



Rotterdam Open Data

Protocol definition dynamic data

April 7, 2014
Document version 0.3

Verified by:
Technolution B.V.

Yvon Kalmeijer
Senior Consultant

DOCUMENT INFORMATION

Title: Protocol definition dynamic data
Client: Gemeente Rotterdam
Author(s): Oskar Janssen
Version: 0.3
Date: April 7, 2014
File: Open Data Rotterdam protocol definition dynamic data v0.3.docx
Project: Rotterdam Open Data
Project number: GMR12001

Document versions:

Version	Datue	Author	Comments	Review	Style
0.1	26-02-2014	OJA	Initial version	YKA	BHE
0.2	04-02-2014	OJA	Update after review		
0.3	07-04-2014	OJA	Update after meeting with Anton		

Document distribution:

Gemeente Rotterdam

Mark Lodder
Anton Ruiter

Technolution B.V.

Sandor van Goor
Yvon Kalmeijer
Henk den Breejen

This word is provided under the terms of the Creative Commons Public License. A summary explanation is available at:

<http://creativecommons.org/licenses/by-nd/3.0/>

Full license text is at the end of this document and available at:

<http://creativecommons.org/licenses/by-nd/3.0/legalcode>

© Technolution B.V.

CONTENTS

1.	INTRODUCTION	4
1.1	Context	4
1.2	Purpose of this document	4
2.	OPEN DATA PROTOCOL	5
2.1	Dynamic parking data.....	5
2.1.1	ActualStatus	6
2.2	Dynamic bridge data	6
2.2.1	ActualStatus	6
2.2.2	<Enumeration> BridgeStatus	6
2.3	Dynamic display data	7
2.3.1	ActualStatus	7
2.3.2	<Enumeration> DisplayStatus.....	7
2.4	Dynamic VRI data	8
2.4.1	ActualStatus	8
2.4.2	<Enumeration> VriStatus.....	8
3.	REST INTERFACE	9
3.1	Client pull response	9
3.2	Authentication.....	9
3.3	Server status response codes.....	10
4.	GLOSSARY	11
5.	DOCUMENT REFERENCES.....	12
	APPENDIX A. ICON TAGS FOR DISPLAYS.....	13
	APPENDIX B. CREATIVE COMMONS LICENTIE.....	14

1. INTRODUCTION

1.1 Context

The City of Rotterdam gathers, produces and maintains a large amount of data. This data includes information about bridges, parking lots, information panels etc.

The 'Open Data' project initiated by the City of Rotterdam makes this data available to the public for common use.

Rotterdam Open Data is published in such a way that it is compliant to the 'Standard for Publishing Dynamic Parking Data' protocol [TL_SPDP]. The protocol has been extended for other required data types. However, Open Data does not support all of the functionality described in [TL_SPDP]; only dynamic data and only via the so-called 'pull' protocol (see Figure 1).

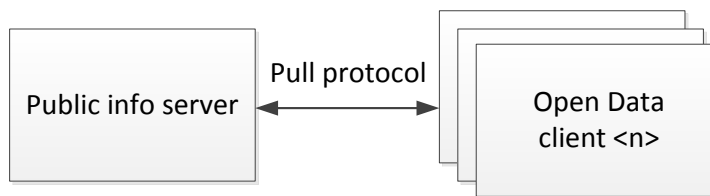


Figure 1: System overview

1.2 Purpose of this document

This document describes the Open Data protocol that is available to Open Data clients for obtaining dynamic data. Application developers can use this document as reference guide.

2. OPEN DATA PROTOCOL

Four object types are supported for the Rotterdam Open Data protocol:

- parking facilities;
- bridges;
- information displays;
- VRI's¹.

[TL_SPDP] only describes the content of parking facility data. This chapter describes the contents of other object types as well; these descriptions are not based on a standard (since there is currently no standard for this type of data). For the sake of completeness the definition of parking data has also been included.

