Case Study | Denver Street Maintenance Division

Customer Profile

Organization: Street Maintenance Division, City of Denver

Responsibility: Responsible for maintaining safe and usable streets and alleys in the City and County of Denver. The primary functions of the Agency are profiling and resurfacing, asphalt patching, crack sealing, street sweeping, and snow and ice control.

Network: 2,000 miles of road and 550 miles of alleys

Helping the City of Denver analyze road conditions and determine budgetary requirements

Highlights

Challenge: In 2006-07, Denver was hit with an exceptionally harsh winter. The city needed to assess road damage and the impact on work programs and future budgets.

Solution: Deighton worked with the Denver Street Maintenance Division to analyze road conditions and determine a dollar value for the damages.

Outcome: The division presented hard data to City Council and obtained supplemental funding for the next several years.

The City of Denver's Street Maintenance Division relies on dTIMS CT to establish their six-year plans and annual report programs. When the division was faced with a major project—assessing road conditions after an extremely tough winter and comparing conditions with previous years—they were confident that the Deighton team could provide a solution.

CHALLENGE: Dealing with the aftermath of severe winter weather

In 2006-07, the City of Denver experienced an exceptionally harsh winter. For several weeks, the city was hit with a series of large storms that accelerated the deterioration of city roads. Denver's Street Maintenance Division was aware that the roads had taken more damage than a typical winter. The division needed a way to quantify the damage and assess the long-term impact on their work programs and future budgets.

SOLUTION: Analyzing road conditions with dTIMS CT

To assess the damage, the division integrated their own survey methods and used the analysis capabilities provided by dTIMS CT, with the assistance of the Deighton team.

Surveying the damage

The City of Denver has approximately 23,000 individual road segments (typically block segments) that are grouped together to form 4-6 block “super segments”. To keep the road assessment at a manageable level, the Street Maintenance Division decided to assess these super segments on the arterial roads and collectors.

In March 2007, the division spent three weeks performing a “wind chill survey” of the roads. Knowing they would be running the data through dTIMS CT, the division evaluated the roads using criteria needed for the detailed dTIMS CT analysis:

- pothole patching, which provided a good indication of the base road condition before the winter storms occurred,
- environmental and structural cracking, which provided a good indication of the damage caused by the storms, and
- overall road conditions (surface roughness, ride ability, rutting, etc.).

The division drove through a sample of the road segments and assigned a 1-5 rating for each of these criteria, then determined a condition index (CI) for the roads. This provided the division with an idea of the current damage to the roads, but they still needed to compare this with the CI for prior years.

Turning survey results into usable data

The division turned to Deighton for help converting their condition index for the current year into a format that could be compared with the condition index from past years, which were available in dTIMS CT. This would allow the division to perform an “apples to apples” comparison of the road conditions for the current and past years.

The Deighton team converted the current year CI (based on the division's survey) into an equivalent dTIMS CT CI. Deighton then applied this correlation to the city's entire network of arterials and collectors on a segment basis. This allowed Deighton to generate a new analysis of the network, assess the damage caused by the winter storms, and determine the budgetary impact.

OUTCOME: Obtaining funding based on dTIMS CT reports

Based on the dTIMS CT analysis, the Street Maintenance Division produced reports showing the damage to the network, the dollar value for the losses suffered over the winter, and the immediate needs for repairs and upgrades.

The division presented their findings to Denver City Council and, as a result, established supplementary funding for the next several years. As well, the division is now able to use this tangible evidence to push for a more appropriate level of funding for the long-term maintenance of the city roads.

In the past, the Denver Street Maintenance Division faced a dilemma common among many engineers. As a professional familiar with the network, an engineer may have a strong “gut feeling” about the requirements and funding needed to keep the network in an adequate condition to support the city. However, it is often difficult to back up these requirements with hard facts that government officials can easily understand.

Without the ability to manage and analyze data with dTIMS CT, the Denver Street Maintenance Division would not have been able to approach the City Council with information based on sound engineering, or present this information using detailed tables and graphs that clearly illustrated the issues. dTIMS CT allowed the division to present their findings with confidence and secure much needed funding to maintain the city roads.

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