
Sustainable cities and communities — Indicators for resilient cities

*Villes et communautés territoriales durables — Indicateurs de
performance pour les villes résilientes*

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 37123:2019

<https://standards.iteh.ai/catalog/standards/iso/d9640929-4bd5-47b5-9e83-8a5cbcf9010f/iso-37123-2019>



iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO 37123:2019

<https://standards.itih.ai/catalog/standards/iso/d9640929-4bd5-47b5-9e83-8a5cbcf9010f/iso-37123-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	x
Introduction.....	xi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 City indicators.....	3
5 Economy.....	4
5.1 Historical disaster losses as a percentage of city product.....	4
5.1.1 General.....	4
5.1.2 Indicator requirements.....	4
5.1.3 Data sources.....	5
5.2 Average annual disaster loss as a percentage of city product.....	5
5.2.1 General.....	5
5.2.2 Indicator requirements.....	5
5.2.3 Data sources.....	5
5.2.4 Data interpretation.....	6
5.3 Percentage of properties with insurance coverage for high-risk hazards.....	6
5.3.1 General.....	6
5.3.2 Indicator requirements.....	6
5.3.3 Data sources.....	6
5.3.4 Data interpretation.....	6
5.4 Percentage of total insured value to total value at risk within the city.....	7
5.4.1 General.....	7
5.4.2 Indicator requirements.....	7
5.4.3 Data sources.....	7
5.4.4 Data interpretation.....	7
5.5 Employment concentration.....	8
5.5.1 General.....	8
5.5.2 Indicator requirements.....	8
5.5.3 Data sources.....	8
5.5.4 Data interpretation.....	8
5.6 Percentage of the workforce in informal employment.....	8
5.6.1 General.....	8
5.6.2 Indicator requirements.....	9
5.6.3 Data sources.....	9
5.6.4 Data interpretation.....	9
5.7 Average household disposable income.....	9
5.7.1 General.....	9
5.7.2 Indicator requirements.....	9
5.7.3 Data sources.....	10
6 Education.....	10
6.1 Percentage of schools that teach emergency preparedness and disaster risk reduction.....	10
6.1.1 General.....	10
6.1.2 Indicator requirements.....	10
6.1.3 Data sources.....	10
6.2 Percentage of population trained in emergency preparedness and disaster risk reduction.....	11
6.2.1 General.....	11
6.2.2 Indicator requirements.....	11
6.2.3 Data sources.....	11
6.3 Percentage of emergency preparedness publications provided in alternative languages.....	11
6.3.1 General.....	11

6.3.2	Indicator requirements.....	11
6.3.3	Data sources.....	12
6.4	Educational disruption.....	12
6.4.1	General.....	12
6.4.2	Indicator requirements.....	12
6.4.3	Data sources.....	12
7	Energy.....	13
7.1	Number of different electricity sources providing at least 5 % of total energy supply capacity.....	13
7.1.1	General.....	13
7.1.2	Indicator requirements.....	13
7.1.3	Data sources.....	13
7.1.4	Data interpretation.....	14
7.2	Electricity supply capacity as a percentage of peak electricity demand.....	14
7.2.1	General.....	14
7.2.2	Indicator requirements.....	14
7.2.3	Data sources.....	14
7.3	Percentage of critical facilities served by off-grid energy services.....	14
7.3.1	General.....	14
7.3.2	Indicator requirements.....	15
7.3.3	Data sources.....	15
8	Environment and climate change.....	16
8.1	Magnitude of urban heat island effects (atmospheric).....	16
8.1.1	General.....	16
8.1.2	Indicator requirements.....	16
8.1.3	Data sources.....	16
8.1.4	Data interpretation.....	16
8.2	Percentage of natural areas within the city that have undergone ecological evaluation for their protective services.....	17
8.2.1	General.....	17
8.2.2	Indicator requirements.....	17
8.2.3	Data sources.....	17
8.3	Territory undergoing ecosystem restoration as a percentage of total city area.....	18
8.3.1	General.....	18
8.3.2	Indicator requirements.....	18
8.3.3	Data sources.....	18
8.3.4	Data interpretation.....	18
8.4	Annual frequency of extreme rainfall events.....	19
8.4.1	General.....	19
8.4.2	Indicator requirements.....	19
8.4.3	Data sources.....	19
8.5	Annual frequency of extreme heat events.....	19
8.5.1	General.....	19
8.5.2	Indicator requirements.....	19
8.5.3	Data sources.....	20
8.6	Annual frequency of extreme cold events.....	20
8.6.1	General.....	20
8.6.2	Indicator requirements.....	20
8.6.3	Data sources.....	20
8.7	Annual frequency of flood events.....	20
8.7.1	General.....	20
8.7.2	Indicator requirements.....	20
8.7.3	Data sources.....	21
8.8	Percentage of city land area covered by tree canopy.....	21
8.8.1	General.....	21
8.8.2	Indicator requirements.....	21
8.8.3	Data sources.....	21

