

FEDERAL BUREAU OF INVESTIGATION
CELLULAR ANALYSIS SURVEY TEAM



Cellular Analysis

(313) 579-8507

(313) 412-6845

SA Christopher J. Hess
Detroit Division
Detroit Major Crimes Task Force

281R-DE-105923

November 5, 2013

INVESTIGATIVE INFORMATION

CASE FACTS: Special Agent Vicente Ruiz, Federal Bureau of Investigation, Detroit Division, investigated a case involving multiple armed robberies dating back to 2010. The robberies occurred in the Detroit metropolitan area as well as Warren, Ohio. Investigators linked cellular telephone number (313) 579-8507 to Timothy Sanders (Target Cell Phone 1) and (313) 412-6845 to Timothy Carpenter (Target Telephone 2).

REQUESTING INFORMATION

PURPOSE OF ANALYSIS: SA Ruiz requested cell site analysis of the target phones to determine the geographic area where the target phones were located in relation to incident date(s) and time(s).

TARGET CELL PHONE 1 INFORMATION

SERVICE PROVIDER: T-Mobile

SUBSCRIBER INFORMATION: N/A

TYPE OF RECORDS BEING ANALYZED: Call Detail Records (CDRs)

SOURCE FROM WHICH RECORDS ACQUIRED: SA Vicente Ruiz furnished an electronic copy of records associated with Target Phone 1.

DATE & TIME RANGE USED FOR ANALYSIS:

03/04/2011, 2:52 p.m.

TARGET CELL PHONE 2 INFORMATION

SERVICE PROVIDER: Metro PCS

SUBSCRIBER INFORMATION: Michael Mayers

TYPE OF RECORDS BEING ANALYZED: Call Detail Records (CDRs)

SOURCE FROM WHICH RECORDS ACQUIRED: SA Vicente Ruiz furnished an electronic copy of records associated with Target Phone 2.

DATE & TIME RANGE USED FOR ANALYSIS:

12/13/2010, 10:35 a.m.

12/18/2010, 4:50 p.m.

03/04/2011, 2:52 p.m.

04/05/2011, 2:40 p.m.

BASIC PRINCIPALS UTILIZED IN RECORD ANALYSIS

TECHNOLOGY

Cell phones are RADIOS that use RADIO FREQUENCIES to communicate. Some additional facts:

- Cell phones (when "on") constantly scan their environment looking for the best signal from the tower.
- The best signal generally comes from the tower that is CLOSEST to the phone, or in its direct LINE OF SIGHT.
- The tower with the best signal is the one the handset will use for service, this is the serving cell and will be used to make and receive calls
- The phone will use the serving cell to make/receive calls.
- The phone "sees" other towers around the SERVING CELL and will constantly measure those signal strengths. However the phone will not randomly reselect to an adjacent tower unless the tower is on its "neighbor list" which is controlled by the network service provider. This allows the network to accurately manage and control the subscribers.
- As the phone moves, it will choose a new serving cell based on signal strength and neighbor list. If this occurs while the phone is in a call, the phone will "handoff" the call to the next cell site/sector. Therefore some service providers, such as SPRINT and AT&T, show a "beginning cell site" (call originated) and an "ending cell site" (call ended) in their records.

CELL SITES AND SECTORS

Cell towers (also known as CELL SITES or BASE TRANSCIEVER STATIONS) come in all shapes and sizes and can be located anywhere (church steeples, water towers, sides of buildings, etc.).

- A typical cell tower has THREE, 120° sectors. The service provider sometimes labels the sectors numerically, such as 1, 2, 3, or ALPHA, BETA, GAMMA. Sector 1 (or Alpha) typically covers the NORTHERN sector of the tower, 2 (EAST), 3 (WEST).
- It is important to note that each BTS has its own unique identifier, this identifier is used to track which towers the handsets use and is like a fingerprint on the network. It is not duplicated anywhere else.
- The location of a cell tower is often determined by sales/marketing, capacity, improvement of coverage, or expansion/growth of a service provider. Generally there are more towers with overlapping coverage in urban areas; less towers (less coverage) in rural areas.
- Antennas on cell towers have downward tilt and are pointed towards the earth. The antenna arrays are fine tuned to provide a specific area of coverage. As RF travels away from the tower, their strength (and

distance) diminishes. A good illustration of this principle is to think of a cell tower and the area that it covers as an upside down funnel.

