

# Designing the Production Network at CoolWipes

Matt O’Grady, vice president of supply chain at CoolWipes thought that his current production and distribution network was inappropriate given the significant increase in transportation costs over the past few years. Compared to when the company had set up its production facility in Chicago, transportation costs had increased by a factor of more than four and were expected to continue growing in the next few years. They then decided to analyze the performance of the current network to see how it could be restructured to better cope with the new challenges.

## CoolWipes

CoolWipes was founded in the late 1980s and produced baby wipes and diaper ointments. Demand for the two products is shown in Table 1. The company currently had one factory in Chicago that produced both products for the entire country. The wipes line in the Chicago facility had a capacity of 5 million units, an annualized fixed cost of \$5 million a year, and a variable cost of \$11 per unit. The ointment line in the Chicago facility had a capacity of 1 million units, an annualized fixed cost of \$2 million a year, and a variable cost of \$20 per unit. In order to better plan the needs of its market-based products, Matt’s team has divided the territory into six geographic regions defining the areas of demand. Figure 1 provides the repartition of demand and the 6 geographic zones.

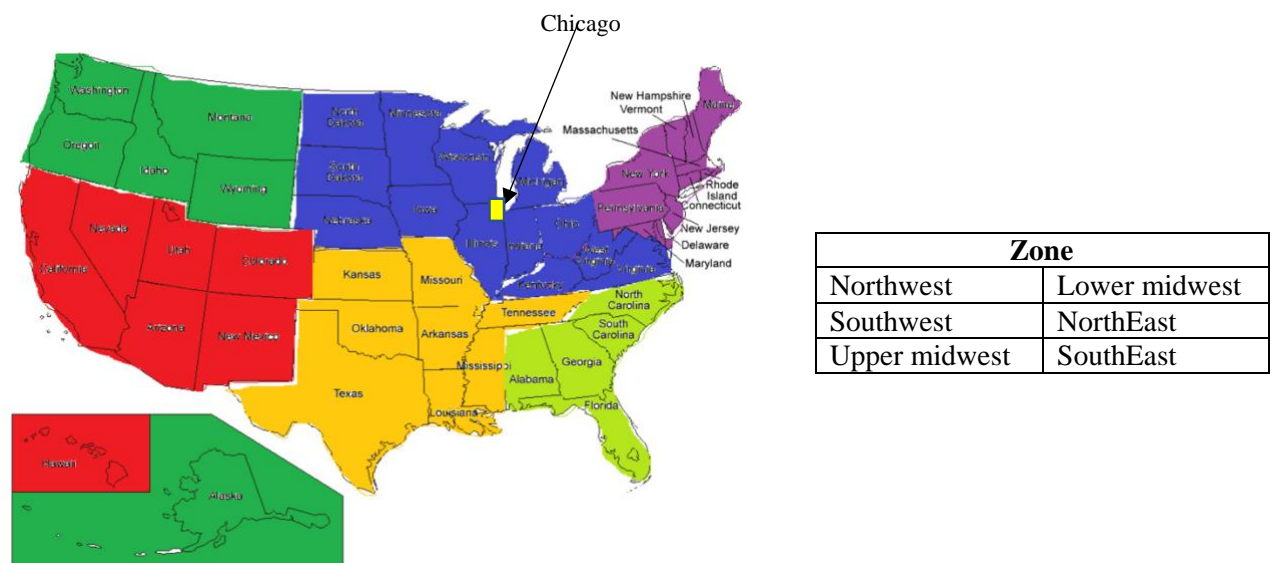


Figure 1: Demand and Geographic regions

Table 1: Regional Demand at CoolWipes (in ,000s)

		Northwest	Southwest	Upper midwest	Lower midwest	Northeast	Southeast
	Wipes	500	670	900	800	1000	600
<b>Demand</b>	Ointment	50	110	120	70	120	70

Matt and his team can see that is expected to continue growing in the next years, coupled with an increase in demand. One possible option is to deploy in one or more production sites. This could save the

company significant amounts in transportation expenses in the future. Thus, Matt should decide whether to build a new plant and, if so, which production lines to put into the new plant.

Matt had identified Princeton in New Jersey, Atlanta, and Los Angeles as potential sites for new plants. Each new plant could have a wipes line, an ointment line, or both. A new wipes line has a capacity of 2 million units, while a new ointment line has a capacity of 1 million units. The annual fixed cost for a new line of production and the variable production cost per unit are presented in Table 2.

**Table 2: Fixed cost.( in \$)**

	Fixed Cost (\$)		Variable costs per unit (\$)	
	Wipes	Ointment	Wipes	Ointment
Chicago	4 500 000	2 000 000	10	20
Princeton	2 200 000	1 700 000	10	20
Atlanta	3 200 000	1 500 000	10	20
Los Angeles	2 500 000	1 500 000	10	20

The company charges a cost of transportation to its customers on the basis of the negotiated rates with its transport service provider for each shipment. The current transportation costs per unit (for both wipes and ointment) are shown in Table 3.

**Table 3: Transportation Costs per unit.( in \$)**

	upper lower Northwest southwest midwest midwest northeast southeast					
	Northwest	southwest	midwest	midwest	northeast	southeast
Chicago	6.32	6.32	3.68	4.04	5.76	5.96
Princeton	6.6	6.6	5.76	5.92	3.68	4.08
Atlanta	6.72	6.48	5.92	4.08	4.04	3.64
Los Angeles	4.36	3.68	6.32	6.32	6.72	6.6

- First, one should estimate the annual cost of serving the entire nation from Chicago.
- Next, do you recommend adding any plant(s)? If so, where should the plant(s) be built and what lines should be included? Assume that the Chicago plant will be maintained at its current capacity but could be run at lower utilization.
  - Would your decision be different if transportation costs are half of their current value?
  - What if transportation costs were double their current value?
- If Matt could design a new network from scratch (assume he did not have the Chicago plant but could build it at the cost and capacity specified in the case), what production network would you recommend? Assume that any new plants built besides Chicago would be at the cost and capacity specified under the new network options.
  - Would your decision be different if transportation costs were half of their current value?
  - What if they were double their current value?

On the other hand, in the long term, Matt and his team are concerned about the future delivery needs of their customers. Currently, the CoolWipes is offering their products in three days. Matt's team considers that if they start offering a next-day delivery option in two years, they could increase their demand by 35% by region for the next two years, after which demand is expected to stabilize.

Accordingly, what will be the structure of the CoolWipes' network for the next year 2026. Can the production lines support this growth in demand?

What would you recommend to Matt' team to improve the responsiveness of their supply chain network?

With the rapid expansion of AI and data-driven technologies, Matt is actively exploring how these advancements can be leveraged to enhance the efficiency, visibility, and responsiveness of its supply chain network. Additionally, Matt aims to optimize operations on a broader scale, ensuring they align with strategic goals and deliver measurable improvements.

According to you, what can you recommend for determining the optimal level of smart technology integration in their supply chain?

In what ways can a smart supply chain network reduce lead times and improve delivery accuracy?