

Asset Management Condition Grading Standards

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Introduction

Condition grading/rating standards are often used to identify and prioritize the renewal requirements for infrastructures such as roads, sewers, and water mains. This rating standard typically includes a point scoring system for each performance indicator (see Table 1 for key performance indicators for roads, sewers and water mains). The number of indicators to be included in a condition rating system will vary depending on the data available and the specific conditions for each system.

Table 1: Key Performance Indicators		
Roads	Sewers	Water Mains
Structural/bearing capacity Condition/distress	Structural defects	Structural/break rates
Volume/Capacity ratio	Hydraulic capacity	Hydraulic capacity
Roughness/rideability	Infiltration	Leakage
Safety	Service defects	Water quality
Importance	Importance	Importance

Source: *National Guide to Sustainable Municipal Infrastructure*, 2003.

http://fmv.fcm.ca/files/Infraguide/Roads_and_Sidewalks/guidelines_sealing_fil_cracks_pavmnt.pdf

Simple Condition Rating Model	
Rank	Description of Condition
1	Very Good Condition Only normal maintenance required
2	Minor Defects Only Minor maintenance required (5%)
3	Maintenance Required to Return to Accepted Level of Service Significant maintenance required (10-20%)
4	Requires Renewal Significant renewal/upgrade required (20-40%)
5	Asset Unserviceable Over 50% of asset requires replacement

Source: *International Infrastructure Management Manual – Version 3.0*, 2006

http://openlibrary.org/books/OL21245688M/International_infrastructure_management_manual

Intermediate Condition Rating Model		
Rank	Description of Condition	
3.0 3.4 3.8	Level of Service Maintenance	Minor Average Significant
4.0 4.2 4.4 4.6 4.8	Requires Major Upgrade	Minor Average Medium Substantial Significant
5.0 5.2 5.4 5.6 5.8	Asset Basically Unserviceable	Minor Average Medium Substantial Significant

Source: International Infrastructure Management Manual – Version 3.0, 2006

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A Sophisticated Condition Assessment Model						
Base Ranking	Roads (0 – 100)	Drains, Sewers (0 – 200)	Water Mains (0 – 500)	Buildings (0 – 10)	Parks (0 – 125)	Plant (0 – 100)
1	0 – 200	0 - 40	0 – 100	0 - 2	0 – 25	0 – 20
2	200 – 400	40 – 80	100 – 150	2 – 4	25 – 50	20 – 40
3	400 – 600	80 – 120	150 – 200	4 – 6	50 – 75	40 – 60
4	600 – 800	120 – 160	200 – 300	6 – 8	75 – 100	60 – 80
5	800 – 1000	160 - 200	300 - 500	8 - 10	100 - 125	80 - 100

Source: Source: International Infrastructure Management Manual – Version 3.0, 2006

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On the following page are more specific condition grading standards for a range of infrastructure types namely: wastewater distribution systems, water mains, roads, bridges and property assets.

A. Wastewater Distribution Systems

Wastewater Reticulation Condition Assessment Criteria						
Inspection Criteria for Pipeline		Ranking				
		1	2	3	4	5
Pipe Cracking	Single Pattern	Best	Fine	Apparent	Extensive	Failed
Joint Displacement		None	Appearing	Open, no filtration	Open, with filtration	Failed
Invert Erosion		None	Shallow scour	Apparent	Deep scour, not broken	Broken through
Debris/ Settlement		None	Silting apparent	Some blockage, flow not retarded	Blockage, flow retarded	Totally blocked
Upstream Structure Condition		Excellent	Slight blemishes	Obvious blemishes	Major blemishes	Failed Poor, indicating neglect
Root Penetration		None		Medium		Neglected/ blocked

Source: International Infrastructure Management Manual – Version 3.0, 2006

http://openlibrary.org/books/OL21245688M/International_infrastructure_management_manual

Water Supply, Stormwater and Wastewater Condition Grading Standards: Civil Structures		
Grade	Condition	Description
0	Non-existent	Asset abandoned or no longer exists.
1	Very Good	Sound physical condition. Asset likely to perform adequately without major work for 25 years or more.
2	Good	Acceptable physical condition; minimal short-term failure risk but potential for deterioration in long-term (10 years plus). Only minor work required (if any).
3	Fair	Significant deterioration evident; failure unlikely within next 2 years but further deterioration likely and major replacement likely within next 10 years. Minor components or isolated sections of the asset need replacement or repair now but asset still functions safely at adequate level of service. Work required but asset is still serviceable.
4	Poor	Failure likely in short-term. Likely need to replace most or all of asset within 2 years. No immediate risk to health or safety but works required within 2 years to ensure asset remains safe. Substantial work required in short-term, asset barely serviceable.
5	Very Poor	Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently.

