

## **Retroactive Labor Productivity Evaluations**

Several methodologies are available to quantify field labor productivity impacts that a contractor could experience during construction. Two of the most widely used methodologies in both construction and legal forums are the Measured Mile Methodology and the Mechanical Contractors Association of America (MCAA) Factors Methodology.

Besides the MCAA, other productivity resources include the Construction Industry Institute (CII) and the National Electrical Contractors Association (NECA). However, the MCAA is the most common resource for the analysis of mechanical construction projects.

Both the Measured Mile and MCAA Factors methodologies are industry standard productivity analyses used in construction to assess a contractor's loss of labor productivity due to an issue or a series of issues. Both methodologies use the analysis of project documents for the identification of discrete events or actions of the parties that caused the impacts to the construction process and the determination of the durations that these events affected the contractor's performance. In addition, project documentation or personnel interviews are used to identify the party responsible for the labor productivity losses. In many cases, the durations of these impacts overlap, making it difficult to separate the exact causes of any additional labor hour expenditures and costs related to a specific event, necessitating the use of a labor productivity analysis to evaluate the impacts.

However, in certain situations, the application of one methodology is more appropriate than the other, as discussed in the following sections.

### **The Measured Mile Methodology**

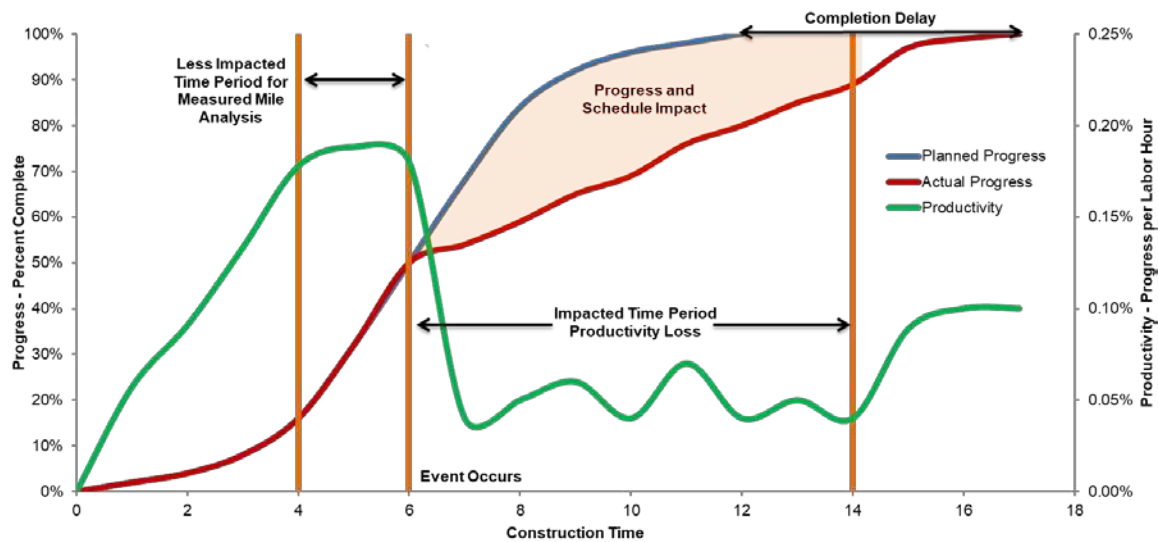
In certain instances, the [Measured Mile Methodology](#) is a more appropriate labor productivity loss determination tool than the MCAA Factors Methodology. The Measured Mile Methodology is the less subjective of the two productivity impact valuation methodologies. However, the use of the Measured Mile Methodology requires that an unimpacted period be identified and a number of additional criteria be met.

To use the Measured Mile Methodology, a time period must be identified when potential changes or impacts did not affect the contract, which is referred to as the unimpacted or "measured mile period." The productivity of the measured mile period is then compared to the productivity during the impacted period when the project issues affected the contractor's performance.

In other words, the intent of the Measured Mile Methodology is to use the actual productivity the contractor was able to achieve on the project without the effects of anything other than the contractor's own operational efficiency during the measured mile period and compare it to the impacted time period. Thus, any of the contractor's own inefficiencies are accounted for in the measured mile period.

