


Instructions for Collecting Pedestrian Data from Videos

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Project objectives

- ❧ Use videos to collect data on # of people walking at signalized intersections throughout Utah
- ❧ Compare observed pedestrian counts to pedestrian push-button data from traffic signals, obtained from  **ATSPM**
Automated Traffic Signal Performance Measures
- ❧ Develop factoring methods to convert pedestrian signal data to intersection pedestrian volumes
- ❧ Estimate # of people walking at any signalized intersection in Utah, real-time or historical



Step-by-step instructions

❧ 1. Installation & setup

- ❧ 1a: Install Box Drive
- ❧ 1b: Install & setup VLC Media Player
- ❧ 1c: Install & setup R and RStudio

❧ 2. Prepare video and Shiny app

- ❧ 2a: Claim a folder & open a video
- ❧ 2b: Open the Shiny app in RStudio
- ❧ 2c: Become familiar with the location and camera view
- ❧ 2d: Check video information

❧ 3. Watch video & record events

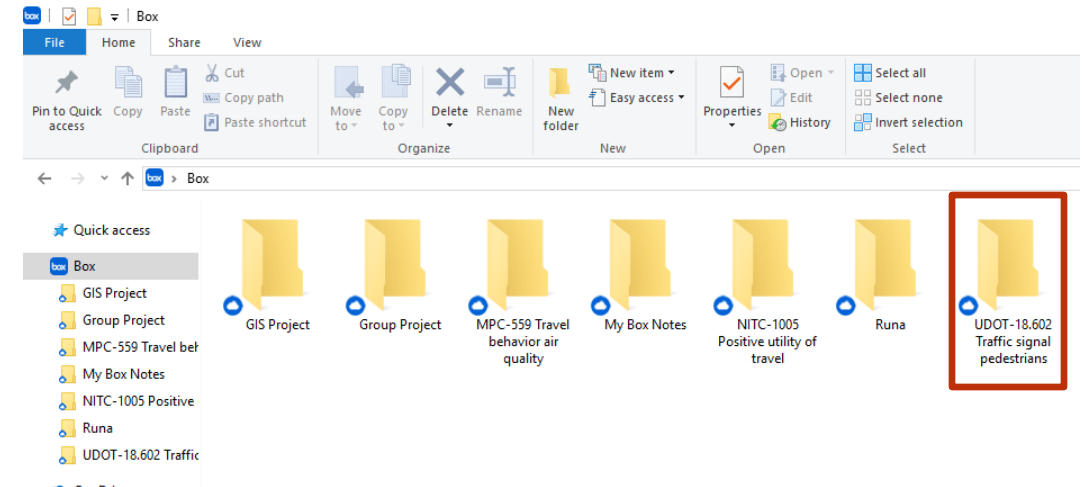
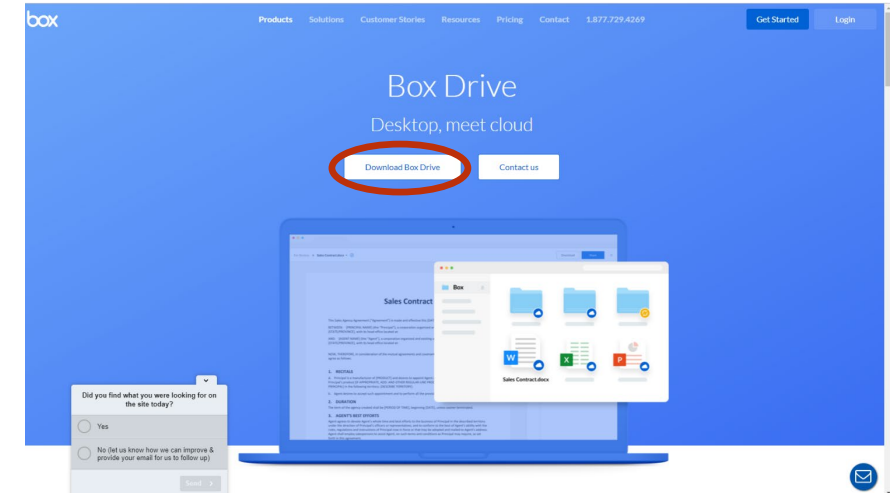
- ❧ 3a: Pedestrian events
 - ❧ Pedestrian crossing
 - ❧ Duplicate crossing
 - ❧ Pedestrian corner
- ❧ 3b: Other mode events
 - ❧ Bicyclist/scooter/other event
- ❧ 3c: Special situations
 - ❧ Low visibility
 - ❧ Mistakes & edits

❧ 4. Finish

1a: Install Box Drive

❧ Install Box Drive

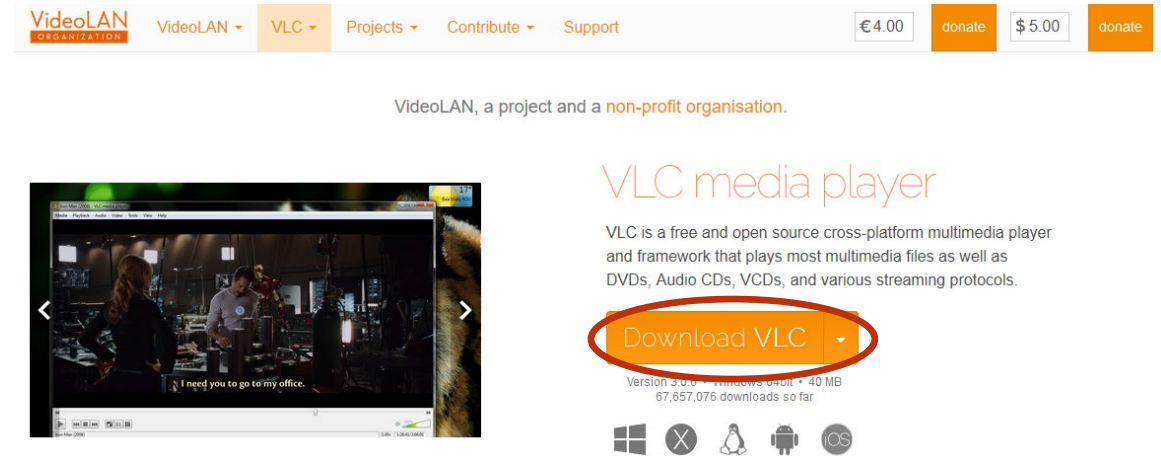
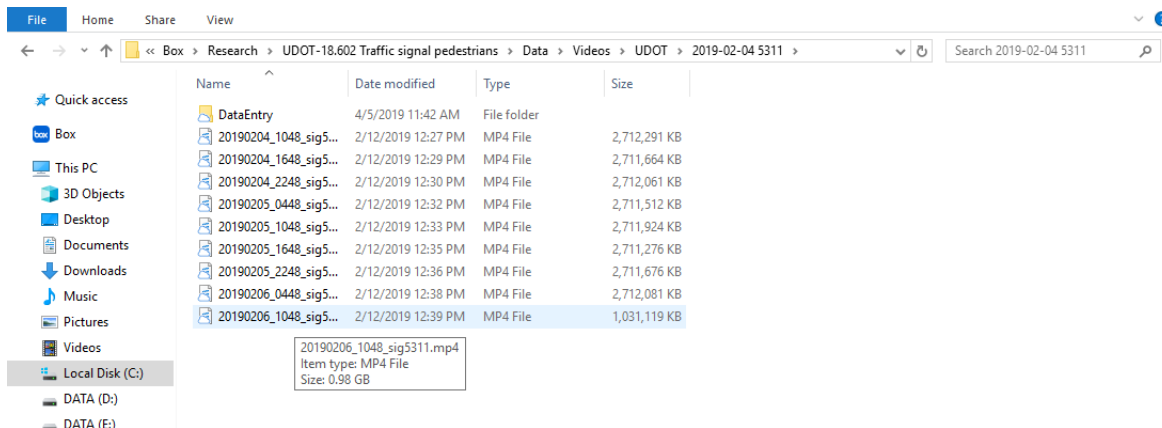
- ❧ Go to <https://www.box.com/resources/downloads/drive>
- ❧ Download and install for your operating system
- ❧ (Do NOT install Box Sync! It is something different.)
- ❧ Box Drive lets you access Box as if it were just another folder/disk drive on your computer →
- ❧ Open and view the UDOT folders that were shared with you



