

Texting While Driving Cases: Case Study, Best Practices, GPS Demos from Mobile & Cloud Sources

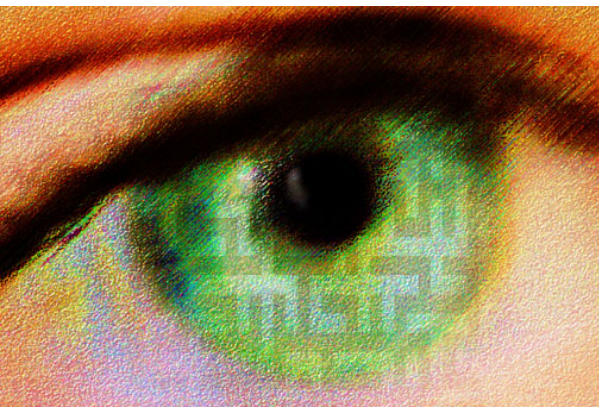
Criminal Justice Institute 2017

Minnesota CLE

August 23, 2017

John J. Carney
Carney Forensics

Bruce N. Ringstrom
Ringstrom Law



Criminal Vehicular Homicide and Injury

- State accuses Sara of overshooting her planned exit by 80 miles, texting all the way.
- When she makes a left turn on a small highway to turn around and head back, she drives in front of two motorcyclists.
- The first motorcyclist collides with her car and the second collides with the first motorcyclist.
- One dies and one is permanently disabled.

Criminal Vehicular Homicide and Injury

- State's expert opines that after an accident, most people get out and check on others before calling 911.
- Since Sara made her 911 call at 11:59AM, and she received her last text at 11:57AM, he opines she was very likely texting during or just before the accident.

Feature Phone Evidence



CARNEY FORENSICS DIGITAL EVIDENCE CAPTION

Client: **Ringstrom Law**

Case ID: **Sarah Jo Braith**

Case #: **14-CR-15-99**

Date: **2-9-2015**

Device Make: **Samsung**

Device Model: **SCH-U485**



GPS Evidence



Feature Phone Evidence



CARNEY FORENSICS DIGITAL EVIDENCE CAPTION

Client: **Ringstrom Law**

Case ID: **Sarah Jo Braith**

Case #: **14-CR-15-99**

Date: **2-9-2015**

Device Make: **Samsung**

Device Model: **SCH-U485**



Feature Phone Evidence

Contents

Type	Included in report		Total	
Call Log	113	(35 Deleted)	113	(35 Deleted)
Outgoing	111	(33 Deleted)	111	(33 Deleted)
Uncategorized	111	(33 Deleted)	111	(33 Deleted)
Unknown	2	(2 Deleted)	2	(2 Deleted)
Uncategorized	2	(2 Deleted)	2	(2 Deleted)
Contacts	63	(9 Deleted)	63	(9 Deleted)
Uncategorized	63	(9 Deleted)	63	(9 Deleted)
Uncategorized	63	(9 Deleted)	63	(9 Deleted)
SMS Messages	108		108	
Inbox	52		52	
Uncategorized	52		52	
Outbox	55		55	
Uncategorized	55		55	
Unknown	1		1	
Uncategorized	1		1	
Timeline	221	(35 Deleted)	221	(35 Deleted)
Data Files	112	(4 Deleted)	112	(4 Deleted)
Audio	11	(2 Deleted)	11	(2 Deleted)
Images	90	(2 Deleted)	90	(2 Deleted)
Videos	11		11	

Text message evidence recovered by Cellebrite UFED on January 24, 2016 is the same as February 10, 2015 recovery.

Feature Phone Message Evidence

SMS Messages (108)

⚠ * These details are cross-referenced from this device's contacts

Inbox (52)

Uncategorized (52)

#	Party	Time	Status	Message	Deleted
1	From 6123085599 Mike*	2/2/2015 4:28:38 PM	Read	I really do	Intact
2	From 6123085599 Mike*	2/2/2015 4:11:50 PM	Read	Ok	Intact
3	From 6123085599 Mike*	2/2/2015 3:51:57 PM	Read	Ya	Intact

Status of text messages in
Inbox can be "Read" or
"Unread".

Feature Phone Message Evidence

Timeline (221)

#	Type	Direction	Attachments	Locations	Timestamp	Party	Description	Deleted
1	SMS Messages	From			6/19/2014 2:14:38 AM	From: 6123085599 Mike	Good	Intact
2	SMS Messages	From			8/11/2014 11:09:43 PM	From: 6123085599 Mike	Mich	Intact
3	SMS Messages	From			9/5/2014 6:03:17 PM	From: 6122806204 Ma	3767 yeste	Intact
4	SMS Messages	From			9/5/2014 6:08:04 PM	From: 6122806204 Ma	Shut	Intact
5	Call Log	To			9/18/2014 4:55:01 PM(UTC-5)	From: 6128674192		Intact
6	Call Log	To			9/18/2014 4:55:01 PM(UTC-5)	From: 6128674192 Cancer Center		Deleted
7	Call Log	To			9/20/2014 11:42:52 AM(UTC-5)	From: 6122806204 Ma		Deleted
8	Call Log	To			9/22/2014 4:17:11 PM(UTC-5)	From: 7636825420 Counselor		Deleted
9	Call Log	To			9/23/2014 5:57:29 PM(UTC-5)	From: 6122621005		Intact
10	Call Log	To			9/24/2014 2:48:25 PM(UTC-5)	From: 7636828787 Lori		Deleted
11	Call Log	To			9/24/2014 2:49:04 PM(UTC-5)	From: 6125703083 Tiffany Kramer		Intact
12	Call Log	To			9/24/2014 6:14:05 PM(UTC-5)	From: 8070		Deleted
13	Call Log	To			9/24/2014 6:14:05 PM(UTC-5)	From: 8070 Unknown		Deleted
14	Call Log	To			9/25/2014 12:21:23 AM(UTC-5)	From: #6366		Deleted
15	Call Log	To			9/25/2014 1:30:08 PM(UTC-5)	From: 6123085599 Mike		Deleted
16	Call Log	To			9/25/2014 1:30:45 PM(UTC-5)	From: 6123085599 Mike		Deleted
17	Call Log	To			9/26/2014 6:43:26 AM(UTC-5)	From: 7636828360 Kidkare		Deleted
18	Call Log	To			9/26/2014 6:43:26 AM(UTC-5)	From: 7636828360 Mes Kidkare		Intact
19	Call Log	To			9/26/2014 1:54:25 PM(UTC-5)	From: 6123085599 Mike		Deleted
20	Call Log	To			9/26/2014 5:07:08 PM(UTC-5)	From: 6122806204 Ma		Deleted
21	Call Log	To			9/26/2014 7:14:43 PM(UTC-5)	From: 7638072593 Debbie H		Intact
22	Call Log	To			9/30/2014 11:29:38 AM(UTC-5)	From: 9522206051		Intact

No evidence recovered from August 30, 2014. Only two live text messages recovered from before accident.

Verizon Wireless Text Message Log

Network Element Name	Switch	MDN	Msg Send Date	Msg Deliver Date	Message	Originating Adc	Destination Address	Message Direction
GoldenValley_MR85	M	6122809061	8/30/2014 11:41:11 AM	8/30/2014 11:41:20 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:49 AM	8/30/2014 11:54:49 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:49 AM	8/30/2014 11:54:55 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M	6122809061	8/30/2014 11:55:12 AM	8/30/2014 11:55:13 AM	1	6122809061	6123085599	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:55:12 AM	8/30/2014 11:55:13 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:39 AM	8/30/2014 11:57:39 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:39 AM	8/30/2014 11:57:40 AM	1	6122809061	6123085599	Sent 4
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:54 AM	8/30/2014 11:57:54 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:54 AM	8/30/2014 11:57:58 AM	1	6123085599	6122809061	Received 3
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:18 AM	8/30/2014 11:54:19 AM	1	6122809061	6123085599	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:18 AM	8/30/2014 11:54:19 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:56:41 AM	8/30/2014 11:56:47 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M	6122809061	8/30/2014 11:56:41 AM	8/30/2014 11:56:41 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:03 AM	8/30/2014 11:54:03 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 11:54:03 AM	8/30/2014 11:54:08 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:11 AM	8/30/2014 11:57:12 AM	1	6122809061	6123085599	Sent 4
GoldenValley_MR85	M	6122809061	8/30/2014 11:57:11 AM	8/30/2014 11:57:12 AM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 12:00:21 PM	8/30/2014 12:00:22 PM	16	6122809061	90080004101	4
GoldenValley_MR85	M	6122809061	8/30/2014 12:08:05 PM	8/30/2014 12:08:06 PM	1	6123085599	6122809061	3
GoldenValley_MR85	M	6122809061	8/30/2014 12:08:05 PM	8/30/2014 12:08:05 PM	16	6122809061	90080004101	4

