

Logistics Efficiency

6.20.18

Karl Gimbel

Purchasing – Planning

Honda Manufacturing of Indiana, LLC

Production Started – 2008

GREENSBURG, IN



Civic Sedan



Insight



CR-V

INDIANA

2,500 direct associates

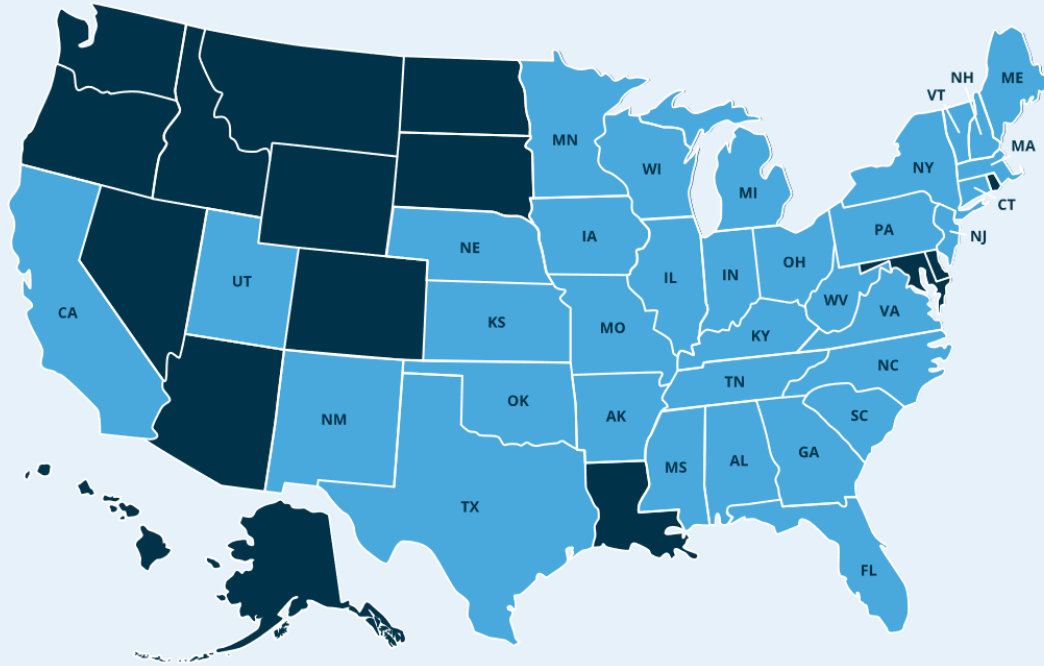
250,000 annual vehicle capacity

\$1.1 billion in total capital investment

295 authorized dealerships w/ 3,340 employees

64 supplier facilities

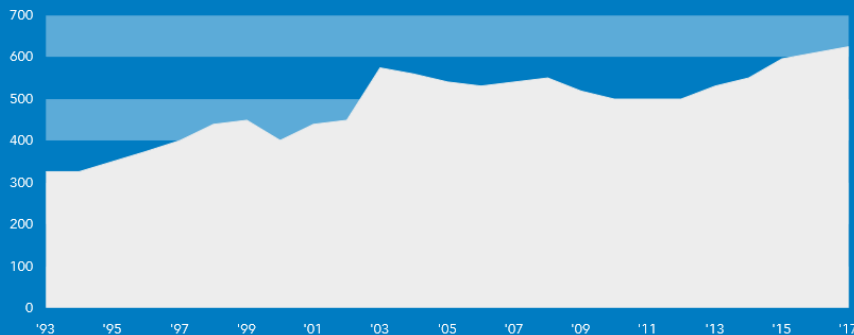
Honda has 624 OEM suppliers located in 32 states.



