6. 19. 2017



Republic of the Philippines DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS OFFICE OF THE SECRETARY Manila



SUBJECT: Guidelines for Geotagging Infrastructure Projects in Contract Management Stages

In order to improve transparency and accountability, Construction personnel shall capture geotagged photographs of all infrastructure projects for implementation in accordance with the Guidelines for Geotagging Infrastructure Projects in Contract Management Stage. The use of geotagging technology will provide a more transparent and accurate reporting of project accomplishments.

Definition of Terms

Infrastructure Project Include the construction, improvement, rehabilitation, demolition, Alias Civil Works, Works, repair, restoration or maintenance of roads and bridges, railways, Capital Outlay Project, communication facilities, civil works airports, seaports, **Capital Project** components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/ power and electrification facilities, national buildings, school buildings, hospital buildings and other related construction project of the government. To be classified as a capital outlay project, the works must extend the life of the asset by more than 1 year. **Civil Works Contract** A binding agreement between the Agency and a Contractor or consultant and the specific plan or design to complete terms Alias identified in the Contract. **Construction Project**

Contract Management

For all Civil Works Contracts, staff from the Construction Division/Section of the Implementing Offices must capture geotagged photographs showing the location of the Contract.

There are three (3) specific stages and purposes for capture of these photographs:

	'Before' photos shall be captured during the conduct of the joint field
Before	as-staked survey to ensure that the contract is in the same location as
	the actual project and to confirm site availability and condition.
	'During' photos shall be captured at least once for the entire duration
During	of the project to show physical progress and, potentially, for billing
	purposes

	'After' photos shall be captured during final inspection and should be
After	uploaded before or on the day of issuance of Certificate of
	Completion to show the completed infrastructure

The number and type of photographs to be taken shall be as follows:

Type Of Infrastructure	Location	Photographs to be taken
Linear: Roads, Bridges, Flood Control Structures	Start, Intermediate, and End	Start : take photographs no greater than five (5) meters away from the start of the contract site, facing the start of the contract site. Intermediate : take as many photos as needed, at an interval of no less than one hundred (100) meters.
		End : take photographs no more than five (5) meters away from the end of the contract site, facing the end of the proposed site.
Point: Office buildings, school buildings, day care centers, municipal buildings and other similar infrastructure	If flagpole is available, get the location there. Otherwise, get the location no greater than five meters from the door of the building (or the closest area in front of the building where GPS signal is available)	At least four (4) photographs showing the contract site. • Front • Right • Left • Back/Rear For the After Photos , the entire structure should be captured in the photograph.

Photographs shall be taken using the attached Mobile Data Collection System Project Monitoring Manual. All photographs will be visible through the Project and Contract Management Application (PCMA). Project Engineers (PEs) shall be responsible for the review and quality assurance of these photographs. Appropriate training shall be conducted by personnel from the Bureau of Construction (BOC) with the assistance of the Information Management Service (IMS).

This Order shall take effect immediately.

nú

MARK A. VILLAR Secretary

11.1.1 ETC/RBC/NSP



ANNEX A



Mobile Data Collection System

Project Monitoring

User Manual

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1 Introduction

1.1 Subject

This document provides 1) the guidelines for recording location and geotagging photos of DPWH-implemented projects and 2) step-by-step procedures on using the open source mobile application for DPWH-implemented projects, which is part of the mobile data collection system (MDCS) recently set up in the Department.

1.2 Purpose

- The geotagging guidelines and procedures discussed on this manual shall be used by DPWH to enhance its documentation and monitoring system for Before and After stages of project completion through recording of GPS-based location and capturing geotagged photos for DPWH-implemented projects.
- The mobile application for project monitoring (hereafter, MDCS-PM) shall also aim to complement the Project and Contract Management Application (PCMA).

1.3 Audience

This document is intended primarily for engineers from Bureau of Construction (BOC), project engineers and monitoring engineers from District Engineering Offices (DEOs) and Regional Offices (ROs). Experience in operating Android-powered mobile devices and basic ArcGIS applications are useful but not necessary.

1.4 Other Documentation

A user manual on how to build XLSForm – file format being used by Open Data Kit (ODK) tools – using MS Excel is also available for those who are interested on designing and deploying other ODK-based survey forms.

2 Definition of Terms

Geotagging – the attachment of geographical identification to electronic media such as photographs, video or any file. One of its simplest forms is the attachment of x and y coordinates to a photograph, so that the location at which the photograph was taken can be shown automatically in a map. Any electronic file, including a Word document or a PDF can be geotagged.

- Georeferencing aligning geographic data to a known coordinate system so it can be viewed, queried, and analyzed with other geographic data. Georeferencing may involve shifting, rotating, scaling, and skewing (ESRI)
- Mobile device portable computing device such as a smartphone or tablet computer (Oxford Dictionaries)
- Open-source software (OSS) computer software with its source code made available with a license in which the copyright holder provides the rights to study, change and distribute the software to anyone for any purpose (St. Laurent, 2008)
- Project Component distinct task or activity in the life cycle of a project that needs to be tracked separately for management and monitoring purposes. Examples of Project Component include Feasibility, Right-of-Way, Civil Works, Supervision and Lump Sum (MYPS Operations Guide V 1.2)

3 About ODK

The platform used in developing MDCS-PM is based on Open Data Kit (ODK). ODK is an open-source suite of tools that helps organizations author, field, and manage mobile data collection solutions. The main goals of ODK are to make open-source and standards-based tools which are easy to try, easy to use, easy to modify and easy to scale. There are three general requirements in using ODK: design a form; setup a server; and connect the device to that server.



Figure 1: General ODK Process Flow

Once those three items have been accomplished, the user is ready to conduct data gathering. The user shall need three tools: Build or XLSForm (to design the survey form), Collect (that runs on an Android mobile device to download and fill-in the survey) and Aggregate (for hosting the survey form and gathering the survey results).

4 ODK Process Flow for DPWH

In using the ODK tools, the DPWH shall refer to the process flow illustrated below:



Figure 2: ODK Process Flow for DPWH

Table 1: ODK Process Flow for DPWH

Process Flow No.	Description	Tools	In-charge
1	Design XLSForm using MS Excel. The	XLSForm Offline	IMS
	XLSForm will be converted to XForms, which	converter, ODK	
	will be loaded in the mobile device to gather	Validate, ODK	
	data.	Collect	
2	Set up a dedicated server using PostgreSQL	ODK Aggregate	IMS
	to aggregate and house the data that will be		
	collected by the mobile app.		
3	Load the XForm into the android mobile	ODK Collect	BOC
	device		
4	Collect data in the field using the XForm	ODK Collect	BOC
	loaded in the android mobile device.		
5	Upload the collected data from mobile device	ODK Aggregate,	BOC
	to ODK Aggregate (server) using ODK	ODK Briefcase	

Process Flow No.	Description	Tools	In-charge
	Briefcase.		
6	Download the data in csv format from ODK Aggregate server to desktop computer using ODK Briefcase	ODK Aggregate, ODK Briefcase	BOC
7	Post-process the csv file and import it to a GIS web app for further visualization and analyses	MS Excel, ArcGIS Online	BOC

Process flow numbers 1 and 2 are discussed in a separate manual intended for programmers, system and network development personnel.