Objects are matched by a UUID, which is part of the requested URL (see chapter 3 for details). The UUID is also part of a generic wrapper structure that is applicable to all object types. Figure 2 shows this generic structure and its relation to the ActualStatus object for parking data (as defined in [TL_SPDP]).

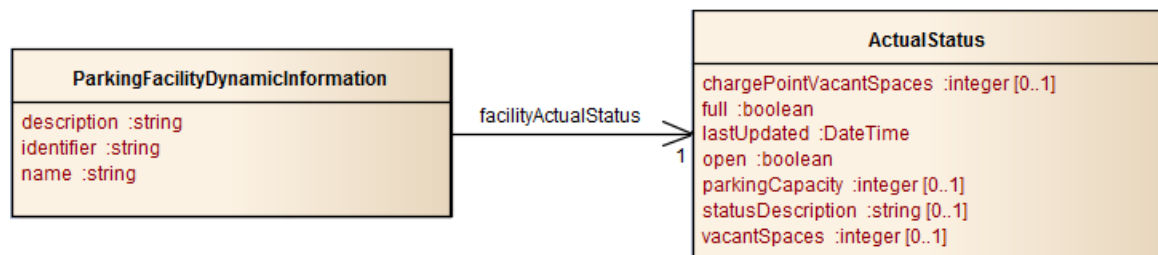


Figure 2: Dynamic data structure for parking data

The meaning of the fields of the generic structure are described in the following table. This table is applicable to all object types described in the remainder of this chapter.

Field	Description
description	Description of the object
identifier	UUID of the object
name	Name of the object

All timestamp fields 'lastUpdated' represent seconds since Unix Epoch (according to [TL_SPDP]).

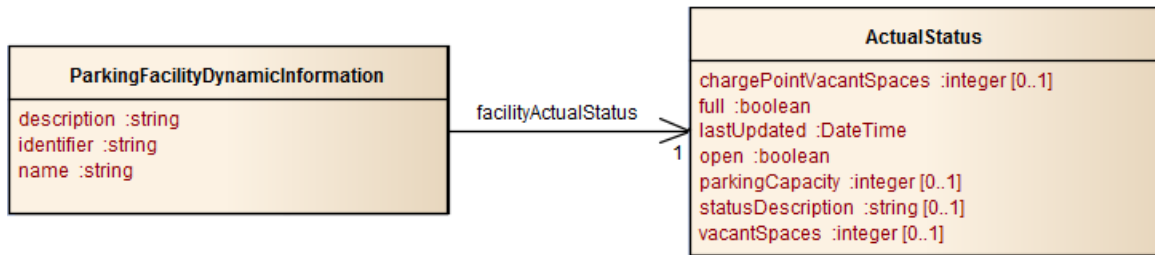
Not all attributes of ActualStatus objects are mandatory. Optional attributes are marked with [0..1].

2.1 Dynamic parking data

As described in [TL_SPDP].

¹ VRI is an abbreviation of the dutch word 'verkeersregelinstallatie'. This is a generic term that can be translated as 'traffic control installation'. In the Rotterdam Open Data interface a 'VRI' is equivalent to the subtype 'traffic light'.

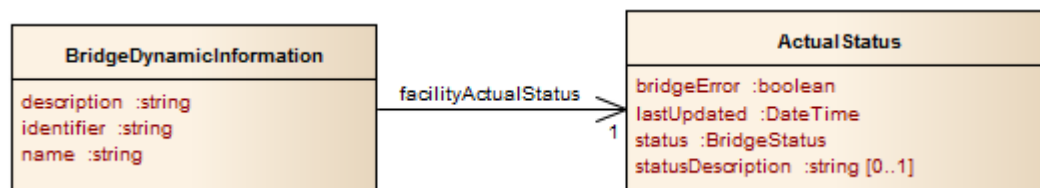
2.1.1 ActualStatus



Field	Description
chargePointVacantSpaces	Number of vacant parking spaces with a charge point.
full	Indicates whether the facility currently has vacant spaces for visitors.
lastUpdated	Timestamp of last update.
open	Indicates whether the facility is currently open to visitors.
parkingCapacity	Number of parking spaces for area, facility of assigned parking. This capacity may be dynamic, e.g. when a dynamic allocation is made for subscription holders. This number therefore signifies the total number of parking spaces (occupied and non-occupied) for casual users.
statusDescription	Explanation for the current actual status.
vacantSpaces	Number of vacant spaces for area, facility or assigned parking.

