the Performance dialog box accessed through the Tools menu, Shared Options>Performance.
- When you set up performance curves using the performance dialog box, each condition category curve is combined, through a weighted average, to generate the Overall Condition Index curve.
- The performance curves reflect the anticipated deterioration of each Condition Category, and as a result the Overall Condition Index, if no maintenance is done to that asset. The weights assigned to each Condition Category help determine the OCI curve. Each curve is comprised of an Age (in years) and an Index. Age values should begin at 0 and end at the asset's anticipated expiration age. Index values should begin at 100 and end at 0.

About Prediction Groups

The Performance library contains deterioration data used to predict the asset's OCI and remaining life. The data for each prediction group describes the theoretical performance and remaining life of an asset for various condition categories. Prediction groups are a family of assets that deteriorate in similar ways and affected by conditions categories in the same way. Records are placed in a prediction group based on the contents of a filter. Edit the filters to change the way assets are selected for a prediction group.

About Estimated Conditions Calculations

When the Estimated Condition Action is run for a single asset or for all assets—the values in the following fields are cleared:

- Prediction Group
- Condition Group
- Replace Before
- Today's OCI

A Condition Group is selected based on the contents of the Minimum Condition library. A Prediction Group is selected based on the contents of the Performance library. If a Prediction or Condition Group cannot be found for the asset, no calculations are performed.

The Performance Curve is shifted if the current inspection is better or worse than the curve predicts. The age of the asset as of today is plotted on the adjusted curve. These results are stored in the Today's OCI field.

The point where the adjusted curve falls below the minimum index for that asset type is stored in the Replace Before field.

About Calculations

Condition assessments calculate the Overall Condition Index (OCI) for an asset. OCI is calculated for the date of the inspection. The minimum condition is used to calculate the asset's failure point. Additional data is used to determine the estimated condition of an asset as of today, and the point at which the asset fails. Inspection(s) should have data for every condition category with weights and a performance curve.

NOTE: *For segments with an inspection record, Detailed Distress observations are optional.*

OCI Calculations

The Weight, or relative importance, of an Index is stored in the Condition Category library. The OCI is the result of dividing the sum of the weighted condition category indexes by the sum of the weights used.

Use higher Weight values to increase the relative importance of a Condition Category when calculating OCI. Use lower Weight values to decrease the relative importance of a Condition Category when calculating OCI.

Null or zero values in Index or Weight have special effects on OCI:

If the Index is	If the Weight is	Effect on OCI
NULL	a number	Condition Category not used to calculate OCI
0	a number	Index of 0 used to calculated OCI
a number	NULL	Condition Category not used to calculate OCI
a number	0	Condition Category not used to calculate OCI

Once the OCI is calculated, it is used to lookup the Overall Condition Rating (OCR) is stored in the Overall Ratings library.

Inspection Setup Overview

TO SETUP THE INSPECTION PROCESS FOR YOUR ORGANIZATION:

1. Setup Overall Ratings.
2. Setup Condition Categories and assign a weight to each condition category.
3. Setup the Ranking for each Condition Category to set the measurement scale.
4. Add the activities that affect the condition categories.
5. Assign an impact to each activity.
6. Setup Prediction Groups.
7. After setting up individual curves, review the OCI line for each prediction group and use that information to set the Minimum Conditions.
8. Verify the asset has an Origin date, Replace date, or both before performing any calculations.
9. Verify data is populated in the asset record so that records are included in the prediction group.

10. Open the **Condition** form and click **Calculate**. All information about the asset fills in on the Condition form and displays Today's OCI, Rehabilitate Before, and Remaining Life.

    NOTE: *There are additional fields on the SIGNview and MARKINGview version of the form.*

11. From the flex form, click **Performance** to view the individual condition categories of the asset and how they are deteriorating.
12. If you add an activity that impacts the condition category to the Event table, those actual and predicted activities affect your performance chart and Today's Condition calculations.

About Overall Ratings

Cartegraph's standard inspection methodology uses Overall Condition Rating to specify the Index and Rating scale for all assets of the same type.

The index values associated to each condition category rating affect the Overall Condition Rating.

All ratings are stored within the Overall Ratings table. However only ratings with a corresponding index value are included in an asset's Overall Condition Rating calculation.

Setup Overall Ratings from the Tools menu, Shared Options>Overall Ratings.

About Index and Ratings

Inspection Index and Rating are tied together.

- OCR is based on the OCI value
- Index entry determines the Rating
- Rating entry determines Index

The Condition Category grid includes a status field indicating whether Index or Rating was input. You cannot input both Input and Rating, the last value entered calculates the other.

Index and Rating

In the library, each Rating is paired with the Minimum Index that earns that Rating. The list of Minimum Index values calculates a range of Indexes that earn a rating. See the example below:

Minimum Index	Range	Rating
85	85 - 100	Excellent
60	60 - 84	Acceptable
45	45-59	Marginal
0	0-44	Failed

- If an inspection has an index of 93 the rating is Excellent (greater than 85)
- If an inspection has an index of 85, the rating is Excellent (is equal to 85)
- If an inspection has an index of 65, the rating is Acceptable (less than 85, but more than 60)
- If an inspection has an index of 42, the rating is Failed (less than 45)
- If an inspection has a rating of Excellent , the index is 100
- If an inspection has a rating of Acceptable , the index is 84
- If an inspection has a rating of Marginal, the index is 59
- An asset's Overall Condition Rating is determined in the same way, using the Overall Ratings library.

About the Activity Impact on Asset Condition

Activities are performed to extend the asset's life. The Asset Condition Categories\Impact library contains the impact of activities that extends the asset life. The activity's impact is calculated to update that individual condition category.

The impacts affect the individual condition category, not the overall rating.

Activities' impacts display on the Performance charts and are part of estimating future conditions.

NOTE: *For PAVEMENTview enter all the activities that effect the segment's ride.*

Impacts are expressed as:

- absolute—resets the index to the number indicated
- relative—increases the index by the number indicated
- %— increases the index by the percent indicated

For example, an asset has a condition category index of 50. A maintenance activity is performed with an impact factor of 75%. The estimated index for the condition category increases by 75% to 87.5.

About the Condition Form

This form allows users to view the predicted condition of their asset.

Based on the Prediction Group, Condition Category Curves, and Minimum Condition Group, the software shows the predicted condition for each Condition Category with a curve, as well as the Overall Condition Index based on the weighted average of the condition category values.

The predicted values are based on:

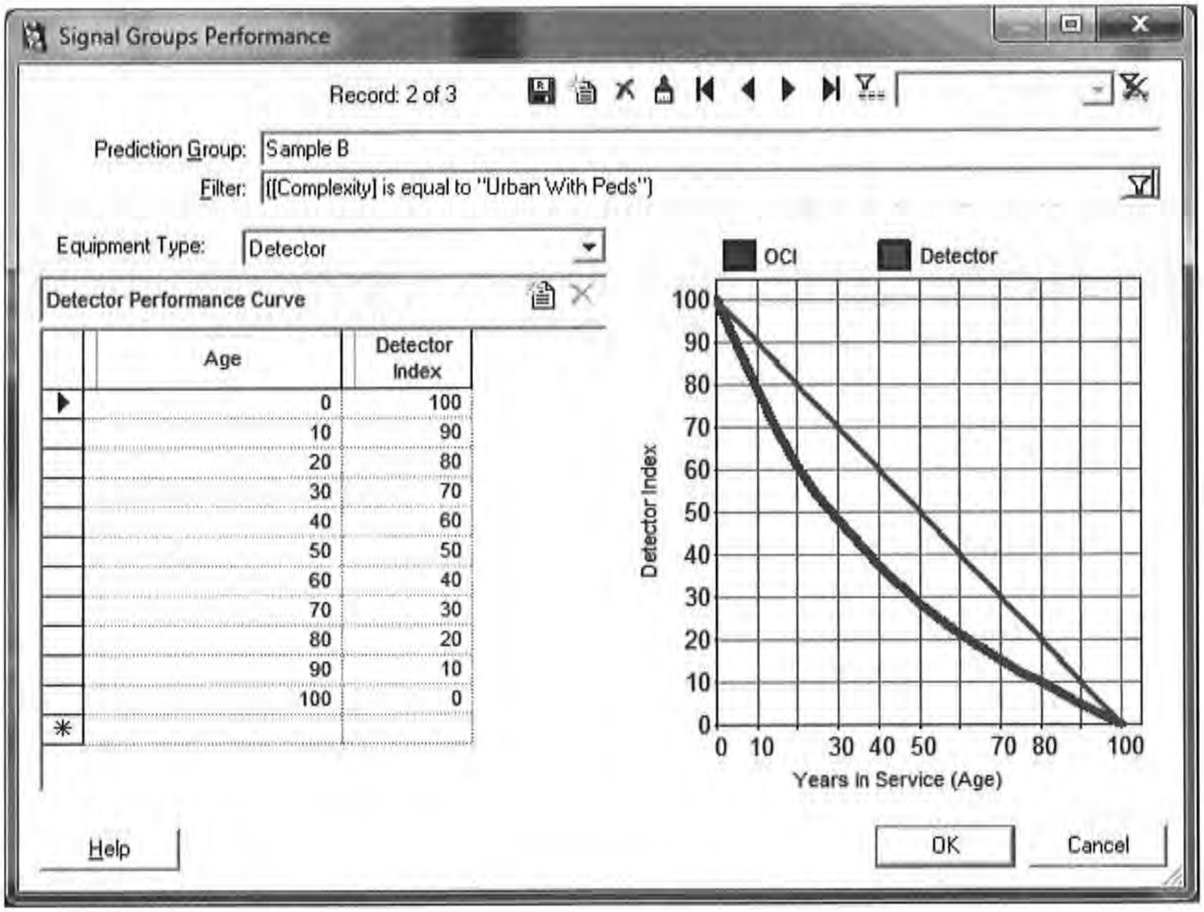
- Creation or replacement year—For example, when the asset was created or replaced as a starting point for the curve.
- Curve—For example, how the specific condition deteriorates over time.
- Weight—For example, how much of an impact does the condition category have on the overall condition of the asset.
- Activities and Impacts—How performing a maintenance activity improves a specific condition category index.
- Inspection records—What was the last known index of a particular condition category. If the condition category was never inspected, but has a curve as part of the prediction group setup, today's predicted index is based on the established curve. If any inspections or activities and impacts occurred since the replaced date, they are included in determining the predicted index.

Remaining life and Replace before values determine the amount of time it takes for the asset to reach its established Minimum Condition value based on the individual condition category curves.

Today's OCI Example

Below is an example of how Today's OCI is calculated.

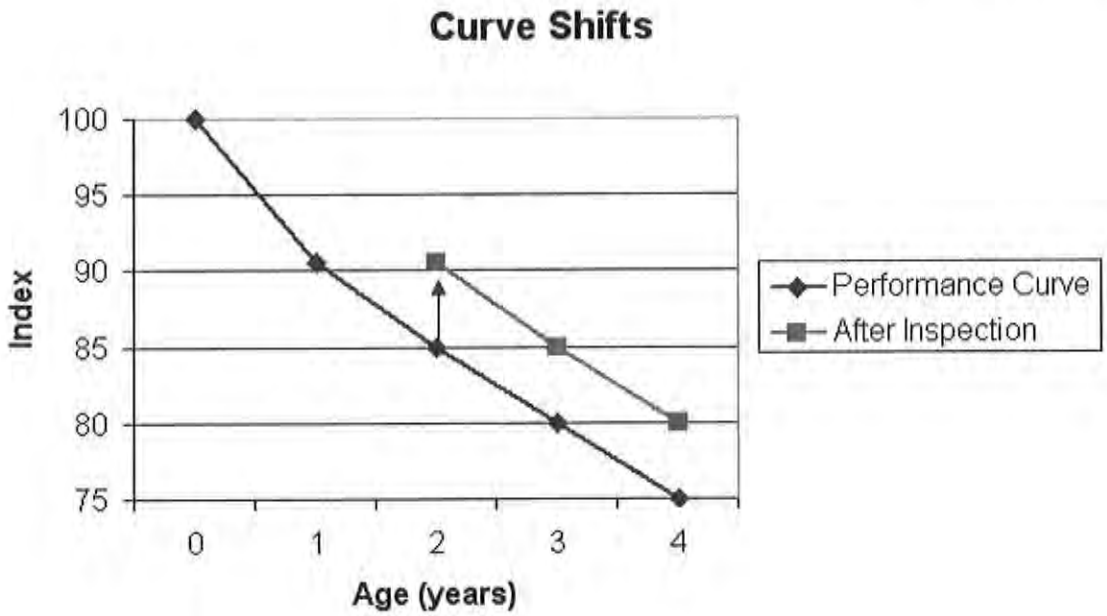
An asset is 2 1/2 years old and belongs to Prediction Group Sample B.



The age of the segment is estimated with the Performance Curve data. In this case, the Distress Index for year 2.5 is calculated as 98.

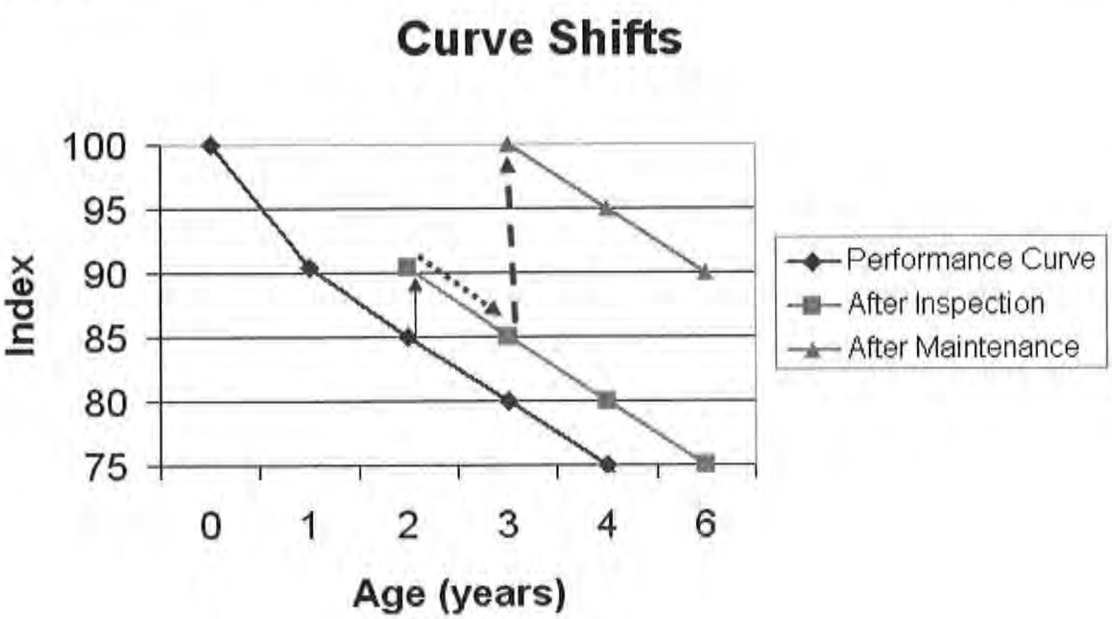
NOTE: *The system calculates date differences using a 365 day year. This does not take leap-year days into account. Differences between system calculated and manually calculated condition estimates are .01 or less in a four year period.*

Adjustments to conditions are made based on inspection results. If an inspection for any condition was done since the asset was installed or replaced and the asset has a different condition index than predicted by the curve, the curve shifts vertically so that the actual inspection index lines up with the date of the inspection.



In this illustration the performance curve estimated the index for year two at 85. An inspection in year two showed that the actual index was 90. The curve was shifted upward, indicated by the red arrow. The estimated condition uses the After Inspection line for the index value.

Additional adjustments to the index are made based on the impacts of maintenance activities that occurred after the inspection.



The asset continues to age according to the After Inspection line, indicated by the dotted red line. In this case, it ages from 90 in year two to 85 in year three.

A maintenance activity occurred in year three. The After Maintenance index (indicated by green line) improves as indicated in the Impacts recordset for the condition category. In this case the index is improved to 100. This shift is indicated by the dashed red line.

The final index uses the After Maintenance curve to determine today's condition.

The calculations above are performed for each condition category.

An OCI is calculated for the asset. OCI is calculated for the next year, on the anniversary date of the last replace or install date until the OCI drops below the minimum index for the asset's Condition Group.

The year when the OCI drops below the minimum index, found in the Minimum Conditions library, displays in the Replace Before field. If the asset does not have a valid Prediction group, the asset deteriorates to an OCI of zero and that date is stored in the Replace Before field.

- The Minimum Condition Group library stores the data which determines the point an asset needs repair or replacement.
- The Replace Before field is set to the date the asset's OCI goes below the minimum index for the condition category the asset belongs to, or 0 if the asset does not belong to a condition category.
- To prevent infinite calculations in case the OCI increases, the system stops the check at 110 years from the install or replace date.
- Since the OCI is a weighted average of all condition indexes for that date, this process first calculates the index for each condition category for that year.

Customize Inspection Calculation Settings Overview

TO CUSTOMIZE THE SETTINGS USED TO CALCULATE INSPECTION OCI AND OCR AND APPLY THE NEW SETTINGS TO EXISTING INSPECTIONS:

1. Add or change Condition Category Weights.
2. Add or change the Index and Rating.
3. Recalculate Inspection Indexes.

PAVEMENT*view* Plus Calculations Overview

TO SETUP PAVEMENT*VIEW* PLUS CALCULATIONS:

1. Select segments for analysis.

   The Segments recordset is filtered using the filter statements found in the Model Scopes library. Analysis is performed on the selected segments.

2. A Condition Estimate (or OCI) is calculated for the segment.

   For each selected segment, a new estimated condition is calculated for the beginning of each plan year. Inspections and maintenance performed since the last install / replace date are factored into the calculation. These calculations are based on the Performance Curve and Condition Categories\Impacts library data using the same methods as PAVEMENT*view*'s recalculate conditions action. The upper part of the Planning Form includes the beginning OCI for each segment. The network OCI for the segments is calculated and stored as Unimproved Network OCI the Scenario\Network OCI Schedules recordset.

3. Maintenance activities are suggested.

   Based on the estimated condition results the segment is compared to the contents of the MR&R Protocols library. Proposed activities are selected and stored, and are part of the Details for selected plan item on the Planning form. Using data from the Activities library, a cost is calculated for each selected activity.

4. Activities are excluded from further analysis based on the data in the MR&R Protocols\Disallowed library.

   For each segment record the proposed activities are reviewed.

5. The NPR (Network Priority Ranking) for the segment is calculated.

   This ranking combines OCI with other factors to establish the relative ranking of the maintenance needs for this segment. The calculation is based on the contents of the Segment NPR Parameters calculation library.

6. For each segment in NPR/Do Best First order: Activities not eliminated by the Preemption data are selected for the plan.

   If scenario is not OCI driven they are selected as long as the budget type contains enough money. If OCI driven, activities are selected until the network achieves target OCI.

7. For activities selected the Indexes for condition categories is increased according to the contents of the Condition Categories\Impacts library at the beginning of the plan year. A new Improved OCI is calculated and stored on the planning form.

8. The Network OCI is calculated. This calculation provides an overview of the condition of the segment inventory at the beginning of the plan year.

9. The condition of the segment is updated for the end of the plan year using Performance Curve data. This is the basis for the analysis for the next plan year.

10. Locking

    Once the maintenance priorities have been calculated and maintenance activities proposed, users can lock a segment. This means that the activities marked for the selected segment will automatically be selected for performance during future analysis. This allows users maximum flexibility when planning future maintenance requirements.

Segment Analysis Scenarios Overview

Before you begin: create settings for Activities, Model Scopes, Budget Plans, and MR&R Protocol.

TO CREATE OR UPDATE AN ANALYSIS MODEL AND THE SCENARIOS IT USES:

1. Open the **Segment Analysis** form.
2. Navigate to an existing model or create a new Model ID.
3. Enter the Start Date. This is the date when analysis begins.
4. Enter the **Model Scope** that selects the segments included in the analysis.

   Enter the analysis model Description.
5. Click **Save Model.**
6. Enter a Scenario name.
7. Enter or select a **Protocol**. MR&R Protocols determine which activities are included in the analysis.
8. Enter the Time Frame or number of years to analyze.

   *Select the **Do Best First** check box if maintenance priority is given to segments with a higher OCI. Leave this blank if the priority is given to segments in poor condition.*
9. Select the **Is OCI Driven** check box if this scenario calculates the activities and budgets needed to achieve a target network OCI.

   Or, if this scenario determines the activities that can be done with available funds, enter or select a **Budget**.

   *Enter the **Inflation** Factor. This factor is entered as a whole number and converted to a percent when used in calculations. For example, if you enter 2.9, the calculations use 1.029.*

   *Enter the **interest rate** to be used in the analysis. This is entered as a whole number and converted to a percent when used in calculations. For example, if you enter 2.9, the calculations use 1.029.*
10. Click  on the Scenarios toolbar.

    For OCI driven analyses, in the Network OCI Schedules Grid enter the Plan Year and the Target Network OCI for that plan year. You do not have to enter a Target Network OCI for each plan year. If no value is entered for a plan year, the Target Network OCI is set to the value for the previous year.

    Click .

    Repeat from step 6 for each scenario. Different scenarios normally reflect different budget amounts. This provides objective information to determine the appropriate funding level and the impact on the Network OCI.
11. Click **Save Model**.

NOTE: *Cartegraph recommends occasionally deleting old planned items, especially if plan items are for more than three years. This avoids creating duplicate OIDs and storing large outdated files.*

Segment Fields Required for PAVEMENT*view* Plus Analysis

Segments must have the following fields populated to be included in PAVEMENTview Plus analysis:

- **Pavement Classification** or other field used to determine Prediction Group. This field is often used to select segments in the Decision Matrix.
- **Functional Classification** or other field used to select segment's Minimum Condition. This field is often used by PAVEMENT*view* Plus to determine a segment's priority and NPR.
- **Segment Length, Segment Width**, and **Segment Area.**
- **Origin** and **Reconstruct Date**—date assigned to a segment when it has an Install or Replace event.
- **Prediction Group**—analysis calculations can be performed only if segments qualify for a prediction group.
- **Route**-it isn't technically required. The easiest way to identify the segments location.

About Selecting Segments

The Segments recordset is filtered using the filter statements found in the Model Scopes library. Analysis is performed on the selected segments.

About Model Scope

The Model Scopes library contains filters to select analyzed segments. Model Scopes are most often used to select a portion of the pavement network for analysis. Common selection filters may identify segments that qualify for Federal Matching Fund budgets, or to identify a district's segments.

About Network OCI

The Network OCI is calculated for all plan years. By comparing Network OCIs for different scenarios you can determine the plan's most effective maintenance activities. The Network OCI for each plan year is shown on the Segment Analysis form and Budget Summary report.

Network OCI is the weighted average of the predicted OCI for all segments selected by the model scope filter. The pavement area is used to weight the segment's predicted OCI at the end of the analysis.

Network OCI example:

	Predicted OCI	Segment Area	Product
Segment 1	68	8432	573376
Segment 2	42	2464	103488
Segment 3	93	5692	529356
Sum		16588	1206220
Network OCI			72.72

Budget-Based and OCI-Driven Activity Selection

Analysis scenarios select activities based on your budget or a target OCI:

- Use a budget-based scenario to determine the Network OCI is achieved with available funds.
- Use an OCI-driven scenario to determine how much it costs to achieve a target OCI.

Your analysis can include both OCI-driven and budget-based scenarios to compare results.

All scenarios begin the same:

- A list of activities meeting the decision criteria is created for all segments in the plan.
- The NPR is calculated.
- Each activity is compared to the Preemption data. If an activity already marked Used preempts the suggested activity, the suggested activity is not used.

Budget-Based Scenario

- The activity is not preempted by another activity
- There are sufficient funds for the budget type
- The suggested activity is marked Used
- The cost of the activity is deducted from the available funds for that budget type

Cartegraph

OCI-Driven Scenario

- The activity is not preempted by another activity
- The suggested activity is marked Used
- The activity cost is recorded
- The activity impact is applied to the segment condition
- Network OCI is recalculated
- When the Network OCI equals or exceeds the Target OCI, analysis for the plan year ends

About Activities Settings

The unit cost for an activity is the basis for activity costs. The Cost Factor, Estimate Cost, Estimate Date, and Inflation Factor (found in the Scenarios section of the Segment Analysis form) are all used to calculate the cost for an activity. Changing any of these data fields changes the activity calculated cost.

NOTE: *It is especially important to review and update the Unit Cost, Estimate Date, and Estimate Cost data. Verify the cost and estimate units used are appropriate for the activity.*

Budget Type is used to indicate the source of funds for an activity. During analysis, suggested activities are marked for performance, only if there is sufficient money remaining in the designated budget type. Changing this data field may cause a suggested activity to be marked for performance, depending on the amounts available for the new budget type.

About the Activities Library

The Activities library contains data used when recording events and special data used for segment maintenance planning. The Activities library contains the following factors used in segment analysis. Assign the factors to maintenance activities. The key fields used for Segment Analysis are:

- **Budget Type**—used to control the budget line items from which funds are drawn for this activity.
- **Cost Factor**—a constant used to project cost estimates forward in time, accounting for incremental increases in cost, independent of inflation.
- **Unit Cost**—cost per unit of the activity. For example, the unit cost for AC Pothole filling is $1.25 per unit the units are defined as the default unit for the pavement segment.
- **Estimate Date**—date the cost of maintenance, repair, or reconstruction was estimated.
- **Estimated Cost**— estimated cost of the maintenance activity.
- **Parent Activity**—group activities that are performed at the same time using the Parent field.

About Protocols

The Protocols contain information that selects the maintenance activities to perform based on the predicted condition of the pavement segment. A named protocol contains decision statements for each activity. For example, a pavement segment requires the performance of GenModerate Maintenance activity when the OCI for that segment is between 75 and 50.

The Preemption tab contains the lists of activities that are allowed after the current activity is performed. For example, patching is not allowed after a pavement segment has an overlay applied.

Using Repeat and OCI to Select Activities

Using Repeat settings and OCI together creates a relationship where more criteria must be met. An activity is suggested in the selected repeat years only when the OCI or other criteria is met.

If you wish the activities to be selected in the specified years and when the OCI criteria is met, create separate decisions, one containing the repeat settings and another with the OCI settings.

Repeat this activity on a year schedule

Use this option to repeat an activity in specific years. The activity is not selected unless the segment meets the other criteria for the decision.

START REPEATING IN YEAR

Select this option and the year to repeat an activity at selected intervals.

Example: The decision to select the activity AC-Crack Seal requires that the segment OCI at the beginning of the plan year is less than 75. This activity is set to repeat every two years, beginning in plan year 2.

In plan year 1, the segment OCI is 72. AC-Crack Seal is not selected since the activity repeat interval starts in plan year 2.

In plan year 2, the segment OCI is 68. AC-Crack Seal is selected since the OCI is less than 75 and the repeat interval starts in plan year 2.

In plan year 3, the segment OCI is 74. AC-Crack Seal is not selected since the activity repeat interval is 2 years.

In plan year 4, the segment OCI is 72. AC-Crack Seal is selected since the OCI is less than 75 and the repeat interval is 2 years.

START REPEATING BASED ON WHEN ACTIVITY WAS LAST PERFORMED

This option takes segment events into account when selecting activities.

Example: The decision to select the activity AC-Shoulder Fill & Regrade requires that the segment OCI at the beginning of the plan year is less than 75. This activity is set to repeat every two years, based on when the activity was last performed.

In plan year 1, Segment A's OCI is 72. AC-Shoulder Fill & Regrade is selected since it was last performed two years ago.

In plan year 1, Segment B's OCI is 88. AC-Shoulder Fill & Regrade was last performed two years ago. AC-Shoulder Fill & Regrade is not selected since the OCI is above 75.

In plan year 1, Segment C's OCI is 58. AC-Shoulder Fill & Regrade was performed last year. AC-Shoulder Fill & Regrade is not selected since the repeat interval is two years.

In plan year 2, Segment C's OCI is 56. AC-Shoulder Fill & Regrade was performed two years ago. AC-Shoulder Fill & Regrade is selected since it was last performed two years ago.

Repeat this activity only in the selected years

Use this option to schedule activities in a selected year. This is most helpful if your organization plans major activities in a year when matching funds are available.

Example: The decision to select the activity AC-RR Crossing-Reconstruct requires that the segment OCI is less than 80. It is scheduled to repeat in 2013 and 2015.

In plan year 1 (2012), Segment A's OCI is 68. AC-RR Crossing-Reconstruct is not selected since the repeat year is 2013.

In plan year 2 (2013), Segment A's OCI is 65. AC-RR Crossing-Reconstruct is selected since it is 2013 and the OCI is under 80.

In plan year 4 (2015), Segment A's OCI is 83. AC-RR Crossing-Reconstruct is not selected since the OCI is over 80

PAVEMENT*view* Plus Activity Cost Calculation

The calculation of the activity cost uses the Estimate Cost expression to convert the appropriate measure (usually length or area) for the segment. The converted measure is multiplied by the unit cost after the inflation and cost factors are applied to the original unit cost value.

In this example, the following data is used for the activity AC Heater Scarify: Estimate date is 1/1/1996, Unit Cost is 1.25, Cost Factor is 5. The Estimate Cost field indicates that the unit cost is based on square feet as the unit of measure.

The analysis scenario includes the following data: Start Date is 1/1/2005 (nine years from the estimate date). Inflation is 2.9.

NOTE: *Both Cost and Inflation factors are entered as a whole number that represents a percent. When the inflation factor is entered as 2.9, the value used in the calculation is 1.029.*

NOTE: *Elapsed time is the number of years between the Estimate date and the beginning of the plan year. If no estimate date is entered, the inflation factor is used for plan years only.*

The unit cost for the activity is calculated:

```
UnitCost
*(CostFactorelapsedtime)*(InflationFactorelapsedtime)
```

The cost of the activity in plan year 1 is calculated:

$$1.25 * (1.05^{9}) * (1.029^{9}) = 2.51008$$

For a segment with 131698 ft^2 the cost of the activity would be 131698 * 2.51008 = 331572.94.

NPR Calculations

During the analysis, a maintenance priority for the pavement segment, called NPR, is calculated. In addition to the estimated OCI for the segment (the predicted OCI of the segment at the beginning of the analysis period), other factors such as the ADT, Detour Length, System Designation, Functional Classification, etc. are taken into account when evaluating the maintenance needs of the segment in relation to other segments.

The Functional Classification, System Designation, and Pavement Classification libraries include a field called Segment Priority Ranking which provide the values used in the weighted average calculation.

The Do Best First setting, part of the scenario details, determines the order maintenance activities are recommended.

Using the Segment NPR Parameters shown below the NPR is calculated:

Parameter	Value Assigned	Weight	Weighted Value
OCI	78	12	936
System Designation	70	10	700
Functional Classification	80	3	240

Parameter	Value Assigned	Weight	Weighted Value
ADT	20	2	40
Detour Length	20	2	40
Pavement Classification	80	1	80
Sum		30	2036
NPR			68

Segments with the highest NPR are selected for planned maintenance activity, if Do Best First is selected. If this setting is off the segment with the lowest NPR is selected. Maintenance activities continue to be selected for segments as long as there is an available budget.

About NPR Do Best First Calculations

When scenarios are calculated, each segment is given a Network Priority Rating (NPR) to order which segments are worked on first. Select the check box to invert the order of the segments, causing the system to suggest work to be done on the segments with a higher OCI first.

This comes from the school of thought that doing smaller, cheaper maintenance on a road prevents it from needing a complete, very costly reconstruction, therefore keeping the network OCI higher and saving money long-term.

A typical guideline is a pavement area that costs one dollar in maintenance (crack seal, patch, seal, etc.) costs ten dollars to rehabilitate (overlay, slab replacement) and one hundred dollars to reconstruct.

NPR Do Best First Calculations

Do best first means that the segments in the best condition receive maintenance priority. It does not mean that the highest traffic segment, or highest detour length (other factors effecting NPR) segments are maintained first.

With Do Best First selected for the NPR calculation, OCI is sorted best to worst order, everything else that effects the NPR remains the same.

When Do Best First is not selected OCI is sorted from worst to first order, everything else that effects the NPR again remain the same.

For example, if NPR depends upon OCI (70%) and Traffic (30%) only and the following is the segment data:

Segment 1: OCI = 80, Traffic Ranking = 60

Segment 2: OCI = 55, Traffic Ranking = 70

For Do Best First, following is the NPR:

Segment 1: .7 * 80 + .3 * 60 = 74

Segment 2: .7 * 55 + .3 * 70 = 59.5

Segment 1 will be selected for maintenance before segment 2.

For Worst First, NPR will be:

Segment 1: .7 (100-80) + .3 *60 = 32

Segment 2: .7 * (100-55) + .3 *70 = 52.5

Segment 2 will be selected for maintenance before segment 1.

About the NPR Parameters Library

The Network Priority Rating (NPR) establishes the overall priority of each segment to be considered for MR&R each year. The NPR calculation combines the OCI value along with other factors to produce an inclusive index of maintenance priorities. The library contains expressions used to prioritize segment records based on functional classification, pavement classification, system priority ranking, ADT, OCI and detour length.

The NPR is calculated:

- For each parameter a value is assigned based on the contents of the filter expression.
- The value for each parameter is multiplied by the weight.
- The NPR for the segment is calculated: Sum of (Value * Weight)/Sum of Weights.

NOTE: *The use of -1 in the expressions indicates that the value is ignored. Neither the weight nor the value is used in calculations.*

About the Budget Plans Library

The Budget Plans library contains the budget scenarios used for analysis. Each Budget Plan contains information on the amount of money available for each budget type and plan year. Budget Type is tied to activities through the Activity library. Selected MR&R activities are applied to the budget using the budget type.

Budget Plans and Surplus

When there is money remaining for a budget type, the surplus accumulates interest and is added to the budget for the next plan year.

NOTE: *The budget surplus amount appears only on the Budget Surplus Report.*

Budget Type = Minor	Budget	Used	Surplus	Total Available
Plan Year 1	$2,000,000	$1,985,000	$15,000	
Accumulate Interest		(Surplus * Interest Rate)	$ 675	
		(15000 * 1.045)		
Plan Year 2	$2,000,000		$15,675	$2,015,675

About Preemption

Preemption data provides the logic that identifies mutually exclusive activities (such as AC Overlay <2" and AC Overlay >2" which would not be performed in the same year) and activities that may be done in combination (Pothole Filling and AC Overlay <2" for example).

The MR&R Protocol Details window includes a tab for creating Preemptions.

Since the activity list is limited to those activities chosen by a decision, the preemption logic is defined after the decisions are built.

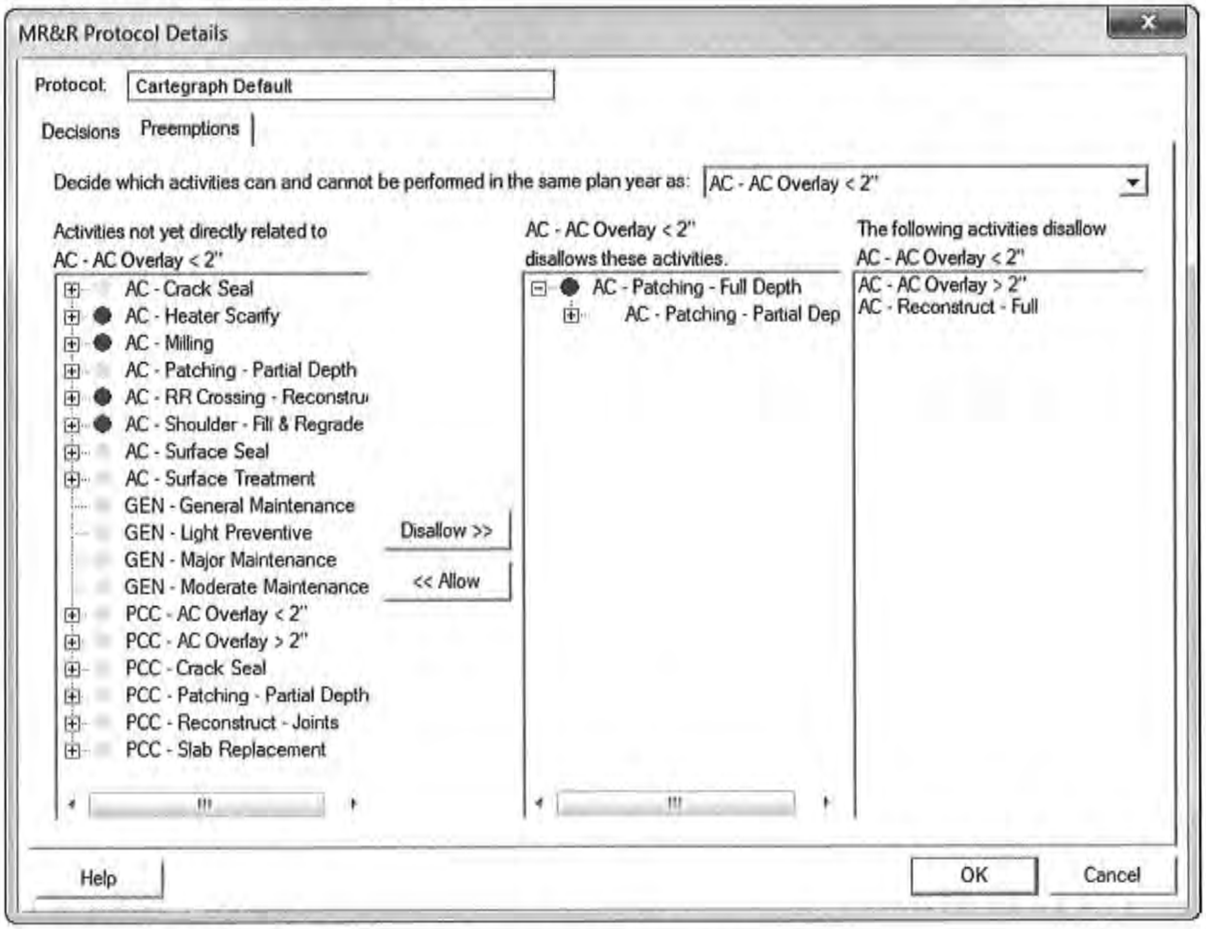
The plus signs next to an activity indicates that there is another, direct relationship with another activity. These relationships cannot be changed in the current activity selection, instead click on the plus sign.

Example

The highlighted activity (AC Overlay <2") is selected. The disallow pane on the right indicates that if AC-

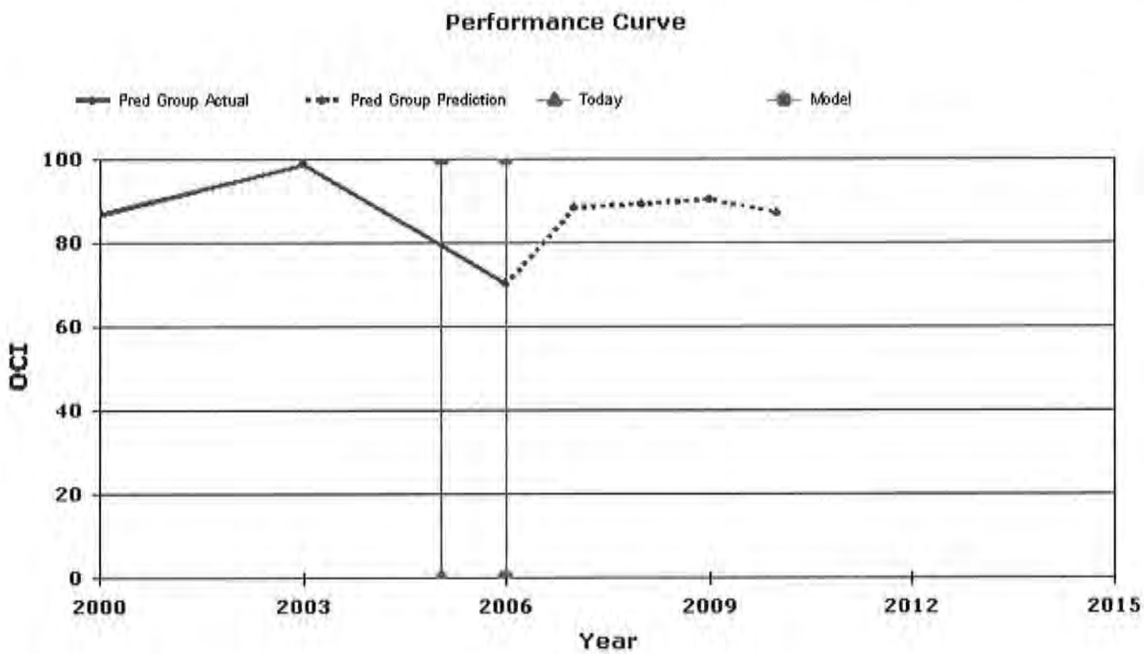
Reconstruct is to be performed, that AC Overlay <2" is not performed that year. The center pane shows that when AC Overlay <2" is selected AC-Patching -Full Depth is not performed in that year. Under AC-Patching, we see that AC-Crack Seal cannot be performed in that year either-the Overlay activity inherits the preemption from AC- Patching. Only the green light activities shown in the left pane can be performed in the same year as AC Overlay <2".

When AC Surface Seal is selected, the **Disallowed by** list includes AC Overlay. If I want to allow this activity, I must first select AC Overlay at the top of this window, and move Surface Seal from the center pane to the left. Click Allow to move the activity.



PAVEMENT*view* Plus Performance Analysis Graph

This graph shows the results of an analysis for a specific scenario, and performance group combination. This graph is displayed on the Performance Analysis form and on the Graphical Segment Performance Analysis report.



- **Performance Graph Model**—The pink vertical line represents the analysis start date.
- **Performance Graph Actual**—The solid red line represents the condition of the segments in the prediction group based on actual inspection observations.
- **Performance Graph Prediction**—The dotted red line represents the condition of the segments in the prediction group based on the performance curve predictions and proposed maintenance activity performed in the future.
- **Performance Graph Today**—The vertical green line indicates today's date on the x-axis.
- **Performance Graph X-axis**—The X-axis shows the year.
- **Performance Graph Y-axis**—The Y-axis of the graph displays the numeric OCI value for the selected condition category.

About Lock Selected Activities

After analysis you can identify the proposed activities that must be performed. Cartegraph allows you to lock these activities. The activities remain selected, and you can rerun the analysis to allocate remaining funds where they are most needed.

Customize PAVEMENT*view* Plus Setup

PAVEMENT*view* Plus Analysis requires you to customize data used for complex calculations. Some of these libraries may already contain your organization's data since they are used by PAVEMENT*view* to determine Today's Condition. PAVEMENT*view* tracks pavement inventory and conditions. PAVEMENT*view* Plus analyzes maintenance needs and their costs. Some libraries are unique to PAVEMENT*view* Plus:

Customize Environment:

- Customize Activity costs.
- Customize Condition Category Impacts.
- Customize Performance Curves.

Customize Analysis Environment:

- Customize MR&R Protocols Decisions and Preemptions.
- Customize Network Priority criteria and weights.

Customize Analysis Model and Scenario:

- Customize Model Scopes to select segments.
- Customize Budget Plans used by analysis scenarios.

Appendix C

Distresses Used in the City of Arlington

Pavement Management Program

Pavement Classification *AC Asphalt Concrete*

Distress AC Bumps & Sags

Description

Category: Surface Defects
-Bumps are small localized, upward displacements of the pavement surface. They are different from "Shoves" in that shoves are caused by unstable pavement. Bumps, on the other hand, can be caused by several factors, including:
1. Frost heave (ice, lens growth).
2. Infiltration of buildup of material in a crack in combination with traffic loading (sometimes called "Tenting").
-Sags are small, abrupt, downward displacements of the pavement surface.
Distortion and displacement that occur over large areas of the pavement surface, causing large and/or long dips in the pavement are called "swelling".

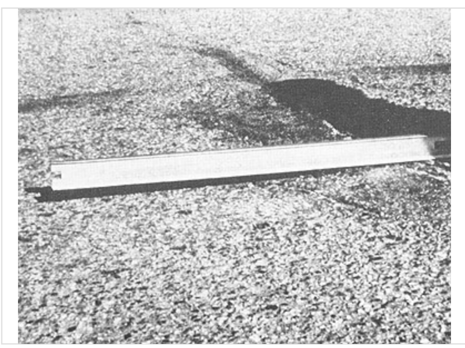
How To Measure

Are measured in linear feet. If bumps appear in a pattern perpendicular to traffic flow and are spaced at less than 10' (3m), the distress is called "Corrugation". If the bump occurs in combination with a crack, the crack is also recorded, under the appropriate distress.

Caption 1 Linear Feet | Caption 2 | Severities Apply Yes

Caption 1 Unit ft | Caption 2 Unit

Low Severity	Moderate Severity	High Severity
Causes low-severity ride quality, does not affect travel speed.	Causes medium-severity ride quality, and causes traffic to slow down.	Causes high-severity ride quality, and causes traffic to slow down significantly.



Pavement Classification *AC Asphalt Concrete*

Distress AC Edge Cracking

Description

Category: Cracking
Applies only to pavements with unpaved shoulders.
Crescent-shaped cracks or fairly continuous cracks which intersect the pavement edge and are located within 0.6 m (2 ft) of the pavement edge, adjacent to the shoulder. Includes longitudinal cracks outside of the wheel path and within 0.6 m (2 ft) of the pavement edge. The area between the crack and pavement edge is classified as raveled if it breaks up (sometimes to the extend that pieces are removed).

How To Measure

Record length in linear feet of pavement edge affected at each severity level. The combined quantity of edge cracking CANNOT exceed the length of the section.

