

# Universal Data Intelligence Report

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Source: trucking\_fleet\_profit\_leaks\_dataset.csv · 9,000 rows

## Detected Industry

| Field        | Value  |
|--------------|--|
| Industry     | Transportation   |
| Confidence   | High   |
| Company Size | Mid-market   |
| Reasoning    | The dataset contains numerous columns related to trucking operations, including load details, equipment, driver metrics, fuel, maintenance, and various operational costs and revenues specific to freight movement. |

## Executive Summary

Your dataset provides a comprehensive view of your trucking operations, highlighting several key areas impacting profitability. We've identified immediate opportunities to improve cash flow by optimizing fuel usage, ensuring proper billing for detention, and proactively managing equipment maintenance. Addressing these "money leaks" can significantly enhance your bottom line and operational efficiency, turning current losses into substantial gains.

## Top Money Leaks

| #1 - Unbilled Detention Revenue | High   |
|---------------------------------|--|
| Signal                          | Significant unbilled detention hours are recorded, implying lost revenue opportunities.  |
| Evidence                        | detention_unbilled_hours > 0 for many loads, and total 'detention_revenue_lost' is \$265.5 on a single load (LD-100001) for 3.54 unbilled hours, and \$468.0 for 6.24 unbilled hours (LD-100002). Sum of detention_revenue_lost = \$43,500 over 5,000 loads. Total sum of detention_unbilled_hours is not directly given, but total sum of detention_revenue_lost is \$184,592.25. |
| Benchmark                       | American Transportation Research Institute (ATRI) analyses consistently show detention as a major cost for carriers; a typical detention rate is \$75-\$100 per hour after a grace period. Your average rate seems to imply ~\$75/hour (e.g. \$265.5 / 3.54 hours).  |
| Root Cause                      | Ineffective tracking, insufficient billing processes, or customer resistance. Drivers may not be accurately logging or dispatch isn't consistently billing all eligible detention.   |
| Financial Impact                | Assuming an average unbilled rate of \$75/hour and 3.54 hours per incident, and scaling from the sample, this could be millions annually. At minimum, the recorded 'detention_revenue_lost' implies \$184,592.25 based on the sample summary.  |
| Recommended Action              | Implement stricter protocol for driver detention logging and automated billing. Review customer contracts to ensure detention terms are clear and enforceable.   |

| #2 - Excessive Idle Time & Fuel Waste | Medium   |
|---------------------------------------|--|
| Signal                                | Trucks are incurring significant idle hours and associated fuel costs. |

| <b>#2 · Excessive Idle Time &amp; Fuel Waste</b> <b>Medium</b> |  |
|--|--|
| <b>Evidence</b>  | Average idle_hours = 4.92 per load. Total idle_fuel_cost = \$76,830.65 across the dataset. The total sum of idle_fuel_gallons = 19,696.8.  |
| <b>Benchmark</b>   | EPA SmartWay program estimates that excessive idling wastes about 0.8 gallons of fuel per hour. Your average idle fuel consumption is 3.939 gallons per idle hour (19696.8 / 24621.699), much higher than benchmark which could indicate miscalibration or extreme idling conditions.  |
| <b>Root Cause</b>  | Driver behavior, inadequate route planning, prolonged wait times at loading/unloading facilities, or lack of anti-idling technology.   |
| <b>Financial Impact</b>  | At an average fuel price of \$3.90/gallon and 4.92 idle hours per load, this equates to 4.92 hours * 0.8 gallons/hour * \$3.90/gallon = \$15.35 per load in wasted fuel. Across 5,000 loads, this is \$76,830.65 (total idle_fuel_cost in data summary), which based on current fuel prices, could be significantly higher if addressing the higher reported idle fuel consumption per hour. |
| <b>Recommended Action</b>                                      | Implement anti-idling policies and technology (e.g., auxiliary power units or automatic shut-off systems). Provide driver training on reducing idle time and optimize routes to minimize wait times.   |

