



Process Driven Solutions

XXXXXXXXXXXXXX

Manufacturing

Site Visit Review

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# Executive Summary

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On December 11 and 12, 2019, Mike Anderson and Charles Cooper visited XXXXXXXXXXXX Manufacturing in XXXXXXXX, OH. The purpose was to determine any immediate operational concerns at XXXXXXXXXXXX and to get a better understanding of capacity in the business.

Meetings with JN, CD and BM allowed us to learn more about the team and their capabilities, helped us understand how XXXXXXXXXXXX looks at manufacturing capacity and allowed us to gauge the likelihood and risks associated with the forecast presented in the management presentation materials.

We were very impressed with JN and his team. The culture of improvement is authentic. JN is the driving force behind the culture, but it is obvious to us that both CD and BM have bought in.

We believe the entire team meets or exceeds expectations in their current roles. However, the next few years will require the management team to fill new roles in order to continue with the rapid growth XXXXXXXXXXXX is experiencing. We believe this can be done with the three main players, backfilling for them, with some guidance and training. Strategic plan development is a key area that needs to be addressed as JN is certainly capable of taking on this responsibility but is already near capacity. XXXXXXXXXXXX will need support in this area until JN can offload responsibility to other managers.

The XXXXXXXXXXXX team looks at capacity from an opportunistic viewpoint. Each sales opportunity is weighed against current capacity needed to manufacture that product. If there isn't enough capacity, a plan is made to add equipment or labor. As the business matures and outbound sales become more of a focus, management will be able to generate more throughput by selling existing excess capacity.

XXXXXXXXXXXX manufacturing is forecasting \$23 million revenue for 2024 with \$3.2 million of capex from 2020-2024. We believe that JN and his team can achieve this. It is our opinion that XXXXXXXXXXXX will be able to generate the forecasted revenue given:

- XXXXXXXXXXXX is awarded the forecasted business
- The capex plan is approved
- The ramp schedule is followed
- The off-shift cells can be staffed

Our analysis below assumes that the PROG 1 program migrates to the new PROD 1 for the 1B variant as is contemplated in XXXXXXXXXXXX's forecast. If the PROD 1 program is not implemented and the current parts are maintained, the Company can meet the demand for the parts they are making today in cells LC1 and LC2 today.

The revenue contribution of the separate sources of capacity are:

- Existing capacity \$13.3 Currently Realized
- Cellularizing existing non-cell operations 1.4 In planning
- Capital Projects 7.4 Additional capacity if can be sold out

Below is a chart showing the revenue capacity at current sales prices and mix for a single shift, as currently shifted or planned to be shifted for capex equipment and the upside if a 3 shift/5 day operation is implemented. There are also upside opportunities from 2 shifts or additional shifts for certain cells.

	Single	Current/Plan	3 Shifts/5 Days
Current Equipment	\$ 8.62	\$ 13.29	\$ 22.40
Capex Equipment	6.22	8.33	18.66
Total	\$ 14.26	\$ 21.62	\$ 41.06

It is important to note that adding shifts and capex generate additional capacity only if products that consume that capacity are sold. The closer XXXXXXXXXXXX wants to get to those numbers, the more critical it becomes that they sell the capacity that has been created.

## Resource Review

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### Equipment

We did not perform an in-depth inspection of XXXXXXXXXXXX's equipment, but the machines are up to date and in good condition. We did witness a few machines with outdated electronics that will need to be replaced at some time in the next few years. These units are rather large and can be replaced with smaller units.

### People

We met with JN, CD and BM. This team has achieved impressive results in the shop. The business is well managed and there is an obvious culture of innovation. They believe in their philosophy. They both articulate and implement it very well.

One benefit of the lean cells is that they are much easier to manage. We feel that the current leadership can absorb the forecasted revenue increase with minimal risk due to the conversion to lean cells.

