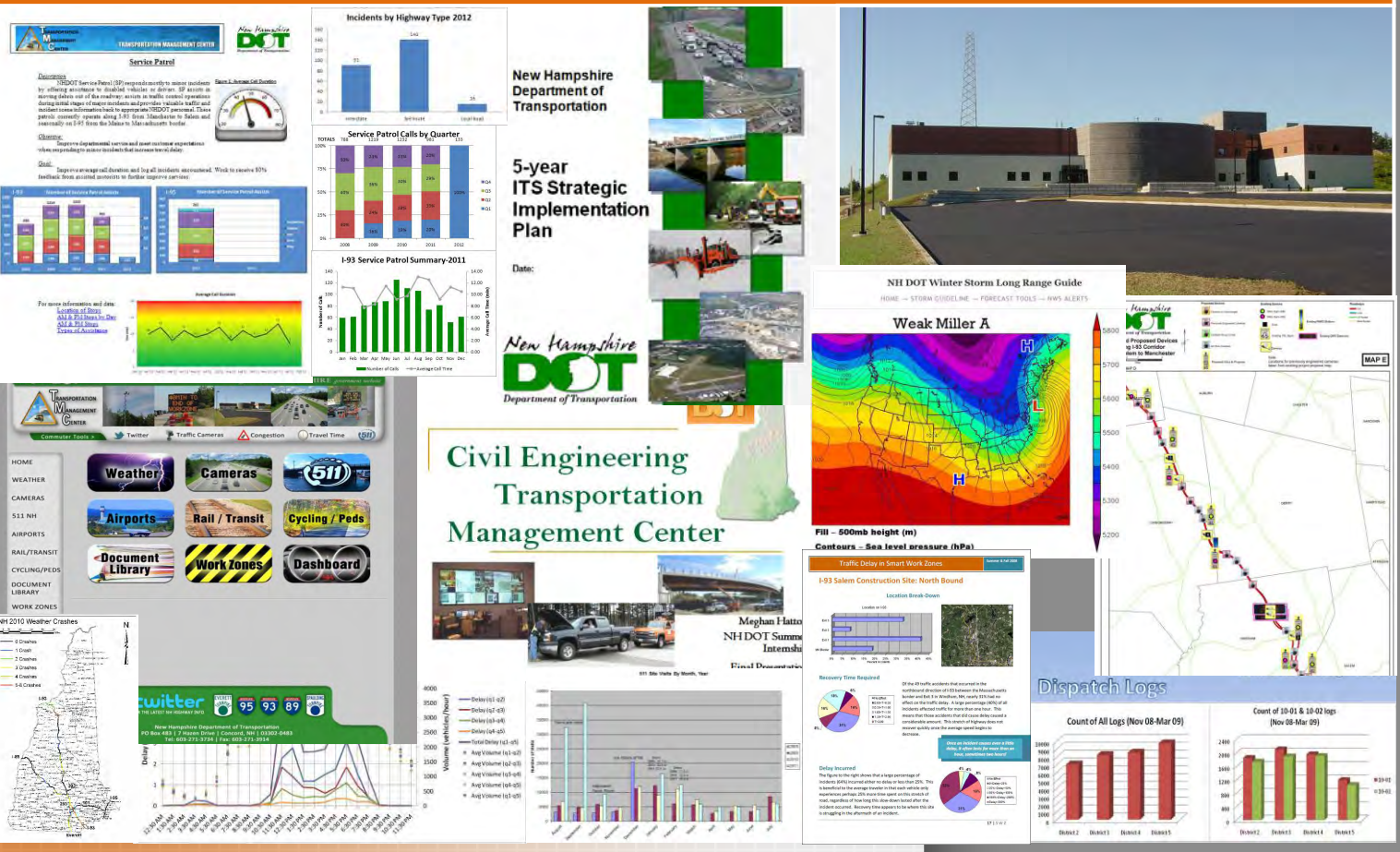
2009-2012

TMC Intern Program



Denise Markow, P.E.
Transportation Management Center
Bureau of Traffic
NH Department of Transportation

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Executive Summary

Between the years of 2009 and 2012, the TMC has had the pleasure of working with over fourteen interns or summer trainees. The ability to work with young professionals who are task oriented, possess superb technical skills and bring a real willingness to learn and do well has been an excellent experience for the center.

The summer interns have been very enthusiastic because for many, it is their first professional working experience. The ability to enhance their resume by working for the Department of Transportation has been a real asset to their career development.

The trainees, all of whom are civil engineers, have had the opportunity to be exposed to another type of transportation engineering, Systems Engineering. The need to manage the flow of traffic on existing corridors and to collect data about traffic operations are areas that they have never been exposed to in their educational experience.

The TMC has benefited greatly by having the opportunity to have targeted specific projects completed at a greatly reduced cost by employing interns and trainees. The cost comparison at the back of the report shows how much savings can be realized by using this workforce.

TMC Intern Program

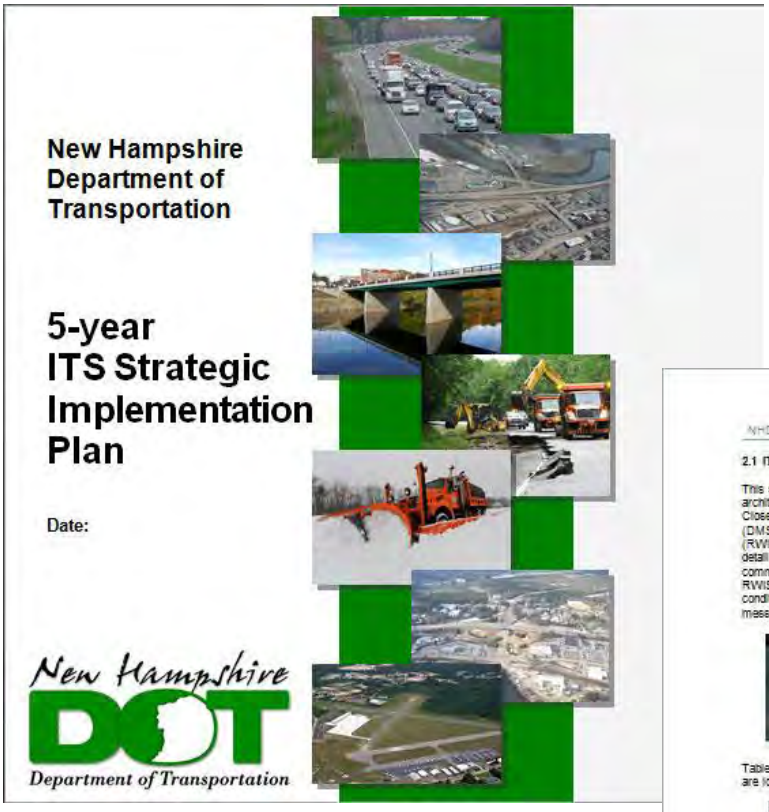
2009-2012

David Gaylord

Training Program

Time at TMC: June 2012 (3 weeks)
College Major: Civil Engineering
Projects:

- Assembled the ITS Strategic Plan draft template which is in final review
- Developed an ITS Mainstreaming for Bridge Design Presentation



NHDOT ITS Strategic Implementation Plan

2.1 ITS Infrastructure and Device Deployment

This section summarizes the current ITS initiatives that include ITS architecture, planning, and field deployment. The infrastructure includes Closed Circuit Television (CCTV) cameras, Dynamic Message Signs (DMS), Variable Speed Limit (VSL), Road Weather Information Systems (RWIS), as well as the communication infrastructure, which is described in detail in section 2.5. The devices serve as the primary method of communication to travelers and TMC operators. The CCTV cameras and RWIS sensors provide operators a clear picture of traffic flow and weather conditions on major roadways. DMSs and VSLs are used to communicate messages and reduced speeds from TMC operators to the travelling public.

Table 2 summarizes the current ITS deployment. Figure 1 contains a map of where the devices are located.

Table 2: ITS Device Inventory

Roadway	CCTV	DMS	RWIS	VSL
I-93	18	15	9	3
I-293	1	2	0	1
I-95	9	8	0	0
FE Everett Turnpike	0	2	0	0
NH Route 101	4	3	1	2
I-89	2	7	1	0
Spaulding Turnpike	11	3	1	0
US 4	1	1	0	0
NH 112	1	0	1	0
NH 9	1	0	1	0
Woodbury Ave	0	1	0	0

Currently, major ongoing ITS deployment projects involve full corridor deployment of I-93 Salem to Manchester and I-95/Spaulding Turnpike. After the main corridors are instrumented the focus of ITS deployment will turn to main arterials.

