2023

NCDIT-T GIS Content Publication Standards and Policies

VERSION 1.1

Document Control

Author	Version	Date	Description
NCDIT-T GIS Unit	0.1	Dec. 2019	Initial draft
NCDIT-T GIS Unit	0.2	Feb. 2020	Addressed GIS Unit review comments
NCDIT-T GIS Unit	1.0	June 3, 2020	Approved by Marc Clifford, DIT-T Deputy CIO
NCDIT-T GIS Unit	1.0	June 3, 2020	Approved by Emily Jones Wiley, DOT Director of Data Projects
NCDIT-T GIS Unit	1.1	April 28, 2023	Minor revision approved by Eric Wilson, GIS Unit Manager

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Purpose

The purpose of this document is to establish and describe the GIS content publication standards, policies, and related procedures concerning the appropriate dissemination and use of geospatial content made available to various web and server environments. Until more environments become available for hosting data and services, this document will address areas such as NCDOT GO!NC, on-premises GIS servers, and the NCDOT Connect site.

Following this set of standards and policies, the enterprise may address the key focus areas of data governance in usability, consistency, data integrity, data security, and availability. This set of standards and policies mandate processes to ensure effective data management throughout the enterprise to improve accountability and reduce adverse effects of poor data quality. Implementation of the standards and policies aligns enterprise data assets to support data driven decision making processes at various levels of the organization.

All NCDOT employees, DIT-T employees, NCDOT Contractors, and NCDOT Vendors who perform various tasks for NCDOT to create and publish GIS content shall follow the standards, policies, and procedures outlined in this document. All questions shall be directed to gishelp@ncdot.gov.

Benefit

The primary benefit of publishing to this standard is that data can be more easily found by others searching for authoritative sources; users can determine if the data is current enough for their specific use; and users can determine whether the data is appropriate for their specific purpose. In addition, these standards support data publishers to better adhere to state policies concerning accessibility, interoperability, information security, IT architectural standards, backup and recovery, business continuity, and record retention policies.

Applicable Standards and Guidelines

1. NCDOT GIS Content Overview Properties Standard

    In addition to the metadata, each AGOL (ArcGIS Online) and on-premises portal content item has overview properties that describe the general nature of the item, such as title, description, access and use constraints, searchable tags, and thumbnail.

    All of these item overview details shall be completed for all content in AGOL, NCDOT's portal for ArcGIS, or NCDOT's ArcGIS servers. Refer to **Appendix A** for more information about the item properties requirements.

2. NCDOT GIS Content Metadata Standard

Metadata describes the specific characteristics of the data products. It is important to ensure the proper use of geospatial data products provided by NCDOT.   It is the responsibility of the product (data, service, map, etc.) owner to ensure that a clear and appropriate level of metadata is provided with their products. This standard can be found at https://xfer.services.ncdot.gov/gisdot/GISStandardsAndPractices/NCDOT%20GIS%20Metadata%20Content%20Standard.pdf

3. NCDOT GIS Data Schema Naming Standard

Following good practices of data governance, we adopt NCDOT's Enterprise SQL Server Standard Naming Convention Version 1.0 as the GIS Data Schema Naming Standard, since NCDOT's Enterprise GIS (EGIS) is largely implemented on SQL server platform. The naming convention can be found at https://inside.ncdot.gov/Teams/it/Documents/Forms/AllItems.aspx?RootFolder=%2fTeams%2fit%2fDocuments%2fDBA&FolderCTID=0x01200076FE4363C8289743BCE558B2BDA9BB6B

4. NCDIT Data Classification and Handling Policy

All GIS Content items are subject to NCDIT Data Classification and Handling Policy for proper handling of sensitive information. Details can be found at https://files.nc.gov/ncdit/documents/files/Statewide-Data-Class-Handling.pdf

5. NCDOT Public Content Guideline

All NCDOT GIS contents that are to be published or made available to the public are subject to review and approval by NCDOT's Web Content Team, Office of Communications, and Community Outreach & Public Engagement regardless of the tools by which the content is authored. Examples of publication or authoring tools include NCDOT's share-point web portal, Collector, and GO!NC applications such as Survey123, Hub, QuickCapture, Experience Builder, and StoryMaps.

