

# Indiana Department of Transportation

## Modernization of the FRA Grade Crossing Inventory

Implementing new technology to develop an automated process for field-to-office workflows by the Esri platform and the FRA web API.

Thursday, May 17, 2018



U.S. Department of Transportation  
**Federal Railroad Administration**

**HNTB**



# Our Team

## INDOT

- Tom Rueschhoff – Project Manager
- Rich Blanford – Lead Inspector
- Matt Cook – GIS Lead

## HNTB

- Darin Welch – Geospatial Team Lead
- Adam Horn – Sr. Geospatial Solutions Developer
- Wuxuan Xiang – Sr. Developer



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# Goals and Objectives

- Transition from paper field collection
- Maintain Rail Crossing GIS data
- Automate FRA submission process



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# Agenda

- **Previous Process**
- **New semi-automated process**
- **Next steps**



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# Previous Process – Workflow

## Manual Steps

- Search FRA website for crossing form
- Print crossing form
- Update paper form in the field
- Take pictures
- Update form on website back in the office
- Submit form
- Download images
- Create image directories
- Rename images
- Store images

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION  
U. S. DOT CROSSING INVENTORY FORM  
OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public, high-voltage grade crossings, complete the entire inventory form for private high-voltage grade crossings, complete the entire, Parts I and II, and the Submission Information section for public, low-voltage grade crossings (including pedestrian and/or bicycle grade crossings), complete the Header, Parts I and II, and the Submission Information section for private, low-voltage grade crossings (including pedestrian and/or bicycle grade crossings), complete the Header, Parts I and II, and the Submission Information section for change to existing data, complete the Header, Parts I and II, and the Submission Information section, in addition to the contained data fields. Note: For online completion, Part I, Section 2, is the required cross-reference field.

Submission Date: 03/05/2016  
MANAGERS: W. K. R. / 2016  
W. K. R. / 2016  
Date:  Date  Traffic  Other  Closed  
Change to Existing Data:  Change to Existing Data  Change to Existing Data  Change to Existing Data

Part I: Location and Classification Information  
1. Primary Operating Railroad: Norfolk Southern Railway Company (US)  
2. City/Municipality: Quincy  
3. State: IL  
4. County: Quincy  
5. Street/Road Name & Block Number: N. 1st St  
6. City: Quincy  
7. State: IL  
8. Other Railroad Operate or Separate Track of Crossing: No  
9. Other Railroad Operate or Separate Track of Crossing: No  
10. Branch or Line Name: Chicago Line  
11. Branch or Line Name: Chicago Line  
12. Crossing Type: Public  
13. Line Segment: 4  
14. Railroad Division or Region: SEABOARD  
15. Railroad Subdivision or Station: QUINCY YARDS  
16. Railroad Mile Post: 41.6245005  
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# New Process – Workflow

## Manual Steps

- Search FRA website for crossing form
- Print crossing form
- Update paper form in the field
- Take pictures
- Update form on website back in the office
- Submit form
- Download images
- Create image directories
- Rename images
- Store images

## Manual Steps

- Update electronic form in the field
- Take pictures; associate with crossing
- Submit changes to crossing

