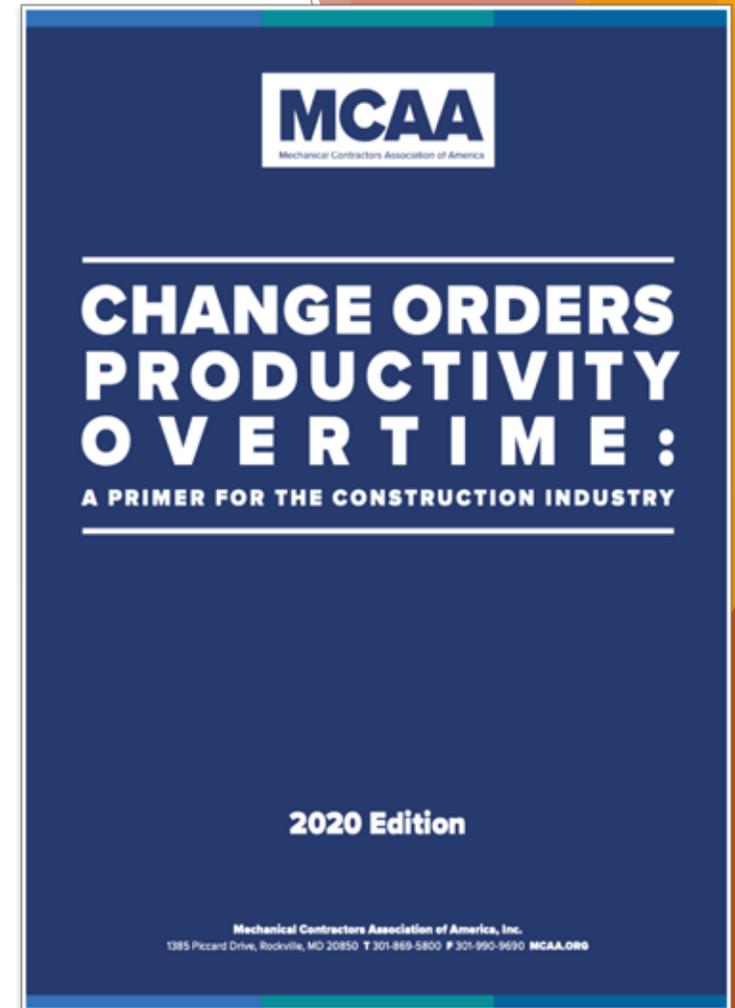


How to Apply the Measured Mile Method of Productivity Analysis

Presented by
John R. Koontz
MCAA



About the Teacher

John Koontz

MCAA, Director of Project Management Education (Since 1999)

- ▶ **MCAA IPM/AIPM Director - 21 years**
- ▶ **Associate Professor (Purdue University) - 8 yrs**
- ▶ **Mechanical Industry Consultant - 25 yrs +**
- ▶ **Mechanical Project Manager - 15 yrs**

- 
- ▶ I Love mechanical contracting
 - ▶ I love project management
 - ▶ I love learning
 - ▶ I've been learning about mechanical contracting for 38 yrs.
 - ▶ I've been learning about project management for 42 yrs.
 - ▶ I love teaching
 - ▶ I've been teaching people about mechanical contracting and project management for 30 yrs.
 - ▶ **I LOVE ALL THIS STUFF AND I SURE HOPE IT SHOWS!!**



Goals for This Session

- My focus today will be a 60-minute description, explanation, and general awareness of the Measured Mile Method
- To inspire and motivate you to learn more about the Measured Mile Method and its specific applications

What We'll Cover Today

Briefly discuss the CO/PROD/OT Manual

When and why you should use the Measured Mile Analysis?

What is the Measured Mile Analysis(MMA)?

What is a measured mile?

Area basis or time period basis?

What if you have no "unimpacted" time periods or areas?

