

# *GEOINFORMATION IN DIGITAL LIBRARIES AND LINKED DATA*

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DH2016

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# OVERVIEW

- Intro – LD4L project
- History/Background: MARC Bibliographic Records
- Linked Records / BIBFRAME
- Current Project: LD4L-Labs & LD4L-Production (LD4P)
  - Sub-group Examining Cartographic Content
- Gathering your input / Use Cases

# WHITHER MARC?

- Developed in the 1960s
- MARC coded catalog records were created with the intent to share catalog records electronically
- They are created and used by virtually all library catalog systems around the world
- Is not discoverable on the web
- MARC is not indexed by search engines (other than formal catalog systems)
- Bibliographic connects to extensive names and subjects cross referencing structures

# MARC CATALOG RECORD

- Text-based
- Flat data structure
- Non-semantic
- Deployed in closed systems

San Francisco and vicinity.  
Southern Pacific Company.  
[San Francisco, Calif.] : Southern Pacific Company, c1915 (Buffalo, N.Y. : Matthews-Northrup Works)

[View Online](#) Locations & Availability [Details](#) [Browse Shelf](#)

Title: San Francisco and vicinity.  
Author / Creator: [Southern Pacific Company](#).  
Published: [San Francisco, Calif.] : Southern Pacific Company, c1915 (Buffalo, N.Y. : Matthews-Northrup Works)  
Description: Scale [ca. 1:30,800] (W 122°31'--W 122°21'/N 37°49'--N 37°42')  
1 map : col., both sides ; 65 x 68 cm..  
Language: English  
Notes: Relief shown by hachures.  
Inset map: San Francisco and adjacent territory.  
Indexed.  
Text, ill., and map on verso.  
Folded titles: Map of San Francisco : California invites the world, Panama Pacific Exposition. -- Map of San Francisco : what to see, how to see.  
Copyright dates: 1914 on recto, 1915 on verso.  
Available also as a digital image through the Harvard University Web site.  
Subject: [Transportation -- California -- San Francisco -- Maps.](#); [San Francisco \(Calif.\) -- Maps.](#)  
Form / Genre: Maps.  
Author / Creator: [Matthews-Northrup Works](#).  
Other title / series: [Harvard Map Collection digital maps. Imaging the Urban Environment.](#); [Harvard Map Collection digital maps. California. San Francisco.](#)  
HOLLIS Number: 008620083  
Creation Date: c1915  
Permalink: <http://id.lib.harvard.edu/aleph/008620083/catalog>  
Source: HVD ALEPH

# GEOGRAPHIC FIELDS IN MARC CODE

043 Geographic  
Area Code

260 & 008  
Place of  
Publication

500 & 505  
Keywords in notes

650 & 651 Places in  
Subject Headings

830  
Place in Series Title

008121009s2013 txu bk 001 0 eng c  
010\_ |a 2012041446  
035\_ |a (OCOlc)ocn813301036  
040\_ |a TXA/DLC |c DLC |d TXA  
043\_ |a n-us-tx  
049\_ |a TXAM  
05000 |a ML3477.8.D35 |b G68 2013  
08200 |a 781.6409764/2812 |2 23  
1001\_ |a Govenar, Alan B., |d 1952-  
24510 |a Deep Ellum : |b the other side of Dallas / |c Alan Govenar and Jay Brakefield.  
250\_ |a 1st Texas A&M University Press ed.  
260\_ |a College Station : |b Texas A&M University Press, |c c2013.  
300\_ |a x, 307 p. |b ill. ; |c 24 cm.  
4901\_ |a John and Robin Dickson series in Texas music  
500\_ |a Previously published under title: Deep Ellum and Central Track.  
Denton, Tex. : University of North Texas Press, 1998.  
504\_ |a Includes bibliographical references, discography and index.  
5050\_ |a Deep Ellum: fact and fiction -- "Deep Elem blues": song of the street -- The railroads create Deep Ellum -- William Sidney Pittman: architect of Deep Ellum -- Black Dallas -- Jewish pawnbrokers and merchants of Deep Ellum -- Blind Lemon Jefferson: downhome blues -- The contemporaries of Blind Lemon -- Blind Willie Johnson and Arizona Dranes: the "holy blues" of Deep Ellum -- Alex Moore: Dallas piano blues.  
650\_0 |a Popular music |z Texas |z Dallas |x History and criticism.  
650\_0 |a African Americans |z Texas |z Dallas |x Music |x History and criticism.  
651\_0 |a Deep Ellum (Dallas, Tex.) |x History.  
651\_0 |a Dallas (Tex.) |x Social life and customs.  
7001\_ |a Brakefield, Jay F., |d 1945  
830\_0 |a John and Robin Dickson series in Texas music.