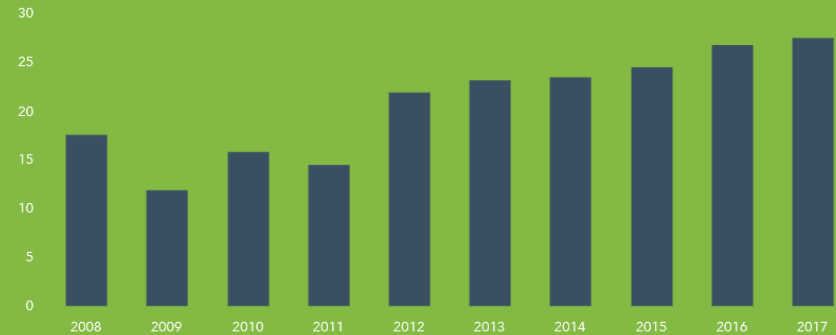
Supplier States

\$27.4 BILLION
Purchased in U.S. Parts & Materials from 624 Suppliers

Honda's U.S. supplier base has more than doubled since 1993

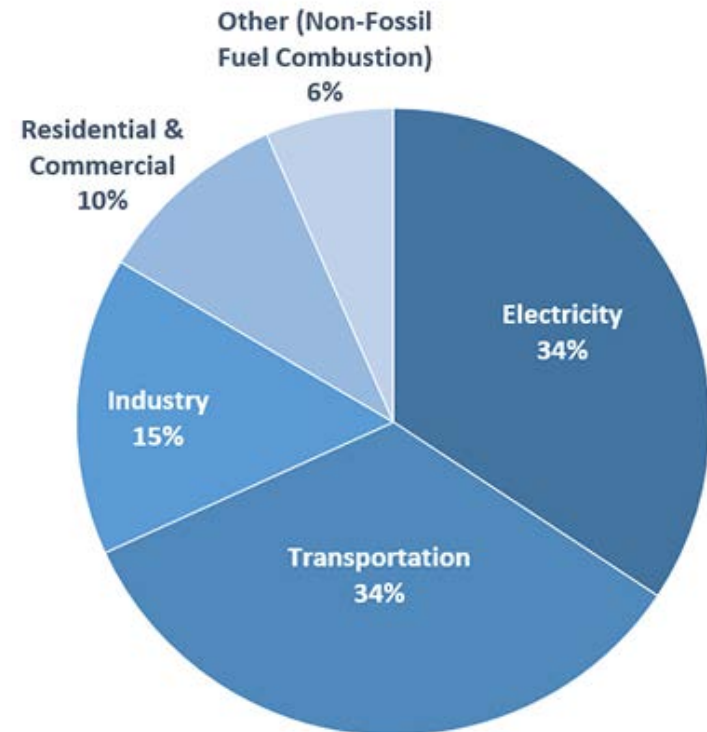


Honda purchased \$27.4 billion in U.S. parts and materials in 2017



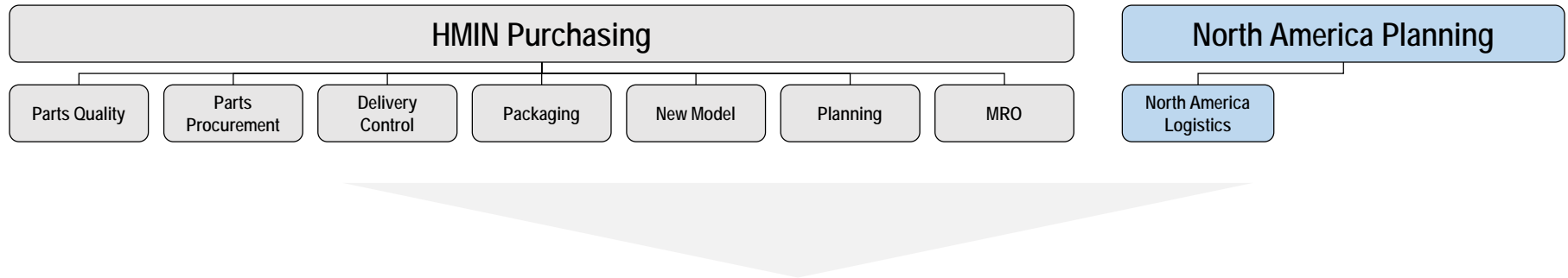
2017 U.S. Production Totals

1,208,000	Cars and Light Trucks
1,866,000	Automobile Engines
1,131,000	Transmissions
1,988,000	General Purpose Engines
581,000	Power Equipment Products
74,000	ATVs
82,000	Utility Vehicle Engines
52,000	Side x Side Utility Vehicles
43	Aircraft
78	Aircraft Engines

2016 U.S. Carbon Dioxide Emissions, By Source

U.S. Environmental Protection Agency (2018). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016

Large transportation network required to support many manufacturing plants.



North American Logistics responsible for transportation routing, in coordination with plant Purchasing teams

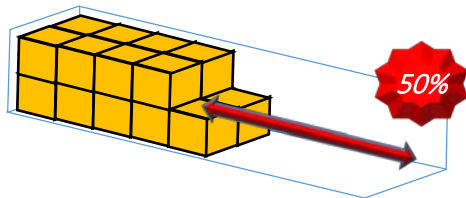
Logistics Efficiency - Trailer Cube Optimization

Current Situation

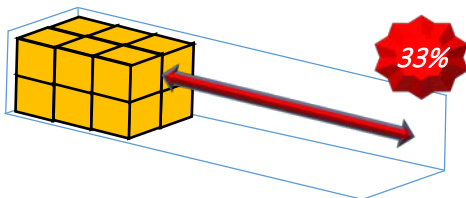
- Current Honda ordering method does not fill trailers based on available space.
- Orders are sent based on need time.
- This leads to wasted space for inbound routes.
- Manual manipulation is required in order to maximize the cube of a trailer (Plant direct).

CURRENT SYSTEM LOGIC**Loss within a day**

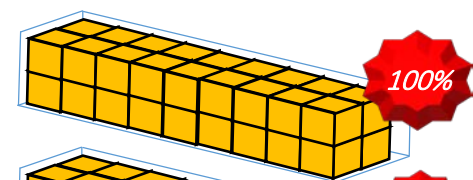
Route Number	Lot Number
001 – 08:00	Lot 1
	Lot 2
	Lot 3



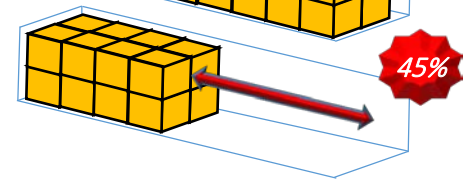
Route Number	Lot Number
002 – 15:00	Lot 4
	Lot 5
	Lot 6

**Loss across days****Day 1**

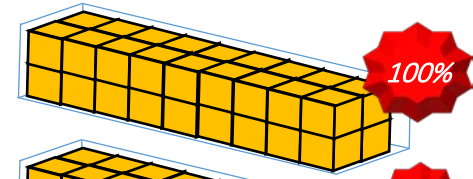
Route Number	Lot Number
001 – 09:00	Lot 1
	Lot 2
	Lot 3
	Lot 4



