



MEMORANDUM

Date: April 11, 2013

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator 

Re: **Information Technology Applications Improving Efficiency of Pavement Repair**

In a recent discussion, I indicated there are a number of application areas now being expanded to improve the overall efficiency of County operations in areas that traditionally have not had significant Information Technology (IT) support services. Finance and Risk Management, Human Resources and IT functions are intertwined on a daily basis. Expanding IT beyond these traditional roles will be the hallmark of a truly integrated IT service delivery model.

Attached is one example where the Department of Transportation collaborated with IT using geographic location information to improve overall productivity in pavement management and pothole patching. They were able to actively monitor and evaluate performance and analyze those factors that reduce overall productivity. In this case, the information obtained from Global Positioning System (GPS) monitoring allowed a better and more comprehensive overall evaluation of the cost for pavement repair and patching versus the traditional low-bid model, where procurement of materials at the lowest possible cost is a driving factor in selecting a vendor.

After reviewing this data and a number of other similar evaluations, it may be that a distributed material supply model could be more cost effective from a productivity perspective. This is just one example of how accurate and interpretable information can assist in delivering better and more cost effective services to the public.

CHH/dph

Attachment

c: John Bernal, Deputy County Administrator for Public Works
Lionel Bittner, Director, Information Technology
Priscilla Cornelio, Director, Transportation

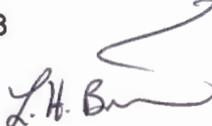


MEMORANDUM

INFORMATION TECHNOLOGY DEPARTMENT

Date: April 10, 2013

To: C. H. Huckelberry
County Administrator

From: L. H. Bittner 
Chief Information Officer

Re: DOT's use of GPS Data to Identify Operational Efficiency Opportunities

A joint ITD and DOT effort was undertaken that analyzed GPS vehicle data to identify opportunities for improving crew efficiency and increasing overall productivity.

The initial effort included extracting DOT vehicle GPS data and mapping it to the GIS. The data from a DOT patch truck was used to prototype the mapping and analysis of daily activities through segregation of data into the following categories:

- Time spent preparing for departure; e.g. vehicle/equipment preparation, fueling, etc.
- Time spent picking up materials
- Time spent at the work site
- Time spent traveling; e.g. to work site, returning to materials plant, returning to work site, and return to dispatch yard at the end of the day

From the prototype, it is evident that for one patch truck's activities on April 27, 2012, only 4 hours and 21 minutes were available at the work site, while 3 hours and 22 minutes were spent traveling. The time spent picking up materials at the CPC plant was 22 minutes. Given the work location, and distance from the materials plant, actual time available at the work site made up 48% of the day, and time spent traveling consumed 37%. The GIS data confirmed that the routing used was the most efficient for the locations and times of day travelled.

The data indicates an opportunity to increase productivity (work time) if travel time can be reduced. One opportunity DOT is evaluating is a partnership with Procurement to identify where additional materials contracts can be negotiated to reduce travel time for materials pick-up. Even if the contract requires a higher price for materials, the overall cost may be lower when factoring in travel time, fuel consumption, and loss of crew productivity.

Next steps for ITD are to research and develop a methodology to analyze a large quantity of vehicles at a time and to develop a method to productionize the integration of GPS data and GIS. Ben Goff from DOT is working with his operational staff to identify additional opportunities for leveraging this data more broadly to influence overall productivity improvements.

Mapping of the prototyped patch truck GPS data to GIS is shown on the following page.

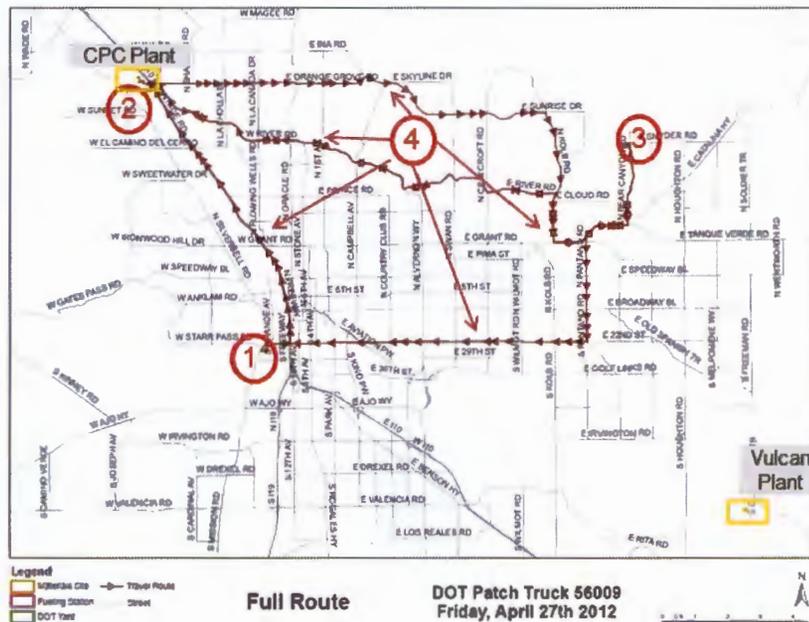
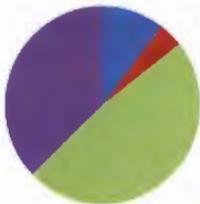
c: J. Bernal, Deputy County Administrator
P. Cornelio, Director, Department of Transportation

GPS Data A Day in the Life of Patch Truck 56009

Overall Travel Path

1. Dispatch (Yard Activities)
2. Materials Pickup
3. Work Site(s)
4. Travel

Daily Activity Regimes



GPS Data A Day in the Life of Patch Truck 56009

Work Area

– Detail