1b: Install & setup VLC Media Player

❧ Install VLC Media Player

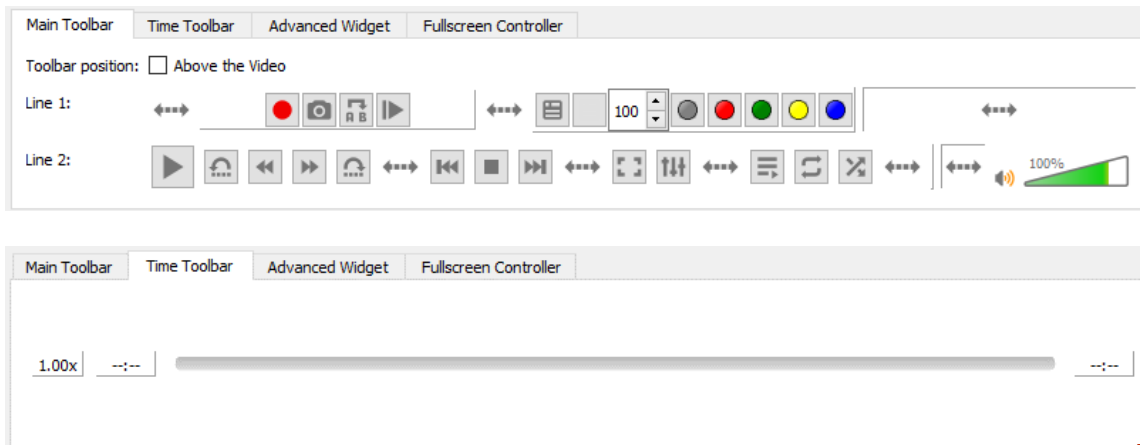
- ❧ Go to <https://www.videolan.org/vlc/>
- ❧ Download and install for your operating system
- ❧ Navigate to Box, and open a video file (right click, Open with, VLC media player)



1b: Install & setup VLC Media Player

☞ Setup VLC media player

- ☞ Configure the controls so they are easier for watching, pausing, and fast-forwarding videos
- ☞ Go to: **Tools, Customize Interface...**
- ☞ Drag and drop toolbar elements so that the Main and Time Toolbars look like:



Play/pause

Jump back 10 seconds

Increase/decrease playback speed

1c: Install & setup R and RStudio

❧ Install R

❧ Go to <https://cloud.r-project.org/>

❧ Download and install
for your operating system

❧ Install RStudio

❧ Go to <https://www.rstudio.com/products/rstudio/download/>

❧ Download and install the FREE
version for your operating system

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)


R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

RStudio

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Choose Your Version of RStudio

RStudio is a set of integrated tools designed to help you be more productive with R. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace. [Learn More about RStudio features.](#)

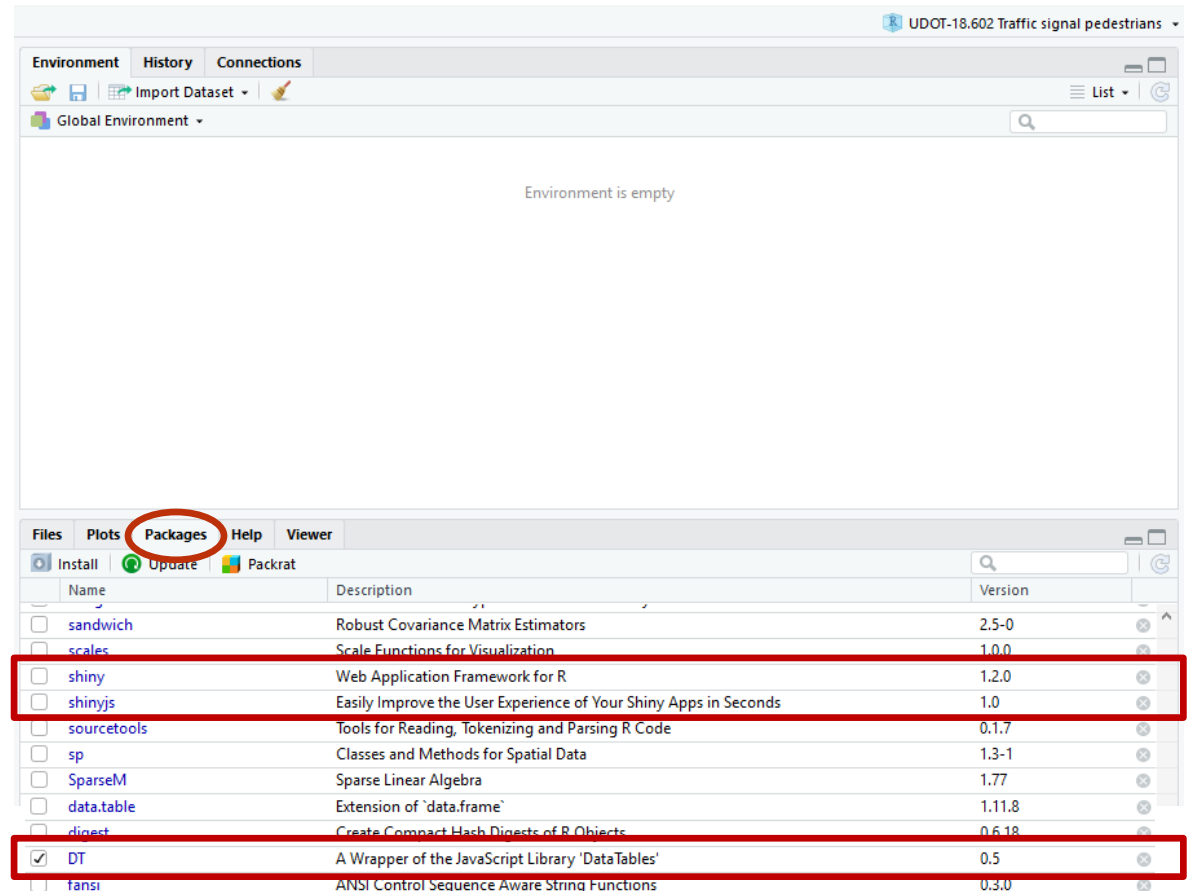


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FREE	\$995 per year	FREE	\$9,995 per year	\$29,995 per year
DOWNLOAD <small>Learn More</small>	BUY <small>Learn More</small>	DOWNLOAD <small>Learn More</small>	DOWNLOAD <small>Learn More</small>	TALK <small>Learn More</small>

1c: Install & setup R and RStudio

Setup RStudio

- Open RStudio
- Click on the Packages tab in the lower right corner of the screen
- Install the following packages
 - shiny
 - shinyjs
 - DT
- RStudio is the programming platform we will use to systematically record any observed pedestrian activity



2a: Claim a folder & open a video

☞ Claim a folder

- ☞ In Box Drive, go to the UDOT folder.
- ☞ Select a video folder and move it into the 0_[name] folder with your name to claim it.