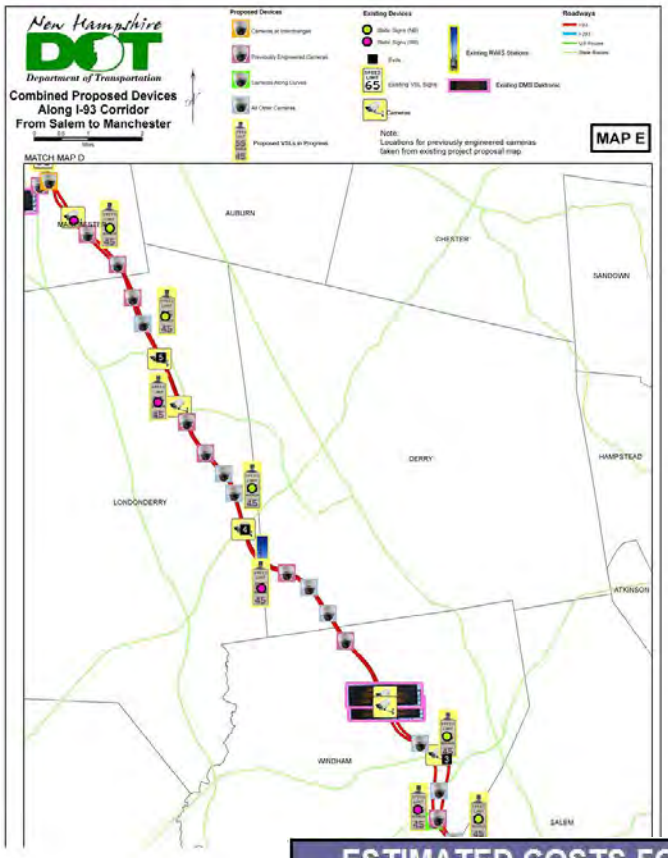
Date Page 9

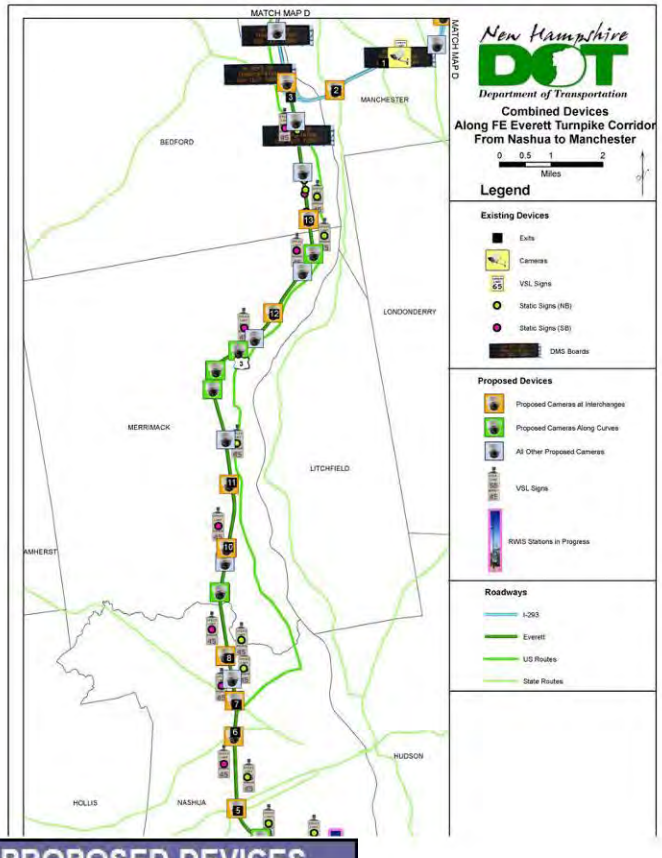
Desiree Carron

Summer Intern

Time at TMC: May – August 2012
College Major: Civil Engineering
Projects:

- Developed ITS Master Plans for divided highways in ArcGis
- Developed ITS Fiber Optic Inventory Mapping in ArcGis
- Self-taught ArcGis in three days





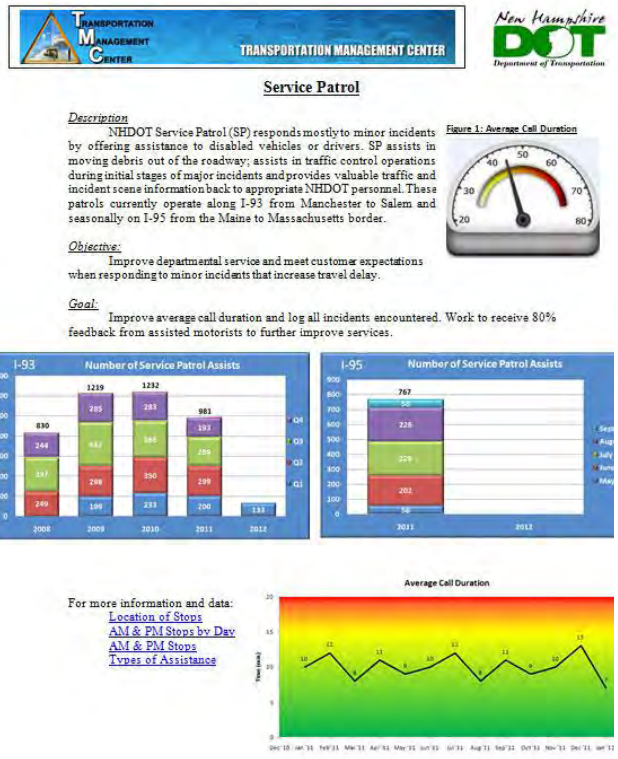
ESTIMATED COSTS FOR PROPOSED DEVICES			
ITEM	TOTAL PROPOSED	UNIT PRICE*	TOTAL COST ESTIMATE
CAMERAS	9	$110,000	$ 990,000.00
FIBER	102,432 FT	$10/FT	$1,024,320.00
VSLs	22	$16,000	$ 352,000.00
RWIS	0	$40,000	$ -
ENGINEERING			
TOTAL			$2,366,320.00
*Estimate taken roughly as average from bids on previous projects			
Fiber measurements estimated from mile markers			

Dustan Eurieck

Training Program

Time at TMC: February - March 2012 (4 weeks)
College Major: Civil Engineering
Projects:

- Developed the TMC Performance Measurement Fact Sheets
- Created the TCP layout for the Nashua Community College Job Fair Opening
- Created Recurring and Nonrecurring Congestion Graphs used for Performance Measurements



TRANSPORTATION MANAGEMENT CENTER

New Hampshire DOT Department of Transportation

Service Patrol

Description

NHDOT Service Patrol (SP) responds mostly to minor incidents by offering assistance to disabled vehicles or drivers. SP assists in moving debris out of the roadway; assists in traffic control operations during initial stages of major incidents and provides valuable traffic and incident scene information back to appropriate NHDOT personnel. These patrols currently operate along I-93 from Manchester to Salem and seasonally on I-95 from the Maine to Massachusetts border.

Figure 1: Average Call Duration

Objective:

Improve departmental service and meet customer expectations when responding to minor incidents that increase travel delay.

Goal:

Improve average call duration and log all incidents encountered. Work to receive 80% feedback from assisted motorists to further improve services.

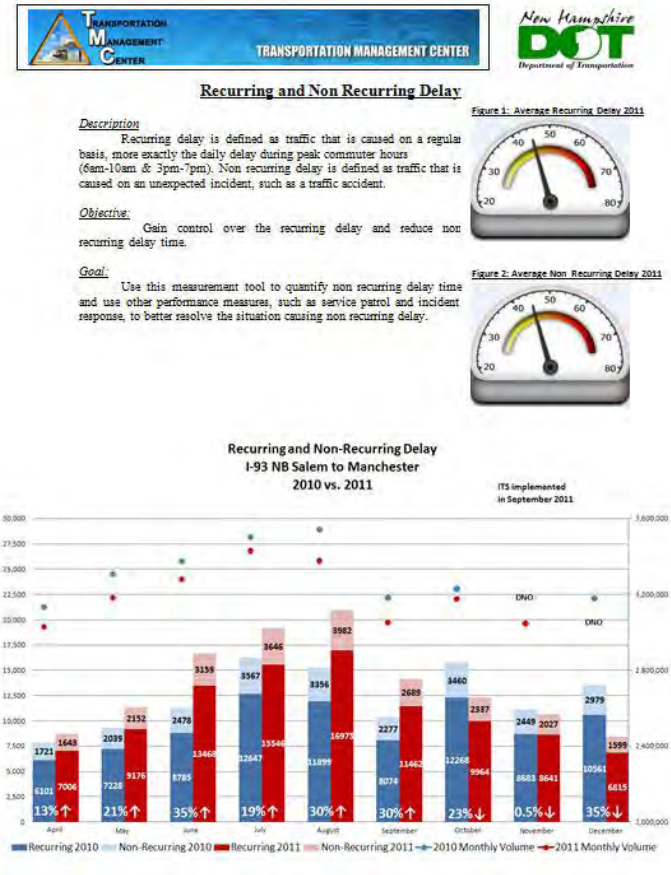
I-93 Number of Service Patrol Assists

I-95 Number of Service Patrol Assists

For more information and data:

Location of Stops
AM & PM Stops by Day
AM & PM Stops
Types of Assistance

Average Call Duration



TRANSPORTATION MANAGEMENT CENTER

New Hampshire DOT Department of Transportation

Recurring and Non Recurring Delay

Description

Recurring delay is defined as traffic that is caused on a regular basis, more exactly the daily delay during peak commuter hours (6am-10am & 3pm-7pm). Non recurring delay is defined as traffic that is caused on an unexpected incident, such as a traffic accident.

Figure 1: Average Recurring Delay 2011

Objective:

Gain control over the recurring delay and reduce non recurring delay time.

Goal:

Use this measurement tool to quantify non recurring delay time and use other performance measures, such as service patrol and incident response, to better resolve the situation causing non recurring delay.