5 Minimum Requirements for Mobile Device

For better results in using ODK-based mobile app such the MDCS-PM, the users should make sure that they are using a mobile device that has the minimum technical specifications. The users should use a uniform/standard mobile device for data gathering. Using a mobile device that does not meet the minimum specifications can result to sub-par output or data not being collected properly. The users may get in touch with Mr. Fortunato Bergania, Jr. of User Support Division at local 43567 for details on minimum specifications and how to procure the required mobile devices.

6 Mobile Device Initialization

It is a good practice for users to always check the GPS capability of their mobile devices. This will help the users to ensure that the data being collected have coordinates or geotagged.

- Make sure that your device is GPS-capable. To check this, the user shall go to device's Settings and turn on Location
- ▲ Make sure the camera app of your device is also GPS-capable: Open device's camera app → go to camera's Settings → turn on Location or GPS or GPS tag

Once the device has been set-up, the users shall go out in an open area to perform an actual test of the GPS capability of the device. It is also highly advisable for the user to perform GPS initialization if the user has spent too much time inside an enclosed area (e.g. inside a room or vehicle) before resuming data gathering.

7 Mobile App Requirements

The user shall download two (2) mobile apps: ODK Collect and GPS Map Camera. The user shall download the mobile apps directly from Google Playstore. Copying the mobile apps through Bluetooth or other file-sharing app is not advisable because it can lead to problems/issues.

- ODK Collect is the main app that the users will need in collecting data including location and geotagged photos.
- GPS Map Camera, on the other hand, is a camera app that already embeds the GPS coordinates on top of the photo and can be used as the default camera app for ODK Collect. By showing the coordinates before capturing the photo, GPS Map Camera allows the user to ensure that the photos will be geotagged.
- **4** Both mobile apps are available in Google Playstore for free.

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Collect Scan Sensors Survey Tables Aggregate	 ← Q : CPS MAP Camera → Map → Address → Weather
$\begin{array}{c} \text{DBC} \\ \text{Derived for phone} \end{array} \\ \begin{array}{c} \text{Designed for phone} \end{array} \\ \begin{array}{c} Designed for phone f$	Array Designed for phone Designed for p
 WHAT'S NEW If you're enjoying ODK and have a minute, please leave us a review. It's much appreciated! # Internal: 	 WHAT'S NEW V1.5.0: 1. Minor bug fix. 2. Modify for tablet layout.

Photo 1: Open Source Mobile Apps

8 ODK Collect's Main Menu

From the Home Page of mobile device, select the **ODK Collect app icon**. By clicking the ODK Collect app icon, the default Main Menu of ODK Collect will appear.

8:58 AM	S ■ A ODK Collect > Main Menu	i 11:26 PM
Thu, October 1	ODK Collect 1.4.7 (1053) Data collection made easier	
Partity survey 31°C According to 2	Fill Blank Form	Fill out a new form
	Edit Saved Form (2)	Edit a saved form
enter and the second se	Send Finalized Form (21)	Send finalized form (forms must be completed already)
	Get Blank Form	Get a blank form to be used in the survey
	Delete Saved Form	Delete a saved form

Photo 2: ODK Collect Main Menu

8.1 Get Blank Form

It is important that users will **only use one blank form** throughout the course of data gathering. Using multiple blank forms will result to different databases making data consolidation extremely difficult.

- While the user can directly download the form from the DPWH Server to his/her mobile device, this is not possible as of the moment since it requires the mobile device to be connected to the Intranet. Connecting the mobile device to the Intranet is not allowed as per the Department's IT Policy. In this case, loading a blank form to the mobile device will be done manually/offline.
- It is highly advisable for BOC distributes the copy of blank form (.xml file) and corresponding media folder during the training session with Regional Offices (ROs) and Project Engineers (PEs) to ensure that all users will just use one and the same blank form.
- BOC shall copy the folder containing the files mdcs_pm3.xml and mdcs_pm3media sub-folder and paste these files to storage/odk/forms of the user's mobile device.



Photo 3: Offline loading of ODK blank form

8.2 Edit Saved Form

- **4** This allows the user to edit previously saved or finalized form.
- **From ODK Collect Main Menu, select Edit Saved Form.**
- 4 Select the form the user wishes to edit.

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ODK Collect 1.4.9 (1059) Data collection made easier	S02698LZ Bonifacio Drive Interchange Finalized on Fri, May 13, 2016 at 08:55
Fill Blank Form	
Edit Saved Form	
Send Finalized Form (3)	
Get Blank Form	
Delete Saved Form	

Photo 4: Edit Saved Form

8.3 Delete Saved Form

- This allows the user to delete a previously saved or finalized form. This is useful when the user has to free up space on his/her device to gather more data. Make sure all SAVED DATA have been backed-up in the PE's computer before performing this operation.
- From ODK Collect Main Menu, select **Delete Saved Form.**
- ↓ Select the form(s) the user wishes to delete.
- Click Delete Selected

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9 Fill Blank Form (survey proper)

- **From the ODK Collect Main Menu, select Fill Blank Form**
- **4** Select Mobile Data Collection System Project Monitoring 3.

اس ODK Collect > Main Menu	ا ب ♦ ♥ ◘ 10:25 AM
ODK Collect 1.4.9 (1059)	Finished scanning. All forms loaded.
Data collection made easier	Mobile Data Collection System - Project Monitoring 3 Added on Thu, May 12, 2016 at 10:25
Fill Blank Form	
Edit Saved Form	
Send Finalized Form (3)	
Get Blank Form	
Delete Saved Form	



9.1 Start of survey

Every time the users will fill up a blank form, this screen will appear showing how they will go forward/backward with the survey form.



9.2 Select Region

The user shall choose the region where s/he belongs. This entry will facilitate postprocessing of data gathered from the field.



Photo 8: Select Region

9.3 Enter Project Component ID

The mobile app has preloaded data on DPWH-implemented projects, which are sourced from PCMA, which in turn, generated from MYPS.



Photo 9: Project Component ID

9.4 Summary of Project Component Details

- Upon entering a valid Project Component ID, a summary of details pertaining to that Project Component will appear to check if the user if surveying the right project component.
- If the user entered a Project Component ID that is not yet in the preloaded dataset, this portion will appear blank but the user can still proceed to the next steps.