GPS Evidence



GPS Evidence



CARNEY FORENSICS DIGITAL EVIDENCE CAPTION

Client: **Ringstrom Law**

Case ID: **State v. Sarah Jo Braith**

Case #: **14-CR-15-99**

Date: **3-13-2015**

Device Make: **Garmin**

Device Model: **nuvi 1300**



GPS Evidence


UFED Physical Analyzer 4.2.1.7

File View Tools Extract Python Plug-ins Report Help

Welcome Extraction Summary

Extraction Summary

Extraction Info



Garmin_Nuvi 1300 Garmin

Extraction start date/time	3/24/2015 6:05:50 PM
Extraction end date/time	3/24/2015 6:11:50 PM
Unit Version	4.1.2.8 PSP 1
Selected Manufacturer	Garmin
Selected Device Name	Nuvi 1300
Connection Type	Cable No. 80
Is encrypted	False
Extraction Type	File system
Extraction ID	B9B68BB4-69C8-45BD-8740-F8A0C79CEA43

Image Hash Information

Hashes have been calculated for this project, but no reference data is available.


Device Info

Detected model	nuvi 1300
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Device Content

Phone Data

Device Locations



49130 (1207)

Garmin GPS unit contained 318 journeys with 49,130 device locations.

Data Files

Databases	Images	Text
4 (0)	12 (0)	15 (0)

Left sidebar tree:

- Garmin_Nuvi 1300
 - Extraction Summary
 - Device Info
 - Images
 - Memory Ranges
 - File Systems
 - Analyzed Data
 - Device Locations (49130)
 - Journeys (318)
 - Locations (1227)
 - Favorites (16)
 - Orphaned Fixes (1207)
 - Data Files
 - Applications
 - Audio
 - Configurations
 - Databases (4)
 - Documents
 - Images (12)
 - Text (15)
 - Videos
 - Uncategorized
 - Carving
 - Images
 - Tags
 - Timeline (49114)
 - Watch Lists
 - Malware Scanner
 - Project Analytics
 - Hex Bookmarks
 - Entity Bookmarks
 - Reports

Correlated Message & GPS Evidence

Locations (43)

#	Name	Time	Latitude	Longitude
1		8/30/2014 11:57:12 AM(UTC-5)	46.673725	-96.420178
2		8/30/2014 11:57:15 AM(UTC-5)	46.67396	-96.420363
3		8/30/2014 11:57:16 AM(UTC-5)	46.673959	-96.420332
4		8/30/2014 11:57:17 AM(UTC-5)	46.673956	-96.42018
5		8/30/2014 11:57:18 AM(UTC-5)	46.673897	-96.420179
6		8/30/2014 11:57:19 AM(UTC-5)	46.673937	-96.420179
7		8/30/2014 11:57:20 AM(UTC-5)	46.673956	-96.42018
8		8/30/2014 11:57:21 AM(UTC-5)	46.673956	-96.42018
9		8/30/2014 11:57:22 AM(UTC-5)	46.673956	-96.42018
10		8/30/2014 11:57:23 AM(UTC-5)	46.673956	-96.42018
11		8/30/2014 11:57:24 AM(UTC-5)	46.673956	-96.42018
12		8/30/2014 11:57:33 AM(UTC-5)	46.675805	-96.42018
13		8/30/2014 11:57:36 AM(UTC-5)	46.676166	-96.42018
14		8/30/2014 11:57:37 AM(UTC-5)	46.67626	-96.42018
15		8/30/2014 11:57:38 AM(UTC-5)	46.67634	-96.42018
16		8/30/2014 11:57:39 AM(UTC-5)	46.676407	-96.42018
17		8/30/2014 11:57:40 AM(UTC-5)	46.676534	-96.419905
18		8/30/2014 11:57:41 AM(UTC-5)	46.676561	-96.419755
19		8/30/2014 11:57:49 AM(UTC-5)	46.676838	-96.418179
20		8/30/2014 11:57:54 AM(UTC-5)	46.676896	-96.417581
21		8/30/2014 11:58:00 AM(UTC-5)	46.676956	-96.416806
22		8/30/2014 11:58:03 AM(UTC-5)	46.676815	-96.415275
23		8/30/2014 11:58:04 AM(UTC-5)	46.676531	-96.413828
24		8/30/2014 11:58:05 AM(UTC-5)	46.676531	-96.413828
25		8/30/2014 11:58:18 AM(UTC-5)	46.676531	-96.413828
26		8/30/2014 11:58:19 AM(UTC-5)	46.676347	-96.413053
27		8/30/2014 11:58:20 AM(UTC-5)	46.676341	-96.413029
28		8/30/2014 11:58:29 AM(UTC-5)	46.676625	-96.413054
29		8/30/2014 11:58:30 AM(UTC-5)	46.67664	-96.413113
30		8/30/2014 11:58:31 AM(UTC-5)	46.676658	-96.413184
31		8/30/2014 11:58:32 AM(UTC-5)	46.67668	-96.413271
32		8/30/2014 11:58:49 AM(UTC-5)	46.678126	-96.417461
33		8/30/2014 11:58:50 AM(UTC-5)	46.678268	-96.417713
34		8/30/2014 11:58:51 AM(UTC-5)	46.678434	-96.417967
35		8/30/2014 11:58:59 AM(UTC-5)	46.679626	-96.419388
36		8/30/2014 11:59:06 AM(UTC-5)	46.679879	-96.420222
37		8/30/2014 11:59:12 AM(UTC-5)	46.679871	-96.420278
38		8/30/2014 11:59:13 AM(UTC-5)	46.679936	-96.420222
39		8/30/2014 11:59:14 AM(UTC-5)	46.67989	-96.420222
40		8/30/2014 11:59:15 AM(UTC-5)	46.679856	-96.420222
41		8/30/2014 11:59:16 AM(UTC-5)	46.679834	-96.420222
42		8/30/2014 11:59:17 AM(UTC-5)	46.679834	-96.420222
43		8/30/2014 11:59:28 AM(UTC-5)	46.67971	-96.420222

