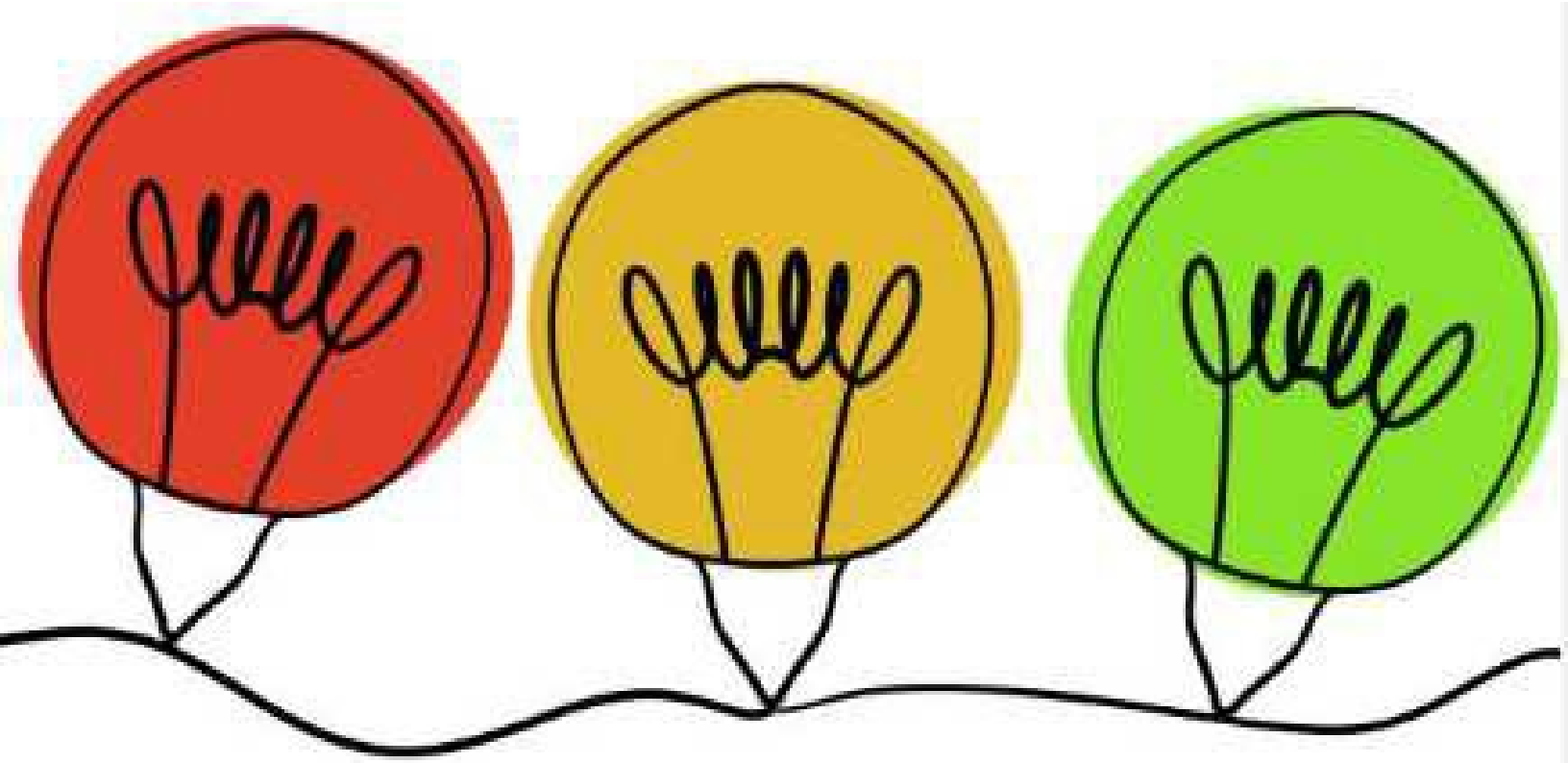
System and Master Planning

Ames, Iowa Traffic Signal Master Plan

Technical White Paper



System & Master Planning | Network Design & Architecture | Infrastructure Design | Network Operations & Maintenance (NOM) | Integration & Troubleshooting | Training

This plan defined the best methods to design, build and integrate a modern, high capability traffic management program for the City of Ames, Iowa. The existing traffic signal management system is based on a technology platform that is currently outdated, inefficient and difficult to maintain.