Caption 1 Linear Feet	Caption 2	Severities Apply Yes
Caption 1 Unit ft	Caption 2 Unit	

Low Severity	Moderate Severity	High Severity
Low or medium cracks with no breakup or loss of material (raveling).	Medium cracks with some breakup or loss of material (raveling).	Considerable breakup and loss of material for more than 10% of the length of the affected portion of the pavement.

Pavement Classification *AC Asphalt Concrete*

Distress AC Rutting

Description

Category: Surface Deformation
A rut is a surface depression in the wheel paths. Pavement uplift may occur along sides of the rut, but, in many instances, ruts are noticeable only after a rainfall when the paths are filled with water. Rutting stems from a permanent deformation in any of the pavement layers or subgrades, usually caused by consolidated or lateral movement of the materials due to traffic load. Significant rutting can lead to major structural failure of the pavement.

How To Measure

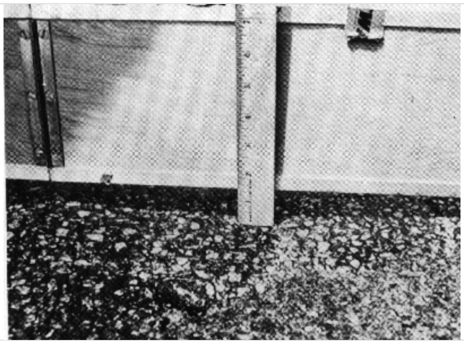
Rutting is measured in square feet of surface area and its severity is determined by the mean depth of the rut (see severities). The mean rut depth is calculated by laying a straight edge across the rut, measuring its depth, then using measurements taken along the length of the rut to compute its mean depth in inches.

Caption 1 Affected Area — Caption 2 Depth (Opt) — Severities Apply Yes

Caption 1 Unit ft² — Caption 2 Unit in

Low Severity	Moderate Severity	High Severity
Mean rut depth less than 1/2" (13mm)	Mean rut depth between 1/2" (14mm) and 1" (25mm)	Mean rut depth greater than 1" (26mm)





Pavement Classification *AC Asphalt Concrete*

Distress AC Linear Cracking (trans/long)

Description

Category: Cracking
Longitudinal cracks are parallel to the pavement's centerline or lay down direction. They may be caused by:
1. A poorly constructed paving lane joint.
2. Shrinkage of the AC surface due to low temperatures or hardening of the asphalt and/or daily temperature cycling.
3. By cracking beneath the surface course.
Transverse cracks extend across the pavement at approximately right angles to the pavement centerline or direction of lay down. These types of cracks are not usually load-associated.

How To Measure

Longitudinal and transverse cracks are measured in linear feet. The length and severity of each crack should be recorded after identification. If the crack does not have the same severity level along is entire length, each portion of the crack having a different severity level should be recorded separately. If a bump or sag occurs at the crack, it should also be recorded under the appropriate distress.

Caption 1 Linear Feet | Caption 2 | Severities Apply Yes

Caption 1 Unit ft | Caption 2 Unit

Low Severity	Moderate Severity	High Severity
One of the following conditions exists: 1. Nonfilled crack width is < 3/8" (10mm) 2. Filled crack of any width (filler in satisfactory condition).	One of the following conditions exists: 1. Nonfilled crack width is 3/8" to 3" (11mm to 75mm) 2. Nonfilled crack with any width up to 3" (75mm) surrounded by light random cracking. 3. Filled crack of any width surrounded by light random cracking.	One of the following conditions exists: 1. Any crack filled or nonfilled surrounded by medium or high severity random cracking. 2. Nonfilled crack over 3" (76mm). 3. A crack of any with where a few inches of pavement around the crack is severely broken.

Pavement Classification *AC Asphalt Concrete*

Distress AC Raveling & Weathering

Description

Category: Surface Defects
Raveling & Weathering are the wearing away of the pavement surface due to a loss of asphalt or tar binder and dislodged aggregate particles. These distresses indicate that either the asphalt binder has hardened appreciably or that a poor-quality mixture is present. In addition, raveling may be caused by certain types of traffic, e.g., tracked vehicles. Softening of the surface and dislodging of the aggregates due to oil spillage are also included under raveling.

How To Measure

Record square feet of affected surface area at each severity level.

Caption 1 Affected Area | Caption 2 | Severities Apply Yes

Caption 1 Unit ft² | Caption 2 Unit

Low Severity

Aggregate or binder has begun to wear away but has not progressed significantly. Some loss of fine-aggregate. In some areas, the surface is starting to pit. In the case of oil spillage, the oil stain can be seen, but the surface is hard and cannot be p

Moderate Severity

Aggregate and/or binder has worn away and the surface texture is becoming rough and pitted; loose particles generally exist; loss of fine aggregate and some loss of coarse aggregate. In the case of oil spillage, the surface is soft and can be penetrated with a coin.

High Severity

Aggregate and/or binder has worn away considerably, and the surface texture is very rough and pitted; loss of course aggregate. In the case of oil spillage, the asphalt binder has lost its binding effect and the aggregate has become loose.
Note: If pitted areas are larger than 4" (10mm) in diameter and more than 1/2" (13mm) deep then they should be counted as "Potholes".

Pavement Classification *AC Asphalt Concrete*

Distress AC Patching

Description

Category: Patching and Potholes
A patch is an area of pavement that has been replaced with new material to repair the existing pavement. A patch is considered a defect no matter how well it is performing (a patched area or adjacent area usually does not perform as well as an original pavement part). Generally, some roughness is associated with this distress.

How To Measure

Patching is rated in square feet of affected surface area. However, if a single patch has areas of differing severity, these areas should be measured and recorded separately. No other distresses are recorded within a patch area. If a large amount of pavement has been replaced, it should not be recorded as a patch, but considered as new pavement (e.g., replacement of a complete intersection).

Caption 1 Affected Area

Caption 1 Unit ft²

Caption 2

Caption 2 Unit

Severities Apply Yes

Low Severity

Patch is in good condition and satisfactory. Ride quality is rated as low severity or better. Patch has at least one low severity distress (of any type).

Moderate Severity

Patch is moderately deteriorated and/or ride quality is rated as medium severity. Patch has at least one moderate severity distress (of any type).

High Severity

Patch is badly deteriorated and/or ride quality is rated as high severity. Needs replacement soon. Patch has at least one high severity distress (of any type).

AC Distress Library

Pavement Classification ***AC Asphalt Concrete***

Distress AC Fatigue (alligator) Cracking

Description

Category: Cracking
Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading. Cracking begins at the bottom of the asphalt surface (or stabilized base) where tensile stress and strain are highest under a wheel load. The cracks propagate to the surface initially as a series of parallel longitudinal cracks. After repeated traffic loading, the cracks connect, forming many-sided, sharp-angled pieces that develop a pattern resembling chicken wire or the skin of an alligator. The pieces are generally less than 2 ft (0.6 m) on the longest side.
Alligator cracking occurs only in areas subjected to repeated traffic loading, such as wheel paths. Therefore, it would not occur over an entire area unless the entire area were subjected to traffic loading.
Note: Pattern-type cracking that occurs over an entire area NOT subjected to loading is called "Block Cracking", which is not a load-associated distress.
Fatigue (alligator) cracking is considered a major structural distress and is usually accompanied by rutting.

How To Measure

Record square meters (square feet) or affected area at each severity level.
If different severity levels existing within an area cannot be distinguished, rate the entire area at the highest severity present.

Caption 1 Affected Area | Caption 2 | Severities Apply Yes

Caption 1 Unit ft² | Caption 2 Unit

Low Severity

Fine, longitudinal hairline cracks running parallel to each other with no, or only a interconnecting crack(s). The cracks are not spalled (crack spalling is a breakdown of the material along the sides of the crack).

Moderate Severity

Further development of light fatigue cracks into a pattern or network of cracks that may be lightly spalled (crack spalling is a breakdown of the material along the sides of the crack).

High Severity

Network or pattern cracking has progressed so that the pieces are well defined and spalled at the edges (crack spalling is a breakdown of the material along the sides of the crack).

Appendix D

Pavement Condition Index and Ratings

By Segment Name

City of Arlington 2013 Pavement Condition Survey - Road Condition
Sorted by Road Name

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1163	166TH PL NE	SMOKEY POINT BLVD	40TH AVE NE	Local	26	1727.42	87	Good
1176	166TH PL NE	40TH AVE NE	DEAD END	Local	26	102.04	100	Good
1156	168TH ST NE	SMOKEY POINT BLVD	40TH AVE NE	Local	26	1590.10	57	Poor
1152	169TH PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	1125.55	77	Satisfactory
1209	170TH PL NE	52ND AVE NE	DEAD END	Local	26	240.25	32	Reconstruct
1151	170TH PL NE	51ST ST NE	52ND AVE NE	Local	26	367.07	44	Poor
1334	172ND PL NE	DEAD END	84TH AVE NE	Local	38	448.11	93	Good
2121	172ND PL NE	79TH DR NE	80TH DR NE	Local	38	358.93	100	Good
1150	173RD PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	482.39	68	Fair
1621	174TH PL NE	SMOKEY POINT BLVD	38TH DR NE	Local	23	1111.25	88	Good
1600	174TH PL NE	DEAD END	40TH DR NE	Local	23	336.28	89	Good
1635	174TH PL NE	40TH DR NE	DEAD END	Local	23	153.33	93	Good
1332	174TH PL NE	79TH DR NE	80TH DR NE	Local	38	282.96	100	Good
1414	174TH PL NE	80TH DR NE	81ST DR NE	Local	38	276.71	100	Good
1603	175TH PL NE	175TH PL NE	DEAD END	Local	23	145.16	53	Poor
1604	175TH PL NE	175TH PL NE	DEAD END	Local	23	133.82	59	Poor
1623	175TH PL NE	175TH PL NE	DEAD END	Local	23	51.09	59	Poor
1639	175TH PL NE	175TH PL NE	175TH PL NE	Local	23	339.34	66	Fair
1640	175TH PL NE	175TH PL NE	38TH DR NE	Local	23	285.48	70	Fair
1634	175TH PL NE	39TH DR NE	40TH DR NE	Local	23	276.30	78	Satisfactory
1602	175TH PL NE	175TH PL NE	175TH PL NE	Local	23	334.33	81	Satisfactory
1625	175TH PL NE	175TH PL NE	DEAD END	Local	23	56.16	83	Satisfactory
1638	175TH PL NE	SMOKEY POINT BLVD	175TH PL NE	Local	23	191.41	84	Satisfactory
1606	175TH PL NE	40TH DR NE	43RD AVE NE	Local	23	870.82	96	Good
1349	175TH PL NE	79TH DR NE	80TH DR NE	Local	38	299.59	100	Good
1324	175TH ST NE	84TH AVE NE	85TH AVE NE	Local	38	299.91	99	Good
1412	175TH ST NE	83RD DR NE	84TH AVE NE	Local	38	230.36	100	Good
1148	176TH PL NE	176TH PL NE	34TH DR NE	Local	26	602.73	50	Poor
1204	176TH PL NE	31ST AVE NE	176TH PL NE	Local	26	260.06	57	Poor

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1147	176TH PL NE	DEAD END	176TH PL NE	Local	26	163.54	73	Satisfactory
1636	176TH PL NE	38TH DR NE	39TH DR NE	Local	23	311.45	86	Good
1624	176TH PL NE	DEAD END	43RD AVE NE	Local	23	498.34	88	Good
1616	176TH PL NE	36TH DR NE	38TH DR NE	Local	23	662.65	99	Good
1637	176TH PL NE	SMOKEY POINT BLVD	36TH DR NE	Local	23	488.81	100	Good
1329	176TH PL NE	85TH AVE NE	DEAD END	Local	38	235.83	100	Good
1336	176TH PL NE	72ND DR NE	73RD AVE NE	Local	38	227.11	100	Good
1337	176TH PL NE	73RD AVE NE	73RD DR NE	Local	38	218.04	100	Good
1342	176TH PL NE	73RD DR NE	74TH DR NE	Local	38	277.50	100	Good
1327	176TH ST NE	84TH AVE NE	85TH AVE NE	Local	38	280.46	99	Good
1418	176TH ST NE	83RD DR NE	84TH AVE NE	Local	38	265.36	100	Good
1611	177TH PL NE	36TH DR NE	38TH DR NE	Local	23	631.48	36	Reconstruct
1179	177TH PL NE	177TH PL NE	DEAD END	Local	26	75.23	47	Poor
1614	177TH PL NE	TOTEM PARK LN	43RD AVE NE	Local	23	648.84	52	Poor
1145	177TH PL NE	177TH PL NE	33RD AVE NE	Local	26	347.79	64	Fair
1203	177TH PL NE	34TH AVE NE	SMOKEY POINT BLVD	Local	26	323.23	68	Fair
1202	177TH PL NE	33RD AVE NE	34TH AVE NE	Local	26	280.62	71	Satisfactory
1201	177TH PL NE	179TH ST NE	177TH PL NE	Local	26	418.58	74	Satisfactory
1351	177TH PL NE	79TH DR NE	80TH DR NE	Local	38	279.94	100	Good
1415	177TH PL NE	80TH DR NE	178TH PL NE	Local	38	79.75	100	Good
1610	178TH PL NE	39TH DR NE	178TH PL NE	Local	23	477.60	43	Poor
1609	178TH PL NE	SMOKEY POINT BLVD	37TH DR NE	Local	23	804.82	50	Poor
1629	178TH PL NE	DEAD END	178TH PL NE	Local	23	42.73	50	Poor
1627	178TH PL NE	37TH DR NE	DEAD END	Local	23	328.51	56	Poor
1631	178TH PL NE	178TH PL NE	177TH PL NE	Local	23	165.40	57	Poor
1630	178TH PL NE	178TH PL NE	DEAD END	Local	23	123.21	57	Poor
1331	178TH PL NE	83RD DR NE	178TH PL NE	Local	38	533.40	100	Good
1166	178TH PL NE	34TH DR NE	SMOKEY POINT BLVD	Local	26	232.77	100	Good
1343	178TH PL NE	81ST DR NE	82ND DR NE	Local	38	325.14	100	Good
1401	178TH PL NE	177TH PL NE	81ST DR NE	Local	38	413.66	100	Good
1402	178TH PL NE	82ND DR NE	83RD DR NE	Local	38	252.85	100	Good
1406	178TH PL NE	85TH AVE NE	178TH PL NE	Local	38	281.87	100	Good
1417	178TH PL NE	178TH PL NE	DEAD END	Local	38	154.94	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1607	179TH PL NE	37TH DR NE	39TH DR NE	Local	23	646.36	39	Reconstruct
1626	179TH PL NE	DEAD END	179TH PL NE	Local	23	53.67	42	Poor
1628	179TH PL NE	39TH DR NE	DEAD END	Local	23	346.94	48	Poor
1347	179TH PL NE	81ST DR NE	82ND DR NE	Local	38	344.51	100	Good
1352	179TH PL NE	83RD DR NE	85TH AVE NE	Local	38	439.67	100	Good
1198	179TH ST NE	31ST AVE NE	177TH PL NE	Local	26	331.65	61	Fair
1142	179TH ST NE	177TH PL NE	33RD AVE NE	Local	26	450.78	68	Fair
1015	180TH ST NE	59TH AVE NE	DEAD END	Local	25	2121.78	65	Fair
1141	180TH ST NE	31ST AVE NE	SMOKEY POINT BLVD	Local	26	1321.33	92	Good
1140	181ST PL NE	SMOKEY POINT BLVD	36TH DR NE	Local	26	485.29	58	Poor
1173	181ST ST NE	31ST AVE NE	182ND ST NE	Local	26	490.91	97	Good
1171	182ND ST NE	183RD PL NE	SMOKEY POINT BLVD	Local	26	967.22	90	Good
1138	183RD PL NE	SMOKEY POINT BLVD	DEAD END	Local	26	597.06	85	Satisfactory
1172	183RD PL NE	31ST AVE NE	182ND ST NE	Local	26	525.94	100	Good
1137	184TH PL NE	DEAD END	31ST AVE NE	Local	26	230.85	100	Good
1170	184TH PL NE	35TH AVE NE	DEAD END	Local	26	498.98	100	Good
1136	185TH PL NE	DEAD END	31ST AVE NE	Local	26	265.10	100	Good
1178	185TH PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	207.07	100	Good
1193	186TH PL NE	29TH AVE NE	31ST AVE NE	Local	26	414.49	94	Good
1192	186TH PL NE	31ST AVE NE	32ND ST NE	Local	26	331.18	96	Good
1134	186TH PL NE	32ND ST NE	SMOKEY POINT BLVD	Local	26	580.30	100	Good
1169	186TH PL NE	35TH AVE NE	DEAD END	Local	26	497.18	100	Good
1434	186TH ST NE	DEAD END	CITY LIMITS	Local	30	550.83	100	Good
1177	187TH PL NE	35TH AVE NE	DEAD END	Local	26	394.32	100	Good
1481	188TH CT NE	DEAD END	42ND DR NE	Local	28	140.66	100	Good
1018	188TH PL NE	61ST AVE NE	63RD AVE NE	Local	25	710.31	10	Reconstruct
1532	188TH ST NE	42ND DR NE	43RD DR NE	Collector	28	394.07	67	Fair
1191	188TH ST NE	SMOKEY POINT BLVD	35TH AVE NE	Collector	26	667.03	72	Satisfactory
1190	188TH ST NE	35TH AVE NE	CITY LIMITS	Collector	26	655.98	80	Satisfactory
1484	188TH ST NE	43RD DR NE	46TH AVE NE	Collector	28	758.64	84	Satisfactory
1531	188TH ST NE	46TH AVE NE	47TH AVE NE	Collector	28	338.26	93	Good
1535	188TH ST NE	CITY LIMITS	42ND DR NE	Collector	28	288.55	95	Good
1028	188TH ST NE	67TH AVE NE	IRIS CT	Local	25	793.96	35	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1483	188TH ST NE	188TH ST NE	DEAD END	Local	28	714.61	57	Poor
1042	188TH ST NE	66TH AVE NE	67TH AVE NE	Local	25	331.30	75	Satisfactory
1029	188TH ST NE	DEAD END	58TH AVE NE	Local	25	40.93	83	Satisfactory
1031	188TH ST NE	59TH DR NE	59TH DR NE	Local	25	86.43	84	Satisfactory
1132	188TH ST NE	29TH AVE NE	SMOKEY POINT BLVD	Local	26	1200.29	85	Satisfactory
1030	188TH ST NE	59TH DR NE	59TH AVE NE	Local	25	85.64	93	Good
1032	188TH ST NE	58TH AVE NE	59TH DR NE	Local	25	243.73	96	Good
1010	188TH ST NE	63RD AVE NE	66TH AVE NE	Local	25	977.29	100	Good
1033	188TH ST NE	59TH AVE NE	61ST AVE NE	Local	25	473.38	100	Good
1034	188TH ST NE	61ST AVE NE	63RD AVE NE	Local	25	832.38	100	Good
1479	189TH PL NE	42ND DR NE	DEAD END	Local	28	267.46	100	Good
1477	189TH PL NE	43RD DR NE	45TH AVE NE	Local	28	482.50	100	Good
1533	189TH PL NE	DEAD END	42ND DR NE	Local	28	265.99	100	Good
1476	189TH ST NE	46TH AVE NE	DEAD END	Local	28	123.57	99	Good
1475	190TH ST NE	46TH AVE NE	DEAD END	Local	28	138.97	100	Good
1472	191ST PL NE	44TH AVE NE	45TH DR NE	Local	28	189.17	97	Good
1482	191ST PL NE	46TH AVE NE	47TH AVE NE	Local	28	309.10	99	Good
1474	191ST ST NE	46TH AVE NE	DEAD END	Local	28	139.28	94	Good
1461	192ND PL NE	DEAD END	45TH DR NE	Local	28	196.37	96	Good
1023	192ND ST NE	62ND AVE NE	63RD AVE NE	Local	25	562.29	89	Good
1007	192ND ST NE	59TH AVE NE	61ST AVE NE	Local	25	600.95	90	Good
1024	192ND ST NE	61ST AVE NE	62ND AVE NE	Local	25	134.63	100	Good
1530	193RD PL NE	46TH DR NE	47TH AVE NE	Local	28	139.92	96	Good
1528	193RD PL NE	DEAD END	45TH DR NE	Local	28	214.28	98	Good
1529	193RD PL NE	45TH DR NE	46TH AVE NE	Local	28	217.84	99	Good
1469	193RD PL NE	46TH AVE NE	46TH DR NE	Local	28	209.23	100	Good
1541	193RD ST NE	CROWN RIDGE BLVD	CITY LIMITS	Local	38	138.32	100	Good
1468	194TH PL NE	DEAD END	45TH DR NE	Local	28	196.09	99	Good
1466	195TH PL NE	DEAD END	45TH DR NE	Local	28	155.14	93	Good
1005	195TH ST NE	59TH AVE NE	62ND AVE NE	Local	25	773.30	29	Reconstruct
1022	195TH ST NE	62ND AVE NE	63RD AVE NE	Local	25	584.90	45	Poor
1467	195TH ST NE	45TH DR NE	47TH AVE NE	Local	28	638.54	91	Good
1506	196TH PL NE	49TH AVE NE	50TH AVE NE	Local	28	356.38	54	Poor

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1505	196TH PL NE	49TH AVE NE	48TH AVE NE	Local	28	337.04	75	Satisfactory
1507	196TH PL NE	47TH AVE NE	48TH AVE NE	Local	28	382.32	84	Satisfactory
1459	196TH PL NE	45TH DR NE	47TH AVE NE	Local	28	635.75	100	Good
1527	196TH PL NE	DEAD END	45TH DR NE	Local	28	147.61	100	Good
1433	196TH PL NE	DEAD END	95TH AVE NE	Local	30	805.14	100	Good
1458	197TH PL NE	DEAD END	49TH AVE NE	Local	28	359.65	53	Poor
2092	197TH PL NE	DEAD END	74TH AVE NE	Local	40	216.18	86	Good
1003	197TH ST NE	63RD AVE NE	67TH AVE NE	Local	25	1336.70	73	Satisfactory
1001	199TH ST NE	60TH AVE NE	63RD AVE NE	Local	40	883.70	90	Good
1456	199TH ST NE	199TH ST NE	CEMETERY RD	Local	28	238.99	99	Good
1452	199TH ST NE	48TH DR NE	HIGH CLOVER BLVD	Local	28	376.59	100	Good
1494	199TH ST NE	47TH DR NE	48TH DR NE	Local	28	257.50	100	Good
1449	200TH PL NE	HIGH CLOVER BLVD	DEAD END	Local	28	244.71	96	Good
1450	200TH ST NE	51ST ST NE	53RD AVE NE	Local	28	559.16	50	Poor
2088	200TH ST NE	77TH AVE NE	DEAD END	Local	40	676.46	67	Fair
1493	200TH ST NE	44TH DR NE	45TH DR NE	Local	28	249.72	99	Good
1448	200TH ST NE	45TH DR NE	HIGH CLOVER BLVD	Local	28	649.88	100	Good
2089	201ST ST NE	71ST AVE NE	74TH AVE NE	Local	40	890.33	85	Satisfactory
1441	202ND PL NE	DEAD END	48TH AVE NE	Local	28	255.23	98	Good
1440	203RD ST NE	46TH AVE NE	48TH AVE NE	Local	28	440.28	99	Good
1499	203RD ST NE	DEAD END	203RD ST NE	Local	28	30.73	100	Good
1500	203RD ST NE	203RD ST NE	DEAD END	Local	28	33.74	100	Good
1109	204TH ST NE	67TH AVE NE	69TH AVE NE	Local	60	557.79	77	Satisfactory
1110	204TH ST NE	74TH AVE NE	SR 9	Local	60	575.27	85	Good
1107	204TH ST NE	80TH AVE NE	KEITH LN	Local	60	487.46	86	Good
1097	204TH ST NE	69TH AVE NE	71ST AVE NE	Local	60	859.97	87	Good
1111	204TH ST NE	SR 9	77TH AVE NE	Local	60	626.76	88	Good
1105	204TH ST NE	71ST AVE NE	72ND AVE NE	Local	60	294.15	92	Good
1106	204TH ST NE	77TH AVE NE	79TH DR NE	Local	60	430.65	92	Good
1108	204TH ST NE	72ND AVE NE	74TH AVE NE	Local	60	496.92	93	Good
1104	204TH ST NE	79TH DR NE	80TH AVE NE	Local	60	275.83	94	Good
1241	206TH PL NE	64TH DR NE	66TH DR NE	Local	40	294.69	100	Good
1258	206TH PL NE	66TH DR NE	DEAD END	Local	40	268.70	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1250	206TH ST NE	62ND AVE NE	63RD AVE NE	Local	40	258.80	96	Good
1249	206TH ST NE	59TH DR NE	60TH AVE NE	Local	40	204.97	100	Good
1251	206TH ST NE	60TH AVE NE	61ST AVE NE	Local	40	285.96	100	Good
1232	206TH ST NE	61ST AVE NE	62ND AVE NE	Local	40	345.46	100	Good
1238	207TH PL NE	CIRCLE BLUFF DR	207TH ST NE	Local	40	214.48	99	Good
2103	207TH ST NE	KEITH LN	207TH ST NE	Local	40	310.96	92	Good
2102	207TH ST NE	S STILLAGUAMISH AVE	UNKNOWN	Local	40	288.34	92	Good
2073	207TH ST NE	JENSEN FARM LN	BURN RD	Local	40	1212.25	93	Good
1239	207TH ST NE	62ND AVE NE	63RD AVE NE	Local	40	300.25	100	Good
1252	207TH ST NE	61ST AVE NE	62ND AVE NE	Local	40	260.52	100	Good
1253	207TH ST NE	59TH AVE NE	60TH AVE NE	Local	40	240.12	100	Good
1254	207TH ST NE	60TH AVE NE	61ST AVE NE	Local	40	268.55	100	Good
1227	208TH ST NE	64TH DR NE	66TH DR NE	Local	40	616.17	72	Satisfactory
1248	208TH ST NE	GROVE PL	64TH DR NE	Local	40	311.64	84	Satisfactory
1221	209TH ST NE	61ST AVE NE	DEAD END	Local	28	647.66	100	Good
1225	210TH ST NE	DEAD END	66TH DR NE	Local	40	430.65	89	Good
1236	211TH PL NE	67TH DR NE	67TH AVE NE	Local	40	965.59	61	Fair
1246	211TH PL NE	CITY LIMITS	66TH DR NE	Local	40	679.85	70	Fair
1245	211TH PL NE	66TH DR NE	67TH DR NE	Local	40	424.98	72	Satisfactory
2061	215TH PL NE	87TH AVE NE	CITY LIMITS	Local	22	111.02	84	Satisfactory
1955	215TH PL NE	DEAD END	87TH AVE NE	Local	22	137.71	100	Good
1942	217TH PL NE	DEAD END	87TH AVE NE	Local	40	143.10	100	Good
1948	218TH PL NE	DEAD END	87TH AVE NE	Local	40	161.41	100	Good
1133	29TH AVE NE	188TH ST NE	186TH PL NE	Local	26	507.07	85	Satisfactory
1135	31ST AVE NE	184TH PL NE	183RD PL NE	Local	26	654.64	77	Satisfactory
1197	31ST AVE NE	183RD PL NE	181ST ST NE	Local	26	510.92	79	Satisfactory
1196	31ST AVE NE	181ST ST NE	180TH ST NE	Local	26	334.00	91	Good
1195	31ST AVE NE	185TH PL NE	184TH PL NE	Local	26	357.23	99	Good
1194	31ST AVE NE	186TH PL NE	185TH PL NE	Local	26	333.09	99	Good
1199	31ST DR NE	180TH ST NE	179TH ST NE	Local	26	322.26	43	Poor
1131	31ST DR NE	179TH ST NE	176TH PL NE	Local	26	894.76	60	Poor
1200	31ST DR NE	176TH PL NE	DEAD END	Local	26	142.40	72	Satisfactory
1185	32ND ST NE	186TH PL NE	DEAD END	Local	26	167.50	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1144	33RD AVE NE	33RD AVE NE	177TH PL NE	Local	26	523.57	69	Fair
1143	33RD AVE NE	177TH PL NE	DEAD END	Local	26	115.50	92	Good
1149	34TH AVE NE	176TH PL NE	DEAD END	Local	26	158.01	47	Poor
1146	34TH AVE NE	177TH PL NE	34TH AVE NE	Local	26	227.72	56	Poor
1167	34TH DR NE	DEAD END	178TH PL NE	Local	26	252.24	100	Good
1186	35TH AVE NE	184TH PL NE	SMOKEY POINT BLVD	Local	26	220.15	70	Satisfactory
1188	35TH AVE NE	187TH PL NE	186TH PL NE	Local	26	268.37	85	Good
1187	35TH AVE NE	188TH ST NE	187TH PL NE	Local	26	231.38	90	Good
1189	35TH AVE NE	186TH PL NE	184TH PL NE	Local	26	590.78	93	Good
1615	36TH DR NE	177TH PL NE	176TH ST NE	Local	23	270.28	34	Reconstruct
1219	36TH DR NE	DEAD END	181ST PL NE	Local	26	112.85	45	Poor
1139	36TH DR NE	181ST PL NE	DEAD END	Local	26	111.91	81	Satisfactory
1608	37TH DR NE	179TH PL NE	178TH PL NE	Local	23	320.00	51	Poor
1620	38TH DR NE	175TH PL NE	174TH PL NE	Local	23	407.43	27	Reconstruct
1617	38TH DR NE	177TH PL NE	176TH ST NE	Local	23	284.29	34	Reconstruct
1605	39TH DR NE	TOTEM PARK LN	175TH PL NE	Local	23	372.80	38	Reconstruct
1622	39TH DR NE	179TH PL NE	178TH PL NE	Local	23	328.87	53	Poor
1618	39TH DR NE	DEAD END	176TH PL NE	Local	23	350.42	55	Poor
1601	40TH DR NE	175TH PL NE	174TH PL NE	Local	23	326.39	90	Good
1534	42ND DR NE	188TH CT NE	188TH ST NE	Local	28	198.75	98	Good
1480	42ND DR NE	189TH PL NE	188TH CT NE	Local	28	426.48	100	Good
2107	43RD AVE NE	175TH PL NE	172ND ST NE	Local	26	1145.50	24	Reconstruct
2109	43RD AVE NE	177TH PL NE	176TH PL NE	Local	26	288.04	40	Poor
2110	43RD AVE NE	176TH PL NE	175TH PL NE	Local	26	377.13	44	Poor
2108	43RD AVE NE	DEAD END	177TH PL NE	Local	26	851.65	81	Satisfactory
2111	43RD AVE NE	172ND ST NE	DEAD END	Local	26	1012.12	100	Good
1523	43RD DR NE	DEAD END	189TH PL NE	Local	28	56.47	82	Satisfactory
1478	43RD DR NE	189TH PL NE	188TH ST NE	Local	28	585.63	95	Good
1473	44TH AVE NE	DEAD END	191ST PL NE	Local	28	318.69	100	Good
1442	44TH DR NE	HIGH CLOVER BLVD	200TH ST NE	Local	28	432.83	99	Good
1492	44TH DR NE	DEAD END	HIGH CLOVER BLVD	Local	28	276.22	99	Good
1512	45TH DR NE	195TH PL NE	195TH ST NE	Local	28	112.57	88	Good
1515	45TH DR NE	195TH ST NE	194TH PL NE	Local	28	237.71	90	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1518	45TH DR NE	194TH PL NE	193RD PL NE	Local	28	380.08	97	Good
1516	45TH DR NE	196TH PL NE	195TH PL NE	Local	28	276.43	98	Good
1514	45TH DR NE	189TH PL NE	DEAD END	Local	28	152.19	98	Good
1447	45TH DR NE	DEAD END	200TH ST NE	Local	28	231.74	99	Good
1517	45TH DR NE	192ND PL NE	191ST PL NE	Local	28	321.40	99	Good
1443	45TH DR NE	DEAD END	HIGH CLOVER BLVD	Local	28	396.14	99	Good
1465	45TH DR NE	191ST PL NE	189TH PL NE	Local	28	553.74	99	Good
1513	45TH DR NE	DEAD END	196TH PL NE	Local	28	120.36	100	Good
1519	45TH DR NE	193RD PL NE	192ND PL NE	Local	28	382.17	100	Good
1445	46TH AVE NE	203RD ST NE	HIGH CLOVER BLVD	Local	28	524.61	94	Good
1522	46TH AVE NE	190TH ST NE	189TH ST NE	Local	28	297.73	99	Good
1520	46TH AVE NE	189TH ST NE	188TH ST NE	Local	28	285.04	100	Good
1471	46TH AVE NE	193RD PL NE	46TH DR NE	Local	28	459.33	100	Good
1521	46TH AVE NE	191ST ST NE	190TH ST NE	Local	28	291.28	100	Good
1524	46TH AVE NE	191ST PL NE	191ST ST NE	Local	28	259.25	100	Good
1526	46TH AVE NE	46TH DR NE	193RD PL NE	Local	28	447.21	100	Good
1525	46TH DR NE	193RD PL NE	46TH AVE NE	Local	28	453.98	100	Good
1470	46TH DR NE	46TH AVE NE	193RD PL NE	Local	28	456.64	100	Good
1510	47TH AVE NE	193RD PL NE	191ST PL NE	Collector	28	651.78	71	Satisfactory
1509	47TH AVE NE	195TH ST NE	193RD PL NE	Collector	28	613.46	72	Satisfactory
1463	47TH AVE NE	191ST PL NE	188TH ST NE	Collector	28	1131.73	80	Satisfactory
1508	47TH AVE NE	196TH PL NE	195TH ST NE	Collector	28	358.17	80	Satisfactory
1511	47TH AVE NE	CEMETERY RD	196TH PL NE	Collector	28	766.21	86	Good
1451	47TH AVE NE	HIGH CLOVER BLVD	199TH ST NE	Local	28	542.30	96	Good
1460	48TH AVE NE	DEAD END	196TH PL NE	Local	28	98.90	56	Poor
1446	48TH AVE NE	202ND PL NE	HIGH CLOVER BLVD	Local	28	496.71	93	Good
1501	48TH AVE NE	203RD ST NE	202ND PL NE	Local	28	250.90	100	Good
1453	48TH DR NE	DEAD END	199TH ST NE	Local	28	357.64	91	Good
1183	48TH DR NE	AIRPORT BLVD	DEAD END	Local	26	265.53	100	Good
1457	49TH AVE NE	197TH PL NE	196TH PL NE	Local	28	401.92	47	Poor
1504	49TH AVE NE	CEMETERY RD	197TH PL NE	Local	28	375.09	69	Fair
1182	49TH DR NE	AIRPORT BLVD	DEAD END	Local	26	279.81	88	Good
1503	50TH AVE NE	196TH PL NE	DEAD END	Local	28	34.46	33	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1464	50TH AVE NE	DEAD END	196TH PL NE	Local	28	310.06	55	Poor
1181	50TH DR NE	AIRPORT BLVD	DEAD END	Local	26	306.05	100	Good
1180	51ST AVE NE	AIRPORT BLVD	172ND ST NE	Minor Arterial	26	989.73	100	Good
1184	51ST AVE NE	170TH PL NE	CITY LIMITS	Collector	26	2148.79	54	Poor
1208	51ST AVE NE	172ND ST NE	170TH PL NE	Collector	26	530.04	61	Fair
1462	51ST DR NE	CEMETERY RD	DEAD END	Local	28	998.85	65	Fair
1502	51ST DR NE	200TH ST NE	CEMETERY RD	Local	28	232.02	70	Fair
1153	52ND AVE NE	170TH PL NE	DEAD END	Local	26	304.42	53	Poor
1455	53RD AVE NE	200TH ST NE	CEMETERY RD	Local	28	237.74	50	Poor
1454	54TH DR NE	DEAD END	CEMETERY RD	Local	28	140.66	57	Poor
1020	58TH AVE NE	188TH ST NE	DEAD END	Local	25	404.52	71	Satisfactory
1008	59TH AVE NE	188TH ST NE	180TH ST NE	Local	25	2682.67	10	Reconstruct
1036	59TH AVE NE	180TH ST NE	172ND ST NE	Local	25	2620.10	29	Reconstruct
1027	59TH AVE NE	195TH ST NE	192ND ST NE	Local	25	837.00	33	Reconstruct
1039	59TH AVE NE	192ND ST NE	188TH ST NE	Local	25	1345.80	50	Poor
1243	59TH AVE NE	CITY LIMITS	CIRCLE BLUFF DR	Local	40	37.30	87	Good
1242	59TH AVE NE	CITY LIMITS	CITY LIMITS	Local	40	555.48	93	Good
1037	59TH AVE NE	172ND ST NE	DEAD END	Local	25	1192.84	94	Good
1230	59TH AVE NE	207TH ST NE	206TH ST NE	Local	40	425.73	100	Good
1021	59TH DR NE	DEAD END	188TH ST NE	Local	25	2103.02	56	Poor
1014	59TH DR NE	188TH ST NE	DEAD END	Local	25	2997.06	56	Poor
1004	60TH AVE NE	199TH ST NE	DEAD END	Local	25	574.72	99	Good
1229	60TH AVE NE	207TH ST NE	206TH ST NE	Local	40	499.34	100	Good
1035	61ST AVE NE	61ST AVE NE	188TH ST NE	Local	25	175.67	38	Reconstruct
1009	61ST AVE NE	192ND ST NE	DEAD END	Local	25	575.10	45	Poor
1228	61ST AVE NE	207TH ST NE	206TH ST NE	Local	40	593.55	100	Good
1259	61ST AVE NE	209TH ST NE	207TH ST NE	Local	40	247.52	100	Good
1006	62ND AVE NE	195TH ST NE	192ND ST NE	Local	25	1088.89	46	Poor
1040	62ND AVE NE	192ND ST NE	DEAD END	Local	25	441.84	85	Satisfactory
1233	62ND AVE NE	207TH ST NE	206TH ST NE	Local	40	599.24	100	Good
1002	63RD AVE NE	195TH ST NE	192ND AVE NE	Local	25	1278.29	53	Poor
1026	63RD AVE NE	192ND ST NE	188TH ST NE	Local	25	1381.53	64	Fair
1044	63RD AVE NE	197TH ST NE	195TH ST NE	Local	25	656.82	67	Fair

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1038	63RD AVE NE	199TH ST NE	197TH ST NE	Local	25	314.07	100	Good
1240	63RD AVE NE	207TH ST NE	GROVE PL	Local	40	240.90	100	Good
1260	63RD AVE NE	GROVE PL	206TH ST NE	Local	40	144.87	100	Good
1231	64TH DR NE	208TH ST NE	DEAD END	Local	26	349.16	50	Poor
1235	64TH DR NE	206TH PL NE	CEMETERY RD	Local	40	924.49	73	Satisfactory
1223	65TH DR NE	206TH PL NE	CEMETERY RD	Local	40	864.38	98	Good
1011	66TH AVE NE	DEAD END	188TH ST NE	Local	25	929.73	63	Fair
1224	66TH DR NE	210TH ST NE	208TH ST NE	Local	40	620.29	85	Satisfactory
1247	66TH DR NE	211TH PL NE	210TH ST NE	Local	40	588.59	89	Good
1222	66TH DR NE	206TH PL NE	66TH DR NE	Local	40	359.70	100	Good
1099	67TH AVE NE	211ST PL NE	204TH ST NE	Minor Arterial	22	2465.65	47	Poor
1103	67TH AVE NE	S WEST AVE	211ST PL NE	Minor Arterial	35	2158.01	53	Poor
1116	67TH AVE NE	UPLAND DR	HIGHLAND VIEW DR	Minor Arterial	35	1356.68	78	Satisfactory
1113	67TH AVE NE	HIGHLAND VIEW DR	172ND ST NE	Minor Arterial	35	817.50	81	Satisfactory
1102	67TH AVE NE	168TH ST NE	CITY LIMITS	Minor Arterial	60	973.82	82	Satisfactory
1078	67TH AVE NE	BOVEE LN	UPLAND DR	Minor Arterial	36	310.08	82	Satisfactory
1114	67TH AVE NE	172ND ST NE	168TH ST NE	Minor Arterial	40	1035.21	83	Satisfactory
1125	67TH AVE NE	188TH ST NE	WOODLANDS WAY	Minor Arterial	35	500.15	90	Good
1118	67TH AVE NE	197TH ST NE	191ST PL NE	Minor Arterial	35	2207.89	91	Good
1124	67TH AVE NE	200TH PL NE	197TH ST NE	Minor Arterial	35	811.29	91	Good
1117	67TH AVE NE	204TH ST NE	200TH PL NE	Minor Arterial	35	1134.52	92	Good
1100	67TH AVE NE	WOODLANDS WAY	BOVEE LN	Minor Arterial	35	2337.13	93	Good
1115	67TH AVE NE	191ST PL NE	188TH ST NE	Minor Arterial	55	1108.11	96	Good
1226	67TH DR NE	211TH PL NE	DEAD END	Local	40	677.13	93	Good
2120	69TH AVE NE	DEAD END	204TH ST NE	Local	30	234.19	100	Good
2090	71ST AVE NE	204TH ST NE	201ST ST NE	Local	40	968.17	86	Good
2093	72ND AVE NE	DEAD END	204TH ST NE	Local	40	783.04	100	Good
1339	72ND DR NE	176TH PL NE	DEAD END	Local	38	650.62	100	Good
1335	73RD AVE NE	176TH PL NE	172ND PL NE	Local	38	908.65	100	Good
1338	73RD DR NE	176TH PL NE	DEAD END	Local	38	743.18	100	Good
2084	74TH AVE NE	204TH ST NE	201ST ST NE	Local	40	1030.00	98	Good
2091	74TH AVE NE	201ST ST NE	DEAD END	Local	40	971.08	99	Good
1341	74TH Dr NE	176TH PL NE	DEAD END	Local	38	637.14	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
2085	77TH AVE NE	204TH ST NE	200TH ST NE	Local	40	970.17	84	Satisfactory
2083	79TH DR NE	204TH ST NE	DEAD END	Local	40	754.54	98	Good
1348	79TH DR NE	177TH PL NE	175TH PL NE	Local	38	641.75	100	Good
1394	79TH DR NE	175TH PL NE	174TH PL NE	Local	38	400.50	100	Good
1395	79TH DR NE	DEAD END	177TH PL NE	Local	38	417.30	100	Good
1396	79TH DR NE	174TH PL NE	172ND PL NE	Local	38	536.28	100	Good
2081	80TH AVE NE	204TH ST NE	DEAD END	Local	40	348.73	9	Reconstruct
1328	80TH DR NE	177TH PL NE	175TH PL NE	Local	38	681.47	100	Good
1397	80TH DR NE	172ND PL NE	172ND ST NE	Local	38	262.45	100	Good
1398	80TH DR NE	175TH PL NE	174TH PL NE	Local	38	396.64	100	Good
1399	80TH DR NE	174TH PL NE	172ND PL NE	Local	38	545.33	100	Good
2079	81ST DR NE	KEITH LN	DEAD END	Local	40	81.94	91	Good
2080	81ST DR NE	DEAD END	KEITH LN	Local	40	432.66	96	Good
1333	81ST DR NE	174TH PL NE	DEAD END	Local	38	628.73	100	Good
1344	81ST DR NE	179TH PL NE	178TH PL NE	Local	38	438.85	100	Good
1400	81ST DR NE	DEAD END	174TH PL NE	Local	38	371.94	100	Good
1345	82ND DR NE	178TH PL NE	177TH ST NE	Local	38	508.07	100	Good
1346	82ND DR NE	179TH PL NE	178TH PL NE	Local	38	348.56	100	Good
1416	82ND DR NE	84TH AVE NE	DEAD END	Local	38	175.03	100	Good
1404	83RD DR NE	179TH PL NE	178TH PL NE	Local	38	244.79	99	Good
1350	83RD DR NE	178TH PL NE	177TH ST NE	Local	38	502.35	100	Good
1403	83RD DR NE	176TH ST NE	175TH ST NE	Local	38	228.97	100	Good
1405	83RD DR NE	177TH ST NE	176TH ST NE	Local	38	416.64	100	Good
1411	84TH AVE NE	172ND PL NE	85TH AVE NE	Local	38	224.50	94	Good
1326	84TH AVE NE	83RD DR NE	176TH ST NE	Local	38	585.92	100	Good
1330	84TH AVE NE	175TH ST NE	172ND PL NE	Local	38	676.49	100	Good
1413	84TH AVE NE	82ND DR NE	83RD DR NE	Local	38	245.06	100	Good
1410	85TH AVE NE	178TH PL NE	176TH PL NE	Local	38	376.85	97	Good
1409	85TH AVE NE	176TH ST NE	175TH ST NE	Local	38	253.91	97	Good
1407	85TH AVE NE	176TH PL NE	176TH ST NE	Local	38	245.50	98	Good
1264	85TH AVE NE	179TH PL NE	178TH PL NE	Local	38	564.07	100	Good
1323	85TH AVE NE	175TH ST NE	84TH AVE NE	Local	38	730.88	100	Good
1408	85TH AVE NE	84TH AVE NE	172ND ST NE	Local	38	241.99	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1954	87TH AVE NE	CITY LIMITS	CITY LIMITS	Local	26	187.16	95	Good
1941	87TH AVE NE	217TH PL NE	215TH PL NE	Local	26	599.95	97	Good
2062	87TH AVE NE	218TH PL NE	217TH PL NE	Local	26	229.69	100	Good
1436	89TH AVE NE	CITY LIMITS	172ND ST NE	Local	20	1329.54	70	Fair
1437	91ST AVE NE	172ND ST NE	CITY LIMITS	Local	30	1309.89	100	Good
1305	ABBEY PL	GREYWALLS DR	DEAD END	Local	38	421.18	99	Good
1168	AIRPORT BLVD	DEAD END	48TH DR NE	Minor Arterial	26	978.83	100	Good
1205	AIRPORT BLVD	50TH DR NE	51ST AVE NE	Minor Arterial	26	236.67	100	Good
1206	AIRPORT BLVD	49TH DR NE	50TH DR NE	Minor Arterial	26	399.50	100	Good
1207	AIRPORT BLVD	48TH DR NE	49TH DR NE	Minor Arterial	26	422.40	100	Good
1309	AMBLESIDE CT	EAGLEFIELD DR	DEAD END	Local	38	410.36	96	Good
2076	ANNA LN	JENSEN FARM LN	DEAD END	Local	40	343.20	96	Good
1284	BALLANTRAE DR	INVERNESS DR	BALMORAL DR	Local	38	438.06	99	Good
1421	BALLANTRAE DR	BALMORAL DR	EAGLEFIELD DR	Local	38	414.06	100	Good
1371	BALMORAL DR	INVERNESS DR	CASTLE CT	Local	38	401.00	97	Good
1282	BALMORAL DR	GREENOCK CT	BALLANTRAE DR	Local	38	252.67	99	Good
1372	BALMORAL DR	CASTLE CT	GREENOCK CT	Local	38	237.66	99	Good
1317	BOREAL CT	REDHAWK DR	DEAD END	Local	38	192.51	100	Good
1325	BOVEE LN	67TH AVE NE	HIGHLAND VIEW DR	Local	38	1319.66	100	Good
1875	BROADWAY AVE	E BURKE AVE	E GILMAN AVE	Principal Arterial	40	295.69	52	Poor
1962	BROADWAY AVE	E GILMAN AVE	ROUNDABOUT	Principal Arterial	40	268.29	75	Satisfactory
1961	BROADWAY AVE	E HALLER AVE	E BURKE AVE	Local	40	284.34	46	Poor
1960	BROADWAY AVE	DEAD END	E HALLER AVE	Local	40	112.23	72	Satisfactory
2095	BURN RD	207TH ST NE	CITY LIMITS	Minor Arterial	40	4159.74	91	Good
1310	CAMBRIDGE DR	EAGLEFIELD DR	DEAD END	Local	38	885.72	100	Good
1301	CARLISLE PL	GREYWALLS DR	DEAD END	Local	38	689.96	100	Good
1281	CASTLE CT	BALMORAL DR	DEAD END	Local	38	164.62	100	Good
1495	CEMETERY RD	53RD AVE NE	54TH DR NE	Collector	28	276.13	50	Poor
1439	CEMETERY RD	54TH DR NE	CITY LIMITS	Collector	28	1722.67	57	Poor
1255	CEMETERY RD	CITY LIMITS	LANTERN LN	Collector	40	176.34	60	Poor
1496	CEMETERY RD	51ST ST NE	53RD AVE NE	Collector	28	597.81	68	Fair
1497	CEMETERY RD	HIGH CLOVER BLVD	51ST ST NE	Collector	28	672.68	81	Satisfactory
1256	CEMETERY RD	65TH DR NE	67TH AVE NE	Collector	40	379.75	82	Satisfactory