Figure 2: Average Non Recurring Delay 2011

Recurring and Non-Recurring Delay
I-93 NB Salem to Manchester
2010 vs. 2011

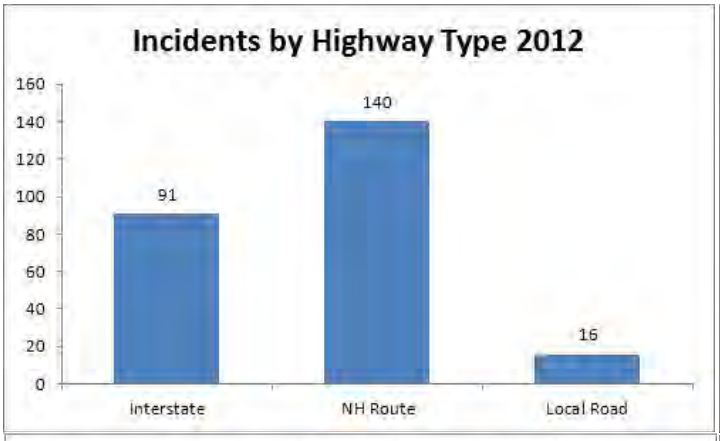
ITS implemented in September 2011

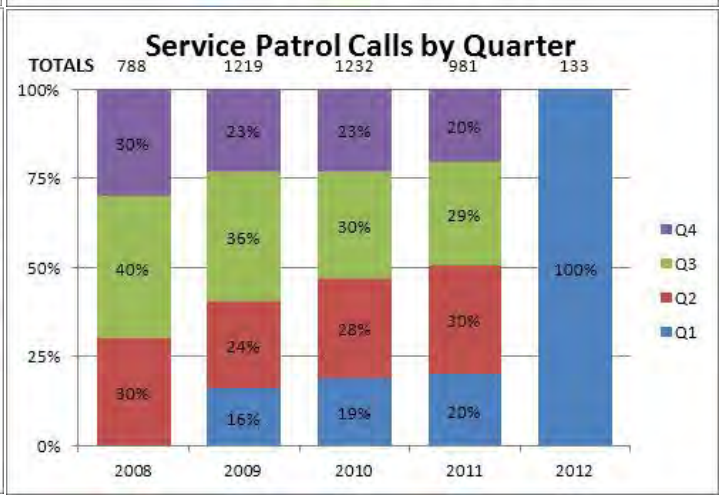
Recurring 2010 | Non-Recurring 2010 | Recurring 2011 | Non-Recurring 2011 | 2010 Monthly Volume | 2011 Monthly Volume

Joe Bodwell

Summer Intern

Time at TMC: May 2012 – Current
College Major: Math
Projects:
- Developing monthly updated performance measures for the TMC Dashboard
- Tracking Service Patrol numbers, Incident Clearance Time, Average Travel Speed, and Peak Hour Speed
- He is using Visual Basic to create the programs, which automatically updates the statistics



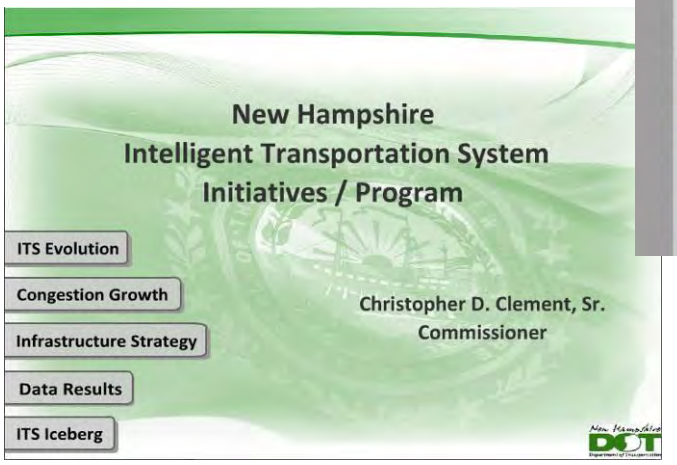


Kody McCarthy

Summer Intern

Time at TMC: June 2011 - Current
College Major: Video Game Art
Projects:

- Developing the TMC website
- Created visualizations for Road and Weather Systems
- Developed Road and Weather data analyses highlighting:
  - Communication
  - Pavement Sensor Reliability
  - Storm Times
  - Surface Temperature Reliability
- Created many Flash Presentations including one for the Commissioner



TMC Intern Program

2009-2012

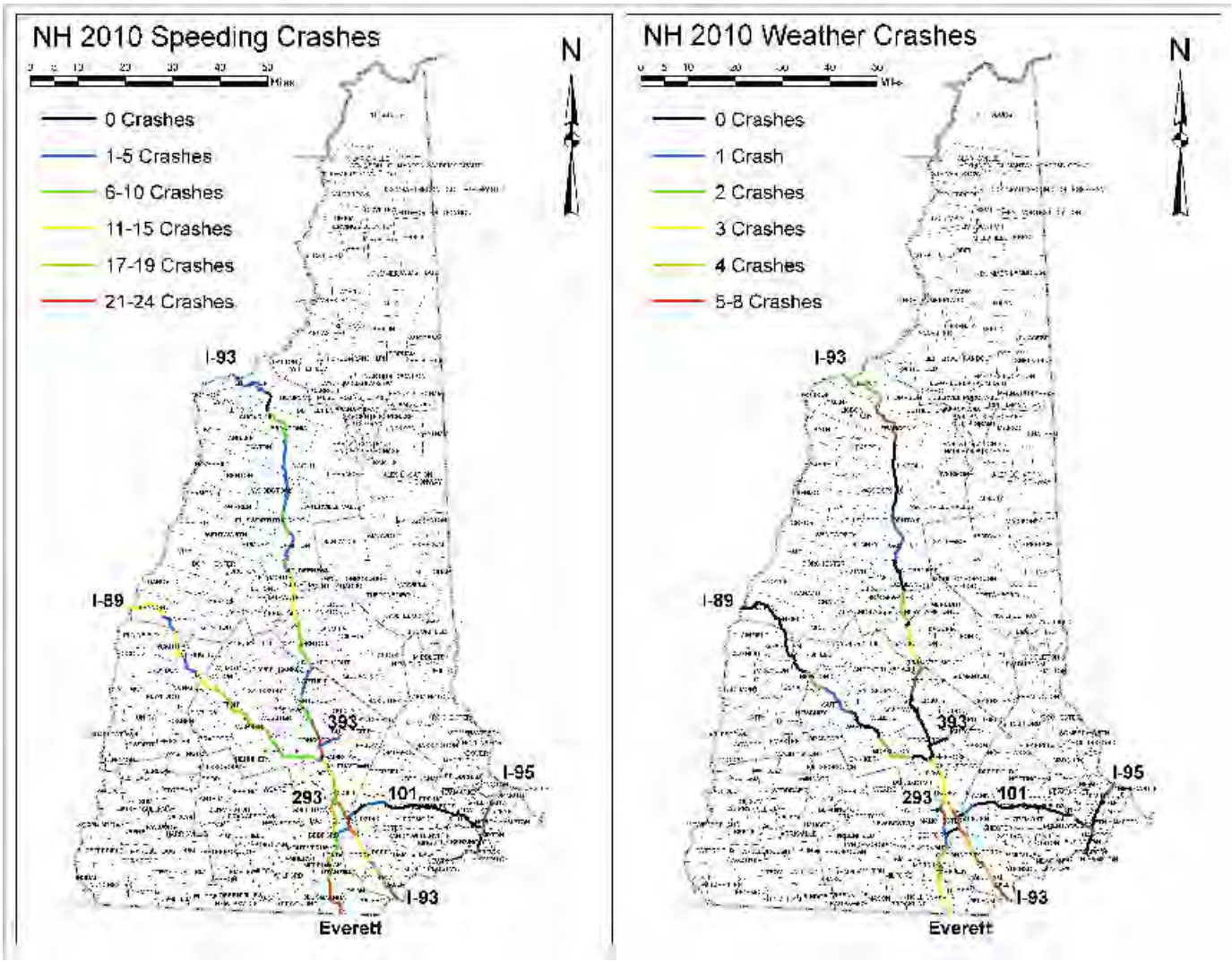
2011

Joe Ruskowski

Training Program

Time at TMC: March 2011 (3 weeks)
College Major: Civil Engineering
Projects:
- Took 2010 accident data* based on cause and plotted on the major corridors in GIS
- The maps clearly highlighted the corridors with multiple accidents
- Self-taught ArcGis in 4 days