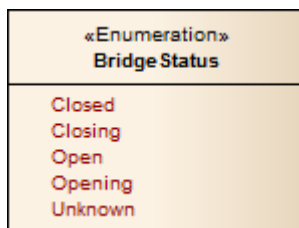
2.2 Dynamic bridge data

2.2.1 ActualStatus



Field	Description
bridgeError	Indicates if the bridge is currently in error state (this state is independent of the operational state). This might be due to a broken peripheral (e.g. a warning light).
lastUpdated	Timestamp of last update.
status	Operational state of the bridge. See paragraph 2.2.2 for details.
statusDescription	Explanation for the current actual status.

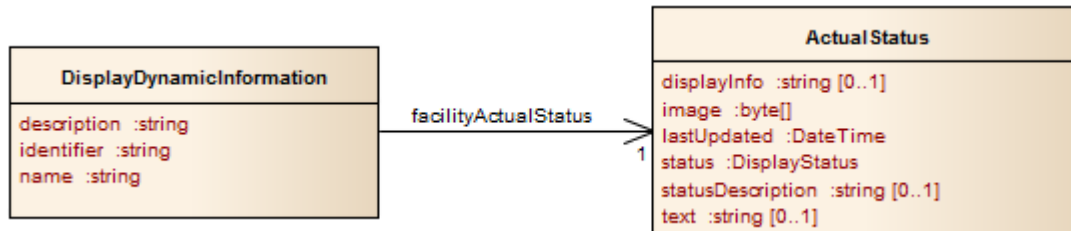
2.2.2 <Enumeration> BridgeStatus



Field	Description
Closed	The bridge is closed. Road traffic can cross the bridge.
Closing	The bridge is moving from 'Open' to 'Closed' state.
Open	The bridge is fully opened. No road traffic can cross the bridge.
Opening	The bridge is moving from 'Closed' to 'Open' state.
Unknown	The bridge status is unknown (e.g. no communication).

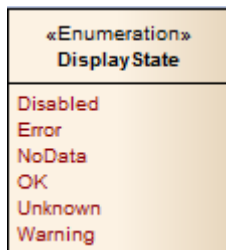
2.3 Dynamic display data

2.3.1 ActualStatus



Field	Description
displayInfo	A string representing (optional) display information like current luminance, temperature and protocol version.
image	Array of bytes representing the current image in PNG format. This includes text and images (the full display content is represented as an image).
lastUpdated	Timestamp of last update.
status	Operational state of the display. See paragraph 2.3.2 for details.
statusDescription	Explanation for the current actual status.
text	The display content represented as a (readable) ASCII text string. Predefined icons are represented by a 'tag' ² . Other images are not available as text. Multiple lines are separated by a line feed ('\n').

2.3.2 <Enumeration> DisplayStatus

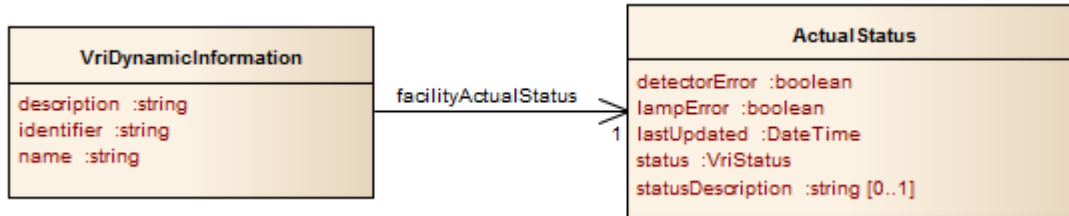


Field	Description
Disabled	The display is extinguished.
Error	The display has an error.
NoData	The display has no data to show.
OK	The display functions as intended.
Unknown	The display cannot be operated (e.g. no communication).
Warning	The display has a non-critical error (e.g. single led defect).