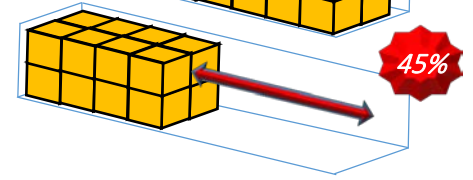
Route Number	Lot Number
002 – 17:00	Lot 5
	Lot 6

**Day 2**

Route Number	Lot Number
001 – 09:00	Lot 1
	Lot 2
	Lot 3
	Lot 4



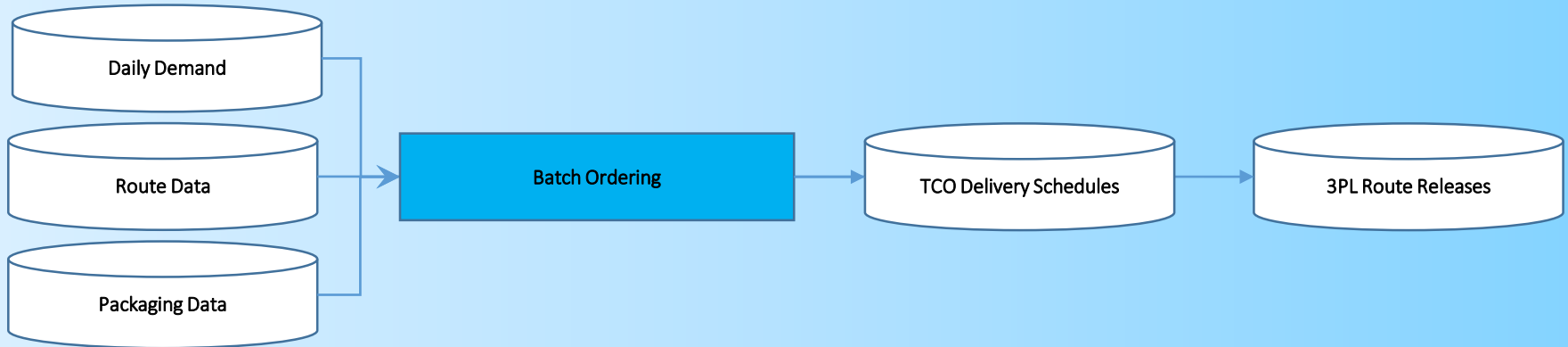
Route Number	Lot Number
002 – 17:00	Lot 5
	Lot 6



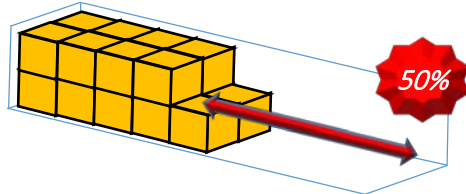
Current ordering system does not consider available trailer space when setting delivery schedules, resulting in loss.

UPDATE – Trailer Cube Optimization

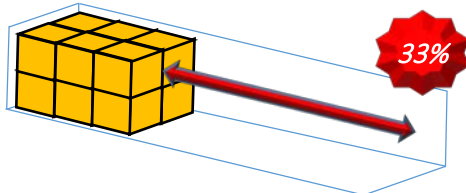
- Updated system logic to consider trailer space & packaging information in daily order generation
- No manual order manipulation required
- Better suited to handle HMIN “3 Box” environment (Production fluctuation / variation)
- Optimizes trailer cube while reducing CO2 gas

TRAILER CUBE OPTIMIZATION SYSTEM LOGIC**Trailer Cube Optimization within Single Day**

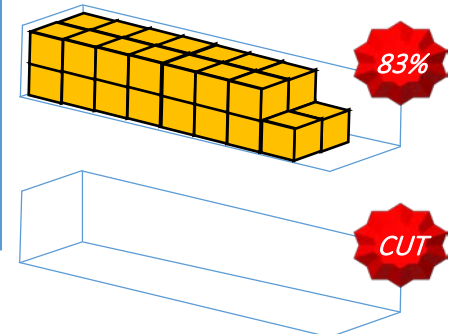
Route Number	Lot Number
001 – 08:00	Lot 1
	Lot 2
	Lot 3