8.9	Percentage of city surface area covered with high-albedo materials contributing to the mitigation of urban heat islands	21
8.9.1	General	21
8.9.2	Indicator requirements	22
8.9.3	Data sources	22
9	Finance	22
9.1	Annual expenditure on upgrades and maintenance of city service assets as a percentage of total city budget	22
9.1.1	General	22
9.1.2	Indicator requirements	22
9.1.3	Data sources	23
9.2	Annual expenditure on upgrades and maintenance of storm water infrastructure as a percentage of total city budget	23
9.2.1	General	23
9.2.2	Indicator requirements	23
9.2.3	Data sources	23
9.3	Annual expenditure allocated to ecosystem restoration in the city's territory as a percentage of total city budget	23
9.3.1	General	23
9.3.2	Indicator requirements	24
9.3.3	Data sources	24
9.3.4	Data interpretation	24
9.4	Annual expenditure on green and blue infrastructure as a percentage of total city budget	24
9.4.1	General	24
9.4.2	Indicator requirements	24
9.4.3	Data sources	25
9.4.4	Data interpretation	25
9.5	Annual expenditure on emergency management planning as a percentage of total city budget	25
9.5.1	General	25
9.5.2	Indicator requirements	25
9.5.3	Data sources	25
9.6	Annual expenditure on social and community services as a percentage of total city budget	26
9.6.1	General	26
9.6.2	Indicator requirements	26
9.6.3	Data sources	26
9.6.4	Data interpretation	26
9.7	Total allocation of disaster reserve funds as a percentage of total city budget	26
9.7.1	General	26
9.7.2	Indicator requirements	27
9.7.3	Data sources	27
9.7.4	Data interpretation	27
10	Governance	27
10.1	Frequency with which disaster-management plans are updated	27
10.1.1	General	27
10.1.2	Indicator requirements	27
10.1.3	Data sources	27
10.2	Percentage of essential city services covered by a documented continuity plan	28
10.2.1	General	28
10.2.2	Indicator requirements	28
10.2.3	Data sources	28
10.2.4	Data interpretation	28
10.3	Percentage of city electronic data with secure and remote back-up storage	29
10.3.1	General	29
10.3.2	Indicator requirements	29

