

North Dakota's Web-based Interactive APMS Tool

2024 REFERENCE GUIDE



2024 IDEA REFERENCE GUIDE

User Guide Prepared By:



Mead & Hunt

600 S. 2nd Street, Suite 120
Bismark, North Dakota 58504
701-566-6449
www.meadhunt.com



Applied Pavement Technology

1908 S. 1st Street, Suite 201
Champaign, Illinois 61820
217-398-3977
www.appliedpavement.com



Marr Arnold Planning

1328 California Avenue
Ames, Iowa 50014
515-231-0344
www.marrarnoldplanning.com



This document was prepared under
the guidance of:

North Dakota Aeronautics Commission

- **Kyle Wanner**, Executive Director
 - **Adam Dillin**, Airport Planner
 - **Grant Erwin**, Airport Planner
- 701-328-9650 | www.aero.nd.gov

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Introduction

This reference guide provides an overview of some of the key features of North Dakota Aeronautics Commission's 2024 web-based Interactive airport pavement management system (APMS) tool, or IDEA. IDEA presents the results of the 2024 update to North Dakota's APMS and is organized into five modules. These modules can be accessed through links associated in the module descriptions or from the tabs found in the top menu.

North Dakota 2024 IDEA

Statewide Summary Airport Details Maintenance Guidelines Pavement Inspection Miscellaneous

North Dakota Aeronautics Commission
Pavement Management System Update

This program presents the results of the 2024 update of the North Dakota Aeronautics Commission pavement management system. During this project the runway, taxiway, apron, and T-hangar pavements at selected airports in North Dakota were evaluated. This program is organized into the modules accessible from the links below or the menu above.

- **Statewide Summary**—View the 2024 Executive Summary document, as well as a summary of pavement inventory area, age, and condition information at the statewide level.
- **Airport Details**—View detailed inventory information, condition data, work history information, photographs, and the proposed 5-year maintenance and rehabilitation plan.
- **Maintenance Guidelines**—View general recommendations for pavement maintenance at North Dakota airports as well as FAA guidelines for pavement maintenance.
- **Pavement Inspection**—Review background information on the PCI survey method used to assess pavement condition, and access the FAA pavement inspection report.
- **Miscellaneous**—View definitions of abbreviations used throughout the IDEA, and learn about this program as well as Applied Pavement Technology.

Developed by:  applied pavement TECHNOLOGY



Statewide Summary

The Statewide Summary module contains summarized statistics for area, age, and condition of airport pavements included in the APMS. Additionally, historic statewide performance statistics, funding needs information, and both current and historic Statewide Executive Summary reports are accessible in this module.

The summary statistics for area, age, and condition are presented for the entire State and subcategories of the State including airport classification, oil region, and funding eligibility.

Some of the larger data displays have multiple view options that allow the user to view the data as a graphic, in a table, or both.





Airport Details

The Airport Details module provides comprehensive information for each airport. This information includes inventory data, condition data, work history, inspection photographs, distress data, and maintenance and rehabilitation (M&R) recommendations.

Data Views

The airport details data is presented at multiple viewing levels. Toggling between each level (Network, Branch, and Section) can be done using the “Data View” icons located in the upper left portion of IDEA. Network data consists of information pertaining to the entire airport. Branch data provides summary statistics for facilities (i.e., runways, taxiways, and aprons). Section data contains detailed information for each pavement section constructed on an airport.

Network PCIs

The following table summarizes the overall area-weighted network-level PCIs. The 2018, 2021, and 2024 PCIs are inspected values. Please note, Duneith and New Rockford were not inspected in 2024 due to major rehabilitation or reconstruction projects occurring in 2024 and 2025, respectively.

Airport Name	2018 (Inspection)	2021 (Inspection)	2024 (Inspection)	2025	2026	2027	2028	2029
Ashley Municipal Airport	93	79	74	72	70	67	64	61
Beach Airport	81	75	88	86	84	82	80	78
Beulah Municipal Airport	71	69	73	72	71	69	68	66
Bismarck Municipal Airport	82	76	74	73	71	70	68	67
Bottineau Municipal Airport	74	63	81	80	79	77	76	74
Bowman Regional Airport	100	97	93	93	92	91	90	89
Cando Municipal Airport	68	91	87	84	81	79	76	73
Carrington Municipal Airport	62	62	83	81	79	76	74	71
Casselton - Robert Miller Regional Airport	64	55	48	46	43	40	38	35
Cavalier Municipal Airport	79	61	54	52	50	48	45	43
Cooperstown Municipal Airport	82	66	63	61	59	56	54	51



Selecting Map Types

Both the Network and Section level data views contain multiple map types for visual representations of various data sets. These map types are accessed by selecting the Map Type drop-down list in the top left portion of the map viewport.