## Existing Operation Capacity

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### Current Capacity

Current capacity at XXXXXXXXXXXX is constrained by sales. In its most basic form, sales-constrained capacity is the current run rate. Since we are stating capacity in dollars, the current capacity of XXXXXXXXXXXX is roughly \$13.3 million.

<i>Cell/Group</i>	<i>Desc</i>	<i>Current</i>		
		<i>Revenue</i>	<i>Shifts</i>	<i>Utilization</i>
LC1		3.30	3	100%
LC2		4.03	2	100%
LC3		1.00	1	60%
C4		0.99	1	100%
LC5		0.41	1	100%
LC11		0.41	3	100%
C12		0.06	1	
<i>Cellular Totals</i>		10.19		
C6	Equipment Group 6		2	100%
C7	Equipment Group 7		1.5	100%
C8	Equipment Group 8		1	80%
C9	Equipment Group 9		1	100%
C10	Equipment Group 10		2	80%
<i>Non Cellular Totals</i>		3.11	1.5	90%
<b>Total</b>		<b>13.29</b>		

Since the Non-Cellular equipment is used in multiple combinations across different platforms, assigning revenue to individual equipment adds no value for this exercise. Given the level of data capture, doing so would be inaccurate and doesn't add value for what we are trying to accomplish.

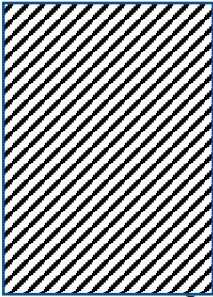
### Cellularization Projects

XXXXXXXXXXXX has plans to continue cellularization on lines where it is feasible. Currently, plans are to convert Cell 4 to a Lean Cell. Cell 4 is a bit misleading. Cell 4 refers to a group of equipment that is used together but is not reformatted into a Lean Cell. The same is true of Cell 12.

In our presentation material, C4 and C12 refer to the existing cell. LC4 and LC12 are the proposed Lean Cells. We present a negative capacity on the Cx cells and the new, higher capacity on the LCx cells. The intent is to keep each capacity increase source separated to reduce the risk of intermingling or double counting any increase.

In the dataset presented below, C4 has a negative capacity increase and LC4 has a positive capacity increase. The \$610k increase is the result of capacity gained by moving from roughly 25 units to 40 units per shift.

The assumption made here is that XXXXXXXXXXXX will cellularize to gain capacity before changing shifting in the business. This makes sense as the Lean Cells are less complex and thus easier to staff off-shift. Current plans will yield an additional \$730k in revenue. Completing the project on all existing equipment will increase revenue capacity by \$1.4mm.

		<b>Cellularization Project</b>			
<b>Cell/Group</b>	<b>Desc</b>	<b>Revenue</b>	<b>Shifts</b>	<b>Utilization</b>	
LC1					
LC2					
LC3					
C4		(0.99)			
LC4		1.60	2	60%	
LC5					
LC11					
C12		(0.06)	1		
LC12		0.18	1		
<b>Cellular Totals</b>		0.73			
C6		Equipment Group 6			
C7		Equipment Group 7			
C8	Equipment Group 8				
C9	Equipment Group 9				
C10	Equipment Group 10				
<b>Non Cellular Totals</b>		0.68			
<b>Total</b>		<b>1.41</b>			

## Shifting

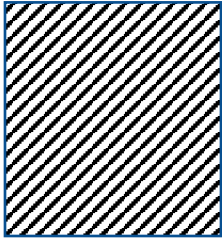
We feel there is a significant amount of capacity to be gained by adding more night and weekend shifts. This is limited by demand for parts being made on the equipment with added shifts. Care must be taken to understand that achieving a mix that maximizes each piece of equipment is nearly impossible.

The concept behind shifting is to run each existing piece of equipment to its fullest potential as many hours as possible. There are several limitations that must be overcome.