² See Appendix A for details

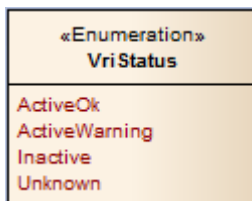
2.4 Dynamic VRI data

2.4.1 ActualStatus



Field	Description
detectorError	Indicates if the VRI has 1 or more defect detectors.
lampError	Indicates if the VRI has 1 or more defect lamps.
lastUpdated	Timestamp of last update.
status	Operational status of the VRI. See paragraph 2.4.2 for details.
statusDescription	Explanation for the current actual status.

2.4.2 <Enumeration> VriStatus



Field	Description
ActiveOk	The VRI is controlled autonomously without any problems.
ActiveWarning	The VRI is controlled autonomously, but has problems (e.g. a lamp or detector problem).
Inactive	The VRI is not being controlled (e.g. extinguished or blinking).
Unknown	The status of the VRI is unknown (e.g. no communication).

3. REST INTERFACE

Clients obtain data by requesting a URL. This URL is built up as follows:

```
http://<server_IP>/<objectType>/<version>/<static|dynamic>/<UUID>
```

- <server_IP>: the IP address of the server;
- <objectType>: one of the following types:
 - parkingdata;
 - bridgedata;
 - displaydata;
 - vridata.
- <version>: protocol version (for the current interface 'v1');
- <static|dynamic>: indicates whether 'static' or 'dynamic' data is involved.
Only dynamic data is supported;
- <UUID>: globally unique identifier.

3.1 Client pull response

Since the UUID is globally unique, it corresponds to exactly one item if it exists. The actual status is returned as follows (example based on [TL_SPDP]):

```
GET /parkingdata/v1/dynamic/<UUID> HTTP/1.1
Content-Type: application/json
Content-Length: ...
{
  "parkingFacilityDynamicInformation": {
    "description": "...",
    "identifier": "UUID",
    "name": "p1",
    "facilityActualStatus": {
      "lastUpdated": 1386166308,
      "open": true,
      "full": false,
      "statusDescription": "...",
      "parkingCapacity": 250,
      "vacantSpaces": 123,
      "chargePointVacantSpaces": 0
    }
  }
}
```

An error code is returned if the requested UUID cannot be found (see 3.3).

3.2 Authentication

No authentication is required for the Rotterdam Open Data interface towards clients.

3.3 Server status response codes

According to [TL_SPDP], the server can respond with one of the following HTTP response codes:

- status code 200 ('Ok') if the request was accepted by the server;
- status code 400 ('Bad request') if the request is incorrect according to the server;
- status code 404 ('Not found') if the server has no data for this object.

4. GLOSSARY

Abbreviation	Explanation
HTTP	Hypertext Transfer Protocol
JSON	JavaScript Object Notation
URL	Uniform Resource Locator
UUID	Universally Unique Identifier

5. DOCUMENT REFERENCES





























































Reference	Document
[TL_SPDP]	Standaard voor Publicatie Dynamische Parkeerdata, Standard for Publishing Dynamic Parking Data, Werkgroep SPDP, version 1.0, 09-02-2014

APPENDIX A. ICON TAGS FOR DISPLAYS

Some displays support the ability to show text lines combined with icons. These icons are part of a fixed set. To show an icon, a tag is inserted in the text line.