6. NC General Statutes concerning "Public Records"

Information that falls under the definition of North Carolina "Public Records" (https://www.ncleg.gov/EnactedLegislation/Statutes/PDF/BySection/Chapter_132/GS_132-1.pdf) is subject to NC G.S. 132. Details can be found at https://www.ncleg.gov/Laws/GeneralStatuteSections/Chapter132.

7. Non-Spatial Surveys

GIS field data collection solutions are intended to capture data that includes a spatial component, or location on the planet. Data collection efforts that do not include a spatial component should not use GIS tools, such as Survey123 and Quick Capture. Instead, other NCDOT survey development tools shall be used to support non-spatial

data collection efforts for community engagement, focused work efforts, or gathering public feedback.

8. Geospatial Service Content Metadata Guide

It is recommended that metadata for services be applied using the Description area on the Overview page of the service item. The Guide can be found at https://xfer.services.ncdot.gov/gisdot/GISStandardsAndPractices/GISUServiceContentMetadataGuide.pdf

9. GO!NC Specific Standards and Guidelines

- *GO!NC Publishing Standards And Guidelines*: a subset of standards and guidelines that are applicable to GO!NC users and publishers. https://www.arcgis.com/sharing/rest/content/items/3c72fe6dae464becbcc023838d3a0de9/data
- *GO!NC Publishing With ArcGIS Desktop*: a user help for GO!NC publishers who use ArcGIS Desktop to share and publish their GIS content. https://ncdot.maps.arcgis.com/sharing/rest/content/items/57792a882cf94a158ee514f71ca13328/data
- *GO!NC Thumbnail Use Standards*: a set of standard thumbnails created to help identify GO!NC content items. https://ncdot.maps.arcgis.com/sharing/rest/content/items/734049932dc34c7d94489bd4827dddf9/data
- *Publishing to AGOL-Key Concepts*: an introduction to the fundamentals of publishing to AGOL. https://ncdot.maps.arcgis.com/sharing/rest/content/items/55f22c885be94f8889f87c1c2d932366/data

Data Backup Guidelines for ArcGIS Online and On-Premises Portal

When hosting data in ArcGIS Online or an on-premises portal, regularly downloading copies of hosted data is important for two reasons:

1. Data backups are crucial to protecting against data and productivity loss.

Esri does not have reliable backup and recovery processes and procedures for content hosted in their ArcGIS Online environment (aka GO!NC). NCDIT-T has backup processes geared towards contents under official application accounts. Due to limitations of technology and the vast amount of contents, not all services or items are fully and correctly backed up. It is highly recommended that owners of application accounts that host important or mission critical data to discuss with GIS Geospatial Services team and verify what is backed up. Services or data which are not covered by any backup processes, need to be downloaded to on-premises file servers, SharePoint, etc.

There are also regular backup processes for content hosted in the NCDIT-T on-premises portal. It is recommended that item owners to review with Geospatial Services team and ensure backuprequirements of important data are met to facilitate reliable recovery process.

2. ArcGIS Online does not fit the definition of a "system of record."

Copies of data hosted in AGOL are not maintained in an on-premises location and by default are not backup. They should not be deemed as "system of record". Data hosted through a NCDIT-T on-premises portal or federated ArcGIS servers are considered stored in a system of record.

Export and download of AGOL or on-premises portal hosted data can be performed at any time by the data owner.

GIS Change Management Practices

The objective of change management is to ensure that standardized methods and procedures are used for efficient and prompt handling of all changes. NCDIT-T GIS Unit follows enterprise change policies and procedures. We established Development, Test, and QC stages in addition to a Production stage where end users perform their daily operations to reduce the impact to production systems. Changes to the system are promoted or deployed from the volatile Development environment to Test stage for integration testing, and then to QC stage for user verification before production roll-out, which often happens outside of normal business hours or during designated maintenance windows.

GO!NC User Management

Types of users

Viewer

Anyone can be a viewer of GO!NC content. **Viewers** can manipulate maps and apps but cannot save or share content. A GO!NC account is not required to be a viewer. Viewers are limited to publicly shared content.