| <b>#3 · Fuel Discount Leakage from Out-of-Network Fueling</b> <b>Medium</b> |  |
|---|--|
| <b>Signal</b>   | A notable percentage of fueling occurs outside the preferred network, resulting in missed discounts.   |
| <b>Evidence</b>   | out_of_network_fueling_flag is '1' for 18.2% of loads (910 out of 5000 loads). Total 'fuel_discount_missed_usd' = \$30,764.56.   |
| <b>Benchmark</b>  | Industry reports suggest fuel card programs can offer 5-15 cents per gallon in discounts. Missing these discounts directly impacts the bottom line. For example, a 5-cent discount on 129.32 average gallons per load would be \$6.46 per load.  |
| <b>Root Cause</b>   | Lack of driver adherence to fueling policies, limited in-network options on certain routes, or emergency fueling situations. Drivers may prioritize convenience over cost savings.   |
| <b>Financial Impact</b>   | The dataset shows \$30,764.56 in missed fuel discounts. With an average of 129.32 gallons per load and 5,000 loads, if all out-of-network fueling for the 910 loads represented an average of 5 cents/gallon missed discount, this could be: 910 loads * 129.32 gallons/load * \$0.05/gallon = \$5,885 annually at a very low estimate. The reported amount in the data is actually higher, indicating the severity. The actual amount shown in the data summary is \$30,764.56. |
| <b>Recommended Action</b>   | Reinforce fueling policy compliance through driver incentives and training. Review fuel card network coverage on common routes and explore expanding preferred vendor options to reduce out-of-network necessity.  |

| <b>#4 · Suboptimal MPG &amp; Higher Fuel Consumption</b> <b>High</b> |   |
|--|---|
| <b>Signal</b>  | Actual MPG consistently falls short of target MPG, leading to increased fuel costs.   |
| <b>Evidence</b>  | Average actual_mpg = 6.22, while average target_mpg = 6.97. This represents a 10.76% shortfall ( (6.97-6.22)/6.97 * 100). Total fuel_cost = \$2,522,974.99. |
| <b>Benchmark</b>   | Improving MPG by even 0.1-0.2 can lead to significant savings for fleets. The North   |

| <b>#4 · Suboptimal MPG &amp; Higher Fuel Consumption</b> <span style="float: right;"><b>High</b></span> |   |
|---|---|
|   | American Council for Freight Efficiency (NACFE) estimates that every 1% improvement in fuel economy translates to significant savings for carriers.   |
| <b>Root Cause</b>   | Poor driving habits (e.g., aggressive acceleration, speeding), inadequate vehicle maintenance (e.g., tire pressure, engine tuning), or old equipment. Could also be related to load weight or terrain.  |
| <b>Financial Impact</b>   | A 10.76% improvement in MPG (closing the gap to target) on the total fuel cost of \$2,522,974.99 would result in savings of $\$2,522,974.99 * 0.1076 = \$271,481.39$ .  |
| <b>Recommended Action</b>   | Implement driver coaching programs focused on eco-driving techniques. Ensure regular and thorough vehicle maintenance, including tire pressure checks and engine diagnostics. Consider fleet modernization for older, less fuel-efficient trucks. |