☞ Open a video

- ☞ Option 1: Select an MP4 file, right-click, Open with, VLC media player
- ☞ Option 2: Copy/download an MP4 file to your desktop, repeat instructions above.

How to read a folder name:

Date Signal

Date: Year-Mo-Dy

Signal: 4-digit ID

How to read a file name:

Date_Time_sigSignal

Date: YearMoDy

Start time: HrMn

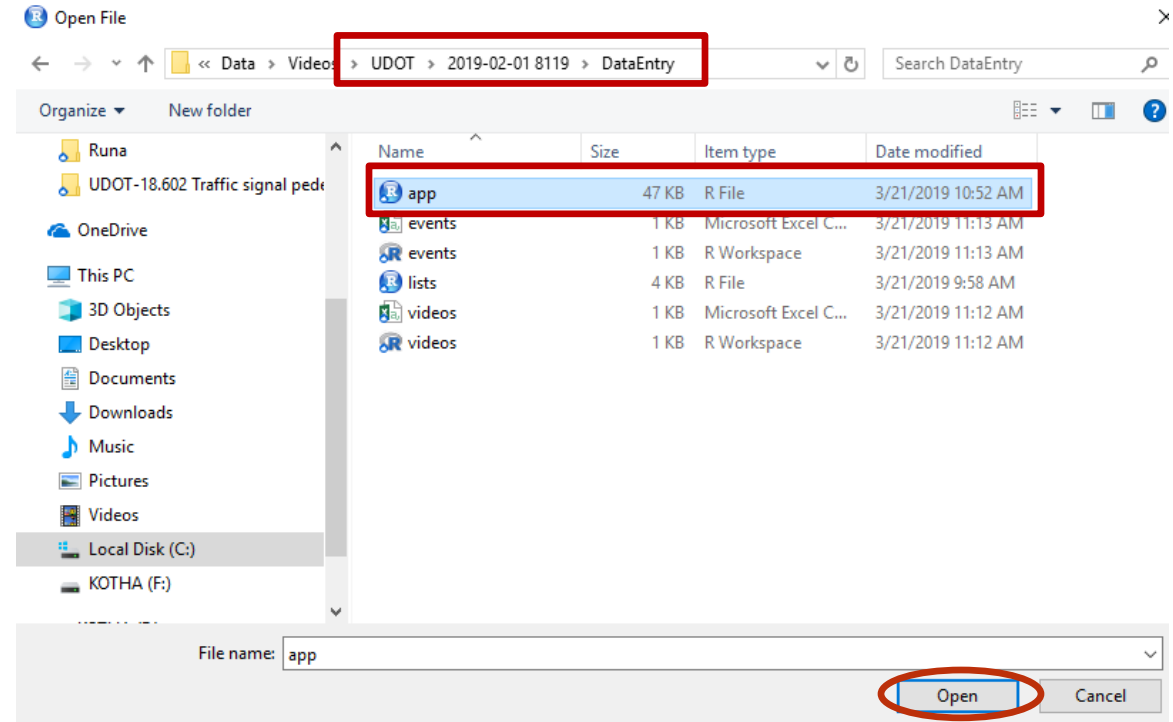
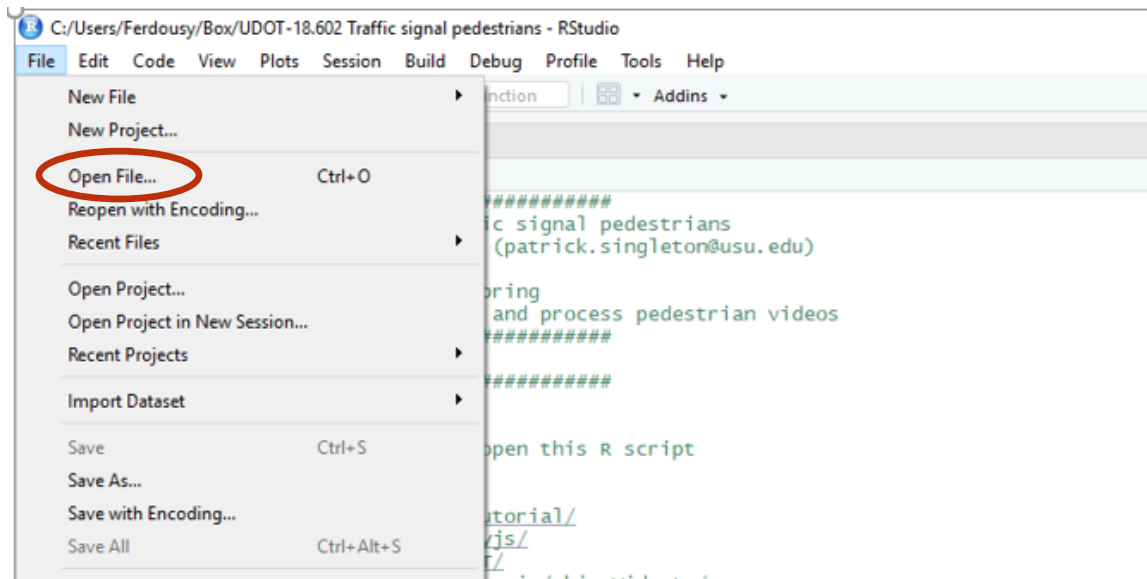
Signal: 4-digit ID

2b: Open the Shiny app in RStudio

Open the Shiny app in RStudio

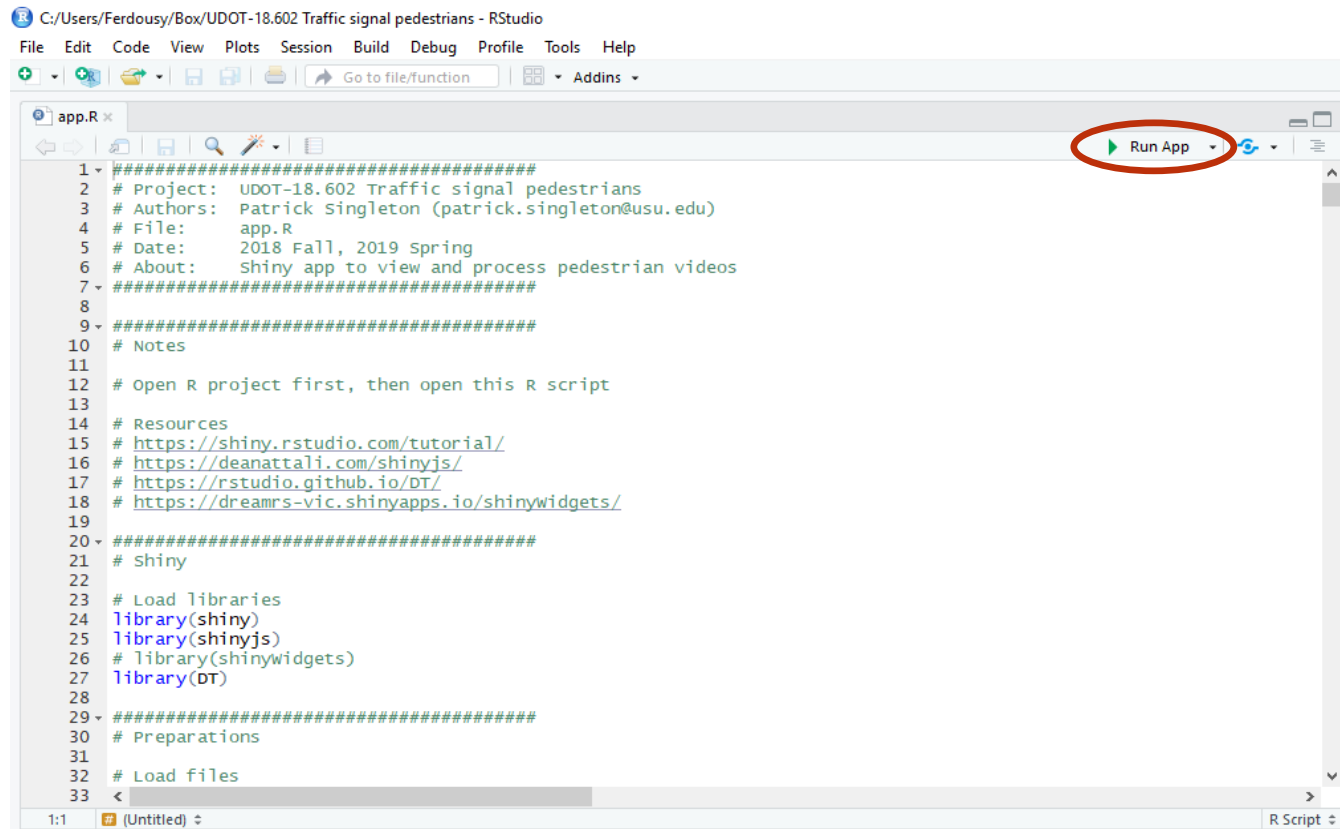
Open RStudio.