Standard User

Standard Users typically access public and non-public content on GO!NC for review purposes and create maps, apps, and data layers for personal or small group use.

Typically a Standard User account is assigned to NCDOT staff when he or she needs to create GIS content and share to co-workers in GO!NC.

This type of user:
- Requires a GO!NC Standard account.
- Can share content to one or a few groups
- Has access to analysis tools.

Enterprise Content Publisher (aka Business Unit Publisher)

An **Enterprise Content Publisher** is responsible for the publication, maintenance, and sharing of official production content for their business unit through GO!NC.

A Business Unit who wants to host and share enterprise content is provided a "Business Unit Publisher Account." That account is owned by the business unit. The business unit will assign a primary and backup NCDOT staff person to manage and use the account.

The person who is responsible for publishing the business unit's data and maps will maintain and secure the account (e.g. account description, password) and use the account when publishing enterprise content products.

This type of user:
- Requires a GO!NC Business Unit account.
- Can share content to groups, the organization, and the public.
- Has access to analysis tools.

Contractor

A **Contractor** does not have NCDOT credentials and is typically an editor assigned to perform field data collection activities.

This type of user:
- Requires a GO!NC account.
- Cannot create or share content.
- Can only access content shared to groups of which they are a member.

In rare instances, a Contractor may be given broader access depending on the assigned work. For example, vendors working on a specific project with a start and end date may be considered a Standard User during the duration of the project.

NCDOT GO!NC and Portal Publisher Agreement

As owner and publisher of GIS content, users of a Standard account or an Enterprise Content Publisher account can create a wide range of GIS contents and share to their user community. As any other computing resources granted by NCDOT to its employees, GO!NC and Portal accounts are only permitted for conducting NCDOT business. These content owners and publishers are responsible and accountable for the data, maps, and apps they maintain and publish. Prior to obtaining a GO!NC account, new Standard account or Enterprise Content Publisher account holders must accept the NCDOT GO!NC and Portal Publisher Agreement.

The agreement will be delivered via email and user acceptance will be assumed when it is returned, via email, indicating acceptance.

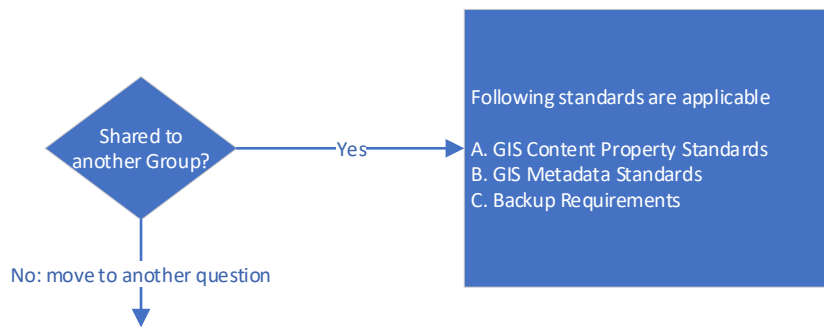Refer to **Appendix B** to review the NCDOT GO!NC and Portal Publisher Agreement and return instructions.

GIS Content Publication Policies

A set of standards apply whenever NCDOT Data Owners or designated Publishers share or publish data to the enterprise systems. The delivery of GIS data and metadata can vary; however, standards apply regardless of data format or how the data is provided. Below are examples of typical methods of publication:
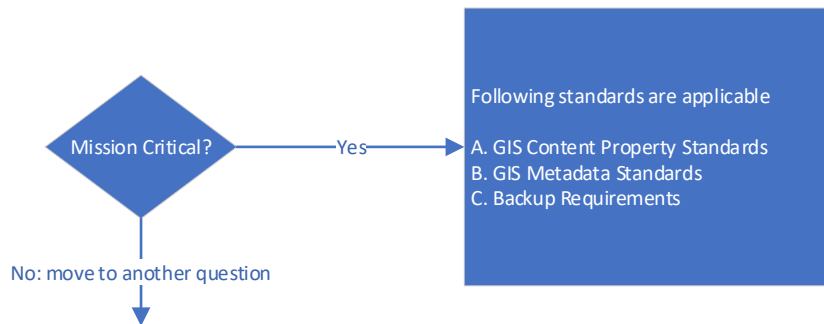
- **GO!NC** – GIS content or geospatial services can be published and then shared either to internal user groups, an entire organization, or to the public. Data content and configurations are stored on Esri's servers in the cloud (but not backed up). All published data is expected to meet the appropriate metadata requirements and use the right amount of Tags to promote consumers' ability to discover data. A guide to tagging is included in Appendix A of this document.
- **EGIS on-premises Servers** – geospatial services can be published and then shared to internal user groups or to the public. Contents and configurations that are hosted with on-premises Servers are backed up.
- **Downloadable Products (maps or data)** on NCDOT web sites - either Connect, or the Internal NCDOT SharePoint Portal. These publications are intended to be static files and are not geospatial services, although in some cases geoservices are also published for the same data.