Route Number	Lot Number
002 – 15:00	Lot 4
	Lot 5
	Lot 6

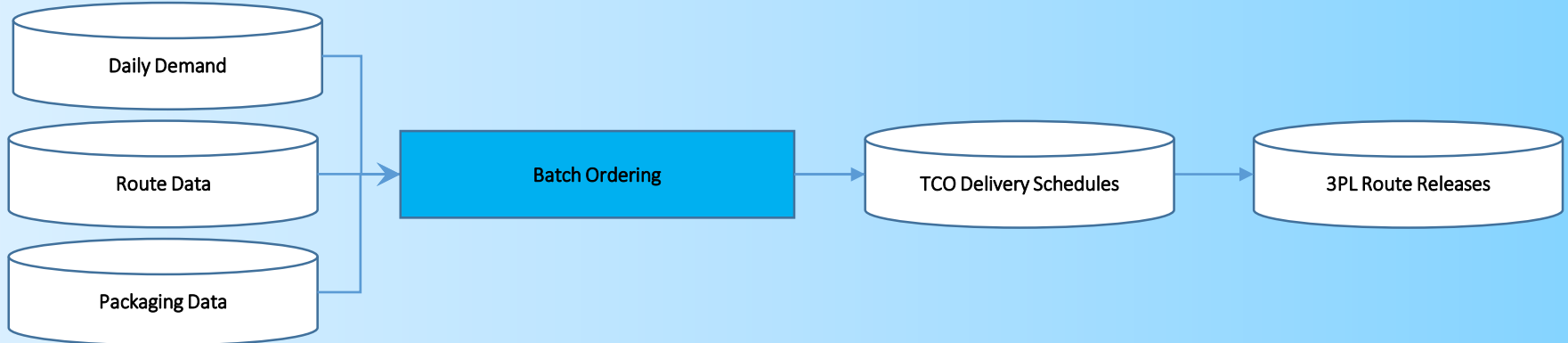


Route Number	Lot Number
001 – 08:00	Lot 1
	Lot 2
	Lot 3
	Lot 4
	Lot 5
	Lot 6



Optimize orders within single day through a pull ahead process.

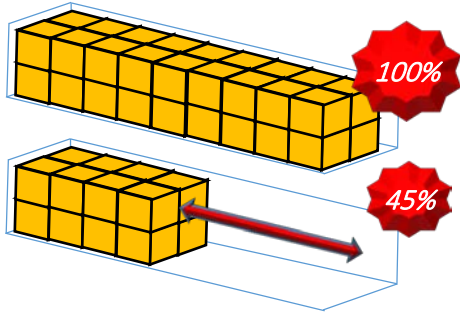
TRAILER CUBE OPTIMIZATION SYSTEM LOGIC



Trailer Cube Optimization across multiple days

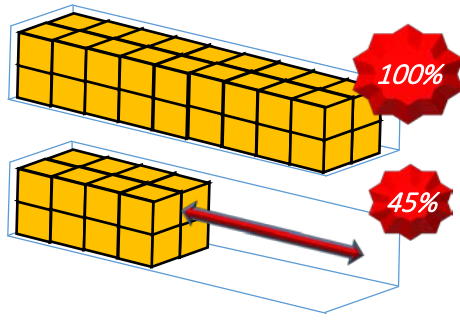
Day 1

Route Number	Lot Number
001 – 09:00	Lot 1 Lot 2 Lot 3 Lot 4
002 – 17:00	Lot 5 Lot 6



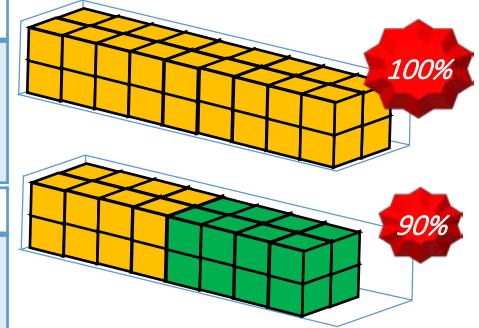
Day 2

Route Number	Lot Number
001 – 09:00	Lot 1 Lot 2 Lot 3 Lot 4
002 – 17:00	Lot 5 Lot 6



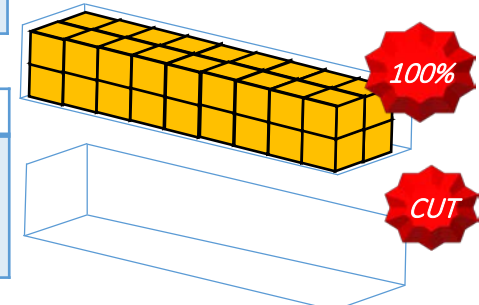
Day 1

Route Number	Lot Number
001 – 09:00	Lot 1 Lot 2 Lot 3 Lot 4
002 – 17:00	Lot 5 Lot 6 Lot 1 (Day 2) Lot 2 (Day 2)

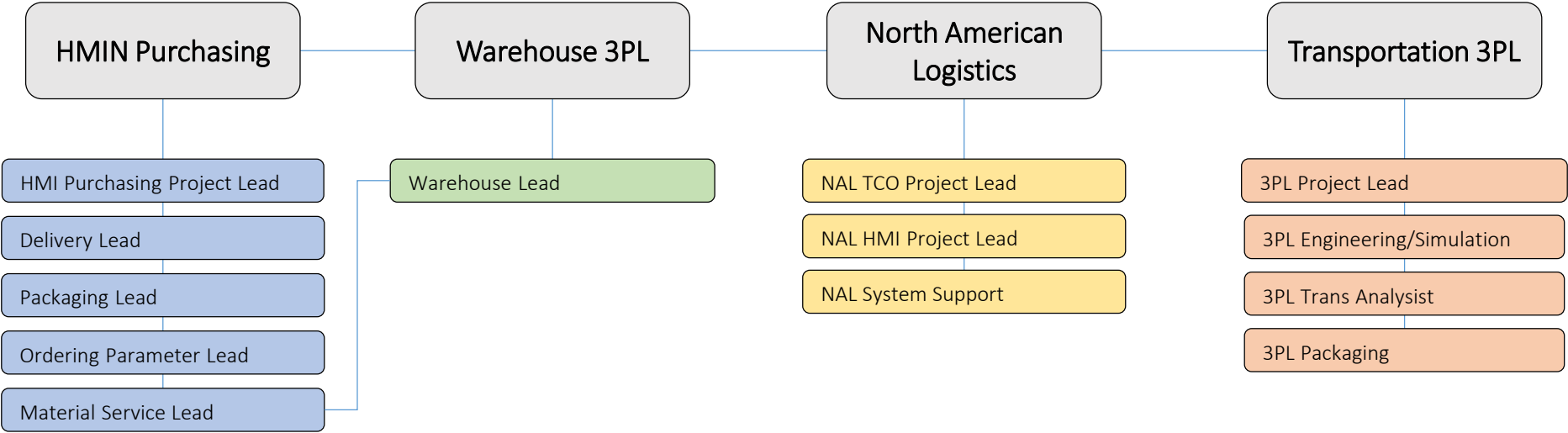


Day 2

Route Number	Lot Number
001 – 09:00	Lot 3 Lot 4 Lot 5 Lot 6



Optimize orders across multiple days through a pull ahead process.



