

APPENDIX A
CRASH DATA EVALUATION
RED FLAG SUMMARY REPORT
HAM-32F-0.00
PID 86461
RELOCATED SR-32 SEGMENT 1
RED BANK CORRIDOR IMPROVEMENTS
EASTERN CORRIDOR MULTIMODAL PROJECTS
HAMILTON COUNTY, OHIO



URS Corporation
564 White Pond Dr.
Akron, OH 44320

Date: November 8, 2010

To: Dave Wormald, PE, AICP
Senior Project Engineer

From: William F. Madden, PE, PTOE
Senior Traffic Engineer

Subject: **Crash Data Analysis
ODOT - HAM 32F 0.00
Relocated SR-32 Segment 1
Red Bank Corridor
URS Job Number 15017500**

Introduction

A GIS Crash Analysis Tool (GCAT) and Crash Analysis Module (CAM) were requested from ODOT District 8 staff via e-mail. This request covered the project area as shown on the attached maps. Tom Arnold of District 8 provided the data. A total of 830 crash records – both logged and unlogged by milepost - were provided for five years (2005-2009).

Crash Location Uncertainty

URS GIS staff located the logged crashes by the provided latitude/longitude in the crash data. Initial inspection of the crash locations raised some questions: On Red Bank Expressway, there were not any crashes between Madison Road and the I-71 interchange, save for a few at the Duck Creek Road intersection. The data indicated that there were no crashes on the southbound Red Bank Expressway approach to Madison Road. This is apparently due to location data errors in the initial accident reporting. Similarly there are also, several crashes were “stacked” at *exactly the same* longitude/latitude.

URS conferred with Tom Arnold (ODOT District 8) to determine the potential sources of the location errors in the crash data provided. He explained that the differing locations for Red Bank Road vs Red Bank Expressway may not have been coded by Cincinnati police officers. The similar names in the same vicinity could certainly cause confusion. Also, there are not any entrance driveways on Red Bank Expressway north of Madison Road; therefore this section has not been assigned street address numbers. Cincinnati PD locates crashes almost exclusively by street addresses. Mr. Arnold is of the opinion that Cincinnati PD may have assigned street addresses to this section of Red Bank Expressway. If this is true, these addresses numbers are almost certainly the same for the

two routes. The mixing of the street names and street addresses make reliable crash location on these two routes difficult.

Longitude/latitude could be used as a reliable method to locate crashes, independent of the street address. However, the initial mapping showed that in several locations the crashes were stacked, with as many as twenty crashes at exactly matching GPS coordinates. This seems to be an unlikely event. Two theories as to why this occurred were formulated:

- Cincinnati PD uses a coordinate key for intersections and other common crash locations, and this data is entered into the report form after the crash occurs. A GPS unit to precisely locate the crash is not used.
- The GPS units used to locate the crashes are imprecise, and snap to the nearest known coordinate. This results in the actual crash occurring at some radius around the snapped coordinate.

Either of these scenarios could explain the lack of crash data on the southbound Red Bank Expressway approach to Madison Road. Also, these crashes could have been located by street address on Red Bank Road, not Red Bank Expressway.

An effort was made to look at the individual records with the goal of increasing confidence in the location data. In order to get a better grasp on the data, only the latest three years were considered; the 2005 and 2006 data was eliminated. This resulted in 407 logged records. When the same ratio was applied to the 197 five-year total of unlogged crashes, the number of latest three year unlogged crashes is 128. This gives a total of 535 crashes within the project limits from 2007 to 2009 inclusive.

Fatal Crashes

There were two fatal crashes within the project limits from 2007 to 2009 inclusive:

- On December 4, 2008 a pedestrian was struck when crossing Madison Road at the Anderson Place intersection. The pedestrian – who was carrying a bus pass – was within the marked cross-walk; the driver was charged with vehicular homicide. Given the proximity of St. Paul Village, an apartment complex for senior citizens, and the bus route on Madison Road, the pedestrian flasher at this intersection may need to be upgraded to a full traffic signal.

- On June 3, 2009 a vehicle traveling eastbound on Duck Creek Road lost control and hit a metal pole at the Red Bank Road intersection. The driver was killed in this single vehicle crash. He was suspected of driving under the influence of alcohol, was not wearing a seatbelt, and was suspected of driving 10 MPH above the posted speed limit of 35 MPH.

Intersection and Corridor Reviews

After reviewing the two fatal crashes, we concentrated our efforts on four sub-areas within the project limits:

- Intersection of Red Bank Expressway and Madison Road,
- Red Bank Road corridor from Duck Creek Road northward to the I-71 underpass (a length of approximately 2500', including the area in front of Seven Hills Middle School),
- Erie Avenue corridor within the project limits
- Intersection of Murray Road and Virginia Avenue.