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1244	CEMETERY RD	64TH DR NE	65TH DR NE	Collector	40	419.78	83	Satisfactory
1257	CEMETERY RD	LANTERN LN	64TH DR NE	Collector	40	389.67	84	Satisfactory
1498	CEMETERY RD	CITY LIMITS	HIGH CLOVER BLVD	Collector	28	751.13	86	Good
1424	CHAMPIONS DR	EAGLEFIELD DR	MASTERS CT	Local	38	227.33	97	Good
1307	CHAMPIONS DR	MASTERS CT	PUTTERS CT	Local	38	1266.00	99	Good
1425	CHAMPIONS DR	PUTTERS CT	GALLERY LN	Local	38	332.76	100	Good
1322	CONDOR DR NE	GLENEAGLE BLVD	REDHAWK DR	Local	38	260.67	99	Good
1321	CONDOR DR NE	REDHAWK DR	DEAD END	Local	38	174.44	100	Good
1547	CROWN RIDGE BLVD	PEAK PL	VISTA DR	Local	38	879.23	88	Good
1543	CROWN RIDGE BLVD	VISTA DR	VALLEY VIEW DR	Local	38	288.84	89	Good
1536	CROWN RIDGE BLVD	VISTA DR	SR 9	Local	38	2534.23	89	Good
1545	CROWN RIDGE BLVD	KNOLL DR	PEAK PL	Local	38	394.29	89	Good
1544	CROWN RIDGE BLVD	193RD ST NE	VISTA DR	Local	38	309.84	90	Good
1546	CROWN RIDGE BLVD	VALLEY VIEW DR	193RD ST NE	Local	38	730.63	93	Good
1542	CROWN RIDGE BLVD	DEAD END	KNOLL DR	Local	38	263.01	96	Good
2039	DUNHAM AVE	E 1ST ST	E MAPLE ST	Local	40	428.10	88	Good
1918	DUNHAM AVE	E MAPLE ST	E UNION ST	Local	40	448.09	100	Good
2042	DUNHAM AVE	E UNION ST	E JACKSON ST	Local	40	435.22	100	Good
2026	E 1ST ST	N GIFFORD AVE	N WASHINGTON AVE	Collector	40	308.94	45	Poor
2028	E 1ST ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Collector	40	318.97	50	Poor
2015	E 1ST ST	N OLYMPIC AVE	N MACLEOD AVE	Collector	40	301.30	56	Poor
2018	E 1ST ST	N DUNHAM AVE	N FRENCH AVE	Collector	40	308.99	61	Fair
2016	E 1ST ST	N MCLEOD AVE	N DUNHAM ST	Collector	40	319.60	72	Satisfactory
2024	E 1ST ST	N LENORE AVE	N GIFFORD AVE	Collector	40	303.32	80	Satisfactory
2021	E 1ST ST	N FRENCH AVE	N LENORE AVE	Collector	40	318.31	88	Good
1909	E 1ST ST	N STILLAGUAMISH AVE	HAMLIN DR	Local	40	536.73	70	Satisfactory
2027	E 2ND ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	314.62	49	Poor
1947	E 2ND ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	328.90	55	Poor
2025	E 2ND ST	N LENORE AVE	N GIFFORD AVE	Local	40	303.92	63	Fair
2019	E 2ND ST	N DUNHAM AVE	N FRENCH AVE	Local	40	308.00	73	Satisfactory
2022	E 2ND ST	N FRENCH AVE	N LENORE AVE	Local	40	319.14	80	Satisfactory
1903	E 2ND ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	294.97	100	Good
2008	E 3RD ST	N WEST AVE	N OLYMPIC AVE	Collector	40	393.04	92	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1902	E 3RD ST	N STILLAGUAMISH AVE	ROBINHOOD DR	Local	40	308.37	17	Reconstruct
2017	E 3RD ST	N DUNHAM AVE	N FRENCH AVE	Local	40	306.79	66	Fair
1899	E 3RD ST	N MCLEOD AVE	N DUNHAM ST	Local	40	307.81	79	Satisfactory
1901	E 3RD ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	321.65	80	Satisfactory
2010	E 3RD ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	312.50	90	Good
2020	E 3RD ST	N FRENCH AVE	N LENORE AVE	Local	40	313.32	98	Good
2023	E 3RD ST	N LENORE AVE	N GIFFORD AVE	Local	40	311.56	99	Good
1900	E 3RD ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	317.82	100	Good
1949	E 4TH ST	N MCLEOD AVE	N DUNHAM ST	Local	40	311.65	24	Reconstruct
1985	E 4TH ST	N STILLAGUAMISH AVE	N ALCAZAR AVE	Local	40	276.27	38	Reconstruct
1896	E 4TH ST	N ALCAZAR AVE	N CLARA ST	Local	40	357.36	68	Fair
2012	E 4TH ST	N DUNHAM AVE	N FRENCH AVE	Local	40	308.03	77	Satisfactory
2009	E 4TH ST	N WEST AVE	N OLYMPIC AVE	Local	40	415.98	97	Good
2011	E 4TH ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	309.10	100	Good
2001	E 5TH ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	262.40	22	Reconstruct
2000	E 5TH ST	N STILLAGUAMISH AVE	N ALCAZAR AVE	Local	40	272.69	24	Reconstruct
2002	E 5TH ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	282.98	39	Reconstruct
2005	E 5TH ST	N DUNHAM AVE	N FRENCH AVE	Local	40	303.10	40	Reconstruct
2004	E 5TH ST	N FRENCH AVE	N HIGH ST	Local	40	271.05	44	Poor
1891	E 5TH ST	N CLARA ST	N BECKY AVE	Local	40	957.95	46	Poor
2003	E 5TH ST	N HIGH ST	N GIFFORD AVE	Local	40	266.66	48	Poor
1890	E 5TH ST	N WEST AVE	N OLYMPIC AVE	Local	40	441.07	76	Satisfactory
1983	E 5TH ST	N ALCAZAR AVE	N CLARA ST	Local	40	343.00	79	Satisfactory
2006	E 5TH ST	N MCLEOD AVE	N DUNHAM ST	Local	40	315.99	100	Good
2007	E 5TH ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	312.69	100	Good
1300	E COUNTRY CLUB DR	GLENEAGLE BLVD	EAGLEFIELD DR	Local	38	2215.56	96	Good
1419	E COUNTRY CLUB DR	IVERNESS DR	EAGLEFIELD DR	Local	38	1347.18	100	Good
1883	E DIVISION ST	N TALCOTT ST	N ALCAZAR AVE	Local	20	623.51	21	Reconstruct
1882	E DIVISION ST	HIGH ST	N TALCOTT ST	Local	20	496.68	42	Poor
1965	E DIVISION ST (EAST ROUDNABOUT)			Principal Arterial	40	277.10	92	Good
1967	E DIVISION ST (EASTBOUND)	N WEST AVE	N OLYMPIC AVE	Principal Arterial	40	366.22	91	Good
2014	E DIVISION ST (EASTBOUND)	N OLYMPIC AVE	BROADWAY AVE	Principal Arterial	40	229.04	95	Good
1934	E DIVISION ST (EASTBOUND)	N DUNHAM AVE	N FRENCH AVE	Collector	40	299.59	7	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1982	E DIVISION ST (EASTBOUND)	N FRENCH AVE	HIGH ST	Collector	40	264.48	38	Reconstruct
1976	E DIVISION ST (EASTBOUND)	N MCLEOD AVE	N DUNHAM ST	Collector	40	333.65	40	Poor
2013	E DIVISION ST (WESTBOUND)	N OLYMPIC AVE	BROADWAY AVE	Principal Arterial	40	215.28	86	Good
1966	E DIVISION ST (WESTBOUND)	N WEST AVE	N OLYMPIC AVE	Principal Arterial	40	381.18	89	Good
1981	E DIVISION ST (WESTBOUND)	N DUNHAM AVE	N NEWBERRY ST	Collector	40	105.57	16	Reconstruct
1977	E DIVISION ST (WESTBOUND)	N NEWBERRY ST	N HIGH ST	Collector	40	464.65	29	Reconstruct
1975	E DIVISION ST (WESTBOUND)	N MCLEOD AVE	N DUNHAM ST	Collector	40	339.15	50	Poor
1972	E GILMAN AVE	N TALCOTT ST	CITY LIMITS	Local	40	552.39	4	Reconstruct
1964	E GILMAN AVE	ALLEY	BROADWAY AVE	Local	40	422.02	36	Reconstruct
1974	E GILMAN AVE	NEWBERRY ST	N MANHATTAN AVE	Local	40	458.46	52	Poor
1973	E GILMAN AVE	N MANHATTAN AVE	N TALCOTT ST	Local	40	466.47	59	Poor
1879	E GILMAN AVE	BROADWAY AVE	NEWBERRY ST	Local	40	461.30	63	Fair
1876	E HALLER AVE	N WEST AVE	BROADWAY AVE	Local	40	567.74	46	Poor
1959	E HALLER AVE	BROADWAY AVE	DEAD END	Local	40	222.75	100	Good
2057	E HIGHLAND DR	DUNHAM AVE	S FRENCH AVE	Minor Arterial	40	326.58	38	Reconstruct
1938	E HIGHLAND DR	S FRENCH ST	S STILLAGUAMISH AVE	Minor Arterial	40	1216.16	40	Reconstruct
2055	E HIGHLAND DR	S OLYMPIC AVE	S MCLEOD AVE	Minor Arterial	40	308.11	64	Fair
2056	E HIGHLAND DR	S MCLEOD AVE	DUNHAM AVE	Minor Arterial	40	314.44	67	Fair
2053	E HIGHLAND DR	SR 9	S COBB ST	Local	40	192.32	67	Fair
2054	E HIGHLAND DR	S COBB ST	S OLYMPIC AVE	Local	40	273.78	74	Satisfactory
1920	E JACKSON ST	S MCLEOD AVE	DUNHAM AVE	Local	40	315.49	26	Reconstruct
2047	E JACKSON ST	S COBB ST	S OLYMPIC AVE	Local	40	283.08	31	Reconstruct
2059	E JACKSON ST	S OLYMPIC AVE	S MCLEOD AVE	Local	40	296.26	41	Poor
2050	E JACKSON ST	DUNHAM AVE	S FRENCH AVE	Local	40	316.53	44	Poor
1936	E MAPLE ST	LEBANON ST	S OLYMPIC AVE	Minor Arterial	40	267.40	74	Satisfactory
1912	E MAPLE ST	DUNHAM AVE	S FRENCH AVE	Local	40	317.02	25	Reconstruct
2048	E MAPLE ST	S MCLEOD AVE	DUNHAM AVE	Local	40	301.66	43	Poor
1914	E MAPLE ST	S HAMLIN DR	DEAD END	Local	40	249.39	75	Satisfactory
1916	E MAPLE ST	N STILLAGUAMISH AVE	HAMLIN DR	Local	40	571.60	98	Good
2049	E UNION ST	DUNHAM AVE	S FRENCH AVE	Local	40	320.37	83	Satisfactory
2046	E UNION ST	S COBB ST	S OLYMPIC AVE	Local	40	267.85	91	Good
2058	E UNION ST	S OLYMPIC AVE	S MCLEOD AVE	Local	40	297.61	91	Good
1917	E UNION ST	S MCLEOD AVE	DUNHAM AVE	Local	40	306.46	95	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1380	EAGLEFIELD DR	WOODBINE DR	OXFORD DR	Local	38	550.01	86	Good
1373	EAGLEFIELD DR	TURNBERRY PL	BALLANTRAE DR	Local	38	185.87	89	Good
1375	EAGLEFIELD DR	OXFORD DR	AMBLESIDE CT	Local	38	292.17	90	Good
1285	EAGLEFIELD DR	TEESIDE LN	CHAMPIONS DR	Local	38	989.05	92	Good
1376	EAGLEFIELD DR	BALLANTRAE DR	TEESIDE LN	Local	38	335.92	95	Good
1381	EAGLEFIELD DR	NEWPORT DR	E COUNTRY CLUB DR	Local	38	566.63	97	Good
1377	EAGLEFIELD DR	CHAMPIONS DR	SR 9	Local	38	334.97	97	Good
1378	EAGLEFIELD DR	E COUNTRY CLUB DR	TURNBERRY PL	Local	38	407.12	98	Good
1379	EAGLEFIELD DR	AMBLESIDE CT	CAMBRIDGE DR	Local	38	433.16	99	Good
1374	EAGLEFIELD DR	CAMBRIDGE DR	NEWPORT DR	Local	38	211.74	100	Good
1278	FALCON CT	DEAD END	WHITEHAWK DR	Local	38	114.47	77	Satisfactory
1263	GALLERY LN	DEAD END	CHAMPIONS DR	Local	38	105.74	100	Good
1389	GLENEAGLE BLVD	GLENWOOD AVE NE	CONDOR DR NE	Local	38	381.54	71	Satisfactory
1388	GLENEAGLE BLVD	GREENLOFT AVE NE	GLENWOOD AVE NE	Local	38	383.41	72	Satisfactory
1276	GLENEAGLE BLVD	W COUNTRY CLUB DR	HARRIER DR	Local	38	530.53	92	Good
1387	GLENEAGLE BLVD	HARRIER DR	GREENLOFT AVE NE	Local	38	375.23	99	Good
1386	GLENEAGLE BLVD	CONDOR DR NE	172ND ST NE	Local	38	200.08	100	Good
1318	GLENWOOD AVE NE	IRONWOOD ST	GLENEAGLE BLVD	Local	38	300.43	99	Good
1314	GREENLOFT AVE NE	IRONWOOD ST	GLENEAGLE BLVD	Local	38	189.48	86	Good
1287	GREENOCK CT	BALMORAL DR	DEAD END	Local	38	181.66	100	Good
1422	GREYWALLS DR	ABBEY PL	HUNTER PL	Local	38	254.39	100	Good
1423	GREYWALLS DR	EAGLEFIELD DR	CARLISLE PL	Local	38	253.25	100	Good
1296	GREYWALLS DR	CARLISLE PL	ABBEY PL	Local	38	998.49	100	Good
1237	GROVE PL	63RD AVE NE	208TH ST NE	Local	40	699.19	99	Good
1911	HAMLIN DR	E 1ST ST	DEAD END	Local	26	367.28	30	Reconstruct
1312	HARRIER DR	GLENEAGLE BLVD	REDHAWK DR	Local	38	218.70	99	Good
1294	HARROW PL	DEAD END	HAWKSVIEW DR	Local	38	249.84	98	Good
1291	HAVEN PL	NEWPORT DR	DEAD END	Local	38	104.27	97	Good
1293	HAWKSVIEW DR	NEWPORT DR	HARROW PL	Local	38	1164.70	95	Good
1368	HAWKSVIEW DR	HARROW PL	WOODBINE DR	Local	38	995.07	99	Good
1280	HERON CT	DEAD END	WHITEHAWK DR	Local	38	337.07	89	Good
1487	HIGH CLOVER BLVD NE	200TH PL NE	199TH ST NE	Local	28	215.36	88	Good
1489	HIGH CLOVER BLVD NE	200TH ST NE	47TH DR NE	Local	28	252.11	89	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1485	HIGH CLOVER BLVD NE	47TH DR NE	48TH AVE NE	Local	28	124.58	90	Good
1486	HIGH CLOVER BLVD NE	199TH ST NE	CEMETERY RD	Local	28	216.73	92	Good
1488	HIGH CLOVER BLVD NE	46TH DR NE	200TH ST NE	Local	28	236.10	95	Good
1444	HIGH CLOVER BLVD NE	48TH AVE NE	200TH PL NE	Local	28	600.32	96	Good
1490	HIGH CLOVER BLVD NE	45TH DR NE	46TH DR NE	Local	28	268.96	100	Good
1491	HIGH CLOVER BLVD NE	44TH DR NE	45TH DR NE	Local	28	298.57	100	Good
1427	HIGHLAND VIEW DR	TOPPER CT	BOVEE LN	Local	38	130.13	93	Good
1267	HIGHLAND VIEW DR	67TH AVE NE	UPLAND DR	Local	38	1165.15	95	Good
1429	HIGHLAND VIEW DR	UPLAND DR	UPLAND DR	Local	38	589.10	97	Good
1428	HIGHLAND VIEW DR	UPLAND DR	TOPPER CT	Local	38	512.07	100	Good
1923	HILLCREST DR	DEAD END	W FLORENCE ST	Local	18	232.61	36	Reconstruct
1265	HILLSIDE CT	UPLAND DR	DEAD END	Local	38	568.33	93	Good
1308	HUNTER PL	GREYWALLS DR	DEAD END	Local	38	424.78	99	Good
1420	INVERNESS DR	E COUNTRY CLUB DR	BALMORAL DR	Local	38	278.66	98	Good
1279	INVERNESS DR	BALMORAL DR	BALLANTRAE DR	Local	38	498.63	99	Good
1340	IRIS CT	188TH ST NE	DEAD END	Local	38	165.17	100	Good
1315	IRONWOOD ST	DEAD END	GREENLOFT AVE	Local	38	190.95	100	Good
1319	IRONWOOD ST	GREENLOFT AVE NE	GLENWOOD AVE NE	Local	38	535.26	100	Good
1320	IRONWOOD ST	GLENWOOD AVE NE	DEAD END	Local	38	209.88	100	Good
2074	JENSEN FARM LN	OLYMPIC PL	ANNA LN	Local	40	832.63	99	Good
2104	JENSEN FARM LN	LOIS LN	207TH ST NE	Local	40	182.26	100	Good
2105	JENSEN FARM LN	ANNA LN	LOIS LN	Local	40	409.11	100	Good
1929	JOANN LN	DEAD END	KONA DR	Local	30	607.39	59	Poor
2078	KEITH LN	207TH ST NE	81ST DR NE	Local	40	392.03	99	Good
1313	KESTREL CT	REDHAWK DR	DEAD END	Local	38	197.72	87	Good
1539	KNOLL DR	CROWN RIDGE BLVD	VISTA DR	Local	38	1325.51	91	Good
1930	KONA DR	JOANN LN	W MARION ST	Local	40	318.32	46	Poor
1924	KONA DR	JOANN LN	HILLCREST DR	Local	40	334.28	59	Poor
1234	LANTERN LN NE	DEAD END	CEMETERY RD	Local	40	236.26	79	Satisfactory
1944	LEBANON ST	67TH AVE NE	E MAPLE ST	Minor Arterial	40	443.37	70	Satisfactory
2075	LOIS LN	DEAD END	JENSEN FARM LN	Local	40	218.73	100	Good
2077	LOIS LN	JENSEN FARM LN	DEAD END	Local	40	308.34	100	Good
1261	MASTERS CT	CHAMPIONS DR	DEAD END	Local	38	101.65	96	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1940	MEDICAL CENTER DR	N STILLAGUAMISH AVE	TVIET RD	Local	40	935.50	100	Good
1272	MUIRFIELD CT	W COUNTRY CLUB DR	DEAD END	Local	38	206.80	97	Good
1979	N ALCAZAR AVE	E DIVISION ST	PARK HILL DR	Local	40	199.07	42	Poor
1980	N ALCAZAR AVE	PARK HILL DR	E 5TH ST	Local	40	334.57	45	Poor
1978	N ALCAZAR AVE	CITY LIMITS	E DIVISION ST	Local	40	298.98	51	Poor
1886	N ALCAZAR AVE	E 5TH ST	E 4TH ST	Local	40	435.50	68	Fair
1881	N BECKY AVE	E 5TH ST	DEAD END	Local	40	235.85	99	Good
1365	N CEDARBOUGH LOOP	NOBLE DR	NOBLE DR	Local	38	386.99	93	Good
1290	N CEDARBOUGH LOOP	WOODLANDS WAY	NOBLE DR	Local	38	436.72	93	Good
1364	N CEDARBOUGH LOOP	NOBLE DR	WOODBINE DR	Local	38	285.71	97	Good
1984	N CLARA ST	E 4TH ST	DEAD END	Local	40	240.33	69	Fair
1897	N CLARA ST	E 5TH ST	E 4TH ST	Local	40	449.79	78	Satisfactory
1986	N DUNHAM AVE	E DIVISION ST	E 5TH ST	Local	40	553.66	58	Poor
1884	N DUNHAM AVE	E 2ND ST	E 1ST ST	Local	40	441.39	91	Good
1990	N DUNHAM AVE	E 5TH ST	E 4TH ST	Local	40	430.10	100	Good
1994	N DUNHAM AVE	E 4TH ST	E 3RD ST	Local	40	427.76	100	Good
2029	N DUNHAM AVE	E 3RD ST	E 2ND ST	Local	40	438.38	100	Good
1950	N FRENCH AVE	E DIVISION ST	E 5TH ST	Collector	40	468.32	22	Reconstruct
1951	N FRENCH AVE	E 5TH ST	E 4TH ST	Collector	40	433.79	37	Reconstruct
1888	N FRENCH AVE	E 2ND ST	E 1ST ST	Collector	40	443.86	54	Poor
1998	N FRENCH AVE	E 4TH ST	E 3RD ST	Collector	40	425.73	54	Poor
2030	N FRENCH AVE	E 3RD ST	E 2ND ST	Collector	40	437.18	56	Poor
1905	N GIFFORD AVE	E 2ND ST	E 1ST ST	Local	40	446.37	22	Reconstruct
2033	N GIFFORD AVE	E 3RD ST	E 2ND ST	Local	40	428.97	46	Poor
1892	N GIFFORD AVE	E 5TH ST	DEAD END	Local	40	391.44	54	Poor
1889	N HIGH ST	E DIVISION ST	E 5TH ST	Local	40	501.28	58	Poor
1904	N LENORE AVE	E 2ND ST	E 1ST ST	Local	40	447.49	48	Poor
2032	N LENORE AVE	E 3RD ST	E 2ND ST	Local	40	432.05	66	Fair
1988	N MACLEOD AVE	E DIVISION ST	E 5TH ST	Local	40	477.54	62	Fair
2031	N MACLEOD AVE	E 2ND ST	E 1ST ST	Local	40	436.72	84	Satisfactory
1992	N MACLEOD AVE	E 5TH ST	E 4TH ST	Local	40	433.69	95	Good
1898	N MACLEOD AVE	E 3RD ST	E 2ND ST	Local	40	437.66	97	Good
1996	N MACLEOD AVE	E 4TH ST	E 3RD ST	Local	40	436.06	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1970	N MANHATTAN AVE	E BURKE AVE	E GILMAN AVE	Collector	40	289.08	49	Poor
1878	N MANHATTAN AVE	E GILMAN AVE	E DIVISION	Collector	40	319.19	57	Poor
1969	N NEWBERRY ST	E GILMAN AVE	E DIVISION ST	Local	40	274.03	45	Poor
1968	N NEWBERRY ST	DEAD END	E BURKE AVE	Local	40	122.20	81	Satisfactory
1877	N NEWBERRY ST	E BURKE AVE	E GILMAN AVE	Local	40	290.55	86	Good
2036	N OLYMPIC AVE	E 3RD ST	E 2ND ST	Minor Arterial	40	443.82	99	Good
1935	N OLYMPIC AVE	E 2ND ST	E 1ST ST	Minor Arterial	40	435.66	99	Good
1989	N OLYMPIC AVE	E DIVISION ST	E 5TH ST	Minor Arterial	40	477.41	100	Good
1993	N OLYMPIC AVE	E 5TH ST	E 4TH ST	Minor Arterial	40	443.06	100	Good
1997	N OLYMPIC AVE	E 4TH ST	E 3RD ST	Minor Arterial	40	429.69	100	Good
1999	N STILLAGUAMISH AVE	E 5TH ST	E 4TH ST	Local	40	419.45	42	Poor
1895	N STILLAGUAMISH AVE	E 4TH ST	E 3RD ST	Local	40	424.12	44	Poor
1907	N STILLAGUAMISH AVE	E 2ND ST	E 1ST ST	Local	40	441.76	58	Poor
2035	N STILLAGUAMISH AVE	E 3RD ST	E 2ND ST	Local	40	439.70	66	Fair
1971	N TALCOTT ST	E GILMAN AVE	E DIVISION ST	Local	40	207.08	75	Satisfactory
1880	N TALCOTT ST	DEAD END	E GILMAN AVE	Local	40	222.00	82	Satisfactory
1893	N WASHINGTON AVE	E 5TH ST	DEAD END	Local	40	358.62	27	Reconstruct
2034	N WASHINGTON AVE	E 3RD ST	E 2ND ST	Local	40	436.05	28	Reconstruct
1906	N WASHINGTON AVE	E 2ND ST	E 1ST ST	Local	40	443.34	42	Poor
1995	N WEST AVE	E 4TH ST	E 3RD ST	Collector	40	429.92	75	Satisfactory
1957	N WEST AVE	DEAD END	W COX ST	Local	25	225.19	69	Fair
1958	N WEST AVE	W COX ST	W HALLER AVE	Local	25	285.94	69	Fair
1925	N WEST AVE	W HALLER AVE	W BURKE AVE	Local	22	312.49	77	Satisfactory
1991	N WEST AVE	E 5TH ST	E 4TH ST	Local	40	451.43	80	Satisfactory
1987	N WEST AVE	E DIVISION ST	E 5TH ST	Local	40	468.07	82	Satisfactory
1887	N WEST AVE	E 3RD ST	67TH AVE NE	Local	40	1587.50	83	Satisfactory
2067	N WEST AVE	DEAD END	W GILMAN AVE	Local	40	215.00	89	Good
1937	N WEST AVE	W GILMAN AVE	ROUNDABOUT	Local	40	277.75	91	Good
1292	NEWPORT DR	HAWKSVIEW DR	HAVEN PL	Local	38	1341.54	94	Good
1369	NEWPORT DR	STERLING PL	EAGLEFIELD DR	Local	38	273.75	98	Good
1370	NEWPORT DR	HAVEN PL	STERLING PL	Local	38	315.72	100	Good
1295	NOBLE DR	N CEDARBOUGH LOOP	N CEDARBOUGH LOOP	Local	38	844.77	44	Poor
1304	OAKWOOD PL	DEAD END	S CEDARBOUGH LOOP	Local	38	163.40	37	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
2106	OLYMPIC PL	JENSEN FARM LN	204TH ST NE	Local	40	1111.41	87	Good
2082	OLYMPIC PL	S OLYMPIC AVE	JENSEN FARM LN	Local	40	1175.81	87	Good
1274	OSPREY RD	DEAD END	PERREGRINE PL	Local	38	200.38	100	Good
1316	OSPREY RD	PERREGRINE PL	REDHAWK DR	Local	38	764.36	100	Good
1311	OXFORD DR	EAGLEFIELD DR	DEAD END	Local	38	1238.72	97	Good
1885	PARK HILL DR	N ALCAZAR AVE	DEAD END	Local	40	737.14	40	Poor
1537	PEAK PL	CROWN RIDGE BLVD	DEAD END	Local	38	480.27	97	Good
1275	PERREGRINE PL	REDHAWK DR	OSPREY RD	Local	38	381.33	100	Good
2070	PORTAGE ST	81ST DR NE	S STILLAGUAMISH AVE	Local	40	736.37	68	Fair
2101	PORTAGE ST	210TH ST NE	79TH DR NE	Local	40	62.04	93	Good
2100	PORTAGE ST	79TH DR NE	82ND DR NE	Local	40	499.82	98	Good
1262	PUTTERS CT	DEAD END	CHAMPIONS DR	Local	38	129.92	100	Good
1273	REDHAWK DR	HARRIER DR	KESTRAL CT	Local	38	227.45	99	Good
1392	REDHAWK DR	OSPREY RD	BOREAL CT	Local	38	259.27	99	Good
1426	REDHAWK DR	PERREGRINE PL	HARRIER DR	Local	38	196.30	100	Good
1390	REDHAWK DR	DEAD END	PERREGRINE PL	Local	38	229.64	100	Good
1391	REDHAWK DR	BOREAL CT	CONDOR DR NE	Local	38	237.88	100	Good
1393	REDHAWK DR	KESTRAL CT	OSPREY RD	Local	38	334.62	100	Good
1908	ROBINHOOD DR	E 3RD ST	DEAD END	Local	40	478.66	7	Reconstruct
1303	S CEDARBOUGH LOOP	SHADY GROVE PL	W COUNTRY CLUB DR	Local	38	899.28	38	Reconstruct
1363	S CEDARBOUGH LOOP	WOODLANDS WAY	OAKWOOD PL	Local	38	415.55	48	Poor
1362	S CEDARBOUGH LOOP	OAKWOOD PL	SHADY GROVE PL	Local	38	245.75	66	Fair
2045	S COBB AVE	E JACKSON ST	E HIGHLAND DR	Local	40	416.77	20	Reconstruct
1919	S COBB AVE	E UNION ST	E JACKSON ST	Local	40	449.55	28	Reconstruct
1939	S DUNHAM AVE	E JACKSON ST	E HIGHLAND DR	Local	40	404.08	94	Good
2038	S FRENCH AVE	E 1ST ST	E MAPLE ST	Collector	40	416.30	39	Reconstruct
2041	S FRENCH AVE	E MAPLE ST	E UNION ST	Collector	40	454.58	53	Poor
2044	S FRENCH AVE	E JACKSON ST	E HIGHLAND DR	Collector	40	380.95	63	Fair
1913	S FRENCH AVE	E UNION ST	E JACKSON ST	Collector	40	440.64	63	Fair
2060	S HAMLIN DR	DEAD END	E MAPLE ST	Local	40	221.34	58	Poor
1928	S HAMLIN DR	E MAPLE ST	DEAD END	Local	40	280.69	100	Good
2064	S HAZEL ST	FIR LANE	W FLORENCE ST	Local	40	206.76	53	Poor
2065	S HAZEL ST	W FLORENCE ST	W MARION ST	Local	40	456.26	95	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1921	S HAZEL ST	W MARION ST	W JENSEN ST	Local	40	394.85	98	Good
2066	S HAZEL ST	W JENSEN ST	DEAD END	Local	40	142.34	99	Good
2043	S MACLEOD AVE	E JACKSON ST	E HIGHLAND DR	Local	40	410.12	73	Satisfactory
2037	S MACLEOD AVE	E 1ST ST	E MAPLE ST	Local	40	426.56	85	Satisfactory
1910	S MACLEOD AVE	E UNION ST	E JACKSON ST	Local	40	439.20	88	Good
2040	S MACLEOD AVE	E MAPLE ST	E UNION ST	Local	40	446.51	89	Good
2114	S OLYMPIC AVE	E UNION ST	E JACKSON ST	Minor Arterial	40	438.30	85	Satisfactory
2118	S OLYMPIC AVE	E JACKSON ST	E HIGHLAND DR	Minor Arterial	40	414.20	86	Good
2115	S OLYMPIC AVE	E 1ST ST	E MAPLE ST	Minor Arterial	40	422.96	99	Good
2117	S OLYMPIC AVE	E MAPLE ST	E UNION ST	Minor Arterial	40	447.13	99	Good
2097	S OLYMPIC AVE	E HIGHLAND DR	OLYMPIC PL	Local	40	341.71	88	Good
2094	S STILLAGUAMISH AVE	WESLEY ST	PORTAGE ST	Minor Arterial	40	763.54	77	Satisfactory
2099	S STILLAGUAMISH AVE	PORTAGE ST	207TH ST NE	Minor Arterial	40	311.53	86	Good
2098	S STILLAGUAMISH AVE	TVEIT RD	WESLEY ST	Minor Arterial	40	235.47	89	Good
1915	S STILLAGUAMISH AVE	E MAPLE ST	MEDICAL CENTER DR	Collector	40	543.56	100	Good
2051	S STILLAGUAMISH AVE	E 1ST ST	E MAPLE ST	Collector	40	699.97	100	Good
2052	S STILLAGUAMISH AVE	MEDICAL CENTER DR	E HIGHLAND DR	Collector	40	428.31	100	Good
1271	SAINT ANDREWS CT	W COUNTRY CLUB DR	DEAD END	Local	38	242.01	96	Good
1306	SHADY GROVE PL	DEAD END	S CEDARBOUGH LOOP	Local	38	197.53	39	Reconstruct
1283	SILVERLEAF PL	DEAD END	WOODBINE DR	Local	38	380.57	70	Satisfactory
1101	SMOKEY POINT BLVD	172ND ST NE	169TH PL NE	Principal Arterial	60	884.12	84	Satisfactory
1121	SMOKEY POINT BLVD	169TH PL NE	168TH ST NE	Principal Arterial	60	529.13	85	Good
1120	SMOKEY POINT BLVD	168TH ST NE	166TH PL NE	Principal Arterial	60	463.71	90	Good
1123	SMOKEY POINT BLVD	166TH PL NE	CITY LIMITS	Principal Arterial	60	764.63	92	Good
1052	SMOKEY POINT BLVD	188TH ST NE	35TH AVE NE	Minor Arterial	22	1459.45	60	Fair
1051	SMOKEY POINT BLVD	193RD ST NE	188TH ST NE	Minor Arterial	22	1828.95	71	Satisfactory
1060	SMOKEY POINT BLVD	176TH PL NE	175TH PL NE	Minor Arterial	22	386.76	82	Satisfactory
1061	SMOKEY POINT BLVD	174TH PL NE	SMOKEY POINT DR	Minor Arterial	22	263.78	87	Good
1122	SMOKEY POINT BLVD	173RD PL NE	172ND ST NE	Minor Arterial	60	590.47	89	Good
1046	SMOKEY POINT BLVD	175TH PL NE	SMOKEY POINT DR	Minor Arterial	22	334.09	95	Good
1053	SMOKEY POINT BLVD	35TH AVE NE	183RD AVE NE	Minor Arterial	22	199.57	100	Good
1054	SMOKEY POINT BLVD	183RD PL NE	182ND ST NE	Minor Arterial	22	554.36	100	Good
1055	SMOKEY POINT BLVD	182ND ST NE	181ST PL NE	Minor Arterial	22	127.72	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1056	SMOKEY POINT BLVD	181ST PL NE	180TH ST NE	Minor Arterial	22	432.88	100	Good
1057	SMOKEY POINT BLVD	180TH ST NE	178TH PL NE	Minor Arterial	22	528.11	100	Good
1058	SMOKEY POINT BLVD	178TH PL NE	177TH PL NE	Minor Arterial	22	366.15	100	Good
1059	SMOKEY POINT BLVD	177TH PL NE	176TH PL NE	Minor Arterial	22	217.81	100	Good
1049	SMOKEY POINT BLVD	SMOKEY POINT BLVD	204TH ST NE	Collector	22	1903.37	80	Satisfactory
1050	SMOKEY POINT BLVD	204TH ST NE	193RD ST NE	Collector	22	3926.61	83	Satisfactory
1048	SMOKEY POINT BLVD	CITY LIMITS (EDGE OF SR 530)	SMOKEY POINT BLVD	Collector	22	609.52	85	Good
1047	SMOKEY POINT BLVD	SR 530	SMOKEY POINT BLVD	Collector	22	703.85	87	Good
1298	SPRUCEWOOD PL	DEAD END	WOODLANDS WAY	Local	38	196.40	43	Poor
1299	STERLING PL	NEWPORT DR	DEAD END	Local	38	149.15	100	Good
1289	TEESIDE LN	DEAD END	EAGLEFIELD DR	Local	38	500.40	99	Good
1270	TOPPER CT	HIGHLAND VIEW DR	DEAD END	Local	38	736.86	99	Good
1632	TOTEM PARK LN	TOTEM PARK LANE	177TH PL NE	Local	23	258.10	19	Reconstruct
1633	TOTEM PARK LN	TOTEM PARK LN	TOTEM PARK LN	Local	23	274.39	36	Reconstruct
1619	TOTEM PARK LN	TOTEM PARK LN	DEAD END	Local	23	100.71	41	Poor
1613	TOTEM PARK LN	DEAD END	TOTEM PARK LN	Local	23	108.48	43	Poor
1612	TOTEM PARK LN	39TH DR NE	TOTEM PARK LN	Local	23	321.08	54	Poor
1269	TROON CT	DEAD END	W COUNTRY CLUB DR	Local	38	198.57	100	Good
1297	TURNBERRY PL	EAGLEFIELD DR	DEAD END	Local	38	161.45	100	Good
1953	TVEIT RD	MEDICAL CENTER DR	CITY LIMITS	Local	40	680.22	87	Good
1435	TVEIT RD	92ND AVE NE	CITY LIMITS	Local	30	1014.38	91	Good
1438	TVEIT RD	CITY LIMITS	92ND AVE NE	Local	30	418.14	94	Good
2063	TVEIT RD	S STILLAGUAMISH AVE	MEDICAL CENTER DR	Local	40	614.95	96	Good
1431	UPLAND DR	HILLSIDE CT	HIGHLAND VIEW DR	Local	38	425.57	98	Good
1268	UPLAND DR	HIGHLAND VIEW DR	HIGHLAND VIEW DR	Local	38	995.08	98	Good
1430	UPLAND DR	67TH AVE NE	HILLSIDE CT	Local	38	197.68	99	Good
1540	VALLEY VIEW DR	VISTA DR	CROWN RIDGE BLVD	Local	38	1369.02	100	Good
1302	VINEWAY PL	WOODLANDS WAY	DEAD END	Local	38	473.35	54	Poor
1549	VISTA DR	KNOLL DR	CROWN RIDGE BLVD	Local	38	761.88	95	Good
1548	VISTA DR	VALLEY VIEW DR	CROWN RIDGE BLVD	Local	38	420.94	95	Good
1538	VISTA DR	KNOLL DR	VALLEY VIEW DR	Local	38	867.69	96	Good
1894	W 4TH ST	SR 9	N WEST AVE	Collector	40	183.54	90	Good
1383	W COUNTRY CLUB DR	SAINT ANDREWS CT	GLENEAGLE BLVD	Local	38	182.24	80	Satisfactory

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1384	W COUNTRY CLUB DR	MUIRFIELD CT	SAINT ANDREWS CT	Local	38	425.74	91	Good
1382	W COUNTRY CLUB DR	WOODBINE DR	S CEDARBOUGH LOOP	Local	38	139.76	95	Good
1385	W COUNTRY CLUB DR	TROON CT	MUIRFIELD CT	Local	38	967.64	99	Good
1266	W COUNTRY CLUB DR	S CEDARBOUGH LOOP	TROON CT	Local	38	1121.58	100	Good
1943	W COX ST	DEAD END	N WEST AVE	Local	40	368.38	80	Satisfactory
1963	W DIVISION ST (EASTBOUND)	SR 9	N WEST AVE	Principal Arterial	40	332.98	84	Satisfactory
1945	W DIVISION ST (WEST ROUNDABOUT)			Principal Arterial	40	304.53	92	Good
1933	W DIVISION ST (WESTBOUND)	SR 9	N WEST AVE	Principal Arterial	40	344.67	75	Satisfactory
1922	W FLORENCE ST	HILLCREST DR	S HAZEL ST	Local	18	328.80	45	Poor
1927	W GILMAN AVE	DEAD END	N WEST AVE	Local	40	388.66	84	Satisfactory
1926	W HALLER AVE	DEAD END	N WEST AVE	Local	40	130.57	75	Satisfactory
1932	W JENSEN ST	DEAD END	S HAZEL ST	Local	40	1341.03	32	Reconstruct
1931	W MARION ST	KONA DR	S HAZEL ST	Local	40	569.42	67	Fair
2068	WESLEY ST	S STILLAGUAMISH AVE	DEAD END	Local	40	408.26	60	Fair
1366	WHITEHAWK DR	FALCON CT	HERON CT	Local	38	304.61	78	Satisfactory
1277	WHITEHAWK DR	HERON CT	WOODBINE DR	Local	38	516.05	86	Good
1367	WHITEHAWK DR	FALCON CT	HAWKSVIEW DR	Local	38	466.83	87	Good
1286	WOODBINE DR	WOODLANDS WAY	SILVERLEAF PL	Local	38	790.34	44	Poor
1359	WOODBINE DR	WHITEHAWK DR	N CEDARBOUGH LOOP	Local	38	347.37	49	Poor
1358	WOODBINE DR	SILVERLEAF PL	WHITEHAWK DR	Local	38	257.08	56	Poor
1357	WOODBINE DR	HAWKSVIEW DR	WOODLANDS WAY	Local	38	148.91	61	Fair
1360	WOODBINE DR	N CEDARBOUGH LOOP	HAWKSVIEW DR	Local	38	557.94	70	Satisfactory
1361	WOODBINE DR	WOODLANDS WAY	EAGLEFIELD DR	Local	38	590.17	85	Good
1288	WOODLANDS WAY	S CEDARBOUGH LOOP	WOODBINE DR	Local	38	946.40	76	Satisfactory
1356	WOODLANDS WAY	67TH AVE NE	WOODBINE DR	Local	38	853.41	94	Good
1354	WOODLANDS WAY	VINEWAY PL	N CEDARBOUGH LOOP	Local	38	155.53	94	Good
1355	WOODLANDS WAY	WOODBINE DR	SPRUCEWOOD PL	Local	38	438.54	95	Good
1353	WOODLANDS WAY	SPRUCEWOOD PL	VINEWAY PL	Local	38	140.72	98	Good
2096	(no name)	207TH ST NE	DEAD END	Local	40	260.84	100	Good

Appendix E

Pavement Condition Index and Ratings

By PCI (Worst to Best by Functional Class)

City of Arlington 2013 Pavement Condition Survey - Road Condition Sorted by Road Classification and Rating