Go to File, Open File..., and navigate to the app.R file within the DataEntry folder in your selected video folder.



2b: Open the Shiny app in RStudio

☞ Click Run App to launch the app. It will pop up in a new window, or you can tell it to open in web-browser window.



The screenshot shows the RStudio IDE with a file named 'app.R' open. The 'Run App' button, represented by a green play icon, is circled in red in the top right corner of the editor window. The script content includes project metadata, notes, resources, and Shiny app initialization code.

```
1 #####
2 # Project: UDOT-18.602 Traffic signal pedestrians
3 # Authors: Patrick Singleton (patrick.singleton@usu.edu)
4 # File: app.R
5 # Date: 2018 Fall, 2019 Spring
6 # About: shiny app to view and process pedestrian videos
7 #####
8
9 #####
10 # Notes
11
12 # Open R project first, then open this R script
13
14 # Resources
15 # https://shiny.rstudio.com/tutorial/
16 # https://deanattali.com/shinyjs/
17 # https://rstudio.github.io/DT/
18 # https://dreamrs-vic.shinyapps.io/shinywidgets/
19
20 #####
21 # Shiny
22
23 # Load libraries
24 library(shiny)
25 library(shinyjs)
26 # library(shinywidgets)
27 library(DT)
28
29 #####
30 # Preparations
31
32 # Load files
33 <
```



2c: Familiar with location/camera view

Information about videos

- Every video can (usually) see at least **two crosswalks** and **one corner**

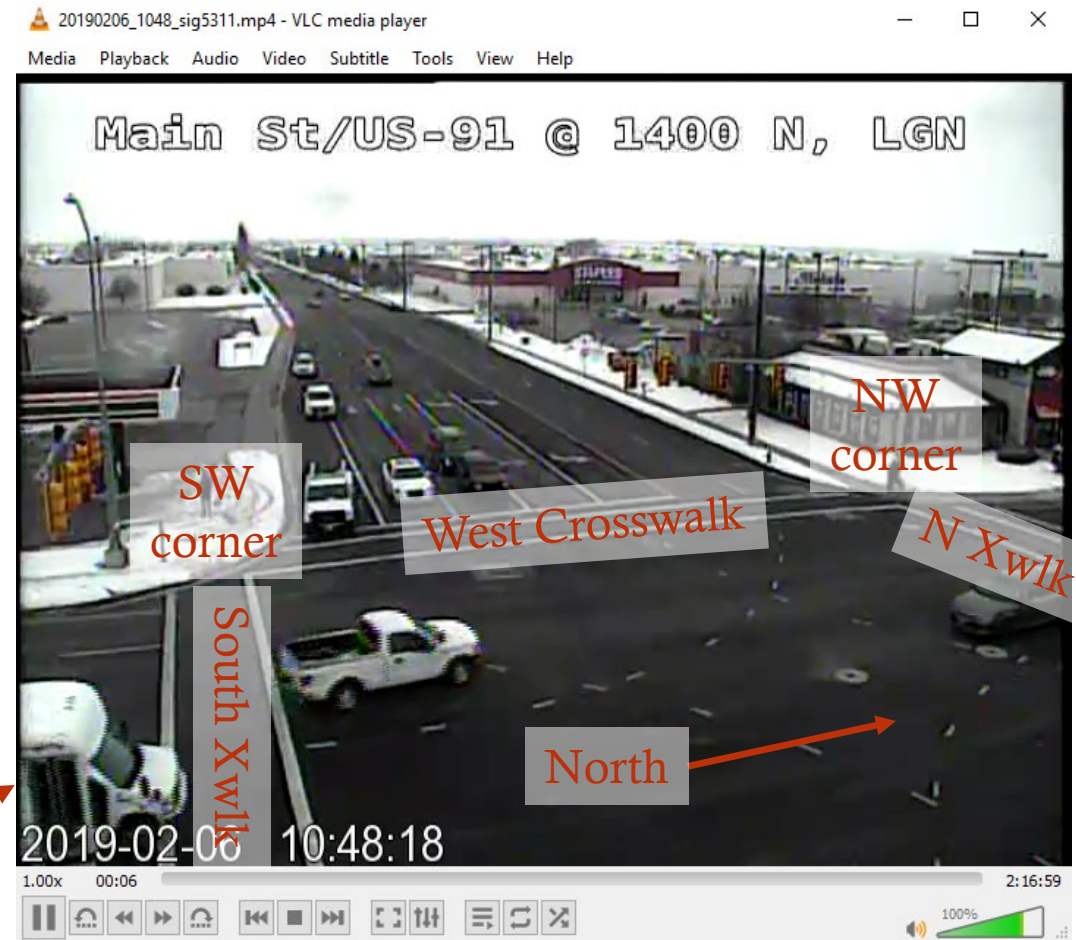
- Some videos can see more

Look up your location in Google Maps

- Figure out which direction the camera is facing (North, East, South, West)

- Figure out **which crosswalks** and **which corners** are visible

Here, we can see **three crosswalks** (S, W, N) and **two corners** (SW, NW)



2d: Check video information

☞ Look at the **Videos** tab (Shiny app)

Video ID: 1 Signal ID: 5306

Signal name: Main St / US-89/91 @ 400 N / US-89, LGN

Video start time: 02/03/2019 07:35:41

Video end time: 02/04/2019 10:17:49

Crosswalks visible: 1: N / NE, 2: E / SE, 3: S / SW, 4: W / NW

Corners visible: 1: NE / N, 2: SE / E, 3: SW / S, 4: NW / W

Created by: PAS

Notes:

Checked by: ABC

Submit View

☞ Check the following (these should be populated)

☞ **Signal name**: roughly matches the name shown at the top of the video

☞ **Video date/time**

☞ Should match the start date/time of **first** and end date/time of **last** videos in your folder