Interviewing the management team

The reasonably similar rule

Project Records/Labor Tracking System

Weighted Average VS. Simple Average

Outliers and Anomalies

Paid Change Orders

Proper Size of Areas

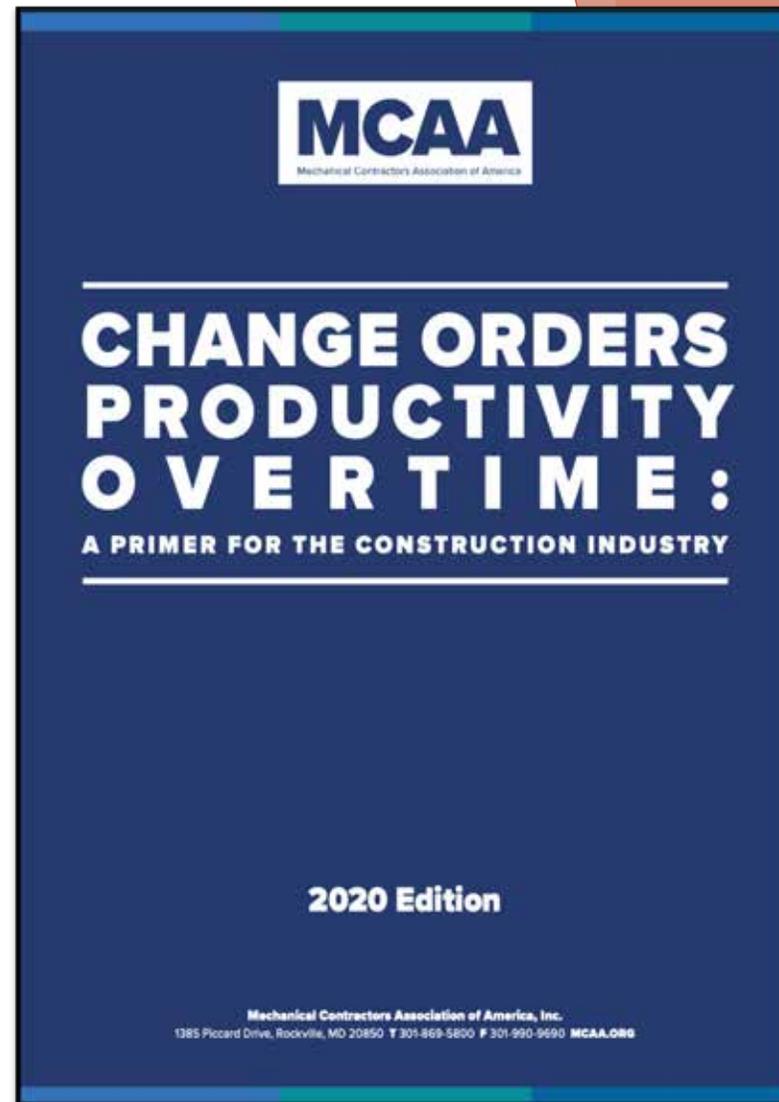
Proper Length of Time Periods

Can I use a similar but separate project comparison?

LEGAL DISCLAIMER

- ▶ *The information discussed in this webinar is not intended to constitute legal advice. Instead, all information, content, and materials discussed are for general informational purposes only. Please contact your attorney to obtain specific legal advice.*

About the Manual



Purpose of the Manual

- ▶ “...was developed to assist construction contractors, their customers, and others involved in construction projects in determining the costs associated with unplanned events, circumstances, and factors that may impact the outcome, productivity, and schedule of those projects.
- ▶ This primer is intended to be a planning tool and not a source for absolute percentages or costs.”

About the Manual

- ▶ Not a substitute for experienced and proven counsel(lawyers), consultants, etc.
- ▶ Not a “pro lawsuit” or “pro claim” publication
- ▶ Deals with numerous complex topics that are situational and intertwined with an almost infinite number of variables.

Contents of the Manual

The Authors

- Prepared and Peer Reviewed by numerous construction industry professionals and expert consultants to the industry.
- Includes many bulletins/publications of the MCAA Management Methods Manual
- Numerous Contributions by Mr. Paul Stynchcomb of Vero Construction Consultants Corp.

Paul L. Stynchcomb

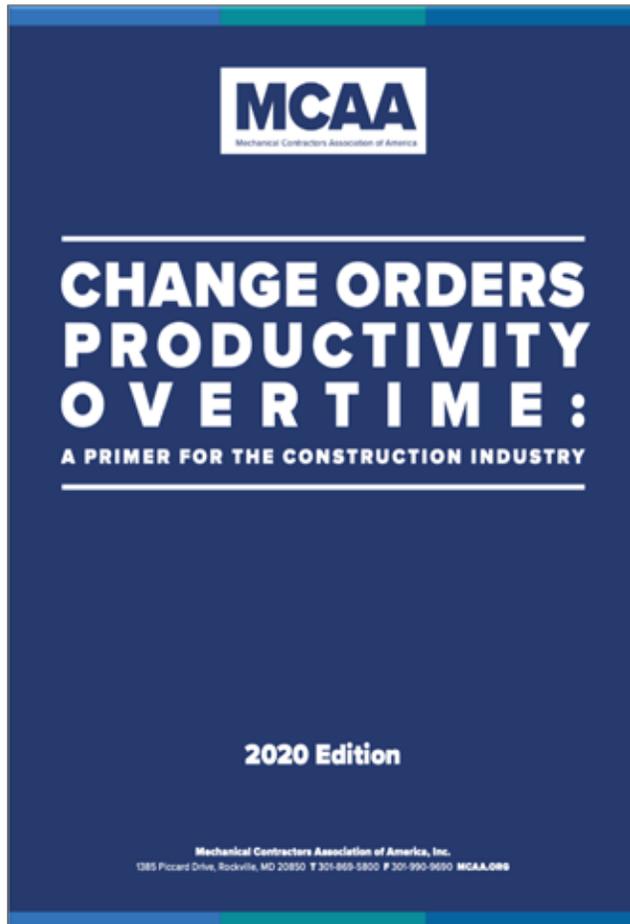
Vero Construction Consultants Corp.