Multiple teams / associates required to coordinate activity.

Simulation – Supplier 1

- Simulate routing for Trailer Cube Optimization for 3 weeks using real production numbers
- Measure potential savings using current planned routes, actual routes, and simulated routes
- Pulls freight across days to cube trailers at 100%
- Current rates and mileage used to measure possible efficiency gain.

Production

	<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>	<u>Day 6</u>	<u>Day 7</u>	<u>Day 8</u>	<u>Day 9</u>	<u>Day 10</u>	<u>Day 11</u>	<u>Day 12</u>	<u>Day 13</u>	<u>Day 14</u>	<u>Day 15</u>
CRV	482	420	482	360	540	576	582	600	502	520	589	508	540	608	585
Civic	541	582	480	622	460	446	420	420	480	480	420	480	480	360	420

<u>Supplier</u>	<u>Models</u>	<u>MQU</u>	<u>GPCS Route</u>	<u>Cube / Unit</u>
Supplier #1	CRV	780	CM2	0.001282051
	Civic	900	CM2	0.001111111

Cube by	CRV	0.62	0.54	0.62	0.46	0.69	0.74	0.75	0.77	0.64	0.67	0.76	0.65	0.69	0.78	0.75	
Model	Civic	0.60	0.65	0.53	0.69	0.51	0.50	0.47	0.47	0.53	0.53	0.47	0.53	0.53	0.40	0.47	
Total Daily Cube		1.22	1.19	1.15	1.15	1.20	1.23	1.21	1.24	1.18	1.20	1.22	1.18	1.23	1.18	1.22	18.00

<u>Simulation</u>		<u>Day 1</u>	<u>Day 2</u>	<u>Day 3</u>	<u>Day 4</u>	<u>Day 5</u>	<u>Day 6</u>	<u>Day 7</u>	<u>Day 8</u>	<u>Day 9</u>	<u>Day 10</u>	<u>Day 11</u>	<u>Day 12</u>	<u>Day 13</u>	<u>Day 14</u>	<u>Day 15</u>	
Cons. Prod.	Start Cube %	0	0.78	0.60	0.44	0.29	0.09	0.85	0.64	0.41	0.23	0.03	0.81	0.62	0.40	0.22	
	Received	2.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	18.00
	Consumed	1.22	1.19	1.15	1.15	1.20	1.23	1.21	1.24	1.18	1.20	1.22	1.18	1.23	1.18	1.22	18.00
	Carryover	0.78	0.60	0.44	0.29	0.09	0.85	0.64	0.41	0.23	0.03	0.81	0.62	0.40	0.22	0.00	
	Carryover %	64%	50%	39%	25%	7%	69%	53%	33%	19%	2%	66%	53%	32%	18%	0%	
	Current Fill %	61%	59%	58%	58%	60%	62%	61%	62%	59%	60%	61%	59%	61%	59%	61%	

# Loads	9/11	9/12	9/13	9/14	9/15	9/18	9/19	9/20	9/21	9/22	9/25	9/26	9/27	9/28	9/29	
Current Loads	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	30
TCO Loads	2	1	1	1	1	2	1	1	1	1	2	1	1	1	1	18
Actual Loads	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	30

Example: Simulation projected 12 truck loads eliminated in 3 week period (40% decrease).

Supplier Specified Action Plan (SAP) created

- Hold internal meetings with all impacted groups
- Analyze Order data & Route Releases
- Review Packaging Constraints
- Trailer pool assessment
- Estimate increased inbound container flow
 - + Warehouse space assessment
- Create Issue Tracker
 - Countermeasure activates and feedback
- Hold a Go / No Go meeting

Review RCM Output

Order	Part	MBN	Pre MTC	Post MTC	Diff	%Increase	Oct 25 2017 13:30	Oct 30 2017 10
00000005	7670071A	AQ20M1	19 57	33	13.43	68%	1	1
00000007	7664071A	AQ20M1	19 57	33	13.43	68%	1	1
00N064	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00N300	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00000124	7650071A	AQ20M1	19 57	32 6	13 03	65%	5	5
00N034	7650071A	AQ20M1	12 70	22 8	10 10	80%	17	17

Confirm RCC is loading trailers full

Analyze Cost Impact – Report Estimated Reduction

Order	Part	MBN	Pre MTC	Post MTC	Diff	%Increase	Oct 25 2017 13:30	Oct 30 2017 10
00000005	7670071A	AQ20M1	19 57	33	13.43	68%	1	1
00000007	7664071A	AQ20M1	19 57	33	13.43	68%	1	1
00N064	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00N300	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00000124	7650071A	AQ20M1	19 57	32 6	13 03	65%	5	5
00N034	7650071A	AQ20M1	12 70	22 8	10 10	80%	17	17