The NCDIT-T or NCDOT GIS Content Publication Standards and Policies applies to the posting or publication of downloadable products and hosted geospatial services, regardless of which platform the data is posted on. The policies state that different applicable standards and guidelines are applied according to the nature of the content sharing, the criticality, and how the content is consumed by the enterprise. All of the following six questions shall be asked to determine what standards are applicable to a GIS content item. Please note that the item **B. GIS Metadata Standards** in the following illustartion and use case examples refers to both *NCDOT GIS Content Metadata Standard* and *Geospatial Service Content Metadata Guide*
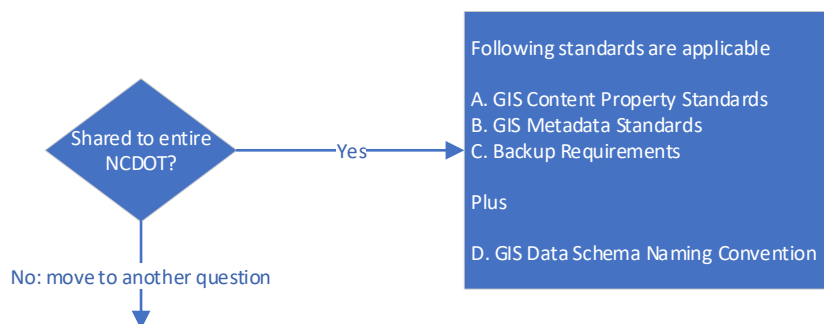
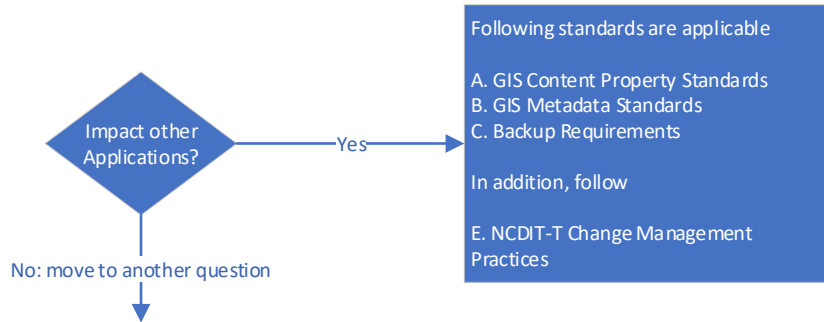1. Is the GIS content shared to another NCDOT organizational group?

Shared to another Group? —Yes→

Following standards are applicable
A. GIS Content Property Standards
B. GIS Metadata Standards
C. Backup Requirements

No: move to another question

2. Is the GIS content deemed as mission critical?

Mission Critical? —Yes→

Following standards are applicable
A. GIS Content Property Standards
B. GIS Metadata Standards
C. Backup Requirements