The screenshot displays the 'North Dakota 2024 IDEA' web application interface for the 'BISMARCK MUNICIPAL AIRPORT'. The top navigation bar includes 'Statewide Summary', 'Airport Details', 'Maintenance Guidelines', 'Pavement Inspection', and 'Miscellaneous'. The left sidebar shows 'DATA VIEW' with 'Section' selected, and 'MAP TYPE: PCI' highlighted. A 'MAP TYPE' pop-up menu is open, showing options: Overview, Inventory, Surface Type, Conditions (with 'PCI' selected), Capital Improvement, M&R, and PCR (with 'ACR/PCR Ratio' selected). The central map area shows an aerial view of the airport with various runway segments highlighted in green, yellow, and red, indicating their Pavement Condition Index (PCI) values. Labels on the map include: TWB-BK-10 (96), TWC1-BK-05 (52), TH-BK-05 (96), TWC2-BK-05 (54), TWC-BK-35 (65), AGA-BK-53 (100), AGA-BK-57 (91), TWA2-BK-10 (28), AGA-BK-40 (62), ATERM-BK-65 (27), RW1331-BK-20 (98), TWD-BK-12 (64), ATERM-BK-60 (70), RW321-BK-15 (64), TWC4-BK-05 (54), TWD2-BK-05 (63), TWC-BK-10 (59), RW321-BK-05 (60), TWD-BK-25 (85), RW321-BK-35 (98), TWC-BK-15 (61), RW321-BK-25 (37), TWD-BK-11 (60), TWC-BK-15 (61), RW321-BK-05 (60), TWC5-BK-30 (69), and TWD1-BK-10 (58). The right sidebar shows a 'TIMELINE' for 'INSPECTED' years (2018, 2021, 2024) and 'PREDICTED' years (2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034). The bottom of the interface features a 'PAVEMENT CONDITION INDEX (PCI):' legend with a color scale from 100-86 (green) to 40-0 (red). The bottom right corner has buttons for 'Map Labels', 'Aerial Imagery', and 'Photos'.



Individual Airport Details

The most detailed information for each airport can be accessed through the Section level data view. A bookmark can be created in the user's web browser for direct access to an airport by using the link below and entering the airport's three-letter identifier in replacement of **aaa**. Note that the letters in the three-letter identifier need to be lowercase.

Link: https://apps.appliedpavement.com/hosting/northdakota_2024/airport-details/airport-details.html?network=aaa&depth=section

For example, if you wanted to bookmark Bismarck Municipal Airport, the link would be https://apps.appliedpavement.com/hosting/northdakota_2024/airport-details/airport-details.html?network=bis&depth=section.

While in the Section level data view, information pertaining to the individual pavement's conditions, inventory data, distress data, photos, and M&R recommendations are accessed through the tabs on the right side of the screen. Data for a specific section can be obtained by using the object selection drop-down lists on the left side of the screen or by clicking the pavement of interest on the map.

The screenshot displays the 'BISMARCK MUNICIPAL AIRPORT' details for 'Section TWC-BK-10'. The interface includes a sidebar for object selection, a central map with a timeline, and a right-hand panel with a table of Section PCIs.

Section PCIs Table:

Branch ID	Section ID	2018 (Inspection)	2021 (Inspection)	2024 (Inspection)	2025	2026	2027	2028	2029	2030	2031
TWC-BK	10	71	64	59	58	57	56	54	52	51	48
TWC-BK	15	71	68	61	60	59	58	57	56	54	52
TWC-BK	20	54	38	33	30	26	23	19	15	12	8
TWC-BK	30	34	32	28	27	25	22	19	16	14	11
TWC-BK	35	77	72	65	63	60	58	55	53	51	49
TWC1-BK	05	N/A	93	52	50	47	44	41	38	35	32
TWC1-BK	10	39	92	80	78	75	72	69	66	63	60
TWC2-BK	05	N/A	99	54	52	49	46	43	40	37	34
TWC2-BK	10	38	90	80	78	75	72	69	66	63	60



The user can adjust how much of the map or the data is shown by sliding the bar located between the map and data viewports to the right or left, or by selecting the Display View tabs in the upper right of the screen.

