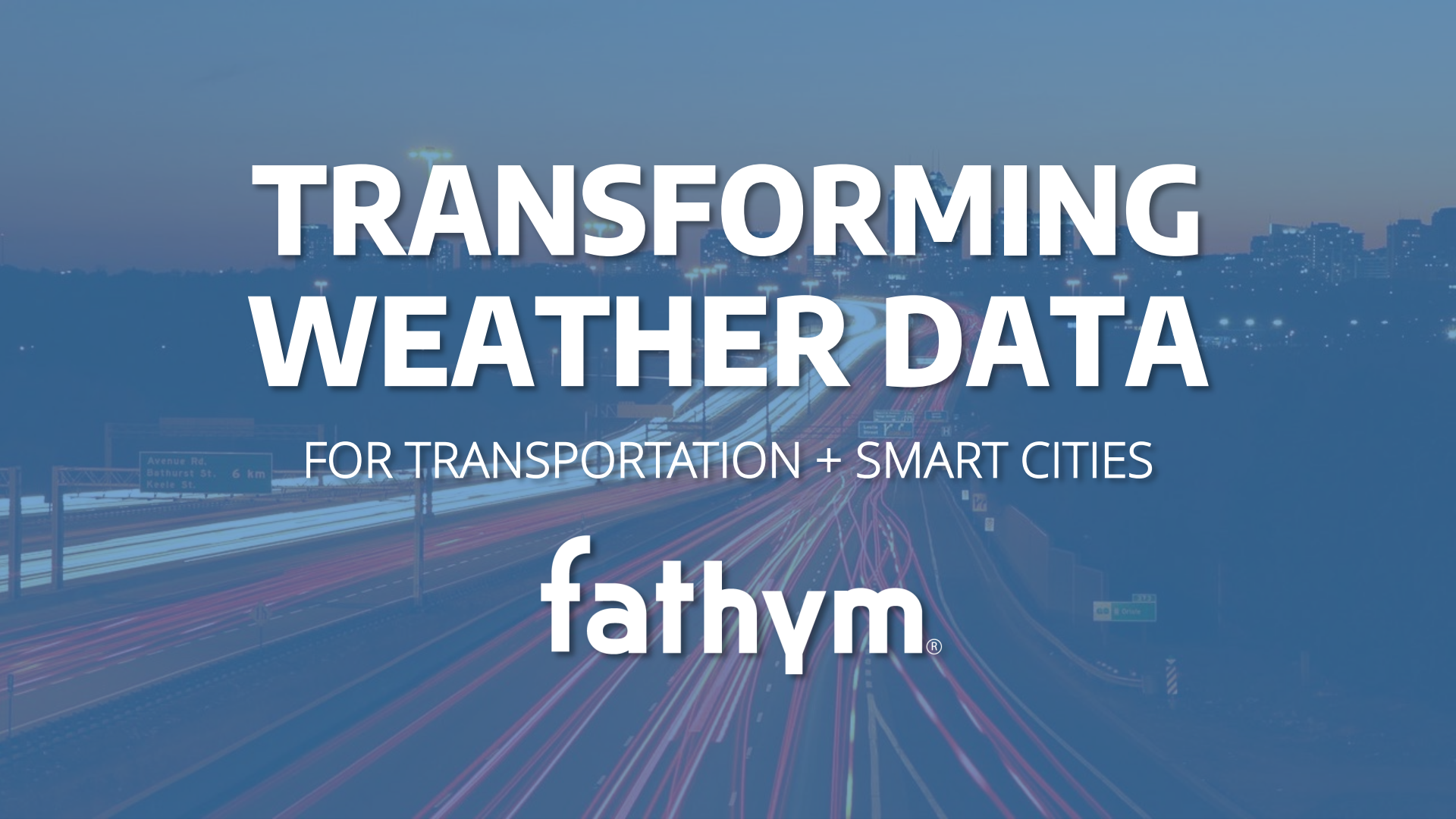
TRANSFORMING
WEATHER DATA
FOR TRANSPORTATION + SMART CITIES
fathym®

# FATHYM COMPANY OVERVIEW

Fathym's Low-Code Framework empowers developers of all skill levels to rapidly and collaboratively build data applications that optimize businesses and fuel the Internet of Things.