No: move to another question

3. Is the GIS content shared to entire NCDOT?

Shared to entire NCDOT? —Yes→

Following standards are applicable

A. GIS Content Property Standards
B. GIS Metadata Standards
C. Backup Requirements

Plus

D. GIS Data Schema Naming Convention

No: move to another question

4. Does any change to the GIS content impact other applications?

Impact other Applications?
Yes →
No: move to another question

Following standards are applicable

A. GIS Content Property Standards
B. GIS Metadata Standards
C. Backup Requirements

In addition, follow

E. NCDIT-T Change Management Practices

5. Is the GIS content shared with the public?

Shared to Public?
Yes →
No: move to another question

Following standards are applicable

A. GIS Content Property Standards
B. GIS Metadata Standards
C. Backup Requirements
D. GIS Data Schema Naming Convention

Plus

F. NCDOT Public Content Guidelines
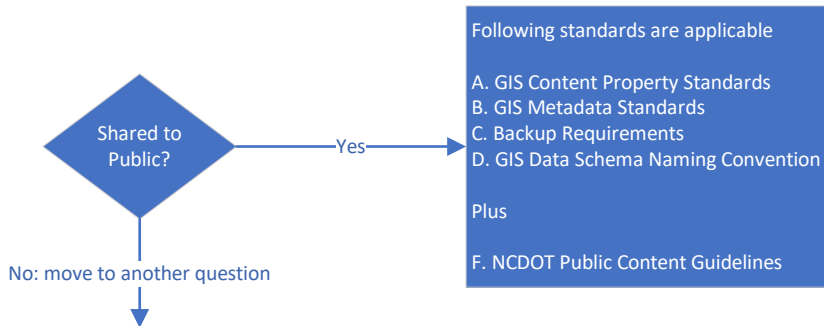
6. Is the GIS content classified as medium or high risk according to NCDIT Data Classification Policies?

Medium or High Risk?
Yes →
No: move to another question

Follow the State policies

G. NCDIT Data Classification Handling Policies
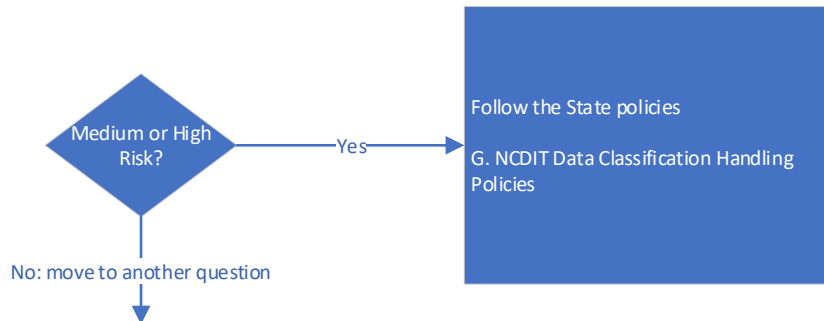
The following typical use cases demonstrate how to decide what standards shall be applied to a GIS content item. It also shows that not all policy criteria apply to a content item. However, all questions shall be asked.

GIS Content Publication Typical Use Cases		
Content Item Sharing and Criticality	**Applicable Standards or Requirements**	**Comments and Examples**
Case 1: IF content is developed for an employee's own benefit of testing processes or improving personal productivity, and the content is not deemed as mission critical.	There are no applicable standards other than enough description of the content to help the employee to accomplish the task.	
Case 2: IF content is developed for internal use of one NCDOT business or organizational group and the content is not deemed as mission critical.	There are no applicable standards. However, recommended good practice is to have well documented content properties and enough metadata to help the group use the content properly.	<u>NCDOT Organizational Group</u> is the smallest team that has a supervisor and usually has less than 10 employees.
Case 3: IF content is developed for personal productivity or for internal use of a group but deemed as mission critical.	It is required for such contents to meet: A. GIS Content Property Standards B. GIS Metadata Standards C. Data content is required to be backed up on NCDOT on-premises systems according to update cycle	NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and must approve content metadata.
Case 4: IF content is shared between two or more NCDOT business or organizational groups but not to the entire organization, and there are no custom applications developed against the content.	It is required for such contents to meet: A. GIS Content Property Standards B. GIS Metadata Standards C. Data content is required to be backed	NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and must approve content metadata.

	up on NCDOT on-premises systems according to update cycle	

Case 5: IF content is shared between two or more NCDOT business or organizational groups, including the case when content is shared to the entire organization, and there are custom applications developed or will be developed against the content.	It is required for such contents to meet:
	  A. GIS Content Property Standards
	  B. GIS Metadata Standards
	  C. Data content is required to be backed up on NCDOT on-premises systems according to update cycle
	  D. NCDOT Data Schema Naming Standards
	  E. NCDOT GIS Change Management Practices.
		NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and must approve content metadata.
		NCDIT-T GIS Unit needs to be involved in the design of data schema for custom application development, either developed in-house or through Request for Proposal (RFP), or any other contract vehicles.