Text message sent
@ 11:57:11AM

Text message sent
@ 11:57:39AM

Text message received
@ 11:57:58AM

GPS Evidence for Validation

ACTIVE LOG: 30 AUG 2014 10:42

Properties

Graph

Notes

References

ACTIVE LOG: 30 AUG 2014 10:42

Summary

Points: 407

Distance: 78.0 mi

Area: 62.1 sq mi

Time

Elapsed Time: 2:33:11

Moving Time: 1:22:02

Stopped Time: 1:11:09

Speed

Avg: 30.6 mph

Avg Moving: 57.1 mph

Min: 0 mph

Max: 140 mph

Elevation

Min: 888 ft

Max: 1204 ft

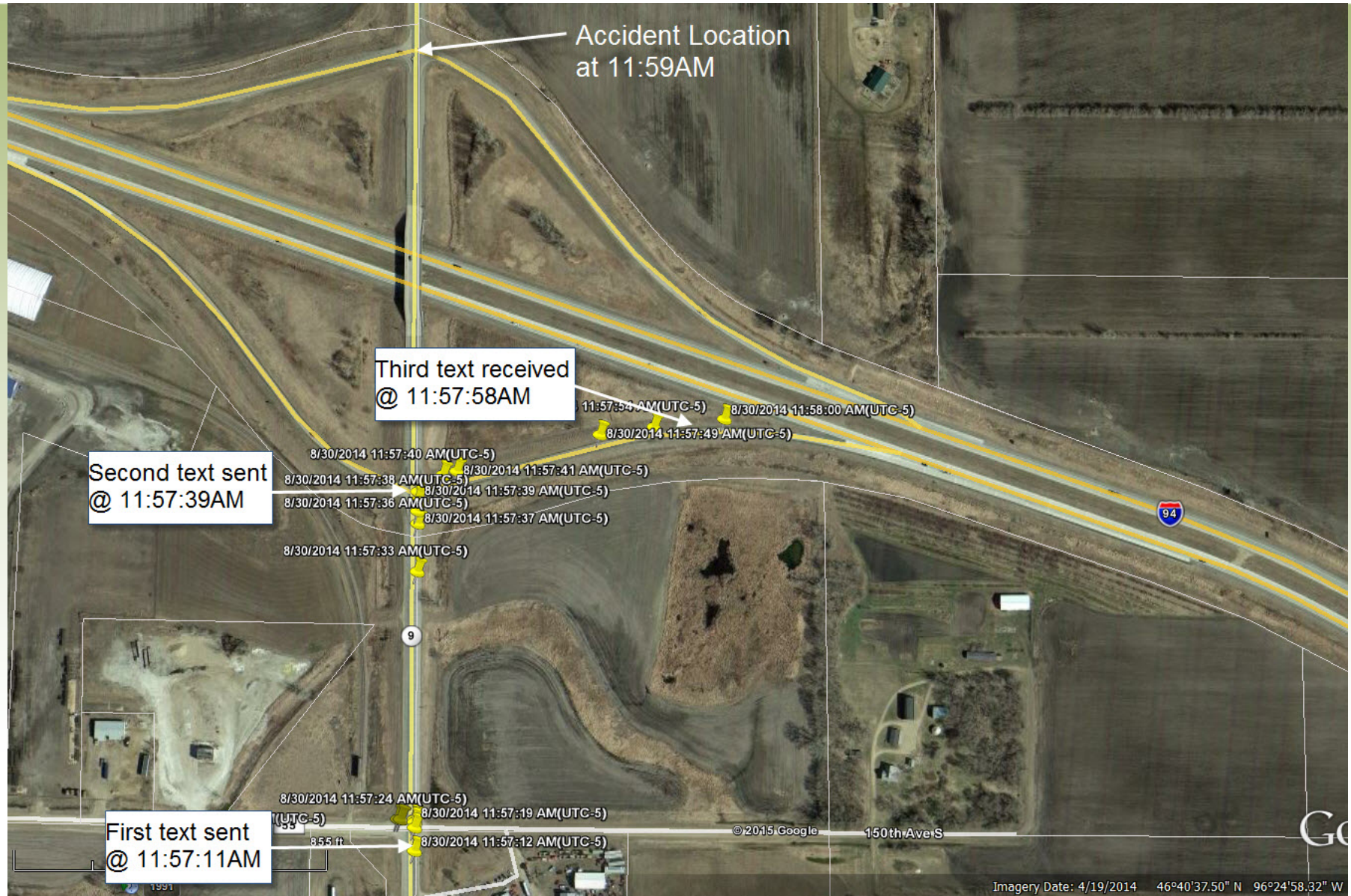
Ascent: 386 ft

Descent: 307 ft

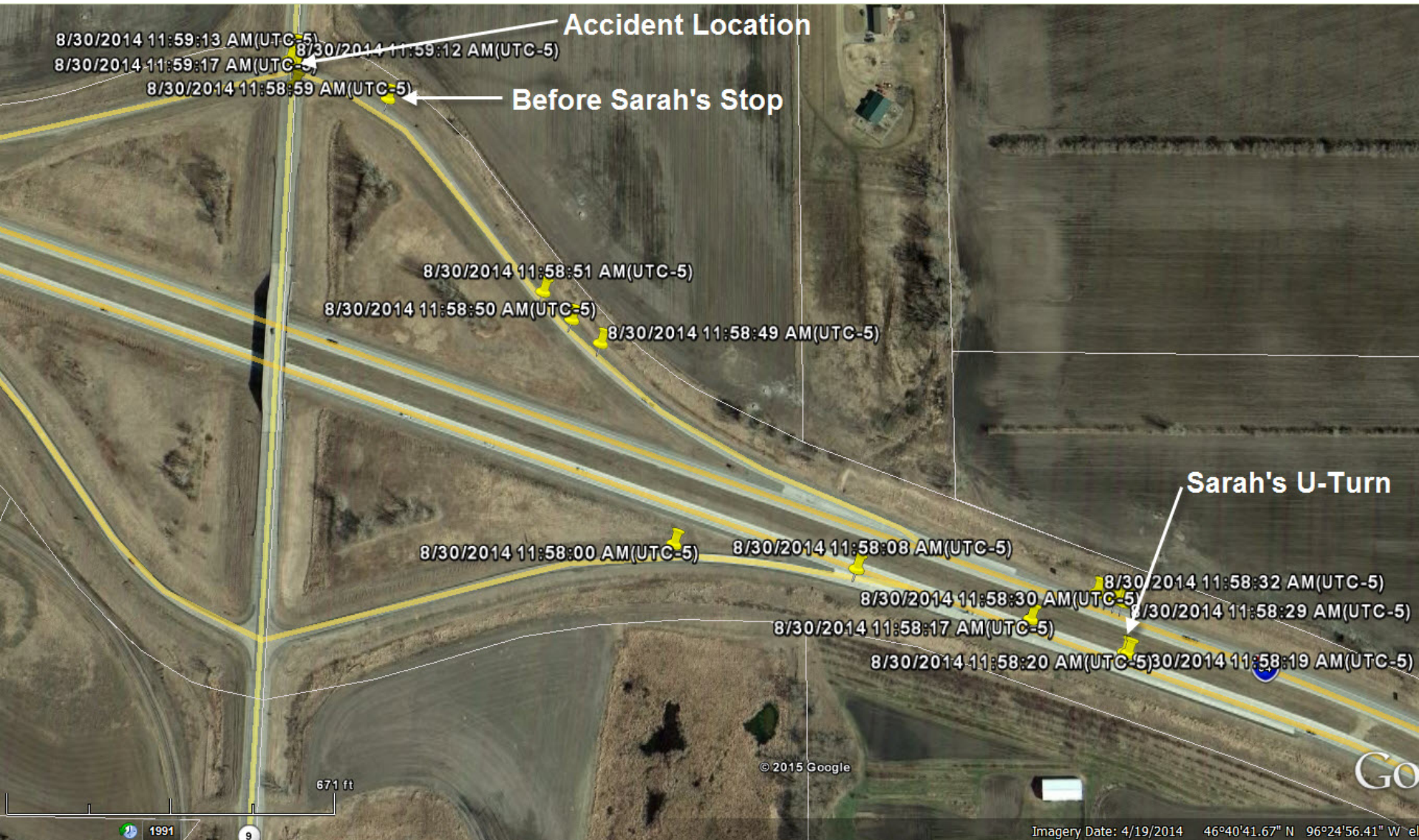
Grade: 0.0 %

Ind...	Elevation	Leg Distance	Leg Time	Leg Speed	Leg Course	Time		Position	
258	992 ft	1 ft	0:00:01	0.5 mph	180.0° true	8/30/2014 11:56:57 AM	N46° 40.424' W96° 25.211'		
259	991 ft	0 ft	0:00:14	0 mph	0.0° true	8/30/2014 11:56:58 AM	N46° 40.423' W96° 25.211'		
260	994 ft	98 ft	0:00:03	22 mph	331.6° true	8/30/2014 11:57:12 AM	N46° 40.423' W96° 25.211'		
261	996 ft	8 ft	0:00:01	5 mph	92.7° true	8/30/2014 11:57:15 AM	N46° 40.438' W96° 25.222'		
262	996 ft	38 ft	0:00:01	26 mph	91.7° true	8/30/2014 11:57:16 AM	N46° 40.438' W96° 25.220'		
263	994 ft	22 ft	0:00:01	15 mph	179.3° true	8/30/2014 11:57:17 AM	N46° 40.437' W96° 25.211'		
264	994 ft	15 ft	0:00:01	10 mph	0.0° true	8/30/2014 11:57:18 AM	N46° 40.434' W96° 25.211'		
265	994 ft	7 ft	0:00:01	5 mph	357.9° true	8/30/2014 11:57:19 AM	N46° 40.436' W96° 25.211'		
266	992 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:57:20 AM	N46° 40.437' W96° 25.211'		
267	992 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:57:21 AM	N46° 40.437' W96° 25.211'		
268	991 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:57:22 AM	N46° 40.437' W96° 25.211'		
269	988 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:57:23 AM	N46° 40.437' W96° 25.211'		
270	984 ft	0.1 mi	0:00:09	51 mph	0.0° true	8/30/2014 11:57:24 AM	N46° 40.437' W96° 25.211'		
271	973 ft	132 ft	0:00:03	30 mph	0.0° true	8/30/2014 11:57:33 AM	N46° 40.548' W96° 25.211'		
272	973 ft	34 ft	0:00:01	23 mph	0.0° true	8/30/2014 11:57:36 AM	N46° 40.570' W96° 25.211'		
273	972 ft	29 ft	0:00:01	20 mph	0.0° true	8/30/2014 11:57:37 AM	N46° 40.576' W96° 25.211'		
274	972 ft	24 ft	0:00:01	17 mph	0.0° true	8/30/2014 11:57:38 AM	N46° 40.580' W96° 25.211'		
275	972 ft	83 ft	0:00:01	57 mph	56.1° true	8/30/2014 11:57:39 AM	N46° 40.584' W96° 25.211'		
276	973 ft	39 ft	0:00:01	27 mph	75.3° true	8/30/2014 11:57:40 AM	N46° 40.592' W96° 25.194'		
277	975 ft	408 ft	0:00:08	35 mph	75.6° true	8/30/2014 11:57:41 AM	N46° 40.594' W96° 25.185'		
278	984 ft	151 ft	0:00:05	21 mph	82.0° true	8/30/2014 11:57:49 AM	N46° 40.610' W96° 25.091'		
279	984 ft	195 ft	0:00:06	22 mph	83.6° true	8/30/2014 11:57:54 AM	N46° 40.614' W96° 25.055'		
280	984 ft	387 ft	0:00:08	33 mph	97.6° true	8/30/2014 11:58:00 AM	N46° 40.617' W96° 25.008'		
