# Fleet Electrification

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# Walmart's Network


## Stores

- 5,362 Retail Units
- 5 Formats
- 38,000 – 185,000 $ft^2$
- 1.5 Million Associates
- Walmart.com

## Distribution Centers

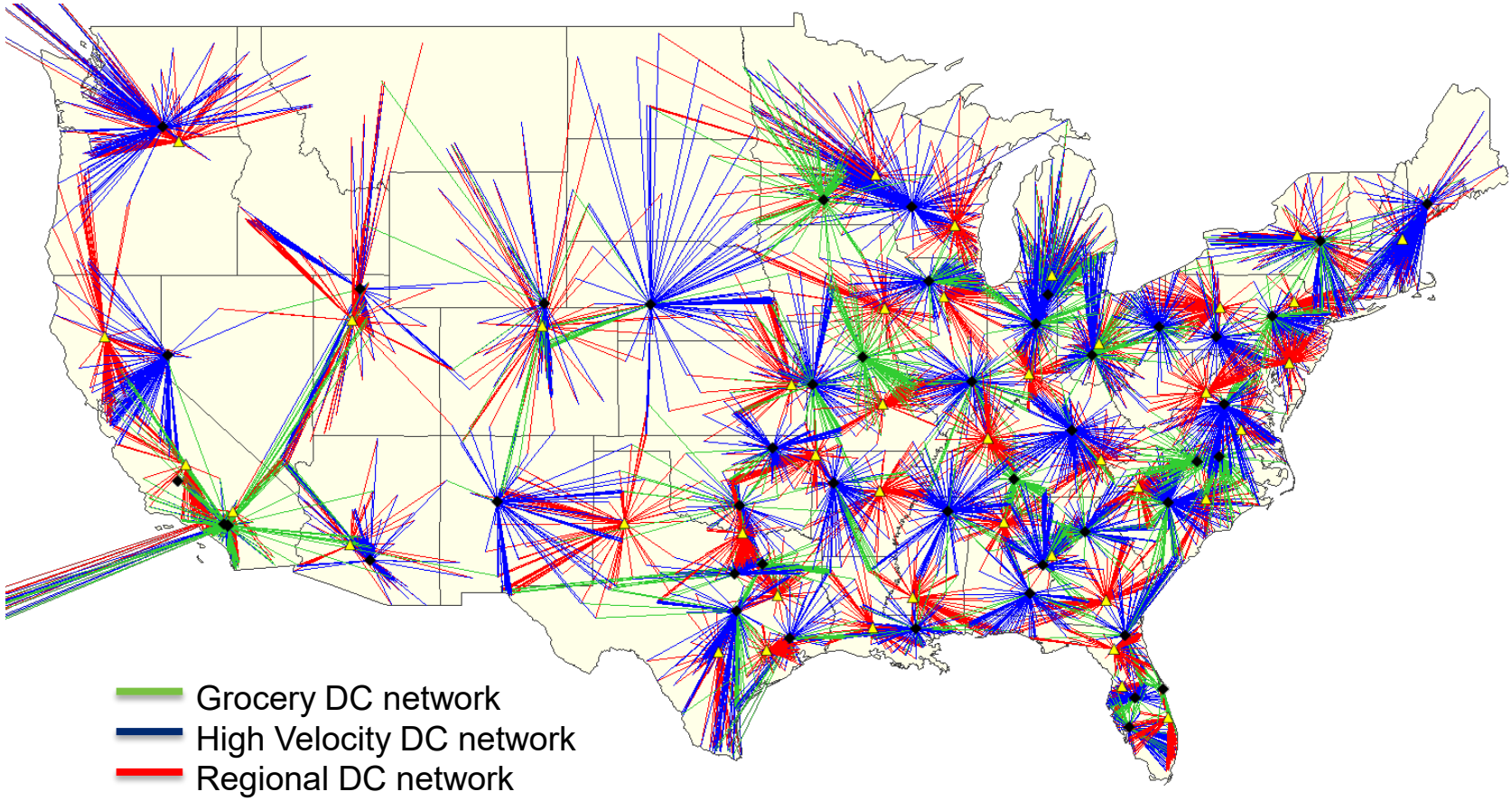
- > 175 Facilities
- 18 Formats
- 75-100 Stores / DC
- 250 Mile Radius

## Transportation

- 8,200 Drivers
- 6,500 Tractors
- 60,000 Trailers
- 750 Million Miles / Year

Walmart
Save money. Live better.

# Walmart's Network



# Walmart's 2025 Energy Commitments

- In 2005 we set an aspirational goal to be powered 100% by renewable energy

- On November 4, 2016 we announced new sustainability goals for 2025 that build on our existing energy goals
  - Be supplied by 50% renewable energy
  - Use a combination of energy efficiency and renewable energy to reduce emissions in our operations by 18 percent
  - Target is science-based, which is the level of decarbonization needed to keep global temperature increase below 2°C compared to pre-industrial temperatures


# Walmart's Fleet is Integral to Walmart's Sustainability Efforts

- Fleet Efficiency = Cases Shipped / Gallons of Fuel Burned

- Historical Fleet Efficiency Goals vs. 2005 Baseline:
  - 25 Percent Increase by 2008 – **Reached 38%**
  - Double U.S. Fleet Efficiency by 2015 – **Reached 102.2%**

- 2015 Compared to 2005 Baseline:
  - Delivered 1 Billion More Cases
  - Drove 465 Million Less Miles
  - **Equates to a One Year Savings of $1 Billion**

# Walmart's Fleet is Integral to Walmart's Sustainability Efforts

- Alternative Fuels, Including Electricity, are the Next Step in Our Fleet Sustainability Journey

# Fleet Electrification: Two Paths Forward

## Yard Trucks

- Best option near-term
- Currently available in the market
- Don’t require national infrastructure
- Captured asset
- Short term demos in California and ongoing long term test in Kansas

## Over the Road Trucks

- Longer-term focus
- Current availability is very limited
- Initial hypothesized usage is for distribution centers in densely-populated areas with shorter trips (e.g., Houston, Southern California, Northeastern U.S.)