* Supplied by Dept. of Safety

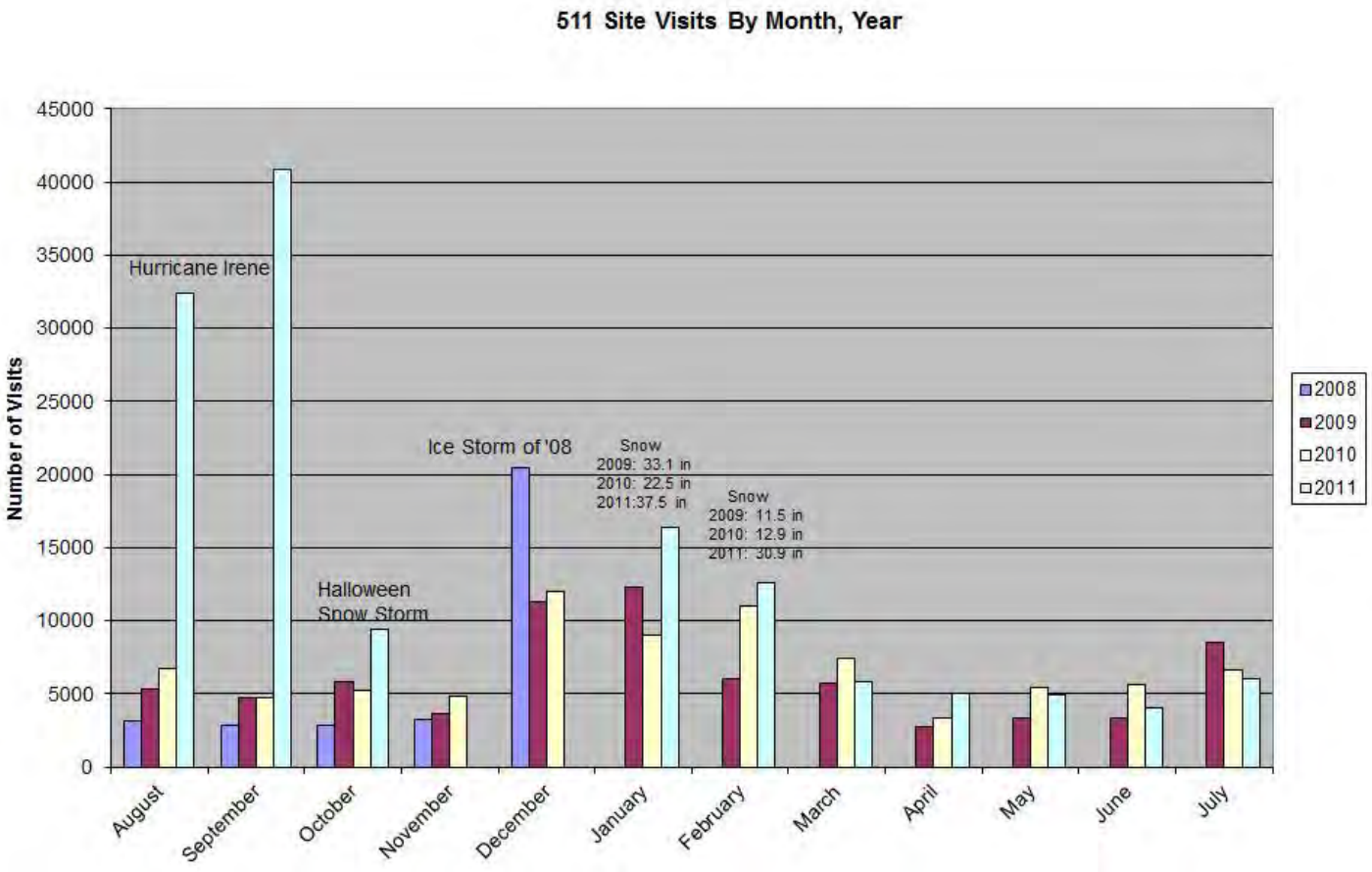


John Kowalski

Training Program

Time at TMC: November - December 2011 (3 weeks)
College Major: Civil Engineering
Projects:

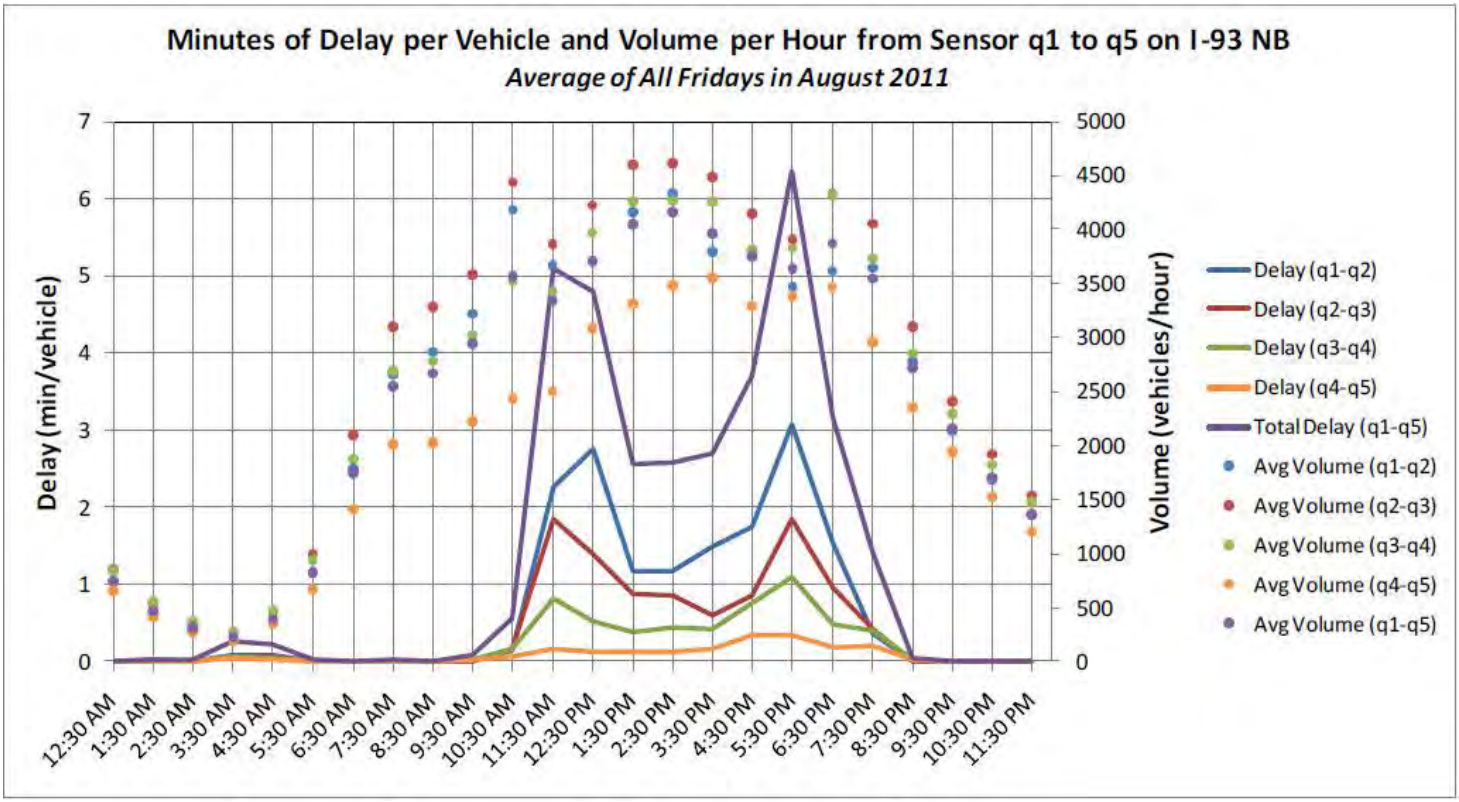
- Gathered and reported on 511 web statistics
- Data highlighted increased web visits during weather events
- Data showed that the 511 site is the second most visited site after nh.gov



Phil Brogan

Training Program

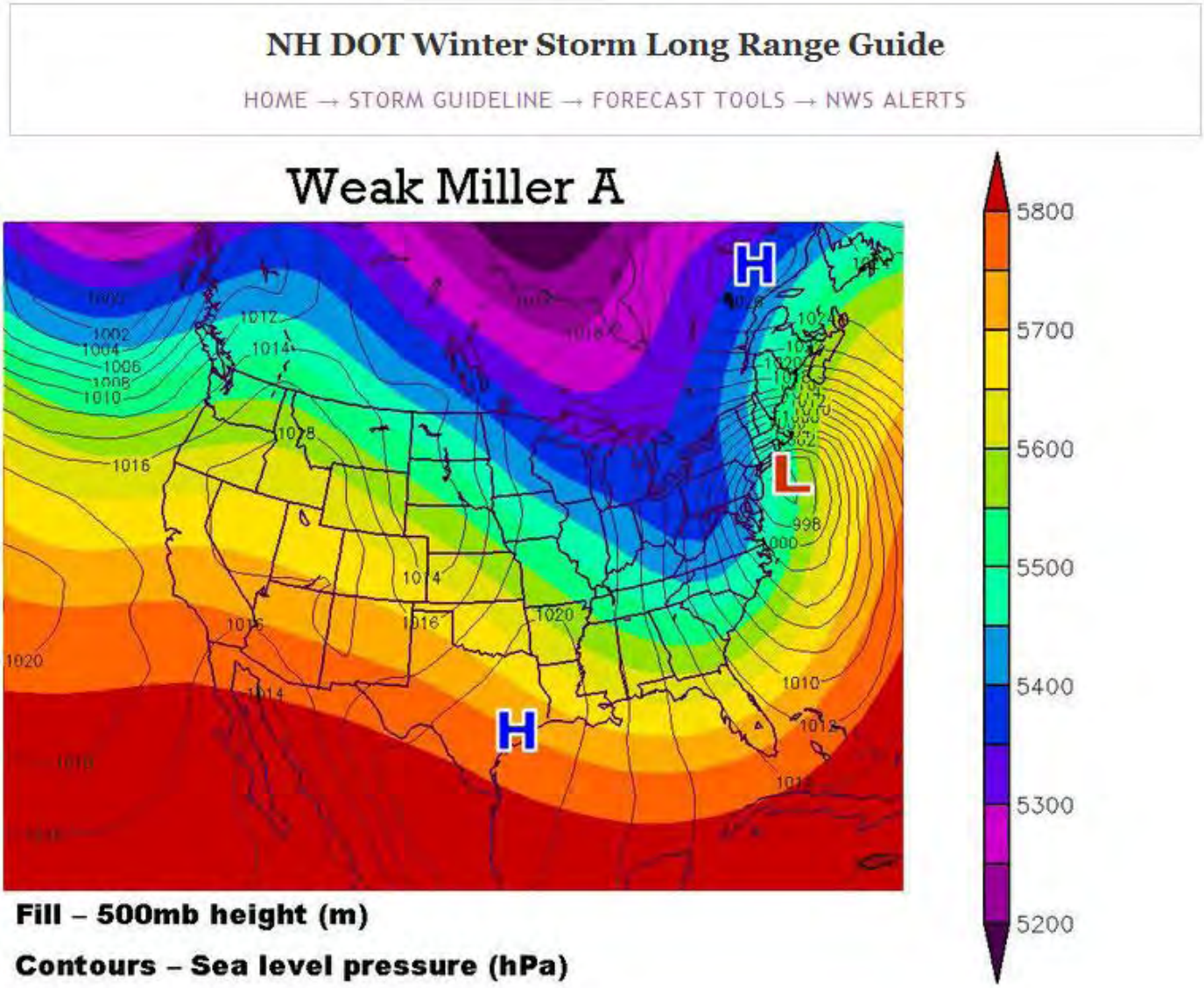
Time at TMC: December 2011 (4 weeks)
College Major: Civil Engineering
Projects:
- Created I-93 Traffic Analysis Summaries for Delay
- The data is being used as the backbone data structure for the current TDM initiative on I-93.