Cellular Phone Record Analysis of (313) 579-8507

Date Range: 03/04/2011, 2:52 p.m.

ANALYSIS (313) 579-8507 (Target Telephone 1)

A review of the Call Detail Records (CDRs) revealed that there was call activity during the period covered by the records. The analysis was focused on the specific date and time referenced above. The CDRs contained the cell sites associated with each call event. The cell sites identified on the call detail records were compared to T-Mobile tower records. The tower records were imported to Microsoft MapPoint to visually depict the locations of towers within the T-Mobile network in the Detroit and Ohio markets. The cell sites identified on the CDRs were then plotted utilizing the corresponding tower records.

As a result, during the specified date, cell sites that were utilized by Target Telephone 1 were concentrated within the Warren, Ohio area. Analysis of the specified time period yielded the following results:

03/04/2011: A call was initiated at 2:20 PM. The duration of the call activity was over 31 minutes. The call originated and terminated on cell site 8499 5703 located in the geographic area consistent with the robbery scene at 2553 Parkman, Warren, Ohio.

A representation of this analysis can be seen in the attached Microsoft PowerPoint presentation labeled Attachment A.

Cellular Phone Record Analysis of (313) 412-6845

Date Range: 12/13/2010, 10:35 a.m.; 12/18/2010, 4:50 p.m.; 03/04/2011, 2:52 p.m.; 04/05/2011, 2:40 p.m.

ANALYSIS (313) 412-6845 (Target Telephone 2)

A review of the Call Detail Records (CDRs) revealed that there was call activity during the period covered by the records. The analysis was focused on the specific dates and times referenced above. The CDRs contained the cell sites associated with each call event. The cell sites identified on the call detail records were compared to the tower records furnished by Metro PCS. The tower records were imported to Microsoft MapPoint to visually depict the locations of towers within the Metro PCS network in the Detroit Metropolitan Area. On 03/04/2011, Target Telephone 2 was located outside of the Metro PCS market and roaming on the Sprint PCS network in Ohio. Sprint PCS tower records in the Ohio market were imported to Microsoft MapPoint as well. The cell sites identified on the CDRs were then plotted utilizing the corresponding tower records.

As a result, cell sites that were utilized by Target Telephone 2 were in the Detroit, Michigan and Warren, Ohio. On Analysis of the specified time periods yielded the following results:

12/13/2010, 10:35 a.m.: Call activity immediately prior to the reported time of the robbery utilized tower 127, sector 1 and sector 2. The tower is located southwest of the robbery scene. The next call originated on an adjacent tower north of the robbery scene.

12/18/2010, 4:50 p.m.: Call activity in and around the time of the robbery incident utilized tower 173 and tower 188. The towers are located south of the robbery scene.

03/04/2011, 2:52 p.m.: Call activity before and after the robbery utilized tower 208 293 on the Sprint network. The tower is located south of the robbery location.

04/05/2011, 2:40 p.m.: Call activity prior to the robbery incident utilized tower 502 and tower 170. Tower 502 is located south of the robbery scene.

A representation of this analysis can be seen in the attached Microsoft PowerPoint presentation labeled Attachment B.

CONCLUSION

LOCATION OF TARGET CELL PHONE: Based upon my training, experience, and analysis, it is determined that:

Target Telephone 1 utilized cell sites in the geographic area consistent with the robbery scene located at 2553 Parkman, Warren, Ohio on March 4, 2011.

Target Telephone 2 utilized cell sites in the geographic area consistent with the robbery scenes on December 13 and 18, 2010, as well as March 4, 2011, and April 5, 2011.