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
			Principal Arterials					
1875	BROADWAY AVE	E BURKE AVE	E GILMAN AVE	Principal Arterial	40	295.69	52	Poor
1933	W DIVISION ST (WESTBOUND)	SR 9	N WEST AVE	Principal Arterial	40	344.67	75	Satisfactory
1962	BROADWAY AVE	E GILMAN AVE	ROUNDABOUT	Principal Arterial	40	268.29	75	Satisfactory
1101	SMOKEY POINT BLVD	172ND ST NE	169TH PL NE	Principal Arterial	60	884.12	84	Satisfactory
1963	W DIVISION ST (EASTBOUND)	SR 9	N WEST AVE	Principal Arterial	40	332.98	84	Satisfactory
1121	SMOKEY POINT BLVD	169TH PL NE	168TH ST NE	Principal Arterial	60	529.13	85	Good
2013	E DIVISION ST (WESTBOUND)	N OLYMPIC AVE	BROADWAY AVE	Principal Arterial	40	215.28	86	Good
1966	E DIVISION ST (WESTBOUND)	N WEST AVE	N OLYMPIC AVE	Principal Arterial	40	381.18	89	Good
1120	SMOKEY POINT BLVD	168TH ST NE	166TH PL NE	Principal Arterial	60	463.71	90	Good
1967	E DIVISION ST (EASTBOUND)	N WEST AVE	N OLYMPIC AVE	Principal Arterial	40	366.22	91	Good
1945	W DIVISION ST (WEST ROUNDABOUT)			Principal Arterial	40	304.53	92	Good
1965	E DIVISION ST (EAST ROUDNABOUT)			Principal Arterial	40	277.10	92	Good
1123	SMOKEY POINT BLVD	166TH PL NE	CITY LIMITS	Principal Arterial	60	764.63	92	Good
2014	E DIVISION ST (EASTBOUND)	N OLYMPIC AVE	BROADWAY AVE	Principal Arterial	40	229.04	95	Good
			Minor Arterials					
2057	E HIGHLAND DR	DUNHAM AVE	S FRENCH AVE	Minor Arterial	40	326.58	38	Reconstruct
1938	E HIGHLAND DR	S FRENCH ST	S STILLAGUAMISH AVE	Minor Arterial	40	1216.16	40	Reconstruct
1099	67TH AVE NE	211ST PL NE	204TH ST NE	Minor Arterial	22	2465.65	47	Poor
1103	67TH AVE NE	S WEST AVE	211ST PL NE	Minor Arterial	35	2158.01	53	Poor
1052	SMOKEY POINT BLVD	188TH ST NE	35TH AVE NE	Minor Arterial	22	1459.45	60	Fair
2055	E HIGHLAND DR	S OLYMPIC AVE	S MCLEOD AVE	Minor Arterial	40	308.11	64	Fair
2056	E HIGHLAND DR	S MCLEOD AVE	DUNHAM AVE	Minor Arterial	40	314.44	67	Fair
1944	LEBANON ST	67TH AVE NE	E MAPLE ST	Minor Arterial	40	443.37	70	Satisfactory
1051	SMOKEY POINT BLVD	193RD ST NE	188TH ST NE	Minor Arterial	22	1828.95	71	Satisfactory
1936	E MAPLE ST	LEBANON ST	S OLYMPIC AVE	Minor Arterial	40	267.40	74	Satisfactory
2094	S STILLAGUAMISH AVE	WESLEY ST	PORTAGE ST	Minor Arterial	40	763.54	77	Satisfactory
1116	67TH AVE NE	UPLAND DR	HIGHLAND VIEW DR	Minor Arterial	35	1356.68	78	Satisfactory
1113	67TH AVE NE	HIGHLAND VIEW DR	172ND ST NE	Minor Arterial	35	817.50	81	Satisfactory

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1060	SMOKEY POINT BLVD	176TH PL NE	175TH PL NE	Minor Arterial	22	386.76	82	Satisfactory
1102	67TH AVE NE	168TH ST NE	CITY LIMITS	Minor Arterial	60	973.82	82	Satisfactory
1078	67TH AVE NE	BOVEE LN	UPLAND DR	Minor Arterial	36	310.08	82	Satisfactory
1114	67TH AVE NE	172ND ST NE	168TH ST NE	Minor Arterial	40	1035.21	83	Satisfactory
2114	S OLYMPIC AVE	E UNION ST	E JACKSON ST	Minor Arterial	40	438.30	85	Satisfactory
2099	S STILLAGUAMISH AVE	PORTAGE ST	207TH ST NE	Minor Arterial	40	311.53	86	Good
2118	S OLYMPIC AVE	E JACKSON ST	E HIGHLAND DR	Minor Arterial	40	414.20	86	Good
1061	SMOKEY POINT BLVD	174TH PL NE	SMOKEY POINT DR	Minor Arterial	22	263.78	87	Good
1122	SMOKEY POINT BLVD	173RD PL NE	172ND ST NE	Minor Arterial	60	590.47	89	Good
2098	S STILLAGUAMISH AVE	TVEIT RD	WESLEY ST	Minor Arterial	40	235.47	89	Good
1125	67TH AVE NE	188TH ST NE	WOODLANDS WAY	Minor Arterial	35	500.15	90	Good
1118	67TH AVE NE	197TH ST NE	191ST PL NE	Minor Arterial	35	2207.89	91	Good
1124	67TH AVE NE	200TH PL NE	197TH ST NE	Minor Arterial	35	811.29	91	Good
2095	BURN RD	207TH ST NE	CITY LIMITS	Minor Arterial	40	4159.74	91	Good
1117	67TH AVE NE	204TH ST NE	200TH PL NE	Minor Arterial	35	1134.52	92	Good
1100	67TH AVE NE	WOODLANDS WAY	BOVEE LN	Minor Arterial	35	2337.13	93	Good
1046	SMOKEY POINT BLVD	175TH PL NE	SMOKEY POINT DR	Minor Arterial	22	334.09	95	Good
1115	67TH AVE NE	191ST PL NE	188TH ST NE	Minor Arterial	55	1108.11	96	Good
2036	N OLYMPIC AVE	E 3RD ST	E 2ND ST	Minor Arterial	40	443.82	99	Good
2115	S OLYMPIC AVE	E 1ST ST	E MAPLE ST	Minor Arterial	40	422.96	99	Good
1935	N OLYMPIC AVE	E 2ND ST	E 1ST ST	Minor Arterial	40	435.66	99	Good
2117	S OLYMPIC AVE	E MAPLE ST	E UNION ST	Minor Arterial	40	447.13	99	Good
1180	51ST AVE NE	AIRPORT BLVD	172ND ST NE	Minor Arterial	26	989.73	100	Good
1168	AIRPORT BLVD	DEAD END	48TH DR NE	Minor Arterial	26	978.83	100	Good
1205	AIRPORT BLVD	50TH DR NE	51ST AVE NE	Minor Arterial	26	236.67	100	Good
1206	AIRPORT BLVD	49TH DR NE	50TH DR NE	Minor Arterial	26	399.50	100	Good
1207	AIRPORT BLVD	48TH DR NE	49TH DR NE	Minor Arterial	26	422.40	100	Good
1989	N OLYMPIC AVE	E DIVISION ST	E 5TH ST	Minor Arterial	40	477.41	100	Good
1993	N OLYMPIC AVE	E 5TH ST	E 4TH ST	Minor Arterial	40	443.06	100	Good
1997	N OLYMPIC AVE	E 4TH ST	E 3RD ST	Minor Arterial	40	429.69	100	Good
1053	SMOKEY POINT BLVD	35TH AVE NE	183RD AVE NE	Minor Arterial	22	199.57	100	Good
1054	SMOKEY POINT BLVD	183RD PL NE	182ND ST NE	Minor Arterial	22	554.36	100	Good
1055	SMOKEY POINT BLVD	182ND ST NE	181ST PL NE	Minor Arterial	22	127.72	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1056	SMOKEY POINT BLVD	181ST PL NE	180TH ST NE	Minor Arterial	22	432.88	100	Good
1057	SMOKEY POINT BLVD	180TH ST NE	178TH PL NE	Minor Arterial	22	528.11	100	Good
1058	SMOKEY POINT BLVD	178TH PL NE	177TH PL NE	Minor Arterial	22	366.15	100	Good
1059	SMOKEY POINT BLVD	177TH PL NE	176TH PL NE	Minor Arterial	22	217.81	100	Good
			Collectors					
1934	E DIVISION ST (EASTBOUND)	N DUNHAM AVE	N FRENCH AVE	Collector	40	299.59	7	Reconstruct
1981	E DIVISION ST (WESTBOUND)	N DUNHAM AVE	N NEWBERRY ST	Collector	40	105.57	16	Reconstruct
1950	N FRENCH AVE	E DIVISION ST	E 5TH ST	Collector	40	468.32	22	Reconstruct
1977	E DIVISION ST (WESTBOUND)	N NEWBERRY ST	N HIGH ST	Collector	40	464.65	29	Reconstruct
1951	N FRENCH AVE	E 5TH ST	E 4TH ST	Collector	40	433.79	37	Reconstruct
1982	E DIVISION ST (EASTBOUND)	N FRENCH AVE	HIGH ST	Collector	40	264.48	38	Reconstruct
2038	S FRENCH AVE	E 1ST ST	E MAPLE ST	Collector	40	416.30	39	Reconstruct
1976	E DIVISION ST (EASTBOUND)	N MCLEOD AVE	N DUNHAM ST	Collector	40	333.65	40	Poor
2026	E 1ST ST	N GIFFORD AVE	N WASHINGTON AVE	Collector	40	308.94	45	Poor
1970	N MANHATTAN AVE	E BURKE AVE	E GILMAN AVE	Collector	40	289.08	49	Poor
2028	E 1ST ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Collector	40	318.97	50	Poor
1975	E DIVISION ST (WESTBOUND)	N MCLEOD AVE	N DUNHAM ST	Collector	40	339.15	50	Poor
1495	CEMETERY RD	53RD AVE NE	54TH DR NE	Collector	28	276.13	50	Poor
2041	S FRENCH AVE	E MAPLE ST	E UNION ST	Collector	40	454.58	53	Poor
1888	N FRENCH AVE	E 2ND ST	E 1ST ST	Collector	40	443.86	54	Poor
1184	51ST AVE NE	170TH PL NE	CITY LIMITS	Collector	26	2148.79	54	Poor
1998	N FRENCH AVE	E 4TH ST	E 3RD ST	Collector	40	425.73	54	Poor
2030	N FRENCH AVE	E 3RD ST	E 2ND ST	Collector	40	437.18	56	Poor
2015	E 1ST ST	N OLYMPIC AVE	N MACLEOD AVE	Collector	40	301.30	56	Poor
1878	N MANHATTAN AVE	E GILMAN AVE	E DIVISION	Collector	40	319.19	57	Poor
1439	CEMETERY RD	54TH DR NE	CITY LIMITS	Collector	28	1722.67	57	Poor
1255	CEMETERY RD	CITY LIMITS	LANTERN LN	Collector	40	176.34	60	Poor
1208	51ST AVE NE	172ND ST NE	170TH PL NE	Collector	26	530.04	61	Fair
2018	E 1ST ST	N DUNHAM AVE	N FRENCH AVE	Collector	40	308.99	61	Fair
2044	S FRENCH AVE	E JACKSON ST	E HIGHLAND DR	Collector	40	380.95	63	Fair
1913	S FRENCH AVE	E UNION ST	E JACKSON ST	Collector	40	440.64	63	Fair
1532	188TH ST NE	42ND DR NE	43RD DR NE	Collector	28	394.07	67	Fair
1496	CEMETERY RD	51ST ST NE	53RD AVE NE	Collector	28	597.81	68	Fair

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1510	47TH AVE NE	193RD PL NE	191ST PL NE	Collector	28	651.78	71	Satisfactory
1509	47TH AVE NE	195TH ST NE	193RD PL NE	Collector	28	613.46	72	Satisfactory
1191	188TH ST NE	SMOKEY POINT BLVD	35TH AVE NE	Collector	26	667.03	72	Satisfactory
2016	E 1ST ST	N MCLEOD AVE	N DUNHAM ST	Collector	40	319.60	72	Satisfactory
1995	N WEST AVE	E 4TH ST	E 3RD ST	Collector	40	429.92	75	Satisfactory
1049	SMOKEY POINT BLVD	SMOKEY POINT BLVD	204TH ST NE	Collector	22	1903.37	80	Satisfactory
2024	E 1ST ST	N LENORE AVE	N GIFFORD AVE	Collector	40	303.32	80	Satisfactory
1190	188TH ST NE	35TH AVE NE	CITY LIMITS	Collector	26	655.98	80	Satisfactory
1463	47TH AVE NE	191ST PL NE	188TH ST NE	Collector	28	1131.73	80	Satisfactory
1508	47TH AVE NE	196TH PL NE	195TH ST NE	Collector	28	358.17	80	Satisfactory
1497	CEMETERY RD	HIGH CLOVER BLVD	51ST ST NE	Collector	28	672.68	81	Satisfactory
1256	CEMETERY RD	65TH DR NE	67TH AVE NE	Collector	40	379.75	82	Satisfactory
1050	SMOKEY POINT BLVD	204TH ST NE	193RD ST NE	Collector	22	3926.61	83	Satisfactory
1244	CEMETERY RD	64TH DR NE	65TH DR NE	Collector	40	419.78	83	Satisfactory
1257	CEMETERY RD	LANTERN LN	64TH DR NE	Collector	40	389.67	84	Satisfactory
1484	188TH ST NE	43RD DR NE	46TH AVE NE	Collector	28	758.64	84	Satisfactory
1048	SMOKEY POINT BLVD	CITY LIMITS (EDGE OF SR 530)	SMOKEY POINT BLVD	Collector	22	609.52	85	Good
1498	CEMETERY RD	CITY LIMITS	HIGH CLOVER BLVD	Collector	28	751.13	86	Good
1511	47TH AVE NE	CEMETERY RD	196TH PL NE	Collector	28	766.21	86	Good
1047	SMOKEY POINT BLVD	SR 530	SMOKEY POINT BLVD	Collector	22	703.85	87	Good
2021	E 1ST ST	N FRENCH AVE	N LENORE AVE	Collector	40	318.31	88	Good
1894	W 4TH ST	SR 9	N WEST AVE	Collector	40	183.54	90	Good
2008	E 3RD ST	N WEST AVE	N OLYMPIC AVE	Collector	40	393.04	92	Good
1531	188TH ST NE	46TH AVE NE	47TH AVE NE	Collector	28	338.26	93	Good
1535	188TH ST NE	CITY LIMITS	42ND DR NE	Collector	28	288.55	95	Good
1915	S STILLAGUAMISH AVE	E MAPLE ST	MEDICAL CENTER DR	Collector	40	543.56	100	Good
2051	S STILLAGUAMISH AVE	E 1ST ST	E MAPLE ST	Collector	40	699.97	100	Good
2052	S STILLAGUAMISH AVE	MEDICAL CENTER DR	E HIGHLAND DR	Collector	40	428.31	100	Good
			Local					
1972	E GILMAN AVE	N TALCOTT ST	CITY LIMITS	Local	40	552.39	4	Reconstruct
1908	ROBINHOOD DR	E 3RD ST	DEAD END	Local	40	478.66	7	Reconstruct
2081	80TH AVE NE	204TH ST NE	DEAD END	Local	40	348.73	9	Reconstruct
1018	188TH PL NE	61ST AVE NE	63RD AVE NE	Local	25	710.31	10	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1008	59TH AVE NE	188TH ST NE	180TH ST NE	Local	25	2682.67	10	Reconstruct
1902	E 3RD ST	N STILLAGUAMISH AVE	ROBINHOOD DR	Local	40	308.37	17	Reconstruct
1632	TOTEM PARK LN	TOTEM PARK LANE	177TH PL NE	Local	23	258.10	19	Reconstruct
2045	S COBB AVE	E JACKSON ST	E HIGHLAND DR	Local	40	416.77	20	Reconstruct
1883	E DIVISION ST	N TALCOTT ST	N ALCAZAR AVE	Local	20	623.51	21	Reconstruct
1905	N GIFFORD AVE	E 2ND ST	E 1ST ST	Local	40	446.37	22	Reconstruct
2001	E 5TH ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	262.40	22	Reconstruct
2000	E 5TH ST	N STILLAGUAMISH AVE	N ALCAZAR AVE	Local	40	272.69	24	Reconstruct
1949	E 4TH ST	N MCLEOD AVE	N DUNHAM ST	Local	40	311.65	24	Reconstruct
2107	43RD AVE NE	175TH PL NE	172ND ST NE	Local	26	1145.50	24	Reconstruct
1912	E MAPLE ST	DUNHAM AVE	S FRENCH AVE	Local	40	317.02	25	Reconstruct
1920	E JACKSON ST	S MCLEOD AVE	DUNHAM AVE	Local	40	315.49	26	Reconstruct
1893	N WASHINGTON AVE	E 5TH ST	DEAD END	Local	40	358.62	27	Reconstruct
1620	38TH DR NE	175TH PL NE	174TH PL NE	Local	23	407.43	27	Reconstruct
2034	N WASHINGTON AVE	E 3RD ST	E 2ND ST	Local	40	436.05	28	Reconstruct
1919	S COBB AVE	E UNION ST	E JACKSON ST	Local	40	449.55	28	Reconstruct
1036	59TH AVE NE	180TH ST NE	172ND ST NE	Local	25	2620.10	29	Reconstruct
1005	195TH ST NE	59TH AVE NE	62ND AVE NE	Local	25	773.30	29	Reconstruct
1911	HAMLIN DR	E 1ST ST	DEAD END	Local	26	367.28	30	Reconstruct
2047	E JACKSON ST	S COBB ST	S OLYMPIC AVE	Local	40	283.08	31	Reconstruct
1932	W JENSEN ST	DEAD END	S HAZEL ST	Local	40	1341.03	32	Reconstruct
1209	170TH PL NE	52ND AVE NE	DEAD END	Local	26	240.25	32	Reconstruct
1503	50TH AVE NE	196TH PL NE	DEAD END	Local	28	34.46	33	Reconstruct
1027	59TH AVE NE	195TH ST NE	192ND ST NE	Local	25	837.00	33	Reconstruct
1617	38TH DR NE	177TH PL NE	176TH ST NE	Local	23	284.29	34	Reconstruct
1615	36TH DR NE	177TH PL NE	176TH ST NE	Local	23	270.28	34	Reconstruct
1028	188TH ST NE	67TH AVE NE	IRIS CT	Local	25	793.96	35	Reconstruct
1633	TOTEM PARK LN	TOTEM PARK LN	TOTEM PARK LN	Local	23	274.39	36	Reconstruct
1611	177TH PL NE	36TH DR NE	38TH DR NE	Local	23	631.48	36	Reconstruct
1964	E GILMAN AVE	ALLEY	BROADWAY AVE	Local	40	422.02	36	Reconstruct
1923	HILLCREST DR	DEAD END	W FLORENCE ST	Local	18	232.61	36	Reconstruct
1304	OAKWOOD PL	DEAD END	S CEDARBOUGH LOOP	Local	38	163.40	37	Reconstruct
1303	S CEDARBOUGH LOOP	SHADY GROVE PL	W COUNTRY CLUB DR	Local	38	899.28	38	Reconstruct

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1985	E 4TH ST	N STILLAGUAMISH AVE	N ALCAZAR AVE	Local	40	276.27	38	Reconstruct
1035	61ST AVE NE	61ST AVE NE	188TH ST NE	Local	25	175.67	38	Reconstruct
1605	39TH DR NE	TOTEM PARK LN	175TH PL NE	Local	23	372.80	38	Reconstruct
1607	179TH PL NE	37TH DR NE	39TH DR NE	Local	23	646.36	39	Reconstruct
2002	E 5TH ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	282.98	39	Reconstruct
1306	SHADY GROVE PL	DEAD END	S CEDARBOUGH LOOP	Local	38	197.53	39	Reconstruct
2005	E 5TH ST	N DUNHAM AVE	N FRENCH AVE	Local	40	303.10	40	Reconstruct
2109	43RD AVE NE	177TH PL NE	176TH PL NE	Local	26	288.04	40	Poor
1885	PARK HILL DR	N ALCAZAR AVE	DEAD END	Local	40	737.14	40	Poor
2059	E JACKSON ST	S OLYMPIC AVE	S MCLEOD AVE	Local	40	296.26	41	Poor
1619	TOTEM PARK LN	TOTEM PARK LN	DEAD END	Local	23	100.71	41	Poor
1999	N STILLAGUAMISH AVE	E 5TH ST	E 4TH ST	Local	40	419.45	42	Poor
1882	E DIVISION ST	HIGH ST	N TALCOTT ST	Local	20	496.68	42	Poor
1906	N WASHINGTON AVE	E 2ND ST	E 1ST ST	Local	40	443.34	42	Poor
1626	179TH PL NE	DEAD END	179TH PL NE	Local	23	53.67	42	Poor
1979	N ALCAZAR AVE	E DIVISION ST	PARK HILL DR	Local	40	199.07	42	Poor
1199	31ST DR NE	180TH ST NE	179TH ST NE	Local	26	322.26	43	Poor
1610	178TH PL NE	39TH DR NE	178TH PL NE	Local	23	477.60	43	Poor
1613	TOTEM PARK LN	DEAD END	TOTEM PARK LN	Local	23	108.48	43	Poor
2048	E MAPLE ST	S MCLEOD AVE	DUNHAM AVE	Local	40	301.66	43	Poor
1298	SPRUCEWOOD PL	DEAD END	WOODLANDS WAY	Local	38	196.40	43	Poor
2004	E 5TH ST	N FRENCH AVE	N HIGH ST	Local	40	271.05	44	Poor
1151	170TH PL NE	51ST ST NE	52ND AVE NE	Local	26	367.07	44	Poor
2050	E JACKSON ST	DUNHAM AVE	S FRENCH AVE	Local	40	316.53	44	Poor
1895	N STILLAGUAMISH AVE	E 4TH ST	E 3RD ST	Local	40	424.12	44	Poor
1286	WOODBINE DR	WOODLANDS WAY	SILVERLEAF PL	Local	38	790.34	44	Poor
1295	NOBLE DR	N CEDARBOUGH LOOP	N CEDARBOUGH LOOP	Local	38	844.77	44	Poor
2110	43RD AVE NE	176TH PL NE	175TH PL NE	Local	26	377.13	44	Poor
1980	N ALCAZAR AVE	PARK HILL DR	E 5TH ST	Local	40	334.57	45	Poor
1022	195TH ST NE	62ND AVE NE	63RD AVE NE	Local	25	584.90	45	Poor
1922	W FLORENCE ST	HILLCREST DR	S HAZEL ST	Local	18	328.80	45	Poor
1009	61ST AVE NE	192ND ST NE	DEAD END	Local	25	575.10	45	Poor
1219	36TH DR NE	DEAD END	181ST PL NE	Local	26	112.85	45	Poor

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1969	N NEWBERRY ST	E GILMAN AVE	E DIVISION ST	Local	40	274.03	45	Poor
1961	BROADWAY AVE	E HALLER AVE	E BURKE AVE	Local	40	284.34	46	Poor
1876	E HALLER AVE	N WEST AVE	BROADWAY AVE	Local	40	567.74	46	Poor
1930	KONA DR	JOANN LN	W MARION ST	Local	40	318.32	46	Poor
1891	E 5TH ST	N CLARA ST	N BECKY AVE	Local	40	957.95	46	Poor
2033	N GIFFORD AVE	E 3RD ST	E 2ND ST	Local	40	428.97	46	Poor
1006	62ND AVE NE	195TH ST NE	192ND ST NE	Local	25	1088.89	46	Poor
1457	49TH AVE NE	197TH PL NE	196TH PL NE	Local	28	401.92	47	Poor
1149	34TH AVE NE	176TH PL NE	DEAD END	Local	26	158.01	47	Poor
1179	177TH PL NE	177TH PL NE	DEAD END	Local	26	75.23	47	Poor
1628	179TH PL NE	39TH DR NE	DEAD END	Local	23	346.94	48	Poor
1904	N LENORE AVE	E 2ND ST	E 1ST ST	Local	40	447.49	48	Poor
1363	S CEDARBOUGH LOOP	WOODLANDS WAY	OAKWOOD PL	Local	38	415.55	48	Poor
2003	E 5TH ST	N HIGH ST	N GIFFORD AVE	Local	40	266.66	48	Poor
2027	E 2ND ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	314.62	49	Poor
1359	WOODBINE DR	WHITEHAWK DR	N CEDARBOUGH LOOP	Local	38	347.37	49	Poor
1455	53RD AVE NE	200TH ST NE	CEMETERY RD	Local	28	237.74	50	Poor
1609	178TH PL NE	SMOKEY POINT BLVD	37TH DR NE	Local	23	804.82	50	Poor
1231	64TH DR NE	208TH ST NE	DEAD END	Local	26	349.16	50	Poor
1148	176TH PL NE	176TH PL NE	34TH DR NE	Local	26	602.73	50	Poor
1450	200TH ST NE	51ST ST NE	53RD AVE NE	Local	28	559.16	50	Poor
1629	178TH PL NE	DEAD END	178TH PL NE	Local	23	42.73	50	Poor
1039	59TH AVE NE	192ND ST NE	188TH ST NE	Local	25	1345.80	50	Poor
1978	N ALCAZAR AVE	CITY LIMITS	E DIVISION ST	Local	40	298.98	51	Poor
1608	37TH DR NE	179TH PL NE	178TH PL NE	Local	23	320.00	51	Poor
1614	177TH PL NE	TOTEM PARK LN	43RD AVE NE	Local	23	648.84	52	Poor
1974	E GILMAN AVE	NEWBERRY ST	N MANHATTAN AVE	Local	40	458.46	52	Poor
1622	39TH DR NE	179TH PL NE	178TH PL NE	Local	23	328.87	53	Poor
1153	52ND AVE NE	170TH PL NE	DEAD END	Local	26	304.42	53	Poor
2064	S HAZEL ST	FIR LANE	W FLORENCE ST	Local	40	206.76	53	Poor
1458	197TH PL NE	DEAD END	49TH AVE NE	Local	28	359.65	53	Poor
1603	175TH PL NE	175TH PL NE	DEAD END	Local	23	145.16	53	Poor
1002	63RD AVE NE	195TH ST NE	192ND AVE NE	Local	25	1278.29	53	Poor

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1612	TOTEM PARK LN	39TH DR NE	TOTEM PARK LN	Local	23	321.08	54	Poor
1302	VINEWAY PL	WOODLANDS WAY	DEAD END	Local	38	473.35	54	Poor
1506	196TH PL NE	49TH AVE NE	50TH AVE NE	Local	28	356.38	54	Poor
1892	N GIFFORD AVE	E 5TH ST	DEAD END	Local	40	391.44	54	Poor
1947	E 2ND ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	328.90	55	Poor
1464	50TH AVE NE	DEAD END	196TH PL NE	Local	28	310.06	55	Poor
1618	39TH DR NE	DEAD END	176TH PL NE	Local	23	350.42	55	Poor
1021	59TH DR NE	DEAD END	188TH ST NE	Local	25	2103.02	56	Poor
1358	WOODBINE DR	SILVERLEAF PL	WHITEHAWK DR	Local	38	257.08	56	Poor
1014	59TH DR NE	188TH ST NE	DEAD END	Local	25	2997.06	56	Poor
1146	34TH AVE NE	177TH PL NE	34TH AVE NE	Local	26	227.72	56	Poor
1627	178TH PL NE	37TH DR NE	DEAD END	Local	23	328.51	56	Poor
1460	48TH AVE NE	DEAD END	196TH PL NE	Local	28	98.90	56	Poor
1204	176TH PL NE	31ST AVE NE	176TH PL NE	Local	26	260.06	57	Poor
1156	168TH ST NE	SMOKEY POINT BLVD	40TH AVE NE	Local	26	1590.10	57	Poor
1631	178TH PL NE	178TH PL NE	177TH PL NE	Local	23	165.40	57	Poor
1454	54TH DR NE	DEAD END	CEMETERY RD	Local	28	140.66	57	Poor
1483	188TH ST NE	188TH ST NE	DEAD END	Local	28	714.61	57	Poor
1630	178TH PL NE	178TH PL NE	DEAD END	Local	23	123.21	57	Poor
2060	S HAMLIN DR	DEAD END	E MAPLE ST	Local	40	221.34	58	Poor
1907	N STILLAGUAMISH AVE	E 2ND ST	E 1ST ST	Local	40	441.76	58	Poor
1986	N DUNHAM AVE	E DIVISION ST	E 5TH ST	Local	40	553.66	58	Poor
1889	N HIGH ST	E DIVISION ST	E 5TH ST	Local	40	501.28	58	Poor
1140	181ST PL NE	SMOKEY POINT BLVD	36TH DR NE	Local	26	485.29	58	Poor
1929	JOANN LN	DEAD END	KONA DR	Local	30	607.39	59	Poor
1973	E GILMAN AVE	N MANHATTAN AVE	N TALCOTT ST	Local	40	466.47	59	Poor
1604	175TH PL NE	175TH PL NE	DEAD END	Local	23	133.82	59	Poor
1623	175TH PL NE	175TH PL NE	DEAD END	Local	23	51.09	59	Poor
1924	KONA DR	JOANN LN	HILLCREST DR	Local	40	334.28	59	Poor
1131	31ST DR NE	179TH ST NE	176TH PL NE	Local	26	894.76	60	Poor
2068	WESLEY ST	S STILLAGUAMISH AVE	DEAD END	Local	40	408.26	60	Fair
1198	179TH ST NE	31ST AVE NE	177TH PL NE	Local	26	331.65	61	Fair
1236	211TH PL NE	67TH DR NE	67TH AVE NE	Local	40	965.59	61	Fair

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1357	WOODBINE DR	HAWKSVIEW DR	WOODLANDS WAY	Local	38	148.91	61	Fair
1988	N MACLEOD AVE	E DIVISION ST	E 5TH ST	Local	40	477.54	62	Fair
2025	E 2ND ST	N LENORE AVE	N GIFFORD AVE	Local	40	303.92	63	Fair
1011	66TH AVE NE	DEAD END	188TH ST NE	Local	25	929.73	63	Fair
1879	E GILMAN AVE	BROADWAY AVE	NEWBERRY ST	Local	40	461.30	63	Fair
1145	177TH PL NE	177TH PL NE	33RD AVE NE	Local	26	347.79	64	Fair
1026	63RD AVE NE	192ND ST NE	188TH ST NE	Local	25	1381.53	64	Fair
1462	51ST DR NE	CEMETERY RD	DEAD END	Local	28	998.85	65	Fair
1015	180TH ST NE	59TH AVE NE	DEAD END	Local	25	2121.78	65	Fair
2017	E 3RD ST	N DUNHAM AVE	N FRENCH AVE	Local	40	306.79	66	Fair
2032	N LENORE AVE	E 3RD ST	E 2ND ST	Local	40	432.05	66	Fair
1362	S CEDARBOUGH LOOP	OAKWOOD PL	SHADY GROVE PL	Local	38	245.75	66	Fair
1639	175TH PL NE	175TH PL NE	175TH PL NE	Local	23	339.34	66	Fair
2035	N STILLAGUAMISH AVE	E 3RD ST	E 2ND ST	Local	40	439.70	66	Fair
1931	W MARION ST	KONA DR	S HAZEL ST	Local	40	569.42	67	Fair
2053	E HIGHLAND DR	SR 9	S COBB ST	Local	40	192.32	67	Fair
2088	200TH ST NE	77TH AVE NE	DEAD END	Local	40	676.46	67	Fair
1044	63RD AVE NE	197TH ST NE	195TH ST NE	Local	25	656.82	67	Fair
2070	PORTAGE ST	81ST DR NE	S STILLAGUAMISH AVE	Local	40	736.37	68	Fair
1142	179TH ST NE	177TH PL NE	33RD AVE NE	Local	26	450.78	68	Fair
1203	177TH PL NE	34TH AVE NE	SMOKEY POINT BLVD	Local	26	323.23	68	Fair
1886	N ALCAZAR AVE	E 5TH ST	E 4TH ST	Local	40	435.50	68	Fair
1896	E 4TH ST	N ALCAZAR AVE	N CLARA ST	Local	40	357.36	68	Fair
1150	173RD PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	482.39	68	Fair
1957	N WEST AVE	DEAD END	W COX ST	Local	25	225.19	69	Fair
1958	N WEST AVE	W COX ST	W HALLER AVE	Local	25	285.94	69	Fair
1144	33RD AVE NE	33RD AVE NE	177TH PL NE	Local	26	523.57	69	Fair
1984	N CLARA ST	E 4TH ST	DEAD END	Local	40	240.33	69	Fair
1504	49TH AVE NE	CEMETERY RD	197TH PL NE	Local	28	375.09	69	Fair
1640	175TH PL NE	175TH PL NE	38TH DR NE	Local	23	285.48	70	Fair
1502	51ST DR NE	200TH ST NE	CEMETERY RD	Local	28	232.02	70	Fair
1246	211TH PL NE	CITY LIMITS	66TH DR NE	Local	40	679.85	70	Fair
1436	89TH AVE NE	CITY LIMITS	172ND ST NE	Local	20	1329.54	70	Fair

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1186	35TH AVE NE	184TH PL NE	SMOKEY POINT BLVD	Local	26	220.15	70	Satisfactory
1909	E 1ST ST	N STILLAGUAMISH AVE	HAMLIN DR	Local	40	536.73	70	Satisfactory
1283	SILVERLEAF PL	DEAD END	WOODBINE DR	Local	38	380.57	70	Satisfactory
1360	WOODBINE DR	N CEDARBOUGH LOOP	HAWKSVIEW DR	Local	38	557.94	70	Satisfactory
1202	177TH PL NE	33RD AVE NE	34TH AVE NE	Local	26	280.62	71	Satisfactory
1020	58TH AVE NE	188TH ST NE	DEAD END	Local	25	404.52	71	Satisfactory
1389	GLENEAGLE BLVD	GLENWOOD AVE NE	CONDOR DR NE	Local	38	381.54	71	Satisfactory
1227	208TH ST NE	64TH DR NE	66TH DR NE	Local	40	616.17	72	Satisfactory
1200	31ST DR NE	176TH PL NE	DEAD END	Local	26	142.40	72	Satisfactory
1960	BROADWAY AVE	DEAD END	E HALLER AVE	Local	40	112.23	72	Satisfactory
1388	GLENEAGLE BLVD	GREENLOFT AVE NE	GLENWOOD AVE NE	Local	38	383.41	72	Satisfactory
1245	211TH PL NE	66TH DR NE	67TH DR NE	Local	40	424.98	72	Satisfactory
2019	E 2ND ST	N DUNHAM AVE	N FRENCH AVE	Local	40	308.00	73	Satisfactory
1003	197TH ST NE	63RD AVE NE	67TH AVE NE	Local	25	1336.70	73	Satisfactory
1147	176TH PL NE	DEAD END	176TH PL NE	Local	26	163.54	73	Satisfactory
2043	S MACLEOD AVE	E JACKSON ST	E HIGHLAND DR	Local	40	410.12	73	Satisfactory
1235	64TH DR NE	206TH PL NE	CEMETERY RD	Local	40	924.49	73	Satisfactory
2054	E HIGHLAND DR	S COBB ST	S OLYMPIC AVE	Local	40	273.78	74	Satisfactory
1201	177TH PL NE	179TH ST NE	177TH PL NE	Local	26	418.58	74	Satisfactory
1042	188TH ST NE	66TH AVE NE	67TH AVE NE	Local	25	331.30	75	Satisfactory
1971	N TALCOTT ST	E GILMAN AVE	E DIVISION ST	Local	40	207.08	75	Satisfactory
1926	W HALLER AVE	DEAD END	N WEST AVE	Local	40	130.57	75	Satisfactory
1914	E MAPLE ST	S HAMLIN DR	DEAD END	Local	40	249.39	75	Satisfactory
1505	196TH PL NE	49TH AVE NE	48TH AVE NE	Local	28	337.04	75	Satisfactory
1288	WOODLANDS WAY	S CEDARBOUGH LOOP	WOODBINE DR	Local	38	946.40	76	Satisfactory
1890	E 5TH ST	N WEST AVE	N OLYMPIC AVE	Local	40	441.07	76	Satisfactory
1109	204TH ST NE	67TH AVE NE	69TH AVE NE	Local	60	557.79	77	Satisfactory
1278	FALCON CT	DEAD END	WHITEHAWK DR	Local	38	114.47	77	Satisfactory
1152	169TH PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	1125.55	77	Satisfactory
2012	E 4TH ST	N DUNHAM AVE	N FRENCH AVE	Local	40	308.03	77	Satisfactory
1925	N WEST AVE	W HALLER AVE	W BURKE AVE	Local	22	312.49	77	Satisfactory
1135	31ST AVE NE	184TH PL NE	183RD PL NE	Local	26	654.64	77	Satisfactory
1897	N CLARA ST	E 5TH ST	E 4TH ST	Local	40	449.79	78	Satisfactory

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1366	WHITEHAWK DR	FALCON CT	HERON CT	Local	38	304.61	78	Satisfactory
1634	175TH PL NE	39TH DR NE	40TH DR NE	Local	23	276.30	78	Satisfactory
1899	E 3RD ST	N MCLEOD AVE	N DUNHAM ST	Local	40	307.81	79	Satisfactory
1234	LANTERN LN NE	DEAD END	CEMETERY RD	Local	40	236.26	79	Satisfactory
1197	31ST AVE NE	183RD PL NE	181ST ST NE	Local	26	510.92	79	Satisfactory
1983	E 5TH ST	N ALCAZAR AVE	N CLARA ST	Local	40	343.00	79	Satisfactory
2022	E 2ND ST	N FRENCH AVE	N LENORE AVE	Local	40	319.14	80	Satisfactory
1943	W COX ST	DEAD END	N WEST AVE	Local	40	368.38	80	Satisfactory
1991	N WEST AVE	E 5TH ST	E 4TH ST	Local	40	451.43	80	Satisfactory
1383	W COUNTRY CLUB DR	SAINT ANDREWS CT	GLENEAGLE BLVD	Local	38	182.24	80	Satisfactory
1901	E 3RD ST	N WASHINGTON AVE	N STILLAGUAMISH AVE	Local	40	321.65	80	Satisfactory
1968	N NEWBERRY ST	DEAD END	E BURKE AVE	Local	40	122.20	81	Satisfactory
1139	36TH DR NE	181ST PL NE	DEAD END	Local	26	111.91	81	Satisfactory
1602	175TH PL NE	175TH PL NE	175TH PL NE	Local	23	334.33	81	Satisfactory
2108	43RD AVE NE	DEAD END	177TH PL NE	Local	26	851.65	81	Satisfactory
1523	43RD DR NE	DEAD END	189TH PL NE	Local	28	56.47	82	Satisfactory
1987	N WEST AVE	E DIVISION ST	E 5TH ST	Local	40	468.07	82	Satisfactory
1880	N TALCOTT ST	DEAD END	E GILMAN AVE	Local	40	222.00	82	Satisfactory
1029	188TH ST NE	DEAD END	58TH AVE NE	Local	25	40.93	83	Satisfactory
2049	E UNION ST	DUNHAM AVE	S FRENCH AVE	Local	40	320.37	83	Satisfactory
1887	N WEST AVE	E 3RD ST	67TH AVE NE	Local	40	1587.50	83	Satisfactory
1625	175TH PL NE	175TH PL NE	DEAD END	Local	23	56.16	83	Satisfactory
2061	215TH PL NE	87TH AVE NE	CITY LIMITS	Local	22	111.02	84	Satisfactory
1031	188TH ST NE	59TH DR NE	59TH DR NE	Local	25	86.43	84	Satisfactory
1507	196TH PL NE	47TH AVE NE	48TH AVE NE	Local	28	382.32	84	Satisfactory
2085	77TH AVE NE	204TH ST NE	200TH ST NE	Local	40	970.17	84	Satisfactory
1248	208TH ST NE	GROVE PL	64TH DR NE	Local	40	311.64	84	Satisfactory
1638	175TH PL NE	SMOKEY POINT BLVD	175TH PL NE	Local	23	191.41	84	Satisfactory
2031	N MACLEOD AVE	E 2ND ST	E 1ST ST	Local	40	436.72	84	Satisfactory
1927	W GILMAN AVE	DEAD END	N WEST AVE	Local	40	388.66	84	Satisfactory
1133	29TH AVE NE	188TH ST NE	186TH PL NE	Local	26	507.07	85	Satisfactory
2089	201ST ST NE	71ST AVE NE	74TH AVE NE	Local	40	890.33	85	Satisfactory
2037	S MACLEOD AVE	E 1ST ST	E MAPLE ST	Local	40	426.56	85	Satisfactory

