



Indiana Partners for Pollution Prevention



September 30, 2015



It can't be done!

Why Not?

***Because that's not how
we do it.***



Fort Wayne Assembly – *The Overview*



- ❖ **General Motor's corporate challenged all plants to eliminate color changes by improving block painting ratio to an average of 5 consecutive vehicles of the same color.**

- ✚ Ratio is defined by the number of trucks painted / number of color changes.

- ✚ Estimated Savings \$1,000,000 annually (Paint + Purge).

- ❖ **Baseline Snap Shot**

- ✚ Ratio 2.26

- ✚ .67 Gallons of Purge Used Per Color Change

- ✚ Cost of a Color Change \$6.88

- Purge \$2.87

- Paint \$4.01



Fort Wayne Assembly – Color Change



❖ What is a color change?

- A Color Change requires a solvent based product to be flushed through the paint line to remove all remaining paint from the previous color, to prepare for the next color.





Fort Wayne Assembly – *Why Batch Paint?*



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Units Painted	Ratio	Number of Color Changes	Color Change Gallons Used	Cap Wash every 3 trucks	Total Gallons used	Annual Cost (240 days of prod.)
			1 Gallon per CC	1/4 gallon per		
1108	1	1108	1108	92	1201	\$1,161,434.43
1108	2	554	554	92	646	\$625,387.77
1108	3	369	369	92	462	\$446,705.55
1108	4	277	277	92	369	\$357,364.44
1108	5	222	222	92	314	\$303,759.77
1108	6	185	185	92	277	\$268,023.33
1108	7	158	158	92	251	\$242,497.30
1108	8	139	139	92	231	\$223,352.77
1108	9	123	123	92	215	\$208,462.59
1108	10	111	111	92	203	\$196,550.44
1108	11	101	101	92	193	\$186,804.14
1108	12	92	92	92	185	\$178,682.22



Fort Wayne Assembly – *The Overview*



Current State

- ❖ Schedule sent to plants for 1 week build
- ❖ Schedule sent to body shop with plant specific hard build rules
- ❖ Most Plants cycle through color pallet once per day

Change Drivers

- ❖ Block Paint (Why)
- ❖ Reduce waste caused by the color change process.
 - Challenge
- ❖ In a Mod shop it is difficult to keep a block together



Fort Wayne Assembly – *The Team*



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❖ General Motors Corporate

❖ UAW Team Members

❖ Plant Leadership

❖ Paint Shop Manager

❖ Paint Planner

❖ Paint Process Team

❖ Clean Room Supervisor

❖ Sequence Forecasting

❖ Scheduling

❖ Environmental





Fort Wayne Assembly – *Batches and Frequency?*



- Fort Wayne used a X,Y, and Z batch family process

Monotone Counsel

Mod 1

Mod 2

Mod 3

Mod 4

Mod 5

Mod 6

Mod 7

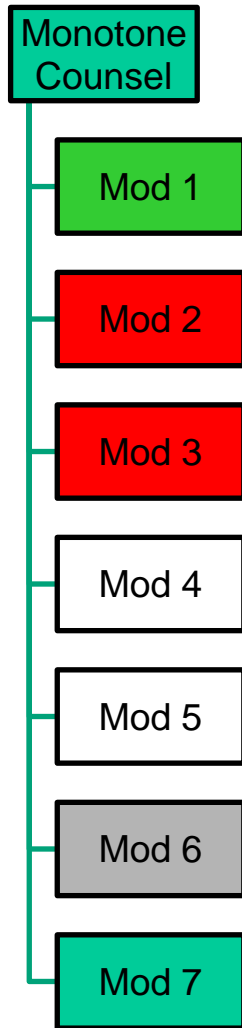
- Analysis revealed each batch was running once per day.
 - With a 3 job que, a 21 job “Block” would cause a color change in 3 jobs
- Ran simulation with the batch process turned on with the population expanded to once per week
- Improvement averaging a ratio of 5