☑ 3:30 PM
ODK Collect > Mobile Data Collection System 🗒 🌯
Project Component Details
Project Component ID: P00030009LZ CW1
Infrastructure Type: Civil Works
Project Description: Development of Basco Kaychanarianan Port Road to National Road with Bridge
Contractor Name:
Contract Effectivity Date:
Implementing Office: Batanes District Engineering Office

Photo 10: Summary of Project Component

9.5 Confirm Summary of Project Component

The user shall confirm (by a simple Yes or No) if the Summary of Project Component is correct or not. If user selects **No**, the user can provide the correction on the next step. These corrections will be forwarded to the PCMA and MYPS teams for their verification. Note that the user cannot make changes on preloaded data within the mobile app.

	,ill ≡ 3:30	ן יייק י	* = -	.al 🖲 3:3	3 PM
ODK Collect > Mobile Data Collection System		я,	ODK Collect > Mobile Data Collection System		94,
Are the Project Component Details correct?			Input correction on the project component deta	ails	
○ Yes			No data		
No					

Photo 11: Confirm Summary of Project Component

9.6 Infrastructure Type for Geotagging Purposes

- 4 The user shall specify the infrastructure type that will be geotagged.
- Note that the answer to this portion shall determine the structure of the proceeding questions.



Photo 12: Infrastructure Type for Geotagging Purposes

9.7 Purpose of Geotagging

The user shall also specify whether the purpose of geotagging is for BEFORE or AFTER project completion. The option PROGRESS PHOTOS shall be selected for dredging activity only.



9.8 Guidelines for Recording Location and Geotagging Photos

The user shall refer to the following guidelines and procedures in geotagging location and photos for before and after stages of DPWH project component. Note that these images are also available in the mobile application.



Photo 14: Affected Station Limits

9.9 Record Location Coordinates

The user shall record GPS coordinates following the same guidelines in 9.8.



Photo 15: Record Coordinates

Accuracy: 8m

9.10 Capture Photos

- After recording the location, the user will start capturing geotagged photos for before/after stages of DPWH project component. The user should note that this is a repeating process.
- The user shall select Add Group to start capturing photos. The user shall also use the GPS Map Camera app (discussed above) in capturing photos during the survey.
- In the GPS Map Camera, click the **Settings** (lower right corner) and do the following:
 - For **GPS Use**, set it to **roughly GPS location** (if the user thinks that there is a good signal in the area, s/he can choose **good GPS location** instead.
 - For **Prompt Dialog**, set it to **disable** to prevent dialog box to popping up.
- Set the information that will appear on top of the picture by clicking the second icon from the upper-left corner. The user may check all the information. If the mobile device has Internet connection, the map and address will be available. If the mobile device has no Internet connection (offline) only the Latitude, Longitude, Date and Time will appear.
- If the coordinates (Lat-Long) are not visible, the user may need to do GPS initialization of the device and camera app again.

Camera Choice	face back car bro		Backgroun	nt	
Scene	auto		Forground		
Exposure	0.0		Transpare	nt	
White Balance	auto		Map + Add	Iress	
Color Effect	none				
Focus Mode	auto		Map + Lat	/Lng	
Antibanding			Address +	Lat/Lng	
Picture Size	1536x2048				
Picture Quality	normal		Address		
GPS Use		ation			1
GPS picture say	ve both		Lat/Lng		
Мар Туре	Normal				
Map Resolution	n (148)				
Map Zoom Scal	e 15				
Map Size	small				
Photo Viewer	internal viewer				
Sound	enable				

Photo 16: Setting-up the GPS Map Camera App

The user should wait for the coordinates to appear on top of the photo before capturing and saving the photo.



9.11 Enter Landmark Visible in the Photo

Once the photo has been taken, the user shall enter the **Landmark** visible in the photo.



Photo 18: Priority Level of Damages

9.12 Type of Photo

The user shall then classify each photo that s/he will capture. For every infrastructure type, there is a corresponding list of types of photo. In the case of dredging, an additional entry Description of Progress Photos will appear.

	_ոլ 🗎 3:49 PM	ψ μ	4:3 🖻 ا لر	81 PM
ODK Collect > Mobile	Data Collection System 📔 🛸	ODK Collect > Mobile Da	ata Collection System	94
Capture Photos (1)		Capture Photos (1)		
Type of Photo	For road, dike, spur	Type of Photo	For bridge	
Start of Project	dike and revetment	O From Bridge Approac	:h	
\bigcirc Interval		\bigcirc Bridge Left-Side		
\odot End of Project		 Bridge Right-Side 		
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♥ ■ ODK Collect > Mobile Capture Photos (1) Type of Photo Front View Rear View Right View	ریا کے 4:32 PM Data Collection System 🗎 🔌 For building, gates, channels and dams	ODK Collect > Mobile Da Capture Photos (1) Type of Photo Excavation Site Place of Disposal Equipment	ata Collection System 🖺	33 PM

Photo 19: Type of Photos



Photo 20: Progress Photos

After this, the **Do Not Add Group** – **Add Group** will appear again. If the user wishes to get more photos, s/he can select **Add Group** and follow the previous steps. Once the user has finished capturing photos, s/he can select **Do Not Add** and proceed to the next step.



Photo 21: Add/Do Not Add More Photos

9.13 Record End Location (for road, dike, spur dike and revetment projects only)

The user shall record the end location for line projects including road, dike, spur dike and revetment.



9.14 Accomplished by

The user shall enter his/her name, position and office following this format: First Name Last Name, Position, Office.





9.15 Save Form and Exit

After completing the form, the user can save it and exit to start a new form for another project component. Note that the form name is automatically formatted to Project Component ID and Project Description.



You are at the end of Mobile Data Collection System -Project Monitoring 3.

P00030009LZ CW1 Development of Basco Kaychanarianan

Mark form as finalized

Save Form and Exit

Photo 24: Save Form and Exit

10 Mobile Data Collection System

Given the current structure and limitations of ODK tools, the GIS Consultants formulated a process flow that will facilitate the submission and backing-up of data from PEs to to ROs to BOC.