Source: International Infrastructure Management Manual – Version 3.0, 2006

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Condition Rating for Water Pipes	
Rating	Description
Excellent	No failures. Complies with engineering standards.
Good	Few failures. Few areas not complying with engineering standards.
Fair	Failures beginning to occur. Significant areas not complying with engineering standards.
Poor	Regular failures occurring and significant corrosion. Increases operating costs resulting. Many must be replaced.
Failing	Significant failures and should be substantially reconstructed.

Source: Guide to Accounting for and Reporting Tangible Capital Assets.
<http://www.psab-ccsp.ca/other-non-authoritative-guidance/item14603.pdf>

B. Roads

Condition Rating for Roads	
Rating	Description
Excellent	No potholes. No crack filling required. Complies with engineering standards.
Good	Some potholes. Minimal crack filing required. Complies with engineering standards.
Fair	Evidence of deterioration. Has numerous potholes and regular crack filling requirements.
Poor	Pavement deteriorating. Extensive potholes and cracks. Joint failures. Needs resurfacing.
Failing	Road bed and surface needs replacing.

Source: Guide to Accounting for and Reporting Tangible Capital Assets.
<http://www.psab-ccsp.ca/other-non-authoritative-guidance/item14603.pdf>

C. Bridge

An Example of a Condition Grading System for a Bridge	
Rating	Description
1	Excellent Condition: Only cyclic maintenance required
2	Very Good: Minor maintenance required plus cyclic maintenance.
3	Good: Significant maintenance required
4	Average: Significant renewal/upgrade required
5	Poor: Unserviceable

Source: International Infrastructure Management Manual – Version 3.0, 2006
http://openlibrary.org/books/OL21245688M/International_infrastructure_management_manual

D. Property Assets

Condition Grading System for Building Assets					
Element	CONDITION GRADE				
	1	2	3	4	5
	Very Good Condition	Good Condition	Moderate Condition	Poor Condition	Very Poor Condition
Estimated Proportion of Life Consumed	Up to 45%	Between 45% to 90%			90% to 100%
Structure	Sound structure	Functionally sound structure.	Adequate structure, some evidence of foundation movement, minor cracking.	Structure functioning but with problems due foundation movement. Some significant cracking.	Structure has serious problems and concern is held for the integrity of the structure.
External	Fabric constructed with sound materials, true to line and level. No evidence of deterioration or discolouration.	Showing minor wear and tear and minor deterioration of surfaces.	Appearance affected by minor cracking, staining or minor leakage. Indications of breaches of weatherproofing. Minor damage to coatings.	Fabric damaged, weakened or displaced. Appearance affected by cracking, staining, overflows or breakages. Breaches of weatherproofing evident. Coatings in need of heavy maintenance or renewal.	Fabric is badly damaged or weakened. Appearance affected by cracking, staining, overflows, leakage or damage. Breaches of waterproofing. Coatings badly damaged or non-existent.
Internal			Appearance affected by minor cracking, staining or minor leakage, some dampness or mildew. Minor damage to wall/ ceiling finishes.	Fabric damaged, weakened or displaced. Appearance affected by cracking, staining, dampness, leakage or breakages. Breaches of waterproofing evident. Finishes of poor quality and in need of replacement.	Fabric is badly damaged or weakened. Appearance affected by cracking, staining, leakage or willful damage. Breaches of waterproofing. Finishes badly damaged, marked and in need of replacement.
Services	All components operable and well maintained.	All components operable.	Occasional outages, breakdowns or blockages. Increased maintenance required.	Failures of plumbing electrical and mechanical components common place.	Plumbing electrical and mechanical components are unsafe or inoperable.
Fittings	Well-secured and operational, sound of function and appearance.	Operational and functional, minor wear and tear.	Generally operational. Minor breakage.	Fittings of poor quality and appearance, often inoperable and damaged.	Most are inoperable or damaged.

Condition Grading System for Building Assets					
Element	CONDITION GRADE				
	1	2	3	4	5
	Very Good Condition	Good Condition	Moderate Condition	Poor Condition	Very Poor Condition
Maintenance	Well maintained and clean.	Increased maintenance inspection required.	Regular and programmed maintenance inspections essential.	Frequent maintenance inspections essential. Short-term element replacement/rehabilitation.	Minimum life expectancy, requiring urgent rehabilitation or replacement.
Customers	No customer concerns.	Deterioration causes minimal influence on occupational uses. Occasional customer concerns.	Some deterioration beginning to be reflected in minor restrictions on operational uses. Customer concerns.	Regular customer complaints.	Generally not suitable for use by customers.

Source: International Infrastructure Management Manual – Version 3.0, 2006

http://openlibrary.org/books/OL21245688M/International_infrastructure_management_manual