A tag has to following format: ``${icon_tag}`` (e.g. ``${tram}``)

The table below shows the mapping between available tags and the corresponding icon.

tag	icon	tag	icon	tag	icon	tag	icon
aanhanger		keerom		pr		tafrit	
afrit		knooppunt		proute		te	
auto		min		sleep		tn	
autoz		ns		spatie		tram	
bedrijf		ongeval		t0		trein	
brug		p		t1		ts	
bus		pech		t2		tu	
centrum		pijlhl		t3		tunnel	
chl		pijlhr		t4		vliegh	
chr		pijkl		t5		vliegl	
cl		pijkr		t6		vliegr	
cop		pijll		t7		voetbal	
cr		pijllr		t8		vrachtwagen	
file		pijlop		t9		wiu	
h		plus		ta		zoo	

APPENDIX B. CREATIVE COMMONS LICENTIE

THE WORK (AS DEFINED BELOW) IS PROVIDED UNDER THE TERMS OF THIS CREATIVE COMMONS PUBLIC LICENSE ("CCPL" OR "LICENSE"). THE WORK IS PROTECTED BY COPYRIGHT AND/OR OTHER APPLICABLE LAW. ANY USE OF THE WORK OTHER THAN AS AUTHORIZED UNDER THIS LICENSE OR COPYRIGHT LAW IS PROHIBITED.

BY EXERCISING ANY RIGHTS TO THE WORK PROVIDED HERE, YOU ACCEPT AND AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE. TO THE EXTENT THIS LICENSE MAY BE CONSIDERED TO BE A CONTRACT, THE LICENSOR GRANTS YOU THE RIGHTS CONTAINED HERE IN CONSIDERATION OF YOUR ACCEPTANCE OF SUCH TERMS AND CONDITIONS.

1. Definitions

"Adaptation" means a work based upon the Work, or upon the Work and other pre-existing works, such as a translation, adaptation, derivative work, arrangement of music or other alterations of a literary or artistic work, or phonogram or performance and includes cinematographic adaptations or any other form in which the Work may be recast, transformed, or adapted including in any form recognizably derived from the original, except that a work that constitutes a Collection will not be considered an Adaptation for the purpose of this License. For the avoidance of doubt, where the Work is a musical work, performance or phonogram, the synchronization of the Work in timed-relation with a moving image ("synching") will be considered an Adaptation for the purpose of this License.

"Collection" means a collection of literary or artistic works, such as encyclopedias and anthologies, or performances, phonograms or broadcasts, or other works or subject matter other than works listed in Section 1(f) below, which, by reason of the selection and arrangement of their contents, constitute intellectual creations, in which the Work is included in its entirety in unmodified form along with one or more other contributions, each constituting separate and independent works in themselves, which together are assembled into a collective whole. A work that constitutes a Collection will not be considered an Adaptation (as defined above) for the purposes of this License.

"Distribute" means to make available to the public the original and copies of the Work through sale or other transfer of ownership.

"Licensor" means the individual, individuals, entity or entities that offer(s) the Work under the terms of this License.

"Original Author" means, in the case of a literary or artistic work, the individual, individuals, entity or entities who created the Work or if no individual or entity can be identified, the publisher; and in addition (i) in the case of a performance the actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret or otherwise perform literary or artistic works or expressions of folklore; (ii) in the case of a phonogram the producer being the person or legal entity who first fixes the sounds of a performance or other sounds; and, (iii) in the case of broadcasts, the organization that transmits the broadcast.

"Work" means the literary and/or artistic work offered under the terms of this License including without limitation any production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression including digital form, such as a book, pamphlet and other writing; a lecture, address, sermon or other work of the same nature; a dramatic or dramatico-musical work;

a choreographic work or entertainment in dumb show; a musical composition with or without words; a cinematographic work to which are assimilated works expressed by a process analogous to cinematography; a work of drawing, painting, architecture, sculpture, engraving or lithography; a photographic work to which are assimilated works expressed by a process analogous to photography; a work of applied art; an illustration, map, plan, sketch or three-dimensional work relative to geography, topography, architecture or science; a performance; a broadcast; a phonogram; a compilation of data to the extent it is protected as a copyrightable work; or a work performed by a variety or circus performer to the extent it is not otherwise considered a literary or artistic work.