These are the areas that the project team understands from various stakeholders to be the problem locations. Total crashes for each area were mapped, as well as crashes during the morning and afternoon peak hours. Each sub-area location were evaluated separately.

Red Bank Expressway and Madison Road Intersection

The 407 logged records were reviewed by street name in the Excel worksheet to eliminate crashes that did not occur at this intersection. Occasionally individual crash records were consulted, but most of the data sifting was done via the excel spreadsheet in the GCAT. A total of 98 logged records occurred at this intersection. When this same ratio was applied to the unlogged records, 31 crashes occurred at this intersection, for a total of 129 crashes. This gives a crash rate of 4.57 crashes/million entering vehicles. The crash diagram produced by the CAM did locate some of the crashes on the southbound Red Bank Expressway approach.

Murray Road at Virginia Avenue Intersection

The 407 logged records were reviewed by street name in the Excel worksheet to eliminate crashes that did not occur at this intersection. Occasionally individual crash records were consulted, but most of the data sifting was done via the excel spreadsheet.

A total of four (4) logged records occurred at this intersection. When this same ratio was applied to the unlogged records, one (1) crash occurred at this intersection, for a total of five (5) crashes. These five crash reports were reviewed. This gives a crash rate of 0.57 crashes/million entering vehicles. The crash diagram produced by the CAM is included in the exhibits.

Erie Avenue Corridor

The same method used at the Red Bank/Madison intersection was used on the Erie Avenue Corridor. A total of 72 logged crashes were found, and using the ratio of total logged to total unlogged crashes for this corridor 23 unlogged crashes are thought to have occurred here. This gives a total of 95 crashes, for a crash rate of 3.61 crashes/million vehicle miles traveled (MVMT). This is below the Hamilton County average of 3.95 crashes/MVMT.

Red Bank Road Corridor

The same method used at the Red Bank/Madison intersection was used on the Red Bank Road Corridor on the north end of the project limits. However, the individual crash reports were researched due to the small number of crashes. A total of 10 logged crashes were found, and using the ratio of total logged to total unlogged crashes for this corridor 3 unlogged crashes are thought to have occurred here. This gives a total of 13 crashes, for a crash rate of 3.37 crashes/million vehicle miles traveled (MVMT). This is below the Hamilton County average of 3.95 crashes/MVMT.

Conclusions

Based on the crash data for 2007-2009, there does not appear to be a significant safety problem within project limits which would contribute the project purpose and need. Similarly, there do not appear to be significant numbers of crashes that appear to be attributable to existing geometrics, roadside conditions or lighting. Again, this conclusion is based on the crash data provided, and the relative accuracy of the crash locations inherent in any large-scale crash analysis.

There are a few specific locations that could warrant further study. The intersection of Madison Road and Anderson Place could possibly be studied for a pedestrian traffic signal, or other traffic control enhancements. Rear-end and sideswipe crashes appear to be a problem on the Madison Road approaches to Red Bank Road. Efforts to decrease the congestion and queue lengths, and improve lane use signage could possibly improve the crash situation at this intersection.

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LEGEND:

Total Traffic Accidents  Study Area

-  1 - 2
-  3 - 4
-  5 - 6
-  7 - 8
-  9 - 10

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 1
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF RED BANK
AND MADISON ROAD