# SUBJECT AUTHORITY RECORD WITH GEOGRAPHIC COORDINATES

ARN 2060379							
<u>Govt agn</u>	<input checked="" type="checkbox"/>	<u>Auth status</u>	<input type="checkbox"/> a	<u>Subj</u>	<input type="checkbox"/> a	<u>Subj use</u>	<input type="checkbox"/> a
<u>Series</u>	<input type="checkbox"/> n	<u>Auth/ref</u>	<input type="checkbox"/> a	<u>Geo subd</u>	<input checked="" type="checkbox"/>	<u>Ser use</u>	<input type="checkbox"/> b
<u>Ser num</u>	<input type="checkbox"/> n	<u>Name</u>	<input type="checkbox"/> n	<u>Subdiv tp</u>	<input type="checkbox"/> n	<u>Rules</u>	<input type="checkbox"/> n
010		sh 85114790					
040		DLC #b eng #c DLC #d DLC					
034		#d W1150000 #e W1150000 #f N0490000 #g N0490000 #2 Other					
151		Rocky Mountains					
451		Rockies					
451		Stoney Mountains					
550		Mountains #z Canada #w g					
550		Mountains #z West (U.S.) #w g					
670		Longman, Hurst, Rees, and Orme. N. America, 1807: #b map recto (Stoney Mountains)					
670		Oxford Atlas of the World, 2008 #b (range; 49°00'00"N 115°00'00"W)					
675		GNIS; #a Col. gaz. web site					
781	0	#z Rocky Mountains					

# AUTHORITY RECORD WITH REFERENCES TO VERNACULAR NAME

ARN		538469
010		n 80158592 #z sh 85076792
040		DLC #b eng #c DLC #d DLC-S #d DLC #d WaU #d OCoLC #d WaU
034		#d E0093200 #e E0093200 #f N0471000 #g N0471000 #2 geonames
043		e-lh---
151		Liechtenstein
451		Likhtenshtein
451		Fürstentum Liechtenstein
451		Principality of Liechtenstein
451		Lēohtenstān
451		Lēohtenstān Pēodenīče
451		Prinsdom van Liechtenstein
451		Prencipato de Liechtenstein
451		Principáu de Liechtenstein
451		Lixtensteyn
451		Ліхтенштейн
451		Княства Ліхтенштейн
451		Kni <sup>â</sup> stva Likhtenshtein

# BIBFRAME

- A way to evolve the catalog to a linked environment
- Launched in 2011 by LC, uses triples statements
- 2016 version 2.0 of BIBFRAME (model, vocabulary, profiles)
  - implementation testbeds & pilot - specialty groups – arts, music, maps
  - tool development – including transformation services
- Work (has instance) → Instance (has Item) → Item