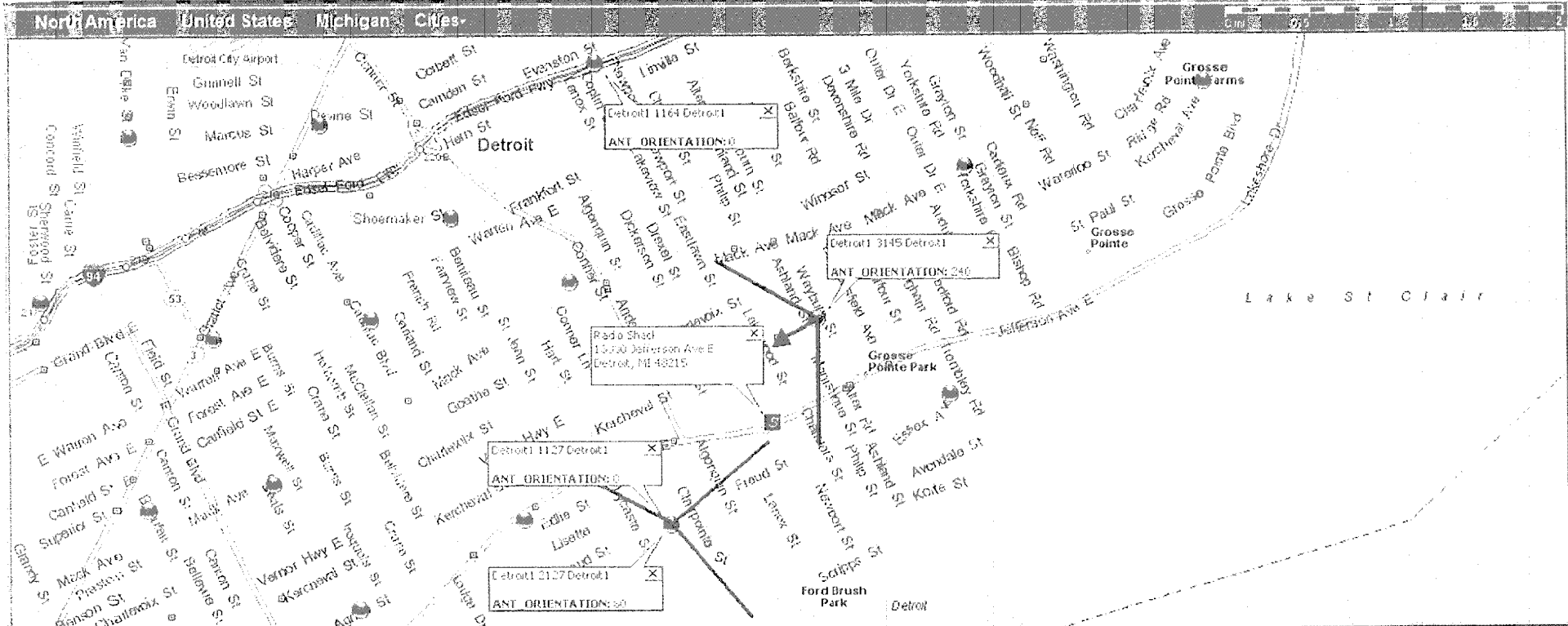
ATTACHMENT A

ATTACHMENT B

Target Number (313) 412-6845

December 13, 2010, 10:35 a.m.

| Search Number: 3134126845 Search Dates: 12/1/2010 - 5/10/2011 | | | | | | | | | | Beginning Cell | | Ending Cell | | |
|---|----------|----------|---------------|-------------|------------|----------|-----------------|------------|---------|----------------|-----|-------------|------|-----|
| Date | Time | Duration | DIR | Dialled Num | Dist Num | Status | Special Feature | Caller | Swap | Sect | Tow | Swap | Sect | Tow |
| 12/13/2010 | 10:24:47 | 3:56 | Incoming Call | | 3134126845 | Answered | None | 3134249573 | Detroit | 1 | 127 | | 2 | 127 |
| 12/13/2010 | 10:31:18 | 8:25 | Outgoing Call | 3134249573 | 3134249573 | Answered | None | | Detroit | 3 | 145 | | 1 | 164 |