281	984 ft	377 ft	0:00:08	32 mph	106.0° true	8/30/2014 11:58:08 AM	N46° 40.609' W96° 24.917'		
282	988 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:58:16 AM	N46° 40.592' W96° 24.830'		
283	988 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:58:17 AM	N46° 40.592' W96° 24.830'		
284	988 ft	205 ft	0:00:01	140 mph	109.1° true	8/30/2014 11:58:18 AM	N46° 40.592' W96° 24.830'		
285	988 ft	6 ft	0:00:01	4.4 mph	110.1° true	8/30/2014 11:58:19 AM	N46° 40.581' W96° 24.783'		
286	988 ft	104 ft	0:00:09	8 mph	356.5° true	8/30/2014 11:58:20 AM	N46° 40.580' W96° 24.782'		
287	991 ft	16 ft	0:00:01	11 mph	290.3° true	8/30/2014 11:58:29 AM	N46° 40.597' W96° 24.783'		
288	991 ft	19 ft	0:00:01	13 mph	290.3° true	8/30/2014 11:58:30 AM	N46° 40.598' W96° 24.787'		
289	991 ft	23 ft	0:00:01	16 mph	290.3° true	8/30/2014 11:58:31 AM	N46° 40.599' W96° 24.791'		
290	992 ft	0.2 mi	0:00:17	47 mph	296.7° true	8/30/2014 11:58:32 AM	N46° 40.601' W96° 24.796'		
291	988 ft	82 ft	0:00:01	56 mph	309.4° true	8/30/2014 11:58:49 AM	N46° 40.688' W96° 25.048'		
292	988 ft	88 ft	0:00:01	60 mph	313.6° true	8/30/2014 11:58:50 AM	N46° 40.696' W96° 25.063'		
293	988 ft	0.1 mi	0:00:08	48 mph	320.7° true	8/30/2014 11:58:51 AM	N46° 40.706' W96° 25.078'		
294	988 ft	228 ft	0:00:07	22 mph	293.9° true	8/30/2014 11:58:59 AM	N46° 40.778' W96° 25.163'		
295	989 ft	14 ft	0:00:06	1.6 mph	258.3° true	8/30/2014 11:59:06 AM	N46° 40.793' W96° 25.213'		
296	992 ft	28 ft	0:00:01	19 mph	30.6° true	8/30/2014 11:59:12 AM	N46° 40.792' W96° 25.217'		
297	994 ft	17 ft	0:00:01	11 mph	180.0° true	8/30/2014 11:59:13 AM	N46° 40.796' W96° 25.213'		
298	996 ft	12 ft	0:00:01	8 mph	180.0° true	8/30/2014 11:59:14 AM	N46° 40.793' W96° 25.213'		
299	997 ft	8 ft	0:00:01	5 mph	180.0° true	8/30/2014 11:59:15 AM	N46° 40.791' W96° 25.213'		
300	999 ft	0 ft	0:00:01	0 mph	0.0° true	8/30/2014 11:59:16 AM	N46° 40.790' W96° 25.213'		
301	1000 ft	45 ft	0:00:11	2.8 mph	180.0° true	8/30/2014 11:59:17 AM	N46° 40.790' W96° 25.213'		
302	1007 ft	89 ft	0:21:46	0.0 mph	87.0° true	8/30/2014 11:59:28 AM	N46° 40.783' W96° 25.213'		
303	1204 ft	98 ft	0:00:28	2.4 mph	268.7° true	8/30/2014 12:21:14 PM	N46° 40.783' W96° 25.192'		
304	1065 ft	7 ft	0:00:23	0.2 mph	211.1° true	8/30/2014 12:21:42 PM	N46° 40.783' W96° 25.215'		

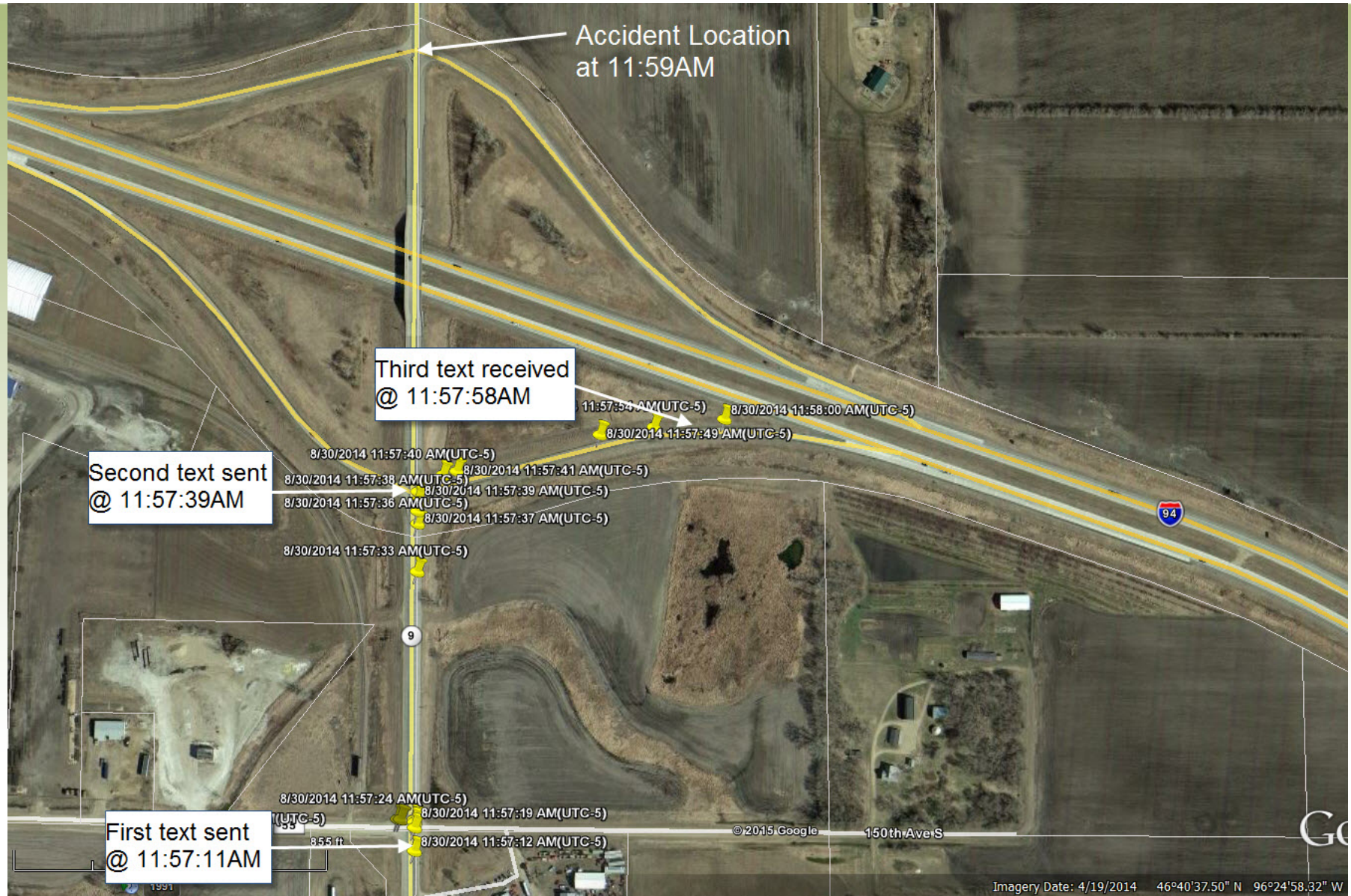
Visualizing Message & GPS Evidence



Visualizing Message & GPS Evidence



Visualizing Message & GPS Evidence



Google Earth



US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Google™ earth

eye alt 6835.70 mi

Touring Set Up for Flyover Video

The screenshot shows the Google Earth Options dialog box, specifically the Touring tab. The dialog is divided into four sections: 'When creating a tour from a folder:', 'When creating a tour from a line:', 'When creating a tour from a track:', and 'When recording a tour:'. Annotations with arrows point to specific settings in each section:

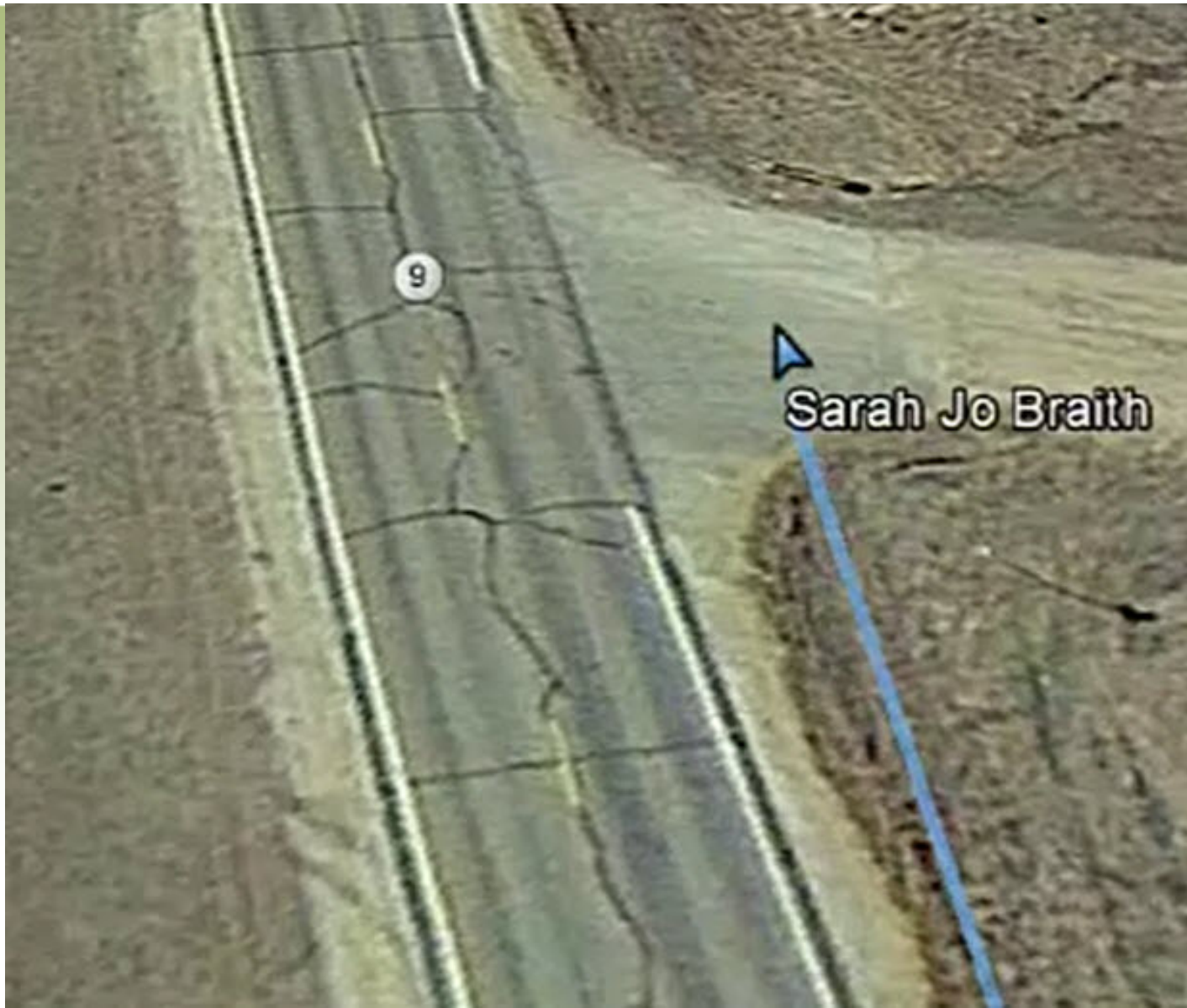
- Folder Approach:** Points to the 'When creating a tour from a folder:' section, which includes sliders for 'Time Between Features' (set to 1.00 seconds) and 'Wait at Features' (set to 0.0 seconds), and checkboxes for 'Fly along lines' (checked) and 'Show balloon when waiting at features' (unchecked).
- Line Approach:** Points to the 'When creating a tour from a line:' section, which includes sliders for 'Camera Tilt Angle' (set to 60.0 degrees), 'Camera Range' (set to 982.3 meters), and 'Speed' (set to 702.9, between Slow and Fast).
- Track Point Approach:** Points to the 'When creating a tour from a track:' section, which includes sliders for 'Speed: (multiples of real-time)' (set to 9.9, between 0.1x and 20x) and 'Seconds Between Key Frames' (set to 0.5 seconds, between 0.1 and 10).

At the bottom of the dialog, there is a 'When recording a tour:' section with a 'Smaller File' slider and a 'Higher Fidelity' option. A large arrow points from the text 'Speed of animation choices are arbitrary and broad' to the 'Speed' and 'Speed: (multiples of real-time)' sliders.

Speed of animation choices are arbitrary and broad

Buttons at the bottom include 'Restore Defaults', 'OK', 'Cancel', and 'Apply'.

Google Earth Flyover Video Preview



Google Earth Flyover Video Preview



Google Earth Flyover Video Preview



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Google Earth Flyover Video Preview



Google Earth Flyover Video Preview



Digital Forensic Best Practices

See Check List in Written Materials!

**Texting While Driving Cases:
Case Study, Best Practices, GPS Demonstrations from
Mobile and Cloud Sources**

**Digital Forensic Best Practices
Check List**

**Criminal Justice Institute
Minnesota CLE**

Collect Relevant, Material Evidence

- Consider ALL Evidence Related to Collision
 - Mobile Devices
 - Cellular Services
- Move to Compel Production of Mobile Devices for Digital Forensics Examination
- Expert Testimony May Be Needed
- Defeat Ineffective Arguments by Opposition
 - Forensic Incompetence
 - Convenience
 - Past Practice



Consider All Transportation Modalities

- Pedestrian



- Bicycle



- Motorcycle



- Automobile

- Truck or Semi-Tractor Trailer

Examine All Relevant Mobile Devices

- Defendant's Smart Phone
 - SMS, MMS, iMessages
 - Mobile messaging apps
 - Navigation apps
- GPS Unit and Watch
 - Track points
 - Date and time stamps



- Victim's Smart Phone and GPS Device
- Correspondents' Mobile Devices

Examine Immediately for Best Recovery

- Evidence can be deleted, overwritten, and lost forever when recovery delayed

- Messages
- Calls
- GPS Locations



- Continued use of mobile device after collision results in deleted and overwritten evidence
- Beware failure to seize and isolate mobile device at earliest opportunity

Examine Immediately for Best Recovery

Timeline (221)

#	Type	Direction	Attachments	Locations	Timestamp	Party	Description	Deleted
1	SMS Messages	From			6/19/2014 2:14:38 AM	From: 6123085599 Mike	Good	Intact
2	SMS Messages	From			8/11/2014 11:09:43 PM	From: 6123085599 Mike	Mich	Intact
3	SMS Messages	From			9/5/2014 6:03:17 PM	From: 6122806204 Ma	3767 yeste	Intact
4	SMS Messages	From			9/5/2014 6:08:04 PM	From: 6122806204 Ma	Shut	Intact
5	Call Log	To			9/18/2014 4:55:01 PM(UTC-5)	From: 6128674192		Intact
6	Call Log	To			9/18/2014 4:55:01 PM(UTC-5)	From: 6128674192 Cancer Center		Deleted
7	Call Log	To			9/20/2014 11:42:52 AM(UTC-5)	From: 6122806204 Ma		Deleted
8	Call Log	To			9/22/2014 4:17:11 PM(UTC-5)	From: 7636825420 Counselor		Deleted
9	Call Log	To			9/23/2014 5:57:29 PM(UTC-5)	From: 6122621005		Intact
10	Call Log	To			9/24/2014 2:48:25 PM(UTC-5)	From: 7636828787 Lori		Deleted
11	Call Log	To			9/24/2014 2:49:04 PM(UTC-5)	From: 6125703083 Tiffany Kramer		Intact
12	Call Log	To			9/24/2014 6:14:05 PM(UTC-5)	From: 8070		Deleted
13	Call Log	To			9/24/2014 6:14:05 PM(UTC-5)	From: 8070 Unknown		Deleted
14	Call Log	To			9/25/2014 12:21:23 AM(UTC-5)	From: #6366		Deleted
15	Call Log	To			9/25/2014 1:30:08 PM(UTC-5)	From: 6123085599 Mike		Deleted
16	Call Log	To			9/25/2014 1:30:45 PM(UTC-5)	From: 6123085599 Mike		Deleted
17	Call Log	To			9/26/2014 6:43:26 AM(UTC-5)	From: 7636828360 Kidkare		Deleted
18	Call Log	To			9/26/2014 6:43:26 AM(UTC-5)	From: 7636828360 Mes Kidkare		Intact
19	Call Log	To			9/26/2014 1:54:25 PM(UTC-5)	From: 6123085599 Mike		Deleted
20	Call Log	To			9/26/2014 5:07:08 PM(UTC-5)	From: 6122806204 Ma		Deleted
21	Call Log	To			9/26/2014 7:14:43 PM(UTC-5)	From: 7638072593 Debbie H		Intact
22	Call Log	To			9/30/2014 11:29:38 AM(UTC-5)	From: 9522206051		Intact

No evidence recovered from August 30, 2014. Only two live text messages recovered from before accident.