1. It is difficult to add and retain labor on off-shifts. Hiring for night shifts or weekend shifts will require that the operations on these shifts are straightforward. They must be easy to train on. They must be documented so that additional overhead isn't required to keep operations running smoothly. Differential pay must be significant to attract operators. In some cases, we have seen shift differentials as high as fifty percent. However, considering the additional throughput without additional operating expense, this is the right approach assuming the additional capacity can be sold.
2. The additional capacity must be sold. Adding capacity to secondary equipment without adding capacity to constraint operations add no effective capacity to the business. If the additional capacity needed can be added to all operations and the part has demand that cannot be met in existing shifts, adding shifts is the right idea.
3. There is additional risk with shifting 24/7. Preventive maintenance timing becomes critical so that machine downtime is kept to a minimum. If capacity is sold out and equipment fails, recovery is difficult or impossible. Service levels will be impacted.

In the following chart, shifts were added to bring capacity to 3 shifts per day, 5 days per week. If we expect to only realize about half of the potential gain on non-cellularized operations, know that LC3 is dedicated to a specific product that is limited by demand, and know that LC2 is paired with LC1 and changeovers would take the better part of the added time, we would expect XXXXXXXXXXXX's maximum capacity increase to be roughly \$7.62mm.

There would be difficulty getting to this number. Getting mix right in this scenario is doable, but with a significant change in how XXXXXXXXXXXX looks at sales. In addition to capitalizing on projects/part packages the market presents to XXXXXXXXXXXX, they would need to begin to seek out opportunities to sell their available capacity. If they achieved this, we believe there is upside to the forecast without additional capex.

Cell/Group	Desc	Shift/Utilization			
		Revenue	Shifts	Utilization	
LC1					
LC2					
LC3		0.80	1	100%	
LC4		3.20	3	100%	
LC5					
LC11					
LC12		0.54	3		
<i>Cellular Totals</i>		4.54			
C6		Equipment Group 6			
C7		Equipment Group 7			
C8		Equipment Group 8			
C9		Equipment Group 9			
C10	Equipment Group 10				
<i>Non Cellular Totals</i>		3.08	2.5	80%	
<b>Total</b>		<b>7.62</b>			

## Other Considerations

XXXXXXXXXXXX Manufacturing needs to continue to drive down changeover times. Compression of changeovers not only frees up additional capacity, it allows for change over for small runs and adding multiple items to a high-speed line to exploit every ounce of capacity. For example, a four-hour changeover means any break in a production run will cost a full shift of capacity to change over and change back. Getting those times down through process or through more investment in quick change tooling allows for idle capacity to be consumed without risk to service proposition.

The non-cellularized equipment in the building is much larger and more error prone than modern counterparts. However, this equipment is needed to run the sister parts and legacy parts needed for a complete catalog. A plan for how the “cats and dogs” should look and be operated is necessary, especially as the Lean Cell concept moves more equipment into cells and scatters the remaining equipment.

The remaining PM equipment is an opportunity in looking at overall capacity and required floorspace. PM equipment takes up about 10% of the total footprint of the building while generating \$500k in revenue. A redesign of the layout of PM equipment is necessary if the product is to remain viable in the short run. If the capacity cannot be easily sold, another option is to exit the xxxxxx market which would free up 10% of the floor space and reduce the risk of need for any building additions during the forecast period.



## Capital Expenditure Capacity Expansion

### Prod 2 Covers

It is almost possible to produce this program with a single cell throughout the forecast period; however, this would put risk on the operation. To mitigate the risk, (assuming continuous improvement activities don't increase capacity to \$2.0 million) XXXXXXXXXXXX needs to consider adding another shift to this cell in 2023 when forecasted revenue exceeds capacity.