North Dakota 2024 IDEA

Statewide Summary | **Airport Details** | Maintenance Guidelines | Pavement Inspection | Miscellaneous

DISPLAY VIEW: Map | **Split** | Data

DATA VIEW: Network | Branch | **Section**

OBJECT SELECTION: Network | Bismarck | Branch | Section

BISMARCK MUNICIPAL AIRPORT

MAP TYPE: PCI | TIMELINE: 2024

Inspected Data (2024)

Map showing various pavement sections with labels such as TWC1-BK-05 (52), TH-BK-05 (96), TWC2-BK-05 (54), TWC-BK-35 (65), AGA-BK-53 (100), AGA-BK-57 (91), TWA2-BK-10 (28), AGA-BK-40 (62), ATERM-BK-65 (27), RW1331-BK-20 (98), TWD-BK-12 (64), ATERM-BK-60 (70), RW321-BK-15 (64), TWC4-BK-05 (54), TWD2-BK-05 (63), TWC-BK-10 (59), RW321-BK-05 (60), TWD-BK-25 (85), RW321-BK-35 (98), TWC-BK-15 (61), RW321-BK-25 (37), TWD-BK-11 (60), TWC-BK-15 (61), TWC5-BK-30 (69), RW321-BK-05 (60), TWD1-BK-10 (58).

PAVEMENT CONDITION INDEX (PCI): 100-86 | 85-71 | 70-56 | 55-41 | 40-0

Section Filters

Condition | Inventory | Inspection | Photos | Recommended Work | Summary Charts | PCR Information | Documents

PCI Data | PCI by Year Chart

Section PCIs

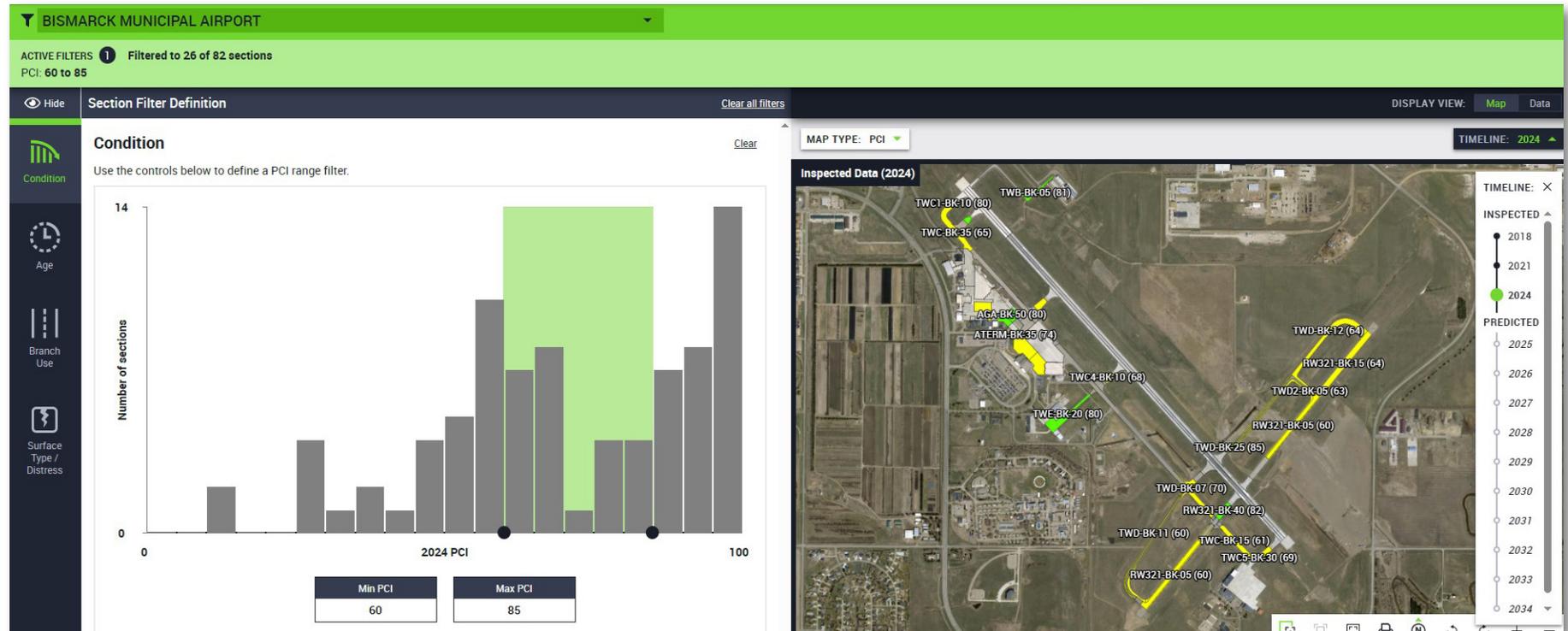
The following table summarizes the section PCIs.