## Automated Steps

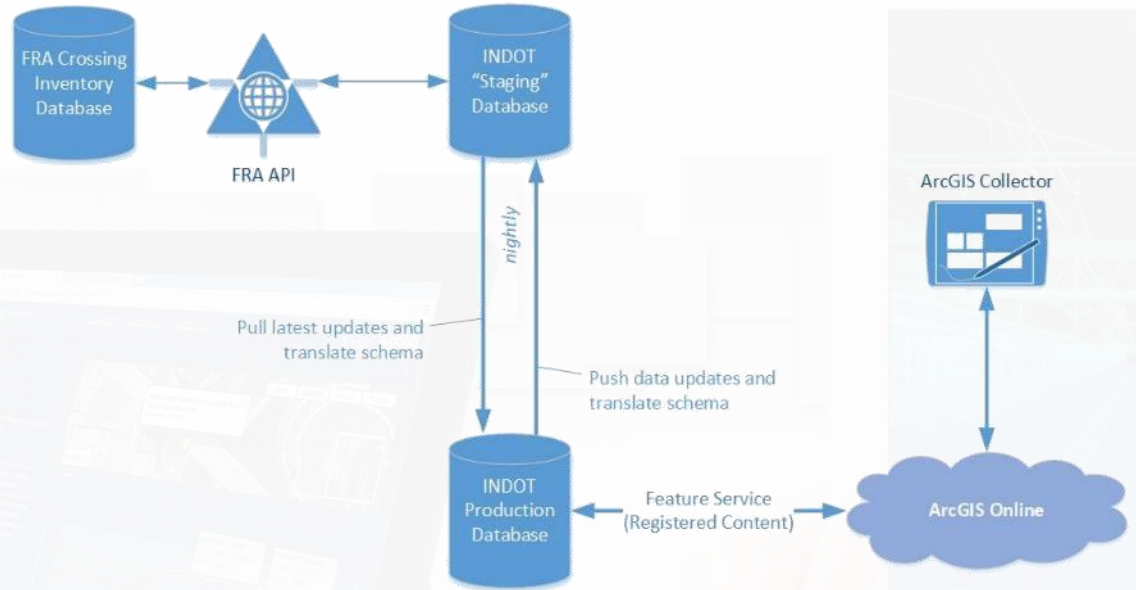
- Nightly sync with FRA web API (to/from)