Examine with Multiple, Upgraded Tools

- Cross validate mobile evidence with several mobile device forensic tools

“There is wisdom in the multitude of counselors”
- Proverbs

- Re-examine mobile device with upgraded tools unavailable months or years earlier
 - New mobile apps supported
 - New, better algorithms for recovering evidence
 - Bugs fixed in mobile device forensic tools

Examine with Multiple, Upgraded Tools

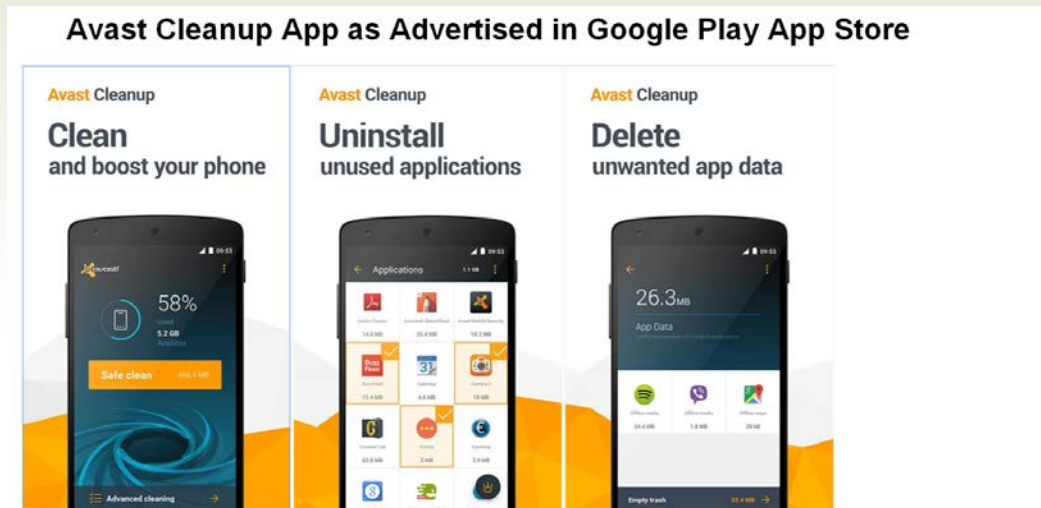


Text Messages Marked as “Open”

- Role of “read” or “unread” status flag
- Role of “read” receipt
- Neither proves automobile driver actually read text message
- Messaging app behavior when conversation or thread is already open on device
- Complex behavior of messaging app in use on lock screen
 - Use of other apps on lock screen at same time
 - Multiple phone settings control messaging app behavior on lock screen

Spoliation of Mobile Device Evidence

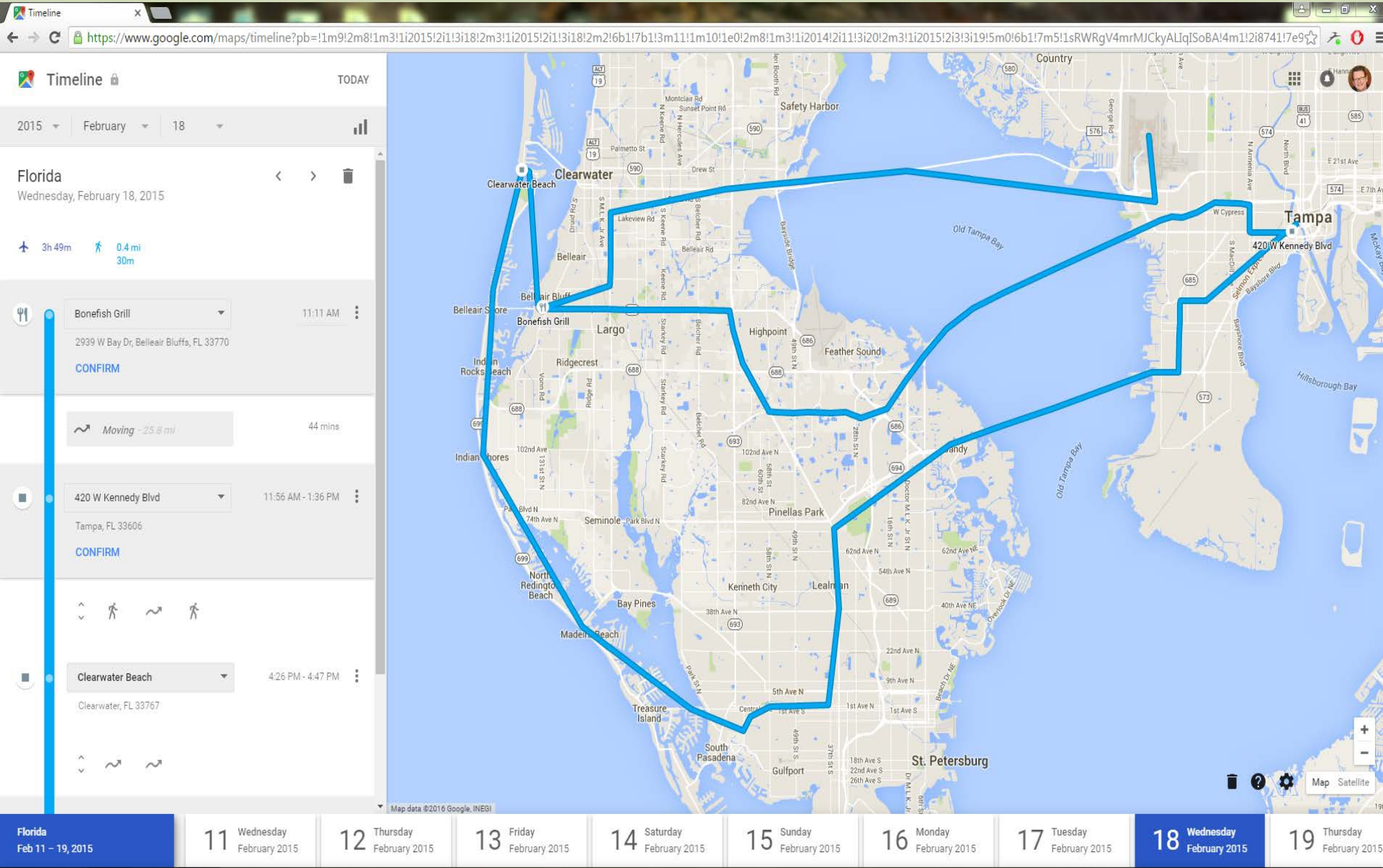
- Consider the possibility of intentional destruction of evidence
- Spoliation by resetting phone to factory conditions
- Spoliation by wiping phone remotely
- Spoliation by using third party “cleaner” apps



Examine Cloud for GPS Locations

- Apple iCloud Photos and Photo Stream
 - GPS locations in photo EXIF data
- Google Location History Tracked from Mobile Device
 - Passive GPS locations tracked every few minutes for past few years
 - More GPS locations are sampled when tracked mobile device is moving
 - GPS location time stamps are precise to second
 - Google shows compelling GPS location maps

Examine Cloud for GPS Locations



Obtain Phone Service Provider Biz Records

- Request and Persist to Retrieve Defendant's and Victim's Business Records
- Request Call Detail Records for Voice Calls
 - Date and time stamps to the second are critical
- Request Text Message Logs (SMS Logs)
 - Date and time stamps to the second are critical
 - Message content is not available
- Request 3G/4G Data Recs for Mobile Apps
- Can Request Cell Tower Sites for Locations
 - Switch and Tower IDs
 - Sector (usually three antennas per tower)