PAUL L. STYNCHCOMB, CCM, PSP, CFCC



Stynchcomb Vocab Words

- ▶ Ethereal
- ▶ Amorphous
- ▶ Aver
- ▶ Nexus
- ▶ “term of art”
- ▶ Axiom
- ▶ Holistic
- ▶ Dichotomy
- ▶ Contemporaneous



We are going to
be reviewing
pages 163 to 180

Why Use the Measured Mile Analysis(MMA)?

- No reliance upon contractor's original estimate or labor plan
- Relies on a productivity rate comparison of actual production rates achieved on the same project
- This gives MMA great credibility



The Measured Mile
is used as a
BASELINE to
predict what your
project labor hours
should have been
or would have
been if you were
unimpacted or
unhindered

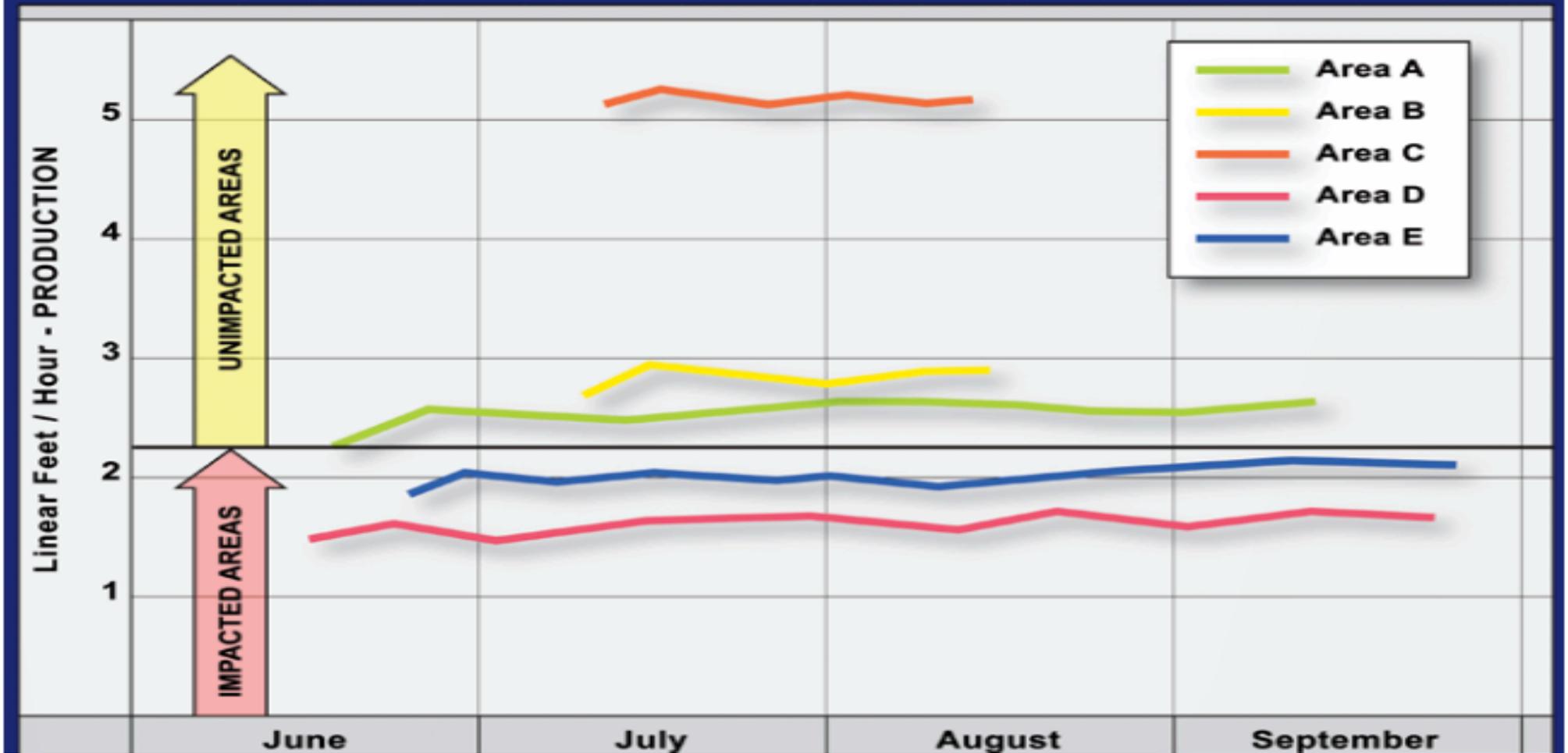
What is a “Measured Mile”