☞ **Crosswalks visible**

☞ 1 is North or Northeast

☞ 2 is East or Southeast

☞ 3 is South or Southwest

☞ 4 is West or Northwest

☞ **Corners visible**

☞ Add your initials to **Checked by**

3. Watch video & record events

- Look at the **Add event** tab (Shiny app)
 - Note visible crossings/corners
 - Ignore the **Rotate** button
 - Invisible crossings/corners are greyed out
 - Add your initials to **Added by**
- For every event, record the following:
 - Date**, **Hour** (0-24), **Minute**, **Second** (see the timestamp on the video)
 - Pedestrian** or **Other** counts
 - Notes** (if needed)
- Click “**Add event**” to finish

The screenshot shows the 'Add event' tab of a Shiny app titled 'Pedestrian video data collection'. The form includes the following fields and sections:

- Event ID:** 2
- Video ID:** 1
- Signal ID:** 4130
- Signal name:** 6200 S @ Jordan Canal Rd / Margray Dr, TAY
- Event time:**
 - Date:** 02/04/2019
 - Hour:** 00
 - Minute:** 00
 - Second:** 00
 - Time:** 2019-02-04 00:00:00
- Pedestrian totals:**
 - Total Peds:** 0
 - Total Crossings:** 0
 - Total Duplicates:** 0
 - Total Corners:** 0
- Event details section (circled in red):**
 - Corner 4:** [Dropdown]
 - Crosswalk 4:** [Dropdown]
 - Corner 3:** [Dropdown]
 - Other:** [Text]
 - Mode:** [Dropdown]
 - Crossing/Corner:** [Dropdown]
 - Count:** 0
 - Notes:** [Text area]
 - Corner 1:** Northeast
 - Crosswalk 2:** East
 - Corner 2:** [Dropdown]
 - Other counts:** Peds, Dups (0 each)
 - Rotate Clockwise:** [Button, circled in red and crossed out]
- Added by:** ABC
- Add event:** [Button, circled in red]
- Checked by:** ABC
- Clear:** [Button]

3. Watch video & record events

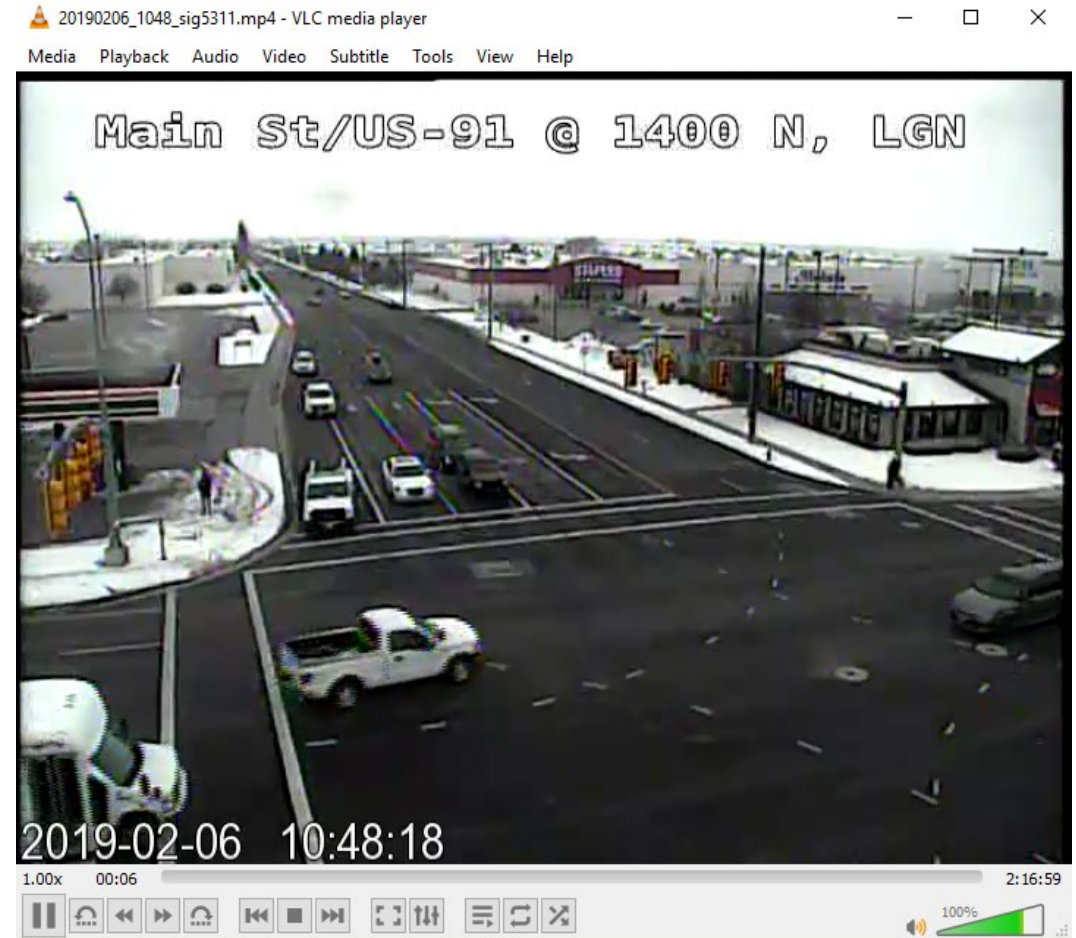
☞ Tips on watching videos

☞ Fast-forwarding

- ☞ Watch at **4x or 8x speed** to start with
- ☞ If very quiet, can go up to **16x speed**
- ☞ Very busy may require **2x or 4x speed**

☞ Pausing

- ☞ Click the **Pause button or Spacebar** when you see something
- ☞ If you miss it, click the button to **jump back 10 seconds**
- ☞ Then decrease the speed to watch at 1x



Play/pause

Jump back 10 seconds

Increase/decrease playback speed

3a: Pedestrian events

- ❧ We want to count the **number of people walking** at this intersection
 - ❧ For the **Peds** boxes within **Crosswalks**, count the number of people you see walking under their own power for each crosswalk at that time
 - ❧ Group size doesn't matter, can record everyone at once
 - ❧ Record the **time** when they are **in the crosswalk**; you don't need to record when they start/stop crossing or when they disappear from view
 - ❧ If you see a person cross, record an event, then see another person cross a few seconds later, you can just record a **new event** with the new time
 - ❧ For the **Peds** boxes within **Corners**, count the number of people you see walking (turning) around that corner BUT not crossing a street
 - ❧ These people do not cross at the intersection, but **just turn a corner**

3a: Pedestrian events

- ❧ We want to count the **number of people walking** at this intersection
 - ❧ For the **Dups** boxes within **Crosswalks**, count the number of people **you have already seen** walking under their own power for each crosswalk at that time; ALSO include them in the **Peds** counts within **Crosswalks**.
 - ❧ If someone walks across one crosswalk, record that as an event with $\text{Peds} = 1$.
 - ❧ If that person then walks across a second crosswalk, record that as a **separate event** with $\text{Peds} = 1$ and $\text{Dups} = 1$.
 - ❧ Make sure that you include the duplicated count within the Peds box for that crosswalk!