Case 6: IF content is shared to NCDOT enterprise.	It is required for such contents to meet:
	  A. GIS Content Property Standards
	  B. GIS Metadata Standards
	  C. Data content is required to be backed up on NCDOT on-premises systems according to update cycle
	  D. NCDOT Data Schema Naming Standards
		NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and must approve content metadata.
		
		NCDIT-T GIS Unit needs to be involved in the design of the data schema.

Case 7: IF content is shared to the public.	It is required for such contents to meet: A. GIS Content Property Standards	NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and

	B. GIS Metadata Standards C. Data content is required to be backed up on NCDOT on-premises systems according to update cycle D. NCDOT Data Schema Naming Standards E. NCDOT Public Content Guideline	must approve content metadata. NCDIT-T GIS Unit needs to be involved in design of the data schema.
Case 8: IF content is transactional in nature, for example, in case of a feature service supporting field data collection. And if content is shared between two or more NCDOT business or organizational groups.	It is required for such contents to meet: A. GIS Content Property Standards B. GIS Metadata Standards C. Data content is required to be backed up on NCDOT on-premises systems according to transaction update frequency and permissible data loss requirements. D. NCDOT Data Schema Naming Standards E. NCDOT GIS Change Management Practices.	NCDIT-T GIS Unit regularly reviews and reports on compliance with the GIS Content Property Standards. GIS Unit also helps review and must approve content metadata. NCDIT-T GIS Unit needs to be involved in the design of data schema.

Glossary

1. AGOL: Also known as ArcGIS Online. It's Esri's cloud-based mapping platform.
2. EGIS: Enterprise GIS. NCDOT's implementation of GIS that supports spatial data collection and maintenance, Linear Referencing Systems (LRS), GIS analysis, and other geospatial services.
3. Esri: Environmental Systems Research Institute. The leading international supplier of geographic information system (GIS) software, web GIS and geodatabase management applications. The company is headquartered in Redlands, California.
4. GO!NC: North Carolina Department of Transportation's portal through which NCDOT staff, business partners, and others can access and publish geospatial information pertaining to transportation in North Carolina.
5. NCDIT-T: North Carolina Department of Information Technology for Transportation.
6. NCDOT: North Carolina Department of Transportation.

Appendix A: GIS Content Overview Properties Standards

The following item overview properties shall be completed for all content in ArcGIS Online (AGOL), NCDOT's portal for ArcGIS, or NCDOT's ArcGIS servers.

Item Information

AGOL provides for basic information for published services, web maps, apps, and other content. All AGOL Item Information should be completed for all items prior to final sharing. AGOL Item Information includes:

- Title
- Summary
- Description
- Access and Use Constraints
- Tags
- Credits
- Thumbnail

Description

A description should include information that can answer the following questions:

- What is the source of the data?
- When was the data published?
- How often is the data updated?
- What does the data represent?
- How was the data collected?
- How should the data/map be used?
- Who should I contact if I have any questions?
- Are there any special use constraints or circumstances where I shouldn't use the data?

Please refer to Geospatial Service Content Metadata Guide for populating Description.

Thumbnail

Prior to sharing content to "Everyone" or the "Organization," a standard thumbnail must be added to the item. A set of standard thumbnail images is hosted in AGOL as well as the "NCDOT GO!NC Thumbnail Use Standard."

In AGOL and the on-premises environment, thumbnails are used to communicate the following:

- Easily distinguishable content type
- Product GO!NC
- Ownership by NCDOT or specific Business unit
- Access by Public, NCDOT, or indication for external resource
- GO!NC branding colors for data types

Access and Use Constraints (Disclaimer)

At a minimum, the following disclaimer should be used in all NCDOT published services and web maps. Additional information, specific to the data/map, may also be included.

The North Carolina Department of Transportation shall not be held liable for any errors in this data. This includes errors of omission, commission, errors concerning the content of the data, and relative and positional accuracy of the data. This data cannot be construed to be a legal document. Primary sources from which this data was compiled must be consulted for verification of information contained in this data.