Fathym accelerates enterprise digital transformation through a visual toolset to enable cloud provisioning, data flow and modular app development.

- Created: 2014
- Locations: Boulder | Berlin

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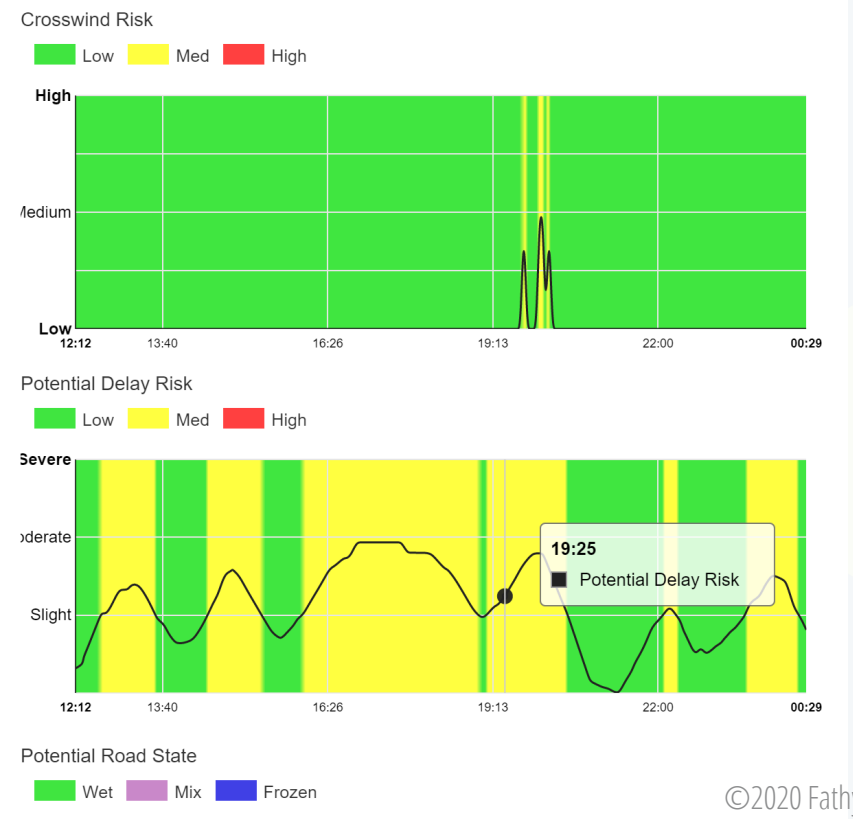
Surface Weather Forecast

The Fathym Forecaster combines the world's best weather forecasts with statistics-based, machine-learning techniques to tackle the largest datasets, including road weather.

# FATHYM FORECAST OVERVIEW




- **Global** Forecast Service blends sensor data from additional third-party sensor sources, such as RWIS and METARs, with atmospheric models
  - A suite of software products and platform allows for the rapid creation of data dashboards (real-time monitoring, asset tracking, hind casts), data management and alerts
  - Point and Route forecasts available via dashboards, API or our robust partner network