Sam Lillo

Summer Intern

Time at TMC: Summer 2010 and 2011
College Major: Meteorology
Projects:
- Created the TMC On-line Weather Toolbox used as a reference by TMC Operators
- Provided Plymouth State University forecasting



TMC Intern Program

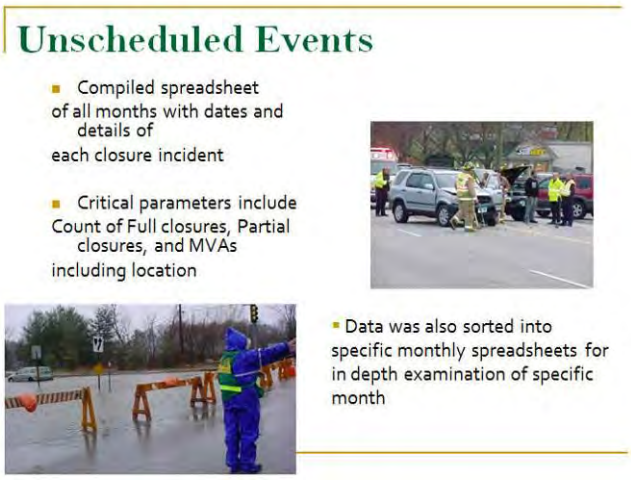
2009-2012

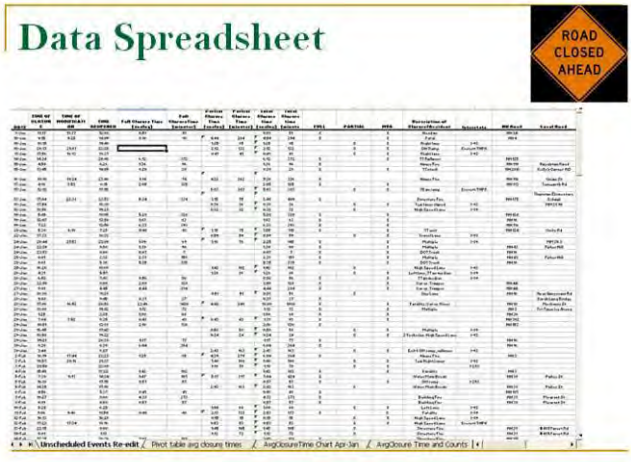
Meghan Hatton

Summer Intern

Time at TMC: June - August 2010
College Major: Civil Engineering
Projects:

- Worked on the I-95 fiber optic design plans
- Placed ROW and utility lines on existing plans using MicroStation
- Developed the Smart Work Zone Toolbox currently in use today
- Initially created the Incident Log inventory program used as the basis for the automated program that feeds the TMC Website Dashboard

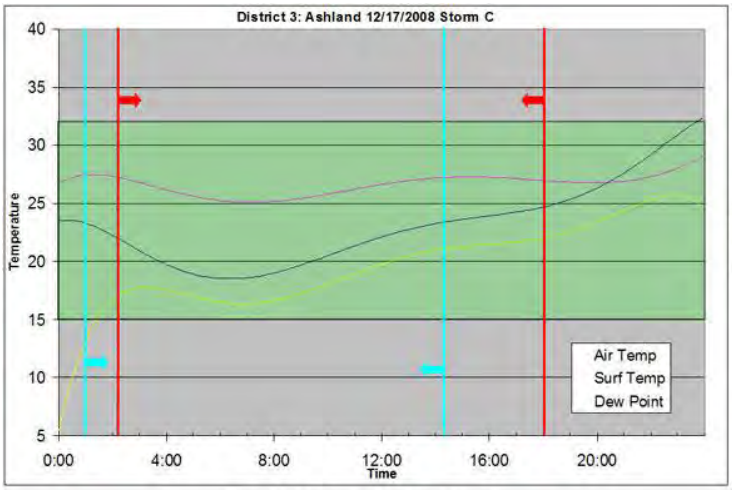


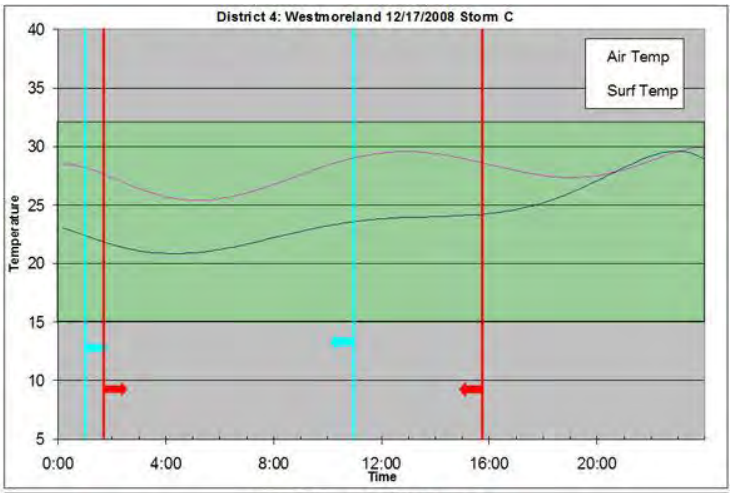


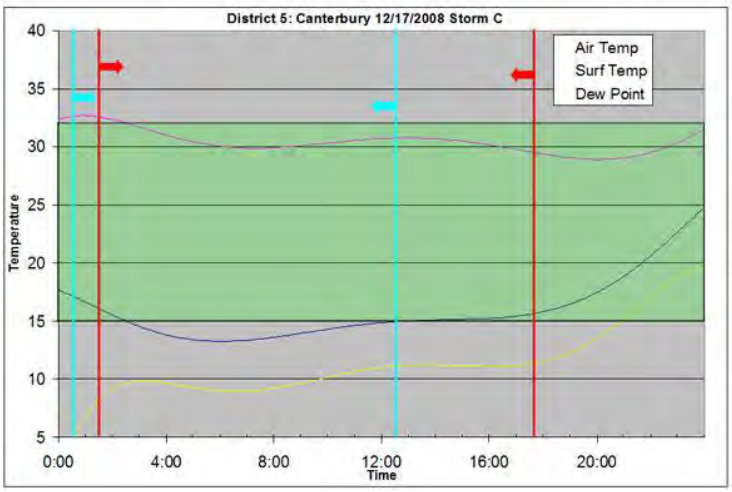
Chris Bourque

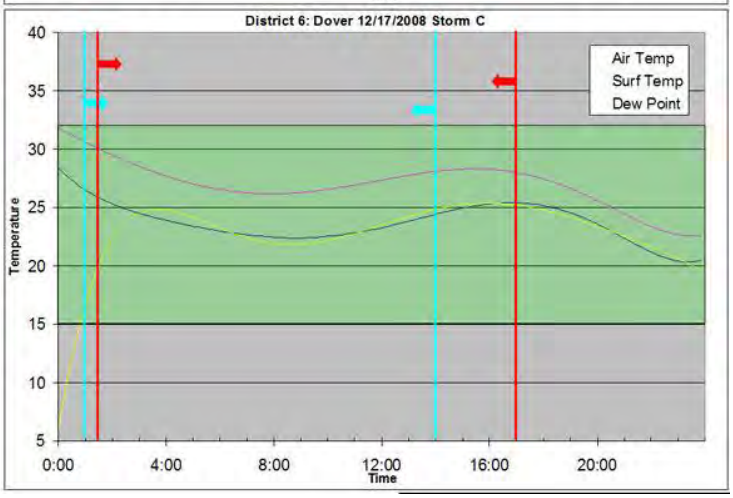
Training Program

Time at TMC: June - August 2009 (6 weeks)
College Major: Civil Engineering
Projects:
- Created an RWIS evaluation study that included storm analysis and showed how RWIS sites can provide helpful data to field personnel