# BIBFRAME 2.0 DESCRIPTION

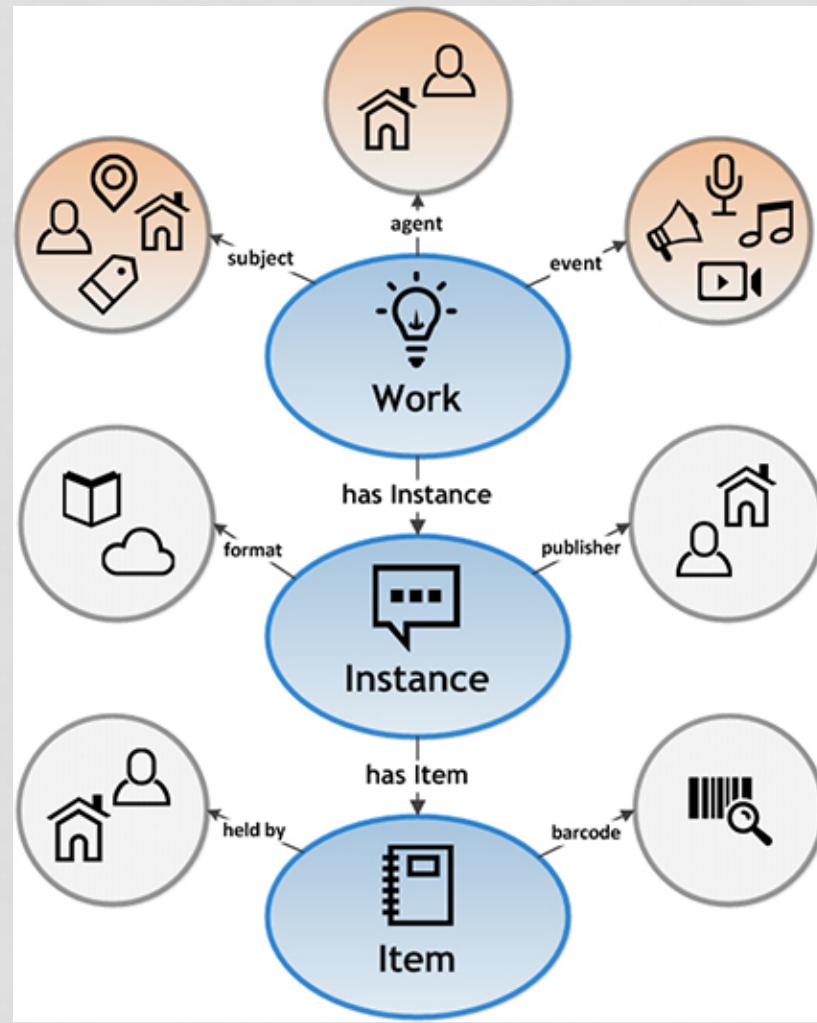
## BIBFRAME 1.0

- Linked descriptions
- Graph data structure
- Semantically-enabled
- Deployed on open web

BIBFRAME 2.0 adds to Work/Instance/Item:

- Agents
- Subjects
- Events

Library of Congress  
BIBFRAME 2.0 Model<sup>3</sup>



# LIBRARY OF CONGRESS NAME AUTHORITY RECORD IN LOD

[ASK A LIBRARIAN](#)[DIGITAL COLLECTIONS](#)[LIBRARY CATALOGS](#)

The Library of Congress > Linked Data Service > LC Subject Headings

## Transportation

From [Library of Congress Subject Headings](#)

[Details](#) [Visualization](#) [Suggest Terminology](#)

### Transportation

#### URI(s)

- > <http://id.loc.gov/authorities/subjects/sh85137027>
- > <info:lc/authorities/sh85137027>
- > <http://id.loc.gov/authorities/sh85137027#concept>

#### Instance Of

- > [MADS/RDF Topic](#)
- > [MADS/RDF Authority](#)
- > [SKOS Concept](#) ↗

#### Scheme Membership(s)

- > [Library of Congress Subject Headings](#)

#### Collection Membership(s)

- > [LCSH Collection - Authorized Headings](#)
- > [LCSH Collection - General Collection](#)
- > [LCSH Collection - May Subdivide Geographically](#)

#### Variants

- > Public transportation
- > Transport
- > Transportation--Economic aspects
- > Transportation, Primitive
- > Transportation companies
- > Transportation industry

#### Broader Terms

- > Locomotion

#### Narrower Terms

- > Acids--Handling and transportation
- > Air travel
- > Bridges

# LOD VOCABULARIES FOR CARTOGRAPHIC MATERIALS

- Dbpedia
- GeoNames
- VIAF
- Library of Congress
- Getty Thesaurus of Geographic Names

# BENEFITS OF SUPPORTING LIBRARY BIBLIOGRAPHIC METADATA IN LOD

Increased discoverability

Disambiguation through URIs & structured web

Improved interoperability

# LOD EXAMPLE: RAVENS HOUSE

**Library of Congress**  
Authorities & Vocabularies

The Library of Congress > [Linked Data Service](#) > LC Subject Headings

**Kamienica Pod Kruki (Kraków, Poland)**

From [Library of Congress Subject Headings](#)

- [Details](#)
- [Visualization](#)
- [Suggest Terminology](#)