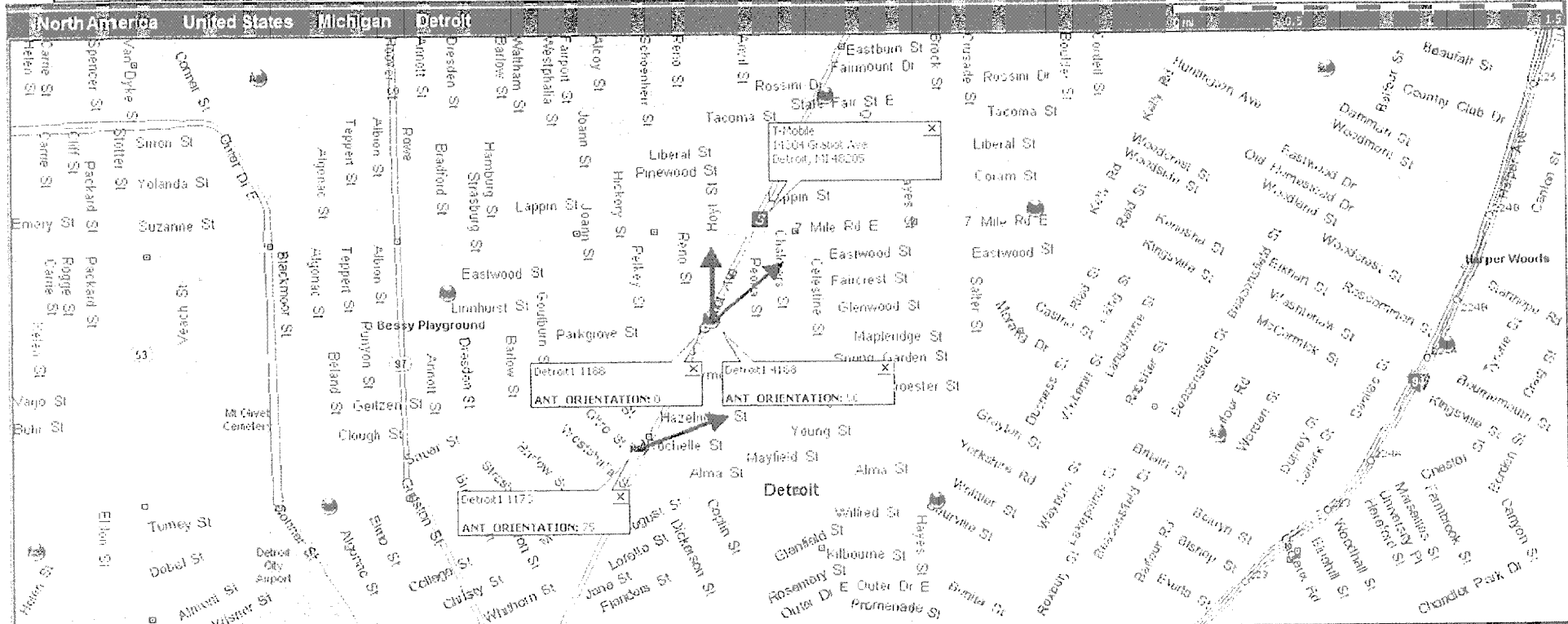


- At 10:24 a.m., a call nearly 4 minutes in duration originated on tower 127, sector 1 and terminated on sector 2. The tower is located southwest of the robbery scene.
- At 10:31 a.m., a call over 8 minutes in duration originated on tower 145 sector 3 and terminated on tower 164, sector 1. Tower 145 is located northeast of the robbery scene and tower 164 is located near I-94.

Target Number (313) 412-6845

December 18, 2010, 4:50 p.m.