Disclaimer for Non-NCDOT Services

In some cases, AGOL will contain links to external services. At a minimum, the following should be included with any external service and is in addition to any disclaimer provided by the agency or organization providing the external service.

This service is not published or maintained by the North Carolina Department of Transportation. *The North Carolina Department of Transportation shall not be held liable for any errors in this data. This includes errors of omission, commission, errors concerning the content of the data, and relative and positional accuracy of the data. This data cannot be construed to be a legal document. Primary sources from which this data was compiled must be consulted for verification of information contained in this data.*

Tags

AGOL and on-premises portal item tags are words, separated by commas, that describe the data or map. Tags are also used in searches.

The standard for Tags in AGOL and on-premises portal is as follows:

1. The following tags are required on <u>every</u> map or service published through AGOL:

   - The words "North Carolina"

   - The word "NC"

   - The word "NCDOT"

   - Only one of the following categories that best describes the map or service:

     - Boundaries
     - Environment
     - Inland Waters

- Location
- Society
- Structure
- Transportation
- Emergency Management
- Imagery

Note: These categories are based on *ISO 19115: Topic Category*

▪ Data Owner name as listed in the online NCDOT Directory

https://apps.dot.state.nc.us/dot/directory/authenticated/ToC.aspx

2. Optionally include any other tags that help describe the service or map to assist users in locating the map or service

Appendix B: NCDOT GO!NC and Portal Publisher Agreement Email

Prior to obtaining a GO!NC Standard or Enterprise Content Publisher account, you must agree to the **NCDOT GO!NC and Portal Publisher Agreement** below. Please review the information and if you agree, type your name and your supervisor's name in the boxes below. Then reply-all to this email and cc your supervisor if needed.

I agree to the NCDOT GO!NC and Portal Publisher Agreement.	
Your Name	
Direct Supervisor	

NCDOT GO!NC and Portal Publisher Agreement
All NCDOT employees, NCDOT Contractors, and NCDOT Vendors using GO!NC ArcGIS Online and ArcGIS Portal agree to use the software in accordance with NCDIT-T GIS Content Publication Standards and Policies (the Policy). Failure to adhere to these policy guidelines may result in immediate revocation of an employee's privilege to use GO!NC ArcGIS Online and Portal sites as a named user.   • Employee must ensure that all content adheres to the publishing and sharing standards relevant for their shared content.   • Employee is wholly responsible for the quality, clarity, and completeness of their GO!NC content.   • Employee shall ensure no "Confidential" or "Sensitive" classified information is stored, loaded, maintained, transmitted, or shared in or with GO!NC.   • Employee acknowledges that items not complying with the Policy may be detected and disabled automatically by scripts or manually by GO!NC administrators until compliant.   • Employee will not adopt, take over, use, share or control personal GO!NC accounts of users that have left NCDOT service.   • Employee will not host and share public data they do not own or steward unless permission is obtained from the data owner or data steward.   • Employee will not set hosted data to allow data downloading of the data if the employee is not the data owner or data steward without permission from the data owner or data steward.   • Employee acknowledges there is no uptime guarantee for ArcGIS Online.   • Employee acknowledges no content or function in ArcGIS Online is back-up protected or fault tolerant and that content can be accidently deleted or corrupted.   • Employee acknowledges there is no delete protection or fault tolerance for data protections in ArcGIS Online and that content can be accidently deleted or corrupted.   • Employee acknowledges that any data originating in ArcGIS Online shall be regularly copied locally and secured to protect against accidental deletion or corruption and as the source of record.   • Employee shall monitor the usage of products they have published and remove products that are obsolete or no longer used.   • Any publicly shared content shall be requested at https://connect.ncdot.gov/site/Website-Requests/Pages/default.aspx and reviewed by the NCDOT Communications, Community Outreach & Public Engagement Unit.   Signing this document, as described above, authorizes me to use the NCDOT ArcGIS Online and Portal systems. This authorization may be terminated by the NCDOT at any time. I have read, understand, and agree to comply with the Policy in order to maintain this authorization of use.