Fort Wayne Assembly – Added W Batch



Batches - W,X,Y, and Z



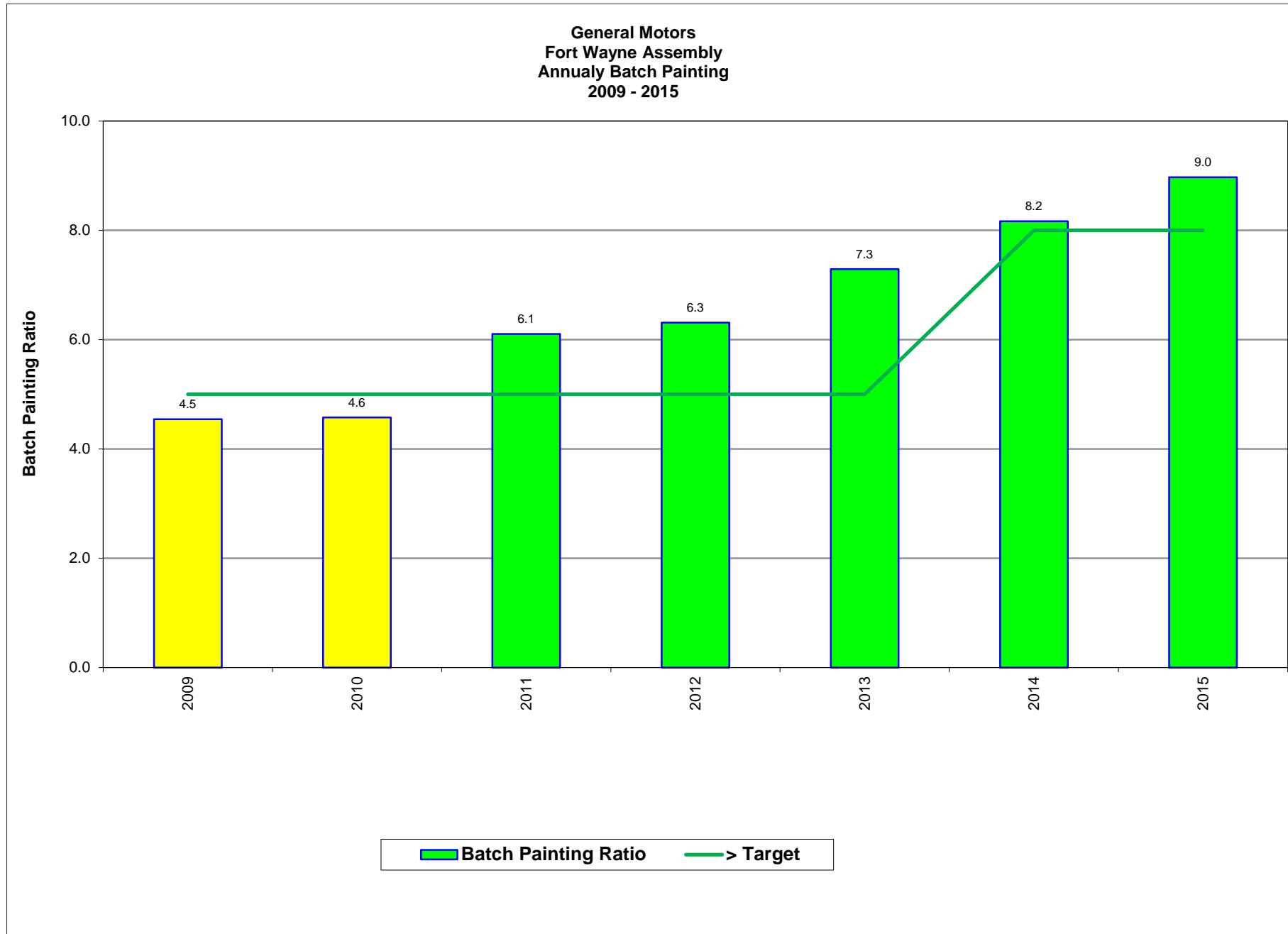
- Needed to limit the number of colors available to the Mod
- Calculations showed by limiting colors larger blocks were possible
- Breakthrough was running a simulation with one more family