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1138	183RD PL NE	SMOKEY POINT BLVD	DEAD END	Local	26	597.06	85	Satisfactory
1132	188TH ST NE	29TH AVE NE	SMOKEY POINT BLVD	Local	26	1200.29	85	Satisfactory
1040	62ND AVE NE	192ND ST NE	DEAD END	Local	25	441.84	85	Satisfactory
1224	66TH DR NE	210TH ST NE	208TH ST NE	Local	40	620.29	85	Satisfactory
1188	35TH AVE NE	187TH PL NE	186TH PL NE	Local	26	268.37	85	Good
1361	WOODBINE DR	WOODLANDS WAY	EAGLEFIELD DR	Local	38	590.17	85	Good
1110	204TH ST NE	74TH AVE NE	SR 9	Local	60	575.27	85	Good
1314	GREENLOFT AVE NE	IRONWOOD ST	GLENEAGLE BLVD	Local	38	189.48	86	Good
1277	WHITEHAWK DR	HERON CT	WOODBINE DR	Local	38	516.05	86	Good
1107	204TH ST NE	80TH AVE NE	KEITH LN	Local	60	487.46	86	Good
2090	71ST AVE NE	204TH ST NE	201ST ST NE	Local	40	968.17	86	Good
1380	EAGLEFIELD DR	WOODBINE DR	OXFORD DR	Local	38	550.01	86	Good
1636	176TH PL NE	38TH DR NE	39TH DR NE	Local	23	311.45	86	Good
1877	N NEWBERRY ST	E BURKE AVE	E GILMAN AVE	Local	40	290.55	86	Good
2092	197TH PL NE	DEAD END	74TH AVE NE	Local	40	216.18	86	Good
1163	166TH PL NE	SMOKEY POINT BLVD	40TH AVE NE	Local	26	1727.42	87	Good
2106	OLYMPIC PL	JENSEN FARM LN	204TH ST NE	Local	40	1111.41	87	Good
1367	WHITEHAWK DR	FALCON CT	HAWKSVIEW DR	Local	38	466.83	87	Good
2082	OLYMPIC PL	S OLYMPIC AVE	JENSEN FARM LN	Local	40	1175.81	87	Good
1953	TVEIT RD	MEDICAL CENTER DR	CITY LIMITS	Local	40	680.22	87	Good
1313	KESTREL CT	REDHAWK DR	DEAD END	Local	38	197.72	87	Good
1097	204TH ST NE	69TH AVE NE	71ST AVE NE	Local	60	859.97	87	Good
1243	59TH AVE NE	CITY LIMITS	CIRCLE BLUFF DR	Local	40	37.30	87	Good
1547	CROWN RIDGE BLVD	PEAK PL	VISTA DR	Local	38	879.23	88	Good
1487	HIGH CLOVER BLVD NE	200TH PL NE	199TH ST NE	Local	28	215.36	88	Good
1512	45TH DR NE	195TH PL NE	195TH ST NE	Local	28	112.57	88	Good
1910	S MACLEOD AVE	E UNION ST	E JACKSON ST	Local	40	439.20	88	Good
1182	49TH DR NE	AIRPORT BLVD	DEAD END	Local	26	279.81	88	Good
2097	S OLYMPIC AVE	E HIGHLAND DR	OLYMPIC PL	Local	40	341.71	88	Good
1624	176TH PL NE	DEAD END	43RD AVE NE	Local	23	498.34	88	Good
2039	DUNHAM AVE	E 1ST ST	E MAPLE ST	Local	40	428.10	88	Good
1111	204TH ST NE	SR 9	77TH AVE NE	Local	60	626.76	88	Good
1621	174TH PL NE	SMOKEY POINT BLVD	38TH DR NE	Local	23	1111.25	88	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1247	66TH DR NE	211TH PL NE	210TH ST NE	Local	40	588.59	89	Good
1373	EAGLEFIELD DR	TURNBERRY PL	BALLANTRAE DR	Local	38	185.87	89	Good
1489	HIGH CLOVER BLVD NE	200TH ST NE	47TH DR NE	Local	28	252.11	89	Good
1023	192ND ST NE	62ND AVE NE	63RD AVE NE	Local	25	562.29	89	Good
1600	174TH PL NE	DEAD END	40TH DR NE	Local	23	336.28	89	Good
2067	N WEST AVE	DEAD END	W GILMAN AVE	Local	40	215.00	89	Good
1543	CROWN RIDGE BLVD	VISTA DR	VALLEY VIEW DR	Local	38	288.84	89	Good
2040	S MACLEOD AVE	E MAPLE ST	E UNION ST	Local	40	446.51	89	Good
1225	210TH ST NE	DEAD END	66TH DR NE	Local	40	430.65	89	Good
1536	CROWN RIDGE BLVD	VISTA DR	SR 9	Local	38	2534.23	89	Good
1280	HERON CT	DEAD END	WHITEHAWK DR	Local	38	337.07	89	Good
1545	CROWN RIDGE BLVD	KNOLL DR	PEAK PL	Local	38	394.29	89	Good
1515	45TH DR NE	195TH ST NE	194TH PL NE	Local	28	237.71	90	Good
2010	E 3RD ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	312.50	90	Good
1544	CROWN RIDGE BLVD	193RD ST NE	VISTA DR	Local	38	309.84	90	Good
1187	35TH AVE NE	188TH ST NE	187TH PL NE	Local	26	231.38	90	Good
1601	40TH DR NE	175TH PL NE	174TH PL NE	Local	23	326.39	90	Good
1007	192ND ST NE	59TH AVE NE	61ST AVE NE	Local	25	600.95	90	Good
1171	182ND ST NE	183RD PL NE	SMOKEY POINT BLVD	Local	26	967.22	90	Good
1485	HIGH CLOVER BLVD NE	47TH DR NE	48TH AVE NE	Local	28	124.58	90	Good
1001	199TH ST NE	60TH AVE NE	63RD AVE NE	Local	40	883.70	90	Good
1375	EAGLEFIELD DR	OXFORD DR	AMBLESIDE CT	Local	38	292.17	90	Good
1384	W COUNTRY CLUB DR	MUIRFIELD CT	SAINT ANDREWS CT	Local	38	425.74	91	Good
2046	E UNION ST	S COBB ST	S OLYMPIC AVE	Local	40	267.85	91	Good
2079	81ST DR NE	KEITH LN	DEAD END	Local	40	81.94	91	Good
1539	KNOLL DR	CROWN RIDGE BLVD	VISTA DR	Local	38	1325.51	91	Good
1937	N WEST AVE	W GILMAN AVE	ROUNDABOUT	Local	40	277.75	91	Good
2058	E UNION ST	S OLYMPIC AVE	S MCLEOD AVE	Local	40	297.61	91	Good
1884	N DUNHAM AVE	E 2ND ST	E 1ST ST	Local	40	441.39	91	Good
1196	31ST AVE NE	181ST ST NE	180TH ST NE	Local	26	334.00	91	Good
1435	TVEIT RD	92ND AVE NE	CITY LIMITS	Local	30	1014.38	91	Good
1467	195TH ST NE	45TH DR NE	47TH AVE NE	Local	28	638.54	91	Good
1453	48TH DR NE	DEAD END	199TH ST NE	Local	28	357.64	91	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1276	GLENEAGLE BLVD	W COUNTRY CLUB DR	HARRIER DR	Local	38	530.53	92	Good
1105	204TH ST NE	71ST AVE NE	72ND AVE NE	Local	60	294.15	92	Good
1143	33RD AVE NE	177TH PL NE	DEAD END	Local	26	115.50	92	Good
2103	207TH ST NE	KEITH LN	207TH ST NE	Local	40	310.96	92	Good
1106	204TH ST NE	77TH AVE NE	79TH DR NE	Local	60	430.65	92	Good
1486	HIGH CLOVER BLVD NE	199TH ST NE	CEMETERY RD	Local	28	216.73	92	Good
2102	207TH ST NE	S STILLAGUAMISH AVE	UNKNOWN	Local	40	288.34	92	Good
1141	180TH ST NE	31ST AVE NE	SMOKEY POINT BLVD	Local	26	1321.33	92	Good
1285	EAGLEFIELD DR	TEESIDE LN	CHAMPIONS DR	Local	38	989.05	92	Good
1030	188TH ST NE	59TH DR NE	59TH AVE NE	Local	25	85.64	93	Good
2101	PORTAGE ST	210TH ST NE	79TH DR NE	Local	40	62.04	93	Good
1466	195TH PL NE	DEAD END	45TH DR NE	Local	28	155.14	93	Good
1446	48TH AVE NE	202ND PL NE	HIGH CLOVER BLVD	Local	28	496.71	93	Good
1427	HIGHLAND VIEW DR	TOPPER CT	BOVEE LN	Local	38	130.13	93	Good
1365	N CEDARBOUGH LOOP	NOBLE DR	NOBLE DR	Local	38	386.99	93	Good
1189	35TH AVE NE	186TH PL NE	184TH PL NE	Local	26	590.78	93	Good
1108	204TH ST NE	72ND AVE NE	74TH AVE NE	Local	60	496.92	93	Good
1226	67TH DR NE	211TH PL NE	DEAD END	Local	40	677.13	93	Good
1334	172ND PL NE	DEAD END	84TH AVE NE	Local	38	448.11	93	Good
1635	174TH PL NE	40TH DR NE	DEAD END	Local	23	153.33	93	Good
2073	207TH ST NE	JENSEN FARM LN	BURN RD	Local	40	1212.25	93	Good
1546	CROWN RIDGE BLVD	VALLEY VIEW DR	193RD ST NE	Local	38	730.63	93	Good
1265	HILLSIDE CT	UPLAND DR	DEAD END	Local	38	568.33	93	Good
1290	N CEDARBOUGH LOOP	WOODLANDS WAY	NOBLE DR	Local	38	436.72	93	Good
1242	59TH AVE NE	CITY LIMITS	CITY LIMITS	Local	40	555.48	93	Good
1438	TVEIT RD	CITY LIMITS	92ND AVE NE	Local	30	418.14	94	Good
1939	S DUNHAM AVE	E JACKSON ST	E HIGHLAND DR	Local	40	404.08	94	Good
1292	NEWPORT DR	HAWKSVIEW DR	HAVEN PL	Local	38	1341.54	94	Good
1356	WOODLANDS WAY	67TH AVE NE	WOODBINE DR	Local	38	853.41	94	Good
1104	204TH ST NE	79TH DR NE	80TH AVE NE	Local	60	275.83	94	Good
1354	WOODLANDS WAY	VINEWAY PL	N CEDARBOUGH LOOP	Local	38	155.53	94	Good
1037	59TH AVE NE	172ND ST NE	DEAD END	Local	25	1192.84	94	Good
1474	191ST ST NE	46TH AVE NE	DEAD END	Local	28	139.28	94	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1411	84TH AVE NE	172ND PL NE	85TH AVE NE	Local	38	224.50	94	Good
1193	186TH PL NE	29TH AVE NE	31ST AVE NE	Local	26	414.49	94	Good
1445	46TH AVE NE	203RD ST NE	HIGH CLOVER BLVD	Local	28	524.61	94	Good
1549	VISTA DR	KNOLL DR	CROWN RIDGE BLVD	Local	38	761.88	95	Good
1267	HIGHLAND VIEW DR	67TH AVE NE	UPLAND DR	Local	38	1165.15	95	Good
1355	WOODLANDS WAY	WOODBINE DR	SPRUCEWOOD PL	Local	38	438.54	95	Good
1548	VISTA DR	VALLEY VIEW DR	CROWN RIDGE BLVD	Local	38	420.94	95	Good
1478	43RD DR NE	189TH PL NE	188TH ST NE	Local	28	585.63	95	Good
1917	E UNION ST	S MCLEOD AVE	DUNHAM AVE	Local	40	306.46	95	Good
1488	HIGH CLOVER BLVD NE	46TH DR NE	200TH ST NE	Local	28	236.10	95	Good
1954	87TH AVE NE	CITY LIMITS	CITY LIMITS	Local	26	187.16	95	Good
1293	HAWKSVIEW DR	NEWPORT DR	HARROW PL	Local	38	1164.70	95	Good
1992	N MACLEOD AVE	E 5TH ST	E 4TH ST	Local	40	433.69	95	Good
1382	W COUNTRY CLUB DR	WOODBINE DR	S CEDARBOUGH LOOP	Local	38	139.76	95	Good
1376	EAGLEFIELD DR	BALLANTRAE DR	TEESIDE LN	Local	38	335.92	95	Good
2065	S HAZEL ST	W FLORENCE ST	W MARION ST	Local	40	456.26	95	Good
1606	175TH PL NE	40TH DR NE	43RD AVE NE	Local	23	870.82	96	Good
1444	HIGH CLOVER BLVD NE	48TH AVE NE	200TH PL NE	Local	28	600.32	96	Good
1309	AMBLESIDE CT	EAGLEFIELD DR	DEAD END	Local	38	410.36	96	Good
2080	81ST DR NE	DEAD END	KEITH LN	Local	40	432.66	96	Good
1032	188TH ST NE	58TH AVE NE	59TH DR NE	Local	25	243.73	96	Good
1530	193RD PL NE	46TH DR NE	47TH AVE NE	Local	28	139.92	96	Good
1542	CROWN RIDGE BLVD	DEAD END	KNOLL DR	Local	38	263.01	96	Good
1300	E COUNTRY CLUB DR	GLENEAGLE BLVD	EAGLEFIELD DR	Local	38	2215.56	96	Good
1271	SAINT ANDREWS CT	W COUNTRY CLUB DR	DEAD END	Local	38	242.01	96	Good
1250	206TH ST NE	62ND AVE NE	63RD AVE NE	Local	40	258.80	96	Good
1449	200TH PL NE	HIGH CLOVER BLVD	DEAD END	Local	28	244.71	96	Good
2076	ANNA LN	JENSEN FARM LN	DEAD END	Local	40	343.20	96	Good
1538	VISTA DR	KNOLL DR	VALLEY VIEW DR	Local	38	867.69	96	Good
1451	47TH AVE NE	HIGH CLOVER BLVD	199TH ST NE	Local	28	542.30	96	Good
1461	192ND PL NE	DEAD END	45TH DR NE	Local	28	196.37	96	Good
2063	TVEIT RD	S STILLAGUAMISH AVE	MEDICAL CENTER DR	Local	40	614.95	96	Good
1192	186TH PL NE	31ST AVE NE	32ND ST NE	Local	26	331.18	96	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1261	MASTERS CT	CHAMPIONS DR	DEAD END	Local	38	101.65	96	Good
1272	MUIRFIELD CT	W COUNTRY CLUB DR	DEAD END	Local	38	206.80	97	Good
1898	N MACLEOD AVE	E 3RD ST	E 2ND ST	Local	40	437.66	97	Good
1291	HAVEN PL	NEWPORT DR	DEAD END	Local	38	104.27	97	Good
1424	CHAMPIONS DR	EAGLEFIELD DR	MASTERS CT	Local	38	227.33	97	Good
1429	HIGHLAND VIEW DR	UPLAND DR	UPLAND DR	Local	38	589.10	97	Good
1173	181ST ST NE	31ST AVE NE	182ND ST NE	Local	26	490.91	97	Good
1941	87TH AVE NE	217TH PL NE	215TH PL NE	Local	26	599.95	97	Good
1518	45TH DR NE	194TH PL NE	193RD PL NE	Local	28	380.08	97	Good
1364	N CEDARBOUGH LOOP	NOBLE DR	WOODBINE DR	Local	38	285.71	97	Good
1381	EAGLEFIELD DR	NEWPORT DR	E COUNTRY CLUB DR	Local	38	566.63	97	Good
1537	PEAK PL	CROWN RIDGE BLVD	DEAD END	Local	38	480.27	97	Good
2009	E 4TH ST	N WEST AVE	N OLYMPIC AVE	Local	40	415.98	97	Good
1410	85TH AVE NE	178TH PL NE	176TH PL NE	Local	38	376.85	97	Good
1371	BALMORAL DR	INVERNESS DR	CASTLE CT	Local	38	401.00	97	Good
1409	85TH AVE NE	176TH ST NE	175TH ST NE	Local	38	253.91	97	Good
1377	EAGLEFIELD DR	CHAMPIONS DR	SR 9	Local	38	334.97	97	Good
1472	191ST PL NE	44TH AVE NE	45TH DR NE	Local	28	189.17	97	Good
1311	OXFORD DR	EAGLEFIELD DR	DEAD END	Local	38	1238.72	97	Good
1916	E MAPLE ST	N STILLAGUAMISH AVE	HAMLIN DR	Local	40	571.60	98	Good
1431	UPLAND DR	HILLSIDE CT	HIGHLAND VIEW DR	Local	38	425.57	98	Good
1407	85TH AVE NE	176TH PL NE	176TH ST NE	Local	38	245.50	98	Good
2020	E 3RD ST	N FRENCH AVE	N LENORE AVE	Local	40	313.32	98	Good
1294	HARROW PL	DEAD END	HAWKSVIEW DR	Local	38	249.84	98	Good
1441	202ND PL NE	DEAD END	48TH AVE NE	Local	28	255.23	98	Good
1516	45TH DR NE	196TH PL NE	195TH PL NE	Local	28	276.43	98	Good
1534	42ND DR NE	188TH CT NE	188TH ST NE	Local	28	198.75	98	Good
1921	S HAZEL ST	W MARION ST	W JENSEN ST	Local	40	394.85	98	Good
1353	WOODLANDS WAY	SPRUCEWOOD PL	VINEWAY PL	Local	38	140.72	98	Good
1378	EAGLEFIELD DR	E COUNTRY CLUB DR	TURNBERRY PL	Local	38	407.12	98	Good
2084	74TH AVE NE	204TH ST NE	201ST ST NE	Local	40	1030.00	98	Good
1369	NEWPORT DR	STERLING PL	EAGLEFIELD DR	Local	38	273.75	98	Good
1514	45TH DR NE	189TH PL NE	DEAD END	Local	28	152.19	98	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1528	193RD PL NE	DEAD END	45TH DR NE	Local	28	214.28	98	Good
1420	INVERNESS DR	E COUNTRY CLUB DR	BALMORAL DR	Local	38	278.66	98	Good
2083	79TH DR NE	204TH ST NE	DEAD END	Local	40	754.54	98	Good
2100	PORTAGE ST	79TH DR NE	82ND DR NE	Local	40	499.82	98	Good
1268	UPLAND DR	HIGHLAND VIEW DR	HIGHLAND VIEW DR	Local	38	995.08	98	Good
1223	65TH DR NE	206TH PL NE	CEMETERY RD	Local	40	864.38	98	Good
1238	207TH PL NE	CIRCLE BLUFF DR	207TH ST NE	Local	40	214.48	99	Good
1387	GLENEAGLE BLVD	HARRIER DR	GREENLOFT AVE NE	Local	38	375.23	99	Good
1270	TOPPER CT	HIGHLAND VIEW DR	DEAD END	Local	38	736.86	99	Good
2091	74TH AVE NE	201ST ST NE	DEAD END	Local	40	971.08	99	Good
1195	31ST AVE NE	185TH PL NE	184TH PL NE	Local	26	357.23	99	Good
1327	176TH ST NE	84TH AVE NE	85TH AVE NE	Local	38	280.46	99	Good
1194	31ST AVE NE	186TH PL NE	185TH PL NE	Local	26	333.09	99	Good
1004	60TH AVE NE	199TH ST NE	DEAD END	Local	25	574.72	99	Good
1284	BALLANTRAE DR	INVERNESS DR	BALMORAL DR	Local	38	438.06	99	Good
1307	CHAMPIONS DR	MASTERS CT	PUTTERS CT	Local	38	1266.00	99	Good
1379	EAGLEFIELD DR	AMBLESIDE CT	CAMBRIDGE DR	Local	38	433.16	99	Good
1430	UPLAND DR	67TH AVE NE	HILLSIDE CT	Local	38	197.68	99	Good
1440	203RD ST NE	46TH AVE NE	48TH AVE NE	Local	28	440.28	99	Good
2023	E 3RD ST	N LENORE AVE	N GIFFORD AVE	Local	40	311.56	99	Good
2074	JENSEN FARM LN	OLYMPIC PL	ANNA LN	Local	40	832.63	99	Good
2066	S HAZEL ST	W JENSEN ST	DEAD END	Local	40	142.34	99	Good
1881	N BECKY AVE	E 5TH ST	DEAD END	Local	40	235.85	99	Good
2078	KEITH LN	207TH ST NE	81ST DR NE	Local	40	392.03	99	Good
1482	191ST PL NE	46TH AVE NE	47TH AVE NE	Local	28	309.10	99	Good
1447	45TH DR NE	DEAD END	200TH ST NE	Local	28	231.74	99	Good
1305	ABBEY PL	GREYWALLS DR	DEAD END	Local	38	421.18	99	Good
1282	BALMORAL DR	GREENOCK CT	BALLANTRAE DR	Local	38	252.67	99	Good
1312	HARRIER DR	GLENEAGLE BLVD	REDHAWK DR	Local	38	218.70	99	Good
1279	INVERNESS DR	BALMORAL DR	BALLANTRAE DR	Local	38	498.63	99	Good
1616	176TH PL NE	36TH DR NE	38TH DR NE	Local	23	662.65	99	Good
1476	189TH ST NE	46TH AVE NE	DEAD END	Local	28	123.57	99	Good
1493	200TH ST NE	44TH DR NE	45TH DR NE	Local	28	249.72	99	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1442	44TH DR NE	HIGH CLOVER BLVD	200TH ST NE	Local	28	432.83	99	Good
1517	45TH DR NE	192ND PL NE	191ST PL NE	Local	28	321.40	99	Good
1372	BALMORAL DR	CASTLE CT	GREENOCK CT	Local	38	237.66	99	Good
1368	HAWKSVIEW DR	HARROW PL	WOODBINE DR	Local	38	995.07	99	Good
1308	HUNTER PL	GREYWALLS DR	DEAD END	Local	38	424.78	99	Good
1237	GROVE PL	63RD AVE NE	208TH ST NE	Local	40	699.19	99	Good
1318	GLENWOOD AVE NE	IRONWOOD ST	GLENEAGLE BLVD	Local	38	300.43	99	Good
1324	175TH ST NE	84TH AVE NE	85TH AVE NE	Local	38	299.91	99	Good
1456	199TH ST NE	199TH ST NE	CEMETERY RD	Local	28	238.99	99	Good
1443	45TH DR NE	DEAD END	HIGH CLOVER BLVD	Local	28	396.14	99	Good
1404	83RD DR NE	179TH PL NE	178TH PL NE	Local	38	244.79	99	Good
1468	194TH PL NE	DEAD END	45TH DR NE	Local	28	196.09	99	Good
1465	45TH DR NE	191ST PL NE	189TH PL NE	Local	28	553.74	99	Good
1273	REDHAWK DR	HARRIER DR	KESTRAL CT	Local	38	227.45	99	Good
1289	TEESIDE LN	DEAD END	EAGLEFIELD DR	Local	38	500.40	99	Good
1492	44TH DR NE	DEAD END	HIGH CLOVER BLVD	Local	28	276.22	99	Good
1522	46TH AVE NE	190TH ST NE	189TH ST NE	Local	28	297.73	99	Good
1322	CONDOR DR NE	GLENEAGLE BLVD	REDHAWK DR	Local	38	260.67	99	Good
1392	REDHAWK DR	OSPREY RD	BOREAL CT	Local	38	259.27	99	Good
1385	W COUNTRY CLUB DR	TROON CT	MUIRFIELD CT	Local	38	967.64	99	Good
1529	193RD PL NE	45TH DR NE	46TH AVE NE	Local	28	217.84	99	Good
1469	193RD PL NE	46TH AVE NE	46TH DR NE	Local	28	209.23	100	Good
1249	206TH ST NE	59TH DR NE	60TH AVE NE	Local	40	204.97	100	Good
1520	46TH AVE NE	189TH ST NE	188TH ST NE	Local	28	285.04	100	Good
2075	LOIS LN	DEAD END	JENSEN FARM LN	Local	40	218.73	100	Good
1540	VALLEY VIEW DR	VISTA DR	CROWN RIDGE BLVD	Local	38	1369.02	100	Good
1134	186TH PL NE	32ND ST NE	SMOKEY POINT BLVD	Local	26	580.30	100	Good
1221	209TH ST NE	61ST AVE NE	DEAD END	Local	28	647.66	100	Good
1421	BALLANTRAE DR	BALMORAL DR	EAGLEFIELD DR	Local	38	414.06	100	Good
1422	GREYWALLS DR	ABBEY PL	HUNTER PL	Local	38	254.39	100	Good
2104	JENSEN FARM LN	LOIS LN	207TH ST NE	Local	40	182.26	100	Good
1996	N MACLEOD AVE	E 4TH ST	E 3RD ST	Local	40	436.06	100	Good
1275	PERREGRINE PL	REDHAWK DR	OSPREY RD	Local	38	381.33	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1269	TROON CT	DEAD END	W COUNTRY CLUB DR	Local	38	198.57	100	Good
1331	178TH PL NE	83RD DR NE	178TH PL NE	Local	38	533.40	100	Good
1475	190TH ST NE	46TH AVE NE	DEAD END	Local	28	138.97	100	Good
1251	206TH ST NE	60TH AVE NE	61ST AVE NE	Local	40	285.96	100	Good
1525	46TH DR NE	193RD PL NE	46TH AVE NE	Local	28	453.98	100	Good
1426	REDHAWK DR	PERREGRINE PL	HARRIER DR	Local	38	196.30	100	Good
1412	175TH ST NE	83RD DR NE	84TH AVE NE	Local	38	230.36	100	Good
1419	E COUNTRY CLUB DR	IVERNESS DR	EAGLEFIELD DR	Local	38	1347.18	100	Good
1263	GALLERY LN	DEAD END	CHAMPIONS DR	Local	38	105.74	100	Good
1428	HIGHLAND VIEW DR	UPLAND DR	TOPPER CT	Local	38	512.07	100	Good
1473	44TH AVE NE	DEAD END	191ST PL NE	Local	28	318.69	100	Good
1459	196TH PL NE	45TH DR NE	47TH AVE NE	Local	28	635.75	100	Good
1230	59TH AVE NE	207TH ST NE	206TH ST NE	Local	40	425.73	100	Good
1900	E 3RD ST	N GIFFORD AVE	N WASHINGTON AVE	Local	40	317.82	100	Good
2105	JENSEN FARM LN	ANNA LN	LOIS LN	Local	40	409.11	100	Good
1262	PUTTERS CT	DEAD END	CHAMPIONS DR	Local	38	129.92	100	Good
1266	W COUNTRY CLUB DR	S CEDARBOUGH LOOP	TROON CT	Local	38	1121.58	100	Good
1169	186TH PL NE	35TH AVE NE	DEAD END	Local	26	497.18	100	Good
1274	OSPREY RD	DEAD END	PERREGRINE PL	Local	38	200.38	100	Good
2096	(no name)	207TH ST NE	DEAD END	Local	40	260.84	100	Good
1176	166TH PL NE	40TH AVE NE	DEAD END	Local	26	102.04	100	Good
2121	172ND PL NE	79TH DR NE	80TH DR NE	Local	38	358.93	100	Good
1332	174TH PL NE	79TH DR NE	80TH DR NE	Local	38	282.96	100	Good
1414	174TH PL NE	80TH DR NE	81ST DR NE	Local	38	276.71	100	Good
1349	175TH PL NE	79TH DR NE	80TH DR NE	Local	38	299.59	100	Good
1637	176TH PL NE	SMOKEY POINT BLVD	36TH DR NE	Local	23	488.81	100	Good
1329	176TH PL NE	85TH AVE NE	DEAD END	Local	38	235.83	100	Good
1336	176TH PL NE	72ND DR NE	73RD AVE NE	Local	38	227.11	100	Good
1337	176TH PL NE	73RD AVE NE	73RD DR NE	Local	38	218.04	100	Good
1342	176TH PL NE	73RD DR NE	74TH DR NE	Local	38	277.50	100	Good
1418	176TH ST NE	83RD DR NE	84TH AVE NE	Local	38	265.36	100	Good
1351	177TH PL NE	79TH DR NE	80TH DR NE	Local	38	279.94	100	Good
1415	177TH PL NE	80TH DR NE	178TH	Local	38	79.75	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1166	178TH PL NE	34TH DR NE	SMOKEY POINT BLVD	Local	26	232.77	100	Good
1343	178TH PL NE	81ST DR NE	82ND DR NE	Local	38	325.14	100	Good
1401	178TH PL NE	177TH PL NE	81ST DR NE	Local	38	413.66	100	Good
1402	178TH PL NE	82ND DR NE	83RD DR NE	Local	38	252.85	100	Good
1406	178TH PL NE	85TH AVE NE	178TH PL NE	Local	38	281.87	100	Good
1417	178TH PL NE	178TH PL NE	DEAD END	Local	38	154.94	100	Good
1347	179TH PL NE	81ST DR NE	82ND DR NE	Local	38	344.51	100	Good
1352	179TH PL NE	83RD DR NE	85TH AVE NE	Local	38	439.67	100	Good
1172	183RD PL NE	31ST AVE NE	182ND ST NE	Local	26	525.94	100	Good
1137	184TH PL NE	DEAD END	31ST AVE NE	Local	26	230.85	100	Good
1170	184TH PL NE	35TH AVE NE	DEAD END	Local	26	498.98	100	Good
1136	185TH PL NE	DEAD END	31ST AVE NE	Local	26	265.10	100	Good
1178	185TH PL NE	DEAD END	SMOKEY POINT BLVD	Local	26	207.07	100	Good
1434	186TH ST NE	DEAD END	CITY LIMITS	Local	30	550.83	100	Good
1177	187TH PL NE	35TH AVE NE	DEAD END	Local	26	394.32	100	Good
1481	188TH CT NE	DEAD END	42ND DR NE	Local	28	140.66	100	Good
1010	188TH ST NE	63RD AVE NE	66TH AVE NE	Local	25	977.29	100	Good
1033	188TH ST NE	59TH AVE NE	61ST AVE NE	Local	25	473.38	100	Good
1034	188TH ST NE	61ST AVE NE	63RD AVE NE	Local	25	832.38	100	Good
1479	189TH PL NE	42ND DR NE	DEAD END	Local	28	267.46	100	Good
1477	189TH PL NE	43RD DR NE	45TH AVE NE	Local	28	482.50	100	Good
1533	189TH PL NE	DEAD END	42ND DR NE	Local	28	265.99	100	Good
1024	192ND ST NE	61ST AVE NE	62ND AVE NE	Local	25	134.63	100	Good
1541	193RD ST NE	CROWN RIDGE BLVD	CITY LIMITS	Local	38	138.32	100	Good
1527	196TH PL NE	DEAD END	45TH DR NE	Local	28	147.61	100	Good
1433	196TH PL NE	DEAD END	95TH AVE NE	Local	30	805.14	100	Good
1452	199TH ST NE	48TH DR NE	HIGH CLOVER BLVD	Local	28	376.59	100	Good
1494	199TH ST NE	47TH DR NE	48TH DR NE	Local	28	257.50	100	Good
1448	200TH ST NE	45TH DR NE	HIGH CLOVER BLVD	Local	28	649.88	100	Good
1499	203RD ST NE	DEAD END	203RD ST NE	Local	28	30.73	100	Good
1500	203RD ST NE	203RD ST NE	DEAD END	Local	28	33.74	100	Good
1241	206TH PL NE	64TH DR NE	66TH DR NE	Local	40	294.69	100	Good
1258	206TH PL NE	66TH DR NE	DEAD END	Local	40	268.70	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1232	206TH ST NE	61ST AVE NE	62ND AVE NE	Local	40	345.46	100	Good
1239	207TH ST NE	62ND AVE NE	63RD AVE NE	Local	40	300.25	100	Good
1252	207TH ST NE	61ST AVE NE	62ND AVE NE	Local	40	260.52	100	Good
1253	207TH ST NE	59TH AVE NE	60TH AVE NE	Local	40	240.12	100	Good
1254	207TH ST NE	60TH AVE NE	61ST AVE NE	Local	40	268.55	100	Good
1955	215TH PL NE	DEAD END	87TH AVE NE	Local	22	137.71	100	Good
1942	217TH PL NE	DEAD END	87TH AVE NE	Local	40	143.10	100	Good
1948	218TH PL NE	DEAD END	87TH AVE NE	Local	40	161.41	100	Good
1185	32ND ST NE	186TH PL NE	DEAD END	Local	26	167.50	100	Good
1167	34TH DR NE	DEAD END	178TH PL NE	Local	26	252.24	100	Good
1480	42ND DR NE	189TH PL NE	188TH CT NE	Local	28	426.48	100	Good
2111	43RD AVE NE	172ND ST NE	DEAD END	Local	26	1012.12	100	Good
1513	45TH DR NE	DEAD END	196TH PL NE	Local	28	120.36	100	Good
1519	45TH DR NE	193RD PL NE	192ND PL NE	Local	28	382.17	100	Good
1471	46TH AVE NE	193RD PL NE	46TH DR NE	Local	28	459.33	100	Good
1521	46TH AVE NE	191ST ST NE	190TH ST NE	Local	28	291.28	100	Good
1524	46TH AVE NE	191ST PL NE	191ST ST NE	Local	28	259.25	100	Good
1526	46TH AVE NE	46TH DR NE	193RD PL NE	Local	28	447.21	100	Good
1470	46TH DR NE	46TH AVE NE	193RD PL NE	Local	28	456.64	100	Good
1501	48TH AVE NE	203RD ST NE	202ND PL NE	Local	28	250.90	100	Good
1183	48TH DR NE	AIRPORT BLVD	DEAD END	Local	26	265.53	100	Good
1181	50TH DR NE	AIRPORT BLVD	DEAD END	Local	26	306.05	100	Good
1229	60TH AVE NE	207TH ST NE	206TH ST NE	Local	40	499.34	100	Good
1228	61ST AVE NE	207TH ST NE	206TH ST NE	Local	40	593.55	100	Good
1259	61ST AVE NE	209TH ST NE	207TH ST NE	Local	40	247.52	100	Good
1233	62ND AVE NE	207TH ST NE	206TH ST NE	Local	40	599.24	100	Good
1038	63RD AVE NE	199TH ST NE	197TH ST NE	Local	25	314.07	100	Good
1240	63RD AVE NE	207TH ST NE	GROVE PL	Local	40	240.90	100	Good
1260	63RD AVE NE	GROVE PL	206TH ST NE	Local	40	144.87	100	Good
1222	66TH DR NE	206TH PL NE	66TH DR NE	Local	40	359.70	100	Good
2120	69TH AVE NE	DEAD END	204TH ST NE	Local	30	234.19	100	Good
2093	72ND AVE NE	DEAD END	204TH ST NE	Local	40	783.04	100	Good
1339	72ND DR NE	176TH PL NE	DEAD END	Local	38	650.62	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1335	73RD AVE NE	176TH PL NE	172ND PL NE	Local	38	908.65	100	Good
1338	73RD DR NE	176TH PL NE	DEAD END	Local	38	743.18	100	Good
1341	74TH Dr NE	176TH PL NE	DEAD END	Local	38	637.14	100	Good
1348	79TH DR NE	177TH PL NE	175TH PL NE	Local	38	641.75	100	Good
1394	79TH DR NE	175TH PL NE	174TH PL NE	Local	38	400.50	100	Good
1395	79TH DR NE	DEAD END	177TH PL NE	Local	38	417.30	100	Good
1396	79TH DR NE	174TH PL NE	172ND PL NE	Local	38	536.28	100	Good
1328	80TH DR NE	177TH PL NE	175TH PL NE	Local	38	681.47	100	Good
1397	80TH DR NE	172ND PL NE	172ND ST NE	Local	38	262.45	100	Good
1398	80TH DR NE	175TH PL NE	174TH PL NE	Local	38	396.64	100	Good
1399	80TH DR NE	174TH PL NE	172ND PL NE	Local	38	545.33	100	Good
1333	81ST DR NE	174TH PL NE	DEAD END	Local	38	628.73	100	Good
1344	81ST DR NE	179TH PL NE	178TH PL NE	Local	38	438.85	100	Good
1400	81ST DR NE	DEAD END	174TH PL NE	Local	38	371.94	100	Good
1345	82ND DR NE	178TH PL NE	177TH ST NE	Local	38	508.07	100	Good
1346	82ND DR NE	179TH PL NE	178TH PL NE	Local	38	348.56	100	Good
1416	82ND DR NE	84TH AVE NE	DEAD END	Local	38	175.03	100	Good
1350	83RD DR NE	178TH PL NE	177TH ST NE	Local	38	502.35	100	Good
1403	83RD DR NE	176TH ST NE	175TH ST NE	Local	38	228.97	100	Good
1405	83RD DR NE	177TH ST NE	176TH ST NE	Local	38	416.64	100	Good
1326	84TH AVE NE	83RD DR NE	176TH ST NE	Local	38	585.92	100	Good
1330	84TH AVE NE	175TH ST NE	172ND PL NE	Local	38	676.49	100	Good
1413	84TH AVE NE	82ND DR NE	83RD DR NE	Local	38	245.06	100	Good
1264	85TH AVE NE	179TH PL NE	178TH PL NE	Local	38	564.07	100	Good
1323	85TH AVE NE	175TH ST NE	84TH AVE NE	Local	38	730.88	100	Good
1408	85TH AVE NE	84TH AVE NE	172ND ST NE	Local	38	241.99	100	Good
2062	87TH AVE NE	218TH PL NE	217TH PL NE	Local	26	229.69	100	Good
1437	91ST AVE NE	172ND ST NE	CITY LIMITS	Local	30	1309.89	100	Good
1317	BOREAL CT	REDHAWK DR	DEAD END	Local	38	192.51	100	Good
1325	BOVEE LN	67TH AVE NE	HIGHLAND VIEW DR	Local	38	1319.66	100	Good
1310	CAMBRIDGE DR	EAGLEFIELD DR	DEAD END	Local	38	885.72	100	Good
1301	CARLISLE PL	GREYWALLS DR	DEAD END	Local	38	689.96	100	Good
1281	CASTLE CT	BALMORAL DR	DEAD END	Local	38	164.62	100	Good

Segment ID	Segment Name	Segment Start	Segment End	Functional Class	Segment Width (ft)	Segment Length (ft)	PCI	PCR
1425	CHAMPIONS DR	PUTTERS CT	GALLERY LN	Local	38	332.76	100	Good
1321	CONDOR DR NE	REDHAWK DR	DEAD END	Local	38	174.44	100	Good
1918	DUNHAM AVE	E MAPLE ST	E UNION ST	Local	40	448.09	100	Good
2042	DUNHAM AVE	E UNION ST	E JACKSON ST	Local	40	435.22	100	Good
1903	E 2ND ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	294.97	100	Good
2011	E 4TH ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	309.10	100	Good
2006	E 5TH ST	N MCLEOD AVE	N DUNHAM ST	Local	40	315.99	100	Good
2007	E 5TH ST	N OLYMPIC AVE	N MACLEOD AVE	Local	40	312.69	100	Good
1959	E HALLER AVE	BROADWAY AVE	DEAD END	Local	40	222.75	100	Good
1374	EAGLEFIELD DR	CAMBRIDGE DR	NEWPORT DR	Local	38	211.74	100	Good
1386	GLENEAGLE BLVD	CONDOR DR NE	172ND ST NE	Local	38	200.08	100	Good
1287	GREENOCK CT	BALMORAL DR	DEAD END	Local	38	181.66	100	Good
1423	GREYWALLS DR	EAGLEFIELD DR	CARLISLE PL	Local	38	253.25	100	Good
1296	GREYWALLS DR	CARLISLE PL	ABBEY PL	Local	38	998.49	100	Good
1490	HIGH CLOVER BLVD NE	45TH DR NE	46TH DR NE	Local	28	268.96	100	Good
1491	HIGH CLOVER BLVD NE	44TH DR NE	45TH DR NE	Local	28	298.57	100	Good
1340	IRIS CT	188TH ST NE	DEAD END	Local	38	165.17	100	Good
1315	IRONWOOD ST	DEAD END	GREENLOFT AVE	Local	38	190.95	100	Good
1319	IRONWOOD ST	GREENLOFT AVE NE	GLENWOOD AVE NE	Local	38	535.26	100	Good
1320	IRONWOOD ST	GLENWOOD AVE NE	DEAD END	Local	38	209.88	100	Good
2077	LOIS LN	JENSEN FARM LN	DEAD END	Local	40	308.34	100	Good
1940	MEDICAL CENTER DR	N STILLAGUAMISH AVE	TVIET RD	Local	40	935.50	100	Good
1990	N DUNHAM AVE	E 5TH ST	E 4TH ST	Local	40	430.10	100	Good
1994	N DUNHAM AVE	E 4TH ST	E 3RD ST	Local	40	427.76	100	Good
2029	N DUNHAM AVE	E 3RD ST	E 2ND ST	Local	40	438.38	100	Good
1370	NEWPORT DR	HAVEN PL	STERLING PL	Local	38	315.72	100	Good
1316	OSPREY RD	PERREGRINE PL	REDHAWK DR	Local	38	764.36	100	Good
1390	REDHAWK DR	DEAD END	PERREGRINE PL	Local	38	229.64	100	Good
1391	REDHAWK DR	BOREAL CT	CONDOR DR NE	Local	38	237.88	100	Good
1393	REDHAWK DR	KESTRAL CT	OSPREY RD	Local	38	334.62	100	Good
1928	S HAMLIN DR	E MAPLE ST	DEAD END	Local	40	280.69	100	Good
1299	STERLING PL	NEWPORT DR	DEAD END	Local	38	149.15	100	Good
1297	TURNBERRY PL	EAGLEFIELD DR	DEAD END	Local	38	161.45	100	Good

Appendix F

ASTM Guidelines for Implementing the

Pavement Condition Rating System

Designation: D 6433 – 07

Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys[1]

This standard is issued under the fixed designation D 6433; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the determination of roads and parking lots pavement condition through visual surveys using the Pavement Condition Index (PCI) method of quantifying pavement condition.

1.2 The PCI for roads and parking lots was developed by the U.S. Army Corps of Engineers **(1, 2)**.[2] It is further verified and adopted by DOD and APWA.

1.3 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in Section 6.

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *additional sample*—a sample unit inspected in addition to the random sample units to include nonrepresentative sample units in the determination of the pavement condition. This includes very poor or excellent samples that are not typical of the section and sample units, which contain an unusual distress such as a utility cut. If a sample unit containing an unusual distress is chosen at random it should be counted as an additional sample unit and another random sample unit should be chosen. If every sample unit is surveyed, then there are no additional sample units.

2.1.2 *asphalt concrete (AC) surface*—aggregate mixture with an asphalt cement binder. This term also refers to surfaces constructed of coal tars and natural tars for purposes of this practice.

2.1.3 *pavement branch*—a branch is an identifiable part of the pavement network that is a single entity and has a distinct function. For example, each roadway or parking area is a separate branch.

2.1.4 *pavement condition index (PCI)*—a numerical rating of the pavement condition that ranges from 0 to 100 with 0 being the worst possible condition and 100 being the best possible condition.

2.1.5 *pavement condition rating*—a verbal description of pavement condition as a function of the PCI value that varies from "failed" to "excellent" as shown in Fig. 1.

2.1.6 *pavement distress*—external indicators of pavement deterioration caused by loading, environmental factors, construction deficiencies, or a combination thereof. Typical distresses are cracks, rutting, and weathering of the pavement surface. Distress types and severity levels detailed in Appendix X1 for AC, and Appendix X2 for PCC pavements must be used to obtain an accurate PCI value.

2.1.7 *pavement sample unit*—a subdivision of a pavement section that has a standard size range: 20 contiguous slabs (±8 slabs if the total number of slabs in the section is not evenly divided by 20 or to accommodate specific field condition) for PCC pavement, and 2500 contiguous square feet, ± 1000 ft^2 (225 ± 90 m^2), if the pavement is not evenly divided by 2500 or to accommodate specific field condition, for AC pavement.

2.1.8 *pavement section*—a contiguous pavement area having uniform construction, maintenance, usage history, and condition. A section should have the same traffic volume and load intensity.

2.1.9 *portland cement concrete (PCC) pavement*—aggregate mixture with portland cement binder including nonreinforced and reinforced jointed pavement.

2.1.10 *random sample*—a sample unit of the pavement section selected for inspection by random sampling techniques, such as a random number table or systematic random procedure.

3. Summary of Practice

3.1 The pavement is divided into branches that are divided into sections. Each section is divided into sample units. The type and severity of pavement distress is assessed by visual

[1] This practice is under the jurisdiction of ASTM Committee E17 on Vehicle - Pavement Systems and is the direct responsibility of Subcommittee E17.41 on Pavement Testing, Evaluation, and Management Methods.

Current edition approved Dec. 1, 2007. Published January 2008. Originally approved in 1999. Last previous edition approved in 2003 as D 6433 – 03.

[2] The boldface numbers in parentheses refer to the list of references at the end of this standard.

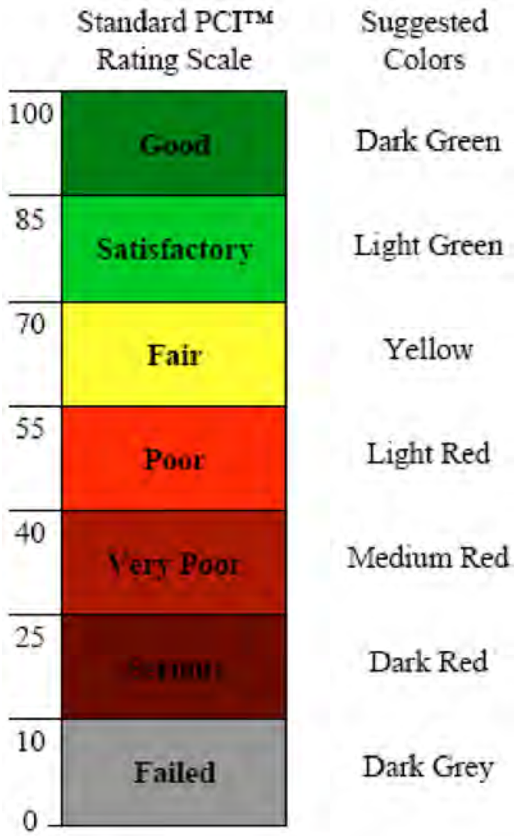


FIG. 1 Pavement Condition Index (PCI), Rating Scale, and Suggested Colors

inspection of the pavement sample units. The quantity of the distress is measured as described in Appendix X1 and Appendix X2. The distress data are used to calculate the PCI for each sample unit. The PCI of the pavement section is determined based on the PCI of the inspected sample units within the section.

4. Significance and Use

4.1 The PCI is a numerical indicator that rates the surface condition of the pavement. The PCI provides a measure of the present condition of the pavement based on the distress observed on the surface of the pavement, which also indicates the structural integrity and surface operational condition (localized roughness and safety). The PCI cannot measure structural capacity nor does it provide direct measurement of skid resistance or roughness. It provides an objective and rational basis for determining maintenance and repair needs and priorities. Continuous monitoring of the PCI is used to establish the rate of pavement deterioration, which permits early identification of major rehabilitation needs. The PCI provides feedback on pavement performance for validation or improvement of current pavement design and maintenance procedures.

5. Apparatus

5.1 *Data Sheets*, or other field recording instruments that record at a minimum the following information: date, location, branch, section, sample unit size, slab number and size, distress types, severity levels, quantities, and names of surveyors. Example data sheets for AC and PCC pavements are shown in Figs. 2 and 3.

5.2 *Hand Odometer Wheel*, that reads to the nearest 0.1 ft (30 mm).

5.3 *Straightedge or String Line*, (AC only), 10 ft (3 m).

5.4 *Scale*, 12 in. (300 mm) that reads to ⅛ in. (3 mm) or better. Additional 12-in. (300 mm) ruler or straightedge is needed to measure faulting in PCC pavements.

5.5 *Layout Plan*, for network to be inspected.

6. Hazards

6.1 Traffic is a hazard as inspectors may walk on the pavement to perform the condition survey.

7. Sampling and Sample Units

7.1 Identify branches of the pavement with different uses such as roadways and parking on the network layout plan.

7.2 Divide each branch into sections based on the pavements design, construction history, traffic, and condition.

7.3 Divide the pavement sections into sample units. If the pavement slabs in PCC have joint spacing greater than 25 ft (8 m) subdivide each slab into imaginary slabs. The imaginary slabs all should be less than or equal to 25 ft (8 m) in length, and the imaginary joints dividing the slabs are assumed to be in perfect condition. This is needed because the deduct values developed for jointed concrete slabs are less than or equal to 25 ft (8 m).

7.4 Individual sample units to be inspected should be marked or identified in a manner to allow inspectors and quality control personnel to easily locate them on the pavement surface. Paint marks along the edge and sketches with locations connected to physical pavement features are acceptable. It is necessary to be able to accurately relocate the sample units to allow verification of current distress data, to examine changes in condition with time of a particular sample unit, and to enable future inspections of the same sample unit if desired.

7.5 Select the sample units to be inspected. The number of sample units to be inspected may vary from the following: all of the sample units in the section, a number of sample units that provides a 95 % confidence level, or a lesser number.

7.5.1 All sample units in the section may be inspected to determine the average PCI of the section. This is usually precluded for routine management purposes by available manpower, funds, and time. Total sampling, however, is desirable for project analysis to help estimate maintenance and repair quantities.

7.5.2 The minimum number of sample units (n) that must be surveyed within a given section to obtain a statistically adequate estimate (95 % confidence) of the PCI of the section

ASPHALT SURFACED ROADS AND PARKING LOTS CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT	SKETCH:
BRANCH ____________ SECTION _________ SAMPLE UNIT _________ SURVEYED BY ___________ DATE _________ SAMPLE AREA _________	

1. Alligator Cracking
2. Bleeding
3. Block Cracking
4. Bumps and Sags
5. Corrugation
6. Depression
7. Edge Cracking
8. Jt. Reflection Cracking
9. Lane/Shoulder Drop Off
10. Long & Trans Cracking
11. Patching & Util Cut Patching
12. Polished Aggregate
13. Potholes
14. Railroad Crossing
15. Rutting
16. Shoving
17. Slippage Cracking
18. Swell
19. Weathering/Raveling

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE

FIG. 2 Flexible Pavement Condition Survey Data Sheet for Sample Unit

CONCRETE SURFACED ROADS AND PARKING LOTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH__________ SECTION__________ SAMPLE UNIT__________
SURVEYED BY__________ DATE__________ SAMPLE AREA__________

Distress Types

21. Blow up/Buckling
22. Corner Break
23. Divided Slab
24. Durability Crack
25. Faulting
26. Joint Seal
27. Lane/Shoulder
28. Linear Cracking
29. Patching (Large)
30. Patching (Small)
31. Polished Aggregate
32. Popouts
33. Pumping
34. Punchout
35. Railroad Crossing
36. Scaling
37. Shrinkage
38. Spalling Corner
39. Spalling Joint

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE

SKETCH:

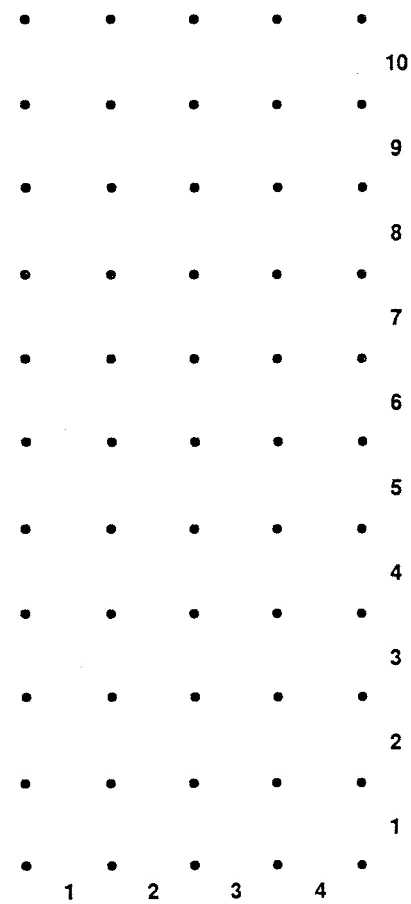


FIG. 3 Joint Rigid Pavement Condition Survey Data Sheet for Sample Unit

is calculated using the following formula and rounding n to the next highest whole number (see Eq 1).

$$n = Ns^2/((e^2/4)(N-1) + s^2) \quad (1)$$

where:

e = acceptable error in estimating the section PCI; commonly, $e = \pm 5$ PCI points;
s = standard deviation of the PCI from one sample unit to another within the section. When performing the initial inspection the standard deviation is assumed to be ten for AC pavements and 15 for PCC pavements. This assumption should be checked as described below after PCI values are determined. For subsequent inspections, the standard deviation from the preceding inspection should be used to determine n; and,
N = total number of sample units in the section.