- Work that was performed in the “unhindered”, “unimpacted”, or “less impacted” areas or time frames
- Known as the “Baseline” or “Measured Mile” Labor
- The Measured Mile is the “Should Have Spent” or “Would have Spent” Labor Hours/Labor Cost

Areas or Time Periods (Geography or Calendar)

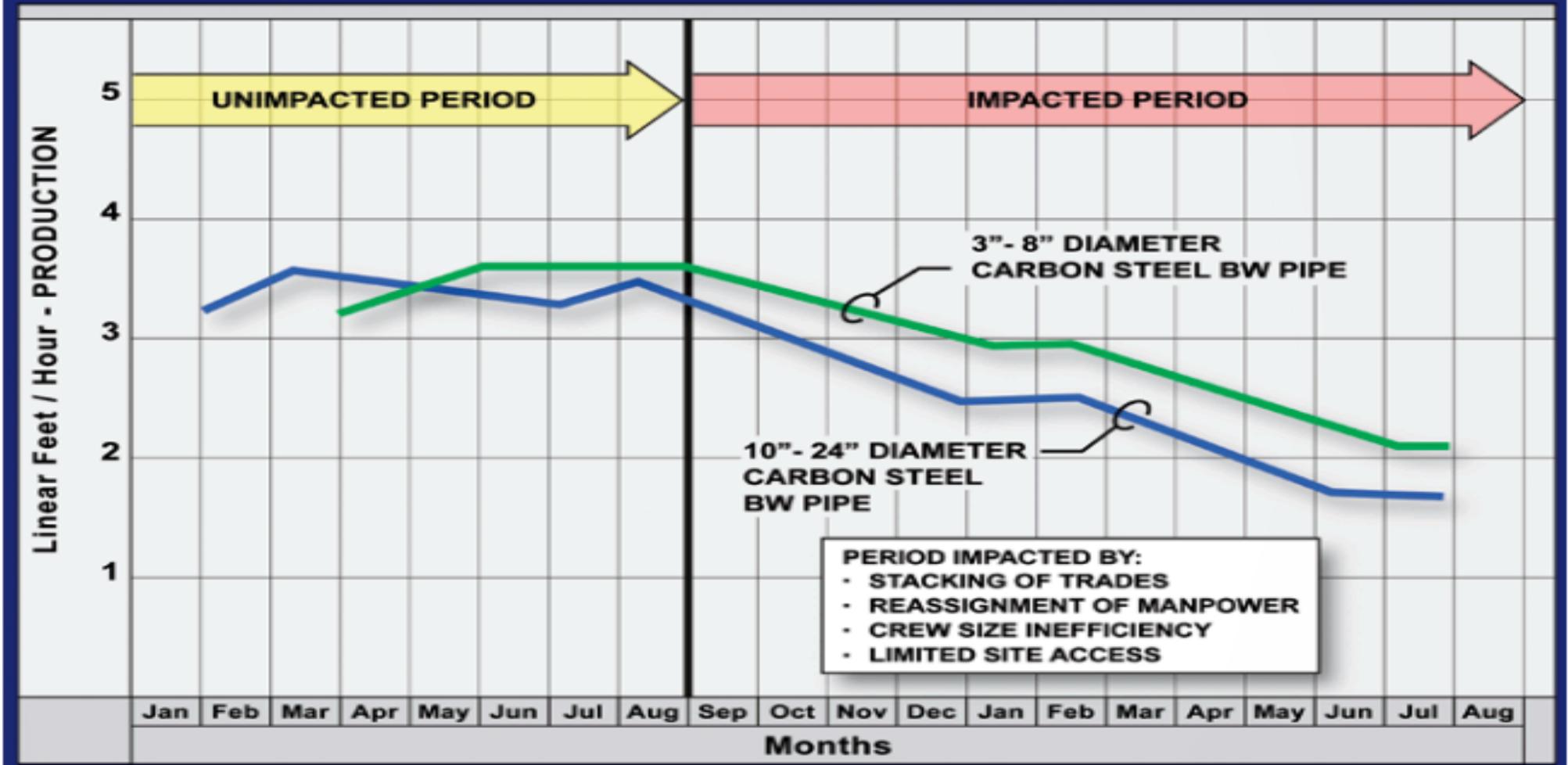
Sample Productivity Chart by Area

Productivity Differential Measured by Area



Sample Productivity Graphic by Time Period

Productivity Differential Measured by Time Period



What if my project has no *unimpacted* areas or time periods?

- This is not uncommon on projects that are impacted from the outset due to things such as:
 - ❖ major defective design impacts
 - ❖ projects with enormous initial scope growth (cumulative impact)
 - ❖ Out-of-the-gate, constant, and consistent delays that eventually lead to constructive acceleration

What if my project has no *unimpacted* areas or time periods?

➤ Spring/Summer 2020 Example

- ❖ A project that was estimated, and acquired, prior to the Covid19 pandemic but did not start construction until after the advent of Covid19 requirements and their subsequent impacts would be impacted from the outset

What can I do? Does it mean that it's now impossible to use the MMA?

- ❖ It is not impossible to still use the MMA - just more challenging
- ❖ Your problems, their analysis, and their explanation is a lot more complicated when you have no unimpacted areas or time frames

What can I do? Does it mean that it's now impossible to use the MMA?

- ❖ You would need to identify those areas or time frames that are the “least impacted” and then perform an MCAA labor inefficiency factor analysis using the appropriate MCAA Labor Factors (See pages 135 -162 of the primer)
- ❖ This must be done to set a “revised baseline”, or “revised measured mile” that can now be used as your “unimpacted” area or time frame for the MMA



In order to perform an MMA.....

- ▶ Different Areas or Time Frames need to be identified