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	600,000	0	0	0	0	0
Demand	2,520	8,000	13,600	18,000	21,600	24,000
Sale Price	77.57	77.57	77.57	77.57	77.57	77.57
Material	18.13	18.13	18.13	18.13	18.13	18.13
Total T	149,789	475,520	808,384	1,069,920	1,283,904	1,426,560
Total Revenue	195,476	620,560	1,054,952	1,396,260	1,675,512	1,861,680
Cell Capacity @ 24/5	47,200	47,200	47,200	47,200	47,200	47,200
Revenue Capacity	3,661,304	3,661,304	3,661,304	3,661,304	3,661,304	3,661,304
Utilization at 24/5 shifting	5.3%	16.9%	28.8%	38.1%	45.8%	50.8%

### Part 1 (PROD 1/PROG 1)

Since Part 1 will use reallocated capacity from the current PROG 1 cell and has no capex spend, it is added to the overall model as a consumption of capacity to measure overall utilization.

#### Part 1 at 50% Volume

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	-	-	-	-	-	-
Demand	-	1,500	10,000	15,000	15,000	15,000
Sale Price	-	50.53	50.53	50.53	50.53	50.53
Material	-	8.00	8.00	8.00	8.00	8.00
Total T	-	63,795	425,300	637,950	637,950	637,950
Total Revenue	-	75,795	505,300	757,950	757,950	757,950
Cell Capacity @ 24/5	-	-	-	-	-	-
Revenue Capacity	-	-	-	-	-	-
Utilization at 24/5 shifting	-	-	-	-	-	-

## Parts 2/3 (PROD 1/PROG 1)

Parts 2/3 are sisters that will run together in a single cell. Since they are sister parts and have equal volumes, they are modeled as average sales price and average material cost. The total volume is the sum of volumes for both.

### Parts 2/3 at 50% Volume

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	-	350,000	-	-	-	-
Demand		3,000	20,000	30,000	30,000	30,000
Sale Price		30.68	30.68	30.68	30.68	30.68
Material	-	9.87	9.87	9.87	9.87	9.87
Total T	-	62,415	416,100	624,150	624,150	624,150
Total Revenue	-	92,025	613,500	920,250	920,250	920,250
Cell Capacity @ 24/5		65,283	65,283	65,283	65,283	65,283
Revenue Capacity	-	2,002,546	2,002,546	2,002,546	2,002,546	2,002,546
Utilization at 24/5 shifting		4.6%	30.6%	46.0%	46.0%	46.0%

## Part 4 (PROD 1/PROG 1)

Part 4 is currently modeled as stand-alone for capacity utilization. It is important to note that the capex estimate for this part has gone up to \$750k to cover 5 CNC machines. This part is currently in redesign, so this could change. However, for now, this is the most likely capital spend.

### Part 4 at 50% Volume

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	-	750,000	-	-	-	-
Demand		1,500	10,000	15,000	15,000	15,000
Sale Price		200.00	200.00	200.00	200.00	200.00
Material	-	85.00	85.00	85.00	85.00	85.00
Total T	-	172,500	1,150,000	1,725,000	1,725,000	1,725,000
Total Revenue	-	300,000	2,000,000	3,000,000	3,000,000	3,000,000
Cell Capacity @ 24/5		28,153	28,153	28,153	28,153	28,153
Revenue Capacity	-	5,630,631	5,630,631	5,630,631	5,630,631	5,630,631
Utilization at 24/5 shifting		5.3%	35.5%	53.3%	53.3%	53.3%

## Part 5 (PROD 1/PROG 1)

Part 5 has been revised in capex required from \$350k to \$450k.

### Part 5 at 50% Volume

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	-	450,000	-	-	-	-
Demand		1,500	10,000	15,000	15,000	15,000
Sale Price		119.43	119.43	119.43	119.43	119.43
Material	-	9.00	9.00	9.00	9.00	9.00
Total T	-	165,645	1,104,300	1,656,450	1,656,450	1,656,450
Total Revenue	-	179,145	1,194,300	1,791,450	1,791,450	1,791,450
Cell Capacity @ 24/5		61,706	61,706	61,706	61,706	61,706
Revenue Capacity	-	7,369,493	7,369,493	7,369,493	7,369,493	7,369,493
Utilization at 24/5 shifting		2.4%	16.2%	24.3%	24.3%	24.3%

## New PROD 2 and PROD 1/PROG 1 Parts Consolidated

The model we are using is fairly simple and meant to show the cumulative impact of all projects. Any combination of projects can be added.