10.1 Process Flow



Figure 3: Mobile Data Collection Process

Process	Assigned	Details
1. Gather data using the mobile app for project monitoring	PE/DEO	Refer to the step-by-step procedures for using the mobile app
2. Once all project components under a PE have been surveyed, the <i>odk</i> folder from the mobile device will be copied to the designated desktop computer in the PE	PE/DEO	 The designated desktop computer of PE must have at least 250 GB of hard drive storage (to be expanded as the need arises). PE shall create a folder inside Drive C of its desktop computer (e.g., <i>pe_mobile_app</i> folder) PE must copy the ENTIRE <i>odk</i> folder from its mobile device to the desktop computer. PE should NEVER delete the contents of this <i>pe_mobile_app</i> folder. This serves as the data back up at PE level. PE will open the <i>instances</i> folder* inside the <i>odk</i> folder (check below the folder structures for details on which folder to open/copy) PE shall modify the name of the folders inside the instances folder by ADDING _region_pe (e.g., _ncr_sm for South Manila) AT THE END of the default folder name. DO NOT REMOVE/MODIFY the folder's default name
3. Copy the <i>instances</i> folder (from the previous step) to a flash drive/ external hard drive (EHD) and hand-carry it to the regional office.	RO, PE	 The RO shall assign a contact person for all mobile app matters. RO shall provide the name and contact details of this personnel to BOC and IMS. The Regional IT Support Officer (RITSO) shall set up a shared folder (i.e., <i>region_mobile_app</i>) inside RO Admin Server Inside shared folder, RITSO will create a folder with a default name <i>region_mobile_app</i> (e.g., <i>ncr_mdcs_fc</i>). Inside this folder, a subfolder <i>instances</i> will be created. Inside the <i>instances</i> folder. each PF

Table 2: Summary of Mobile Dat Collection Process

		 under that RO will have its own subfolder (i.e., <i>pe_mobile_app</i>) The RITSO will then map the shared folder (i.e., <i>region_mobile_app</i>) in a dedicated computer (with at least a storage of 250GB, to be expanded as the need arises) of designated RO user. RO shall notify BOC as soon as the instances folder is ready for copying based on agreed schedule among RO, BOC and IMS.
 Set up a shared folder in the DPWH Main Server to consolidate the regional submissions 	BOC, IMS	 BOC in close coordination with IMS shall create a shared folder (i.e., <i>boc_mdcs</i>) inside the DPWH Main Server. This shared folder has the <i>regional_submissions</i> folder, which will consolidate all the submissions from the regions. This shared folder will also have the <i>upload</i> folder, which will be connected to ODK Briefcase (located inside the BOC desktop computer). Using ODK Briefcase, the submissions of all regions will be uploaded to the DPWH ODK Aggregate Server more seamlessly.
 5. Auto sync the instances folder of each RO to a shared folder housed in the DPWH server. 6. Copy the contents of <i>instances</i> 	BOC, IMS, RO (RITSO)	 Based on an agreed schedule, the IMS in close coordination with BOC and RO-RITSO shall automatically copy the contents of <i>instances</i> folder per region (inside <i>regional_submissions/ mobile_app / region / instances</i>) on a per batch basis to control the bandwidth consumption of the Department. Auto sync shall commence from the moment BOC notify IMS that the instances are ready for copying.
 Copy the contents of <i>instances</i> folder (per region) to the <i>instances</i> folder (inside <i>upload/</i> <i>mobile_app</i>) 	BOC	 BOC shall (manually) consolidate all the regional submissions by copying these files into upload/ mobile_ app/

				<i>instances</i> . At this point, the <i>instances</i> folder will contain submissions from different regions (not sorted by region anymore).
7.	Connect the <i>upload/ mobile_app</i> folder to ODK Briefcase.	BOC	•	Detailed step-by-step procedures on how to use ODK Briefcase are provided below.

		Table 3: Folder Structu	ire	
Main Folder	Sub-folder 1	Sub-folder 2/ file	Sub-folder 3/file	Sub-folder 4/file
odk	forms	blank form (.xml)		
(This is the		media		
folder that will	instances	submissions	accomplished	
be copied by	(PE shall copy (PE shall modify	forms (.xml)		
PE to its	this folder to a	the name of this	photos (.jpeg)	
computer)	flash drive/ EHD	tolder by ADDING		
computer)	deskton	THE END of the		
	computer in the	default name		
	RO)			
	metadata			
<i>boc_apps</i> (shared folder inside the DPWH Server)	regional_submis sions	<i>mobile_app</i> (e.g. MAFS)	<i>region</i> (e.g. ncr, region i, car, etc.)	<i>instances</i> (this folder is auto sync to the contents of instances folder at the RO level)
	upload	<i>mobile_app</i> (e.g.	instances	
	(this folder is	MAFS)	forms	
	connected to the		(BOC and IMS	
	ODK Briefcase		shall provide the	
			subfolder)	
	designated		Subiolaci	
	desktop			
	computer)			

10.2 GeoSetter

GeoSetter is a free desktop tool, which the PE and RO engineers can use in validating the coordinates/location for their geotagged photos. This desktop tool shall allow the user to double check his/her geotagged photos before submitting to BOC.

- The user shall ask RITSO to install GeoSetter in his/her desktop computer
- 🔸 Once installed, the user shall click GeoSetter icon 🜏
- The GeoSetter main page has two main areas: the left side shows the area for files/photos while the right side shows the map.

GeoSetter



Photo 25: GeoSetter Main Page



Drag the *instance* folder (where the photos are located) to the file area (left side) of GeoSetter.

Photo 26: Drag Photos in the File Area

Filter the images with coordinates. If there are photos that have no coordinates, the user were not able to capture geotagged photos properly and may have to repeat the data gathering process.



Photo 27: Filter Images with Coordinates

The user can click on the photo (with coordinates) and will see the corresponding location icon in the map. The user can check if the location icon on the map indicates the right location for the photos.



Photo 28: Check the Location of the Photos

10.3 ODK Briefcase

Note: The next steps are primarily intended for BOC-Project Monitoring Division (PMD), which will use the ODK Briefcase.

The seventh step in the mobile data collection process discussed in 10.1 mentioned ODK Briefcase. This ODK tool facilitates consolidation of data gathered by different users and aggregate those data in a dedicated DPWH server.

- **4** ODK Briefcase can do the following:
 - Pull blank forms and submissions (finalized forms) from ODK Collect or ODK Aggregate Server into a local ODK Briefcase Storage location.
 - Push blank forms and submissions from ODK Briefcase Storage location to ODK Aggregate Server.
 - Export submissions to a CSV file for processing by other applications.
- Download and Install ODK Briefcase to your desktop. BOC shall coordinate with IMS-SAS for setting up Java and ODK Briefcase on its designated computer.
 - Download and install Java 7 or higher to your computer: <u>https://java.com/en/download/</u>
 - Download ODK Briefcase: <u>https://opendatakit.org/downloads/download-info/odk-briefcase/</u>)
- BOC shall create a folder (e.g., *drive c/boc_mdcs/mobile_app*) in his/her desktop computer to serves as storage area for all ODK Briefcase-related files.