 - ▶ These should be contrasted, one from another, by the inefficiency factors that you believe to be the root cause of your productivity losses



In order to perform
an MMA.....

- ▶ Choosing between physical areas of the project or project time frames
 - ▶ At your discretion based upon the specific project conditions
 - ▶ Examples?

In order to perform an MMA.....Interview the Jobsite Management Team

- ▶ It's smart to interview the jobsite management team for their specific and 1st hand input and knowledge about areas and time frames that were productive or less productive
 - ▶ This interview will most likely become your basis for the cause-and-effect connection when you must prove and explain the production rate differences



After the interviews.....

- Staff observations, contemporaneously written project records, and actual labor production records should be compared
- Physical Area Comparison vs. Time Frame Comparison
- It usually becomes obvious whether area or time frame is best utilized

In order to perform an MMA.....
The Reasonably Similar Rule

- ▶ To be effective, the work performed in each area or period needs to be of a reasonably similar nature
- ▶ The unimpacted work and the impacted work to be measured and compared needs to be **reasonably similar**
 - ▶ THEY DO NOT NEED TO BE EXACT
- ▶ For the same work, to be installed by same crew, in the same work environment, in the same space, at the same time.....nearly impossible - that situation would be a unicorn not a horse



Reasonably Similar Work - Factors

- ▶ Material and Equipment Type
- ▶ Means and Method of Installation
- ▶ Experience, quality, and quality of supervision

Reasonably Similar Work - Factors

- ▶ Labor from the same labor pool
- ▶ Work requiring similar effort and skill level
- ▶ Work environment: weather exposure, height installed, size of space, amount of lighting, shop vs. field, etc.
- ▶ **Any other factor which would skew the study!**

▶ What would be some examples of:

▶ Reasonably similar?

▶ Not reasonably similar?