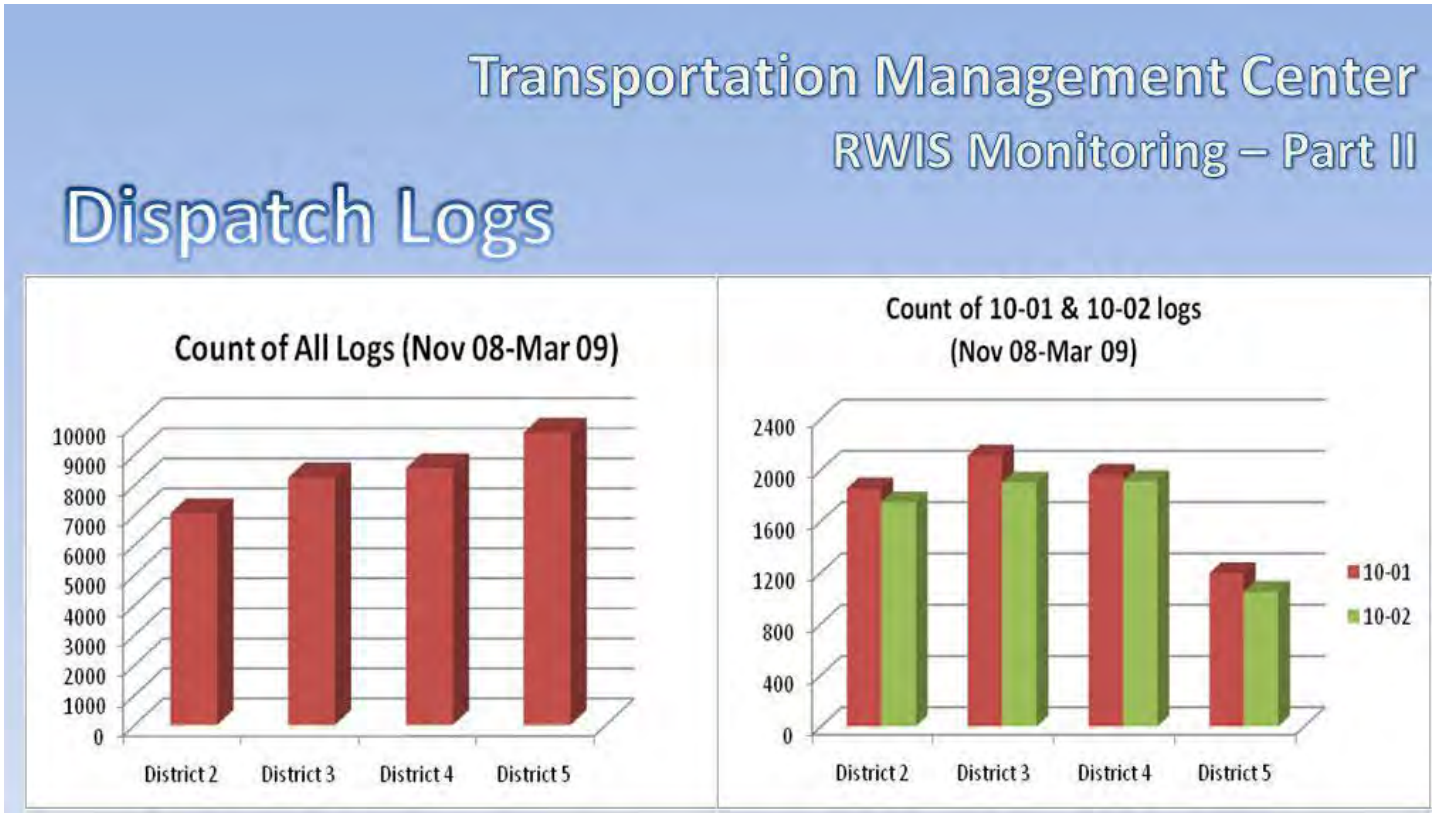




Kelly Parks

Training Program

Time at TMC: August - September 2009 (6 weeks)
College Major: Civil Engineering
Projects:
- Submitted the weather and maintenance system report
- Her report furthered the initiative for a standardized electronic dispatch log

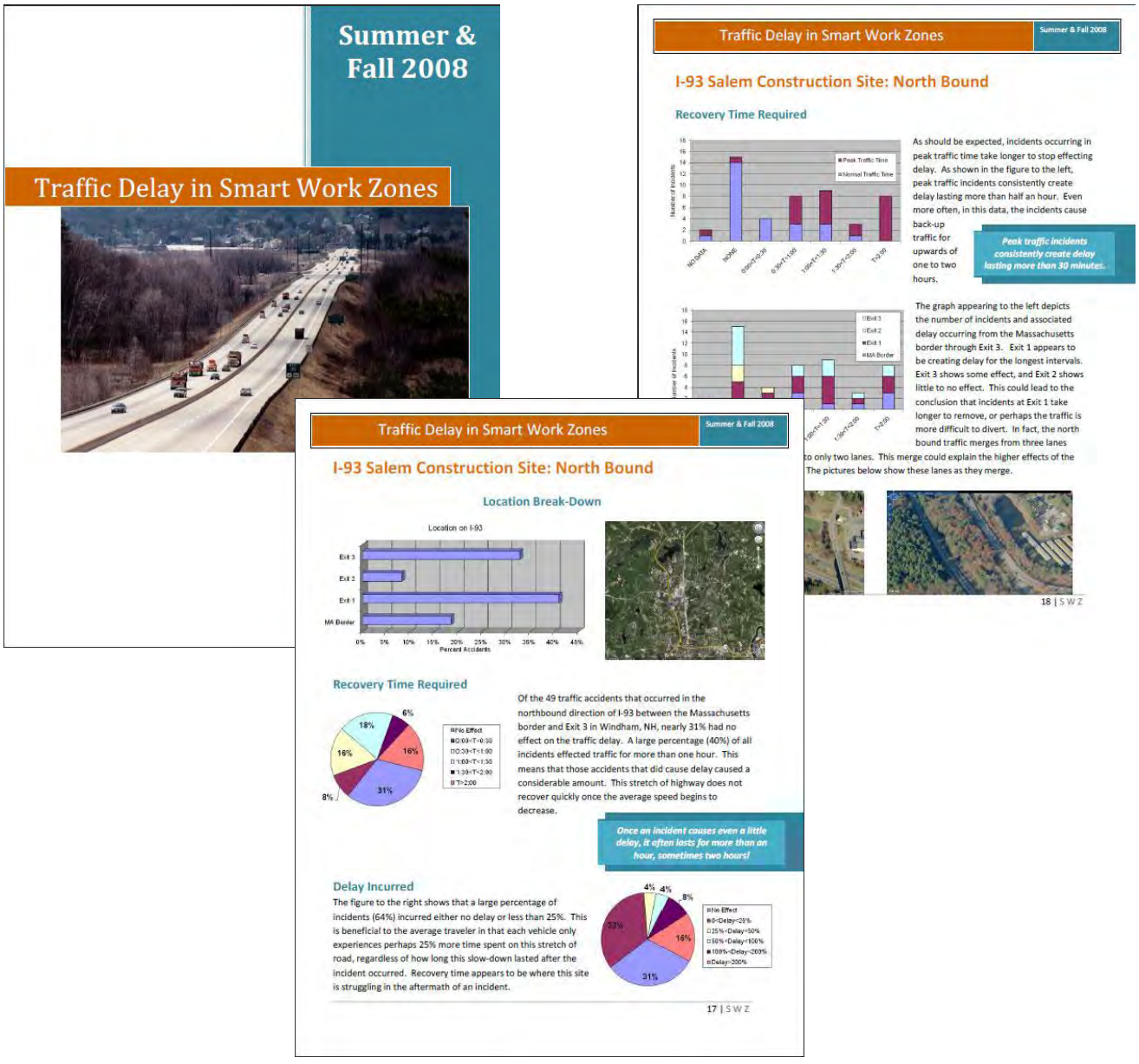


Mary Ferguson

Summer Intern

Time at TMC: June - September 2009
College Major: Civil Engineering
Projects:

- Created I-93 + Rochester SWZ Delay Report.
- Evaluated recovery time and calculated delay due to recurring congestion, holiday traffic, and weather
- Her report is now used as a reference for the TMC when working with the TDM initiative on I-93