"You" means an individual or entity exercising rights under this License who has not previously violated the terms of this License with respect to the Work, or who has received express permission from the Licensor to exercise rights under this License despite a previous violation.

"Publicly Perform" means to perform public recitations of the Work and to communicate to the public those public recitations, by any means or process, including by wire or wireless means or public digital performances; to make available to the public Works in such a way that members of the public may access these Works from a place and at a place individually chosen by them; to perform the Work to the public by any means or process and the communication to the public of the performances of the Work, including by public digital performance; to broadcast and rebroadcast the Work by any means including signs, sounds or images.

"Reproduce" means to make copies of the Work by any means including without limitation by sound or visual recordings and the right of fixation and reproducing fixations of the Work, including storage of a protected performance or phonogram in digital form or other electronic medium.

2. Fair Dealing Rights. Nothing in this License is intended to reduce, limit, or restrict any uses free from copyright or rights arising from limitations or exceptions that are provided for in connection with the copyright protection under copyright law or other applicable laws.

3. License Grant. Subject to the terms and conditions of this License, Licensor hereby grants You a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) license to exercise the rights in the Work as stated below:

to Reproduce the Work, to incorporate the Work into one or more Collections, and to Reproduce the Work as incorporated in the Collections; and,

to Distribute and Publicly Perform the Work including as incorporated in Collections.

For the avoidance of doubt:

Non-waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme cannot be waived, the Licensor reserves the exclusive right to collect such royalties for any exercise by You of the rights granted under this License;

Waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme can be waived, the Licensor waives the exclusive right to collect such royalties for any exercise by You of the rights granted under this License; and,

Voluntary License Schemes. The Licensor waives the right to collect royalties, whether individually or, in the event that the Licensor is a member of a collecting society that administers voluntary licensing schemes, via that society, from any exercise by You of the rights granted under this License.

The above rights may be exercised in all media and formats whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats, but otherwise you have no rights to make Adaptations. Subject to Section 8(f), all rights not expressly granted by Licensor are hereby reserved.

4. Restrictions. The license granted in Section 3 above is expressly made subject to and limited by the following restrictions:

You may Distribute or Publicly Perform the Work only under the terms of this License. You must include a copy of, or the Uniform Resource Identifier (URI) for, this License with every copy of the Work You Distribute or Publicly Perform. You may not offer or impose any terms on the Work that restrict the terms of this License or the ability of the recipient of the Work to exercise the rights granted to that recipient under the terms of the License. You may not sublicense the Work. You must keep intact all notices that refer to this License and to the disclaimer of warranties with every copy of the Work You Distribute or Publicly Perform. When You Distribute or Publicly Perform the Work, You may not impose any effective technological measures on the Work that restrict the ability of a recipient of the Work from You to exercise the rights granted to that recipient under the terms of the License. This Section 4(a) applies to the Work as incorporated in a Collection, but this does not require the Collection apart from the Work itself to be made subject to the terms of this License. If You create a Collection, upon notice from any Licensor You must, to the extent practicable, remove from the Collection any credit as required by Section 4(b), as requested.

If You Distribute, or Publicly Perform the Work or Collections, You must, unless a request has been made pursuant to Section 4(a), keep intact all copyright notices for the Work and provide, reasonable to the medium or means You are utilizing: (i) the name of the Original Author (or pseudonym, if applicable) if supplied, and/or if the Original Author and/or Licensor designate another party or parties (e.g., a sponsor institute, publishing entity, journal) for attribution ("Attribution Parties") in Licensor's copyright notice, terms of service or by other reasonable means, the name of such party or parties; (ii) the title of the Work if supplied; (iii) to the extent reasonably practicable, the URI, if any, that Licensor specifies to be associated with the Work, unless such URI does not refer to the copyright notice or licensing information for the Work. The credit required by this Section 4(b) may be implemented in any reasonable manner; provided, however, that in the case of a Collection, at a minimum such credit will appear, if a credit for all contributing authors of the Collection appears, then as part of these credits and in a manner at least as prominent as the credits for the other contributing authors. For the avoidance of doubt, You may only use the credit required by this Section for the purpose of attribution in the manner set out above and, by exercising Your rights under this License, You may not implicitly or explicitly assert or imply any connection with, sponsorship or endorsement by the Original Author, Licensor and/or Attribution Parties, as