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Capex	600,000	1,550,000	-	-	-	-
Demand	2,520	15,500	63,600	93,000	96,600	99,000
Sale Price	77.57	478.21	478.21	478.21	478.21	478.21
Material	18.13	130.00	130.00	130.00	130.00	130.00
Total T	149,789	939,875	3,904,084	5,713,470	5,927,454	6,070,110
Total Revenue	195,476	1,267,525	5,368,052	7,865,910	8,145,162	8,331,330
Cell Capacity @ 24/5	47,200	202,341	202,341	202,341	202,341	202,341
Revenue Capacity	3,661,304	18,663,973	18,663,973	18,663,973	18,663,973	18,663,973
Utilization at 24/5 shifting	5%	7%	29%	42%	44%	45%

We think this simple analytical tool brings the most visibility to capacity and capex prioritization at a high level. If a more detailed analysis is required, we can build that into a more robust model.

## Next Steps

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XXXXXXXXXXXX has done a lot of work and seen great results in reducing changeover times. This can be done by changing tooling, simplifying setup by using jigs, redesigning parts where possible, reordering operations and even more creative opportunities. XXXXXXXXXXXX may want to employ outside resources to help add some horsepower to their ongoing projects to reduce changeover times.

We believe XXXXXXXXXXXX needs to create shop floor drawings to plan for future expansion. Once the proposed capex projects are approved, having a modeled plan for the best floor density and work flow is critical for continued improvement.

## About Us

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### Our Philosophy

Title 2 Business Services exists to create value for its clients, associates and members. We achieve this by helping our clients foster a culture of value creation through problem solving and enhancing their businesses through holistic process. We believe businesses do this by meeting the responsibilities of management:

- Provide employees the tools and materials to do their jobs.
- Provide systems that communicate expectations.
- Provide systems that give continuous feedback about meeting those expectations.

We believe that value is created when businesses commit their resources only to activities that increase throughput, decrease operating expenses or meet necessary conditions.

We believe all processes in a business must:

- Address the responsibilities of management
- Be designed to optimize the business, not the function
- Allow for concrete performance metrics that drive activity
- Clearly define functions and their interactions with other functions
- Prompt leadership to lead, not be captured in the “run.”

We believe the best run businesses hold themselves accountable by separating plan creation from plan execution.

Value creation happens when a business is optimized to generate the highest level of throughput for its level of capacity. Once capacity is clearly defined, a business is at its greatest value when managed to that capacity.

## Our Team

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### *Mike Anderson*



After graduating Texas A&M University, Mike began work in the building products industry. He spent 17 years in the industry and then entered the world of private equity. He became a Partner/Vice President at Linsalata Capital Partners and has spent the last 9 years working with their various portfolio companies in value creation activities. Mike has experience in both manufacturing and distribution across several different industries.

### *Matt Bonn*



Matt started his career as a power plant operator and instructor in the US Navy Nuclear Power program. He has over 19 years of experience in manufacturing and distribution operations. His background was in Information Systems before moving into operations in the building products and consumer goods industries. He brings experience in project management, systems integration and implementation, and operations management in distressed and rapidly changing organizations.

*Charles Cooper*



Coop graduated from Western Carolina University with a degree in corporate finance. He has over 20 years of experience in manufacturing and distribution operations. He came from an accounting and finance background before moving into operations management for several national manufacturers of paper, consumer goods, and building products. He brings experience in managing change with troubled, fast growing, or high rate-of-change operations. Before university, he was an infantryman in the US Army.