7.5.2.1 If obtaining the 95 % confidence level is critical, the adequacy of the number of sample units surveyed must be confirmed. The number of sample units was estimated based on an assumed standard deviation. Calculate the actual standard deviation (s) as follows (see Eq 2):

$$s = \left(\sum_{i=1}^{n}(PCI_i - PCI_s)^2/(n-1)\right)^{1/2} \quad (2)$$

where:

PCI_i = PCI of surveyed sample units i,
PCI_s = PCI of section (mean PCI of surveyed sample units), and
n = total number of sample units surveyed.

7.5.2.2 Calculate the revised minimum number of sample units (Eq 1) to be surveyed using the calculated standard deviation (Eq 2). If the revised number of sample units to be surveyed is greater than the number of sample units already surveyed, select and survey additional random sample units. These sample units should be spaced evenly across the section. Repeat the process of checking the revised number of sample units and surveying additional random sample units until the total number of sample units surveyed equals or exceeds the minimum required sample units (*n*) in Eq 1, using the actual total sample standard deviation.

7.5.3 Once the number of sample units to be inspected has been determined, compute the spacing interval of the units using systematic random sampling. Samples are spaced equally throughout the section with the first sample selected at random. The spacing interval (*i*) of the units to be sampled is calculated by the following formula rounded to the next lowest whole number:

$$i = N/n \tag{3}$$

where:
N = total number of sample units in the section, and
n = number of sample units to be inspected.

The first sample unit to be inspected is selected at random from sample units 1 through *i*. The sample units within a section that are successive increments of the interval *i* after the first randomly selected unit also are inspected.

7.6 A lessor sampling rate than the above mentioned 95 % confidence level can be used based on the condition survey objective. As an example, one agency uses the following table for selecting the number of sample units to be inspected for other than project analysis:

Given	Survey
1 to 5 sample units	1 sample unit
6 to 10 sample units	2 sample units
11 to 15 sample units	3 sample units
16 to 40 sample units	4 sample units
over 40 sample units	10 %

7.7 Additional sample units only are to be inspected when nonrepresentative distresses are observed as defined in 2.1.1. These sample units are selected by the user.

8. Inspection Procedure

8.1 The definitions and guidelines for quantifying distresses for PCI determination are given in Appendix X1 for AC pavements. Using this test method, inspectors should identify distress types accurately 95 % of the time. Linear measurements should be considered accurate when they are within 10 % if remeasured, and area measurements should be considered accurate when they are within 20 % if remeasured. Distress severities that one determines based on ride quality are considered subjective.

8.2 *Asphalt Concrete (AC) Surfaced Pavement*—Individually inspect each sample unit chosen. Sketch the sample unit, including orientation. Record the branch and section number and the number and type of the sample unit (random or additional). Record the sample unit size measured with the hand odometer. Conduct the distress inspection by walking over the sidewalk/shoulder of the sample unit being surveyed, measuring the quantity of each severity level of every distress type present, and recording the data. Each distress must correspond in type and severity to that described in Appendix X1. The method of measurement is included with each distress description. Repeat this procedure for each sample unit to be inspected. A copy of a Blank Flexible Pavement Condition Survey Data Sheet for Sample Unit is included in Fig. 2.

8.3 *PCC Pavements*—Individually inspect each sample unit chosen. Sketch the sample unit showing the location of the slabs. Record the sample unit size, branch and section number, and number and type of the sample unit (random or additional), the number of slabs in the sample unit and the slab size measured with the hand odometer. Perform the inspection by walking over the sidewalk/shoulder of the sample unit being surveyed and recording all distress existing in the slab along with their severity level. Each distress type and severity must correspond with that described in Appendix X2. Summarize the distress types, their severity levels and the number of slabs in the sample unit containing each type and severity level. Repeat this procedure for each sample unit to be inspected. A copy of a Blank Jointed Rigid Pavement Condition Survey Data Sheet for Sample Unit is included in Fig. 3.

9. Calculation of PCI for Asphalt Concrete (AC) Pavement

9.1 Add up the total quantity of each distress type at each severity level, and record them in the "Total Severities" section. For example, Fig. 4 shows five entries for the Distress Type 1, "Alligator Cracking": 5L, 4L, 4L, 8H, and 6H. The distress at each severity level is summed and entered in the "Total Severity" section as 13 ft^2 (1.2 m^2) of low severity and 14 ft^2 (1.3 m^2) of medium severity. The units for the quantities may be either in square feet (square meters), linear feet (meters), or number of occurrences, depending on the distress type.

9.2 Divide the total quantity of each distress type at each severity level from 9.1 by the total area of the sample unit and multiply by 100 to obtain the percent density of each distress type and severity.

9.3 Determine the deduct value (DV) for each distress type and severity level combination from the distress deduct value curves in Appendix X3.

9.4 Determine the maximum corrected deduct value (CDV). The procedure for determining maximum CDV from individual DVs is identical for both AC and PCC pavement types.

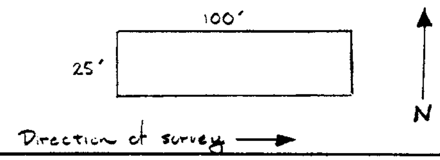
9.5 The following procedure must be used to determine the maximum CDV.

9.5.1 If none or only one individual deduct value is greater than two, the total value is used in place of the maximum CDV in determining the PCI; otherwise, maximum CDV must be determined using the procedure described in 9.5.2-9.5.5.

9.5.2 List the individual deduct values in descending order. For example, in Fig. 4 this will be 25.1, 23.4, 17.9, 11.2, 7.9, 7.5, 6.9, and 5.3.

9.5.3 Determine the allowable number of deducts, *m*, from Fig. 5, or using the following formula (see Eq 4):

$$m = 1 + (9/98)(100\text{–}HDV) \leq 10 \tag{4}$$

ASPHALT SURFACED ROADS AND PARKING LOTS CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT	SKETCH:
BRANCH SPRINGFIELD SECTION 001 SAMPLE UNIT 1 SURVEYED BY KAK DATE 10 Jul 93 SAMPLE AREA 2500 sf	

1. Alligator Cracking	6. Depression	11. Patching & Util Cut Patching	16. Shoving
2. Bleeding	7. Edge Cracking	12. Polished Aggregate	17. Slippage Cracking
3. Block Cracking	8. Jt. Reflection Cracking	13. Potholes	18. Swell
4. Bumps and Sags	9. Lane/Shoulder Drop Off	14. Railroad Crossing	19. Weathering/Raveling
5. Corrugation	10. Long & Trans Cracking	15. Rutting	

DISTRESS SEVERITY	QUANTITY									TOTAL	DENSITY %	DEDUCT VALUE
1 L	1×5	1×4	1×4							13	0.52	7.9
1 H	1×8	1×6								14	0.56	23.4
7 L	32	15	18	24	41					130	5.20	7.5
8 M	20	15	35	27	23	10	13			143	5.72	25.1
11 H	3×4	2×5								22	0.88	17.9
13 L	1									1	0.04	11.2
15 L	4	9	8							21	0.84	6.9
19 L	250									250	10.0	5.3

FIG. 4 Example of a Flexible Pavement Condition Survey Data Sheet

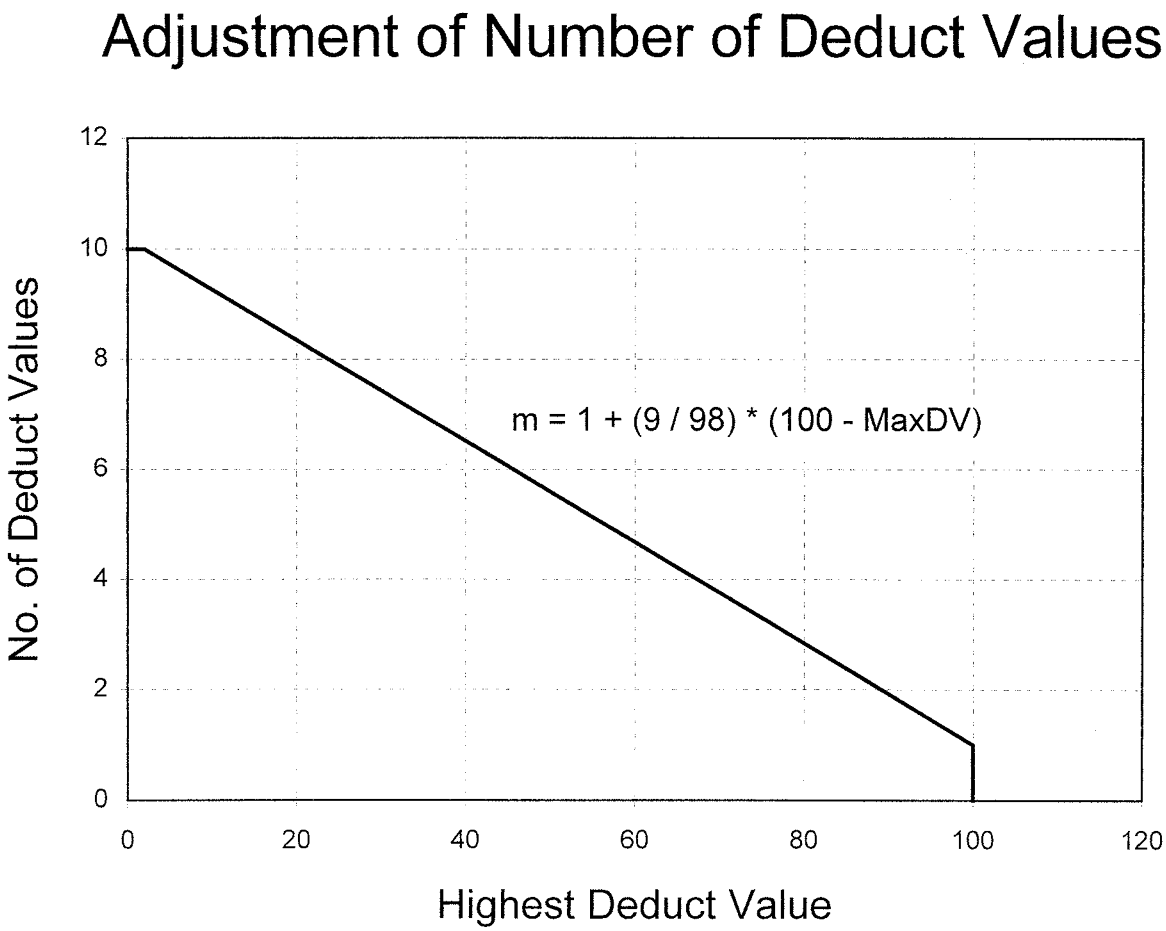


FIG. 5 Adjustment of Number of Deduct Values

where:

m = allowable number of deducts including fractions (must be less than or equal to ten), and
HDV = highest individual deduct value.

(For the example in Fig. 4, $m = 1 + (9/98)(100\text{-}25.1) = 7.9$).

9.5.4 The number of individual deduct values is reduced to the *m* largest deduct values, including the fractional part. For the example in Fig. 6, the values are 25.1, 23.4, 17.9, 11.2, 7.9, 7.5, 6.9, and 4.8 (the 4.8 is obtained by multiplying 5.3 by (7.9 – 7 = 0.9)). If less than *m* deduct values are available, all of the deduct values are used.

9.5.5 Determine maximum CDV iteratively, as shown in Fig. 6.

9.5.5.1 Determine total deduct value by summing individual deduct values. The total deduct value is obtained by adding the individual deduct values in 9.5.4, that is, 104.7.

9.5.5.2 Determine *q* as the number of deducts with a value greater than 2.0. For example, in Fig. 6, $q = 8$.

9.5.5.3 Determine the CDV from total deduct value and *q* by looking up the appropriate correction curve for AC pavements in Fig. X4.15 in Appendix X3.

9.5.5.4 Reduce the smallest individual deduct value greater than 2.0 to 2.0 and repeat 9.5.5.1-9.5.5.3 until $q = 1$.

9.5.5.5 Maximum CDV is the largest of the CDVs.

9.6 Calculate PCI by subtracting the maximum CDV from 100: PCI = 100-max CDV.

9.7 Fig. 6 shows a summary of PCI calculation for the example AC pavement data in Fig. 4. A blank PCI calculation form is included in Fig. 2.

10. Calculation of PCI for Portland Cement Concrete (PCC) Pavement

10.1 For each unique combination of distress type and severity level, add up the total number of slabs in which they occur. For the example in Fig. 7, there are two slabs containing low-severity corner break (Distress 22L).

10.2 Divide the number of slabs from 10.1 by the total number of slabs in the sample unit and multiply by 100 to obtain the percent density of each distress type and severity combination.

10.3 Determine the deduct values for each distress type severity level combination using the corresponding deduct curve in Appendix X4.

10.4 Determine PCI by following the procedures in 9.5 and 9.6, using the correction curve for PCC pavements (see Fig. X4.20 in Appendix X4) in place of the correction curve for AC pavements.

m = 1 + (9/98) (100 - 25.1) = 7.9 < 8

Use highest 7 deducts and 0.9 of eighth deduct.

0.9 x 5.3 = 4.8

#	Deduct Values										Total	q	CDV
1	25.1	23.4	17.9	11.2	7.9	7.5	6.9	4.8			104.7	8	51.0
2	25.1	23.4	17.9	11.2	7.9	7.5	6.9	2			101.9	7	50.0
3	25.1	23.4	17.9	11.2	7.9	7.5	2	2			96.0	6	46.0
4	25.1	23.4	17.9	11.2	7.9	2	2	2			90.5	5	47.0
5	25.1	23.4	17.9	11.2	2	2	2	2			84.6	4	48.0
6	25.1	23.4	17.9	2	2	2	2	2			75.4	3	48.0
7	25.1	23.4	2	2	2	2	2	2			59.5	2	44.0
8	25.1	2	2	2	2	2	2	2			38.1	1	38.0
9													
10													

Max CDV = 51

PCI = 100 - Max CDV = 49

Rating = FAIR

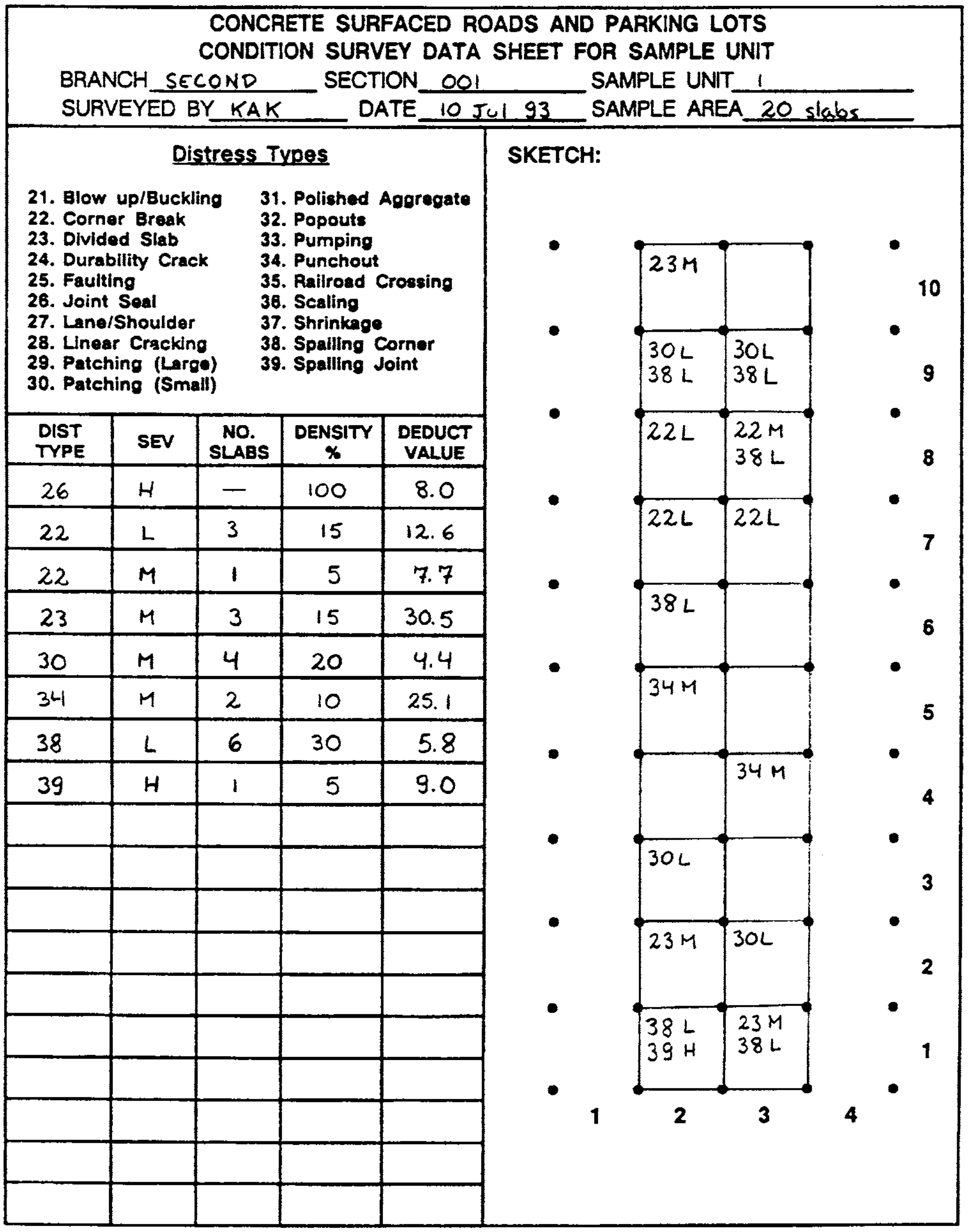
FIG. 6 Calculation of Corrected PCI Value—Flexible Pavement

10.5 Fig. 7 shows a summary of PCI calculation for the example PCC pavement distress data in Fig. 8.

11. Determination of Section PCI

11.1 If all surveyed sample units are selected randomly, then the PCI of the section (PCI_s) is calculated as the area weighted PCI of the randomly surveyed sample units ($\overline{PCI_r}$) using equation 5:

$$PCI_S = \overline{PCI_r} = \frac{\sum_{i=1}^{n} (PCI_{ri} \cdot A_{ri})}{\sum_{i=1}^{n} A_{ri}} \quad (5)$$



CONCRETE SURFACED ROADS AND PARKING LOTS
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

BRANCH SECOND SECTION 001 SAMPLE UNIT 1
SURVEYED BY KAK DATE 10 JUL 93 SAMPLE AREA 20 slabs

Distress Types

21. Blow up/Buckling
22. Corner Break
23. Divided Slab
24. Durability Crack
25. Faulting
26. Joint Seal
27. Lane/Shoulder
28. Linear Cracking
29. Patching (Large)
30. Patching (Small)
31. Polished Aggregate
32. Popouts
33. Pumping
34. Punchout
35. Railroad Crossing
36. Scaling
37. Shrinkage
38. Spalling Corner
39. Spalling Joint

DIST TYPE	SEV	NO. SLABS	DENSITY %	DEDUCT VALUE
26	H	—	100	8.0
22	L	3	15	12.6
22	M	1	5	7.7
23	M	3	15	30.5
30	M	4	20	4.4
34	M	2	10	25.1
38	L	6	30	5.8
39	H	1	5	9.0

SKETCH:

	2	3
10	23M	
9	30L 38L	30L 38L
8	22L	22M 38L
7	22L	22L
6	38L	
5	34M	
4		34M
3	30L	
2	23M	30L
1	38L 39H	23M 38L

1 2 3 4

FIG. 7 Example of a Jointed Rigid Pavement Condition Survey Data Sheet

where:

$\overline{PCI_r}$ = area weighted PCI of randomly surveyed sample units,
PCI_{ri} = PCI of random sample unit i,
A_{ri} = area of random sample unit i,
n = number of random sample units surveyed.

If additional sample units, as defined in 2.1.1, are surveyed, the area weighted PCI of the surveyed additional units ($\overline{PCI_a}$) is calculated using equation 6. The PCI of the pavement section is calculated using equation 7.

$$\overline{PCI_a} = \frac{\sum_{i=1}^{m} (PCI_{ai} \cdot A_{ai})}{\sum_{i=1}^{m} A_{ai}} \tag{6}$$

$$PCI_s = \frac{\overline{PCI_r}(A - \sum_{i=1}^{m} A_{ai}) + \overline{PCI_a}(\sum_{i=1}^{m} A_{ai})}{A} \tag{7}$$

m = 1 + (9/98) (100 - 30.5) = 7.4 < 8

Use highest 7 deducts and 0.4 of eighth deduct.

0.4 x 4.4 = 1.76

#	Deduct Values										Total	q	CDV
1	30.5	25.1	12.6	9.0	8.0	7.7	5.8	(1.76)			100.5	7	50.0
2	30.5	25.1	12.6	9.0	8.0	7.7	2	1.76			96.7	6	49.5
3	30.5	25.1	12.6	9.0	8.0	2	2	1.76			91.0	5	51.0
4	30.5	25.1	12.6	9.0	2	2	2	1.76			85.0	4	49.0
5	30.5	25.1	12.6	2	2	2	2	1.76			78.0	3	50.0
6	30.5	25.1	2	2	2	2	2	1.76			67.4	2	50.0
7	30.5	2	2	2	2	2	2	1.76			44.3	1	44.3
8													
9													
10													

Max CDV = 51

PCI = 100 - Max CDV = 49

Rating = FAIR

FIG. 8 Calculation of Corrected PCI Value—Jointed Rigid Pavement

$\overline{PCI_a}$ = area weighted PCI of additional sample units,
PCI_{ai} = PCI of additional sample unit *i*,
A_{ai} = area of additional sample unit *i*,
A = area of section,
m = number of additional sample units surveyed, and
PCI_s = area weighted PCI of the pavement section.

11.2 Determine the overall condition rating of the section by using the section PCI and the condition rating scale in Fig. 1.

12. Report

12.1 Develop a summary report for each section. The summary lists section location, size, total number of sample units, the sample units inspected, the PCIs obtained, the average PCI for the section, and the section condition rating.

APPENDIXES

(Nonmandatory Information)

X1. Distress in Asphalt Pavements

X1.1 During the field condition surveys and validation of the PCI, several questions are commonly asked about the identification and measurement of some of the distresses. The answers to these questions for each distress are included under the heading "How to Measure." For convenience, however, the most frequently raised issues are addressed below:

X1.1.1 If alligator cracking and rutting occur in the same area, each is recorded separately at its respective severity level.

X1.1.2 If bleeding is counted, polished aggregate is not counted in the same area.

X1.1.3 Spalling as used herein is the further breaking of pavement or loss of materials around cracks or joints.

X1.1.4 If a crack does not have the same severity level along its entire length, each portion of the crack having a different severity level should be recorded separately. If, however, the different levels of severity in a portion of a crack cannot be easily divided, that portion should be rated at the highest severity level present.

X1.1.5 If any distress, including cracking and potholes, is found in a patched area, it is not recorded; its effect on the patch, however, is considered in determining the severity level of the patch.

X1.1.6 A significant amount of polished aggregate should be present before it is counted.

X1.1.7 A distress is said to be raveled if the area surrounding the distress is broken (sometimes to the extent that pieces are removed).

X1.2 The reader should note that the items above are general issues and do not stand alone as inspection criteria. To properly measure each distress type, the inspector must be familiar with its individual measurement criteria.

X1.3 Nineteen distress types for asphalt-surfaced pavements are listed alphabetically in this manual.

RIDE QUALITY

X1.4 Ride quality must be evaluated in order to establish a severity level for the following distress types:

X1.4.1 Bumps.
X1.4.2 Corrugation.
X1.4.3 Railroad crossings.
X1.4.4 Shoving.
X1.4.5 Swells.

X1.4.6 To determine the effect these distresses have on ride quality, the inspector should drive at the normal operating speed and use the following severity-level definitions of ride quality:

X1.4.6.1 **L**—Low. Vehicle vibrations, for example, from corrugation, are noticeable, but no reduction in speed is necessary for comfort or safety. Individual bumps or settlements, or both, cause the vehicle to bounce slightly, but create little discomfort.

X1.4.6.2 **M**—Medium. Vehicle vibrations are significant and some reduction in speed is necessary for safety and comfort. Individual bumps or settlements, or both, cause the vehicle to bounce significantly, creating some discomfort.

X1.4.6.3 **H**—High. Vehicle vibrations are so excessive that speed must be reduced considerably for safety and comfort. Individual bumps or settlements, or both, cause the vehicle to bounce excessively, creating substantial discomfort, safety hazard, or high potential vehicle damage.

X1.4.7 The inspector should drive at the posted speed in a sedan that is representative of cars typically seen in local traffic. Pavement sections near stop signs should be rated at a deceleration speed appropriate for the intersection.

ALLIGATOR CRACKING (FATIGUE)

X1.5 *Description*—Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading. Cracking begins at the bottom of the asphalt surface, or stabilized base, where tensile stress and strain are highest under a wheel load. The cracks propagate to the surface initially as a series of parallel longitudinal cracks. After repeated traffic loading, the cracks connect, forming many sided, sharp-angled pieces that develop a pattern resembling chicken wire or the skin of an alligator. The pieces are generally less than 0.5 m (1.5 ft) on the longest side. Alligator cracking occurs only in areas subjected to repeated traffic loading, such as wheel paths. Pattern-type cracking that occurs over an entire area not subjected to loading is called "block cracking," which is not a load-associated distress.

X1.5.1 *Severity Levels*:

X1.5.1.1 **L**—Fine, longitudinal hairline cracks running parallel to each other with no, or only a few interconnecting cracks. The cracks are not spalled (Fig. X1.1).

FIG. X1.1 Low-Severity Alligator Cracking

X1.5.1.2 **M**—Further development of light alligator cracks into a pattern or network of cracks that may be lightly spalled (Fig. X1.2).

X1.5.1.3 **H**—Network or pattern cracking has progressed so that the pieces are well defined and spalled at the edges. Some of the pieces may rock under traffic (Fig. X1.3).

X1.5.2 *How to Measure*—Alligator cracking is measured in square meters (square feet) of surface area. The major difficulty in measuring this type of distress is that two or three levels of severity often exist within one distressed area. If these portions can be easily distinguished from each other, they should be measured and recorded separately; however, if the different levels of severity cannot be divided easily, the entire area should be rated at the highest severity present. If alligator cracking and rutting occur in the same area, each is recorded separately as its respective severity level.

BLEEDING

X1.6 *Description*—Bleeding is a film of bituminous material on the pavement surface that creates a shiny, glasslike, reflecting surface that usually becomes quite sticky. Bleeding is caused by excessive amounts of asphaltic cement or tars in the mix, excess application of a bituminous sealant, or low air void content, or a combination thereof. It occurs when asphalt fills the voids of the mix during hot weather and then expands onto the pavement surface. Since the bleeding process in not reversible during cold weather, asphalt or tar will accumulate on the surface.

X1.6.1 *Severity Levels*:

X1.6.1.1 **L**—Bleeding only has occurred to a very slight degree and is noticeable only during a few days of the year. Asphalt does not stick to shoes or vehicles (Fig. X1.4).

X1.6.1.2 **M**—Bleeding has occurred to the extent that asphalt sticks to shoes and vehicles during only a few weeks of the year (Fig. X1.5).

X1.6.1.3 **H**—Bleeding has occurred extensively and considerable asphalt sticks to shoes and vehicles during at least several weeks of the year (Fig. X1.6).

X1.6.2 *How to Measure*—Bleeding is measured in square meters (square feet) of surface area. If bleeding is counted, polished aggregate should not be counted.

FIG. X1.2 Medium-Severity Alligator Cracking

FIG. X1.3 High-Severity Alligator Cracking

FIG. X1.4 Low-Severity Bleeding

FIG. X1.5 Medium-Severity Bleeding

BLOCK CRACKING

X1.7 *Description*—Block cracks are interconnected cracks that divide the pavement into approximately rectangular pieces. The blocks may range in size from approximately 0.3 by 0.3 m (1 by 1 ft) to 3 by 3 m (10 by 10 ft). Block cracking is caused mainly by shrinkage of the asphalt concrete and daily

FIG. X1.6 High-Severity Bleeding

temperature cycling, which results in daily stress/strain cycling. It is not load-associated. Block cracking usually indicates that the asphalt has hardened significantly. Block cracking normally occurs over a large portion of the pavement area, but sometimes will occur only in nontraffic areas. This type of distress differs from alligator cracking in that alligator cracks form smaller, many-sided pieces with sharp angles. Also, unlike block, alligator cracks are caused by repeated traffic loadings, and therefore, are found only in traffic areas, that is, wheel paths.

X1.7.1 *Severity Levels*:

X1.7.1.1 **L**—Blocks are defined by low-severity[3] cracks (Fig. X1.7).

[3] See definitions of longitudinal transverse cracking within Appendix X2.10.

X1.7.1.2 **M**—Blocks are defined by medium-severity[3] cracks (Fig. X1.8).

X1.7.1.3 **H**—Blocks are defined by high-severity[3] cracks (Fig. X1.9).

X1.7.2 *How to Measure*—Block cracking is measured in m^2 (ft^2) of surface area. It usually occurs at one severity level in a given pavement section; however, if areas of different severity levels can be distinguished easily from one another, they should be measured and recorded separately.

BUMPS AND SAGS

X1.8 *Description*:

X1.8.1 Bumps are small, localized, upward displacements of the pavement surface. They are different from shoves in that shoves are caused by unstable pavement. Bumps, on the other hand, can be caused by several factors, including:

X1.8.1.1 Buckling or bulging of underlying PCC slabs in AC overlay over PCC pavement.

X1.8.1.2 Frost heave (ice, lens growth).

X1.8.1.3 Infiltration and buildup of material in a crack in combination with traffic loading (sometimes called "tenting").

X1.8.1.4 Sags are small, abrupt, downward displacements of the pavement surface. If bumps appear in a pattern perpendicular to traffic flow and are spaced at less than 3 m (10 ft), the distress is called corrugation. Distortion and displacement that occur over large areas of the pavement surface, causing large or long dips, or both, in the pavement should be recorded as" swelling."

X1.8.2 *Severity Levels*:

X1.8.2.1 **L**—Bump or sag causes low-severity ride quality (Fig. X1.10).

X1.8.2.2 **M**—Bump or sag causes medium-severity ride quality (Fig. X1.11).

X1.8.2.3 **H**—Bump or sag causes high-severity ride quality (Fig. X1.12).

X1.8.3 *How to Measure*—Bumps or sags are measured in linear meters (feet). If the bump occurs in combination with a crack, the crack also is recorded.

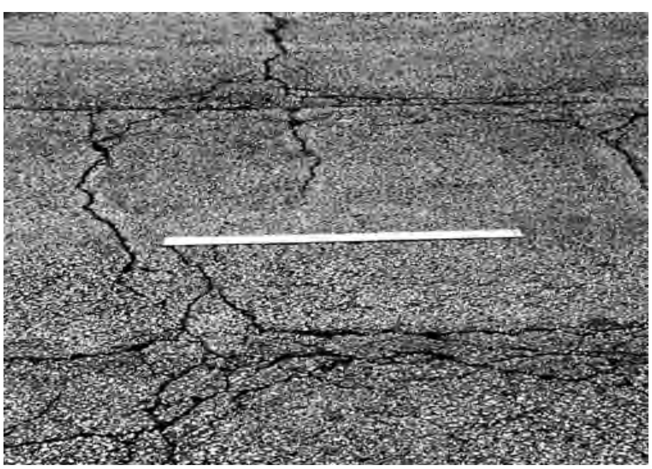


FIG. X1.7 Low-Severity Block Cracking

FIG. X1.8 Medium-Severity Block Cracking

FIG. X1.9 High-Severity Block Cracking

FIG. X1.10 Low-Severity Bumps and Sags

FIG. X1.11 Medium-Severity Bumps and Sags

FIG. X1.12 High-Severity Bumps and Sags

CORRUGATION

X1.9 *Description*—Corrugation, also known as "washboarding", is a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals, usually less than 3 m (10 ft) along the pavement. The ridges are perpendicular to the traffic direction. This type of distress usually is caused by traffic action combined with an unstable pavement surface or base.

X1.9.1 *Severity Levels*:

X1.9.1.1 **L**—Corrugation produces low-severity ride quality (Fig. X1.13).

X1.9.1.2 **M**—Corrugation produces medium-severity ride quality (Fig. X1.14).

X1.9.1.3 **H**—Corrugation produces high-severity ride quality (Fig. X1.15).

X1.9.2 *How to Measure*—Corrugation is measured in square meters (square feet) of surface area.

DEPRESSION

X1.10 *Description*—Depressions are localized pavement surface areas with elevations slightly lower than those of the surrounding pavement. In many instances, light depressions are not noticeable until after a rain, when ponding water creates a "birdbath" area; on dry pavement, depressions can be spotted by looking for stains caused by ponding water. Depressions are created by settlement of the foundation soil or are a result of

FIG. X1.13 Low-Severity Corrugation

FIG. X1.14 Medium-Severity Corrugation

FIG. X1.15 High-Severity Corrugation

improper construction. Depressions cause some roughness, and when deep enough or filled with water, can cause hydroplaning.

X1.10.1 *Severity Levels (Maximum Depth of Depression)*:

X1.10.1.1 **L**–13 to 25 mm (½ to 1 in.) (Fig. X1.16).

X1.10.1.2 **M**–25 to 50 mm (1 to 2 in.) (Fig. X1.17).

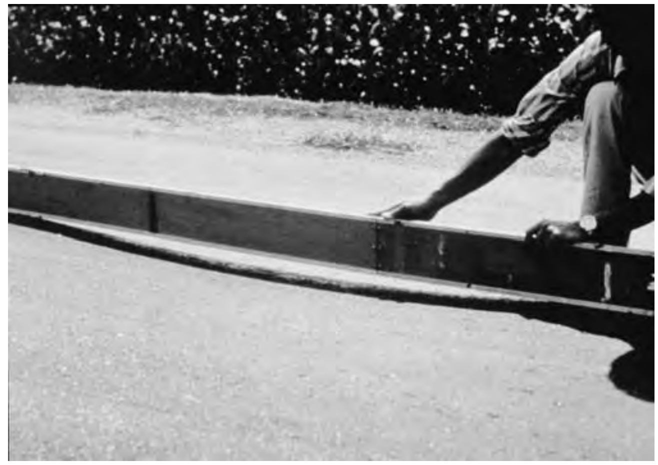


FIG. X1.17 Medium-Severity Depression

X1.10.1.3 **H**—More than 50 mm (2 in.) (Fig. X1.18).

X1.10.2 *How to Measure*—Depressions are measured in square meters (square feet) of surface area.

EDGE CRACKING

X1.11 *Description*—Edge cracks are parallel to and usually within 0.3 to 0.5 m (1 to 1.5 ft) of the outer edge of the pavement. This distress is accelerated by traffic loading and can be caused by frost-weakened base or subgrade near the edge of the pavement. The area between the crack and pavement edge is classified as raveled if it is broken up (sometimes to the extent that pieces are removed).

X1.11.1 *Severity Levels*:

X1.11.1.1 **L**—Low or medium cracking with no breakup or raveling (Fig. X1.19).

X1.11.1.2 **M**—Medium cracks with some breakup and raveling (Fig. X1.20).

X1.11.1.3 **H**—Considerable breakup or raveling along the edge (Fig. X1.21).

X1.11.2 *How to Measure*—Edge cracking is measure in linear meters (feet).

FIG. X1.16 Low-Severity Depression

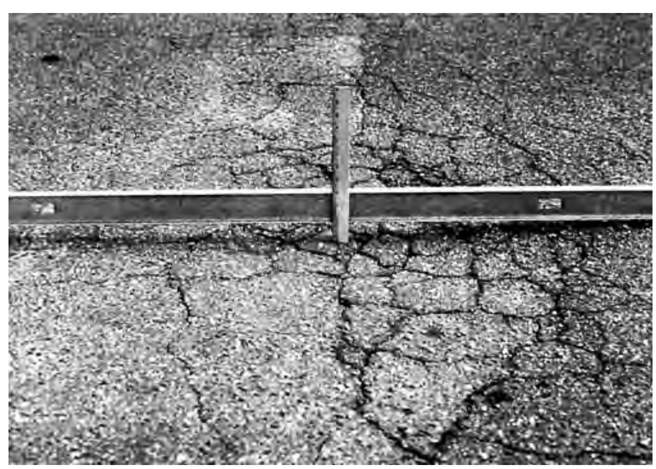


FIG. X1.18 High-Severity Depression

FIG. X1.19 Low-Severity Edge Cracking

FIG. X1.20 Medium-Severity Edge Cracking

FIG. X1.21 High-Severity Edge Cracking

JOINT REFLECTION CRACKING (From Longitudinal and Transverse PCC Slabs)

X1.12 *Description*—This distress occurs only on asphalt-surfaced pavements that have been laid over a PCC slab. It does not include reflection cracks from any other type of base, that is, cement- or lime-stabilized; these cracks are caused mainly by thermal- or moisture-induced movement of the PCC slab beneath the AC surface. This distress is not load-related; however, traffic loading may cause a breakdown of the AC surface near the crack. If the pavement is fragmented along a crack, the crack is said to be spalled. A knowledge of slab dimension beneath the AC surface will help to identify these distresses.

X1.12.1 *Severity Levels*:

X1.12.1.1 **L**—One of the following conditions exists (Fig. X1.22): Nonfilled crack width is less than 10 mm (3⁄8 in.), or filled crack of any width (filler in satisfactory condition).

X1.12.1.2 **M**—One of the following conditions exists (Fig. X1.23): Nonfilled crack width is greater than or equal to 10 mm (3⁄8 in.) and less than 75 mm (3 in.); nonfilled crack less than or equal to 75 mm (3 in.) surrounded by light secondary cracking; or, filled crack of any width surrounded by light secondary cracking.

X1.12.1.3 **H**—One of the following conditions exists (Fig. X1.24): Any crack filled or nonfilled surrounded by medium- or high-severity secondary cracking; nonfilled cracks greater than 75 mm (3 in.); or, a crack of any width where approximately 100 mm (4 in.) of pavement around the crack are severely raveled or broken.

X1.12.2 *How to Measure*—Joint reflection cracking is measured in linear meters (feet). The length and severity level of each crack should be identified and recorded separately. For example, a crack that is 15 m (50 ft) long may have 3 m (10 ft) of high severity cracks, which are all recorded separately. If a bump occurs at the reflection crack, it is recorded also.

LANE/SHOULDER DROP-OFF

X1.13 *Description*—Lane/shoulder drop-off is a difference in elevation between the pavement edge and the shoulder. This distress is caused by shoulder erosion, shoulder settlement, or by building up the roadway without adjusting the shoulder level.

X1.13.1 *Severity Levels*:

X1.13.1.1 **L**—The difference in elevation between the pavement edge and shoulder is > 25 mm (1 in.) and< 50 mm (2 in.) (Fig. X1.25).

FIG. X1.22 Low-Severity Joint Reflection Cracking

FIG. X1.23 Medium-Severity Joint Reflection Cracking

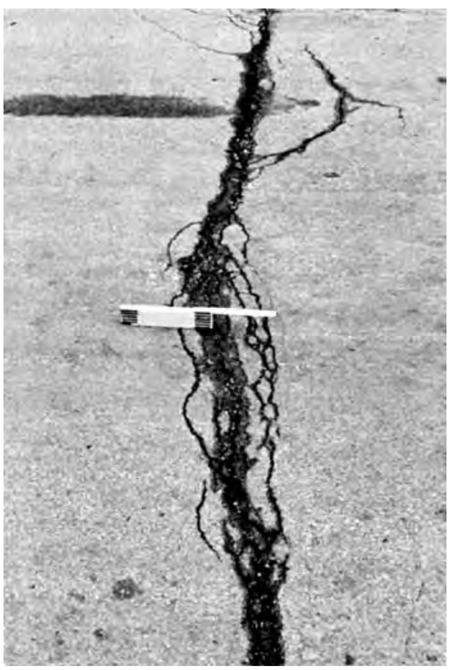


FIG. X1.24 High-Severity Joint Reflection Cracking

X1.13.1.2 **M**—The difference in elevation is > 50 mm (2 in.) and < 100 mm (4 in.) (Fig. X1.26).

X1.13.1.3 **H**—The difference in elevation is > 100 mm (4 in.) (Fig. X1.27).

X1.13.2 *How to Measure*—Lane/shoulder drop-off is measured in linear meters (feet).

LONGITUDINAL AND TRANSVERSE CRACKING (Non-PCC Slab Joint Reflective)

X1.14 *Description*:

FIG. X1.25 Low-Severity Lane/Shoulder Drop-Off

FIG. X1.26 Medium-Severity Lane/Shoulder Drop-Off

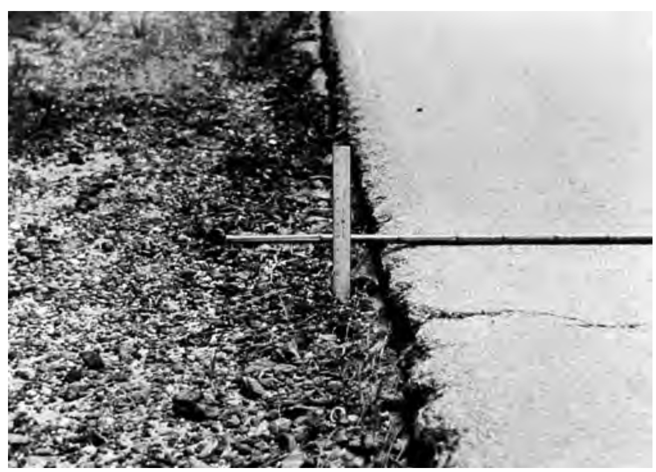


FIG. X1.27 High-Severity Lane/Shoulder Drop-Off

X1.14.1 Longitudinal cracks are parallel to the pavement's centerline or laydown direction. They may be caused by:

X1.14.1.1 A poorly constructed paving lane joint.

X1.14.1.2 Shrinkage of the AC surface due to low temperatures or hardening of the asphalt, or daily temperature cycling, or both.

X1.14.1.3 A reflective crack caused by cracking beneath the surface course, including cracks in PCC slabs, but not PCC joints.

X1.14.1.4 Transverse cracks extend across the pavement at approximately right angles to the pavement centerline or direction of laydown. These types of cracks are not usually load-associated.

X1.14.2 *Severity Levels*:

X1.14.2.1 **L**—One of the following conditions exists (Fig. X1.28): nonfilled crack width is less than 10 mm (3⁄8 in.), or filled crack of any width (filler in satisfactory condition).

X1.14.2.2 **M**—One of the following conditions exists (Fig. X1.29): nonfilled crack width is greater than or equal to 10 mm and less than 75 mm (3⁄8 to 3 in.); nonfilled crack is less than or equal to 75 mm (3 in.) surrounded by light and random cracking; or, filled crack is of any width surrounded by light random cracking.

X1.14.2.3 **H**—One of the following conditions exists (Fig. X1.30): any crack filled or nonfilled surrounded by medium- or high-severity random cracking; nonfilled crack greater than 75 m (3 in.); or, a crack of any width where approximately 100 mm (4 in.) of pavement around the crack is severely broken.

X1.14.3 *How to Measure*—Longitudinal and transverse cracks are measured in linear meters (feet). The length and severity of each crack should be recorded. If the crack does not have the same severity level along its entire length, each portion of the crack having a different severity level should be recorded separately.

PATCHING AND UTILITY CUT PATCHING

X1.15 *Description*—A patch is an area of pavement that has been replaced with new material to repair the existing pavement. A patch is considered a defect no matter how well it is performing (a patched area or adjacent area usually does not perform as well as an original pavement section). Generally, some roughness is associated with this distress.

X1.15.1 *Severity Levels*:

X1.15.1.1 **L**—Patch is in good condition and satisfactory. Ride quality is rated as low severity or better (Fig. X1.31).

X1.15.1.2 **M**—Patch is moderately deteriorated, or ride quality is rated as medium severity, or both (Fig. X1.32).

FIG. X1.28 Low-Severity Longitudinal and Transverse Cracking

FIG. X1.29 Medium-Severity Longitudinal and Transverse Cracking

FIG. X1.30 High-Severity Longitudinal and Transverse Cracking

FIG. X1.31 Low-Severity Patching and Utility Cut Patching

X1.15.1.3 **H**—Patch is badly deteriorated, or ride quality is rated as high severity, or both; needs replacement soon (Fig. X1.33).

X1.15.2 *How to Measure*—Patching is rated in ft^2 of surface area; however, if a single patch has areas of differing

FIG. X1.32 Medium-Severity Patching and Utility Cut Patching

FIG. X1.33 High-Severity Patching and Utility Cut Patching

severity, these areas should be measured and recorded separately. For example, a 2.5 m^2 (27.0 ft^2) patch may have 1 m^2 (11 ft^2) of medium severity and 1.5 m^2 (16 ft^2) of low severity. These areas would be recorded separately. Any distress found in a patched area will not be recorded; however, its effect on the patch will be considered when determining the patch's severity level. No other distresses, for example, are recorded within a patch. Even if the patch material is shoving or cracking, the area is rated only as a patch. If a large amount of pavement has been replaced, it should not be recorded as a patch but considered as new pavement, for example, replacement of a complete intersection.