- ▶ All potential differences must be identified and evaluated when performing an MMA
- ▶ If the differences on their own would have caused a significant measurable variation in production, the areas or time frames being compared are most likely too dissimilar



The Project Records

- ▶ MMA relies upon your actual unit rate ratio of production achieved on the project in different areas or time frames
- ▶ Ideally, your productivity rates can be established from your records of actual labor hours expended to install specific quantities of material or equipment

$$\text{PRODUCTIVITY} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

The Project Records

- ▶ Very few contractors on very few projects contemporaneously track the quantity of materials or equipment installed by hour of labor
- ▶ CONTEMPORANEOUSLY TRACKING QUANTITIES OF MATERIALS OR EQUIPMENT INSTALLED IS NOT ABSOLUTELY REQUIRED

$$\text{PRODUCTIVITY} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

Your Labor Tracking/Reporting System

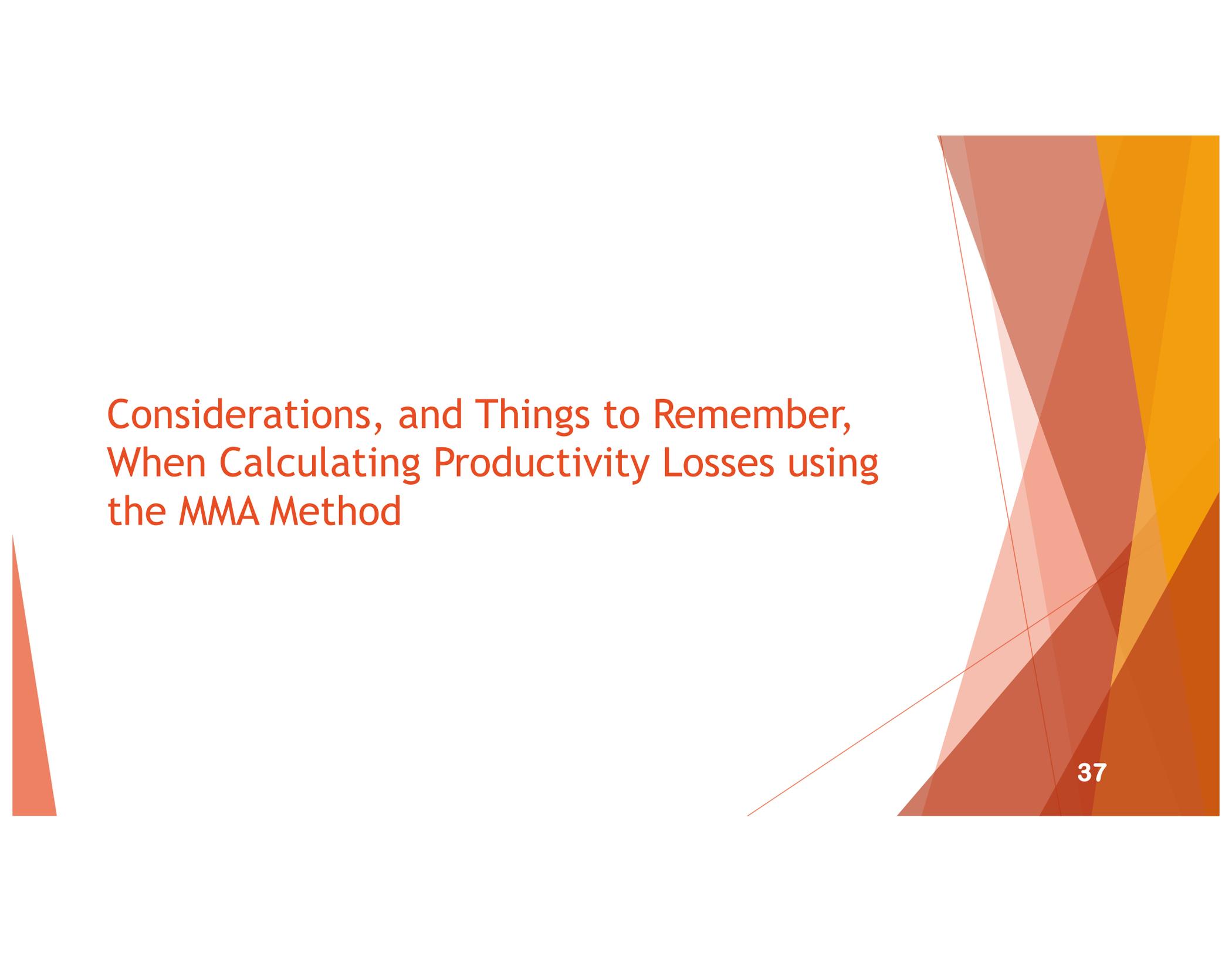
- ▶ Most contractors have an “earned value” type of labor reporting system
 - ▶ See pages 123 -133 of the primer
 - ▶ Actual hours are expended over a specific time period (weekly, monthly, etc.) and then compared to the planned or estimated hours for that work
 - ▶ Variances between actual and planned are calculated/shown

The Labor Performance Report (Example of Detailed Activities)