# FATHYM FORECASTS + ROUTES

**Points Nowcast/Forecast** - Global location-specific weather and road-weather forecast data

**Points Plus Nowcast/Forecast** – Points data tuned with observational data

**Routes** - Road weather-specific routing using Points and Points Plus forecast data

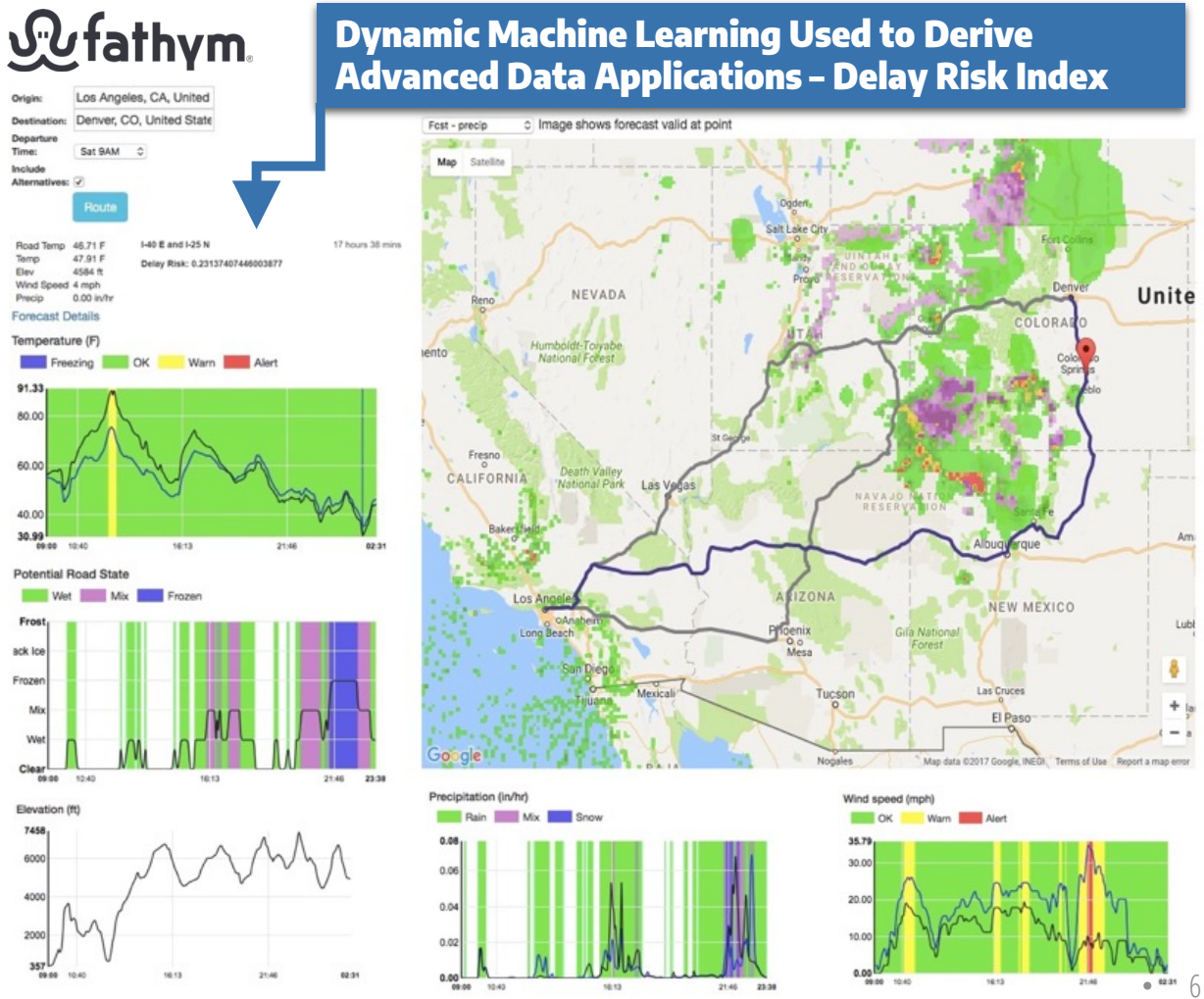
**Tiles** – Atmospheric and road weather visualizations; both gridded and road network

