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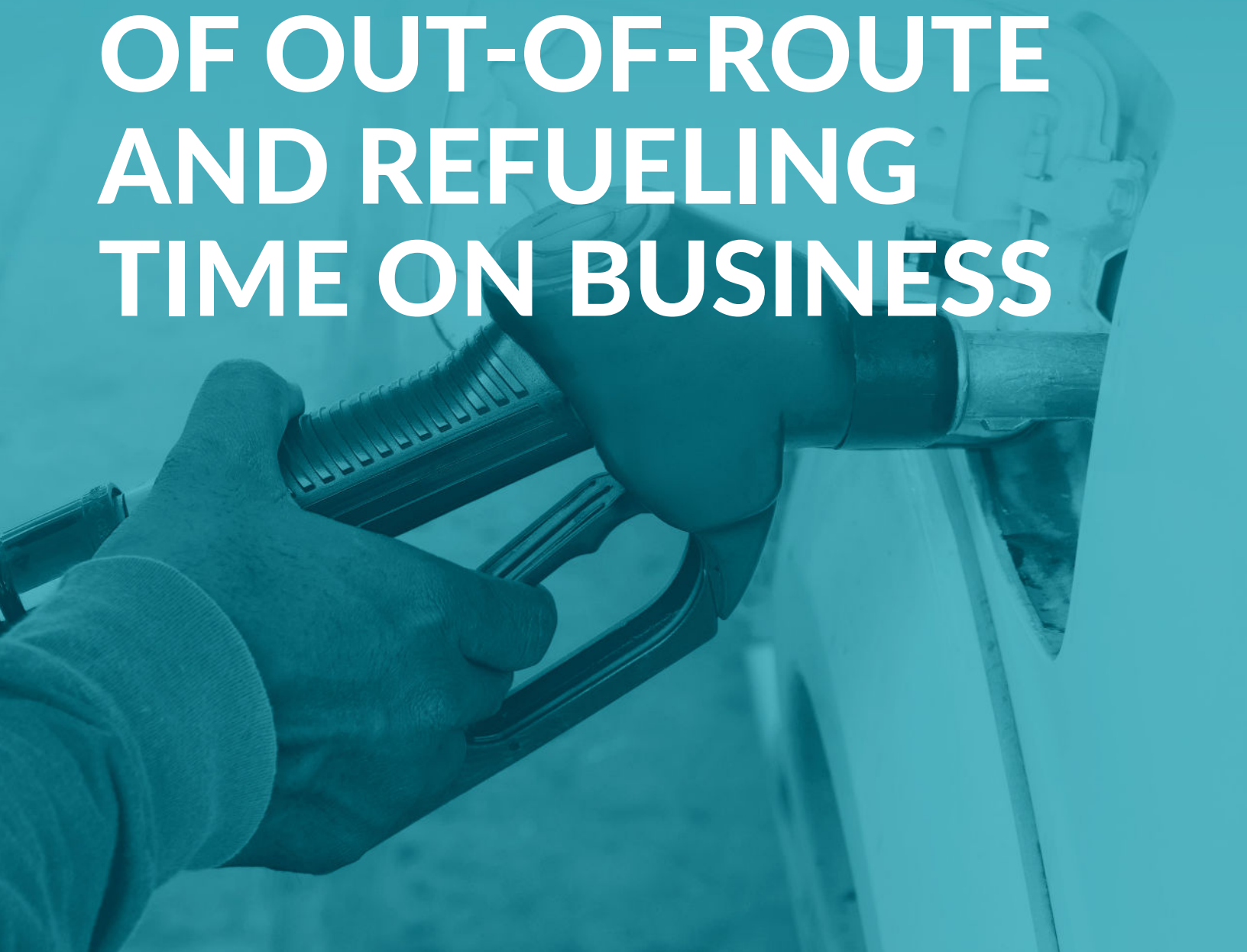
FLEET REFUELING: THE IMPACT OF OUT-OF-ROUTE AND REFUELING TIME ON BUSINESS



Fleet refueling: The impact of out-of-route and refueling time on business

Going to the gas station is a common task for fleet drivers. Some fleet operations refuel every day and others refuel just a few times each week. Some drivers have to travel miles off-route to get to the gas station, while others only drive a few hundred feet. We analyzed connected vehicle data from fleets in key markets across the United States to provide insights on the impact of fleet refueling, in order to help businesses discover areas for improvement..