DATE: 10/26/2010

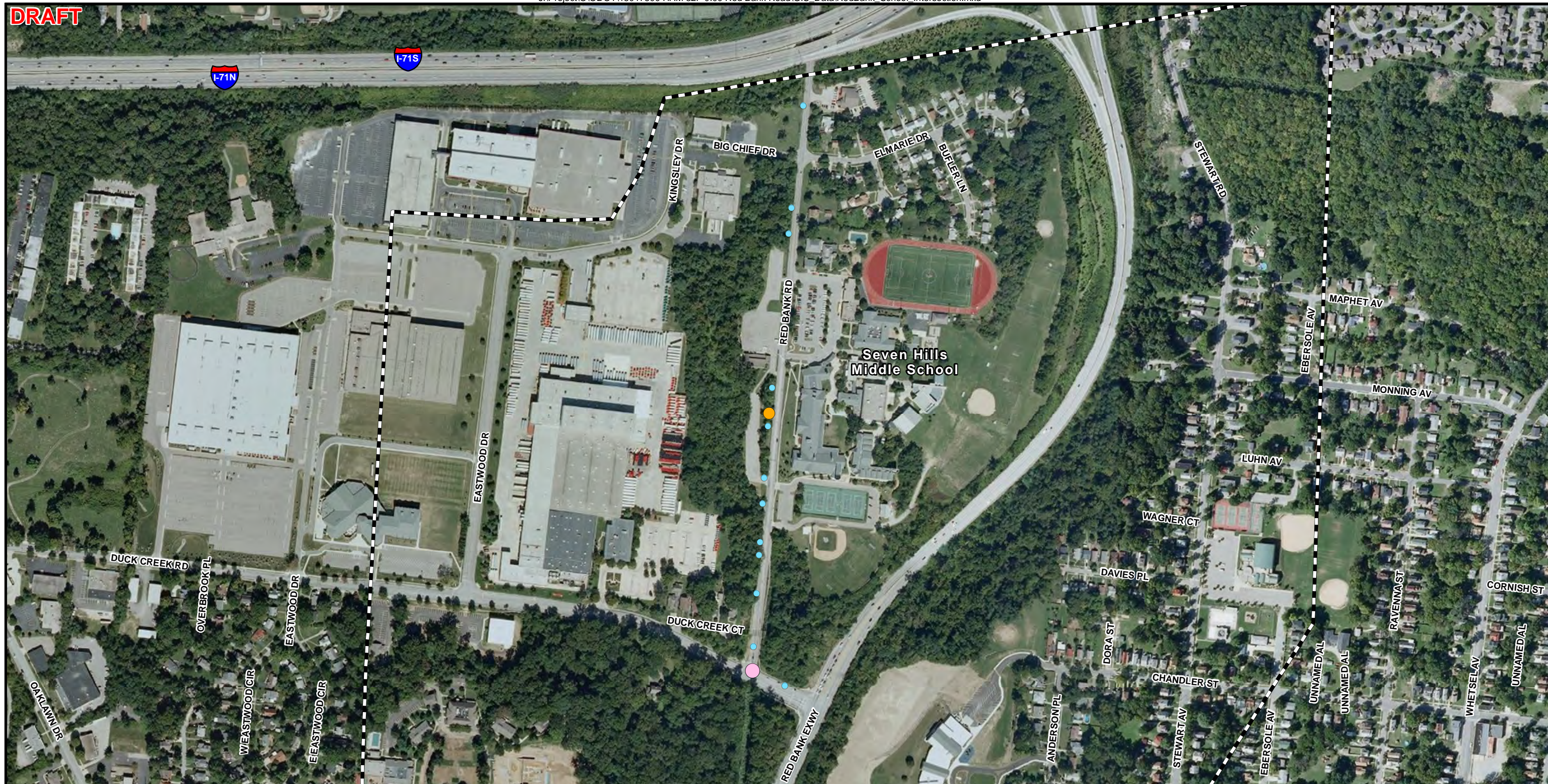
SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

URS

JOB NO. 14949072



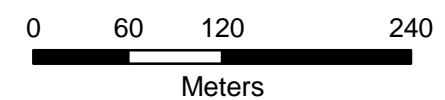
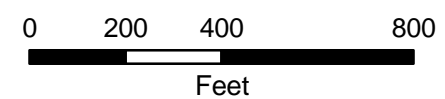
LEGEND:

Total Traffic Accidents



Study Area

- | | |
|---|--------|
|  | 1 - 2 |
|  | 3 - 4 |
|  | 5 - 6 |
|  | 7 - 8 |
|  | 9 - 10 |



BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 2
TOTAL TRAFFIC ACCIDENTS: 2007-2009
RED BANK ROAD AND
SEVEN HILLS MIDDLE SCHOOL

DATE: 10/26/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 400 ft.



JOB NO. 14949072

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LEGEND:

Total Traffic Accidents

 Study Area

-  1 - 2
-  3 - 4
-  5 - 6
-  7 - 8
-  9 - 10

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 3
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF ERIE AVENUE
AND RED BANK ROAD

DATE: 10/26/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

URS

JOB NO. 14949072

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LEGEND:

Total Traffic Accidents

 Study Area

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 4
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF MURRAY ROAD
AND VIRGINIA AVENUE

DATE: 10/26/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

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LEGEND:

Total Accidents: Weekday AM Peak Hours*



Study Area

- 1 - 2
- 3 - 4
- 5 - 6

*Weekday AM Peak Hours:
Monday-Friday 7 AM-9 AM

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 5: WEEKDAY AM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF RED BANK
AND MADISON ROAD

DATE: 11/01/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

URS

JOB NO. 14949072

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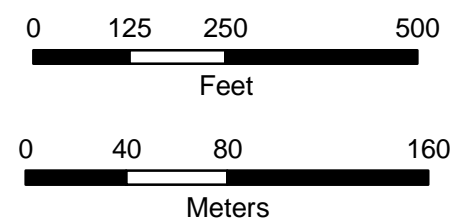


LEGEND:

Total Accidents: Weekday PM Peak Hours*

- 1-2
- Study Area

*Weekday PM Peak Hours:
Monday-Friday 4 PM-6 PM



BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 6: WEEKDAY PM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF RED BANK
AND MADISON ROAD