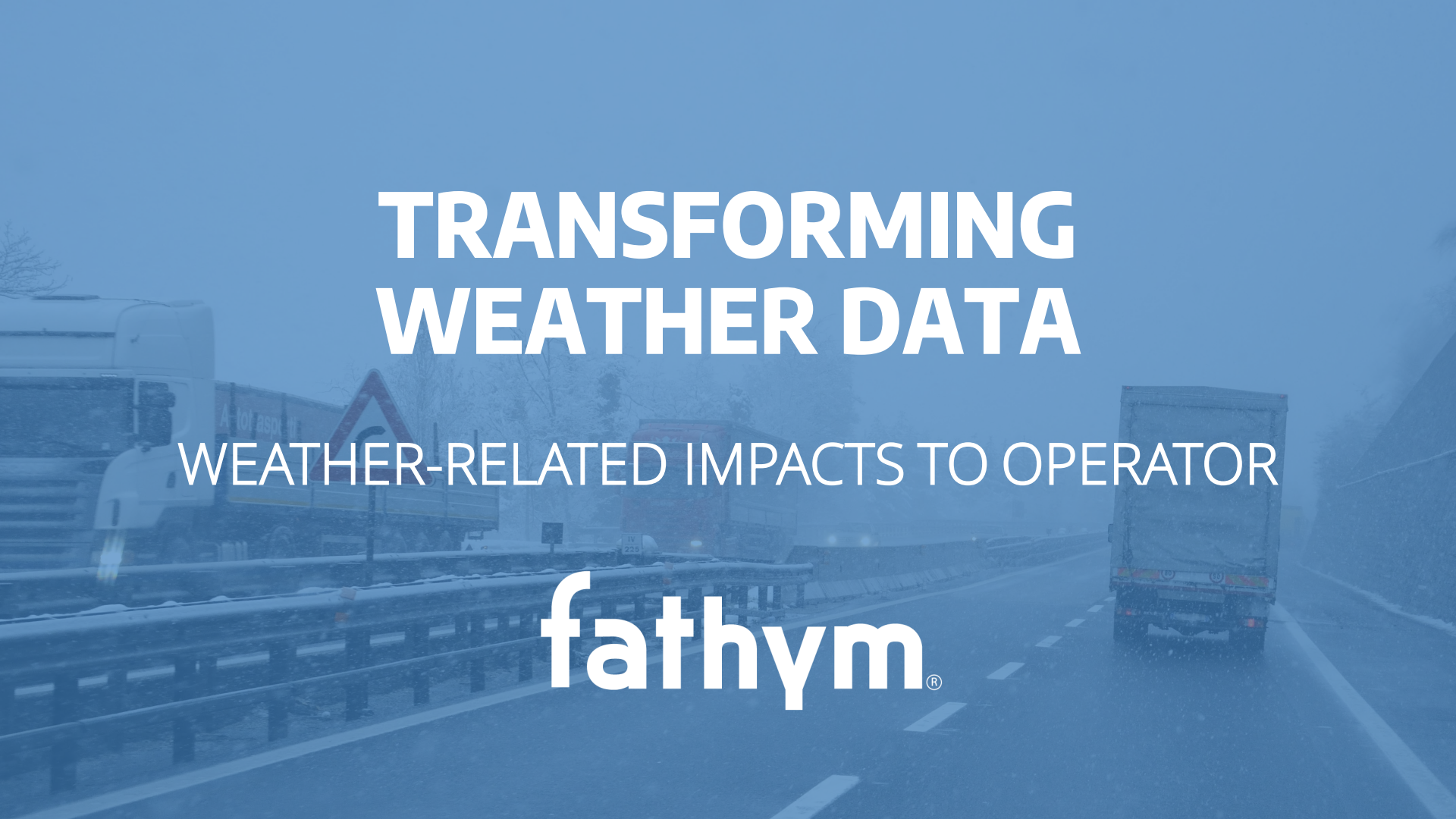
**Points Historic** – Historical lookback of observations, forecasts and visualizations

**Data Integration** – Flexible, scalable, balanced analytics back-end capable of integrating additional datasets

**Web Services** – Easily accessible APIs for JSON, CSV or XML data

## Dynamic Machine Learning Used to Derive Advanced Data Applications – Delay Risk Index





# TRANSFORMING WEATHER DATA

## WEATHER-RELATED IMPACTS TO OPERATOR

fathym®

# WEATHER IMPACTS ON TRUCKING INDUSTRY

4.6% of trucking hours are affected

$9B lost annually due to delays

$30M is lost per $2B in revenue due to delays

18-23% of large truck accidents occur during poor **weather** conditions

- Heavy rain
- Snow
- Poor visibility
- High winds

## Average Cost/Accident

- Property damage: $148.2K
- At least one injury: $335K
- At least one fatality: $7.2M