Time to fuel

Each trip to the gas station requires time to get there, time to pay, time to refuel, and time to get back on route. While it is dismissed as a necessary task and part of doing business that only takes a few minutes, the true impact of refueling has yet to be explored.

Summary of our findings:

- Drivers are diverted about two miles out of the way to get gas.
- Drivers are spending about 8 minutes at the gas station each time they stop for fuel.
- Vehicles have one-third of a tank of fuel, on average, when drivers stop for gas.
- A gas station stop adds more than 20 minutes to each trip a vehicle makes for fuel.
- Gas station stops release an additional 3 pounds of CO_2 into the atmosphere monthly on average.

About the study

This detailed study was conducted by data scientists at Geotab over six months, based on insights from 14 million trips made by over 150,000 vehicles.

Many of the largest fleets in North America and around the world use Geotab data-driven solutions to improve safety, efficiency, and sustainability. Processing billions of data points every day, Geotab provides critical intelligence to lower fuel costs, reduce maintenance, and improve asset utilization. Powered by this robust ecosystem, we investigated how long the average trip to the gas station takes and its impact on businesses.

How we calculated Total Trip Time

There are two factors that go into calculating **Total Trip Time** (total amount of time spent refueling):

1. **Off-Route Time (ORT)**: time spent off-route traveling to and from the gas station; and

2. **Station Dwell Time (SDT)**: the amount of time spent at the gas station, measured by the amount of time the vehicle was idle at the station.

In this study, Total Trip Time was determined by analyzing all routes across each city, then adding actual visits to fueling stations as part of those routes. The time difference between the same route, compared to the route with the addition of a gas station stop produces an average of the Total Trip Time.

Average refueling times

Off-Route Time (ORT) averaged 8 minutes. Station Dwell Time (SDT) at gas stations was 12 minutes, on average, for all fleet vehicles. The effect of both ORT and SDT on Total Trip Time was, on average, 20 minutes across all markets.

Additionally, the average ORT for each trip was 2.2 miles. While this analysis mostly focused on the impact of fueling time, distance traveled off-route shows additional mileage that a vehicle incurs as a result of fueling at the gas station.

Refueling Times	Average Time (minutes)
Off-Route Time (ORT)	12
Station Dwell Time (SDT)	8
Total Trip Time	20

Average total trip time by region

Breaking it down by region, there is a large discrepancy in Total Trip Time with ORT having the most effect on a metro's Total Trip Time. The shortest average Total Trip Time took 11 minutes in San Jose, California, with an average ORT of 4 minutes and SDT of 7 minutes.

However, to find the metro region with the longest Total Fueling Time you don't have to leave California. Los Angeles has an SDT of 7 minutes and ORT of 21 minutes. The average Total Trip Time is 28 minutes, almost three times as long as San Jose.

City	Station Dwell Time (Minutes)	Off-Route Time (Minutes)	Total Trip Time (Minutes)
Austin	7.00	5.00	12.00
Dallas	11.00	4.00	15.00
Fort Worth	10.00	4.00	14.00

Los Angeles	7.00	21.00	28.00
San Francisco	6.00	15.00	21.00
San Jose	7.00	4.00	11.00
Seattle	8.00	7.00	15.00
Washington DC	7.00	18.00	25.00
Weighted Average	**8.00**	**12.00**	**20.00**

Distance by region and fuel optimization

In all geographies, trips to the gas station took vehicles off-route by miles. However, there is huge variability in off-route distances when we look at it by region and city. Austin drivers experience six times fewer off-route miles than Los Angeles, and eight times fewer than Washington DC. California, as a region, racks up almost three times more off-route miles than Texas.

Extrapolating these numbers over a year, a driver and their vehicle in Washington, D.C. will accumulate over 425 additional miles driving to get gas. The regional average of miles accumulated for drivers and their vehicles is between 200-250 miles annually.

While there is a difference in additional miles driven, one thing is common: drivers are not optimizing their fueling visits.