appropriate, of You or Your use of the Work, without the separate, express prior written permission of the Original Author, Licensor and/or Attribution Parties.

Except as otherwise agreed in writing by the Licensor or as may be otherwise permitted by applicable law, if You Reproduce, Distribute or Publicly Perform the Work either by itself or as part of any Collections, You must not distort, mutilate, modify or take other derogatory action in relation to the Work which would be prejudicial to the Original Author's honor or reputation.

5. Representations, Warranties and Disclaimer

UNLESS OTHERWISE MUTUALLY AGREED TO BY THE PARTIES IN WRITING, LICENSOR OFFERS THE WORK AS-IS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND CONCERNING THE WORK, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR THE ABSENCE OF LATENT OR OTHER DEFECTS, ACCURACY, OR THE PRESENCE OF ABSENCE OF ERRORS, WHETHER OR NOT DISCOVERABLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO SUCH EXCLUSION MAY NOT APPLY TO YOU.

6. Limitation on Liability. EXCEPT TO THE EXTENT REQUIRED BY APPLICABLE LAW, IN NO EVENT WILL LICENSOR BE LIABLE TO YOU ON ANY LEGAL THEORY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF THIS LICENSE OR THE USE OF THE WORK, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

7. Termination

This License and the rights granted hereunder will terminate automatically upon any breach by You of the terms of this License. Individuals or entities who have received Collections from You under this License, however, will not have their licenses terminated provided such individuals or entities remain in full compliance with those licenses. Sections 1, 2, 5, 6, 7, and 8 will survive any termination of this License.

Subject to the above terms and conditions, the license granted here is perpetual (for the duration of the applicable copyright in the Work). Notwithstanding the above, Licensor reserves the right to release the Work under different license terms or to stop distributing the Work at any time; provided, however that any such election will not serve to withdraw this License (or any other license that has been, or is required to be, granted under the terms of this License), and this License will continue in full force and effect unless terminated as stated above.

8. Miscellaneous

Each time You Distribute or Publicly Perform the Work or a Collection, the Licensor offers to the recipient a license to the Work on the same terms and conditions as the license granted to You under this License.

If any provision of this License is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this License, and without further action by the parties to this agreement, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.

No term or provision of this License shall be deemed waived and no breach consented to unless such waiver or consent shall be in writing and signed by the party to be charged with such waiver or consent.

This License constitutes the entire agreement between the parties with respect to the Work licensed here. There are no understandings, agreements or representations with respect to the Work not specified here. Licensor shall not be bound by any additional provisions that may appear in any communication from You. This License may not be modified without the mutual written agreement of the Licensor and You.

The rights granted under, and the subject matter referenced, in this License were drafted utilizing the terminology of the Berne Convention for the Protection of Literary and Artistic Works (as amended on September 28, 1979), the Rome Convention of 1961, the WIPO Copyright Treaty of 1996, the WIPO Performances and Phonograms Treaty of 1996 and the Universal Copyright Convention (as revised on July 24, 1971). These rights and subject matter take effect in the relevant jurisdiction in which the License terms are sought to be enforced according to the corresponding provisions of the implementation of those treaty provisions in the applicable national law. If the standard suite of rights granted under applicable copyright law includes additional rights not granted under this License, such additional rights are deemed to be included in the License; this License is not intended to restrict the license of any rights under applicable law.