DATE: 11/01/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

URS

JOB NO. 14949072

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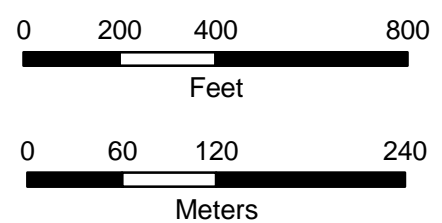


LEGEND:

Total Accidents: Weekday AM Peak Hours*

- 1 - 2
- Study Area

*Weekday AM Peak Hours:
Monday-Friday 7 AM-9 AM



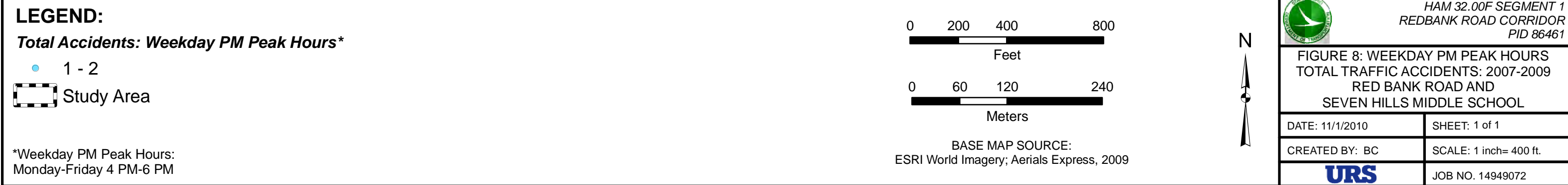
BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

**FIGURE 7: WEEKDAY AM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
RED BANK ROAD AND
SEVEN HILLS MIDDLE SCHOOL**

DATE: 11/1/2010	SHEET: 1 of 1
CREATED BY: BC	SCALE: 1 inch= 400 ft.
URS	JOB NO. 14949072




DRAFT

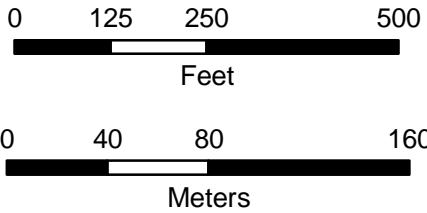


LEGEND:

Total Accidents: Weekday AM Peak Hours*

- 1 - 2
-  Study Area

*Weekday AM Peak Hours:
Monday-Friday 7 AM-9 AM



BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 9: WEEKDAY AM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF ERIE AVENUE
AND RED BANK ROAD

DATE: 11/1/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.



JOB NO. 14949072



LEGEND:

Total Accidents: Weekday PM Peak Hours*

• 1-2

Study Area

*Weekday PM Peak Hours:
Monday-Friday 4 PM-6 PM

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009

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HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

**FIGURE 10: WEEKDAY PM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF ERIE AVENUE
AND RED BANK ROAD**

DATE: 11/1/2010	SHEET: 1 of 1
CREATED BY: BC	SCALE: 1 inch= 250 ft.
	JOB NO. 14949072

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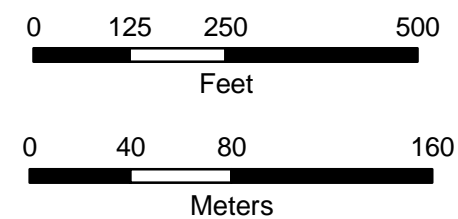


LEGEND:

Total Accidents: Weekday AM Peak Hours*

- 1-2
- Study Area

*Weekday AM Peak Hours:
Monday-Friday 7 AM-9 AM



BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

**FIGURE 11: WEEKDAY AM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF MURRAY ROAD
AND VIRGINIA AVENUE**

DATE: 10/26/2010	SHEET: 1 of 1
CREATED BY: BC	SCALE: 1 inch= 250 ft.
	JOB NO. 14949072

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LEGEND:

Total Accidents: Weekday PM Peak Hours*

1 - 2

3 - 4

Study Area

*Weekday PM Peak Hours:
Monday-Friday 4 PM-6 PM

0 125 250 500
Feet

0 40 80 160
Meters

BASE MAP SOURCE:
ESRI World Imagery; Aerials Express, 2009



HAM 32.00F SEGMENT 1
REDBANK ROAD CORRIDOR
PID 86461

FIGURE 12: WEEKDAY PM PEAK HOURS
TOTAL TRAFFIC ACCIDENTS: 2007-2009
INTERSECTION OF MURRAY ROAD
AND VIRGINIA AVENUE

DATE: 11/2/2010

SHEET: 1 of 1

CREATED BY: BC

SCALE: 1 inch= 250 ft.

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JOB NO. 14949072