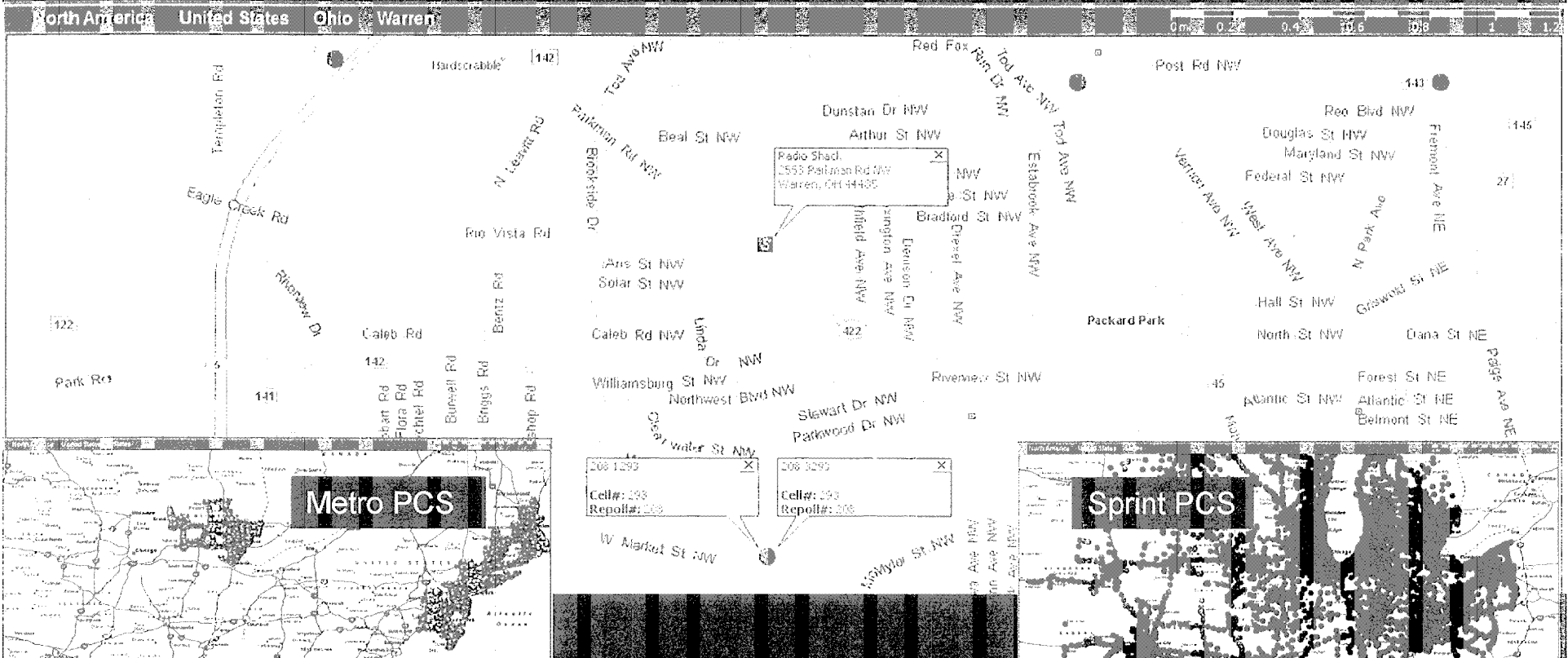
| Search Number: 3134126845 Search Dates: 12/1/2010 - 5/10/2011 | | | | | | | | | | Beginning Cell | | | Ending Cell | | |
|---|------------|----------|------|-----------------|------------|------------|------------------|---------|--------|----------------|-------|--------|-------------|-------|-----|
| Date | Time | Duration | DIR | Detailed Number | D-Station | Status | Special Features | Call ID | Switch | Sector | Tower | Switch | Sector | Tower | |
| 1741 | 12/18/2010 | 16:46:13 | 0:24 | Outgoing Call | 3137785459 | 3137785459 | Answered | None | | Detroit1 | 1 | 173 | | 4 | 188 |
| 1742 | 12/18/2010 | 16:53:31 | 0:35 | Outgoing Call | 3137785459 | 3137785459 | Answered | None | | Detroit1 | 1 | 188 | | 1 | 188 |



- At 4:46 p.m., a call originated on tower 173, sector 1 and terminated on tower 188 sector 4. Both towers are located south of the robbery scene.
- At 4:53 p.m., a call originated and terminated on tower 188 sector 1 and terminated on tower 164, sector 1.

Target Number (313) 412-6845

March 4, 2011, 2:52 p.m.