3a: Example pedestrian crossing

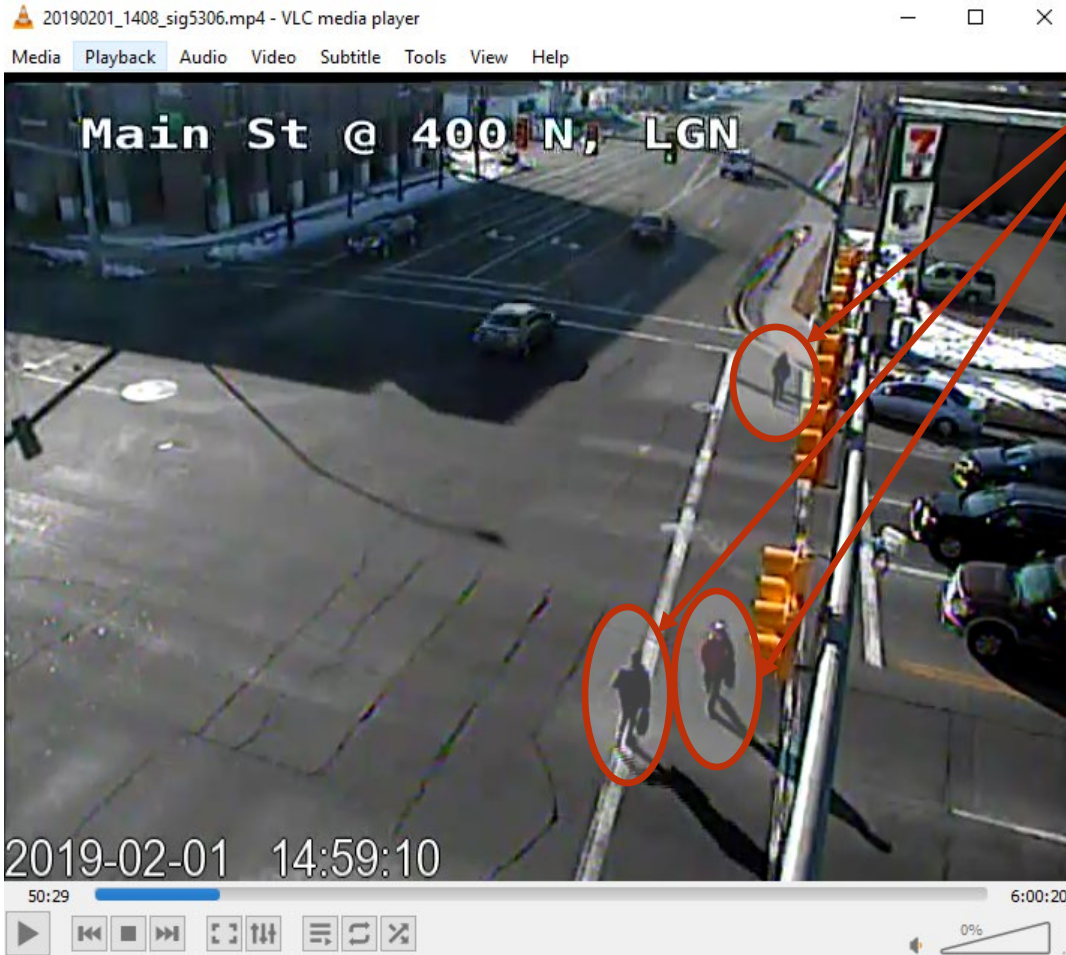


One person using the West crosswalk at 15:21:21.

Pedestrian video data collection Videos Events Add event

Event ID	Video ID	Signal ID	Signal name			
206	1	5306	Main St / US-89/91 @ 400 N / US-89, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/01/2019	15	12	21	2019-02-01 15:12:21
Corner 4	Peds	Crosswalk 1	Peds	Dups	Corner 1	Peds
Northwest	0	North	0	0		0
Crosswalk 4	Peds	Dups			Crosswalk 2	Peds
West	1	0				0
Corner 3	Peds	Crosswalk 3	Peds	Dups	Corner 2	Peds
Southwest	0		0	0		0
Added by	Notes					
FR						
Add event	<input type="checkbox"/> View					
Clear						

3a: Example pedestrian crossing



Three people using the North crosswalk at 14:59:10.

Pedestrian video data collection Videos Events Add event

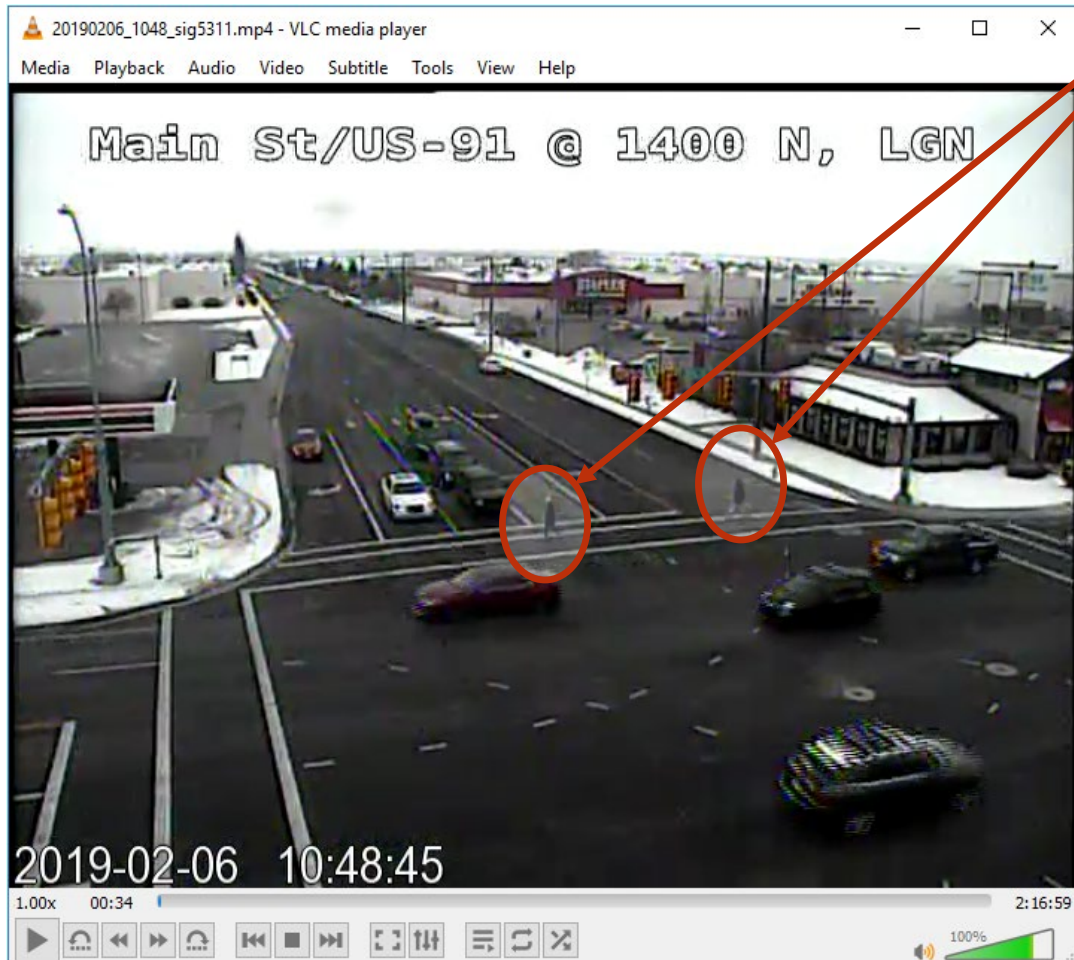
Event ID	Video ID	Signal ID	Signal name			
206	1	5306	Main St / US-89/91 @ 400 N / US-89, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/01/2019	14	59	10	2019-02-01 15:12:21
Corner 4	Peds	Crosswalk 1	Peds	Dups	Corner 1	Peds
Northwest	0	North	3	0		0
Crosswalk 4	Peds	Dups			Crosswalk 2	Peds
West	0	0				0
Corner 3	Peds	Crosswalk 3	Peds	Dups	Corner 2	Peds
Southwest	0		0	0		0
Added by	Notes					
FR						
Add event	<input type="checkbox"/> View					
	Clear					