TMC Intern Program

2009-2012

Certified Public Manager's Course

Steve Lemire

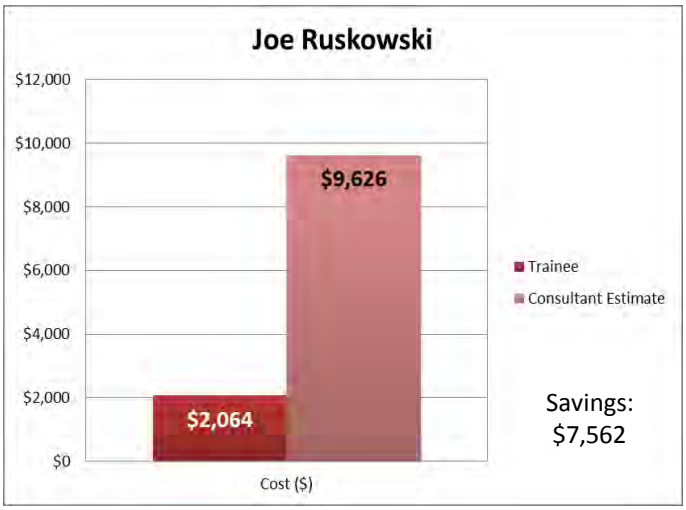
Employee

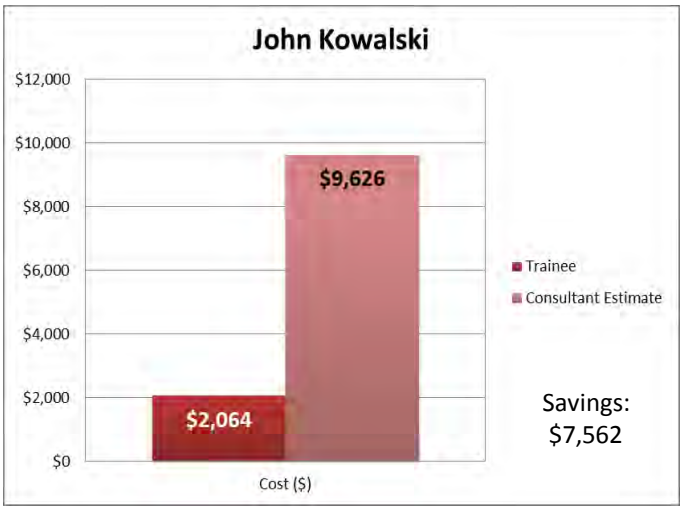
Time at TMC: Current
Certified Public Managers Course
Projects:
- Developed the guidelines for Mainstreaming ITS using systems engineering.
- This program is currently under FHWA review for integration into the Department's project development process.
- Savings to the department for this project was approximately $184,000.

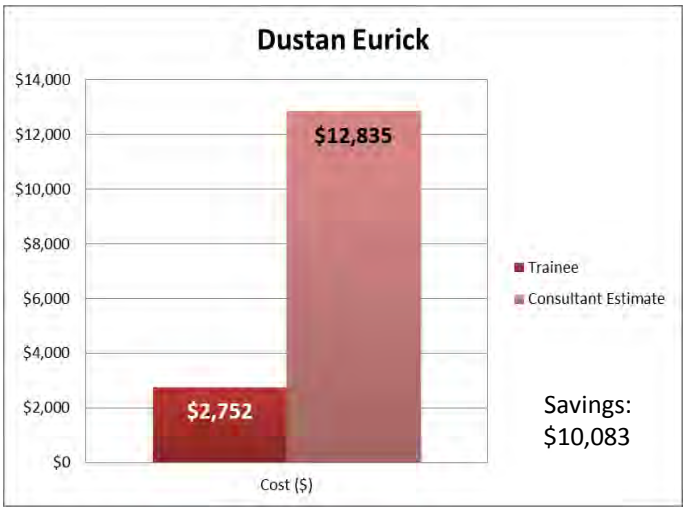
Cost Comparisons

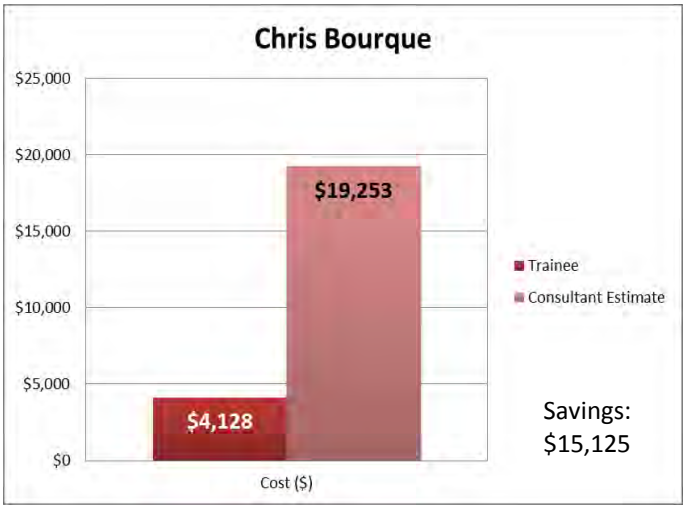
Trainee versus Consultant Cost Differences

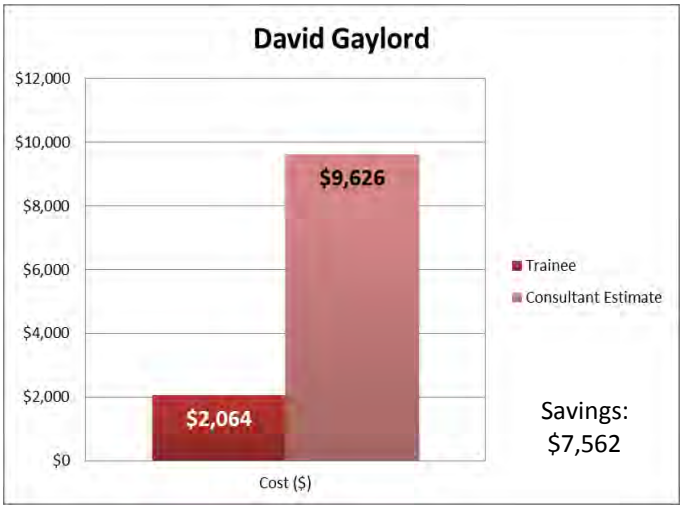
Trainee Hourly Costs were calculated according to a 40-hour week at a Labor Grade 18, Step 1. The Consultant rate was an average rate for a Junior Intelligent Transportation Systems (ITS) Engineer that included overhead. If overall benefits were included in the Trainee calculations, the comparison may be closer.







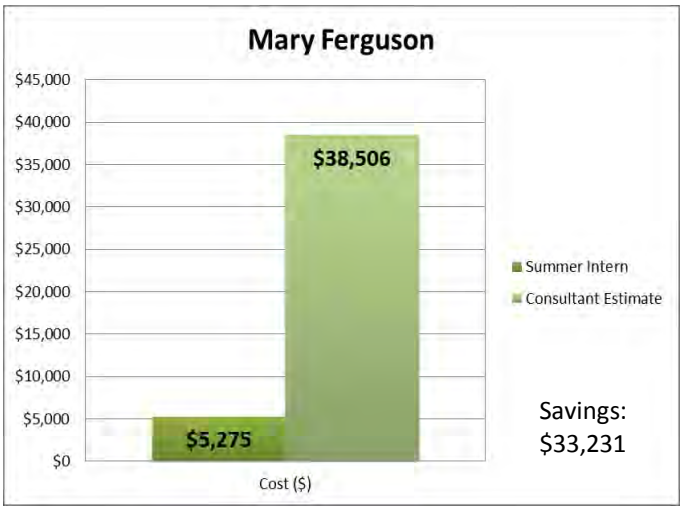


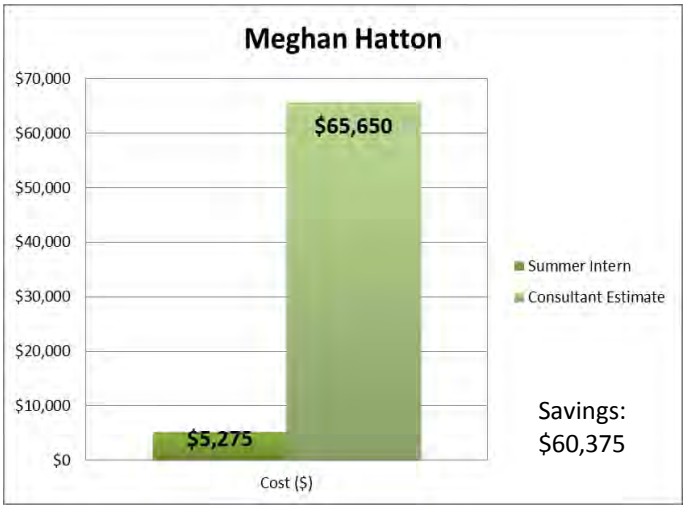


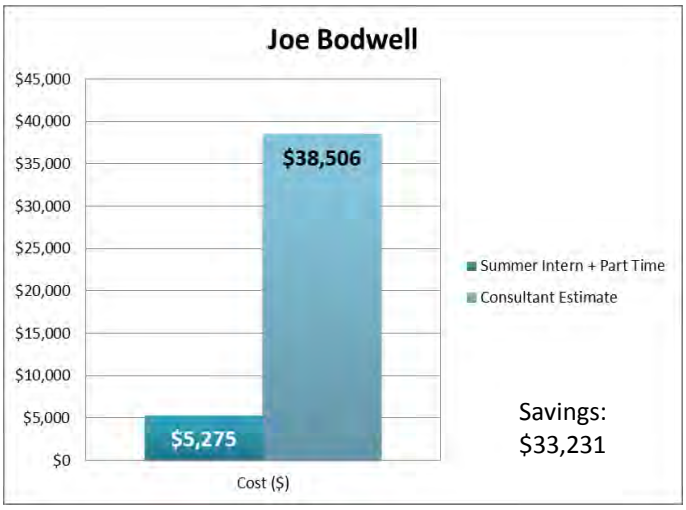
Greater savings were realized by using trainees as the length of their stay at the TMC increased. The actual savings from the project that David Gaylord worked on totaled approximately $43,000 because there was a consultant task order that could be directly tied to his project. The $7,562 savings shown in the graph above only calculates a difference in hourly rate and does not truly reflect the overall savings to the department. David not only completed the task at a greatly reduced hourly rate but he completed 60% of the submitted consultant task order in the three weeks that he was at the TMC.

