**Truce Transparency Platform : Enhancing Shipper Visibility and Negotiation Power**

This software solution aims to empower shippers by centralizing and analyzing freight transportation data, offering actionable insights, and facilitating more informed decision-making.

**I. Data Ingestion & Management**

* **Broker Integration:**
  + **Ingestion:** Accept data provided by brokers. Mechanisms include email attachment as well as file server (file transfer protocol)
  + **Data Mapping & Transformation:** Robust mechanisms to map heterogeneous data fields from different TMS used by brokers to a standardized internal schema, including data cleansing and validation.
  + **Incremental Updates:** Efficient handling of new and updated shipment records from brokers.
* **Core Data Elements Capture:**
  + **Shipment Details:**
    - **Lane Information:** Origin (city, state, zip), Destination (city, state, zip).
    - **Timestamps (Granular):**
      * Load Creation Date/Time
      * Load Activation Date/Time
      * Carrier Assignment Date/Time
      * Origin Arrival Date/Time
      * Origin Open Date/Time
      * Origin Close Date/Time
      * Destination Arrival Date/Time
      * Destination Open Date/Time
      * Destination Close Date/Time
    - **Financials:**
      * Revenue (total, broken down by base freight, accessorial charges, fuel surcharges).
      * *Optional (if provided by broker):* Carrier cost, allowing for margin calculation.
    - **Load Characteristics:**
      * Type of Vehicle (e.g., Dry Van, Reefer, Flatbed, Hazmat)
      * Load Type (FCL - Full Container Load/FTL - Full Truck Load, LCL - Less than Container Load/LTL - Less than Truck Load)
      * Weight, Dimensions (if available)
      * Product Category
  + **Broker Identification:** Unique identifier for each participating broker.

**II. Performance Scoring & Metrics**

* **Broker Performance Scorecard:**
  + **On-Time Performance:**
    - Percentage of shipments delivered within agreed-upon delivery window.
    - Analysis of delays at various stages (origin, transit, destination).
    - Average delay times by broker, lane, and load type.
  + **Cost Efficiency:**
    - Average cost per mile/load by broker, lane, vehicle type, and load type.
    - Comparison of costs against market averages (if external market data is integrated).
  + **Service Quality:**
    - Number of incidents reported (e.g., damages, lost shipments – if such data can be captured).
    - Responsiveness (e.g., time from load creation to carrier assignment).
  + **Margin Visibility (if data is available):** Average margin percentage by broker, allowing shippers to understand potential overheads.
* **Lane Performance Analysis:**
  + Average transit time per lane.
  + Cost trends for specific lanes over time.
  + Identification of problematic lanes (high delays, high costs).
* **Carrier Performance (derived from broker data):**
  + While direct carrier data might be limited, the system can infer carrier performance based on the broker's assigned carriers for specific shipments (e.g., on-time delivery rates for carriers frequently used by a broker).

**III. Predictive Analytics & Machine Learning**

* **Lane Price Prediction:**
  + **Model Training:** Utilize historical shipment data (lanes, dates, load characteristics, actual costs) to train machine learning models (e.g., Regression models like Random Forest, Gradient Boosting, Neural Networks).
  + **Input Parameters:** Source/Destination, desired delivery date, vehicle type, load type, weight/dimensions.
  + **Output:** Predicted price range or estimated cost for a new shipment on a given lane.
  + **Confidence Score:** Provide a confidence level for the prediction.
  + **Feature Importance:** Highlight factors most influencing the predicted price.
* **Transit Time Prediction:**
  + Predict estimated transit times for new shipments based on historical data, factoring in lane, load type, and potentially weather or traffic data (if integrated).
* **Anomaly Detection:**
  + Identify unusual cost spikes or significant delays that deviate from historical norms.

**IV. Reporting & Visualization (Business Intelligence)**

* **Interactive Dashboards:**
  + **Executive Summary:** High-level overview of overall freight spent, on-time performance, and top/bottom performing brokers.
  + **Broker Performance Dashboard:** Detailed views of individual broker performance scores, trends, and comparisons against other brokers.
  + **Lane Performance Dashboard:** Drill-down into specific lane performance, including costs, transit times, and historical trends.
  + **Shipment Detail View:** Ability to view individual shipment records with all associated data.
* **Customizable Reports:**
  + Allow users to generate custom reports based on various filters (e.g., by date range, broker, lane, vehicle type, load type).
  + Export functionality (CSV, Excel, PDF).
* **Slice and Dice / Drill-Down Capabilities:**
  + Enable users to dynamically filter and segment data (e.g., view performance for reefer loads only, or shipments to a specific region).
  + Drill down from high-level summaries to individual shipment details.
* **Trend Analysis:**
  + Historical graphs and charts to visualize trends in costs, transit times, and performance metrics over time.

**V. User Interface & Experience (UI/UX)**

* **Intuitive & User-Friendly Interface:** Clean design, easy navigation, and clear data presentation.
* **Search & Filtering:** Powerful search capabilities for shipments, brokers, and lanes. Advanced filtering options.
* **Alerts & Notifications:**
  + Configurable alerts for significant delays, cost overruns, or underperforming brokers.