City	Average Distance Miles (With Fuel Station Stop)	Average Distance Miles (Direct Trip)	Avg Off-Route Distance (Miles)	Avg Fuel Visit Per Month (Count)	Additional Miles Driven (Monthly)
Austin	5	4.3	0.6	7.9	4.7
Dallas	5	3.7	1.2	7.6	9.1
Fort Worth	5	3.7	1.2	7.6	9.1
Los Angeles	7.4	3.7	3.7	7.5	27.8

San Francisco	4.3	1.2	3.1	10.5	32.6
San Jose	5	3.7	1.2	7.8	9.4
Seattle	5	3.1	1.9	6	11.4
Washington DC	6.8	1.9	5	7.3	36.5
Weighted Average	**6.2**	**3.75**	**2.2**	**7.7**	**17.6**

Average fuel utilization

With drivers going to the gas station an average of seven times per month and with one-third tank of gas left, drivers are making more trips to the gas station than necessary. 85% of vehicles go to the gas station with half a tank of gas remaining.

Metro Region	Avg Fuel Remaining %	Fuel Remaining% -85th Percentile	Fuel Remaining% -15th Percentile	Avg Fuel Visit Per Month (Count)
Austin	29.0	48.0	13.0	7.9
Dallas	40.0	59.0	13.0	7.6
Fort Worth	30.0	50.0	13.0	7.6
Los Angeles	30.0	49.0	20.0	7.5
San Francisco	28.0	45.0	13.0	10.5
San Jose	29.0	49.0	12.0	7.8
Seattle	34.0	54.0	14.0	6
Washington DC	31.0	51.0	14.0	7.3
Weighted Average	**29.0**	**50.0**	**13.0**	**7.7**

The long-term impact of fleet refueling

Off-Route Time (ORT) and Station Dwell Time (SDT) make the Total Trip Time to the gas station more than a quick errand. It is the cause of 2 or more hours of non-productive time a month, on average. The additional miles driven have significant ramifications, not only on vehicle wear and tear but on our environment.

Refueling also impacts fleet sustainability. Each off-route refueling trip added an average of 3.45 pounds of CO_2 monthly. In our analysis, the city with the highest amount of CO_2 output is Los Angeles with 7.06 pounds released monthly by fleet vehicles in the study. This means a 20-vehicle fleet in Los Angeles is adding an additional 74 metric tons of CO_2 into the atmosphere, the equivalent of burning 813 pounds of coal.

Metro	Avg Total Fueling Time Per Month (Minutes)	Avg Gas Station Visits Per Month (Count)	Avg Total Distance Travelled Per Month (Miles)	Gas Station Visits per 1,000 Miles	Avg Fuel Remaining
Austin	112.5	7.9	4.7	2.2	0.3
Dallas	110.0	7.6	9.1	2.2	0.3
Fort Worth	102.7	7.6	9.1	2.2	0.3
Los Angeles	209.0	7.5	27.8	2.7	0.3
San Francisco	207.6	10.5	32.6	2.8	0.3
San Jose	95.8	7.8	9.4	2.7	0.3
Seattle	86.0	6	11.4	2.3	0.3
Washington DC	177.1	7.3	36.5	2.4	0.3
Average	**137.6**	**7.7**	**17.6**	**2.7**	**0.3**

Amount of CO_2 emissions

City	Avg Fuel Used Gallons/Per Mile	Avg Total Distance (Miles)	Avg Fuel Visit Per Month (Count)	Pounds CO2 Emissions Per Vehicle, Per Month
Austin	0.07	0.6	7.9	0.74
Dallas	0.08	1.2	7.6	1.69
Los Angeles	0.11	3.7	7.5	7.06
San Francisco	0.07	3.1	10.5	5.41
San Jose	0.05	1.2	7.8	1.10
Seattle	0.05	1.9	6	1.34
Washington	0.08	5	7.3	6.78
Average	**0.07**	**2.4**	**7.7**	**3.45**

Conclusion

The deep analysis of this common task uncovers the cost of out-of-route and inefficient refueling practices to both businesses and the environment.

The time required to get to the gas station, pay, refuel, and get back on-route in addition to the number of essential and non-essential fuel stops is significant. Overall, current refueling practices are a place for potential optimization.

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