



One of the more positive and encouraging aspects of this project has been the financial aspect. In an update released on August 14<sup>th</sup> the planned budget listed was \$25,410. The actual cost came in at \$11,087, mostly due to donations and cooperation with other agencies. “We haven’t even started to explore corporate donors for this project, but we know there are entities interested in bio-diesel, among them Flying J and Chrysler” said Dallas. “Local waste treatment plants are also interested, as municipalities would save money by allowing UDOT to use the bio-solid waste.”

As the end of the first season of this experiment approaches, there is already a list of things to do to prepare for next season. USU will be conducting greenhouse research work to better determine which crops to plant. This research will include planting depth, soil amendments and best time for seeding.

Among the changes for next season, we may see the addition of Camelina seed to the list of those being planted, although more research is needed in order to determine if it would be an acceptable bio-diesel producing crop. “Camelina tends to oxidize faster than Canola or Safflower, meaning it can be stored for a very short period of time; that may not be what we are looking for with this experiment” said Dallas.

While this year’s crops were less successful, UDOT is optimistic about the future of this project. “We are not done with this research and what you see right now is just some preliminary results. One year’s data is not enough to draw a conclusion. We had a very dry season that very much affected the growth of these plants. We will seed again in the fall and next spring. With more moisture in the ground, hopefully with early seeding and relatively wet season next year, we anticipate better results. These preliminary results give us some good data that we could use for the second phase.” Said Abdul Wakil, Research Project Manager with UDOT’s Research Division, “these plants are very much on their own for water and if it does not rain, as we have experienced this season, then it is pretty much obvious we will get some poor yields.”

---

## **FULL DEPTH RECLAMATION PROJECT. SANTA CLARA CITY-PIONEER PARKWAY**

*By: Richard Sharp, UDOT Research Division*

SemMaterials of North Salt Lake began a full depth reclamation project on the City of Santa Clara’s Pioneer Parkway. The Parkway had early failure and required a total reconstruction of 1.2 miles of this city street.

Rosenberg Associates, the engineering firm chosen to design the project, chose the full depth reclamation because of budget restraints. They determined this to be the most cost effective approach.

The Project consisted of utilizing the top five inches of the existing base and asphalt. The first step of reclaiming was to roto-mill the five inches and add water to establish optimum moisture for processing. The roadway width was 28 feet. The second step of the reclamation process was pulverizing the five inches to a smaller size and adding an asphalt emulsion formulated specifically for the stabilization process. The materials were obtained from the Parkway so the job-site specific mix design could be performed to determine the proper amount of emulsion required to support good roadway performance for years to come. The emulsion-adding process was finished and graded, ready for the hot mix topping.

The overall savings to Santa Clara City was \$ 50,000 when compared to the traditional reconstruct process. The real savings was in traffic interruption and time to complete. There was no material hauled from the site nor imported. The existing roadway materials were used to build the structural section and hot mix



asphalt was used as the topping.

The project began on July 25, 2007 and the traffic marking was performed by August 15, 2007. For more information about this project, please contact Barry Sharp [rsharp@utah.gov](mailto:rsharp@utah.gov)

---

## In The Know

### NEW RESEARCH PROJECTS INITIATED

*By: Blaine Leonard, UDOT Research Division*

The Research Division is in the process of initiating 22 new research projects. These projects are the result of efforts by many UDOT employees, consultants, and university professors who came together at the annual UTRAC Workshop in March to identify UDOT's most pressing needs. At the workshop, nine working groups evaluated 77 unique "Problem Statements", and selected 41 of them as priority issues. The Research Division, in consultation with UDOT's senior leaders, has determined that funding is available to initiate 22 of these projects.



The list of these new projects, and a detailed Problem Statement describing each project, is posted on the Research Division web site, under the "2007 UTRAC Workshop" heading. As each new project is initiated, a Project Manager is assigned from the Research Division. That person works with an internal UDOT Project Champion to assemble a Technical Advisory Committee to help steer the work. If you are interested in being involved with one of these new projects, volunteering to be on the TAC is a great way to get involved without committing large amounts of time. The Project Manager, Champion, and TAC work with the project's Principal Investigator to prepare a detailed scope of work, and issue a contract. In most cases, the Principal Investigator, a

person from a University or a consulting firm who will actually execute the research, is already known during the project selection process. Most projects require 10 to 24 months to complete, although some have longer durations.