## Fuel Burn

- Unnecessary idle time savings:
  - 1 hour/week/year saves ~$1M fleetwide

# WEATHER-RELATED ACCIDENT STATISTICS – MEDIUM/HEAVY TRUCKS

- FMCA study found that 13.3% of Large truck-involved accidents were in adverse weather conditions (e.g. heavy rain, snow, low-visibility)
- Same studies found that 17.9% of Large truck-involved accidents were in poor road conditions (wet roads, icy roads)

Average Yearly US-wide Number of Medium/Heavy Truck Accident by Severity

| Severity | Numbers of Accidents (Approximate) | Cost to Industry |
|---|---|---|
| Property Damage Only | 59,000 | $8.5B |
| At Least One Injury (No Fatality) | 15,000 | $5.0B |
| At Least One Fatality | 650 | $4.5B |
| Total | 74,650 | $18B |

*Source: https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2015#A3*

# WEATHER-RELATED ACCIDENT STATISTICS – CASE STUDY – WERNER TRUCKING COMPANY


## 2 Year Study of Truck Accidents by Severity

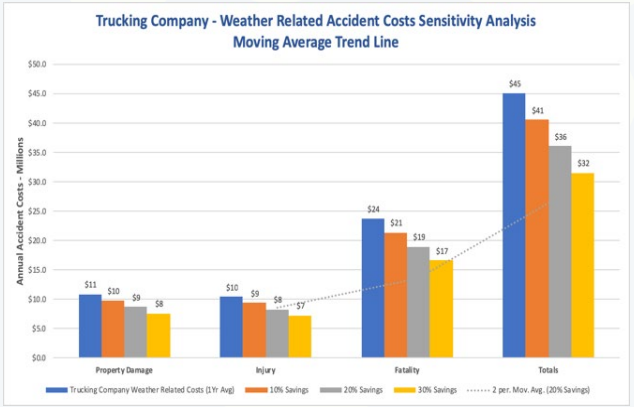
| Severity | Numbers | Estimated Cost |
|---|---|---|
| Property Damage Only | 668 | $101M |
| At Least One Injury (No Fatality) | 286 | $94M |
| At Least One Fatality | 30 | $210M |
| Total | 994 | $405M |

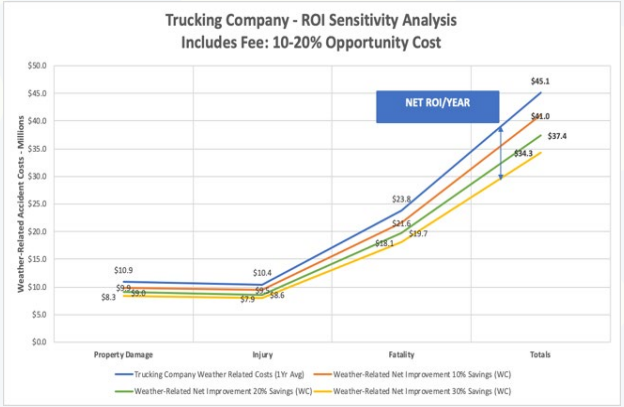
*Source: https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2015#A3*

# WEATHER-RELATED ACCIDENT STATISTICS – CASE STUDY – WERNER TRUCKING COMPANY

## Estimated Weather-Induced Accidents by Severity

| Accident ROI Case Study | Accident Severity | Cost/Accident | Trucking Company Reported Accidents (2 Yr Period) | Trucking Company Total Accident Costs (2 Yr Period) | Weather Related Costs (22%) (2 Yr Period) | Trucking Company Weather Related Costs (1Yr Avg) |
|---|---|---|---|---|---|---|
| | Property Damage | $ 148,279 | 668 | $ 99,050,372 | $ 21,791,082 | $ 10,895,541 |
| | Injury | $ 331,108 | 286 | $ 94,696,888 | $ 20,833,315 | $ 10,416,658 |
| | Fatality | $ 7,200,310 | 30 | $ 216,009,300 | $ 47,522,046 | $ 23,761,023 |
| | **Totals** | | **984** | **$ 409,756,560** | **$ 90,146,443** | **$ 45,073,222** |




| Cost Savings / % Improvement in Road Weather Conditions | | |
|---|---|---|
| 10% | $ | (4,507,322) |
| 15% | $ | (6,760,983) |
| 20% | $ | (9,014,644) |
| 25% | $ | (11,268,305) |
| 30% | $ | (13,521,966) |