Fort Wayne Assembly – Block Painting Results



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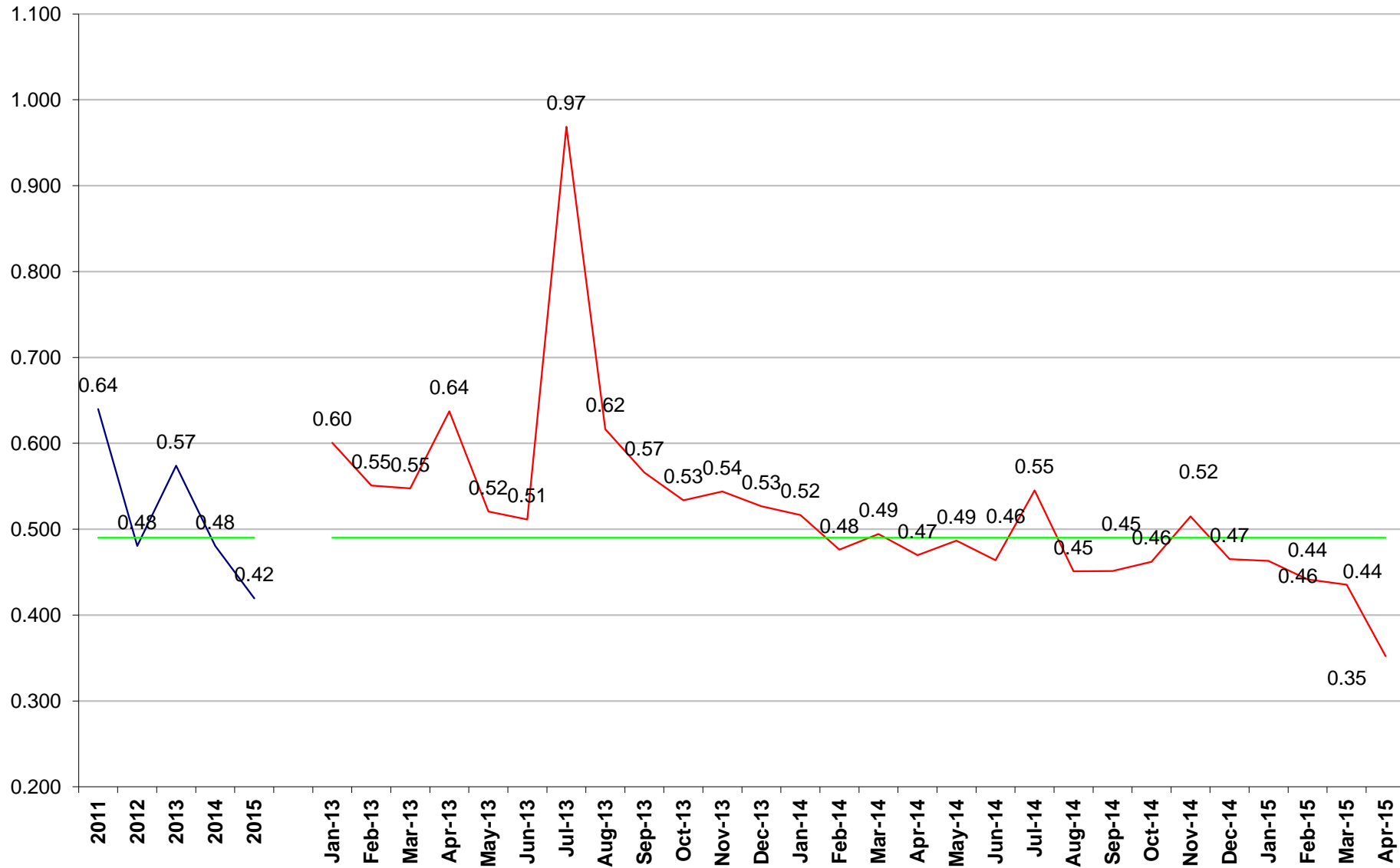




Fort Wayne Assembly – G.P.U. Results



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Fort Wayne Assembly – Block Painting Results



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Fort Wayne Assembly – Block Painting Results



The Results

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