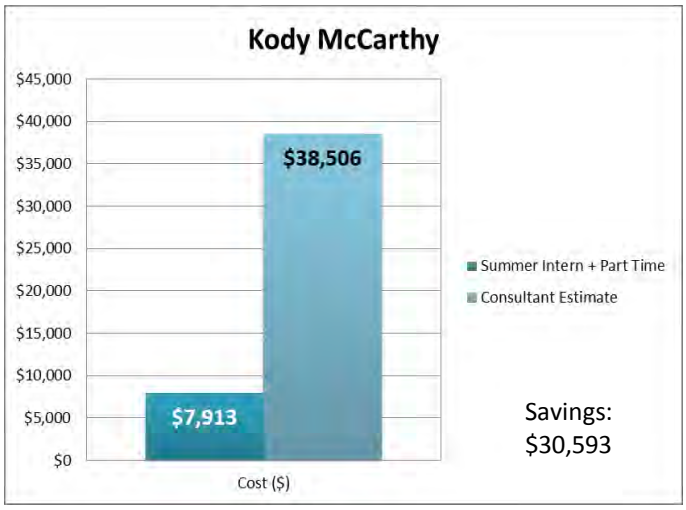
Interns versus Consultant Cost Differences

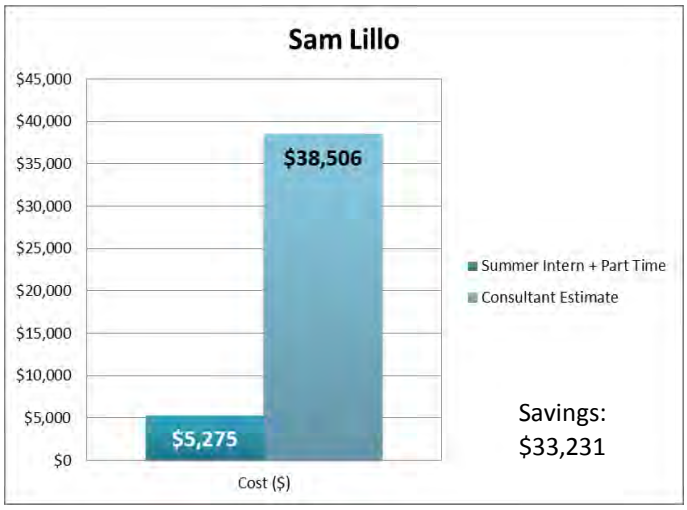
Intern Hourly Costs were calculated according to a 40-hour week at a Labor Grade 6, Step 1, which is $10.99 per hour. The Consultant rate was an average rate for a Junior Intelligent Transportation Systems (ITS) Engineer that included overhead, which was $80.22 per hour.

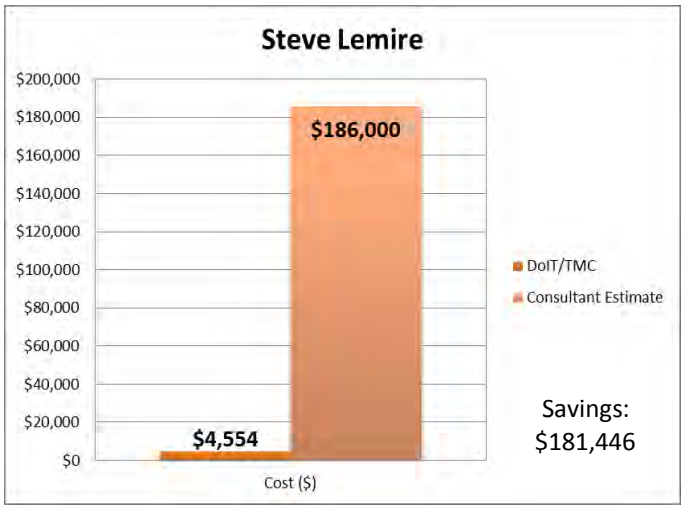










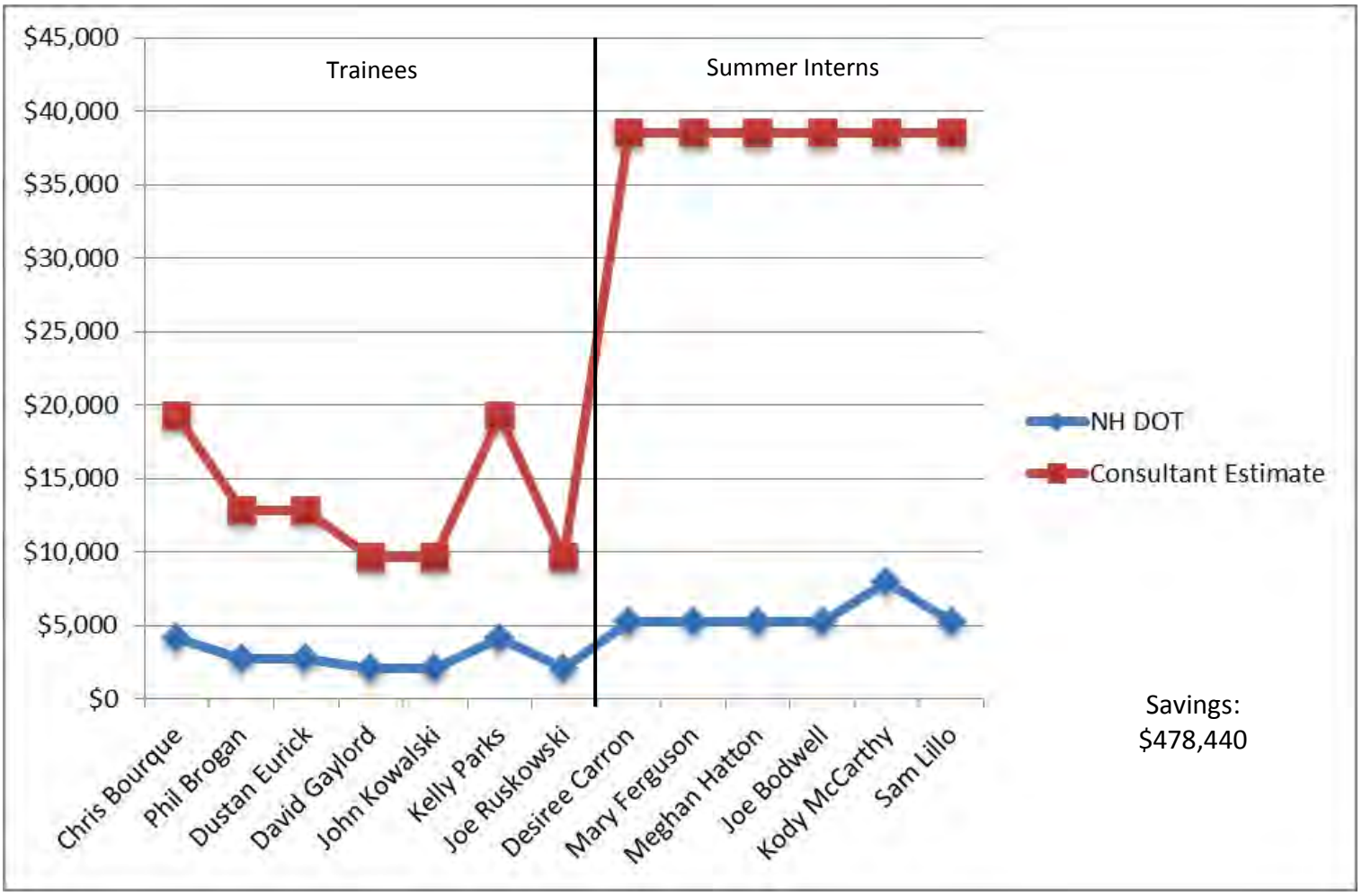


The greatest cost savings were realized to the department when using trainees over the entire summer. In some cases even greater savings to the department were realized than just an hourly rate comparison. Savings from one of the projects that Meghan Hatton worked on totaled approximately $60,375 because there was a consultant task order that could be directly tied to her project.

Steve Lemire completed a Mainstreaming Systems Engineering project and saved the department $184,000 by working through the Certified Public Manager's program rather than through a consultant task order. This project is currently under FHWA review for integration into the department's Project Development process.

Trainee and Intern Overall Cost Savings

Lastly, the graph below depicts cost savings realized by both trainees and interns at the TMC from 2009 through 2012. The greatest savings were realized when employing interns as they worked throughout the entire summer as opposed to the smaller periods of time for trainees.



	NH DOT	Consultant Estimates	Cost Savings	% Savings
Cost	$58,794	$537,234	$478,440	89%