* Incremental Decrease from Base Cost

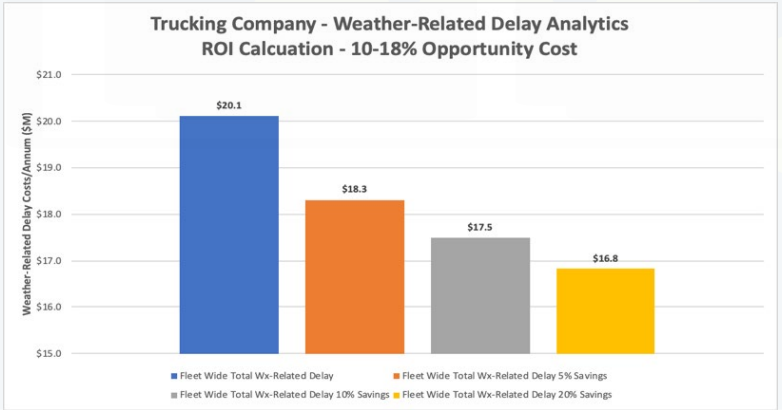
| ROI Calculation | 10% Savings/Yr | 20% Savings/Yr | 30% Savings/Yr |
|---|---|---|---|
| Net Dollars Saved | $ 4,056,590 | $ 7,662,448 | $ 10,817,573 |
| ROI % | 900% | 567% | 400% |

# WEATHER-RELATED ACCIDENT ETA ANALYSIS – CASE STUDY – WERNER TRUCKING COMPANY

## Trucking Company – Weather-Related Delay/Shift

| ETA ROI Case Study | Average Shift Time (Hours) | Average Shift Time (Min) | Weather-Related Delay/Shift (Min) | Dollars/Shift (Estimate) | Dollars/Minute (Estimate) | Weather-Related Delay Cost/Shift | Trucking Fleet Quantity | Fleet-Wide Weather-Related Delay/Day | Fleet-Wide Weather-Related Delay/Annum |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 420 | 21 | $ 800 | $ 0.53 | $ 11.03 | 5,000 | $ 55,125 | $ 20,120,625 |

| Sensitivity Analysis | Wx-Related Savings/Shift | Wx-Related Savings/Shift (Min) | Dollars/Shift (Estimate) | Dollars/Minute (Estimate) | Wx-Related Cost Reduction/Shift | Trucking Fleet Quantity | Total Wx-Related Delays Savings/Day | Total Wx-Related Delay Savings/Annum |
|---|---|---|---|---|---|---|---|---|
| | 10% | 18.90 | $ 800 | $ 0.53 | $ 9.92 | 5,000 | $ 49,613 | $ 18,108,562.50 |
| | 15% | 17.85 | | | $ 9.37 | 5,000 | $ 46,856 | $ 17,102,531.25 |
| | 20% | 16.80 | | | $ 8.82 | 5,000 | $ 44,100 | $ 16,096,500.00 |




| Cost Savings / % Reduction in Weather-Related Delay | | |
|---|---|---|
| 10% | $ | (2,012,063) |
| 15% | $ | (3,018,094) |
| 20% | $ | (4,024,125) |

| Net Savings ($) | Opportunity Cost | Notional Fee ($M) | ETA Savings / Year ROI $M | ROI % |
|---|---|---|---|---|
| 10% Net Savings | 10% | $ 0.20 | $ 1.81 | 900% |
| 15% Net Savings | 13% | $ 0.39 | $ 2.63 | 669% |
| 20% Net Savings | 18% | $ 0.72 | $ 3.30 | 456% |

# CONTACT US

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