



Real-Life Stories

## Whitepaper: University Case Study on Worker Productivity

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Researchers in the Civil Engineering program at Lund University in Sweden conducted a case study to examine the effect of radio communication on productivity within a civil engineering project. This research indicates that when using radio communications the critical downtime for the work team in the case study decreased almost 50%, an average of 17 minutes per 8 hour workday.

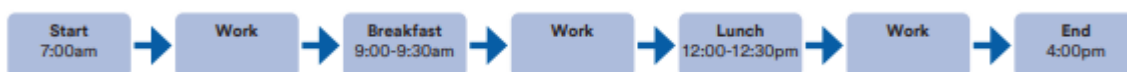
### Methodology

This study is based on observations on a construction project. The project was chosen because of its repetitive and homogenous activities, which makes it suitable for comparing weeks over time. The study included two observations during separate weeks. The study was executed according to the following plan:

- Pre-study and defining the objects to observe
- Observation Team without headsets
- Headset\* classroom Training
- Headset\* Introduction and dry-run with Team
- Observation Team with headsets\*
- Interviews

The team included four officers, three operators, and six workers performing earth excavating, laying pipes, tubing, tube welding, and refill. First the team was performing their tasks as usual and the second time the team was wearing 3M™ PELTOR™ WS™ LiteCom Plus Headsets.

A typical work day for the team members:



The observations were made on the work of one operator and one worker and their downtime on the construction site. Any activities that directly adds value to the project is defined as direct work, this is when they perform the actual earth excavating, laying pipes, tubing, tube welding, and refill. The downtime is defined as single measurements for one minute or more where no direct work is performed, such as walking between places at the site, shorter breaks, reading drawings, looking for

material or equipment, and talking to co-workers to solve problems. Critical downtime is defined as the portion of the total downtime that is potentially affected by radio communication. Any downtime that exceeds one hour is defined as stop time.

## Results

**Table 1** The observed time for direct work, downtime, critical downtime, and stop time in minutes during observation 1 and 2.

	Activity (min)	Mon	Tue	Wed	Thu	Fri	Total (Min)
<b>Observation 1</b>	Direct work	345	375	235	406	339	1700
	Downtime	135	105	135	74	141	590
	Critical downtime	70	44	15	24	29	182
	Stoptime	0	0	110	0	0	110
<b>Observation 2</b> With 3M™ PELTOR™ WS™ LiteCom Plus Headsets	Direct work	424	425	444	412	375	2080
	Downtime	56	55	36	68	105	320
	Critical downtime	16	24	20	21	16	97
	Stoptime	0	0	0	0	0	0

The results of the research study shows that the critical downtime during observation 1 was 182 minutes, and 97 minutes during observation 2. Analyzing only the downtime that could be directly affected through radio communications, the work teams in the study saved 85 minutes in critical downtime when using the communication headsets. Conclusion This research indicates that when using radio communications the critical downtime for the work team in the case study decreased by 85 minutes, almost 50%, which would represent a savings of approximately 37 hours in a normal infrastructure project of 26 weeks. Overall the work team perceived that the use of radio communications helped to make their work more effective and they felt they had a better overall picture of what was happening on the work site. The 3M™ PELTOR™ Communication Headsets can help solve two critical problems of noisy environments: providing hearing protection and enabling effective communication.

3M™ PELTOR™ WS™ LiteCom Plus Headsets have a built in two-way radio for cable free shortrange communication with other headsets within the 3M™ PELTOR™ LiteCom Series to portable two-way radios programmed on the same frequency. Environmental microphones with level dependent function for ambient listening allow users to hear ambient noises, such as warning signals, and have face-to-face conversations in low noise environments. The headsets also have the ability to connect to other external equipment like cell phones or portable two-way radios (regardless of frequency) via Bluetooth® Wireless Technology or via an external audio input. The noise cancelling speech microphone with VOX functionality enables workers to communicate hands-free in noisy environments.

*Download the complete whitepaper [here](#).*

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