Review Actual Load Data

Order	Part	MBN	Pre MTC	Post MTC	Diff	%Increase	Oct 25 2017 13:30	Oct 30 2017 10
00000005	7670071A	AQ20M1	19 57	33	13.43	68%	1	1
00000007	7664071A	AQ20M1	19 57	33	13.43	68%	1	1
00N064	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00N300	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00000124	7650071A	AQ20M1	19 57	32 6	13 03	65%	5	5
00N034	7650071A	AQ20M1	12 70	22 8	10 10	80%	17	17

Review CC/RCC Impact

Order	Part	MBN	Pre MTC	Post MTC	Diff	%Increase	Oct 25 2017 13:30	Oct 30 2017 10
00000005	7670071A	AQ20M1	19 57	33	13.43	68%	1	1
00000007	7664071A	AQ20M1	19 57	33	13.43	68%	1	1
00N064	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00N300	7664071A	AQ20M1	12 70	20 4	7 70	61%	24	24
00000124	7650071A	AQ20M1	19 57	32 6	13 03	65%	5	5
00N034	7650071A	AQ20M1	12 70	22 8	10 10	80%	17	17

Review Issue Tracker – Perform CM Activates

No	Dept	Logistics	SRCC report to update to early	SRCC did not reflect updated orders at around 6:45. Orders (SRCC) had the updated orders. If so, SRCC reflected new order
Rel - 1	A	Buyer	Ship groups associated with each (SRCC) rule needs to be switched to MTC to be active	And as PM
Rel - 2	C	Buyer	Need to insert time in ship group with new effective date for MTC to become active	And as PM
Rel - 3	C	Buyer	Variance "Trailer cube is incorrect"	Month name NB data was not being placed in proper spot
Rel - 4	B	Logistics	Migration sheet failed due to blank field in sheet	Values cannot be null or 0
Rel - 5	A	Logistics	Space is tight for a few parts in the CC	OK the 8 parts, 4 are at risk for space constraints under current MTC delivery conditions, at the time of the confirmation 13:
Rel - 6	A	Logistics		

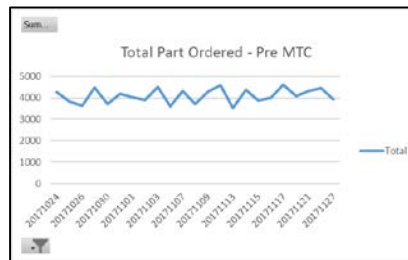
Trial – Supplier 1

- Trailer Cube Optimization functioned as planned (~40% reduction in trailers)
- Part ordering spikes on 2 truck load days, as planned.
- Current routes arrive within one hour of each other
- Worked with carrier and supplier to space out the 2 delivery times to minimize space concerns.

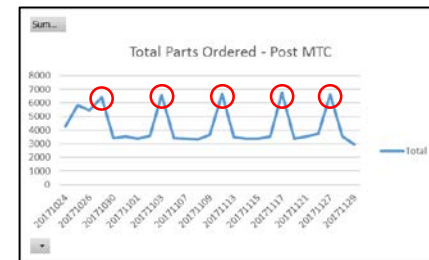
TCO Ordering Turned On

Supp	Plan Ship Date	Plan Ship Time	Sum of Trl %
03230005	20171024	080000	105028054
	20171025	080000	009230769
	20171026	080000	1612179807
	20171027	080000	009230769
	20171028	080000	1567622308
	20171029	080000	000965385
	20171030	080000	001602564
	20171031	080000	0998071736
	20171101	080000	0986715949
	20171102	080000	0986715949
	20171103	080000	0325467179
	20171104	080000	0998071736
	20171105	080000	032692308
	20171106	080000	0998071736

Daily Shipped (Pre-TCO)



Daily Shipped (Post-TCO)



Warehouse Space Observed

Container	Part - MBPN	Pre MTC Avg1B	Post MTC Avg1B-2TL	Diff	%Increase	Avg Available Container Spots	
						Oct 25 2017 13:30	Oct 30 2017 10:30
A100000065	76700TLA A010M1	5.04	6	0.96	19%	16	12
A100000066	76645TLA A022M1	19.57	33	13.43	69%	1	0
A100000067	76640TLA A020M1	19.57	33	13.43	69%	1	0
A100N364	76640TBA A020M1	12.70	20.4	7.70	61%	24	9
A100N390	76645TBA A020M1	12.70	20.4	7.70	61%	24	9
A300000124	76500TLA A020M1	19.57	32.6	13.03	67%	5	0
A300N334	76500TBA A020M1	12.70	22.8	10.10	80%	17	6
C000000060	76740TLA A011M1	19.57	33.6	14.03	72%	0	0

Supp	Plan Ship Date	Plan Ship Time	Trailer #	Sum of Order Qty	Comments
03230005	20171026	080000	1205119	1830	
			1206124	3510	
		090000	1205119	120	*Still Loaded @ 10-30 10:01
	20171026 Total			5460	
	20171027	080000	120409	3120	*Unloaded @ 10-27 17:48
		090000	120959	3300	*Unloaded @ 10-30 7:48
	20171027 Total			6420	
	20171030	080000	1206124	3420	
	20171030 Total			3420	
	20171031	080000	(blank)	3540	
	20171031 Total			3540	

- 4 parts have space concerns if 2 truck loads are unloaded at the same time
- Parts grouped on each trailer by lot; Trucks not unloaded until needed.
- Spacing of trailer arrivals will minimize space concerns as parts are consumed.