POLISHED AGGREGATE

X1.16 *Description*—This distress is caused by repeated traffic applications. Polished aggregate is present when close examination of a pavement reveals that the portion of aggregate extending above the asphalt is either very small, or there are no rough or angular aggregate particles to provide good skid resistance. When the aggregate in the surface becomes smooth to the touch, adhesion with vehicle tires is considerably reduced. When the portion of aggregate extending above the surface is small, the pavement texture does not significantly contribute to reducing vehicle speed. Polished aggregate should be counted when close examination reveals that the aggregate extending above the asphalt is negligible, and the surface aggregate is smooth to the touch. This type of distress is indicated when the number on a skid resistance test is low or has dropped significantly from a previous rating.

X1.16.1 *Severity Levels*—No degrees of severity are defined; however, the degree of polishing should be clearly evident in the sample unit in that the aggregate surface should be smooth to the touch (Fig. X1.34).

X1.16.2 *How to Measure*—Polished aggregate is measured in square meters (square feet) of surface area. If bleeding is counted, polished aggregate should not be counted.

POTHOLES

X1.17 *Description*—Potholes are small—usually less than 750 mm (30 in.) in diameter—bowl-shaped depressions in the pavement surface. They generally have sharp edges and vertical sides near the top of the hole. When holes are created by high-severity alligator cracking, they should be identified as potholes, not as weathering.

X1.17.1 *Severity Levels*:

X1.17.1.1 The levels of severity for potholes less than 750 mm (30 in.) in diameter are based on both the diameter and the depth of the pothole, according to Table X1.1.

X1.17.1.2 If the pothole is more than 750 mm (30 in.) in diameter, the area should be determined in square feet and divided by 0.5 m^2 (5.5 ft^2) find the equivalent number of holes. If the depth is 25 mm (1 in.) or less, the holes are considered medium-severity. If the depth is more than 25 mm (1 in.), they are considered high-severity (Figs. X1.35-X1.37).

X1.17.2 *How to Measure*—Potholes are measured by counting the number that are low-, medium-, and high-severity and recording them separately.

RAILROAD CROSSING

X1.18 *Description*—Railroad crossing defects are depressions or bumps around, or between tracks, or both.

X1.18.1 *Severity Levels*:

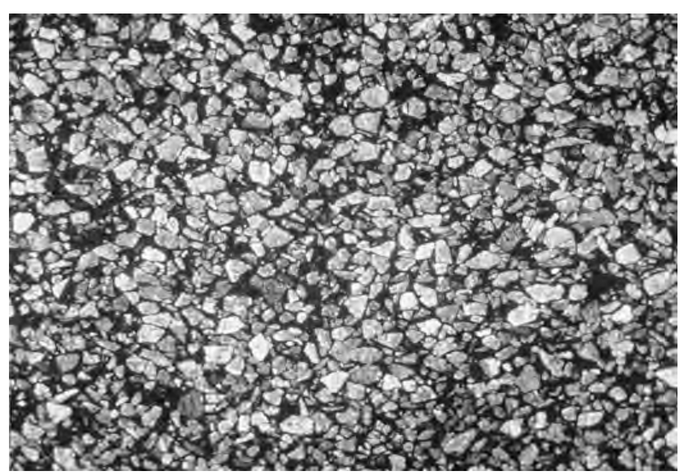


FIG. X1.34 Polished Aggregate

TABLE X1.1 Levels of Severity for Potholes

Maximum Depth of Pothole	Average Diameter (mm) (in.)		
	100 to 200 mm (4 to 8 in.)	200 to 450 mm (8 to 18 in.)	450 to 750 mm (18 to 30 in.)
13 to ≤25 mm (½ to 1 in.)	**L**	**L**	**M**
>25 and ≤50 mm (1 to 2 in.)	**L**	**M**	**H**
>50 mm (2 in.)	**M**	**M**	**H**

FIG. X1.35 Low-Severity Pothole

FIG. X1.36 Medium-Severity Pothole

X1.18.1.1 **L**—Railroad crossing causes low-severity ride quality (Fig. X1.38).

X1.18.1.2 **M**—Railroad crossing causes medium-severity ride quality (Fig. X1.39).

X1.18.1.3 **H**—Railroad crossing causes high-severity ride quality (Fig. X1.40).

X1.18.2 *How to Measure*—The area of the crossing is measured in square meters (square feet) of surface area. If the crossing does not affect ride quality, it should not be counted. Any large bump created by the tracks should be counted as part of the crossing.

FIG. X1.37 High-Severity Pothole

FIG. X1.38 Low-Severity Railroad Crossing

FIG. X1.39 Medium-Severity Railroad Crossing

RUTTING

X1.19 *Description*—A rut is a surface depression in the wheel paths. Pavement uplift may occur along the sides of the rut, but, in many instances, ruts are noticeable only after a

FIG. X1.40 High-Severity Railroad Crossing

rainfall when the paths are filled with water. Rutting stems from a permanent deformation in any of the pavement layers or subgrades, usually caused by consolidated or lateral movement of the materials due to traffic load.

X1.19.1 *Severity Levels (Mean Rut Depth)*:

X1.19.1.1 **L**—6 to 13 mm (¼ to ½ in.) (Fig. X1.41).

X1.19.1.2 **M**—>13 to 25 mm (>½ to 1 in.) (Fig. X1.42).

X1.19.1.3 **H**—>25 mm (>1 in.) (Fig. X1.43).

X1.19.2 *How to Measure*—Rutting is measured in square meters (square feet) of surface area, and its severity is determined by the mean depth of the rut (see X1.19.1.1-X1.19.1.3). The mean rut depth is calculated by laying a straight edge across the rut, measuring its depth, then using measurements taken along the length of the rut to compute its mean depth in millimeters.

SHOVING

X1.20 *Description*:

X1.20.1 Shoving is a permanent, longitudinal displacement of a localized area of the pavement surface caused by traffic loading. When traffic pushes against the pavement, it produces a short, abrupt wave in the pavement surface. This distress normally occurs only in unstable liquid asphalt mix (cutback or emulsion) pavements.

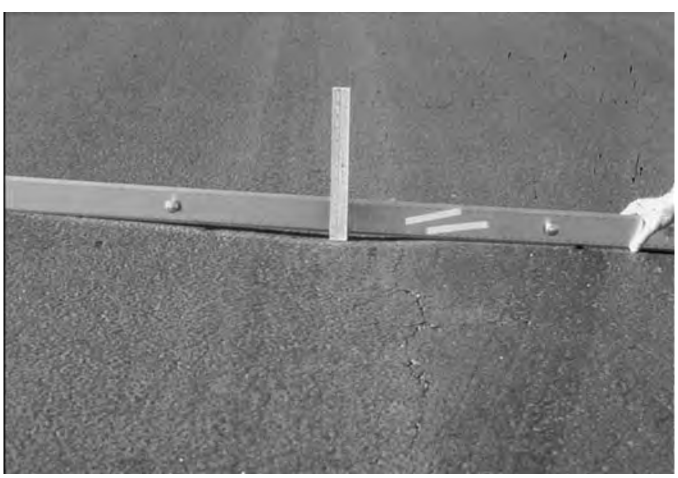


FIG. X1.41 Low-Severity Rutting

FIG. X1.42 Medium-Severity Rutting

FIG. X1.43 High-Severity Rutting

X1.20.2 Shoves also occur where asphalt pavements abut PCC pavements. The PCC pavements increase in length and push the asphalt pavement, causing the shoving.

X1.20.3 *Severity Levels*:

X1.20.3.1 **L**—Shove causes low-severity ride quality (Fig. X1.44).

X1.20.3.2 **M**—Shove causes medium-severity ride quality (Fig. X1.45).

X1.20.3.3 **H**—Shove causes high-severity ride quality (Fig. X1.46).

X1.20.4 *How to Measure*—Shoves are measured in square meters (feet) of surface area. Shoves occurring in patches are considered in rating the patch, not as a separate distress.

SLIPPAGE CRACKING

X1.21 *Description*—Slippage cracks are crescent or half-moon shaped cracks, usually transverse to the direction of travel. They are produced when braking or turning wheels cause the pavement surface to slide or deform. This distress usually occurs in overlaps when there is a poor bond between the surface and the next layer of the pavement structure.

FIG. X1.44 Low-Severity Shoving

FIG. X1.45 Medium-Severity Shoving

FIG. X1.46 High-Severity Shoving

X1.21.1 *Severity Level*:

X1.21.1.1 **L**—Average crack width is < 10 mm (⅜ in.) (Fig. X1.47).

X1.21.1.2 **M**—One of the following conditions exists (Fig. X1.48): average crack width is ≥ 10 and < 40 mm (≥ ⅜ and< 1-½ in.); or the area around the crack is moderately spalled, or surrounded with secondary cracks.

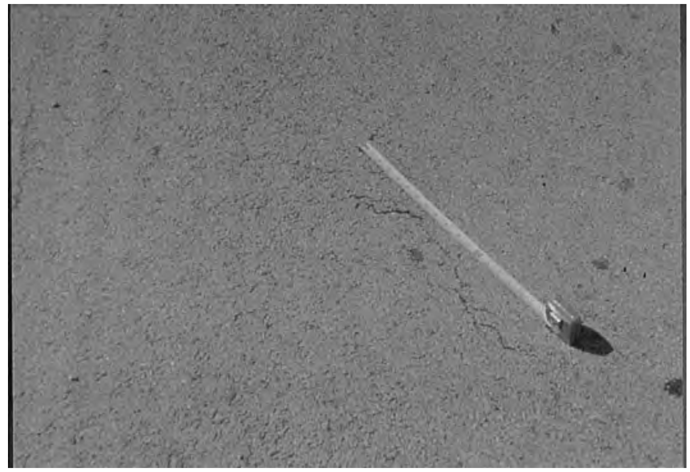


FIG. X1.47 Low-Severity Slippage Cracking

FIG. X1.48 Medium-Severity Slippage Cracking

X1.21.1.3 **H**—One of the following conditions exists (Fig. X1.49): the average crack width is > 40 mm (1-½ in.) or the area around the crack is broken into easily removed pieces.

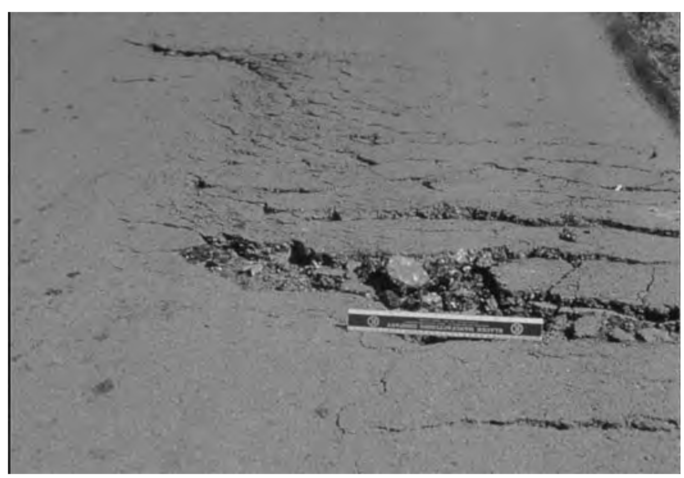


FIG. X1.49 High-Severity Slippage Cracking

X1.21.2 *How to Measure*—The area associated with a given slippage crack is measured in square meters (square feet) and rated according to the highest level of severity in the area.

SWELL

X1.22 *Description*—Swell is characterized by an upward bulge in the pavement's surface, a long, gradual wave more than 3 m (10 ft) long (Fig. X1.50). Swelling can be accompanied by surface cracking. This distress usually is caused by frost action in the subgrade or by swelling soil.

X1.22.1 *Severity Level*:

X1.22.1.1 **L**—Swell causes low-severity ride quality. Low-severity swells are not always easy to see but can be detected by driving at the speed limit over the pavement section. An upward motion will occur at the swell if it is present.

X1.22.1.2 **M**—Swell causes medium-severity ride quality.

X1.22.1.3 **H**—Swell causes high-severity ride quality.

X1.22.2 *How to Measure*—The surface area of the swell is measured in square meters (square feet).

WEATHERING AND RAVELING

X1.23 *Description*—Weathering and raveling are the wearing away of the pavement surface due to a loss of asphalt or tar binder and dislodged aggregate particles. These distresses indicate that either the asphalt binder has hardened appreciably or that a poor-quality mixture is present. In addition, raveling may be caused by certain types of traffic, for example, tracked vehicles. Softening of the surface and dislodging of the aggregates due to oil spillage also are included under raveling.

X1.23.1 *Severity Levels*:

X1.23.1.1 **L**—Aggregate or binder has started to wear away. In some areas, the surface is starting to pit (Fig. X1.51). In the case of oil spillage, the oil stain can be seen, but the surface is hard and cannot be penetrated with a coin.

X1.23.1.2 **M**—Aggregate or binder has worn away. The surface texture is moderately rough and pitted (Fig. X1.52). In the case of oil spillage, the surface is soft and can be penetrated with a coin.

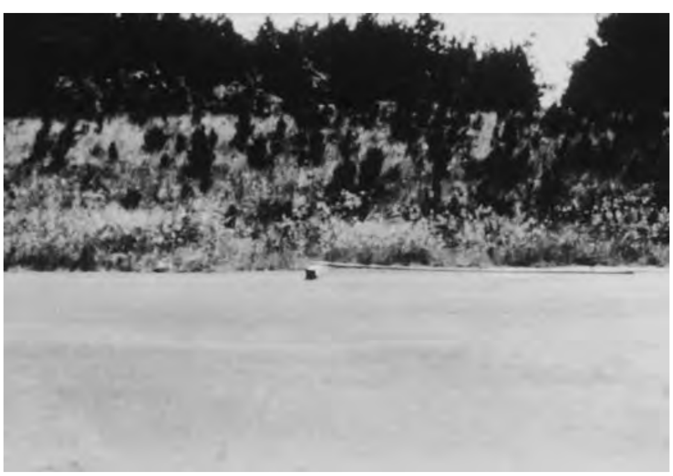


FIG. X1.50 Example Swell. Severity level is based on ride quality criteria.

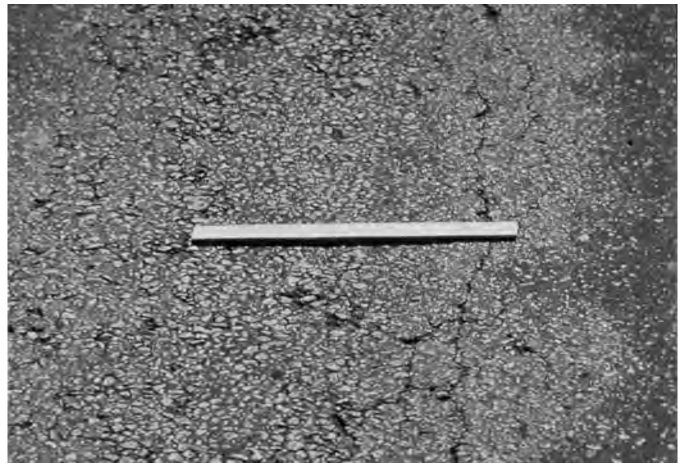


FIG. X1.51 Low-Severity Weathering and Raveling

FIG. X1.52 Medium-Severity Weathering and Raveling

X1.23.1.3 **H**—Aggregate or binder has been worn away considerably. The surface texture is very rough and severely pitted. The pitted areas are less than 10 mm (4 in.) in diameter and less than 13 mm (½ in.) deep (Fig. X1.53); pitted areas larger than this are counted as potholes. In the case of oil

FIG. X1.53 High-Severity Weathering and Raveling

spillage, the asphalt binder has lost its binding effect and the aggregate has become loose.

X1.23.2 *How to Measure*—Weathering and raveling are measured in square meters (square feet) of surface area.

X2. DISTRESS IN JOINTED CONCRETE PAVEMENTS

X2.1 This Appendix lists alphabetically 19 distress types for jointed concrete pavements. Distress definitions apply to both plain and reinforced jointed concrete pavements, with the exception of linear cracking distress, which is defined separately for plain and reinforced jointed concrete.

X2.1.1 During the field condition surveys and validation of the PCI, several questions often are asked about the identification and counted method of some of the distresses. Answers to these questions are included under the heading "How to Count." For convenience, however, the most frequently raised issues are addressed below.

X2.1.1.1 Faulting is counted only at joints. Faulting associated with cracks is not counted separately since it is incorporated into the severity-level definitions of cracks. Crack definitions are also used in defining corner breaks and divided slabs.

X2.1.1.2 Joint seal damage is not counted on a slab-by-slab basis. Instead, a severity level is assigned based on the overall condition of the joint seal in the area.

X2.1.1.3 Cracks in reinforced concrete slabs that are less than ⅛ in. wide are counted as shrinkage cracks. Shrinkage cracks should not be counted to determine if the slab is broken into four or more pieces.

X2.1.1.4 Low-severity scaling, that is, crazing, should only be counted if there is evidence that future scaling is likely to occur.

X2.1.2 The user should note that the items above are general issues and do not stand alone as inspection criteria. To measure each distress type properly, the inspector must be familiar with the individual distress criteria.

X2.2 *Ride Quality*:

X2.2.1 Ride quality must be evaluated in order to establish a severity level for the following distress types:

X2.2.1.1 Blowup/buckling.

X2.2.1.2 Railroad crossings.

X2.2.2 To determine the effect these distresses have on ride quality, the inspector should drive at the normal operating speed and use the following severity-level definitions of ride quality:

X2.2.2.1 **L**—Low. Vehicle vibrations, for example, from corrugation, are noticeable, but no reduction in speed is necessary for comfort or safety, or individual bumps or settlements, or both, cause the vehicle to bounce slightly but create little discomfort.

X2.2.2.2 **M**—Medium. Vehicle vibrations are significant and some reduction in speed is necessary for safety and comfort, or individual bumps or settlements cause the vehicle to bounce significantly, or both, creating some discomfort.

X2.2.2.3 **H**—High. Vehicle vibrations are so excessive that speed must be reduced considerably for safety and comfort, or individual bumps or settlements, or both, cause the vehicle to bounce excessively, creating substantial discomfort, a safety hazard, or high potential vehicle damage, or a combination thereof.

X2.2.3 The inspector should drive at the posted speed in a sedan that is representative of cars typically seen in local traffic. Pavement sections near stop signs should be rated at a deceleration speed appropriate for the intersection.

BLOWUP/BUCKLING

X2.3 *Description*—Blowups or buckles occur in hot weather, usually at a transverse crack or joint that is not wide enough to permit slab expansion. The insufficient width usually is caused by infiltration of incompressible materials into the joint space. When expansion cannot relieve enough pressure, a localized upward movement of the slab edges (buckling) or shattering will occur in the vicinity of the joint. Blowups also can occur at utility cuts and drainage inlets.

X2.3.1 *Severity Levels*:

X2.3.1.1 **L**—Buckling or shattering causes low-severity ride quality (Fig. X2.1).

X2.3.1.2 **M**—Buckling or shattering causes medium-severity ride quality (Fig. X2.2).

X2.3.1.3 **H**—Buckling or shattering causes high-severity ride quality (Fig. X2.3).

X2.3.2 *How to Count*—At a crack, a blowup is counted as being in one slab; however, if the blowup occurs at a joint and affects two slabs, the distress should be recorded as occurring in two slabs. When a blowup renders the pavement impassable, it should be repaired immediately.

CORNER BREAK

X2.4 *Description*—A corner break is a crack that intersects the joints at a distance less than or equal to one-half the slab length on both sides, measured from the corner of the slab. For

FIG. X2.1 Low Severity Blowup/Buckling

FIG. X2.2 Medium Severity Blowup/Buckling

FIG. X2.3 High-Severity Blowup/Buckling

example, a slab measuring 3.5 by 6.0 m (11.5 by 20.0 ft) that has a crack 1.5 m (5 ft) on one side and 3.5 m (11.5 ft) on the other side is not considered a corner break; it is a diagonal crack. However, a crack that intersects 0.5 m (4 ft) on one side and 2.5 m (8 ft) on the other is considered a corner break. A corner break differs from a corner spall in that the crack extends vertically through the entire slab thickness, whereas a corner spall intersects the joint at an angle. Load repetition combined with loss of support and curling stresses usually cause corner breaks.

X2.4.1 *Severity Levels*—

X2.4.1.1 **L**—Break is defined by a low-severity[4] crack. A low severity crack is < 13 mm (½ in.), cracks of any width with satisfactory filler; no faulting. The area between the break and the joints is not cracked or may be lightly cracked (Fig. X2.4).

X2.4.1.2 **M**—Break is defined by a medium-severity[4] crack, or the area between the break and the joints, or both, has a medium crack. A medium severity crack is a nonfilled crack > 13 mm and < 50 mm (>½ in. and < 2 in.), a nonfilled crack < 50 mm (2 in.) with faulting < 10 mm (⅜ in.), or a any filled crack with faulting < 10 mm (⅜ in.) (Fig. X2.5).

FIG. X2.4 Low-Severity Corner Break

X2.4.1.3 **H**—Break is defined by a high-severity[4] crack, or the area between the break and the joints, or both, is highly cracked. A high severity crack is a nonfilled crack >50 mm (2 in.) wide, or any filled or nonfilled crack with faulting >10 mm (⅜ in.) (Fig. X2.6).

X2.4.2 *How to Count*—Distressed slab is recorded as one slab if it:

X2.4.2.1 A single corner break.

X2.4.2.2 More than one break of a particular severity.

X2.4.2.3 Two or more breaks of different severities. For two or more breaks, the highest level of severity should be recorded. For example, a slab containing both low- and medium-severity corner breaks should be counted as one slab with a medium corner break.

FIG. X2.5 Medium-Severity Corner Break

[4] The above crack severity definitions are for nonreinforced slabs. For reinforced slabs, see *linear cracking*.

FIG. X2.6 High-Severity Corner Break

FIG. X2.7 Low-Severity Divided Slab

DIVIDED SLAB

X2.5 *Description*—Slab is divided by cracks into four or more pieces due to overloading, or inadequate support, or both. If all pieces or cracks are contained within a corner break, the distress is categorized as a severe corner break.

X2.5.1 *Severity Levels*—Table X2.1 lists severity levels for divided slabs. Examples are shown in Figs. X2.7-X2.9.

X2.5.2 *How to Count*—If the divided slab is medium- or high-severity, no other distress is counted for that slab.

DURABILITY (“D”) CRACKING

X2.6 *Description*—“D” cracking is caused by freeze-thaw expansion of the large aggregate, which, over time, gradually breaks down the concrete. This distress usually appears as a pattern of cracks running parallel and close to a joint or linear crack. Since the concrete becomes saturated near joints and cracks, a dark-colored deposit can usually be found around fine“ D” cracks. This type of distress may eventually lead to disintegration of the entire slab.

X2.6.1 *Severity Levels*:

X2.6.1.1 *L*—“D” cracks cover less than 15 % of slab area. Most of the cracks are tight, but a few pieces may be loose and or missing (Fig. X2.10).

X2.6.1.2 **M**—One of the following conditions exists (Fig. X2.11): “D” cracks cover less than 15 % of the area and most of the pieces are loose and or missing, or “D” cracks cover more than 15 % of the area. Most of the cracks are tight, but a few pieces may be loose and or missing.

X2.6.1.3 *H*—“D” cracks cover more than 15 % of the area and most of the pieces have come out or could be removed easily (Fig. X2.12).

TABLE X2.1 Levels of Severity for Faulting

Severity Level	Difference of Elevation
L	>3 and <10 mm (>1⁄8 and <3⁄8 in.)
M	>10 and <20 mm (>3⁄8 and <3⁄4 in.)
H	>20 mm (>3⁄4 in.)

FIG. X2.8 Medium-Severity Divided Slab

FIG. X2.9 High-Severity Divided Slab

X2.6.2 *How to Count*—When the distress is located and rated at one severity, it is counted as one slab. If more than one severity level exists, the slab is counted as having the higher severity distress. For example, if low and medium “D” cracking are on the same slab, the slab is counted as medium-severity cracking only.

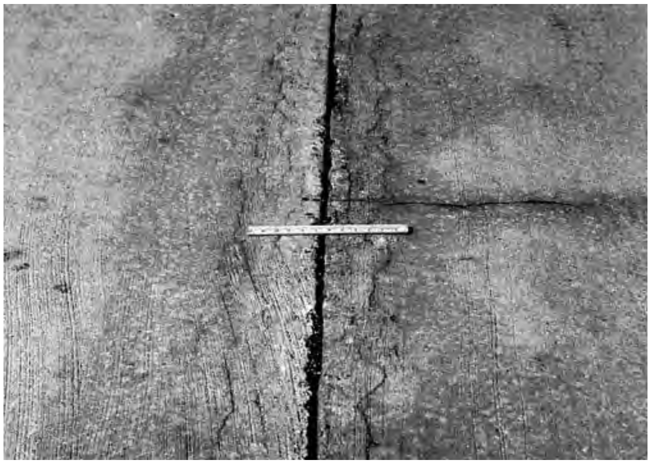


FIG. X2.10 Low-Severity Durability Cracking

FIG. X2.11 Medium-Severity Durability Cracking

FIG. X2.12 High-Severity Durability Cracking

FAULTING

X2.7 *Description*:

X2.7.1 Faulting is the difference in elevation across a joint. Some common causes of faulting are as follows:

X2.7.1.1 Settlement because of soft foundation.

X2.7.1.2 Pumping or eroding of material from under the slab.

X2.7.1.3 Curling of the slab edges due to temperature and moisture changes.

X2.7.2 *Severity Levels*—Severity levels are defined by the difference in elevation across the joint as indicated in Table X2.2. Figs. X2.13-X2.15 show examples of the different severity levels.

X2.7.3 *How to Count*—Faulting across a joint is counted as one slab. Only affected slabs are counted. Faults across a crack are not counted as distress but are considered when defining crack severity.

JOINT SEAL DAMAGE

X2.8 *Description*:

X2.8.1 Joint seal damage is any condition that enables soil or rocks to accumulate in the joints or allows significant water infiltration. Accumulation of incompressible materials prevents the slab from expanding and may result in buckling, shattering, or spalling. A pliable joint filler bonded to the edges of the slabs protects the joints from material accumulation and prevents water from seeping down and softening the foundation supporting the slab. Typical types of joint seal damage are as follows:

X2.8.1.1 Stripping of joint sealant.

X2.8.1.2 Extrusion of joint sealant.

X2.8.1.3 Weed growth.

X2.8.1.4 Hardening of the filler (oxidation).

X2.8.1.5 Loss of bond to the slab edges.

X2.8.1.6 Lack or absence of sealant in the joint.

X2.8.2 *Severity Levels*:

X2.8.2.1 **L**—Joint sealant is in generally good condition throughout section (Fig. X2.16). Sealant is performing well, with only minor damage (see X2.8.1.1-X2.8.1.6). Joint seal damage is at low severity if a few of the joints have sealer, which has debonded from, but is still in contact with, the joint edge. This condition exists if a knife blade can be inserted between sealer and joint face without resistance.

X2.8.2.2 **M**—Joint sealant is in generally fair condition over the entire section, with one or more of the above types of damage occurring to a moderate degree. Sealant needs replacement within two years (Fig. X2.17). Joint seal damage is at medium severity if a few of the joints have any of the following conditions: joint sealer is in place, but water access is possible through visible openings no more than 3 mm (⅛ in.) wide. If a knife blade cannot be inserted easily between sealer and joint face, this condition does not exist; pumping debris are evident at the joint; joint sealer is oxidized and "lifeless" but pliable (like a rope), and generally fills the joint opening; or, vegetation in the joint is obvious but does not obscure the joint opening.

TABLE X2.2 Levels of Severity for Punchouts

Severity of the Majority of Cracks	Number of Pieces 2 to 3	4 to 5	>5
L	**L**	**L**	**M**
M	**L**	**M**	**H**
H	**M**	**H**	**H**

FIG. X2.13 Low-Severity Faulting

FIG. X2.14 Medium-Severity Faulting

FIG. X2.15 High-Severity Faulting

FIG. X2.16 Low-Severity Joint Seal Damage

FIG. X2.17 Medium-Severity Joint Seal Damage

FIG. X2.18 High-Severity Joint Seal Damage

X2.8.2.3 **H**—Joint sealant is in generally poor condition over the entire section, with one or more of the above types of damage occurring to a severe degree. Sealant needs immediate replacement (Fig. X2.18). Joint seal damage is at high severity if 10 % or more of the joint sealer exceeds limiting criteria listed above or if 10 % or more of sealer is missing.

X2.8.3 *How to Count*—Joint seal damage is not counted on a slab-by-slab basis but is rated based on the overall condition of the sealant over the entire area.

LANE/SHOULDER DROP-OFF

X2.9 *Description*—Lane/shoulder drop-off is the difference between the settlement or erosion of the shoulder and the pavement travel-lane edge. The elevation difference can be a safety hazard, and it also can cause increased water infiltration.

X2.9.1 *Severity Levels*:

X2.9.1.1 **L**—The difference between the pavement edge and shoulder is >25 and ≤50 mm (>1 and ≤2 in.) (Fig. X2.19).

X2.9.1.2 **M**—The difference in elevation is >50 and ≤100 mm (>2 and ≤4 in.) (Fig. X2.20).

X2.9.1.3 **H**—The difference in elevation is >100 mm (>4 in.) (Fig. X2.21).

X2.9.2 *How to Count*—The mean lane/shoulder drop-off is computed by averaging the maximum and minimum drop along the slab. Each slab exhibiting distress is measured separately and counted as one slab with the appropriate severity level.

LINEAR CRACKING (Longitudinal, Transverse, and Diagonal Cracks)

X2.10 *Description*—These cracks, which divide the slab into two or three pieces, usually are caused by a combination of repeated traffic loading, thermal gradient curling, and repeated moisture loading. (Slabs divided into four or more pieces are counted as divided slabs.) Hairline cracks that are only a few feet long and do not extend across the entire slab, are counted as shrinkage cracks.

X2.10.1 *Severity Levels (Nonreinforced Slabs)*:

X2.10.1.1 **L**—Nonfilled[4] cracks ≤ 13 mm (≤ ½ in.) or filled cracks of any width with the filler in satisfactory condition. No faulting exists (Fig. X2.22).

X2.10.1.2 **M**—One of the following conditions exists: nonfilled crack with a width >13 and ≤50 mm (>½ and ≤ 2 in.); nonfilled crack of any width ≤ 50 mm (2 in.) with faulting of <10 mm (⅜ in.), or filled crack of any width with faulting <10 mm (⅜ in.) (Fig. X2.23).

X2.10.1.3 **H**—One of the following conditions exists: nonfilled crack with a width >50 mm (2 in.), or filled or nonfilled crack of any width with faulting >10 mm (⅜ in.) (Fig. X2.24).

X2.10.2 *Reinforced Slabs*:

X2.10.2.1 **L**—Nonfilled cracks ≥ 3 and < 25 mm (≥ ⅛ to < 1 in.) wide; filled crack of any width with the filler in satisfactory condition. No faulting exists.

FIG. X2.19 Low-Severity Lane/Shoulder Drop-Off

FIG. X2.20 Medium-Severity Lane/Shoulder Drop-Off

FIG. X2.21 High-Severity Lane/Shoulder Drop-Off

X2.10.2.2 **M**—One of the following conditions exists: nonfilled cracks with a width ≥ 25 and < 75 mm (≥ 1 and < 3 in.) and no faulting; nonfilled crack of any width ≤ 75 mm (3 in.) with ≤ 10 mm (⅜ in.) of faulting, or filled crack of any width with ≤ 10 mm (⅜ in.) faulting.

X2.10.2.3 **H**—Once of the following conditions exists: nonfilled crack >75 mm (3 in.) wide, or filled or nonfilled crack of any width with faulting >10 mm (⅜ in.).

X2.10.3 *How to Count*—One the severity has been identified, the distress is recorded as one slab. If two medium severity cracks are within one slab, the slab is counted as

FIG. X2.22 Low-Severity Linear Cracking

FIG. X2.23 Medium-Severity Linear Cracking

having one high-severity crack. Slabs divided into four or more pieces are counted as divided slabs. In reinforced slabs, cracks <3 mm (⅛ in.) wide are counted as shrinkage cracks. Slabs longer than 9 m (29.5 ft) are divided into approximately equal length“ slabs” having imaginary joints assumed to be in perfect condition.

PATCHING, LARGE (MORE THAN 0.5 M^2 [5.5 FT^2]) AND UTILITY CUTS

X2.11 *Description*—A patch is an area where the original pavement has been removed and replaced by filler material. A utility cut is a patch that has replaced the original pavement to allow the installation or maintenance of underground utilities. The severity levels of a utility cut are assessed according to the same criteria as large patching.

X2.11.1 *Severity Levels*:

FIG. X2.24 High-Severity Linear Cracking

X2.11.1.1 **L**—Patch is functioning well, with little or no deterioration (Fig. X2.25).

X2.11.1.2 **M**—Patch is moderately deteriorated, or moderate spalling can be seen around the edges, or both. Patch material can be dislodged with considerable effort (Fig. X2.26).

X2.11.1.3 **H**—Patch is badly deteriorated. The extent of the deterioration warrants replacement (Fig. X2.27).

X2.11.2 *How to Count*—If a single slab has one or more patches with the same severity level, it is counted as one slab containing that distress. If a single slab has more than one severity level, it is counted as one slab with the higher severity level.

PATCHING, SMALL (LESS THAN 0.5 M^2 [5.5 FT^2])

X2.12 *Description*—A patch is an area where the original pavement has been removed and replaced by a filler material.

X2.12.1 *Severity Levels*:

X2.12.1.1 **L**—Patch is functioning well with little or no deterioration (Fig. X2.28).

X2.12.1.2 **M**—Patch is moderately deteriorated. Patch material can be dislodged with considerable effort (Fig. X2.29).

FIG. X2.25 Low-Severity Patching, Large and Utility Cuts

FIG. X2.26 Medium-Severity Patching, Large and Utility Cuts

FIG. X2.27 High-Severity Patching, Large and Utility Cuts

FIG. X2.28 Low-Severity Patching, Small

X2.12.1.3 **H**—Patch is badly deteriorated. The extent of deterioration warrants replacement (Fig. X2.30).

X2.12.2 *How to Count*—If a single slab has one or more patches with the same severity level, it is counted as one slab containing that distress. If a single slab has more than one severity level, it is counted as one slab with the higher severity level.

FIG. X2.29 Medium-Severity Patching, Small

FIG. X2.30 High-Severity Patching, Small

POLISHED AGGREGATE

X2.13 *Description*—This distress is caused by repeated traffic applications. Polished aggregate is present when close examination of a pavement reveals that the portion of aggregate extending above the asphalt is either very small, or there are no rough or angular aggregate particles to provide good skid resistance.

X2.13.1 *Severity Levels*—No degrees of severity are defined; however, the degree of polishing should be significant before it is included in the condition survey and rated as a defect (Fig. X2.31).

X2.13.2 *How to Count*—A slab with polished aggregate is counted as one slab.

POPOUTS

X2.14 *Description*—A popout is a small piece of pavement that breaks loose from the surface due to freeze-thaw action, combined with expansive aggregates. Popouts usually range in diameter from approximately 25 to 100 mm (1 to 4 in.) and in depth from 13 to 50 mm (½ to 2 in.).

X2.14.1 *Severity Levels*—No degrees of severity are defined for popouts; however, popouts must be extensive before

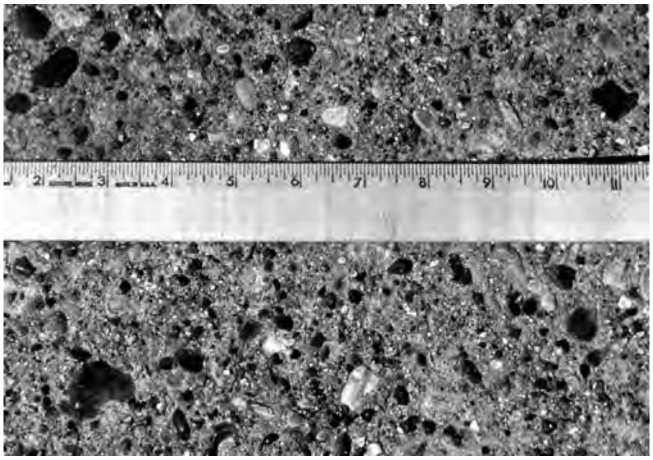


FIG. X2.31 Polished Aggregate

they are counted as a distress. Average popout density must exceed approximately three popouts/m^2 over the entire slab area (Fig. X2.32).

X2.14.2 *How to Count*—The density of the distress must be measured. If there is any doubt that the average is greater than three popouts per square yard, at least three random 1 m^2 (11 ft^2) areas should be checked. When the average is greater than this density, the slab should be counted.

PUMPING

X2.15 *Description*—Pumping is the ejection of material from the slab foundation through joints or cracks. This is caused by deflection of the slab with passing loads. As a load moves across the joint between the slabs, water is first forced under the leading slab, and then forced back under the trailing slab. This action erodes and eventually removes soil particles resulting in progressive loss of pavement support. Pumping can be identified by surface stains and evidence of base or subgrade material on the pavement close to joints or cracks. Pumping near joints is caused by poor joint sealer and indicates loss of support; repeated loading eventually will produce cracks. Pumping also can occur along the slab edge causing loss of support.

FIG. X2.32 Popouts

X2.15.1 *Severity Levels*—No degrees of severity are defined. It is enough to indicate that pumping exists (Fig. X2.33 and Fig. X2.34).

X2.15.2 *How to Count*—One pumping joint between two slabs is counted as two slabs; however, if the remaining joints around the slab are also pumping, one slab is added per additional pumping joint.

PUNCHOUT

X2.16 *Description*—This distress is a localized area of the slab that is broken into pieces. The punchout can take many different shapes and forms, but it is usually defined by a crack and a joint. The distance between the join and the crack or two closely spaced cracks is ≤ 1.5 m (5 ft) wide. This distress is caused by heavy repeated loads, inadequate slab thickness, loss of foundation support, or a localized concrete construction deficiency, for example, honeycombing.

X2.16.1 *Severity Levels*—Table X2.2 lists the severity levels for punchouts, and Figs. X2.35-X2.37 show examples.

X2.16.2 *How to Count*—If a slab contains more than one punchout or a punchout and a crack, it is counted as shattered.

RAILROAD CROSSING

X2.17 *Description*—Railroad crossing distress is characterized by depressions or bumps around the tracks.

X2.17.1 *Severity Levels*:

X2.17.1.1 **L**—Railroad crossing causes low-severity ride quality (Fig. X2.38).

X2.17.1.2 **M**—Railroad crossing causes medium-severity ride quality (Fig. X2.39).

X2.17.1.3 **H**—Railroad crossing causes high-severity ride quality (Fig. X2.40).

FIG. X2.33 Pumping

FIG. X2.34 Pumping

FIG. X2.35 Low-Severity Punchout

X2.17.2 *How to Count*—The number of slabs crossed by the railroad tracks is counted. Any large bump created by the tracks should be counted as part of the crossing.

SCALING, MAP CRACKING, AND CRAZING

X2.18 *Description*—Map cracking or crazing refers to a network of shallow, fine, or hairline cracks that extend only through the upper surface of the concrete. The cracks tend to intersect at angles of 120°. Map cracking or crazing usually is caused by concrete over-finishing and may lead to surface scaling, which is the breakdown of the slab surface to a depth of approximately 6 to 13 mm (¼ to ½ in.). Scaling also may be caused by deicing salts, improper construction, freeze-thaw cycles and poor aggregate. The type of scaling defined here is not caused by "D" cracking. If scaling is caused by "D" cracking, it should be counted under that distress only.

X2.18.1 *Severity Levels*:

FIG. X2.36 Medium-Severity Punchout

FIG. X2.37 High-Severity Punchout

FIG. X2.38 Low-Severity Railroad Crossing

X2.18.1.1 **L**—Crazing or map cracking exists over most of the slab area; the surface is in good condition, with only minor scaling present (Fig. X2.41).

X2.18.1.2 **M**—Slab is scaled but less than 15 % of the slab is affected (Fig. X2.42).

X2.18.1.3 **H**—Slab is scaled over more than 15 % of its area (Fig. X2.43).

FIG. X2.39 Medium-Severity Railroad Crossing

FIG. X2.40 High-Severity Railroad Crossing

FIG. X2.41 Low-Severity Scaling, Map Cracking, and Crazing

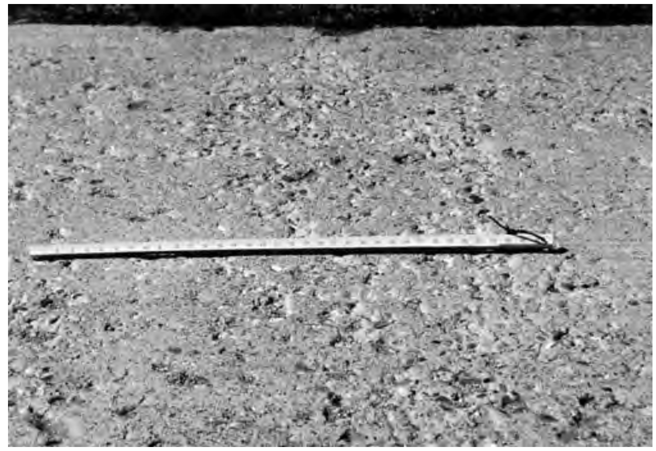


FIG. X2.42 Medium-Severity Scaling, Map Cracking, and Crazing

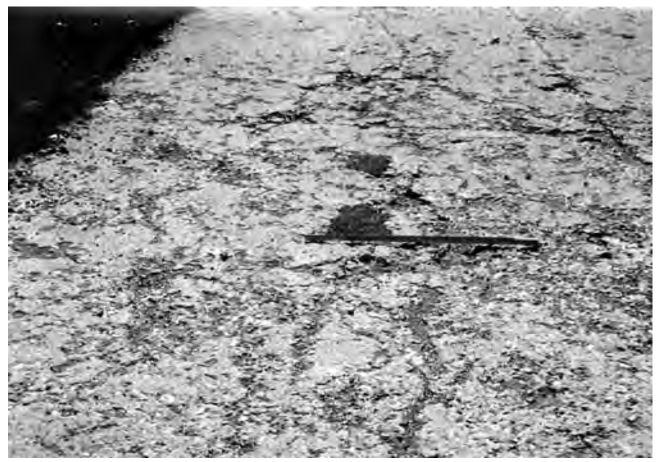


FIG. X2.43 High-Severity Scaling, Map Cracking, and Crazing

X2.18.2 *How to Count*—A scaled slab is counted as one slab. Low-severity crazing only should be counted if the potential for scaling appears to be imminent or a few small pieces come out.

SHRINKAGE CRACKS

X2.19 *Description*—Shrinkage cracks are hairline cracks that usually are less than 2-m long and do not extend across the entire slab. They are formed during the setting and curing of the concrete and usually do not extend through the depth of the slab.

X2.19.1 *Severity Levels*—No degrees of severity are defined. It is enough to indicate that shrinkage cracks are present (Fig. X2.44).

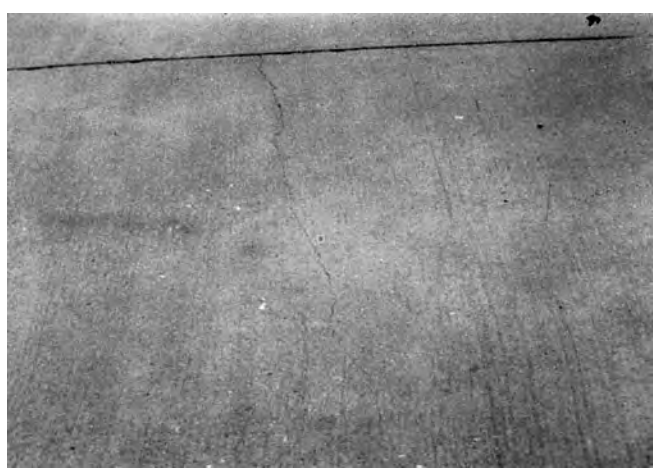


FIG. X2.44 Shrinkage Cracks

X2.19.2 *How to Count*—If any shrinkage cracks exist on a particular slab, the slab is counted as one slab with shrinkage cracks.

SPALLING, CORNER

X2.20 *Description*—Corner spalling is the breakdown of the slab within approximately 0.5 m (1.5 ft) of the corner. A corner spall differs from a corner break in that the spall usually angles downward to intersect the joint, whereas a break extends vertically through the slab corner. Spalls less than 130 mm (5 in.) from the crack to the corner on both sides should not be counted.

X2.20.1 *Severity Levels*—Table X2.3 lists the levels of severity for corner spalling. Figs. X2.45-X2.47 show examples. Corner spalling with an area of less than 650 cm (10 in.^{2}) from the crack to the corner on both sides should not be counted.

X2.20.2 *How to Count*—If one or more corner spalls with the same severity level are in a slab, the slab is counted as one slab with corner spalling. If more than one severity level occurs, it is counted as one slab with the higher severity level.

SPALLING, JOINT

X2.21 *Description*:

X2.21.1 Joint spalling is the breakdown of the slab edges within 0.5 m (1.5 ft) of the joint. A joint spall usually does not extend vertically through the slab, but intersects the joint at an angle. Spalling results from:

X2.21.1.1 Excessive stresses at the joint caused by traffic loading or by infiltration of incompressible materials.

X2.21.1.2 Weak concrete at the joint caused by overworking.

X2.21.1.3 Water accumulation in the joint and freeze-thaw action.

X2.21.2 *Severity Levels*—Table X2.4 and Figs. X2.48-X2.50 show the severity levels of joint spalling. A frayed joint where the concrete has been worn away along the entire joint is rated as low severity.

X2.21.3 *How to Count*—If spall is along the edge of one slab, it is counted as one slab with joint spalling. If spalling is on more than one edge of the same slab, the edge having the highest severity is counted and recorded as one slab. Joint spalling also can occur along the edges of two adjacent slabs. If this is the case, each slab is counted as having joint spalling.