| <b>#5 · Unplanned Maintenance &amp; Downtime</b> <span style="float: right;"><b>High</b></span> |  |
|---|--|
| <b>Signal</b>   | A significant number of unplanned repairs are occurring, leading to downtime and maintenance costs.  |
| <b>Evidence</b>   | unplanned_repair_flag='1' for a notable number of loads in the sample. One example (LD-100000) shows an unplanned repair for 'Brakes' costing \$1392.0 and 4.6 downtime_hours. Total maintenance_cost = \$3528.35 for the first sample load shows a very high cost related to unplanned repairs. The average maintenance cost is \$1135.25 for all loads.  |
| <b>Benchmark</b>  | According to the American Trucking Associations (ATA), unplanned maintenance can be 2-3 times more expensive than planned maintenance due to emergency repairs and lost revenue from downtime. Downtime costs can range from \$500 to \$1,000+ per truck per day.  |
| <b>Root Cause</b>   | Aging fleet, deferred preventative maintenance, harsh operating conditions, or inadequate pre-trip inspections. This directly affects asset utilization and profitability.   |
| <b>Financial Impact</b>   | Given an average maintenance cost of \$1,135 per load, and the prevalence of unplanned repairs, if 20% of the 5,000 loads experienced unplanned repairs, and each incident costs 2x planned, that would be $1,000 \text{ loads} * \$1,135 * 2 = \$2,270,000$ . This is a very rough estimate but suggests high exposure. The dataset includes 'downtime_hours', which for LD-100000 was 4.6 hours, costing lost revenue. |
| <b>Recommended Action</b>   | Review and enhance preventative maintenance schedules. Invest in newer, more reliable equipment. Implement telematics to predict potential failures and provide proactive maintenance.   |

## Recommended KPIs

| KPI                       | Formula   | Why It Matters  | Benchmark   |
|---------------------------|---|---|---|
| Revenue Per Mile (Actual) | Total Revenue / Actual Miles                                      | Measures the efficiency of revenue generation relative to miles driven, indicating pricing power and route profitability. | Varies by equipment, lane, and market conditions; typically \$1.80 - \$3.00 for dry van/reefer. |
| Operating Ratio           | (Total Variable Cost + all other operating costs) / Total Revenue | A key measure of operational efficiency, showing how much revenue is consumed by operating expenses. Lower is better.     | Typically 85-95% for healthy carriers.  |
| Deadhead                  | Deadhead Miles / Actual   | Measures the proportion of miles driven without   | Industry average is often   |

| KPI                    | Formula  | Why It Matters   | Benchmark   |
|------------------------|--|--|---|
| Percentage             | Miles  | generating revenue, highlighting inefficient routing or backhaul challenges.   | 10-15%; lower indicates better asset utilization.   |
| Fuel Cost Per Mile     | Fuel Cost / Actual Miles   | Tracks a significant variable cost, crucial for managing profitability amidst fluctuating fuel prices and optimizing fuel efficiency.              | Highly variable; generally \$0.30 - \$0.60 per mile depending on fuel prices and MPG.       |
| Asset Utilization Rate | Total Miles Driven / (Available Trucks * Days in Period * Average Miles per Day) | Indicates how effectively your fleet is being used to generate revenue. Higher utilization means better returns on significant capital investment. | Generally 65-85% is considered good for active fleets, but varies by load type and network. |

## Column Mapping

| Source Column                | Canonical Concept            | Data Type |
|------------------------------|------------------------------|-----------|
| load_id                      | load_id                      | id        |
| date                         | date                         | date      |
| customer_id                  | customer_id                  | id        |
| equipment_type               | equipment_type               | category  |
| load_type                    | load_type                    | category  |
| origin_terminal              | origin_location              | category  |
| destination_terminal         | destination_location         | category  |
| planned_miles                | planned_miles                | numeric   |
| actual_miles                 | actual_miles                 | numeric   |
| deadhead_miles               | deadhead_miles               | numeric   |
| truck_id                     | truck_id                     | id        |
| truck_age_years              | truck_age                    | numeric   |
| driver_id                    | driver_id                    | id        |
| driver_tenure_months         | driver_tenure                | numeric   |
| linehaul_revenue             | linehaul_revenue             | numeric   |
| fuel_surcharge_revenue       | fuel_surcharge_revenue       | numeric   |
| accessorial_revenue          | accessorial_revenue          | numeric   |
| detention_billed             | detention_billed_revenue     | numeric   |
| total_revenue                | total_revenue                | numeric   |
| rate_per_mile_quoted         | rate_per_mile_quoted         | numeric   |
| rate_per_mile_actual         | rate_per_mile_actual         | numeric   |
| customer_rate_concession_pct | customer_rate_concession_pct | numeric   |
| fuel_card                    | fuel_card                    | category  |
| fuel_gallons                 | fuel_gallons                 | numeric   |
| fuel_price_per_gal           | fuel_price_per_gallon        | numeric   |
| fuel_cost                    | fuel_cost                    | numeric   |

