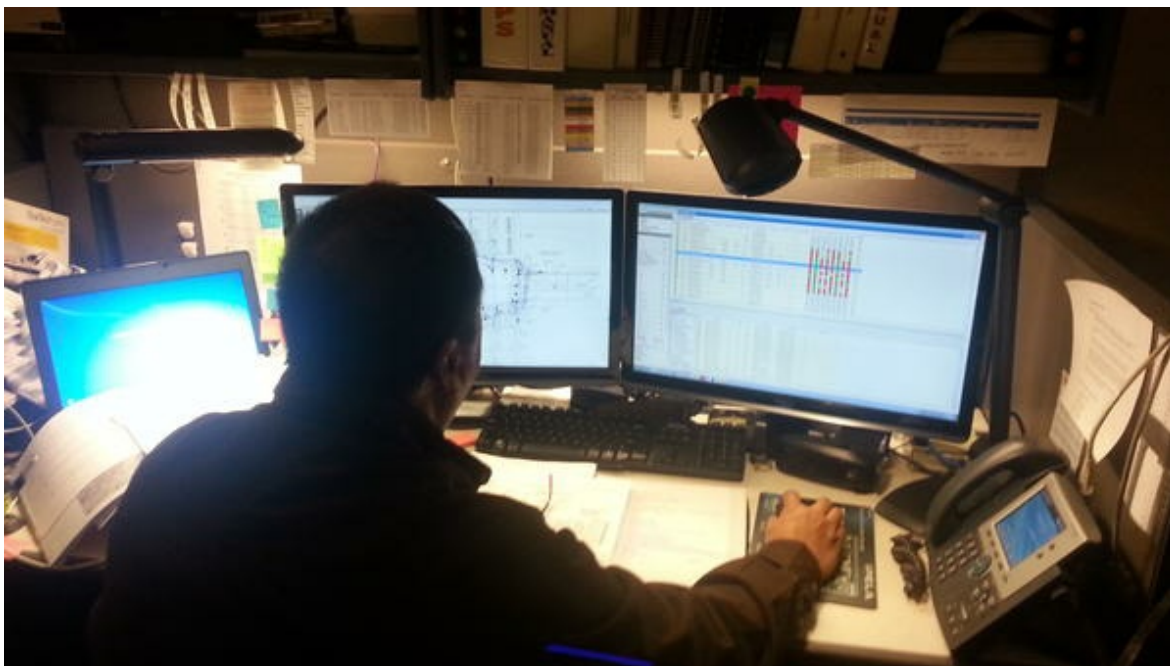


# From Police to Pipes: Fresno Leveraging 'Big Data' To Improve City Functions

By Jeffrey  
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Chris Salazar, Traffic light specialist

Credit Jeffrey Hess

Listen

Listening...

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There is a growing movement in Fresno to leverage the power of big data to improve a wide variety of city services from water conservation, to street lights, to police and more. Powerful computers are now able to crunch billions of data points to provide a clearer picture of what works and what doesn't. The city is increasingly seeing data and information as a two-way street.

I am standing on Shaw Avenue in Fresno.

This heavily traveled street sees tens of thousands of cars a day.

It looks like a normal road but underneath the pavement is a complex network collecting data on every car that goes past in order to improve travel times by sequencing the lights.

"It's all being driven in large part by the data that is being collected on a daily basis," - Fresno City Manager Bruce Rudd

It's part of a larger effort by the city to leverage big data to improve everything from police to pipes.

City manager Bruce Rudd says ever since the recession City Hall has turned its attention to how it can use big data to measure and improve city functions.

“We have over the last couple years been beginning to shift to data-driven outcomes, or businesses analytics. So street lights, water consumption, even our bus system. It’s all being driven in large part by the data that is being collected on a daily basis,” Rudd said.

The city is working on adding 56-miles of streets to the ‘smart light’ system which sends detailed traffic information back to Fresno’s Traffic Control Center.

There signal timing specialists like Chris Salazar monitor hundreds of smart traffic lights.

“So this is real time. We can see how that traffic light is operating. All the calls and executions that are being made,” Salazar said pointing to a computer screen.

Previously, timing the signals and changing their pattern was tedious work done by hand counting cars representing a small snapshot of traffic.

Now, Chris can sit at a computer and see weeks’ worth of traffic data, run simulations on new patterns, and set lights to adjust based on what time of day it is.

“We can download a new traffic pattern, or new timing to adjust for any situation. If there is an accident we can put the intersection in flash so people will be aware that there is a situation there. (So you are like a stop light god?) Yes, stop light god,” Salazar said.

Salazar says he only changes the pattern when the data shows a problem.

But the volume of information on busier corridors is more easily handled by a new computer that can read that data and adjust the lights on the fly, faster than the human traffic engineers could react.

Soon all of the lights on Shaw and Herndon will soon be controlled by high-tech computer.

“And you can see from the dots they are all over the place. So, Ok. If they are everywhere that tells maybe we need to change our marketing and communication to hit a broad spectrum”- Public Utilities Director Thomas Esqueda

Another development in Fresno is the growing body of data on water consumption, thanks to digital smart water meters installed citywide.

Fresno Public Utilities Director Thomas Esqueda

Credit Jeffrey Hess

At City Hall, Fresno’s public utility director Tommy Esqueda studies a series of maps on the wall in his office.

They display water use data that until very recently the city had only been guessing at.

“That is a map of the individuals that were watering on Monday’s Thursday and Fridays. Basically, they were watering five days a week,” Esqueda said.



The meters send back ‘billions of data points’ detailing precisely how much water a home is using.

Esqueda brings up a map of the city’s biggest water wasters that shows not just how much they used by when and for

how long.

“And you can see from the dots they are all over the place. So, Ok. If they are everywhere that tells maybe we need to change our marketing and communication to hit a broad spectrum,” Esqueda said.

Even the Fresno Police Department has turned to crime data to apply what is known as predictive policing to try and anticipate where crimes will occur each day.

Police Chief Jerry Dyer says they take information about past crimes and run it through an algorithm and change how his forces are deployed.

But Dyer is also quick to point out that police work is about more than just looking at a set of numbers, it's about interacting with the community.

“We have been very involved with our crime view system. With capturing crime data and analyzing it. But that is only one part of what we do. And we cannot get lock in as law enforcement into thinking that is all we do,” Dyer said.

"If you don't have goals and you don't have targets and you don't see how you are doing, you can spend a lot of money and waste a lot of money"-Karen Butler, Seattle City Light

It's an approach that has worked in Seattle, Washington which began applying big data approaches to its electrical grid in the mid-2000's.

They have since seen an 18-percent improvement in efficiency among other departmental improvements.

Karen Butler with Seattle City Light says before they began measuring data and setting goals, they were just treading water.

“If you don't have goals and you don't have target and you don't see how you are doing, you can spend a lot of money and waste a lot of money. And that is really what we are trying to prevent,” Butler said.

That's the future of big data according to city manager Bruce Rudd.

Rudd says the recession has changed the mindset at City Hall to one that now acknowledges that its needs better measures of how the city functions.

The next step, Rudd says, is improving the ability to listen to what Fresnans are saying needs to be fixed.

“Giving them the ability to tell us where they see things. What's wrong. Report things. And then on the back end evaluate, what are the priorities, what are the resources being applied and how quickly are we addressing the concerns of the community,” Rudd said.

Rudd also says the city is planning to introduce a new cell phone app sometime in the next six weeks that will quote 'change how we interface with the community'.