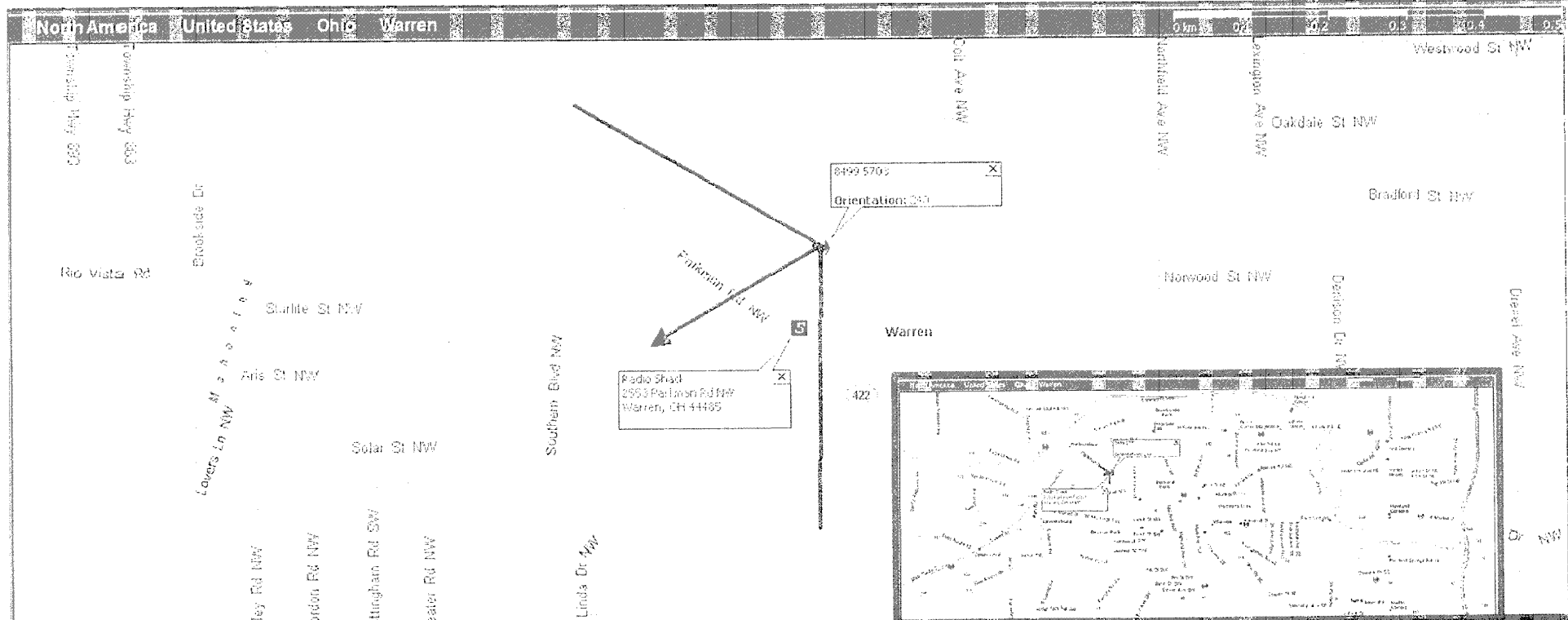


- Call activity at 2:12 p.m. and 3:20 p.m. originated and terminated on tower 208 293.
- Repoll 208 is in the Ohio market and cell site 293 is located south of the robbery scene.

Target Number (313) 579-8507

March 4, 2011, 2:52 p.m.

| | A | B | C | D | E | F | G | H | I | J | K | |
|------|--------------|-----------|----------------|------------|-----------|-------------|---------------|-----------|----------|----------|-------------------|--|
| 1 | Voice Detail | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | Msisdn | Direction | Seizure Date | First Cell | Last Cell | Calling | Called Number | First Lac | Last Lac | Duration | Duration(Minutes) | |
| 7738 | 13135798507 | MTC | 3/4/2011 14:20 | 5703 | 5703 | 12486592168 | 13135798507 | 8499 | 8499 | 1,907 | 31.78 | |
| 7739 | 13135798507 | MTC | 3/4/2011 15:12 | 5703 | 5703 | 13133726179 | 13135798507 | 8499 | 8499 | 32 | 0.53 | |