Branch ID	Section ID	2018 (Inspection)	2021 (Inspection)	2024 (Inspection)	2025	2026	2027	2028	2029	2030
RW321-BK	15	80	73	64	62	60	58	56	53	51
RW321-BK	20	78	66	65	63	61	59	57	54	52
RW321-BK	25	52	49	37	36	35	34	33	32	31
RW321-BK	30	68	54	49	48	47	46	45	44	43
RW321-BK	35	100	100	98	97	96	95	94	94	93
RW321-BK	40	96	87	82	81	79	77	75	74	72
RW321-BK	45	99	87	86	85	83	81	79	77	75
TH-BK	05	87	90	96	95	93	91	89	87	85
TWA2-BK	10	39	32	28	27	25	22	19	16	14
TWB-BK	05	94	86	81	79	76	73	70	67	64
TWB-BK	10	N/A	100	96	95	92	90	87	84	82
TWB-BK	15	N/A	100	56	54	51	48	45	42	39
TWC-BK	10	71	64	59	58	57	56	54	52	51
TWC-BK	15	71	68	61	60	59	58	57	56	54
TWC-BK	20	54	38	33	30	26	23	19	15	12



Section Filter Tool

When viewing results of an airport at the Section level, a filter tool is available on the bottom left side of the screen. This filter allows the user to identify and view specific pavements based on user-defined criteria, including condition, age, branch usage, surface type, and pavement distress characteristics.



Pavement Classification Ratings (PCRs)

PCRs were determined for runways at commercial service airports that are designed for aircraft weighing more than 12,500 lbs. PCR results are viewed at the Section level by selecting the “ACR/PCR Ratio” map type from the drop-down list in the upper left or by selecting the “PCR Information” tab in upper right of the screen. The ACR represents the Aircraft Classification Rating and is already determined for each airport based on the analyzed subgrade strength.



North Dakota 2024 IDEA

Statewide Summary | **Airport Details** | Maintenance Guidelines | Pavement Inspection | Miscellaneous

DISPLAY VIEW: Map | Split | Data

BISMARCK MUNICIPAL AIRPORT

MAP TYPE: **ACR/PCR Ratio** Aircraft: Controlling Aircraft

OBJECT SELECTION: Network (Bismarck), Branch, Section

MAP TYPE: Overview, Inventory (Surface Type), Conditions (PCI), Capital Improvement (M&R), PCR (**ACR/PCR Ratio**)

ACR/PCR Ratio: Structurally Adequate (<=1.00), Overload Guidance Applies (>1.00-1.10), Structurally Inadequate (>1.10), Not Evaluated

PCR Details

The following table summarizes the PCR summary information for the runway(s) at this airport. Aircraft ACRs were determined using the latest version of FAA's FAARFIELD pavement design software (i.e., version 2.1.1; Build 12/21/2023).