IMPORTANT REMINDERS on the use of ODK Briefcase:

ODK Briefcase does not discriminate between incomplete and finalized forms on the device. It will pull ALL data off of the device. This can cause problems during later pushes, and especially, if you are encrypting your finalized forms. To keep your data set clean, you **must ensure that all forms are complete before being pulled off of the device.**

ODK Briefcase cannot discriminate between duplicates of the same filled-in form. After you pull the data into ODK Briefcase, it is important that you delete it from ODK Collect. Otherwise, the next time you follow this process, you will end up with two copies of the filled-in forms from the first pull.

10.4 Using ODK Briefcase

10.4.1 Assigning a folder for ODK Briefcase Storage

4 Open **ODK Briefcase** by double-clicking this icon:



- 4 On the right corner of ODK Briefcase Main Menu, click **Change**.
- The user should locate the folder previously created in his/her desktop computer to serves as ODK Briefcase Storage. All files that will be pulled/pushed to/from ODK Briefcase will be located in this folder.
- 4 Once the folder has been selected, the user should press **OK**.

S#K O[OK Briefcase Storag	e Location	C.	×	anual 04292016 -	Word
Please specify the location ODK Briefcase uses a stor- identified by the ODK Brie holds all your form and su	of the <i>ODK E</i> age area nam fcase Storage bmission data	Briefcase and ODk Location	e Storage area. 6 Briefcase Stora on. This storage a	<i>ge</i> area	Aa 1.1 /	4a 1.1.1 Aa 2 Heading 3 S
Once created, you can cop systems, just like a briefc	by and transpo ase of paper o	ort this locume	storage area acr nts.	oss	v onnect	all none selection :ct
ODK Briefcase Storage Location	e		ОК	Change Cancel	:tails	Size
Temporary File Sharing Fold D DT ACS (GT-N5100) d dpwh-mdcs	Look in: Recent Items Desktop My Documents Computer	Ch	oose ODK Briefcase St	v	n	×
👱 dpwh-mdcs	Network File	older name: es of type:	C:\bom_mdcs\mdcs_dmmrs Directories		~ _	Choose Cancel

Photo 29: Set-up Storage Folder for ODK Briefcase

10.4.2 Pull Stage

The Pull Stage refers to extracting files from the shared folder (inside the DPWH Main Server) to a BOC's designated computer for mobile app data (i.e., *drive c/boC_mdcs/mobile_app*).

- **4** Open **ODK Briefcase**.
- Select Pull.
- Under **Pull data from**, select **Custom Path to ODK Directory**.
- Under ODK Directory, select this folder boC_mdcs/upload/mdcs_pm3 and click Choose. The list of forms located on this folder will appear.
- Under Forms to Pull, check Mobile Data Collection System Project Monitoring
 3 and press Pull.
- The word SUCCESS! will appear once all data have been extracted from the shared folder to the local computer of BOC.

×	ODK Briefcase	- v1.4.6 Production	- 🗆 ×
ODK Briefcase Storage Location	C:\bom_mdcs\mdcs_dmmrs	ODK Briefcase Storage	Change
Pull Push Export			
Pull data from: Custom Path t	o ODK Directory		~
ODK Directory: \\10.0.10.112	\e\bom_mdcs\upload\mdcs_dm	mrs	Choose
Forms to Pull:			
Selected Form Name		Pull Status	Details
Mobile Data Collection	on System - Disaster Manag	SUCCESS!	Details
Clear all			Pull Cancel

Photo 30: ODK Briefcase Pull Stage

10.4.3 Push Stage

The Push Stage refers to sending the submissions from desktop computer of BOC to DPWH dedicated server for mobile data: <u>http://dpwh-mdcs/ODKAggregate/</u>

- **4** Open **ODK Briefcase**.
- Select **Push**.
- Under Push data to: select Aggregate 1.0
- Under URL: enter <u>http://10.0.10.112/ODKAggregate/</u> and press Connect
- **4** BOC shall coordinate with IMS-SAS for the user name and password.
- Under Forms to Push, check Mobile Data Collection System Project Monitoring 3 and click Push.
- The phrase Successful Upload! will appear to indicate successful upload of data to http://dpwh-mdcs/ODKAggregate/

9K	ODK Briefcase - v1.4.6 Production	- 🗆 ×	SIK .	ODK Briefcase - v1.4.6 Production	- • ×
ODK Briefcase Storage Location	C: \bom_mdcs\mdcs_dmmrs\ODK Briefcase Storage	Change	ODK Briefcase Storage Location	C:\bom_mdcs\mdcs_dmmrs\ODK Briefcase Storage	Change
Pull Puth Export	Aggregate v1.x Server Connection × inttp://10.0.10.112/00KAggregate cannot be a Google login; it must be an ODK username with Form Manager' permissions. Connect: Cancel	V Connect Detals Detals	Pull Push Export Push data to: Aggregate 1.0 URL: http://10.0.10.1 Forma to Push: Selected Form Name Image: Model bata Collector	Push Status Push Status on System - Disaster Manag Successful upload!	V Connect Details Details
Cear al	N	sh Cancel	Cear al		Push Cancel

Photo 31: ODK Briefcase Push Stage

10.4.4 Exporting csv file

- Open ODK Briefcase.
- **4** Select **Export.**
- Under Form, select Mobile Data Collection System Project Monitoring
 3.
- **Under Export Type**, it should be **.csv and media files**.
- Under Export Directory, user shall enter where the exported files will be stored.
- Select **Export** (lower right-corner)

The word SUCCEEDED! will appear on the lower left-corner to indicate successful exporting of csv and media files.

S	ODK Briefcase - v1.4.6 Production	- 🗆 ×
ODK Briefcase Storage Location	C:\bom_mdcs\mdcs_dmmrs\ODK Briefcase Storage	Change
Pull Push Export		
Form: Mobile D	Data Collection System - Disaster Management - Major Road Situation	~
Export Type: .csv and	d media files	~
Export Directory: C:\bom	mdcs\mdcs_dmmrs\Exported csv	Choose
PEM Private Key File:		Choose
SUCCEEDED	Export Details E	xport Cancel

Photo 32: Export csv file using ODK Briefcase

11 Post-processing tools

Note: The next steps are primarily intended for BOC-PMD, which will use the Post-Processing Tools for data gathered by the district and regions.

11.1 Export csv file from ODK Aggregate Server

Note: While ODK Briefcase allows user to export csv and media files, a more typical way of exporting csv file is by logging in the dpwh-mdcs server.

- **4** This will only work using DPWH Intranet connection.
- ↓ Open the web browser and type http://dpwh-mdcs/ODKAggregate/
- **4** BOC shall coordinate with IMS-SAS for the user name and password.
- Under Form, select Mobile Data Collection System Project Monitoring 3.
- Click Export (upper right-corner)



Photo 33: Sign-in to DPWH-MDCS Server

4 A dialog box, click **Export** again.



Photo 34: Export csv file from Server

The most recent exported csv file will appear on top of the list of previously exported files. Click the file under **Download File** to download the csv file.