Situation



The existing traffic management system in the City of Ames, Iowa is based on outdated technology: twisted copper interconnect cables, serial modems, closed loop systems and signal controllers that lack desired modern functionality with the ability to use, communicate or integrate with other traffic controls and Intelligent Transportation System (ITS) tools.

Ames Traffic Division currently operates 92 traffic signals. These 92 signals fall into the following categories: 78 full vehicle signals, 6 school flasher signals, 6 school crossing signals, and 2 pedestrian crossing signals. Ames uses both Siemens and McCain signal controllers throughout the system. The Siemens controllers are models M10, M40, M42, and M52, while the McCain controllers are ATCex2. None of the existing M10, M40 or M42 type controllers are IP addressable. Additionally, all of the Siemens controllers are at end-of-life status as Siemens will no longer be supporting these models of controllers.

Solution

Thinking Forward

Ames hired our team to complete a comprehensive study and report to review and analyze the existing signal management infrastructure. This study focused on what options exist for improvements to the operations and management systems, and developed recommendations for steps and incremental improvement projects to modernize the traffic signal communication and management systems.

After assessing the existing communication and traffic signal systems, a high-level needs assessment was conducted to better define and understand the demands to achieve the goals and objectives set forth by the City.

The needs assessment for the upgraded communication system, traffic signal components, and the desired ITS elements were organized into eight specific categories, which include:

1. Communications Systems
2. Traffic Management System
3. Safety Systems
4. Incident Management
5. Traveler Information Systems
6. Public Transportation
7. Parking Management Systems
8. Maintenance and Const. Operations

Results

High-level Alternatives Analysis



In order to meet future goals of improved traffic flow and enhanced safety, Ames decided to implement an Advanced Traffic Management Software (ATMS) for all operations. In addition, Ames also plan to implement or enhance other advanced traffic management strategies such as Emergency Vehicle Preemption (EVP), Transit Service Prioritization (TSP), Advanced Signal Control and Timing (ASCT), and Connected Vehicle (CV) based applications that will all benefit from an operational ATMS.

87.9%

of US Daily Commuters use private vehicles.

Conclusion

Build a Strong Foundation

Our team is working with the City to implement the first components of the new, centralized ATMS. This initial project includes design, installation, and integration of new broadband fiber optic cables and IP based network devices that will provide the required communications for all traffic and ITS systems.

The decision to move forward with a City owned fiber optic comm network was ultimately determined to be the best option for Ames. This citywide fiber construction and network integration project will be phased over a five to seven-year period and will provide the most comprehensive and flexible solution to Ames' transportation communication needs.



Tekniam Engineering - your friend in specialty technology

System & Master Planning – This is the first step in understanding and developing a modern communications and system management network. Without a plan, it just a parade of projects that may or may not work together in harmony and provide the results intended.

Network Design & Architecture – “The Intelligent application of the newest technologies and procedures to make you system operate efficiently”. If only it was that easy – continued operation and support of legacy systems and hardwares, while taking advantage of new technologies, make the design of the network architecture the most critical link in the development of your system.

Infrastructure Design – Creating design plans that meet the requirements of funding agencies and provide the needed information for the proper installation of physical assets is a fundamental component of all wide area management and communication networks. Our licensed professional engineers understand how to make this happen efficiently.

Network Operations & Maintenance (NOM) – “Technology installed but not maintained in misplaced technology.” Just because you built a great communication and management system, doesn’t mean it will always work as intended or when needed. The ongoing monitoring and review of any operational management system is critical if you intend to utilize said network when it’s really needed.

Field Integration & Troubleshooting – The best installed and maintained system will eventually meet with unintended issues. Have a plan on how to mitigate and respond to periodic breakages and device failures – our trained and certified staff can help.

Training – Experience has taught that most technologies are not utilized to anywhere near their capabilities or capacities. This is often due to the fact that system operators don’t know what the new systems are capable of doing. Trained staff can maximize the benefit of any technology or system.

Communications & Technology

by Design