Risks

- Potential Risk for receiving warehouse space (Mitigation by extending time between deliveries and ensuring supplier sequencing)

Benefit

- Reduction in transportation spend (Estimated \$142K / year), Reduction in CO2 gas, Less trailer moves in yard

Path Forward

- Continue with Trailer Cube Optimization for Supplier 1 and expand to other suppliers based on identified criteria

Dec 2 Q4									
Route Rate w Fuel	Cube	# Loads w Mix Cubing	Load Reduction	Proposed Cost	Est. Savings	Est. Annual	Analysis	Conservative	% Reduction
\$ 301.92	3.45	62	-20%	\$ 16,719	\$ (8,269)	\$ (119,168)		\$ -	0%
\$ 435.20	4.08	74	-20%	\$ 32,205	\$ (8,269)	\$ (119,168)		\$ -	-20%
\$ 650.88	0.89	16	-30%	\$ 10,451	\$ -	\$ -		\$ -	0%
\$ 1,587.20	2.25	41	-14%	\$ 63,845	\$ -	\$ -		\$ -	0%
\$ 1,467.44	0.66	12	-14%	\$ 17,009	\$ (2,308)	\$ (42,297)		\$ -	-18%
\$ 330.48	5.35	98	-4%	\$ 31,726	\$ -	\$ -		\$ -	0%
\$ 125.12	7.84	132	-4%	\$ 16,516	\$ (1,001)	\$ (14,436)		\$ (14,436)	-7%
\$ 1,873.52	1.29	24	-28%	\$ 37,764	\$ -	\$ -		\$ -	0%
\$ 621.52	3.94	71	-9%	\$ 44,129	\$ -	\$ -		\$ -	0%
\$ 527.68	16.29	292	0%	\$ 154,083	\$ -	\$ -		\$ -	0%
\$ 481.48	1.57	39	-27%	\$ 13,962	\$ -	\$ -		\$ -	0%
\$ 485.52	1.93	35	-13%	\$ 16,993	\$ -	\$ -		\$ -	0%
\$ 865.04	4.73	85	0%	\$ 96,509	\$ -	\$ -		\$ -	0%
\$ 757.52	2.61	47	-2%	\$ 36,053	\$ -	\$ -		\$ -	0%
\$ 514.08	6.20	111	-14%	\$ 57,063	\$ (9,253)	\$ (133,358)		\$ (133,358)	-18%
\$ 1,158.40	2.68	47	-18%	\$ 52,055	\$ -	\$ -		\$ -	0%
\$ 541.28	0.63	12	0%	\$ 6,495	\$ -	\$ -		\$ -	0%
\$ 199.92	4.25	77	-3%	\$ 15,384	\$ (400)	\$ (5,762)		\$ (5,762)	-2%
\$ 656.88	1.88	34	-10%	\$ 22,334	\$ -	\$ -		\$ -	0%
\$ 722.16	1.20	22	0%	\$ 15,868	\$ -	\$ -		\$ -	0%
\$ 656.88	5.53	99	-11%	\$ 66,031	\$ (7,883)	\$ (113,802)		\$ (113,802)	0%
\$ 1,418.48	1.60	18	-9%	\$ 26,533	\$ (1,418)	\$ (80,443)		\$ (80,443)	-7%
\$ 1,810.24	2.86	52	-11%	\$ 63,732	\$ -	\$ -		\$ -	0%
\$ 390.32	0.43	8	-66%	\$ 3,123	\$ -	\$ -		\$ -	0%
\$ 182.24	8.92	180	-5%	\$ 29,158	\$ (1,840)	\$ (23,638)		\$ (23,638)	-7%
\$ 717.52	2.46	48	0%	\$ 36,361	\$ -	\$ -		\$ -	0%
\$ 685.04	0.70	13	-63%	\$ 8,640	\$ -	\$ -		\$ -	0%
\$ 717.52	1.46	45	-37%	\$ 34,889	\$ (19,696)	\$ (283,547)		\$ (283,547)	0%
\$ 1,054.88	0.86	26	-31%	\$ 27,687	\$ (7,454)	\$ (107,428)		\$ (107,428)	-27%
\$ 523.04	0.86	46	-8%	\$ 8,465	\$ (520)	\$ (7,624)		\$ (7,624)	-6%
\$ 529.04	0.71	13	-24%	\$ 6,878	\$ (2,116)	\$ (26,498)		\$ (26,498)	-30%
\$ 365.84	1.15	21	-24%	\$ 7,683	\$ -	\$ -		\$ -	0%
\$ 485.24	2.64	46	-2%	\$ 23,456	\$ (488)	\$ (7,036)		\$ (7,036)	-3%
\$ 711.28	0.62	12	-29%	\$ 8,535	\$ (3,556)	\$ (51,254)		\$ (51,254)	-38%
\$ 265.84	1.31	24	-33%	\$ 6,138	\$ (2,557)	\$ (8,848)		\$ (8,848)	-43%
\$ 489.60	3.16	57	-2%	\$ 27,907	\$ (490)	\$ (7,056)		\$ (7,056)	-2%
\$ 1,191.84	0.63	12	-33%	\$ 14,162	\$ (7,491)	\$ (100,344)		\$ (100,344)	-43%
\$ 1,111.12	0.46	9	0%	\$ 10,000	\$ -	\$ -		\$ -	0%
\$ 81.80	1.61	19	-34%	\$ 1,565	\$ (979)	\$ (14,112)		\$ (14,112)	-56%
\$ 709.92	1.33	24	-27%	\$ 17,038	\$ (6,389)	\$ (92,081)		\$ (92,081)	-30%