TABLE X2.3 Levels of Severity for Corner Spalling

Depth of Spall	Dimensions of Sides of Spall: 130 × 130 mm to 300 × 300 mm (5 × 5 in.) to (12 × 12 in.)	300 × 300 mm (>12 × 12 in.)
<25 mm (1 in.)	L	L
>25 to 50 mm (1 to 2 in.)	L	M
>50 mm (2 in.)	M	H

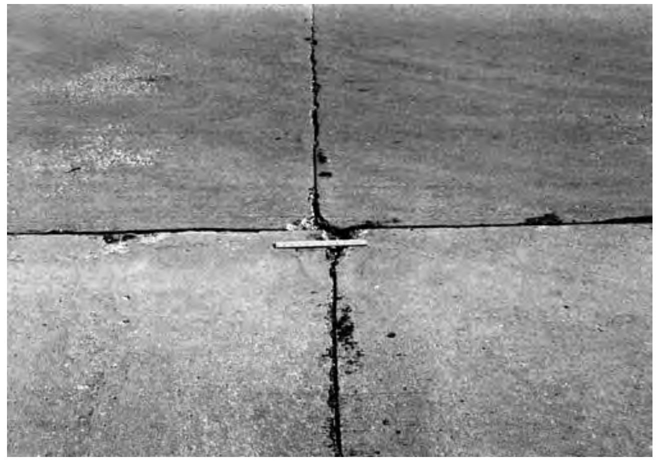


FIG. X2.45 Low-Severity Spalling, Corner

FIG. X2.46 Medium-Severity Spalling, Corner

FIG. X2.47 High-Severity Spalling, Corner

TABLE X2.4 Levels of Severity for Joint Spalling

Spall Pieces	Width of Spall	Length of Spall <0.5 m (1.5 ft)	Length of Spall >0.5 m (1.5 ft)
Tight—cannot be removed easily (maybe a few pieces missing.	<100 mm (4 in.)	**L**	**L**
	>100 mm	**L**	**L**
Loose—can be removed and some pieces are missing; if most or all pieces are missing, spall is shallow, less than 25 mm (1 in.).	<100 mm	**L**	**M**
	>100 mm	**L**	**M**
Missing—most or all pieces have been removed.	<100 mm	**L**	**M**
	>100 mm	**M**	**H**

FIG. X2.48 Low-Severity Spalling, Joint

FIG. X2.49 Medium-Severity Spalling, Joint

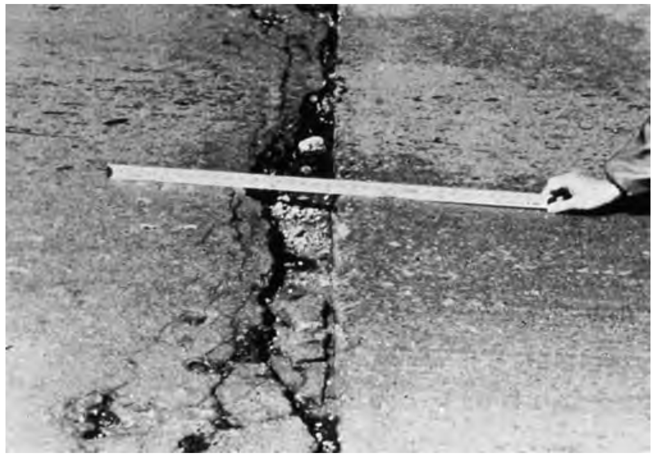


FIG. X2.50 High-Severity Spalling, Joint

X3. DEDUCT VALUE CURVES FOR ASPHALT

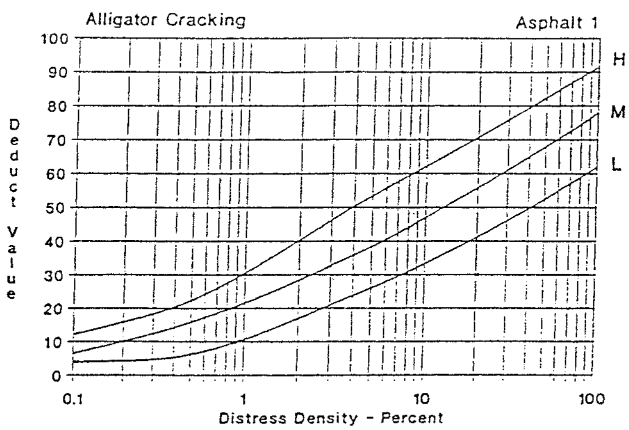


FIG. X3.1 Alligator Cracking

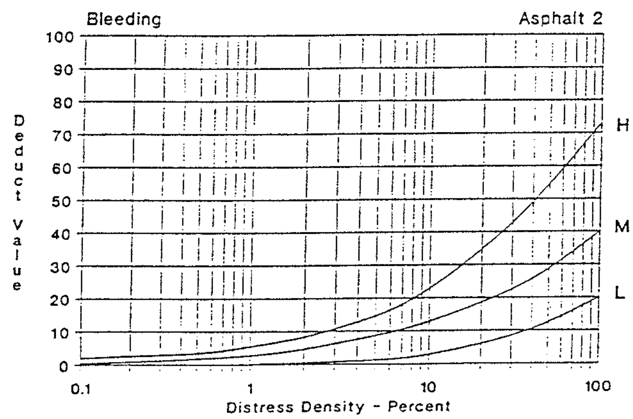


FIG. X3.2 Bleeding

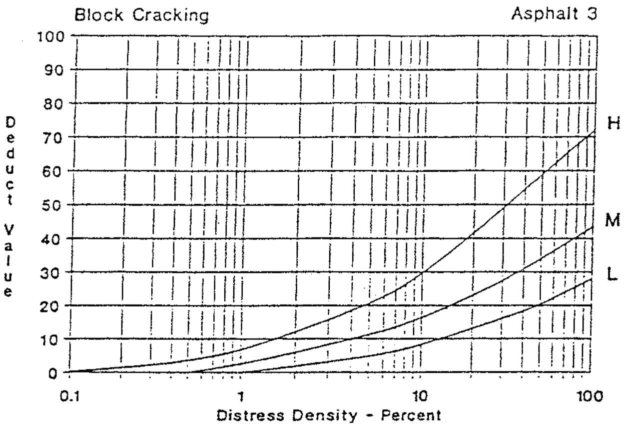


FIG. X3.3 Block Cracking

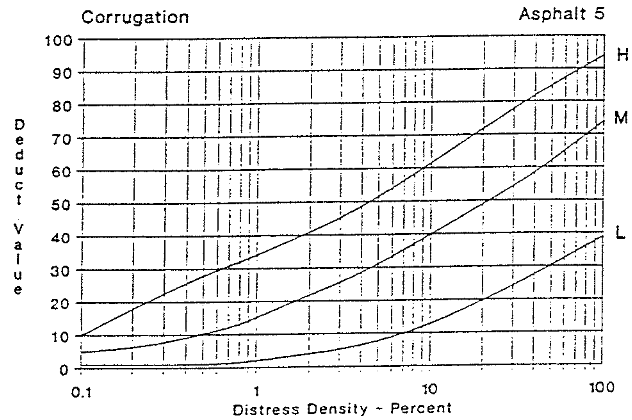


FIG. X3.6 Corrugation

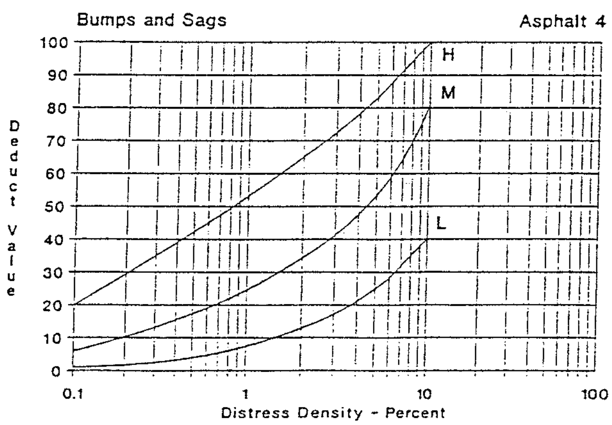


FIG. X3.4 Bumps and Sags

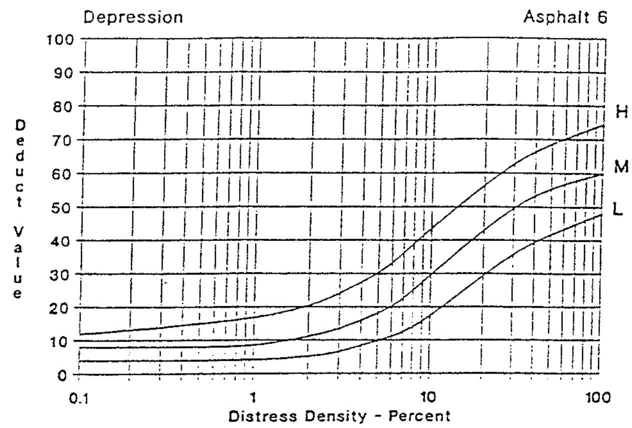


FIG. X3.7 Depression

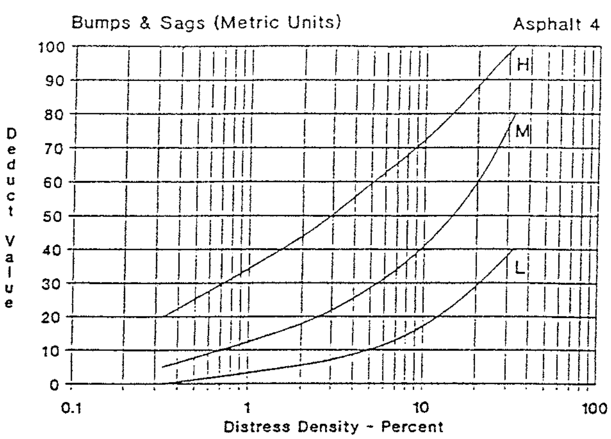


FIG. X3.5 Bumps and Sags (Metric units)

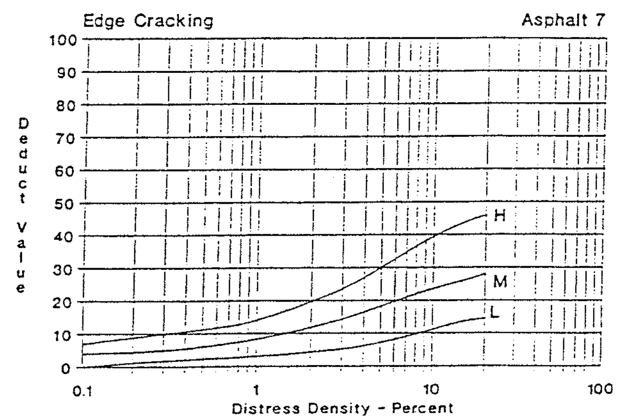


FIG. X3.8 Edge Cracking

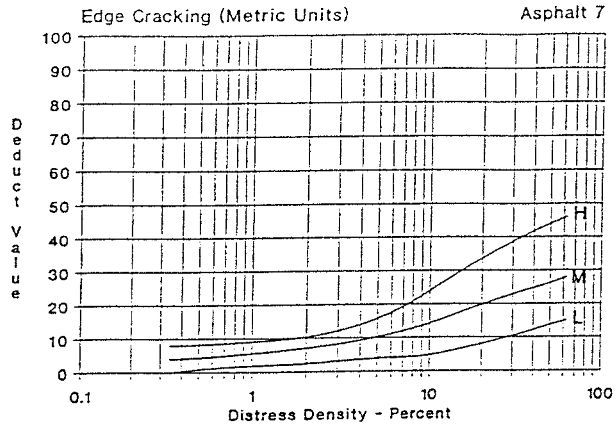


FIG. X3.9 Edge Cracking (metric units)

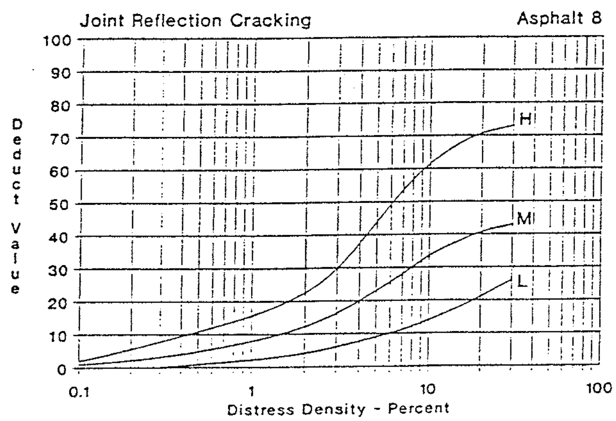


FIG. X3.10 Joint Reflection Cracking

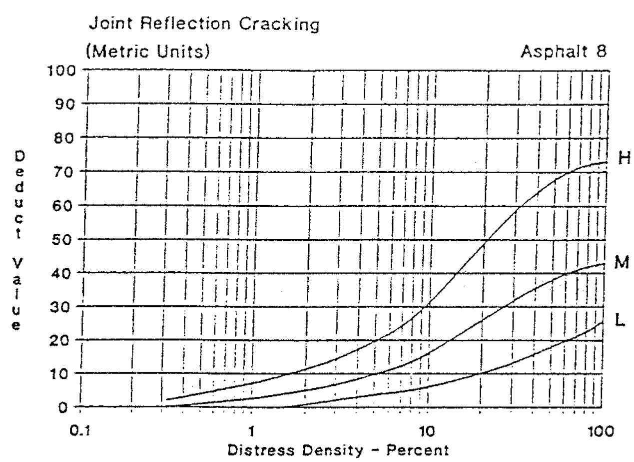


FIG. X3.11 Joint Reflection Cracking (metric units)

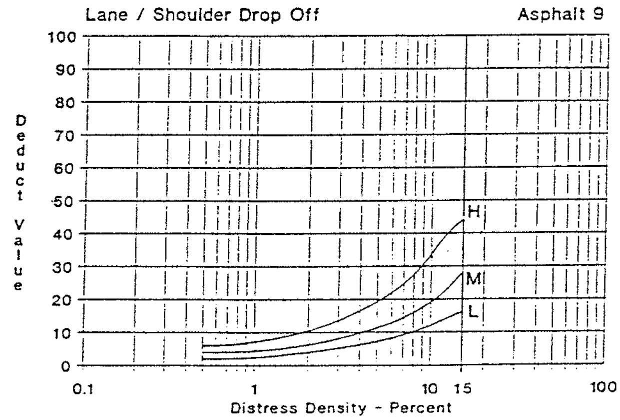


FIG. X3.12 Lane/Shoulder Drop-Off

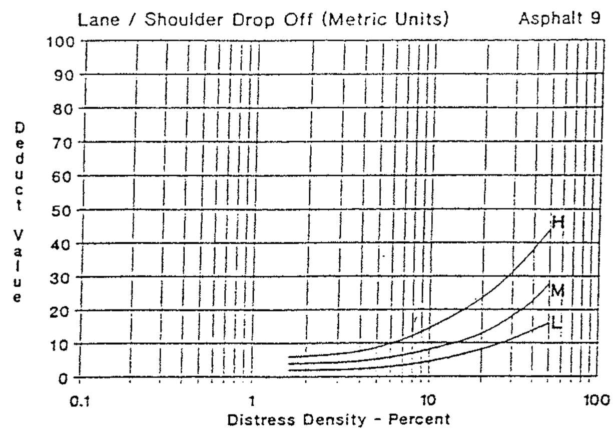


FIG. X3.13 Lane/Shoulder Drop-Off (metric units)

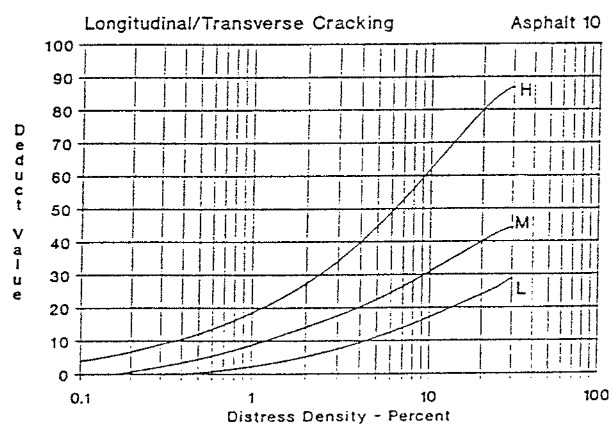


FIG. X3.14 Longitudinal/Transverse Cracking

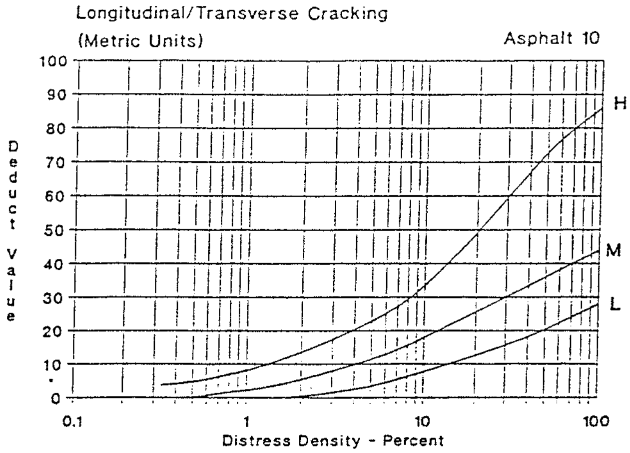


FIG. X3.15 Longitudinal/Transverse Cracking (metric units)

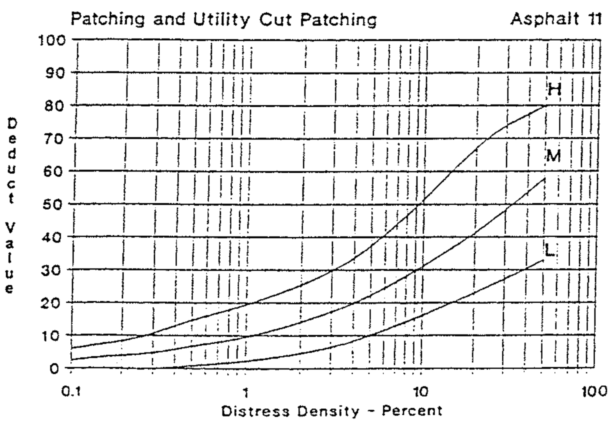


FIG. X3.16 Patching and Utility Cut Patching

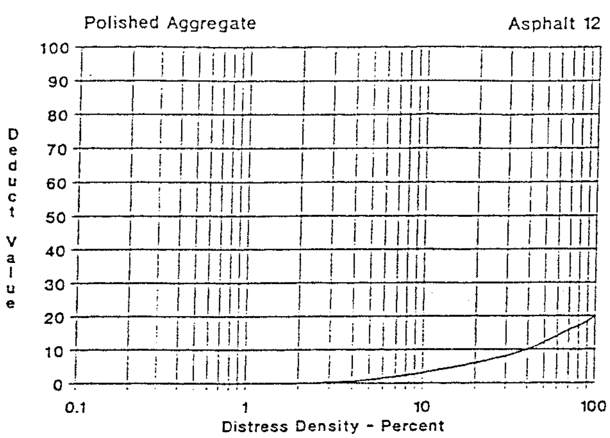


FIG. X3.17 Polished Aggregate

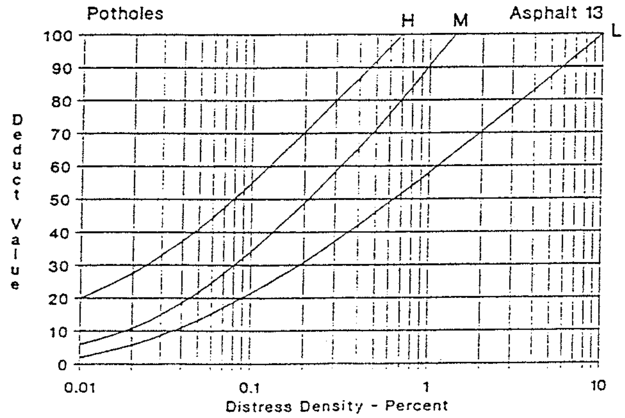


FIG. X3.18 Potholes

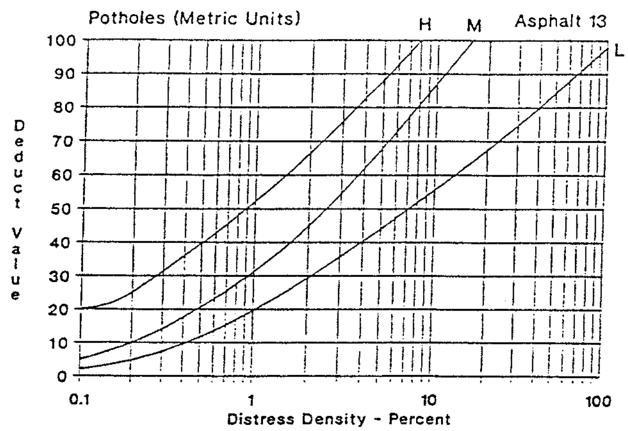


FIG. X3.19 Potholes (metric units)

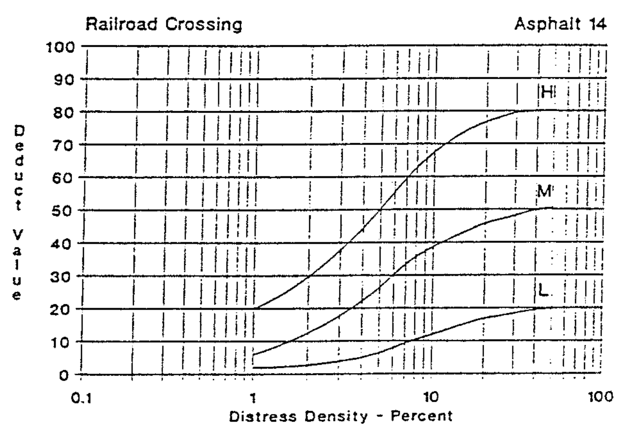


FIG. X3.20 Railroad Crossing

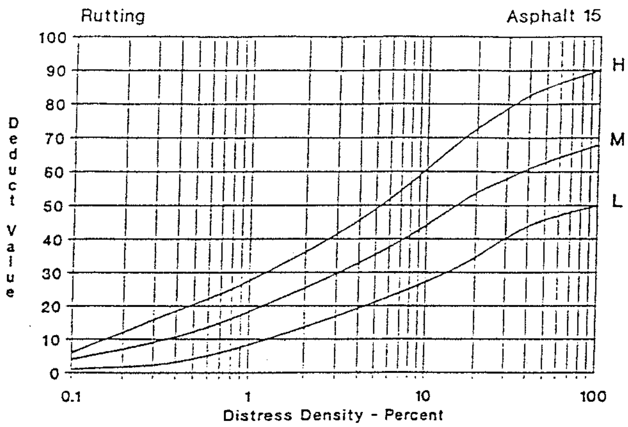


FIG. X3.21 Rutting

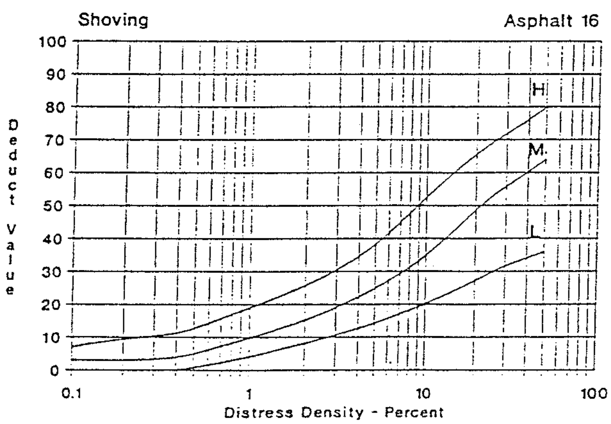


FIG. X3.22 Shoving

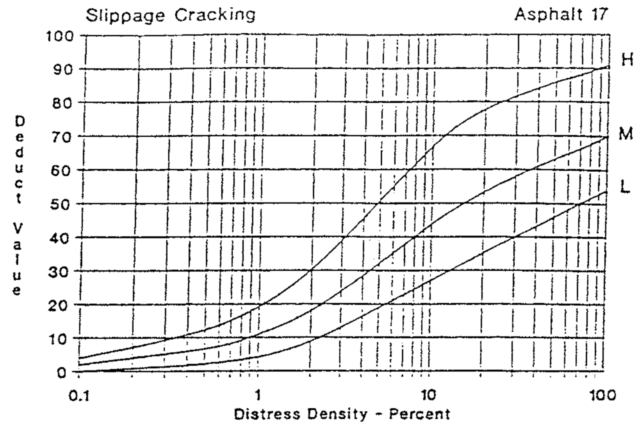


FIG. X3.23 Slippage Cracking

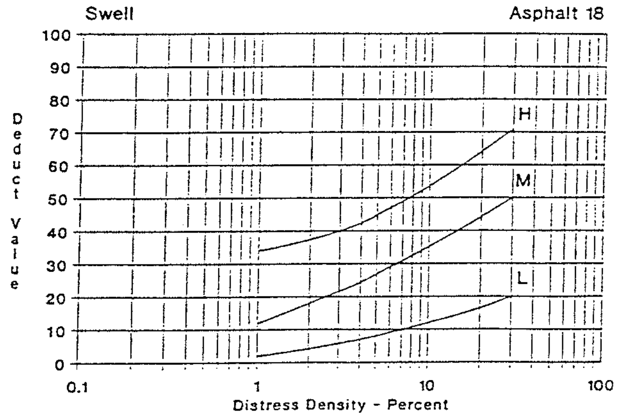


FIG. X3.24 Swell

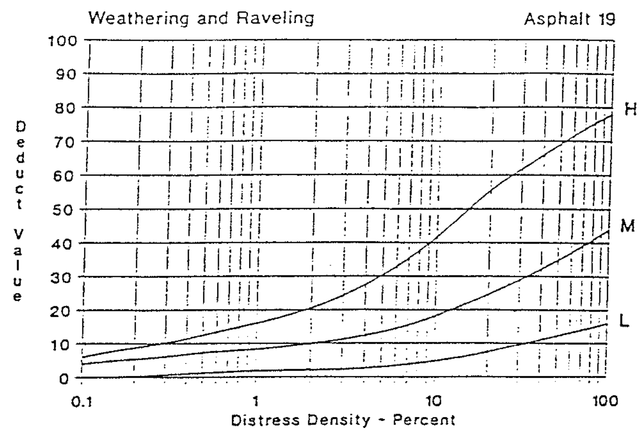


FIG. X3.25 Weathering and Raveling

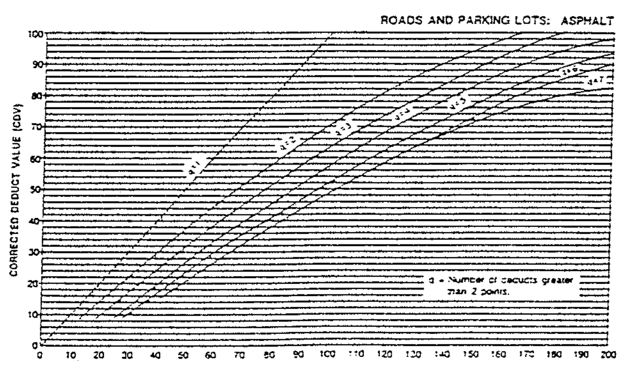


FIG. X3.26 Total Deduct Value

X4. DEDUCT VALUE CURVES FOR CONCRETE

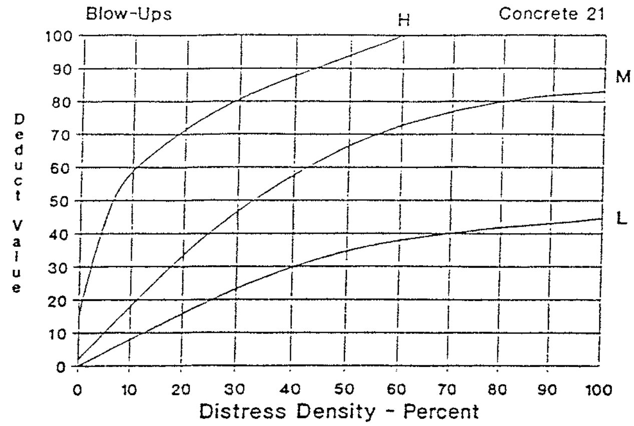


FIG. X4.1 Blowups

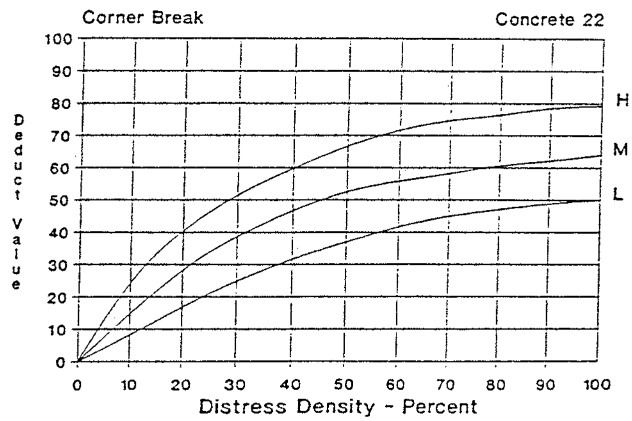


FIG. X4.2 Corner Break

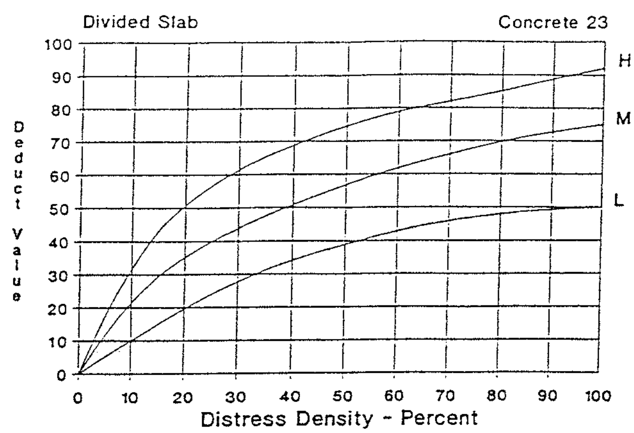


FIG. X4.3 Divided Slab

REFERENCES

(1) *PAVER Asphalt Distress Manual*, US Army Construction Engineering Laboratories, TR 97/104, June 1997.

(2) *PAVER Asphalt Distress Manual*, US Army Construction Engineering Laboratories, TR 97/105, June 1997.

(3) Carey, W.N., Jr. and Irick, P.E., "The Pavement Serviceability-Performance Concept," *HRB Bulletin 250*, 1960.

(4) Sayers, M. W., Gillespie, T. D., and Queiroz, C. A. V., "The International Road Roughness Experiment: Establishing Correlation and a Calibration Standard for Measurements," World Bank Technical Paper No. 45, the International Bank for Reconstruction and Development/the World Bank, Washington, DC, 1986.

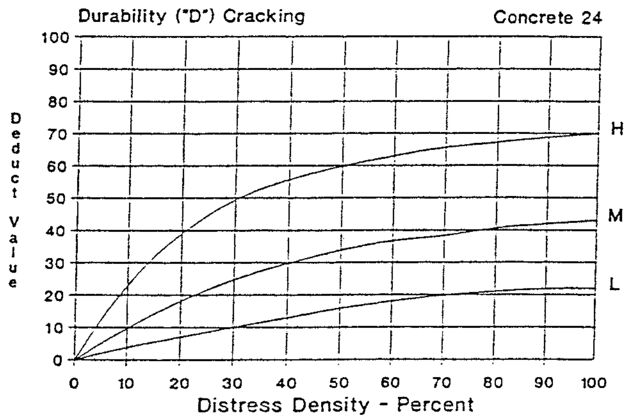


FIG. X4.4 Durability ("D") Cracking

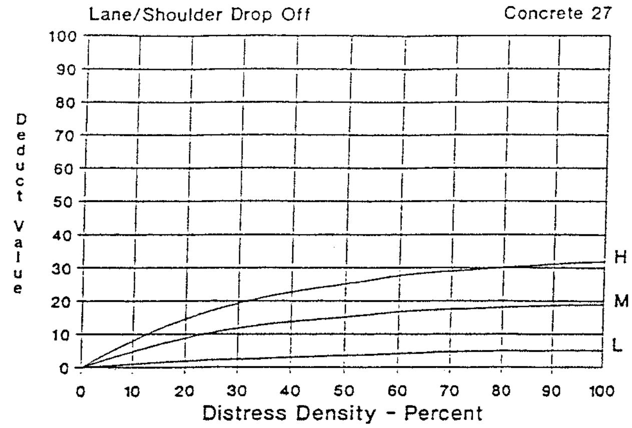


FIG. X4.7 Lane/Shoulder Drop-Off

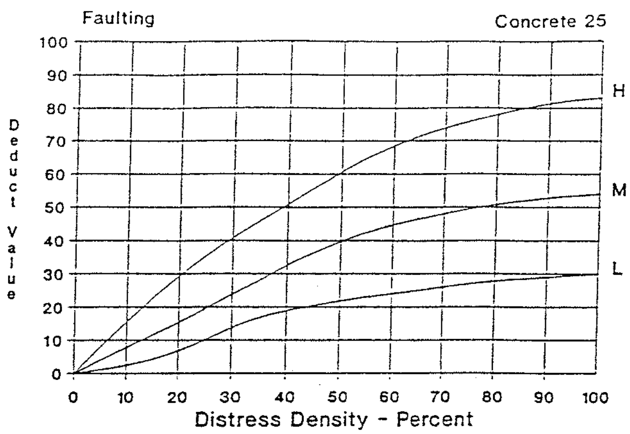


FIG. X4.5 Faulting

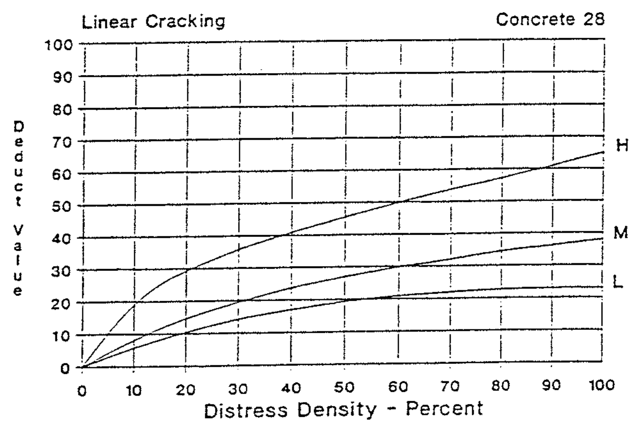


FIG. X4.8 Linear Cracking

Joint Seal Damage Concrete 26

Joint seal damage is not rated by density. The severity of the distress is determined by the sealant's overall condition for a particular sample unit.

The deduct values for the three levels of severity are:

LOW	2 points
MEDIUM	4 points
HIGH	8 points

FIG. X4.6 Rigid Pavement Deduct Values, Distress 26, joint seal damage

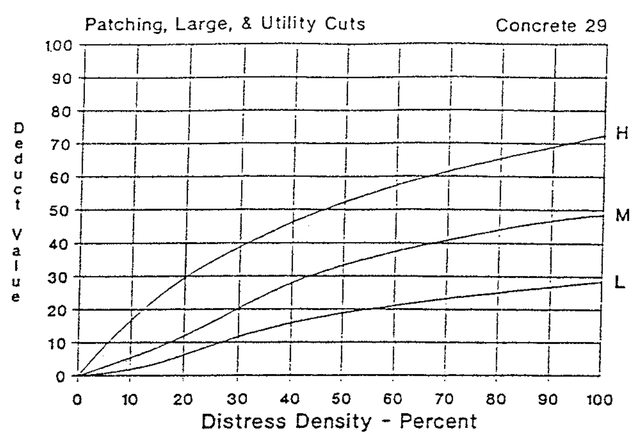


FIG. X4.9 Patching, Large, and Utility Cuts

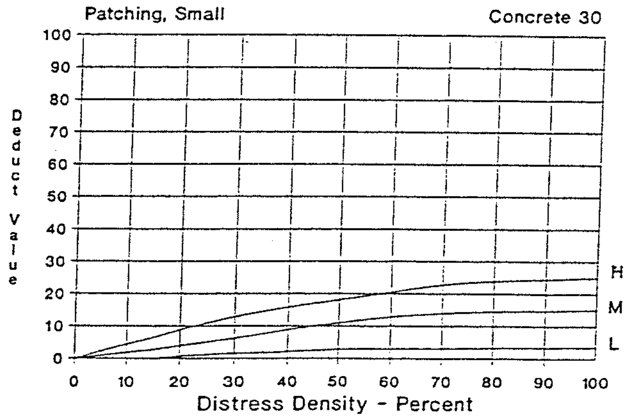


FIG. X4.10 Patching, Small

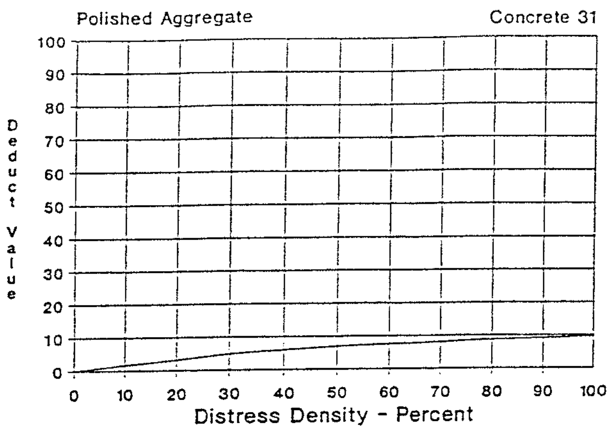


FIG. X4.11 Polished Aggregate

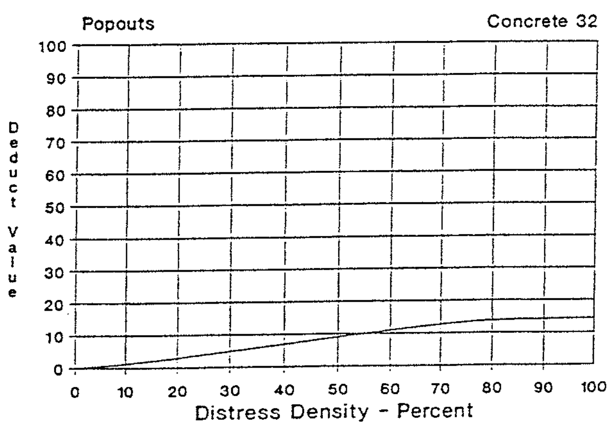


FIG. X4.12 Popouts

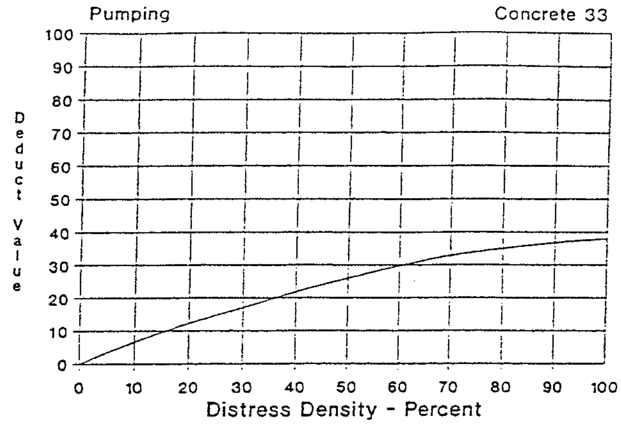


FIG. X4.13 Pumping

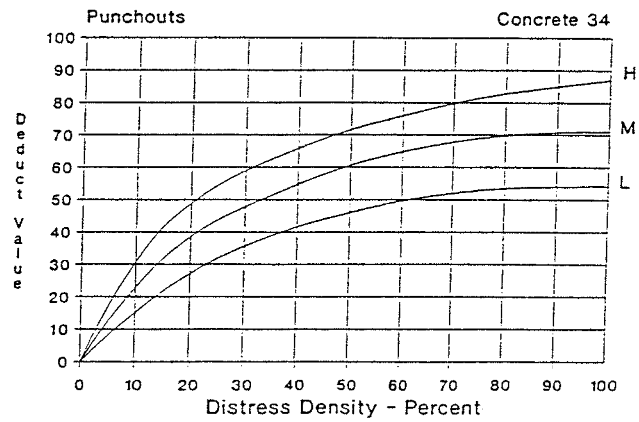


FIG. X4.14 Punchouts

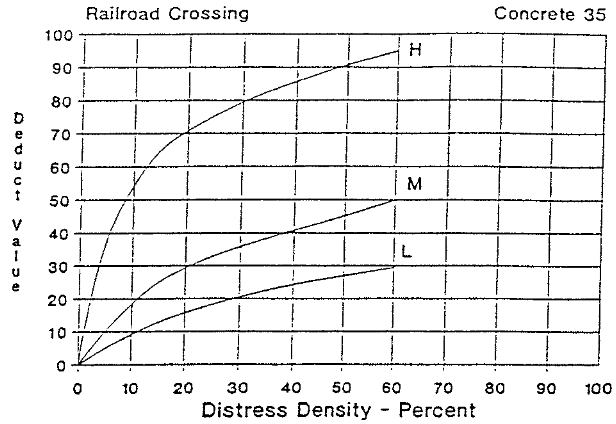


FIG. X4.15 Railroad Crossing

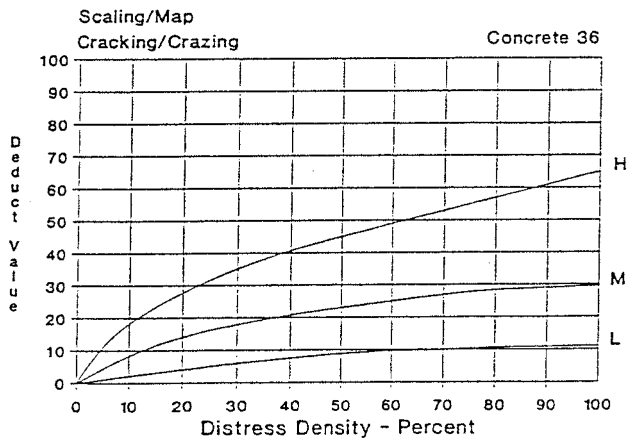


FIG. X4.16 Scaling/Map Cracking/Crazing

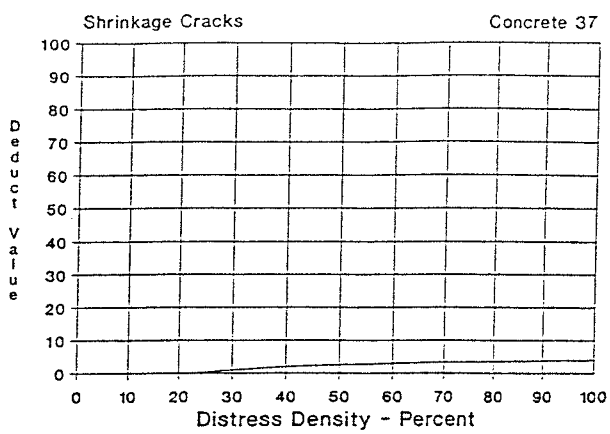


FIG. X4.17 Shrinkage Cracks

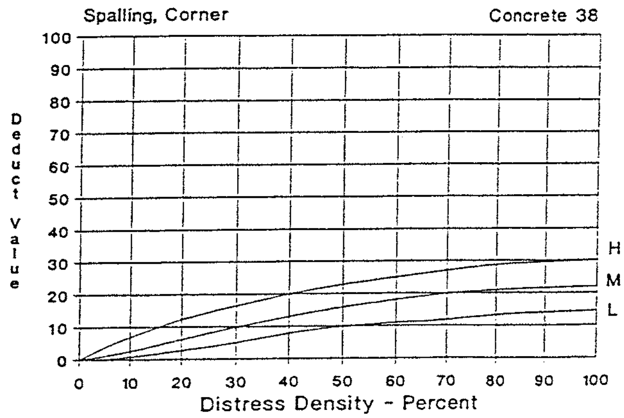


FIG. X4.18 Spalling, Corner

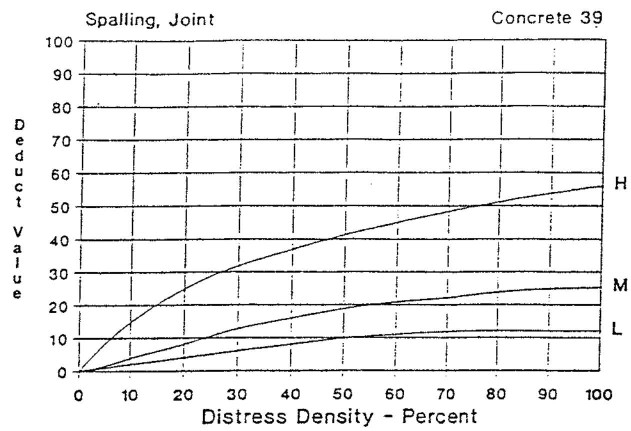
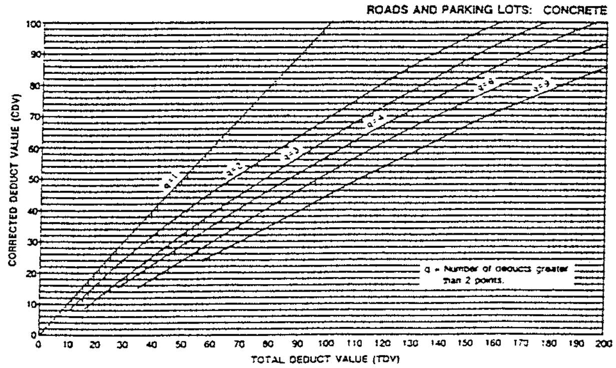


FIG. X4.19 Spalling, Joint



Corrected deduct values for jointed concrete pavement.

FIG. X4.20 Corrected Deduct Values for Jointed Concrete Pavement