

Surface Condition of Active Networks (SCAN): Assessment Ratings for Shared Use Paths



Michigan Department
of Transportation

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Sources of this Document

This document borrows from the Pavement Surface Evaluation and Rating (PASER) methodology, which was developed by the University of Wisconsin-Madison Transportation Information Center. Distress definitions also adopted from the Federal Highway Administration's Distress Identification Manual for the Long-Term Pavement Performance Program.

Background

Michigan's network of shared use paths is robust, crossing communities and providing bicyclists and pedestrians with convenient, safe and affordable access to essential services and destinations. Being several decades in development, many communities along this network find their focus shifting away from new construction and toward maintenance. Essential to effective maintenance is understanding and quantifying surface condition so that priorities can be identified. To date, such efforts have been hampered by the lack of a widely accepted methodology. This document strives to fill that void.

Where Can I Use Surface Condition of Active Networks (SCAN)?

Currently, SCAN condition assessment ratings should only be conducted on asphalt shared use paths. Condition ratings for concrete and aggregate surfaces may be developed in the future.

What is a Shared Use Path?

The Michigan Department of Transportation's (MDOT) [Bicycle and Pedestrian Terminology Booklet](#) defines a shared use paths as follows: "A bikeway physically separated from motor vehicle traffic by an open space or barrier, either within the highway right of way or an independent right of way. Shared use paths also may be used by pedestrians, skaters, wheelchair users, joggers, and other nonmotorized users. Most shared use paths are designated for two-way travel. Also known as Multi-use Pathways."

Shared use paths are typically 8 to 10 feet wide. While some may be built from concrete, crushed limestone aggregate or other materials, SCAN condition assessment ratings should only be conducted on asphalt shared use paths.

Why Use This Assessment?

This condition assessment methodology was developed by both engineers and active transportation professionals for widespread applicability and technical soundness. SCAN is a visual inspection rating from 1 to 5 (very poor to very good, respectively). Ratings are developed not only based on surface distresses, but other factors that can impact the overall condition of a shared use path, such as vegetation and drainage. Use of this methodology will allow for better understanding of shared use path surface conditions, aiding in maintenance efforts, resource allocation and ultimately improved health, safety and enjoyment.

Applicability

The information provided in this document is intended as a resource. MDOT does not mandate or enforce its use. Parties wishing to use this document to assess their active transportation networks should consider becoming more familiar with identifying surface distresses by taking a Pavement Surface Evaluation and Rating (PASER) training course. PASER training courses are offered by the [Center for Technology and Training](#) at Michigan Technological University.



Rating Scale Shared Use Paths: Asphalt

Rating	General Condition and Visible Distress	Treatment Measures
5 Very Good	The pavement is new construction or recent overlay. There is little to no maintenance required. <ul style="list-style-type: none"> • No cracking. • Slight oxidization. 	<ul style="list-style-type: none"> • Fog seal
4 Good	The pavement is showing first signs of aging and still in sound structural condition. Maintain with crack sealing and pavement sealing. <ul style="list-style-type: none"> • Occasional transverse cracks (10 feet or more apart). Open one-quarter inch or less. • Occasional longitudinal cracks. Open one-quarter inch or less. • Very slight or no crack heaving (from vegetation) or crack cupping. • Very slight or no raveling. • Good drainage. 	<ul style="list-style-type: none"> • Route and seal cracks (flush fill) • Fog seal • Micro-surface
3 Fair	The pavement is showing signs of surface aging and is in sound structural condition. Maintain with crack sealing and pavement sealing. Vegetation management should be reviewed. <ul style="list-style-type: none"> • Transverse cracks (some spaced less than 10 feet apart). Open one-half inch or less. • Occasional longitudinal cracks. Open one-half inch or less. • Moderate crack heaving (from vegetation) or crack cupping less than 1 inch. (Note isolated sites of greater depth.) • Uneven profile of less than one-half inch. Note isolated sites of greater depth. • Low to moderate raveling. • Very slight or no vegetative encroachment. • Note isolated sites of poor drainage. 	<ul style="list-style-type: none"> • Route and seal cracks (flush fill) • Mastic • Remove and replace crack heaving/crack cupping locations • Micro-surface • Clear encroaching vegetation • Improve isolated sites of poor drainage
2 Poor	The pavement is showing significant aging. Pavement repairs and patching will be needed prior to an overlay. Vegetation management and drainage should be reviewed. <ul style="list-style-type: none"> • Closely spaced longitudinal and transverse cracks. • Block cracking up to 50 percent of surface. • Some alligator cracking (less than 25 percent of surface). • Moderate uneven profile of one-half to 2 inches. • Severe crack heaving (from vegetation) or crack cupping greater than 1 inch. • Occasional potholes. • Vegetative encroachment on pavement greater than 4 inches. • Poor drainage. 	<ul style="list-style-type: none"> • Remove and replace crack heaving/crack cupping locations • Mastic • Remove and replace crack heaving/crack cupping locations • Micro-surface • Clear encroaching vegetation • Drainage improvements
1 Very Poor	The pavement is showing severe deterioration. Needs reconstruction. Review soil conditions for any stabilization. Vegetation management and drainage should also be reviewed. <ul style="list-style-type: none"> • Severe block cracking (greater than 50 percent of the surface). • Severe alligator cracking (over 25 percent of the surface). • Severe uneven profile of 2 inches or more. • Severe crack heaving (from vegetation) or crack cupping greater than 1 inch. • Potholes. • Vegetative encroachment on pavement greater than 6 inches. • Poor drainage. 	<ul style="list-style-type: none"> • Reconstruction • Vegetation removal • Drainage improvements