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3a: Example (duplicated) ped. crossing

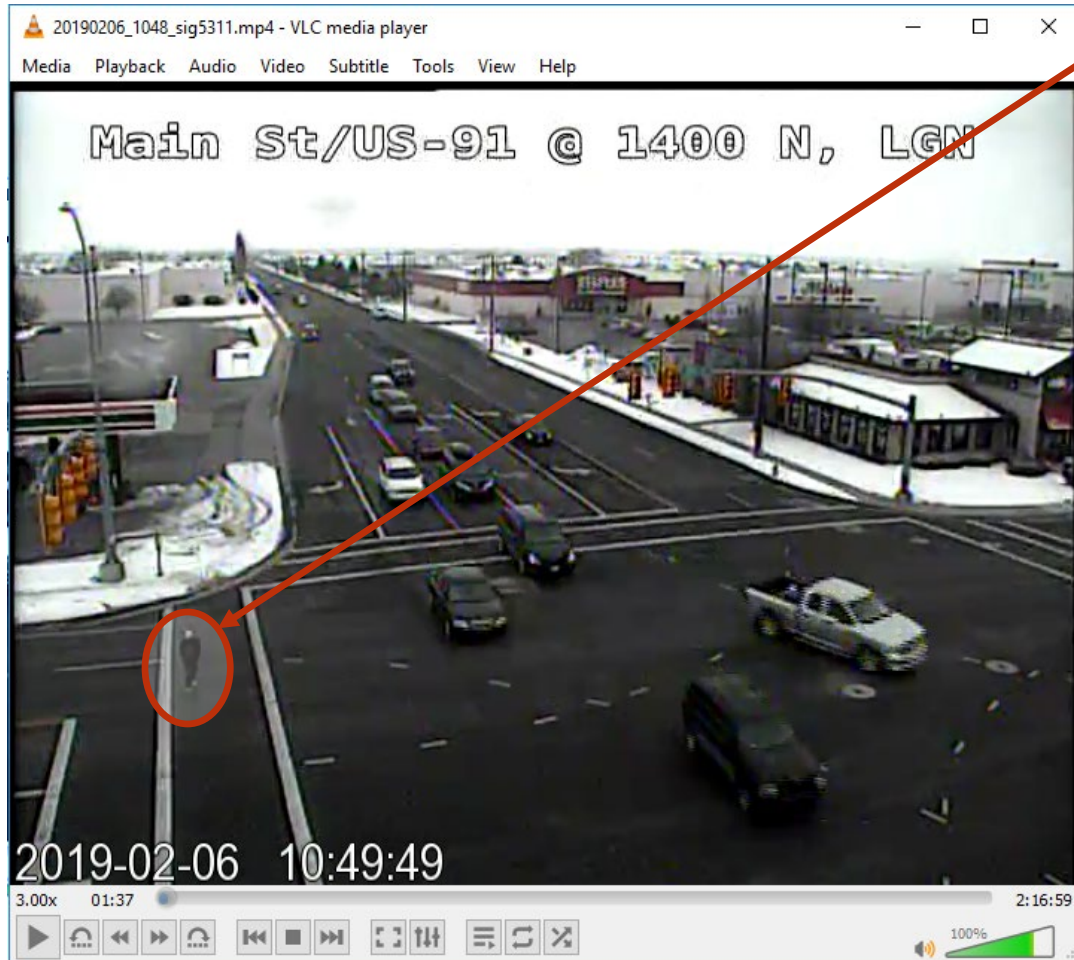


Two people using the **West** crosswalk at **10:48:45**.

Pedestrian video data collection Videos Events Add event

Event ID	Video ID	Signal ID	Signal name			
2	1	5311	Main St / US-91 @ 1400 N, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/06/2019	10	48	45	2019-02-06 00:00:00
Pedestrian totals:		Total Peds	Total Crossings	Total Duplicates	Total Corners	
		0	0	0	0	
Corner 3	Peds	Crosswalk 4	Peds	Dups	Corner 4	Peds
Southwest	0	West	2	0	Northwest	0
Crosswalk 3	Peds	Dups	Rotate Clockwise		Crosswalk 1	Peds
South	0	0			North	0
Corner 2	Peds	Crosswalk 2	Peds	Dups	Corner 1	Peds
	0		0	0		0
Other:	Mode	Crossing/Corner	Count	Notes		
			0			
Added by	Notes				Checked by	
ABC					ABC	
Add event	<input type="checkbox"/> View				Clear	

3a: Example (duplicated) ped. crossing



One person (seen in previous event) using the South xing.

Pedestrian video data collection Videos Events Add event

Event ID	Video ID	Signal ID	Signal name			
2	1	5311	Main St / US-91 @ 1400 N, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/06/2019	10	49	49	2019-02-06 00:00:00
Pedestrian totals:		Total Peds	Total Crossings	Total Duplicates	Total Corners	
		0	0	0	0	
Corner 3	Peds	Crosswalk 4	Peds	Dups	Corner 4	Peds
Southwest	0	West	0	0	Northwest	0
Crosswalk 3	Peds	Dups	Rotate Clockwise			
South	1	1				
Corner 2	Peds	Crosswalk 2	Peds	Dups	Corner 1	Peds
	0		0	0		0
Other:	Mode	Crossing/Corner	Count	Notes		
			0			
Added by	Notes				Checked by	
ABC					ABC	
Add event	<input type="checkbox"/> View				Clear	

New event, 1 Ped AND 1 Dup.

3a: Example pedestrian corner

One person turned the Southwest corner without crossing.