Activity ID Code	Activity Description	Planned Hours	CO Hrs	Rev Plan	Last % C	Current % C	Earned Hours	PT AH	C Act Hrs	Wk -2	Wk -1	Cw
7550	Inst CHWS&R Mains Area B	500		500	30	50	250	300	450	-75	-150	-200
7570	Inst CHWS&R Brnchs Area B	700	50	750	10	20	150	120	200	-40	-45	-50
7590	Connections @ Mech Equip	100		100	10	15	15	10	12	0	0	3

Your Labor Tracking/Reporting System

- ▶ Work activities typically have (should have) project specific definable features or geographic boundaries
- ▶ Labor hours are then coded, and hours expended are then charged to these discrete activities
- ▶ If so, the discrete work activities can be located on the contract drawings and material quantities can be quantified



Considerations, and Things to Remember, When Calculating Productivity Losses using the MMA Method

Weighted Average vs. Simple Arithmetic Average: Good Math is Important

- ▶ When more than one sampling segment of work is included in the MMA, especially when material quantity varies significantly between the segments compared..... A WEIGHTED AVERAGE SHOULD USUALLY BE USED
- ▶ What is a weighted average? (see next slide)
- ▶ Why? A simple arithmetic average and a weighted average can yield significantly different results

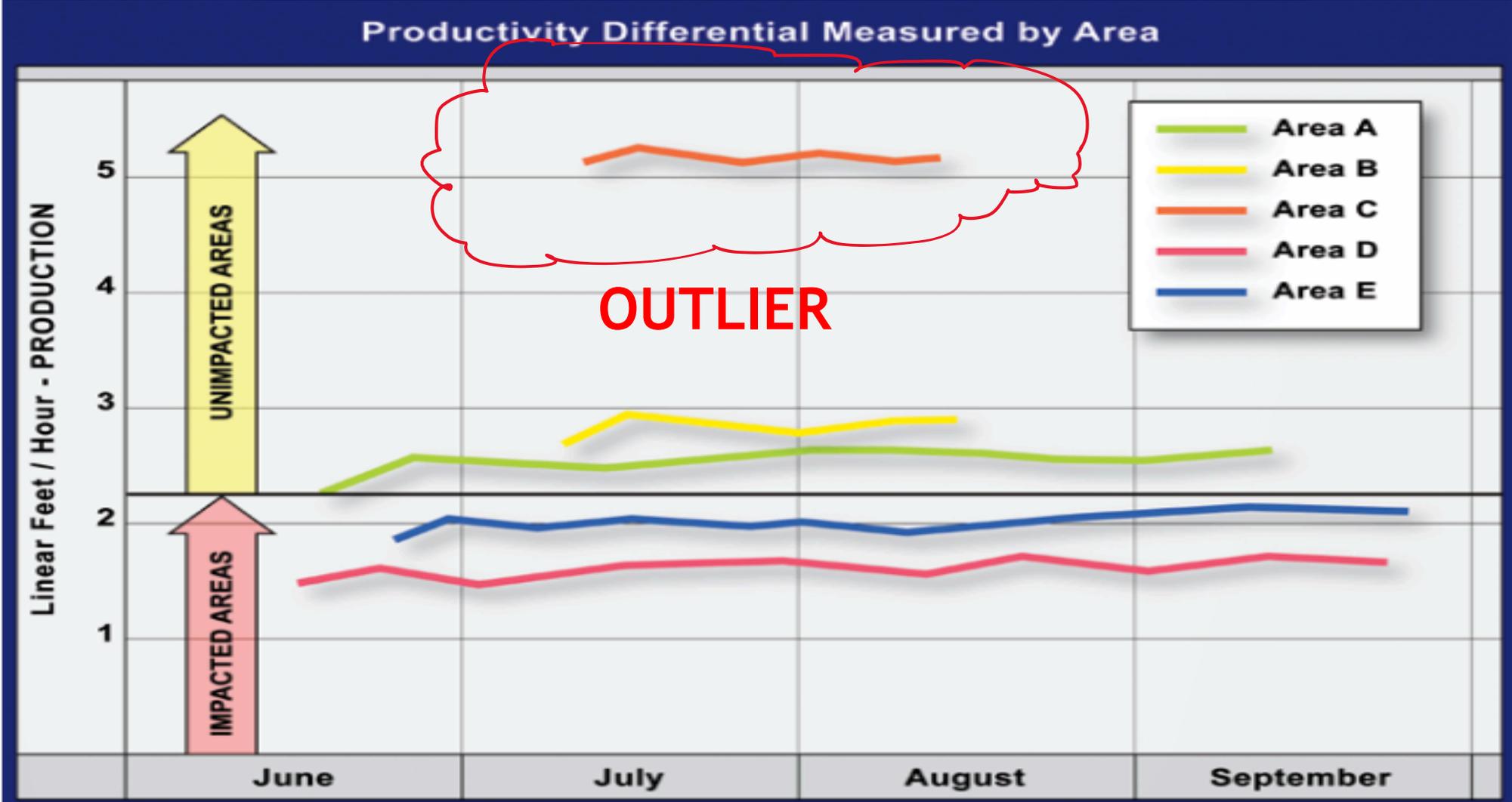
WEIGHTED AVERAGE

- ▶ **Weighted average** is a calculation that considers the varying degrees of importance of the numbers in a data set. In calculating a **weighted average**, each number in the data set is multiplied by a predetermined **weight** before the final calculation is made.

Outliers and Anomalies

- ▶ When performing your MMA, always review your production rates for outliers/anomalies
 - ▶ Sometimes when the MMA is performed you see a time frame or an area that has rates that are very high or very low compared to other rates in the same time frame or area
 - ▶ Carefully review these outliers/anomalies
 - ▶ Do they have a reasonable explanation?
 - ▶ Should these rates be excluded?
 - ▶ Are low rates self inflicted?
 - ▶ Were hours coded and charged properly?