1. (\$15,223) Both HMIN and GBL

CD	Supplier	Priority	MOU Varies?	Simulation?	Potential Savings	Notes
H0328005 USGL	AMERICAN MITSUBA CORPORATION	1	Yes	Yes	\$ 142,656	Good Candidate
H0635846 USGL	ELEEWOOD METAL LTD	2	Yes	Yes	\$ 150,340	Good Candidate, probably understated due to sunroof
H12350702 HMM	KASA NORTH AMERICA INC UPPER SANDUSKY OH	2	Yes	Yes	\$ 374,406	
H05072902 HMM	VAN ROB INC	2	Yes	Yes	\$ 163,046	
H14650002 USGL	NEWMAN TECHNOLOGY INC	3	Yes	Yes	\$ 191,517	compared to actual. Requires combining all parts on 1 GPCS route
H08165613 USGL	TX HOLDINGS INC AIRBAG	4	Yes	Yes	\$ 228,951	Currently 1 TL at 540, plus CR overflow through DXF at 120. Savings calced at 1.235 cube used daily
H10490002 USGL	JEFFERSON INDUSTRIES CORP	5	Yes	Yes	\$ 88,893	
H10300002 USGL	LOSA INC	6	Yes	Yes	\$ 63,973	2 or 3 loads out per week
H05000002 USGL	MARION INDUSTRIES, INC	7	Yes	Yes	\$ 44,893	
H0467003 HMM	CARDINGTON YUTAKA TECHNOLOGIES INC	8	Yes	Yes	\$ 58,283	Mat 6 requests both pull across days and within days
H10300002 HMM	ION, INC	9	Yes	Yes	\$ 26,255	Savings with no TCO. Current TCO loads show no savings. Mat 6 requests both pull across days and within days
H10300002 USGL	KAMCO INDUSTRIES, INC	10	Yes	Yes	\$ 93,084	Good Candidate, need to confirm actual vs. calculated loads
H03704005 USGL	GREENVILLE TECHNOLOGY INC	11	Yes	Yes	\$ 33,880	Good Candidate, only need 1 truck most days
R02021008 USGL	RAP PLASMAN INC	12	Yes	Yes	\$ 64,455	
H10600002 USGL	NISSAN CEMENT AMERICA	13	Yes	Yes	\$ 30,000	MOU needs confirmed. Actuals are different than calculated
H01200005 USGL	AMERICAN SHOWA BLANCHETTER PLY	14	Yes	Yes	\$ 36,246	Currently 1 TL plus CR overflow
H12637027 USGL	AUTOLIV ASP INC	15	Yes	Yes	\$ 36,600	
H03700002 USGL	GREEN TOKAI CO	16	Yes	Yes	\$ 19,618	
H06104005 USGL	P & P AMERICA MFG INC	17	Yes	Yes	\$ 12,871	
H08172005 USGL	HITACHI METALS AMERICA LTD	18	Yes	Yes	\$ 106,443	
H04080002 USGL	ROY AMERICA CO LTD	19	Yes	Yes	\$ 64,546	
H05022005 USGL	MATSU MANUFACTURING (BARRIE) INC	20	Yes	Yes	\$ 140,329	
H14406009 USGL	AUTOLIV SAFETY TECHNOLOGY	21	Yes	Yes	\$ 63,633	
H02638008 USGL	SUMITOMO ELEC. WIRING SYSTEMS	22	Yes	Yes	\$ 71,403	
H05000002 USGL	RAMADA NORTH AMERICA, INC	23	Yes	Yes	\$ 44,848	
H05000002 USGL	AUSTIN TO-HAWK AUTOMOTIVE INC	24	Yes	Yes	\$ 21,385	actual savings will be greater since current MOU set at 690 for all
H11830001 USGL	GECCOM CORPORATION	25	Yes	Yes	\$ 16,363	
H14030001 USGL	MEALON AUTO PRODUCTS MFG INC	26	Yes	Yes	\$ 15,400	MOU needs confirmed
H10100001 USGL	ETH PARTS INDUSTRIES, INC	N/A	Yes	Yes	\$ -	MOU in prod
H00606006 USGL	EG TRANSHIP	N/A	Yes	Yes	\$ -	60% daily cube - routed via collection route / could be 3 TL's per week with TCO
H00675003 USGL	NISSAN BIKARI OHIO INC	N/A	Yes	Yes	\$ 21,701	Marginal Savings, already combined w another GPCS Route
H07014002 USGL	AUTOLIV NISSAN BRAKE SYSTEMS OF AMERICA (AND)	N/A	Yes	Yes	\$ -	
H14047003 USGL	NISSHAKAWA COOPER LLC	N/A	Yes	Yes	\$ -	No savings projected

In process of evaluating three model environment

Initial Estimate, one model \$(815)K per year estimate

Detailed Simulation data, two models \$(2.4)M per year estimate

Summary

- Initial estimate for Honda of Indiana savings with one model \$815K per year
- Latest estimate with model mix changes and additional candidates \$2.4M per year and 2,207 MT of CO2
- Continue investigating opportunities as HMIN expands to three model environment

Concerns

- Amount of returnable packaging in supply chain loop
- Warehouse space required to store inventory during spike shipments

Path Forward

- Work closely with teams to identify potential TCO suppliers based on purchasing, packaging, warehouse, and suppliers constraints.
- Continue to monitor and track all issues during live implementation that may not have been realized during the test environment.

END