 **Kamienica Pod Kruki (Kraków, Poland)**

- URI(s)
  - <http://id.loc.gov/authorities/subjects/sh2009007699>
  - <info:lc/authorities/sh2009007699>
  - <http://id.loc.gov/authorities/sh2009007699#concept>
- Instance Of
  - [MADS/RDF CorporateName](#)
  - [MADS/RDF Authority](#)
  - [SKOS Concept](#) ↗
- Schema Membership(s)
  - [Library of Congress Subject Headings](#)
- Collection Membership(s)
  - [LCSH Collection - Authorized Headings](#)
  - [LCSH Collection - General Collection](#)
- Variants
  -  Ravens House (Kraków, Poland)
- Additional Information
  - <http://id.loc.gov/wo/agents/sh2009007699>
- Broader Terms
  -  [Dwellings--Poland](#)
  -  [Office buildings--Poland](#)
- Sources
  - found: Work cat.: Metamorfozy, c2009: t.p. (Ravens House) p. 6 (loc. at 25 Main Market Square, Krakow, Poland; now used by the International Cultural Center)
  - found: Czytamy.pl website, Aug. 17, 2009 (Metamorfozy Kamienicy Pod Kruki [description of Polish edition of same book])
  - found: Międzynarodowe Centrum Kultury website, Aug. 17, 2009 (renovating building Kamienica Pod Kruki; loc. Kraków; work began in 1998)
  - found: Ronald Berger Reading Room-Counterparts website, Aug. 17, 2009 (The International Cultural Center (ICC) is

<http://id.loc.gov/authorities/subjects/sh2009007699>

located in Krakow; its building has a rich cultural history; in 1842 two medieval houses on the main market square were converted to create the Ravens House; the building was initially residential, it later housed a bank and later offices of youth organizations; the ICC has been there since 1991 and began extensive renovations on the building in 1998)

- Change Notes
  - 2009-09-10: new
- Alternate Formats
  - [RDF/XML \(MADS and SKOS\)](#)
  - [N-Triples \(MADS and SKOS\)](#)
  - [JSON \(MADS/RDF and SKOS/RDF\)](#)
  - [MADS - RDF/XML](#)
  - [MADS - N-Triples](#)
  - [MADS/RDF - JSON](#)
  - [SKOS - RDF/XML](#)
  - [SKOS - N-Triples](#)
  - [SKOS - JSON](#)
  - [MADS/XML](#)
  - [MARC/XML](#)

# WHY AT DH2016?

- To engage cartographic materials linked data user communities to build use cases and user stories to properly frame the ontology modeling, vocabulary selection, and tool development.
- By engaging with the DH community we hope to answer questions such as which description points are most critical, what vocabularies are most useful, and how the library community can change current resource description practices to meet researcher needs.

# LINKED DATA FOR: LIBRARIES/PRODUCTION GRANT

- 2014-2016 → LD4L Cornell, Harvard, Stanford
  - Mission to integrate metadata schemes in use in libraries (MARC, MODS, to LOD environments outside libraries, ie. Schema.org, CIDOC-CRM, EDM)
- 2016 → LD4P adds Library of Congress, Columbia, Princeton
  - Mission to transition library technical services workflows to LOD
  - extension to BIBFRAME for special materials, including cartographic
- <https://www.ld4l.org>

# LD4P CARTOGRAPHIC MATERIALS SUB-PROJECT

- Focus on evaluating ontologies and vocabularies best-suited to the description of cartographic resources (maps, atlases, and geographic datasets)
- Goal - establish a set of library community shared best practices for describing cartographic and geospatial resources
  - Evaluate existing LOD ontologies to integrate existing classes and properties to extend the Linked Data for Libraries BIBFRAME profile to support description of cartographic data.
  - Web Ontology Language (OWL) ontology based on a extended variant of the Bibliographic Framework (BIBFRAME)
  - Shared as linked data triples in the Resource Description Framework (RDF)
- <http://search.ld4l.org>