Sample Productivity Chart by Area



Paid Change Orders

- ▶ Did you receive payment for change order work (in the impacted time frames or areas) that included compensation for loss of productivity?
- ▶ If yes, this work must be removed from the MMA

What is the proper sized area for an MMA area?

- ▶ There is industry debate on how large an area should be to get a credible measure of actual productivity
- ▶ There is no firm industry agreement or judicial guidance
- ▶ General guidelines:
 - ▶ Should be representative of the overall work
 - ▶ Don't use isolated segments that don't resemble most of the project
 - ▶ THINK REASONABLE SIZED SIMILAR SPACES

What is the proper duration of an MMA time period?

- ▶ Again....there is industry debate on how long an MMA time frame should be to get a credible measure of actual productivity
- ▶ Primer Author's Opinion:
 - ▶ Time period should be long enough for the crews to perform enough work to establish a measurable pattern of performance
- ▶ Learning curve production early in a project or early in a work area should be considered
 - ▶ May or may not effect the MM comparisons
 - ▶ Needs to be considered and explained in your narrative

Can a “separate but similar” project be used for my MMA?

- ▶ Can be used when you have no better option
 - ▶ When no “less impacted area” or “less impacted time frame” exists
 - ▶ Can be used when you would need to significantly adjust your baseline to explain numerous inefficiencies
 - ▶ Not recommended, but sometimes you are left with very few options

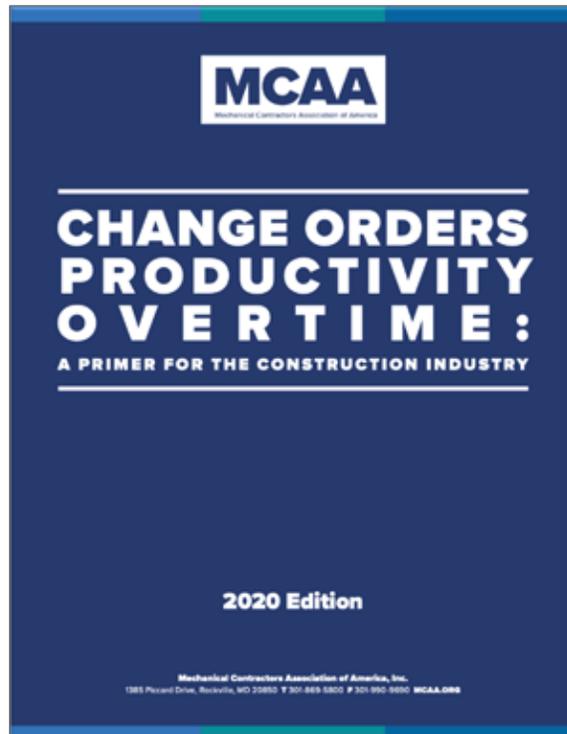
Can a “separate but similar” project be used for my MMA?

- ▶ The farther away from your project you move to make comparisons, the less likely the analysis will be considered valid
- ▶ The two project MM method may make sense, but you will most likely struggle to demonstrate that they’re “reasonably similar”

WHAT HAVE YOU LEARNED?



Acquiring the Manual - MCAA.org



- ▶ Free PDF Download for MCAA Members
- ▶ \$150 for a Hard Copy

Thank
You!

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