AIRCRAFT TYPE: **Controlling Aircraft**

Branch ID	Section ID	Pavement Type	Subgrade	ACR Value	PCR Value	ACR/PCR Ratio	Ratio Comment	PCR Details	Max ACR Value	Max ACR
RW1331-BK	10	Rigid	D	676	750	0.90	Structurally Adequate (<=1.00)	750/R/D/W/T	676	Airbus A3 STI
RW1331-BK	25	Rigid	D	676	750	0.90	Structurally Adequate (<=1.00)	750/R/D/W/T	676	Airbus A3 STI
RW1331-BK	40	Rigid	D	676	750	0.90	Structurally Adequate (<=1.00)	750/R/D/W/T	676	Airbus A3 STI
RW321-BK	05	Flexible	D	441	430	1.03	Overload Guidance Applies (>1.00-1.10)	430/F/D/X/T	441	Airbus A3 STI
RW321-BK	10	Flexible	D	441	430	1.03	Overload Guidance Applies (>1.00-1.10)	430/F/D/X/T	441	Airbus A3 STI
RW321-BK	15	Flexible	D	441	430	1.03	Overload Guidance Applies (>1.00-1.10)	430/F/D/X/T	441	Airbus A3 STI
RW321-BK	45	Flexible	D	441	440	1.00	Overload Guidance Applies (>1.00-1.10)	440/F/D/X/T	441	Airbus A3 STI

ACR/PCR ratios for specific aircraft are accessible through the ACR/PCR Ratio map type and selection of the aircraft type in the available drop-down list. The impact that operating at different weights has on the ACR/PCR ratio for an individual aircraft type can be determined. This is done by using the slide bar below the aircraft drop-down list to adjust the aircraft weight between its lowest analyzed and maximum taxiing weights or typing in specific weights in the adjacent text cell. When weights produce an ACR/PCR ratio of 1.0 or less the aircraft has been determined to be able to use the pavement as it was designed. A ratio between 1.0 and 1.1 indicates the aircraft can operate infrequently under overload guidance as determined by the FAA. Other PCR results are shown under the additional tabs on the right side of the screen.



BISMARCK MUNICIPAL AIRPORT

MAP TYPE: ACR/PCR Ratio Aircraft: Airbus: A320-200 Std Weight: 156,408 lbs (90%)

MAP TYPE: Overview, Inventory, Surface Type, Conditions, Capital Improvement, PCR (selected: ACR/PCR Ratio)

ACR-PCR Overview Aircraft Classification Ratings PCR Results **PCR Details** Documents

PCR Details Export to print

The following table summarizes the PCR summary information for the runway(s) at this airport. Aircraft ACRs were determined using the latest version of FAA's FAARFIELD pavement design software (i.e., version 2.1.1; Build 12/21/2023).

AIRCRAFT TYPE: Airbus: A320-200 Std WEIGHT: 156,408 lbs (90%)

Branch ID	Section ID	Pavement Type	Subgrade	ACR Value	PCR Value	ACR/PCR Ratio	Ratio Comment	PCR Details	Max ACR Value
RW1331-BK	10	Rigid	D	476	750	0.63	Structurally Adequate (<=1.00)	750/R/D/W/T	676
RW1331-BK	25	Rigid	D	476	750	0.63	Structurally Adequate (<=1.00)	750/R/D/W/T	676
RW1331-BK	40	Rigid	D	476	750	0.63	Structurally Adequate (<=1.00)	750/R/D/W/T	676
RW321-BK	05	Flexible	D	421	430	0.98	Structurally Adequate (<=1.00)	430/F/D/X/T	441
RW321-BK	10	Flexible	D	421	430	0.98	Structurally Adequate (<=1.00)	430/F/D/X/T	441
RW321-BK	15	Flexible	D	421	430	0.98	Structurally Adequate (<=1.00)	430/F/D/X/T	441
RW321-BK	45	Flexible	D	421	440	0.96	Structurally Adequate (<=1.00)	440/F/D/X/T	441

Maintenance Guidelines

The Maintenance Guidelines module presents routine maintenance guidelines for airports and links to the FAA Advisory Circulars related to maintenance and requirements of an airport pavement management program.

Pavement Inspection

The Pavement Inspection module provides an overview of the Pavement Condition Index (PCI) survey procedure, distress types included as part this procedure, and descriptions of the typical causes of these distresses.

Miscellaneous

The Miscellaneous module contains definitions for acronyms used throughout the website and some general information about the IDEA.

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