The 22 projects currently being initiated include a wide variety of efforts in the areas of construction, maintenance, materials, environmental, planning and asset management, traffic management and safety, geotechnical, structural, and hydraulics. A few of these projects are as follows:

The "Machine Control Guidance" project will evaluate the use of new GPS and data processing technology to control construction equipment. Successful implementation of this technology will reduce the cost and time involved in construction surveying, resulting in accelerated construction schedules. A pilot project will be selected during the 2008 construction season for the evaluation of this technology. Contact Michael Fazio if you have questions about this project.

A "Field Evaluation of Culvert Rehabilitation" project will help us deal with the large number of aging culverts we have on our system. Slip lining of these culverts is a promising technology which allows for rehabilitation without culvert removal and replacement, but there are questions about standardized techniques, end treatments, and hydraulic characteristics. This project will assess these issues, and give us guidance on how to better repair and maintain our culvert assets. Contact Michael Fazio if you have questions about this project.

The "Quality Control Tests for Asphalt Mixes" project will evaluate the factors of cold temperature and fatigue in the performance of asphalt pavements. With the resolution of rutting issues and the modification of Superpave requirements, fatigue is becoming the most pressing issue in mix design. This project will evaluate rapid hot-mix tests used to control cold temperature characteristics. Contact Doug Anderson for more insight into this project.

A project to evaluate “Prefabricated Decks” will support the Department’s efforts to move toward Accelerated Bridge Construction. As we use precast concrete deck panels, we need more efficient methods for attaching the panels and an understanding of whether these panels can be designed as noncomposite elements. This project will evaluate these issues. Contact Daniel Hsiao for more information about this project.

“Crashes in the Vicinity of Major Crossroads” is a project that will evaluate midblock crashes and their proximity to major crossroads, in an effort to understand the factors involved in these crashes and develop guidelines for setbacks of access points. Contact Doug Anderson if you have questions about this project.

These, and many other interesting projects, are getting underway over the next few months. Please consult the list on the [web site](#), and contact in the Research Division for more information about the new projects or to get involved in these innovative efforts.

For more information, please contact Blaine Leonard [bleonard@utah.gov](mailto:bleonard@utah.gov) or 801-965-4115

---

## **TO THINK OUTSIDE THE BOX**

*By: Michael Fazio, UDOT Research Division*

As engineers we are trained to solve problems, and at times, we can come up with innovative solutions. Today, most of our research is applied to current methods and concepts. We are mostly gathering data about existing products, systems and technologies, but we are really not looking at the future and how to be innovative. How will bridges be built and maintained twenty or thirty years from now? Will cars be our main transportation method?

At a national forum on the future of hydrology and hydraulics research, several researchers from all over the country met to collect innovative research ideas. At the end of the forum, they had plenty of ideas but none was really innovative and forward looking. It’s hard to get somebody to think outside the box, especially for engineers, who are trained to stay in the boundaries provided by standards and policies for security and safety.

Ideas are out there, but most of the time they come from sources outside our industry (schools, colleges and other industries). We must be able to recognize the good ones and be willing to invest in them, even if it means having to accept failure. The idea of producing bio-diesel on our right-of-way came from an agriculture student at USU. UDOT recognized the potential and invested in the idea. Even with this year’s minimal crop production, this research, in my opinion, is a success and it’s setting up a revolution of thought and process all across the states.

I hope that here in Research, we can balance the need of safety with the need to explore new ideas, methods and technologies for transportation, accepting even failure as a possible alternative to a sterile place with no ideas at all.

---

## **COMPLETED UDOT RESEARCH**

Research publications are valuable resources, documenting the results of important research projects. For a list of recently completed Research Projects, please visit the Research & Development website at:

<http://www2.udot.utah.gov/index.php?m=c&tid=235>.

If you would like to obtain an electronic copy or a printed copy of our completed research, please contact Abdul Wakil

[awakil@utah.gov](mailto:awakil@utah.gov) or

Joni DeMille [jdemille@utah.gov](mailto:jdemille@utah.gov)



### [NEED A LITERATURES SEARCH?](#)

The UDOT Research Division and Lester Wire Library provide an important service through literature searches. These searches help identify published information about a topic of interest. To request a search, provide a brief description and some key words and submit it to Abdul Wakil [awakil@utah.gov](mailto:awakil@utah.gov) , Joni DeMille [jdemille@utah.gov](mailto:jdemille@utah.gov). Or you can submit your request online @ <http://www.udot.utah.gov/index.php/m=c/tid=895/>

Please send your comments and questions to Abdul Wakil [awakil@utah.gov](mailto:awakil@utah.gov) or (801) 964-4455