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5 Very Good	<p>The pavement is new construction or recent overlay. There is little to no maintenance required.</p> <ul style="list-style-type: none"> • No cracking. • Slight oxidization. 	<ul style="list-style-type: none"> • Fog seal



Rating Scale	General Condition and Visible Distress	Treatment Measures
4 Good	<p>The pavement is showing first signs of aging and still in sound structural condition. Maintain with crack sealing and pavement sealing.</p> <ul style="list-style-type: none"> Occasional transverse cracks (10 feet or more apart). Open one-quarter inch or less. Occasional longitudinal cracks. Open one-quarter inch or less. Very slight or no crack heaving (from vegetation) or crack cupping. Very slight or no raveling. Good drainage. 	<ul style="list-style-type: none"> Route and seal cracks (flush fill) Fog seal Micro-surface



Rating Scale	General Condition and Visible Distress	Treatment Measures
3 Fair	<p>The pavement is showing signs of surface aging and is in sound structural condition. Maintain with crack sealing and pavement sealing. Vegetation management should be reviewed.</p> <ul style="list-style-type: none"> Transverse cracks (some spaced less than 10 feet apart). Open one-half inch or less. Occasional longitudinal cracks. Open one-half inch or less. Moderate crack heaving (from vegetation) or crack cupping less than 1 inch. (Note isolated sites of greater depth.) Uneven profile of less than one-half inch. Note isolated sites of greater depth. Low to moderate raveling. Very slight or no vegetative encroachment. Note isolated sites of poor drainage. 	<ul style="list-style-type: none"> Route and seal cracks (flush fill) Mastic Remove and replace crack heaving/crack cupping locations Micro-surface Clear encroaching vegetation Improve isolated sites of poor drainage



Rating Scale	General Condition and Visible Distress	Treatment Measures
2 Poor	<p>The pavement is showing significant aging. Pavement repairs and patching will be needed prior to an overlay. Vegetation management and drainage should be reviewed.</p> <ul style="list-style-type: none"> • Closely spaced longitudinal and transverse cracks. • Block cracking up to 50 percent of surface. • Some alligator cracking (less than 25 percent of surface). • Moderate uneven profile of one-half to 2 inches. • Severe crack heaving (from vegetation) or crack cupping greater than 1 inch. • Occasional potholes. • Vegetative encroachment on pavement greater than 4 inches. • Poor drainage. 	<ul style="list-style-type: none"> • Remove and replace crack heaving/crack cupping locations • Mastic • Remove and replace crack heaving/crack cupping locations • Micro-surface • Clear encroaching vegetation • Drainage improvements



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1 Very Poor	<p>The pavement is showing severe deterioration. Needs reconstruction. Review soil conditions for any stabilization. Vegetation management and drainage should also be reviewed.</p> <ul style="list-style-type: none"> Severe block cracking (greater than 50 percent of the surface). Severe alligator cracking (over 25 percent of the surface). Severe uneven profile of 2 inches or more. Severe crack heaving (from vegetation) or crack cupping greater than 1 inch. Potholes. Vegetative encroachment on pavement greater than 6 inches. Poor drainage. 	<ul style="list-style-type: none"> Reconstruction Vegetation removal Drainage improvements



Understanding Terms for Assessing Asphalt

Surface Defects

Type	Definition	Example
Raveling	Raveling is the wearing away of the pavement surface caused by the dislodging of aggregate particles and loss asphalt binder. Slight to moderate raveling has loss of fines. Severe raveling has loss of coarse aggregate, ultimately leading to a very rough and pitted surface with obvious loss of aggregate.	

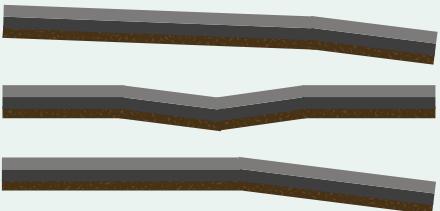
Cracks

Type	Definition	Example
Transverse	Cracks that are predominantly perpendicular to the pavement centerline. They are often regularly spaced. The cause is movement due to temperature changes and hardening of the asphalt with aging.	
Longitudinal	Cracks predominately parallel to the pavement centerline. Cracks within 1 foot of the edge are caused by insufficient shoulder support, poor drainage or frost action. Cracks usually start as hairline or vary narrow and widen and erode with age. Without crack filling, they can ravel, develop multiple cracks and become wide enough to require patching.	

Type	Definition	Example
Block	A pattern of cracks that divides the pavement into approximately rectangular pieces. Blocks may range from 1 foot to approximately 10 feet or more across. The closer spacing indicates more advanced aging caused by shrinking and hardening of the asphalt over time.	
Heaving/Cupping	Heaving is a series of elevated cracks causing an uneven surface, usually caused by underlying tree roots. Cupping is a channel-like depression along a crack caused by the deterioration of the base material. This may be a gentle swale or a fairly severe dip.	
Alligator	A series of interconnected cracks forming small pieces ranging in size from about 1 to 6 inches. On shared use paths, this is often due to inadequate base or subgrade support.	



Other

Type	Definition	Example
Potholes	Bowl-shaped holes of various sizes in the pavement surface. Holes and loss of pavement material caused by fatigue and inadequate strength. Often combined with poor drainage.	
Uneven Surface Profile	A location where the cross slope deviates from its originally designed and constructed uniform consistent condition, resulting in distortions, poor drainage and/or standing water.	<p>Even</p>  <p>Examples of Unevenness</p>  <p>Path Cross Section</p>
Vegetative Encroachment	Refers to the growth of vegetation over an improved surface at ground level. This can reduce useability, create safety hazards and cause premature deterioration.	



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