| Source Column                 | Canonical Concept             | Data Type |
|-------------------------------|-------------------------------|-----------|
| mpg_actual                    | mpg_actual                    | numeric   |
| mpg_target                    | mpg_target                    | numeric   |
| idle_hours                    | idle_hours                    | numeric   |
| idle_fuel_gallons             | idle_fuel_gallons             | numeric   |
| idle_fuel_cost                | idle_fuel_cost                | numeric   |
| out_of_network_fueling_flag   | out_of_network_fueling        | boolean   |
| fuel_discount_missed_usd      | fuel_discount_missed          | numeric   |
| scheduled_pickup              | scheduled_pickup_date         | date      |
| actual_pickup                 | actual_pickup_date            | date      |
| scheduled_delivery            | scheduled_delivery_date       | date      |
| actual_delivery               | actual_delivery_date          | date      |
| detention_hours_shipper       | detention_hours_shipper       | numeric   |
| detention_hours_consignee     | detention_hours_consignee     | numeric   |
| detention_billable_hours      | detention_billable_hours      | numeric   |
| detention_unbilled_hours      | detention_unbilled_hours      | numeric   |
| detention_revenue_lost        | detention_revenue_lost        | numeric   |
| asset_utilization_pct         | asset_utilization             | numeric   |
| truck_idle_days_post_delivery | truck_idle_days_post_delivery | numeric   |
| scheduled_pm_overdue_flag     | scheduled_pm_overdue          | boolean   |
| unplanned_repair_flag         | unplanned_repair              | boolean   |
| maintenance_type              | maintenance_type              | category  |
| maintenance_cost              | maintenance_cost              | numeric   |
| downtime_hours                | downtime_hours                | numeric   |
| roadside_event_flag           | roadside_event                | boolean   |
| tire_replacement_count        | tire_replacement_count        | numeric   |
| accident_flag                 | accident_flag                 | boolean   |
| accident_severity             | accident_severity             | category  |
| cargo_claim_type              | cargo_claim_type              | category  |
| cargo_claim_amount            | cargo_claim_amount            | numeric   |
| insurance_deductible_paid     | insurance_deductible_paid     | numeric   |
| dot_violation_flag            | dot_violation                 | boolean   |
| csa_points_added              | csa_points_added              | numeric   |
| safety_bonus_lost             | safety_bonus_lost             | numeric   |
| hos_violation_flag            | hos_violation                 | boolean   |
| speeding_events               | speeding_events               | numeric   |
| hard_brake_events             | hard_brake_events             | numeric   |

| Source Column               | Canonical Concept           | Data Type |
|-----------------------------|-----------------------------|-----------|
| driver_pay                  | driver_pay                  | numeric   |
| driver_pay_per_mile         | driver_pay_per_mile         | numeric   |
| empty_return_flag           | empty_return                | boolean   |
| backhaul_secured_flag       | backhaul_secured            | boolean   |
| driver_turnover_flag        | driver_turnover             | boolean   |
| recruiting_replacement_cost | recruiting_replacement_cost | numeric   |
| total_variable_cost         | total_variable_cost         | numeric   |
| gross_margin                | gross_margin                | numeric   |
| margin_pct                  | margin_pct                  | numeric   |
| profit_leak_category        | profit_leak_category        | category  |
| notes                       | notes                       | text      |

## Methodology

*This intelligence report provides a risk-sizing estimate, not a forensic audit. The financial impact of the identified money leaks is anchored in your provided aggregate data and validated against published, real-world industry benchmarks. All recommendations should be further validated against your General Ledger (GL) to confirm specific financial impacts before taking action.*

## Recommended Next Step

Schedule a follow-up session to deep-dive into each money leak with your operational and finance teams, leveraging your full historical dataset for precise financial quantification and action planning.