CTK ODK Agg	regate ×			
$\textbf{\leftarrow} \ \Rightarrow \ \textbf{C}$	f D dpwh-mdcs	s/ODKAggregate/Aggregate.h	tml#submissions/export///	
	Submissions	Form Management	Sille Admin	Out odk admin
Filter Subr	nissions Exported	Submissions		
	Exported Files			
File Type	Status	Time Completed	Download File	Delete
CSV file	Dataset Available	2016-05-12 11:58:00.833000000	Project Monitoring Mobile Open link in new tab	🇯 Delete
CSV file	Dataset Available	2016-05-03 14:03:06.734000000	Project Monitoring Mobile Open link in new window	🗱 Delete
CSV file	Dataset Available	2016-05-03 14:03:05.859000000	Open link in incognito window Project Monitoring Mobile	🗱 Delete
CSV file	Dataset Available	2016-05-03 13:59:41.631000000	Save link as Project Monitoring Mobile Copy link address	💲 Delete
CSV file	Dataset Available	2016-05-03 13:58:01.669000000	Project Monitoring Mobile Inspect Ctrl+Shift+1	💲 Delete
CSV file	Dataset Available	2016-05-03 13:57:56.982000000	Project Monitoring Mobile App 3T results.csv	🗱 Delete
CSV file	Dataset Available	2016-05-03 13:55:15.461000000	Project Monitoring Mobile App 3T results.csv	🗱 Delete

Photo 35: Download csv file from Server

11.2 Import csv file to a GIS web app

11.2.1 Create three folders

For a more strategic and organized process in importing a csv file to a GIS web app, the users shall create first three folders that will have the following description:

	Name of folder	Description
1.	raw	contains the raw files directly from the ODK Aggregate Server
		(reference: Step 11.1)
2.	post_processed	contains the files that have been edited/processed
3.	publication	contains the consolidated and edited file. The filename of csv file
		inside this folder should always remain the same

Table 4: Three Folders for Processing

11.2.2 Saving exported csv file

- **4** Following the step-by-step procedures in 11.1 above, go to **Exported Submissions**.
- **4** Right click on the top-most link under **Download File**.
- Fress **Save link as** and save it inside **raw** folder the user previously created.
- For the file name, append the date of export using the format: default_export_name_yyyy_mm_dd_time.

C M dpwh-mdcs/ODKAggregate.html#submissions/export///		lggregate ×								1	- 0 ×
Submission Com Management Ste Atmin Con Cut cits: admin (?) Con Cut cits: admin (?) <thcon (?)<="" admin="" cits:="" cut="" th=""> Con Cut ci</thcon>	← → (C 🕯 🗋 dpwh-mdcs,	/ODKAggregate	e/Aggregate.htm	l#submissions/expo	rt///					9 🔂 🗄
File Submissions Exported Submissions C Save As Image: Save As Save As CSV file Organize • Newfolder CSV file Name Destage Name Destage Name Destage Name Destage No items match your search. SV file Destage Destage No items match your search. SV file Destage Downloads No items match your search. CSV file Destage Destage No items match your search. SV file Destage Downloads Pictures CSV file Destage Destage No items match your search. SV file Destage Downloads Pictures CSV file No items match your search. SV file Destage, Pictures CSV file Destage, Pictures CSV file Dout Dive (D) No SV file File game: Project, Monitoring, Mobile, App, 3T, results, 2016, 05, 12, 12NM Sv file Hide Folders Save es type: Mi		Submissions	Form Manag	gement S	ite Admin				Log Out odk adm	n 🚺	> 🥸
File Jype © © ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °	Filter Si	C Exported	Submissions			Save As					×
CSV file Organize New folder Image: New folder	File Type	€ ∋ - ↑ 🎍 > bo	oc_mdcs ⊦ mdcs_p	im ⊧ raw				~ ¢	Search raw		P
CSV file CSV file Dektop Downloads CSV file Downloads Recent places Downloads CSV file File game Project, Monitoring, Mobile, App, 3T, results, 2016, 05, 12, 12bl M CSV file	CSV file	Organize 👻 New folde	er								
CSV file Elestop No items match your search. CSV file So wondods Recent places CSV file I Libraries I Libraries CSV file I Computer I Computer CSV file I Elesame Friedame Cancel Save a type Microsoft Excel Comma Separated Values File CSV file I Elesame Save Save <td>CSV file</td> <td>☆ Favorites</td> <td>Name</td> <td>^</td> <td>Date modified</td> <td>Туре</td> <td>Size</td> <td></td> <td></td> <td></td> <td></td>	CSV file	☆ Favorites	Name	^	Date modified	Туре	Size				
CSV fle Recent places CSV fle Libraries CSV fle Documents CSV fle Vides CSV fle Vides CSV fle Vides CSV fle Computer CSV fle Computer CSV fle So (C) OVD Drive (D) No Computer CSV fle File game Project_Monitoring_Mobile_App_3T_results_2016_05_12_12NM CSV fle Save as type: Microsoft Excel Comma Separated Values File CSV fle Arrest of the folders	CSV file	Desktop				No items r	natch your search.				
CSV file Ibrainis CSV file Documents CSV file Vides CSV file Vides CSV file Vides CSV file Computer CSV file Computer CSV file File game Project_Monitoring_Mobile_App_3T_results_2016_05_12_12NM v CSV file File game CSV file Save as type: Microsoft Excel Comma Separated Values File CSV file Anticol Computer CSV file Save as type: Microsoft Excel Comma Separated Values File	CSV file	🔛 Recent places									
CSV file Image: Computer Simplify Si	CSV file	Cibraries									
CSV file CSV fi	CSV file	J Music									
CSV file Image: Computer image:	CSV file	Videos									
CSV file CSV fi	CSV file	🛤 Computer									
CSV file Removable Disk (File Data Disk (File	CSV file	ing OS (C:)									
CSV file CSV	CSV file	Removable Disk (E									
CSV file Save as type: Microsoft Excel Comma Separated Values File CSV file Sove as type: Microsoft Excel Comma Separated Values File Sove Microsoft Excel Comma Separated Values File Sove Microsoft Excel Comma Separated Values File CSV file	CSV file	Eile some Decis	et Manitarian Mark	ile Ann 2T result- 201	6 05 12 12NN						
CSV file Hide Folders Save Cancel	CSV file	Save as type: Micro	osoft Excel Comma S	eparated Values File	0_00_12_121414						v
Hide Folders Save Cancel	CSV file										_
	CSV file	Hide Folders							<u>S</u> ave	Cancel	
CSV file Dataset Available 2016-04-13 14/36/41 201000000 Mobile App for Disaster Situation Road 2.0 results csv.	CSV file	Dataset Available	2016-04-13 14:3	6:41.201000000	Mobile	App for Disaster	Situation Road 2.0 r	results csv	😫 Delete		