Obtain Phone Service Provider Biz Records

Network Element	Narr	Switch	MDN	Msg Send Date	Msg Deliver Date	Message	Originating Adk	Destination Address	Message Direction
GoldenValley_MR85	M		6122809061	8/30/2014 11:41:11 AM	8/30/2014 11:41:20 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:49 AM	8/30/2014 11:54:49 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:49 AM	8/30/2014 11:54:55 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M		6122809061	8/30/2014 11:55:12 AM	8/30/2014 11:55:13 AM	1	6122809061	6123085599	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:55:12 AM	8/30/2014 11:55:13 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:39 AM	8/30/2014 11:57:39 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:39 AM	8/30/2014 11:57:40 AM	1	6122809061	6123085599	Sent 4
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:54 AM	8/30/2014 11:57:54 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:54 AM	8/30/2014 11:57:58 AM	1	6123085599	6122809061	Received 3
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:18 AM	8/30/2014 11:54:19 AM	1	6122809061	6123085599	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:18 AM	8/30/2014 11:54:19 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:56:41 AM	8/30/2014 11:56:47 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M		6122809061	8/30/2014 11:56:41 AM	8/30/2014 11:56:41 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:03 AM	8/30/2014 11:54:03 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 11:54:03 AM	8/30/2014 11:54:08 AM	1	6123085599	6122809061	3
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:11 AM	8/30/2014 11:57:12 AM	1	6122809061	6123085599	Sent 4
GoldenValley_MR85	M		6122809061	8/30/2014 11:57:11 AM	8/30/2014 11:57:12 AM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 12:00:21 PM	8/30/2014 12:00:22 PM	16	6122809061	900080004101	4
GoldenValley_MR85	M		6122809061	8/30/2014 12:08:05 PM	8/30/2014 12:08:06 PM	1	6123085599	6122809061	3
GoldenValley_MR85	M		6122809061	8/30/2014 12:08:05 PM	8/30/2014 12:08:05 PM	16	6122809061	900080004101	4

Request E-911 Call Center Records

- Must Determine Outside Time Limit of Collision
- Request from Local E-911 Call Center
- Request ALL E-911 Calls Placed to Center
 - Defendant
 - Eye Witnesses
 - Others
- Date and Time Stamps to the Second are Critical

Request E-911 Call Center Records

Detail Call For Service Report



Login ID: MPhillippi

Print Date/Time: 09/17/2014 08:42

From CFS:	980	From Date:	08/30/2014 12:00	CFS Type:	All
To CFS:	980	To Date:	08/30/2014 12:00	Agency Type:	
Layer:	All	Areas:	All		

CFS Number:	980	Call Date/Time:	08/30/2014 12:00:25	Primary Incident:	2014-00008207
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Narrative, Questionnaire Responses, TDD Text

Create Time	Created By	Narrative
08/30/2014 12:00:25	Fern Cigelske	E911 Info - Class of Service: WPH2 Special Response Info: **WIRELESS 911 CALL** VERIFY CALLER LOCATION AND CALL BACKNUMBER + Uncertainty: Confidence: Additional Location Info: CALLBK=(218)779-6848
 1st e911 call by Cindy Strand		
08/30/2014 12:00:34	Heidi Biggerstaff	Call #: 981 - E911 Info - Class of Service: WPH2 Special Response Info: **WIRELESS 911 CALL** VERIFY CALLER LOCATION AND CALL BACKNUMBER # Uncertainty: Confidence: Additional Location Info: CALLBK=(612)280-9061
 2nd e911 call by Sarah Jo Braith		
08/30/2014 12:00:40	Fern Cigelske	Nature Of Call: 1050I
08/30/2014 12:00:52	Fern Cigelske	2 MC'S WERE HIT BY A VEH
08/30/2014 12:01:14	Heidi Biggerstaff	Call #: 981 - Nature Of Call: car vs mc

Consider Vehicle Forensics Examination

- Recoverable User Evidence

- Contact Lists (Phone Books)
- Text Messages
- Call Logs
- E-mails
- Photographs
- Movies / Videos
- Music / Audio
- Games
- Social Media Feeds
- Installed Apps



Consider Vehicle Forensics Examination

- Recoverable Navigation Evidence
 - Tracklogs or Navigation History
 - Trackpoints or GPS locations
 - Recent Destinations
 - Favorite Locations or Waypoints
- Recoverable Device Evidence
 - Mobile Devices Connected to Vehicle
 - Bluetooth Connections
 - Wi-Fi Connections
 - USB Connections
 - SD Card Connections



Consider Vehicle Forensics Examination

- Recoverable Vehicle Evidence
 - Serial Number
 - Original VIN Number
- Recoverable Vehicle Event Evidence
 - Headlights On and Off
 - Doors Identified for Open and Close
 - Gear Changes for Park and Drive
 - Odometer Readings
 - Velocity Logs
 - GPS Time Synchs
 - System Reboots



Expert Witness Best Practices for Trial

- Use Pictorial Demonstrative Exhibits
 - Ease jury comprehension of complex, scientific forensic evidence
 - Let the demonstrative exhibits tell the story
 - Make court testimony a show and tell session
- Show relevant, integrated evidence
 - Mobile Devices
 - Cloud Accounts
 - Cell Services
- Correlate and integrate to get the true picture
- Synchronize evidence using time stamps