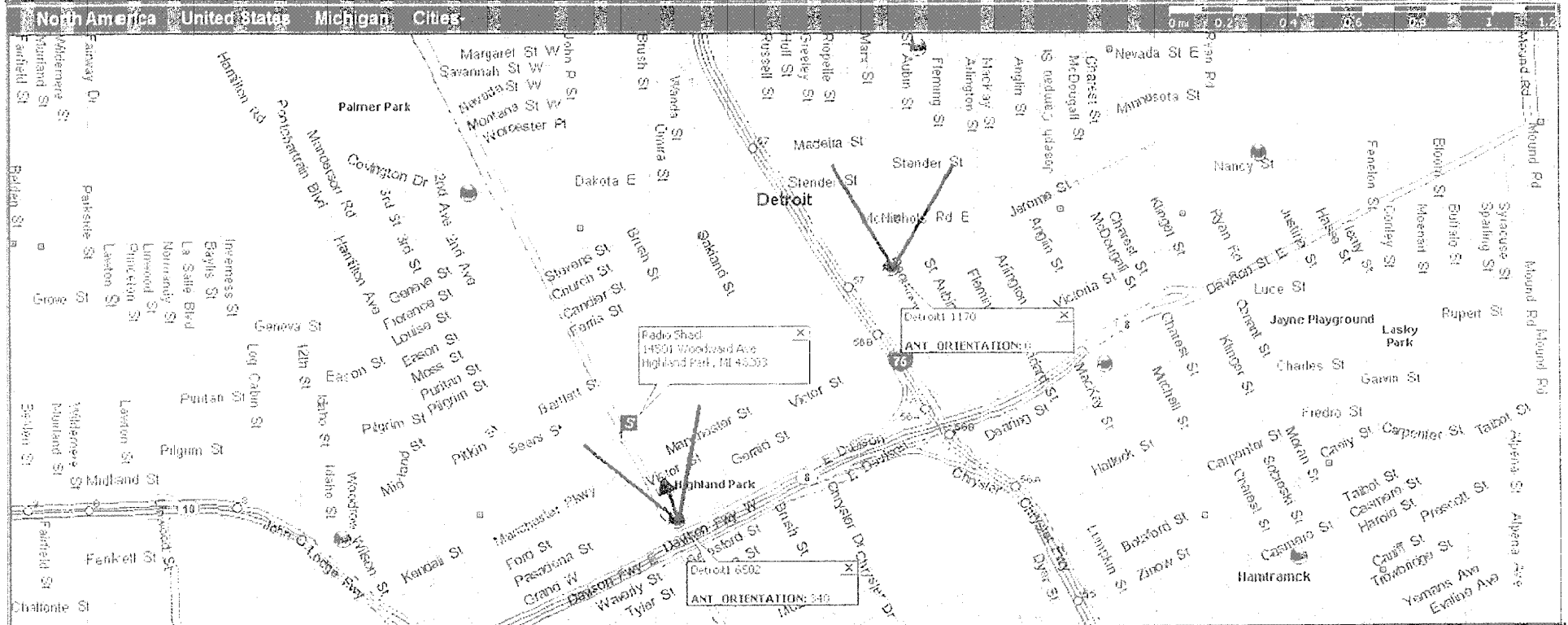


- Call activity was initiated at 14:20 (2:20 p.m.) lasting over 31 minutes.
- The activity originated and terminated on cell site 8499 5703.

Target Number (313) 412-6845

April 5, 2011, 2:40 p.m.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
|------|---|----------|----------|---------------|------|------------|------------|------------------|--------------|------------|----------------|-------|-------------|--------|-------|
| 1 | Search Number: 3134126845 Search Dates: 12/1/2010 - 5/10/2011 | | | | | | | | | | Beginning Cell | | Ending Cell | | |
| 2 | Date | Time | Duration | DIR | Male | Number | Status | Special Features | Caller ID | Cell | Sector | Tower | Cell | Sector | Tower |
| 7855 | 4/5/2011 | 14:21:43 | 15:23 | Outgoing Call | | 3137725969 | 3137725969 | Answered | None | Detroit1 | 6 | 502 | | 1 | 170 |
| 7856 | 4/5/2011 | 14:30:10 | 0:18 | Incoming Call | | 3134126845 | 3134126845 | Answered | Call Waiting | 2482772088 | Detroit1 | 6 | 502 | 6 | 502 |



- Call activity prior to the robbery incident utilized tower 502, sector 6 and tower 170 sector 1.
- Both towers are located in the geographic area consistent with the robbery scene.