Photo 36: Save CSV File to Raw Folder

11.2.3 Post-process/edit raw csv file

- BOC shall designate engineers who will post-process the raw data. Post-processing includes, but not limited to, changing of date format, replacing underscores with spaces, etc.
- To be more efficient and strategic, BOC will assign post-processors for specific regions. Each post-processor shall ensure the accuracy of data or regions assigned to him/her. S/he shall not add/delete columns and/or rows to the csv file.
- Under the **post_processed** folder, there will be sub-folder for each region. Under each regional folder, there will be two sub-folders: line and point. Line refers to projects such as road, dike, spur dike and revetment that has start and end coordinates. Point, on the other hand, refers to projects such as buildings, gates, channels, dams, bridges and dredging that has only one coordinate. Each post-processor shall name the csv file the same way the raw csv file was named appending region name and line or point i.e. *default_export_name_yyyy_mm_dd_time_region_*line

×	Sav	re As	×
🔄 ⊝ → ↑ 🌗	≪ Desktop → boc_mdcs → mdcs_pm → post_proces	ed → REGION I → line v C Searc	h line 🔎
Organize 👻 Ne	ew folder)III 🕶 🔞
Computer Computer OS (C:) COS (C:	Norisk (E 01) (le Sh	Date modified Type Si	ze
File name:	Project_Monitoring_Mobile_App_3T_results_2016_05_12_f	EGION_I_line	~
Save as type:	CSV (Comma delimited)		×
Authors:	Rivera, Rafael S. Tags: Add a tag	Title: Add a title	
Hide Folders		Tools 💌	Save Cancel
		C: » DPWH-WB GIS Project » ODK4D	PWH (mdcs-dpwh) » Flood Control
Options			
		Desktop	

Photo 37: Post-processing of CSV File: Line Folder



Photo 38: Post-processing of CSV File: Point Folder

11.2.4 Consolidate post-processed data for importing to a GIS web app

- **BOC** shall assign a consolidator responsible for consolidating the changes made by the post-processors.
- The consolidate csv file shall be saved inside the production folder using the name of mobile app as the default name (i.e., Project_Monitoring_Mobile_App3_results_2015_05_12_line.csv or Project_Monitoring_Mobile_App3_results_2015_05_12_point.csv). The name of the file inside the production folder should always remain the same.

			productio	on		
File Home Share View						
Copy Paste Paste shortcut Clipboard	ove Copy Delete Rename Organize	New item • New folder New	Properties Open	Select all Select none invert selection Select		
(→ ↑) → boc_mdcs →	mdcs_pm → production					
☆ Favorites	Name	~		Date modified	Туре	Size
E Desktop	Project_Monitoring_Mo	bile_App_3T_results_2016_05	_12_line	5/12/2016 12:11 PM	Microsoft Excel C	4 KB
🐌 Downloads	Project_Monitoring_Mo	bile_App_3T_results_2016_05	5_12_point	5/12/2016 12:13 PM	Microsoft Excel C	3 KB
Documents J Music						
 Pictures Videos 						
Pictures Videos Computer OS (C)						

Photo 39: Production Folder

11.2.5 Import csv file to GIS web app

- Open web browser and copy and paste this link: <u>http://dpwh.maps.arcgis.com/home/item.html?id=4be2402fe8254a499e0133f</u> <u>ab2af86c8</u>
- BOC shall coordinate with BID-DAS for the username and password of this web app.

Sign in to Department of EST Public Works and Highways Username
Password
☐ Keep me signed in
SIGN IN
Forgot password? Forgot username?

Photo 40: Log-in to ArcGIS On-line

- 4 Open Mapviewer
- **4** Select **Add layer from File**
- Choose the csv file inside the production folder
- Select IMPORT LAYER.
- **4** Locate the features using **Latitude** and **Longitude**
- Select ADD LAYER.



Photo 41: Adding CSV Layer to Web App

11.3 ArcGIS Tools

11.3.1 Photos-to-Points-to-Lines (P2L)

Note: ArcMap must be installed in the desktop computer of the users for these tools to work. BOC shall coordinate with IMS-SAS regarding availability and installation of ArcMap.

- 4 Open ArcMap
- ↓ Upon clicking the ArcToolbox, ArcMap display should appear like below:





4 Right-click on the **ArcToolbox** and then select **Add Toolbox**.

Photo 43: Add tool in ArcToolbox

The Add Toolbox window will prompt. Open the folder where the P2L toolbox is located. Select the **P2L.tbx** and click **Open** to add the P2L Toolbox to the ArcTool.

	Add	Toolbox		×
Look in: 🛅	Tool Box	🗸 🖒	🗟 🇰 🗸	😂 📔 🔛
P2L.tbx				
) Nama				
Name:				Open
Show of type:	Toolboxes		~	Cancel

Photo 44: Open ArcToolbox

4 Check if the P2L toolbox is added. The ArcToolbox should now have the Tool Box. Click the icon on the left side of the Tool Box to see if the P2L tool is there.

 3D Analyst Tools Analysis Tools Cartography Tools Conversion Tools Data Interoperability Tools Data Management Tools Data Management Tools Editing Tools Editing Tools Geocoding Tools Geostatistical Analyst Tools Linear Referencing Tools Multidimension Tools Network Analyst Tools Parcel Fabric Tools Schematics Tools Server Tools Server Tools 	
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Parcel Fabric Tools Schematics Tools Server Tools Server Tools Server Tools	
Schematics Tools Server Tools Server Tools	
Server Tools	
- Second Annalised Teacle	
Spatial Analyst Tools	
🗊 🔤 Spatial Statistics Tools	
E STOOL Box	
po P2L	
🕀 🧤 Tracking Analyst Tools	

Double-click the P2 should look like this:

would prompt. It

90	P2L	_ (×
Folder Output Point Field Name (optional) Output Line		P2L	^
OK Cancel E	invironments	Tool Help	Ý

Photo 45: P2L Window

↓ The P2L tool has four (4) input requirements that the users need to accomplish before launching the tool.