# LD4P CARTOGRAPHIC PROJECT OBJECTIVES, 2016-2018

Identify  
Cartographic  
Metadata  
Use Cases

Metadata  
Creation  
Tools, Create  
Sample  
Records

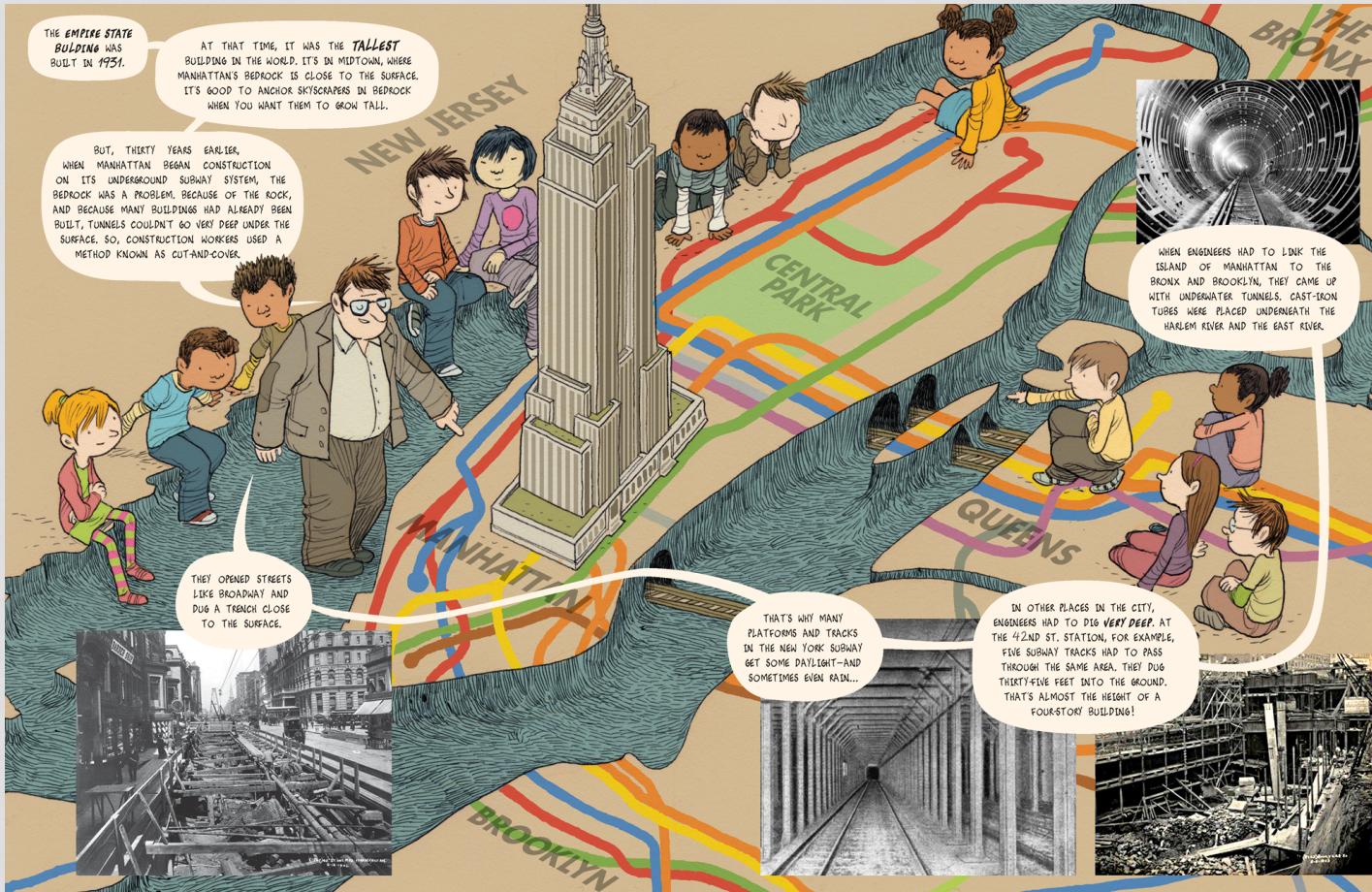
BIBFRAME  
Schema  
Evaluation,  
Cartographic  
Profile

Recommend  
-ations,  
Best  
Practices

# EXAMPLE CARTOGRAPHIC USE CASES

- Search by **cartographic feature types**
  - elevation data, administrative boundaries, cadastral, transportation, etc.
- Search by **geographic feature types**
  - populated places, natural features, man-made features, etc.
- Browse material via **hierarchical administrative geography** relationships
- **Geospatial search and discovery**
  - use of coordinate data explicitly defined and/or inferred from LOD vocabularies
- LOD contributions to **historical gazetteer development**

# MORE USE CASES?



# REFERENCES

1. Bibliographic Framework Initiative, Library of Congress,  
<http://www.loc.gov/bibframe/>
2. “Why linked data?”, Linked Data for Libraries,  
<https://www.ld4l.org/linked-data>
3. Overview of the BIBFRAME 2.0 Model, Library of Congress,  
<https://www.loc.gov/bibframe/docs/bibframe2-model.html>
4. LD4L Ontology, Linked Data for Libraries,  
<https://www.ld4l.org/ontology-overview>
5. “BIBFRAME Use Cases and Requirements”, BIBFRAME, ed. Eric Miller, et al. <http://bibframe.org/documentation/bibframe-usecases/>
6. LD4L Use Cases, Linked Data for Libraries,  
<https://wiki.duraspace.org/display/ld4l/LD4L+Use+Cases>
7. Cartographic Materials LD4P  
<https://wiki.harvard.edu/confluence/display/LibraryStaffDoc/Cartographic+Materials+LD4P>

# YOUR INPUT -

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