# Fleet Electrification: Managing Adoption

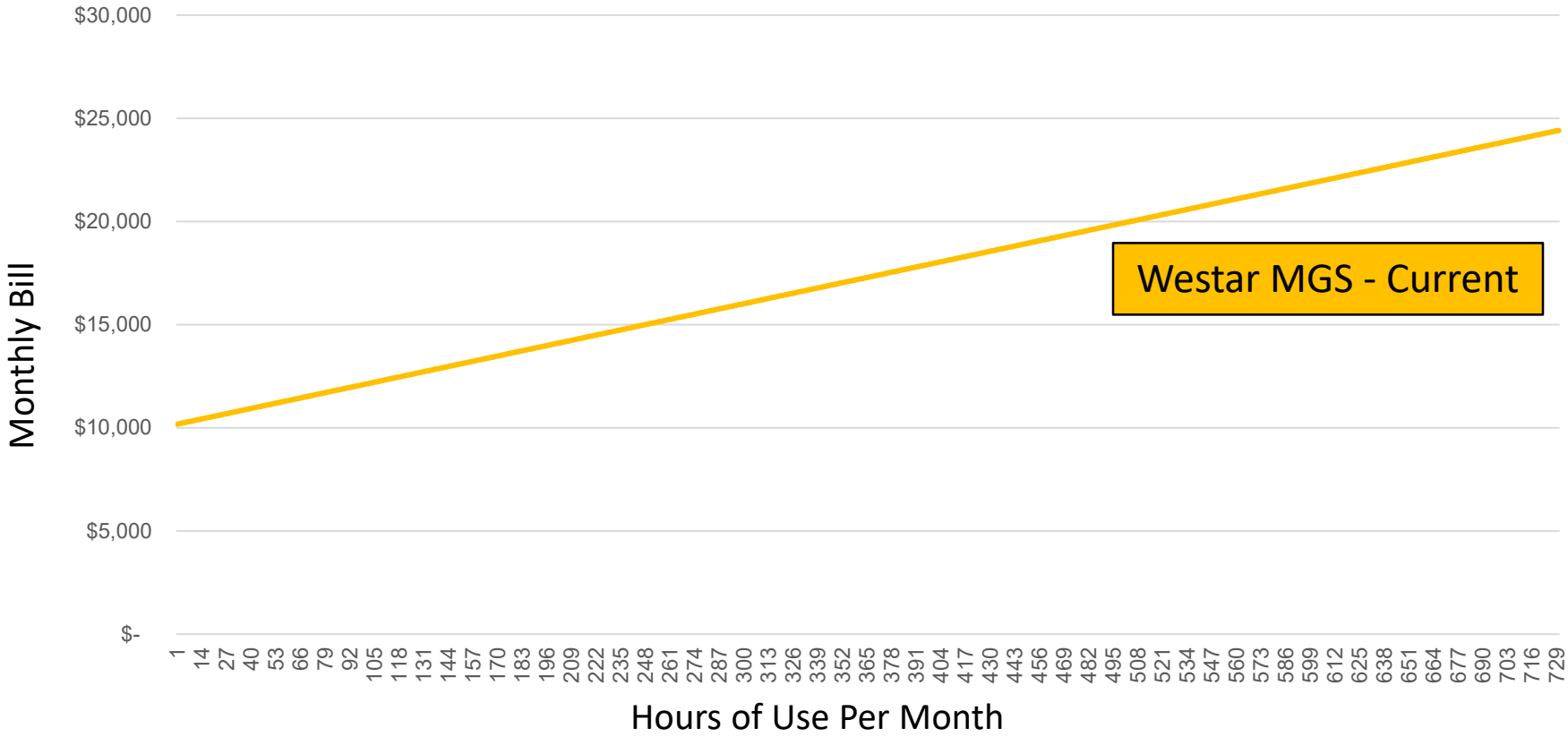
## Internal Factors

- **Our logistics operation is demanding and dynamic**
  - Real time route optimization and trucks can be out for up to 5 days
  - Can't sub-optimize routing and efficiency for charging
- **Significant incremental capital cost**
  - Electric yard trucks are 3X the cost of diesel yard trucks and OTR cost is TBD
- **Range anxiety for OTR trucks**
  - Battery range of 300 to 500 miles vs. diesel range of > 1,000 miles
- **Charge times**
  - Estimated fast-charge time of 1-1.5 hours vs. diesel fueling in 10 minutes

## External Factors

- **Standards**
  - Multiple options for chargers and power requirements are not sustainable
  - Finite space at distribution centers
- **Reliability and resiliency of the grid**
  - Electrical system uptime becomes extraordinarily critical, as an extended outage would shut down both distribution center and fleet
- **National charging network**
  - OTR requires off-site charging and must be fast and reliable
- **Utility factors**
  - Incentives for equipment and infrastructure costs
  - Rates

# Demand Charges Vs. Utilization – 500 kW Charger



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