



# Smart Cities Data Catalog Specification

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## Abstract

As smart city projects continue to expand and evolve, data sharing sits at the intersection of business opportunities and technology developments. Cities can certainly benefit from data sharing across smart city applications and sectors. However, sharing among cities, as well as the development of data exchanges and marketplaces, will signal that smart cities are moving to the next level of value creation for citizens and local governments.

This report assesses data sharing alternatives for smart cities. It also proposes a blueprint for a common framework, a set of critical components and an evolutionary path from data collection to value added capabilities (e.g., economic development, data monetization, third-party relationships).

## Foreword

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This document was developed as part of a partnership between ATIS and US Ignite.

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# 1. Introduction

## 1.1 Purpose

This document was developed as part of a partnership between cities and industry to advance the interoperability of smart city *data catalog* solutions. It was created as part of a larger collaboration between ATIS and US Ignite that is focused on developing a set of smart city *data exchange* specifications and bringing together a core of data-centric cities and leading industry solution providers.

The technical and business requirements contained in this document are intended to create a data catalog blueprint, which can be used to exchange data between cities and city data partners. The data catalog is a key part of a smart city data exchange, providing a linkage between data producers and data consumers.

Data catalogs will play a pivotal role in smart cities, given the growing demand for smart city data and the opportunities for data sharing. It is expected that this specification will be used by municipal chief data officer and chief technology officer/chief information officer organizations to plan, procure, implement and operate smart city data exchanges.

## 1.2 Description

The use of data catalogs has increased in the past few years in big data and other data management applications because they enable data users to discover and search datasets and data sources, without the cumbersome need to know the exact data connection string, syntax or path. Data catalogs can leverage open APIs to create a simplified mechanism to identify data that is relevant to a data consumer's application or need.

In the context of a smart city, data catalogs allow city operations and affiliated third parties to register metadata from any number of data sources to a common repository that can be discovered, searched and filtered by a data consumer partner. Potential data consumers using the catalog include other smart cities, government agencies (i.e., local, state, federal), trusted partners, application developers, citizens and businesses. It is important to note that data catalogs act as a repository and visualization of metadata and thus do not store the actual data itself.

At the core of a smart city data catalog is the fundamental concept of data producers and data consumers. By using data catalogs, *data producers* can register, profile and, in some cases, preview their metadata. This metadata may be associated with data located in data warehouses, data lakes, databases, cloud-stored data, third-party data sources and crowdsourced data. Similarly, *data consumers* are presented with a comprehensive and centralized view of available data sources within a city's data governance domain, thus creating a powerful data acquisition tool. In the future, an additional role will be added to the