CURRICULUM VITAE



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Detroit Division
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PROFESSIONAL EXPERIENCE

Federal Bureau of Investigation
Special Agent

Detroit, Michigan
April 2004 – Present

Assigned to the Violent Crimes squad responsible for investigating crimes including, but not limited to, continuing criminal enterprises, armed robbery, serial homicide, kidnapping, and fugitive cases.

Coordinator for a FBI sponsored multi-jurisdictional task force with the Detroit Police Department, Michigan State Police, Wayne County Sheriff's Office, Drug Enforcement Administration and Bureau of Alcohol, Tobacco, Firearms and Explosives.

Selected to be one of ten original members of the FBI Cellular Analysis Survey Team (CAST). CAST is a specialized team of highly trained Agents who provide support to federal, state and local law enforcement with regard to historical cell site analysis. Additionally, CAST conducts training for law enforcement in the application of historical cell site analysis to further investigations. CAST members also provide expert testimony in the area of historical cell site analysis.

As an investigator and member of the Cellular Analysis Survey Team, utilized cellular telephone analysis to locate and apprehend fugitives, recover victims, include or exclude suspects and corroborate information developed in numerous state and federal investigations.

Consulted with local, state and federal law enforcement and prosecutors on a variety of cases involving cellular telephone record analysis.

National Center for the Analysis of Violent Crime (NCAVC) Coordinator – Detroit Division serving as a liaison between state and local law enforcement and the FBI Behavioral Analysis Units (BAU) located in Quantico, Virginia. Responsible for facilitating case consultation between investigating agencies and BAU Agents commonly referred to as "profilers."

Serve as a certified Operator and Team Leader on the FBI Detroit Division Special Weapons and Tactics (SWAT) team. Responsibilities include service of high risk arrest and search warrants, tactical operations in Weapon of Mass Destruction (WMD) environments, tactical medical care and critical incident response in both urban and rural settings.

Town of Mount Pleasant Police Department

Police Officer

Valhalla, New York
December 2000 – April 2004

Assigned to the patrol division and responsible for investigating criminal complaints and responding to calls for service. Responsible for conducting Terrorism Awareness Training for police officers.

Trained as a certified police instructor at the Westchester County Police Academy instructing police recruits in various law enforcement topics.

Town of White Plains Department of Public Safety

Police Officer

White Plains, New York
August 1998 – December 2000

Conducted uniformed patrol within the City of White Plains.

Additional assignments included Street Crimes Unit and Youth Division familiarization programs.

Served as a certified instructor administering courses in first aid and cardiopulmonary resuscitation.

EDUCATION

City University of New York, John Jay College of Criminal Justice
Master of Public Administration (MPA)

New York, New York
September 2001 – June 2004

Pace University
Bachelor of Business Administration (BBA)

Pleasantville, New York
September 1990 – June 1994

PROFESSIONAL TRAINING & INSTRUCTION

FBI Instructor Development Course – Certified Instructor

Received over 400 hours of training in Radio Frequency Theory, GSM, iDEN, CDMA, and UMTS cellular protocols

Attended cellular network and legal compliance training with AT&T Wireless, Sprint/Nextel Communications, Verizon Wireless, T-Mobile, U.S. Cellular, Cricket Communications and Metro PCS

Received training and certification from JDSU in the application of the company's Wireless Network Optimization Software

Provided instruction to 100's of investigators and agents through an FBI Telephone Records Analysis course

Guest speaker presenting on cellular telephone analysis at training seminars for law enforcement and prosecuting attorneys

COURTROOM EXPERIENCE

Qualified as an expert and provided cellular telephone testimony in:

Federal:

United States District Court, Eastern District of Michigan, Detroit, Michigan
United States District Court, Western District of Michigan, Marquette, Michigan
United States District Court, District of Rhode Island, Providence, Rhode Island
United States District Court, Eastern District of Virginia, Richmond, Virginia

State:

3rd Circuit Court, Wayne County, Detroit, Michigan
44th Circuit Court, Livingston County, Howell, Michigan

20th District Court, Dearborn Heights, Michigan
36th District Court, Detroit, Michigan