The following illustration shows a progress curve and labor productivity curve on a hypothetical work task impacted by an outside interference. Progress and productivity are charted over the course of 18 months for the purpose of establishing a baseline. In this hypothetical plot, at about month six of the task, the contractor experienced an increase in labor hour expenditures for the task due to an event by a source outside of the contractor's control. The two periods, the measured mile period and the impacted period, become the basis for comparison of the work performed:

### Measured Mile Methodology Concept



In addition to the identification of a measured mile period, the following criteria must be reasonably similar during the measured mile period and impacted period for a Measured Mile analysis to be valid:<sup>1</sup>

1. Material and equipment types
2. Installation equipment and/or means and methods
3. Experience, quality, and quantity of supervision
4. Experience and quantity of the work force
5. Inherent work environment, including exposure to weather factors and height of the work being installed
6. Any other factor that would inherently imbalance or skew the productivity study

After lost productivity is quantified, the issues that impacted the contractor must then be identified in order to establish the cause and responsibility of the productivity impacts during the impacted period.

<sup>1</sup> MCAA Management Methods Manual, How to Apply the Measured Mile Method of Productivity Analysis, 2012, p. 3/20.

In summary, while the Measured Mile Methodology is a precise method for the quantification of productivity impacts, the criteria that must be reasonably similar for its use restricts its applicability, unless the impact being quantified is specifically related to these criteria. Often on disrupted projects, there is no unimpacted period, thus further limiting the use of the Measured Mile Methodology.

### **The MCAA Factors Methodology**

When an unimpacted period cannot be identified or the criteria for the Measured Mile Methodology are not met, the [MCAA Factors Methodology](#) is a suitable alternative procedure for evaluating productivity impacts. However, the MCAA Factors Methodology is more subjective than the Measured Mile Methodology.

The MCAA Factors Methodology is based on the MCAA Management Methods Bulletin, which addresses some of the issues that contractors could potentially encounter during a construction project. First, the events that impacted the contractor's productivity need to be identified through the analysis of project records. These events must then be matched with the corresponding MCAA factors.

### **MCAA's Top 16 Impact Factors<sup>2</sup>**

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|-----------------------------|-------------------------------|
| 1. Stacking of trades       | 9. Beneficial occupancy       |
| 2. Morale and attitude      | 10. Joint occupancy           |
| 3. Reassignment of manpower | 11. Site access               |
| 4. Crew size inefficiency   | 12. Logistics                 |
| 5. Concurrent operations    | 13. Fatigue                   |
| 6. Dilution of supervision  | 14. Ripple effect             |
| 7. Learning curve           | 15. Overtime                  |
| 8. Errors and omissions     | 16. Season and weather change |

After identifying the MCAA factors that affected a contractor's productivity, the severity level of each of the factors must be selected. Each of the 16 MCAA factors has percentages for mild, average, and severe impacts. The selection of the impact percentages is based on the experience of the analyst and project circumstances. The application of these factors is where the subjective nature of the MCAA Factors Methodology comes into play. Parties often disagree with the severity level selected by another party, which is a common criticism when the MCAA Factors Methodology is used.

Additionally, several of the MCAA factors overlap; therefore, care needs to be taken to avoid duplication of productivity impacts. For example, overtime work also includes impacts from fatigue, but there is also a separate factor for fatigue.

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<sup>2</sup> MCAA Management Methods Manual, Factors Affecting Labor Productivity Bulletin No. PD2 Revised, pp. 1-2/28.

Because of the subjective nature of the MCAA Factors Methodology, after quantifying the productivity loss, the results need to be compared to the project estimate and actual costs to verify that the assessment is appropriate.

The MCAA Factors Methodology is more subjective than the Measured Mile Methodology for the quantification of labor productivity losses. However, the MCAA Factors Methodology allows for the evaluation of productivity impacts that could have affected a project throughout the project's duration.

In conclusion, the Measured Mile and MCAA Factors methodologies are both recognized productivity analyses used in construction to assess a contractor's loss of labor productivity. However, the different circumstances surrounding the productivity losses affect the applicability of each of the methodologies.

#### **Endnotes**

1. MCAA Management Methods Manual, How to Apply the Measured Mile Method of Productivity Analysis, 2012, p. 3/20.
  2. MCAA Management Methods Manual, Factors Affecting Labor Productivity Bulletin No. PD2 Revised, pp. 1-2/28.
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