}~	P2L	- 🗆 🗙
• Folder 1 Folder	^	P2L
Output Point Output Point		
Field Name (optional) (3) Field Name (option	ial)	
Output Line Output Line	v	
	~	\sim
OK Cancel En	vironments << Hide Help	Tool Help
Photo 46: Inpu	t-Output for P2L	

Table 5: Input-Output for P2L

Input Requirement	Description
Folder	contains the geotagged photos the user wants to process
Output Point	users should identify the name and location of the output point shapefile that will be produced by the Geotagged Photos to point process
Field Name (optional)	field name of point shapefile used to sort the connection of each feature
Output Line	users should identify the name and location of the output line shapefile that will be produced by the points to line process

Click on the browse icon to locate the folder of the geotagged photos. Select the folder of geotagged photos and click Add.

Ĵ≈ P2L – □	×
Folder P2L	^
Output Point	
Compartine	
OK Cancel Environments << Hide Help Tool Help	~
Folder	×
Look in: 🔁 test 🗸 🛧 🏠 🕼 📰 👻 😂 🗊 🕻	•
geotag photos HDM4_x_LRS_2	
Name: April 11 Geotag Photos Add	
Show of type: Basic Types V Cancel	

Photo 47: Adding Geotagged Photos

Click on the browse icon to assign the folder where the output points will be stored. Assign the name of the output points. Use the project component ID (PCID) of your geotagged photos. Click **Save** once users have finished naming their points.

j∞ P2L – □ ×
Folder P2L
Output Point
Field Name (ontional)
v
Output Line
OK Cancel Environments << Hide Help Tool Help
Output Point
Look in: 🔚 April 11 Geotag Photos 🗸 🏠 🖓 🦉 📰 🔻 😂 🕤 🚳
Geotag_Photos_April11.gdb
Name: FCID######## Save
Save as type: Feature classes V Cancel

Photo 48: Assigning Output Folder

Click the dropdown icon to see the different fields of your points. Select the **DateTime** field as your sorting field to properly connect the points.

Þ• P2L	- 🗆 ×
Folder C:\Users\villapb\Desktop\Paolo\test\April 11 Geotag Photos	Field Name (optional)
C:\Users\villapb\Desktop\Paolo\test\April 11 Geotag Photos\FCID#######.shp	No description available
Field Name (optional) DateTime Path DateTime DateTime Direction 	
~	~
OK Cancel Environments << Hide Help	Tool Help

Photo 49: DateTime as Sorting Field

Click on the browse icon to assign the folder where the output Line will be stored. Assign the name of the output line. Use the FCID of your geotagged photos. Click Save once users have finished naming their line.

Dia .	P2L - 🗆
• Folder	∧ P2L
Output Point	t 🖻
Field Name (Output Line	(optional)
	~
	OK Cancel Environments < <hide help="" help<="" td="" tool=""></hide>
\checkmark	
	Output Line
ook in:	🗀 April 11 Geotag Photos 🔹 🗟 🏠 🏹 📰 < 🖆 🗊 🗞
🗍 Geota	ag_Photos_April11.gdb
Name:	FCID########
Save as t	ype: Feature dasses V Cancel

Photo 50: Assigning Folder for Output Line

4 Once all of the input data requirements have been accomplished, users can now click **OK** to apply the conversion.

₽° P2L	- • ×
Folder C: Users\villapb\Desktop\Paolo\test\April 11 Geotag Photos Output Point C: Users\villapb\Desktop\Paolo\test\April 11 Geotag Photos\FCID########.shp Field Name (optional) DateTime Output Line C: Users\villapb\Desktop\Paolo\test\April 11 Geotag Photos\FCID########.shp	Output Line No description available
OK Cancel Environments << Hide Help	Tool Help
Photo 51: Run the P2L Tool	

4 The image below shows the sample output of the geotagged photos to line process.



Photo 52: Sample Output by P2L

To edit the attribute, right-click on the line layer found in the table of contents. Select Open Attribute Table.



The attribute table of the line shapefile will prompt. The users should add a new field for identification. To add a new field, click on the menu icon. Select Add Field.

Tabl	e		Π×
-	🖶 - 🖳 🌄 🖾 🖉 🗙		
25	Find and Replace		×
P	Select By Attributes	ngth	
N	Clear Selection	1811	
2	Switch Selection		
	Select All		
	Add Field		
	Turn All Fields On		
~	Show Field Aliases		
	Arrange Tables	•	
	Restore Default Column Widths		
	Restore Default Field Order		
	Joins and Relates	t of 1 Selected)	
1	Related Tables	P	
dh	Create Graph		
	Add Table to Layout		
2	Reload Cache		
	Print		
	Reports	•	
	Export		
	Appearance		

Photo 54: Adding Field

- **4** The Add Field window will prompt. Use the following for input requirements and then click **OK** to add new field.
- Name: PCID
- \rm Type: Text
- Length: 8

	Add	Field	×	
Name:	FCID			
Type:	Text		~	
Field Prop	perties			
Alias				
Allow	IULL Values	Yes		
Default	Value			
Length		8		
OK Cancel				
Photo 55: Adding Field				

The attribute table should now have a new field in it. Notice that the field do not have any information yet. The users should populate the field with the proper FCID.

Та	ble				□ ×
•	• 🔁 • 🖣	🔂 🖸 🌆	×		
FC	ID_SampleLi	ne			×
	OBJECTID *	Shape *	Shape_Length	FCID	
Þ	1	Polyline Z	0.001811	<null></null>	
Р	• •	1 🕨 🖬 📗	🔲 🗐 (0 out of 1	Selected)	
FC	CID_SampleLine				

Photo 56: Sample Attribute Table

4 To add the PCID, right-click on the PCID field name. Select the **Field Calculator**. A notification will prompt, click **Yes** to proceed.

Table					□ ×
🗄 • 🖶 • 🏪 🗞 🖾 🖑	×				
FCID_SampleLine					×
OBJECTID* Shape* 1 Polyine Z FCID_SampleLine	Shape_Length 0.001811	FCID <nud Selectec X Selectec X</nud 	Sort Ascendin Sort Descendin Advanced Sort Summarize Statistics Field Calculate Calculate Geor Turn Field Off Freeze/Unfreez Delete Field Properties	g ng or metry ze Column	
	Fie	eld Calcul	ator		×
You are about to do a calci session, but there is no way Don't warn me again	ulate outside of an to undo your resu Yes	edit session. Its once the o	This method is calculation begi	faster than cali ins. Do you wisi	culating in an edit h to continue?
Parser © V8 Scrpt Python Pields: C8.3ECTID Shape Length FCID Show Codeblock PCID = T=2000.1.2*	Type:	Functions: Abs () Cos () Exp () Fix () Int () Sm () Sm () Tan ()	•••		
About calculating fields	Clear	Load OK	Save Cancel		

Photo 57: Using Field Calculator

- Type in the text box the FCID of the line (e.g., "F20001LZ"). Do not forget to put text between "". Click OK to add the FCID to the attribute table.
- ✤ The attribute table should now look like this.



Photo 58: Attribute Table with Additional Data



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