# Automated Approach – Overview

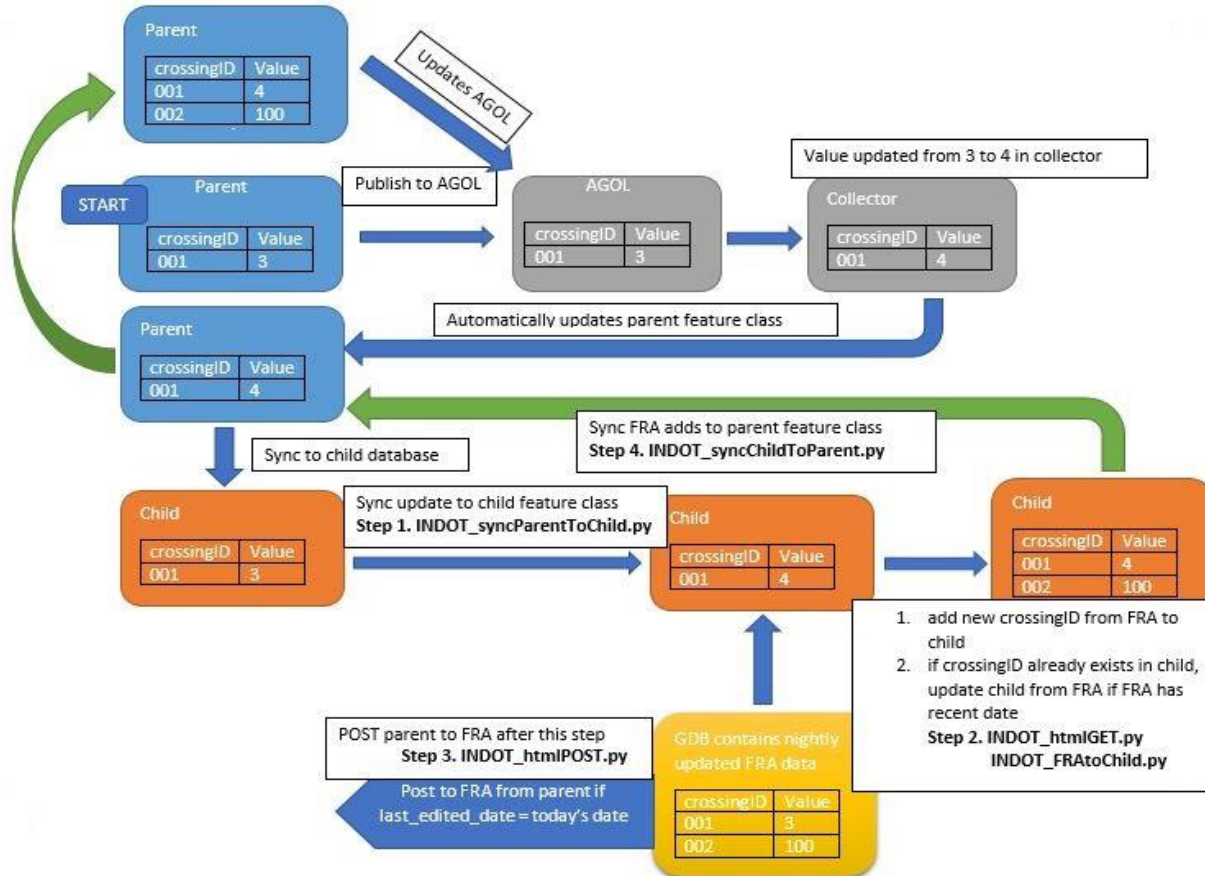
## Semi-automated process

- Develop script to connect to FRA through API call
- Develop data model to create a feature class
- Show records on web map
- Configure webmap for field collection
- Use collector to update records in the field
- Take pictures with tablet using collector
- Update the FRA database nightly





# Automated Approach – Detail



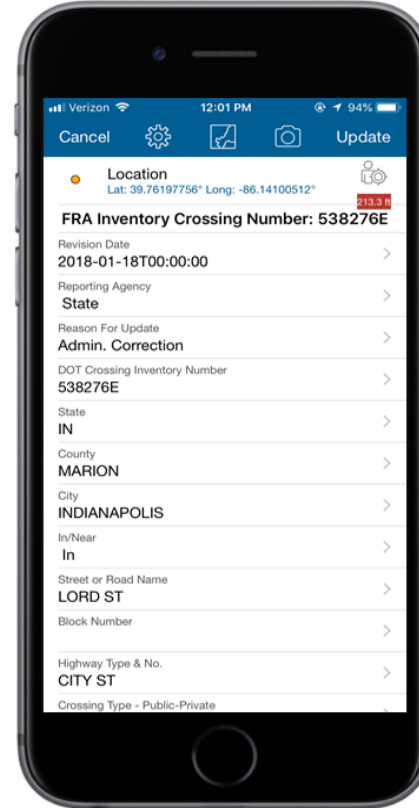
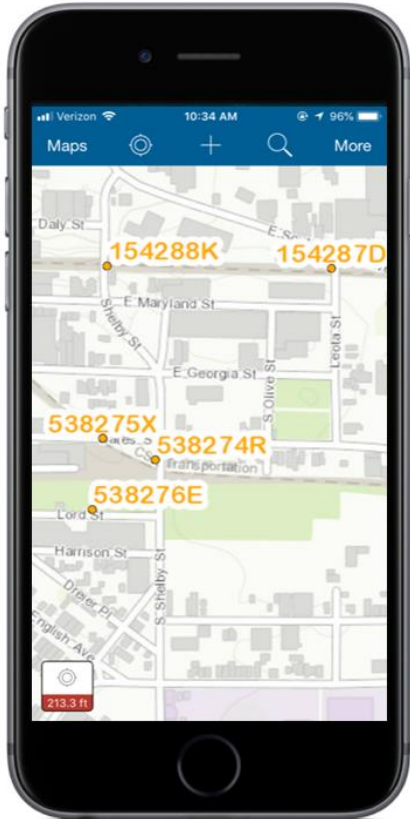
# Deployment – AGOL Configuration

The screenshot displays the ArcGIS Online interface for a group named "INDOT\_RAILCROSSING\_FRA". The left sidebar shows the group's metadata, including a railroad crossing icon, a description, and the latest content. The main map view shows a street map of Indianapolis with several orange circular markers representing rail crossings. A popup window is open over one of the markers, displaying the following information:

FRA Inventory Crossing Number: 850483E	
Revision Date	2017-05-22T00:00:00
Reporting Agency	State
Reason For Update	Change in Data
DCIF Crossing Inventory Number	850483E
State	IN
County	MARION
City	INDIANAPOLIS
In/Near	In
Street or Road Name	VIRGINIA AVE
Zoom to	Get Directions Edit



# Deployment – ArcGIS Collector



# Deployment – In Practice



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# Next Steps

- Offline deployment
- Replace public webmap



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