10.3.3	Data sources.....	29
10.4	Percentage of public meetings dedicated to resilience in the city.....	29
10.4.1	General.....	29
10.4.2	Indicator requirements.....	29
10.4.3	Data sources.....	30
10.5	Number of intergovernmental agreements dedicated to planning for shocks as percentage of total intergovernmental agreements.....	30
10.5.1	General.....	30
10.5.2	Indicator requirements.....	30
10.5.3	Data sources.....	30
10.6	Percentage of essential service providers that have a documented business continuity plan.....	31
10.6.1	General.....	31
10.6.2	Indicator requirements.....	31
10.6.3	Data sources.....	31
10.6.4	Data interpretation.....	31
11	Health.....	32
11.1	Percentage of hospitals equipped with back-up electricity supply.....	32
11.1.1	General.....	32
11.1.2	Indicator requirements.....	32
11.1.3	Data sources.....	32
11.2	Percentage of population with basic health insurance.....	32
11.2.1	General.....	32
11.2.2	Indicator requirements.....	32
11.2.3	Data sources.....	33
11.3	Percentage of population that is fully immunized.....	33
11.3.1	General.....	33
11.3.2	Indicator requirements.....	33
11.3.3	Data sources.....	33
11.4	Number of infectious disease outbreaks per year.....	33
11.4.1	General.....	33
11.4.2	Indicator requirements.....	33
11.4.3	Data sources.....	34
11.4.4	Data interpretation.....	34
12	Housing.....	34
12.1	Capacity of designated emergency shelters per 100 000 population.....	34
12.1.1	General.....	34
12.1.2	Indicator requirements.....	34
12.1.3	Data sources.....	34
12.2	Percentage of buildings structurally vulnerable to high-risk hazards.....	35
12.2.1	General.....	35
12.2.2	Indicator requirements.....	35
12.2.3	Data sources.....	35
12.3	Percentage of residential buildings not in conformity with building codes and standards.....	35
12.3.1	General.....	35
12.3.2	Indicator requirements.....	35
12.3.3	Data sources.....	36
12.4	Percentage of damaged infrastructure that was “built back better” after a disaster.....	36
12.4.1	General.....	36
12.4.2	Indicator requirements.....	36
12.4.3	Data sources.....	37
12.4.4	Data interpretation.....	37
12.5	Annual number of residential properties flooded as a percentage of total residential properties in the city.....	37
12.5.1	General.....	37
12.5.2	Indicator requirements.....	38

12.5.3	Data sources.....	38
12.6	Percentage of residential properties located in high-risk zones.....	38
12.6.1	General.....	38
12.6.2	Indicator requirements.....	38
12.6.3	Data sources.....	38
13	Population and social conditions.....	39
13.1	Vulnerable population as a percentage of city population.....	39
13.1.1	General.....	39
13.1.2	Indicator requirements.....	39
13.1.3	Data sources.....	39
13.1.4	Data interpretation.....	39
13.2	Percentage of population enrolled in social assistance programmes.....	40
13.2.1	General.....	40
13.2.2	Indicator requirements.....	40
13.2.3	Data sources.....	40
13.3	Percentage of population at high risk from natural hazards.....	40
13.3.1	General.....	40
13.3.2	Indicator requirements.....	40
13.3.3	Data sources.....	41
13.4	Percentage of neighbourhoods with regular and open neighbourhood association meetings.....	41
13.4.1	General.....	41
13.4.2	Indicator requirements.....	41
13.4.3	Data sources.....	41
13.5	Annual percentage of the city population directly affected by natural hazards.....	41
13.5.1	General.....	41
13.5.2	Indicator requirements.....	42
13.5.3	Data sources.....	42
14	Recreation.....	42
15	Safety.....	42
15.1	Percentage of city population covered by multi-hazard early warning system.....	42
15.1.1	General.....	42
15.1.2	Indicator requirements.....	42
15.1.3	Data sources.....	43
15.2	Percentage of emergency responders who have received disaster response training.....	43
15.2.1	General.....	43
15.2.2	Indicator requirements.....	43
15.2.3	Data sources.....	43
15.3	Percentage of local hazard warnings issued by national agencies annually that are received in a timely fashion by the city.....	43
15.3.1	General.....	43
15.3.2	Indicator requirements.....	44
15.3.3	Data sources.....	44
15.4	Number of hospital beds in the city destroyed or damaged by natural hazards per 100 000 population.....	44
15.4.1	General.....	44
15.4.2	Indicator requirements.....	44
15.4.3	Data sources.....	45
16	Solid waste.....	45
16.1	Number of active and temporary waste management sites available for debris and rubble per square kilometre.....	45
16.1.1	General.....	45
16.1.2	Indicator requirements.....	45
16.1.3	Data sources.....	45
17	Sport and culture.....	45