Expert Witness Best Practices for Trial



GPS Demonstrations

- Mobile Devices

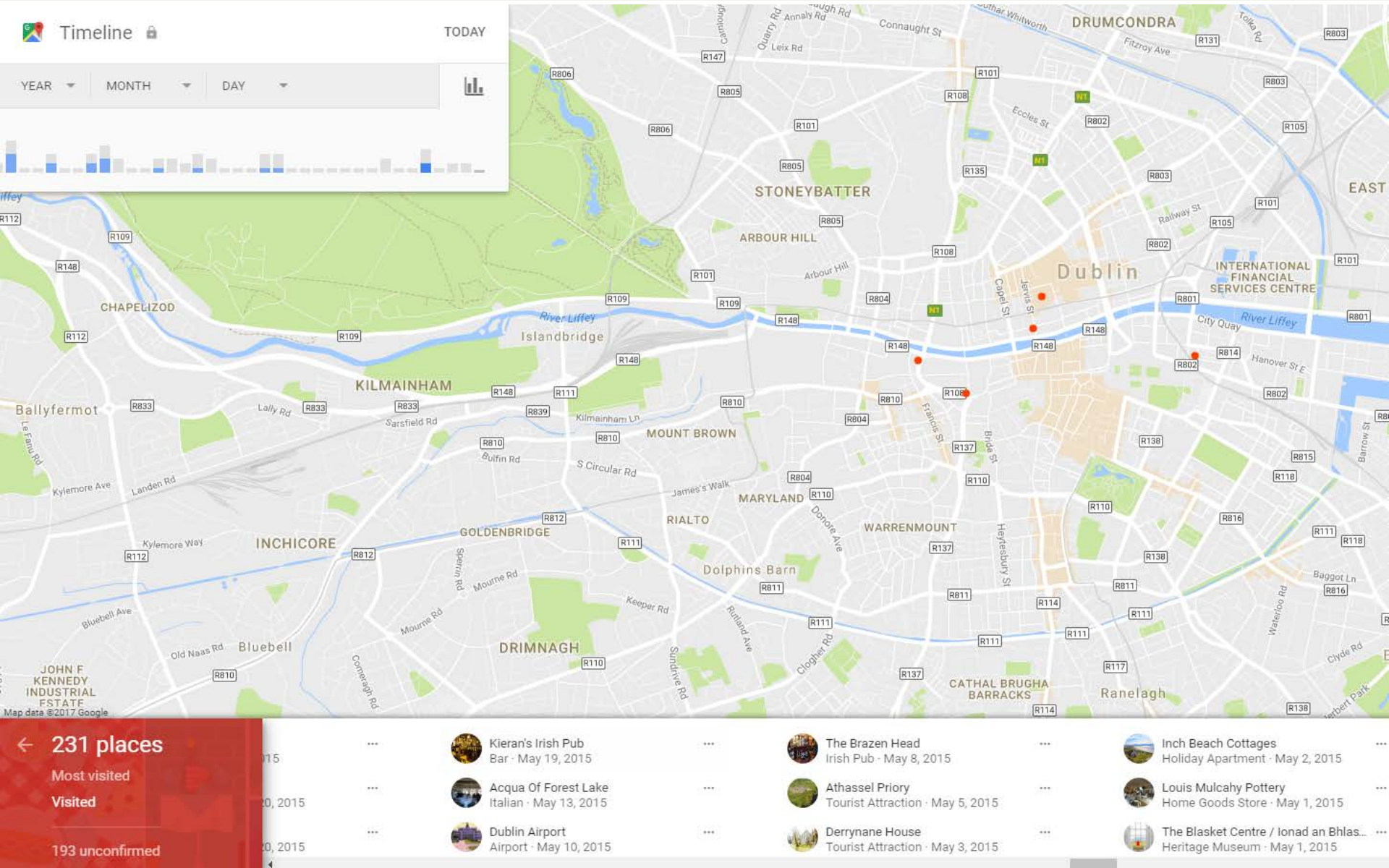
- Photo
- Video
- Wi-Fi
- Texting Apps



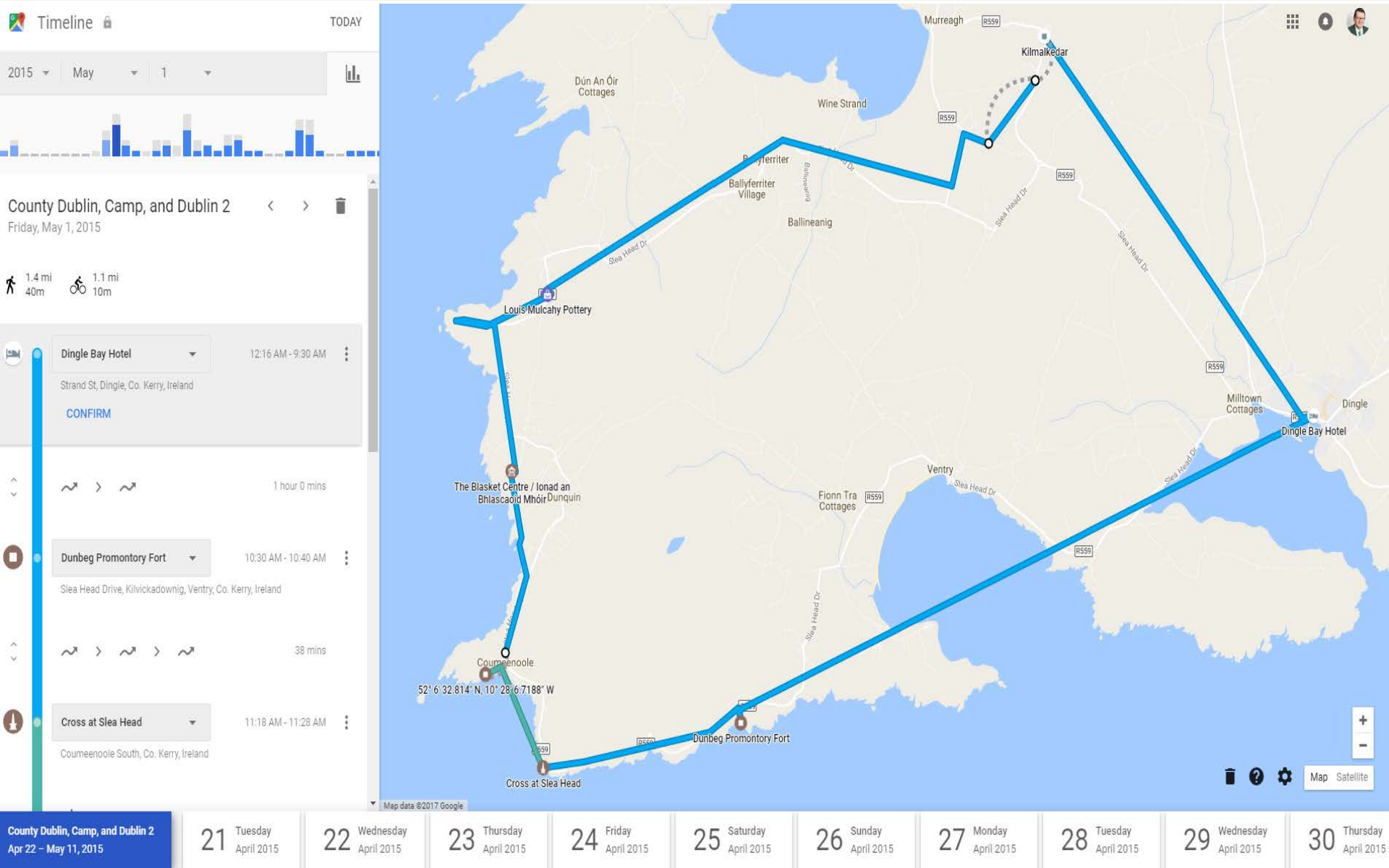
- Google Cloud

- Google Location History

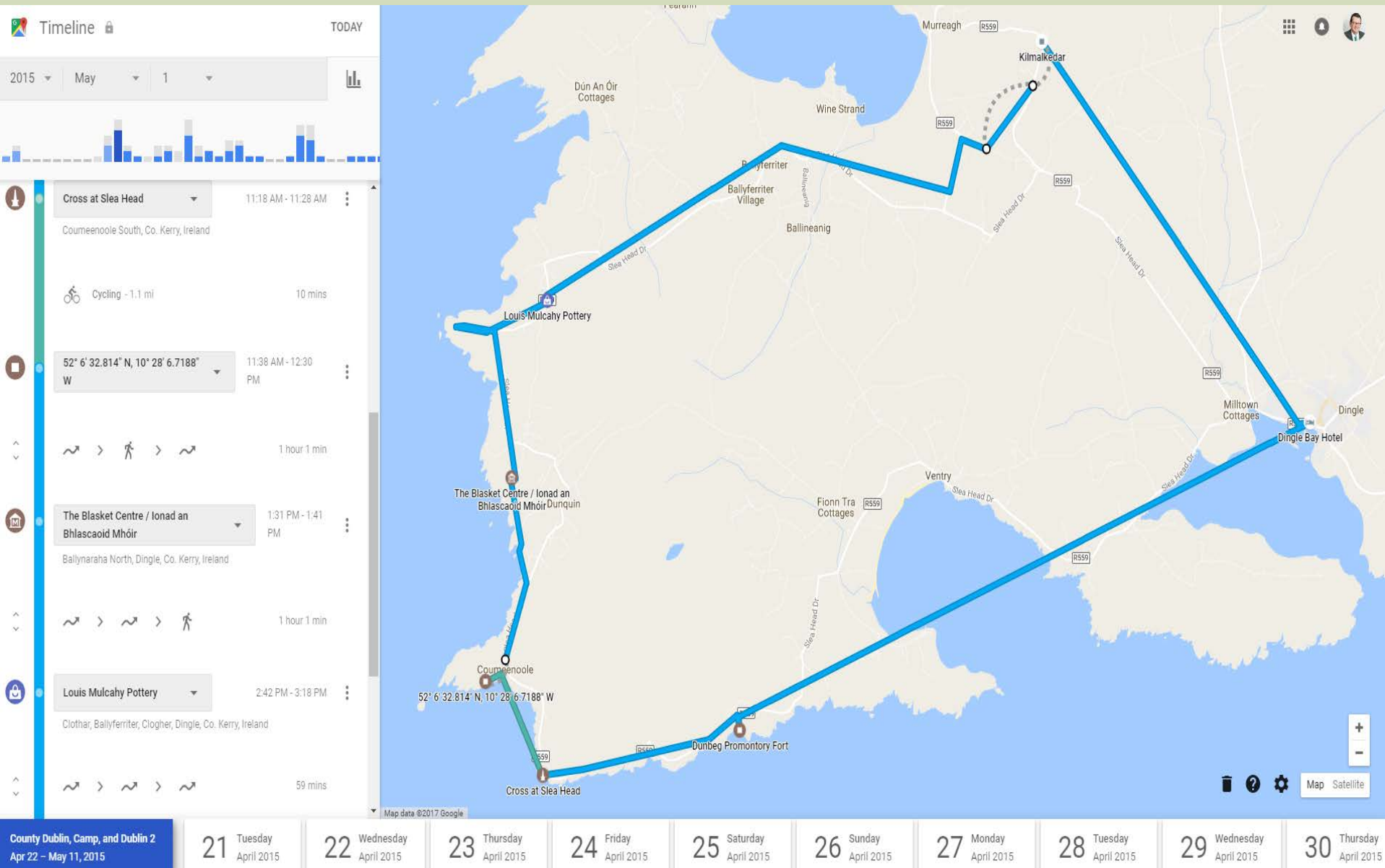
Google Location History: Ireland 2015



Google Location History: Ireland 2015



Google Location History: Ireland 2015



Google Location History: Ireland 2015