Pedestrian video data collection Videos Events Add event

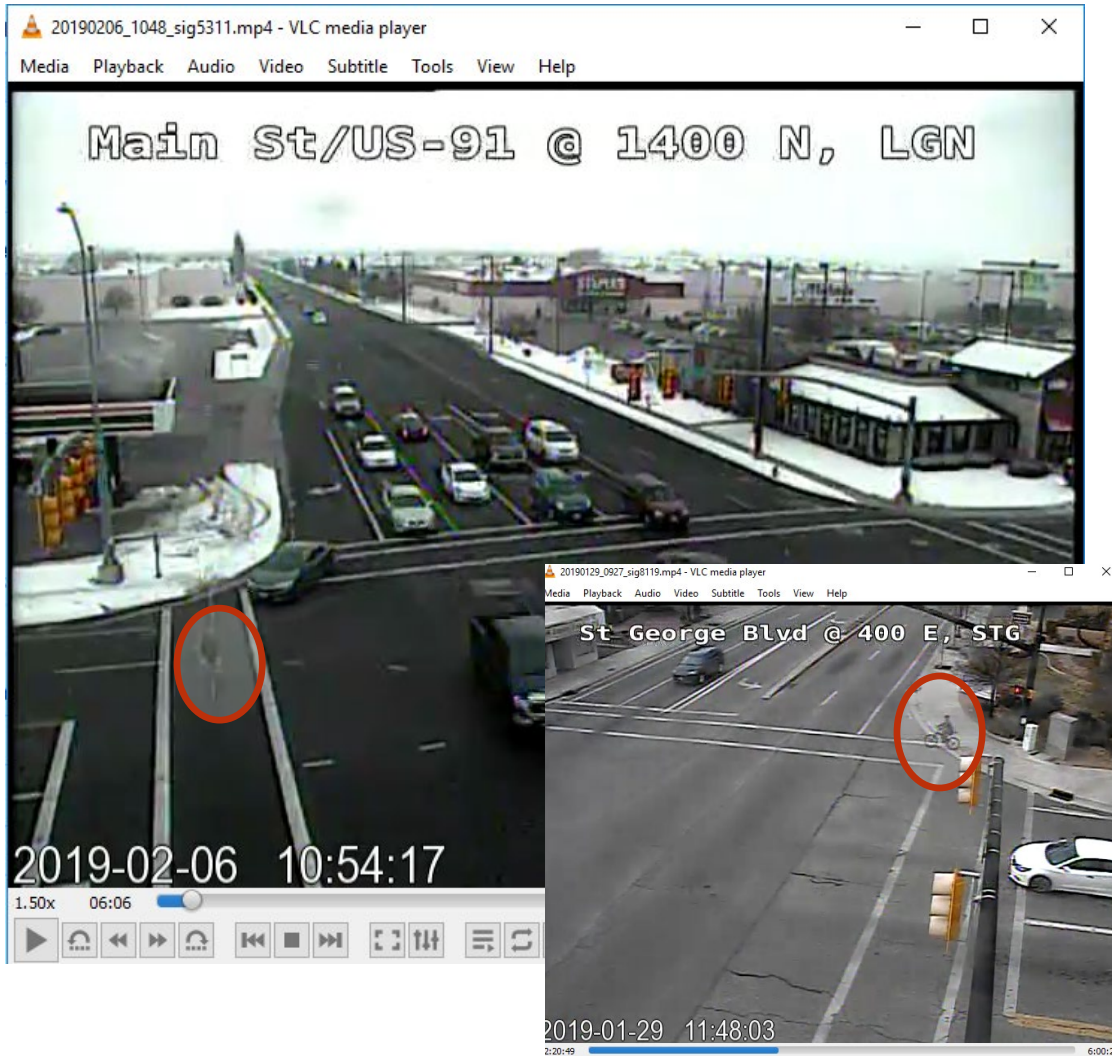
Event ID	Video ID	Signal ID	Signal name			
2	1	5311	Main St / US-91 @ 1400 N, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/06/2019	10	58	52	2019-02-06 00:00:00
Pedestrian totals:		Total Peds	Total Crossings	Total Duplicates	Total Corners	
		0	0	0	0	
Corner 3	Peds	Crosswalk 4	Peds	Dups	Corner 4	Peds
Southwest	1	West	0	0	Northwest	0
Crosswalk 3	Peds	Rotate Clockwise		Crosswalk 1	Peds	Dups
South	0			North	0	0
Corner 2	Peds	Crosswalk 2	Peds	Dups	Corner 1	Peds
	0		0	0		0
Other:	Mode	Crossing/Corner	Count	Notes		
			0			
Added by	Notes				Checked by	
ABC					ABC	
Add event	<input type="checkbox"/> View				Clear	

3b: Other mode events

- ☞ You may see other people (**not walking**) but using the crosswalks
 - ☞ Count them if they are **using the sidewalk and/or the crosswalk**, NOT if they are only in the street
 - ☞ Use the “Other” line, specify the **Mode**, the **Crosswalk/Corner** they are using, the **Count**, and add any **Notes** (if applicable)
 - ☞ **Bicycling**: any type of bicycle (or even a tricycle or unicycle), human- or motor-powered
 - ☞ **Scooter**: a stand-up scooter, usually electric (not a motorcycle or similar)
 - ☞ **Skateboard**
 - ☞ **Wheelchair**: or mobility scooter
 - ☞ **Other**: any other vehicle



3b: Example other crossing



Pedestrian video data collection Videos Events Add event

Event ID	Video ID	Signal ID	Signal name			
2	1	5311	Main St / US-91 @ 1400 N, LGN			
Event time:		Date	Hour	Minute	Second	Time
		02/06/2019	10	54	17	2019-02-06 00:00:00
Pedestrian totals:		Total Peds	Total Crossings	Total Duplicates	Total Corners	
		0	0	0	0	
Corner 3	Peds	Crosswalk 4	Peds	Dups	Corner 4	Peds
Southwest	0	West	0	0	Northwest	0
Crosswalk 3	Peds	Dups	Rotate Clockwise		Crosswalk 1	Peds
South	0	0			North	0
Corner 2	Peds	Crosswalk 2	Peds	Dups	Corner 1	Peds
	0		0	0		0
Other:	Mode	Crossing/Corner	Count	Notes		
	Bicycle	South	1			
Added by	Notes				Checked by	
ABC					ABC	
Add event	<input type="checkbox"/> View				Clear	



3c: Special situations

☞ Low visibility

- ☞ Sometimes you just can't see!
- ☞ This happens especially at **night** and/or during **poor weather**.
- ☞ If you really cannot see anything:
 - ☞ Add an **Other** event with nothing except the time and **Mode** "Start not visible"
 - ☞ When you CAN see again, add another **Other** event with the time and "End not visible"

☞ Pedestrian crossing outside of crosswalks (e.g., midblock)

- ☞ Sometimes, you'll see someone cross the intersection far outside of a crosswalk.
 - ☞ Only do this if it is fairly egregious, such as walking behind stopped cars or > 25 feet.
- ☞ Add an **Other** event, using **Mode** "Pedestrian (outside crosswalk)"

3c: Special situations

If you aren't confident how to fix it, just email us!

❧ Mistakes & edits happen!

❧ Go to the **Events** tab. Page through the table until you find the erroneous event. Click on it.

❧ 1. If you noticed this right away after hitting “Add event”, just click “**Delete selection**” and re-enter the event on the **Add event** tab.

❧ 2. If it happened a while ago, find the error in the form below, fix it, and click “**Submit Edit**”.

There is an issue with the Shiny app, where it sometimes does not load the original Peds numbers. To fix this, unselect that row in the table and select it again. Check that the Peds cells have non-zero numbers in them as appropriate.

The screenshot shows the 'Pedestrian video data collection' Shiny app. The 'Events' tab is selected, displaying a table of events. The second row is highlighted. Below the table, the 'Actions' section includes a 'Delete selected' button, which is circled in red. The table has columns for EVENTID, VIDEOID, SIGNALID, TIME, PED, XPED, XDUP, CPED, X1DIR, X1PED, X1DUP, and X2DIR. The selected row (Event ID 2) has a non-zero value for PED (2).

EVENTID	VIDEOID	SIGNALID	TIME	PED	XPED	XDUP	CPED	X1DIR	X1PED	X1DUP	X2DIR
1	1	5311	2019-02-04 10:48:07	0	0	0	0	N	0	0	
2	1	5311	2019-02-04 00:00:00	2	0	0	2	N	0	0	



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3. Continue recording events

- ∞ Add any notes if needed
- ∞ Click “Add event” after each event.
- ∞ Make sure you have the correct date & time for each event.
- ∞ Keep watching the video and recording events until you get to the end!

4: Finish



☞ Check your events

- ☞ Go to the **Edit Video** tab in the Shiny app window.
- ☞ Look over the table and make sure you entered a **time** and other information for each event.

☞ Close things & tidy up

- ☞ Close the Shiny app window. Close the Shiny app file. Close RStudio.
- ☞ Close VLC Media Player.
- ☞ **Delete any videos** you downloaded to your desktop. (DO NOT delete videos

or files from any Box folder.)

- ☞ Move the entire video folder from your 0_[name] folder to the **1_completed** folder.
- ☞ **Email Patrick and Runa**
 - ☞ Let them know you have completed watching those videos
 - ☞ Tell them the number of hours you spent watching those videos
 - ☞ Enter your hours in Aggietime
 - ☞ Share any issues, questions, or special situations you observed
- ☞ **Pick another folder & start again!**



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