Public Transport Optimization

Abstract

To optimize public transport routes, we use specialized transport models that reflect current or projected transport demand. Existing passenger flows are primarily used for model calibration, not as the main data source for optimization

Transportation optimization helps shippers, 3PLs, and transportation consultants analyze shipments, rates, and constraints to produce realistic load plans that reduce overall freight spend. "Companies are being asked to deliver more frequently and in smaller batches.

Transportation optimization software helps reduce the underlying cost of cartage leading to substantially better outcomes across companies and industries

1.index.html

```
 <!DOCTYPE html>

<html>

<head>

  <title>Public Transport Optimization</title>

  <link rel="stylesheet" type="text/css" href="styles.css">

  <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css"

  integrity="sha512-
xodZBNTC5n17Xt2atTPuE1HxjVMSvLVW9ocqUKLsCC5CXdbqCmblAshOMAS6/keqq/sMZMZ19sc
R4PsZChSR7A=="

  crossorigin="" />

<link rel="stylesheet" href="https://unpkg.com/leaflet-control-
geocoder/dist/Control.Geocoder.css" />

<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css"
rel="stylesheet">

<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstrap.bundle.min.js"></script>

</head>
```

```html
<body>
  <header>
    <h1>Public Transport Optimization</h1>
  </header>
  <main>

    <h1 class="text-center">Transport  Location & Information</h1>
    <div id="map1" class="row">
    <div id="bus-info" class="col-md-3">
      <h2>Bus Information</h2>
      <p>Bus Number: <span id="bus-number">TN-2434</span></p>
      <p>Bus Name: <span id="bus-number">SETC</span></p>
      <p>Arrival Time: <span id="arrival-time">5 minutes</span></p>
      <p>Riders on Board: <span id="riders-on-board">25</span></p>
      <a href="#map" class="btn btn-primary">Location</a>
    </div>
    <div id="bus-info" class="col-md-3">
      <h2>car Information</h2>
      <p>car Name: <span id="bus-number">BMW</span></p>
      <p>car Number: <span id="bus-number">233</span></p>
      <p>Arrival Time: <span id="arrival-time">5 minutes</span></p>
      <p>Riders on Board: <span id="riders-on-board">25</span></p>
      <a href="#map" class="btn btn-primary">Location</a>
    </div>
    <div id="bus-info" class="col-md-3">
      <h2>Bike Information</h2>
      <p>Bike Name: <span id="bus-number">DUKE</span></p>
```

```html
        <p>Bike Number: <span id="bus-number">TN AK -3453</span></p>

        <p>Arrival Time: <span id="arrival-time">5 minutes</span></p>

        <p>Riders on Board: <span id="riders-on-board">25</span></p>

        <a href="#map" class="btn btn-primary">Location</a>

      </div>

    </div>

      <div id="map" class="mt-5"></div>

      <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js"

        integrity="sha512-
XQoYMqMTK8LvdxXYG3nZ448hOEQiglfqkJs1NOQV44cWnUrBc8PkAOcXy20w0vlaXaVUearIOBhi
XZ5V3ynxwA=="

        crossorigin=""></script>

      <script src="https://unpkg.com/leaflet-control-
geocoder/dist/Control.Geocoder.js"></script>

    </main>


    <script src="script.js"></script>
</body>
</html>
```

2.style.css

```css
body {

    font-family: Arial, sans-serif;

    margin: 0;

    padding: 0;

    background-color: #f0f0f0;

}
```

```css
header {
    background-color: #007bff;
    color: white;
    text-align: center;
    padding: 20px;
}

h1{
    padding: 20px;
    margin-left: 70px;
}

main {
    max-width:100%;
    margin: 20px auto;
    background-color: white;
    padding: 20px;
    border: 1px solid #ccc;
    border-radius: 5px;
}

#bus-info {
    border: 1px solid #ddd;
    margin: 10px 10px;
    float: left;
}
```

```css
#map {
    width: 100%;
    height: 50vh;
}
```

3.script.js

```javascript
document.addEventListener("DOMContentLoaded", function () {
    const busNumberElement = document.getElementById("bus-number");

    const arrivalTimeElement = document.getElementById("arrival-time");

    const ridersOnBoardElement = document.getElementById("riders-on-board");


    function updateBusInfo() {
        // Simulate real-time data updates (replace with actual data from sensors or APIs)
        const busData = {
            busNumber: "456",
            arrivalTime: "2 minutes",
            ridersOnBoard: 30,
        };


        // Update the HTML content with the live data
        busNumberElement.textContent = busData.busNumber;
        arrivalTimeElement.textContent = busData.arrivalTime;
        ridersOnBoardElement.textContent = busData.ridersOnBoard;
    }
```

```javascript
    // Simulate real-time updates every 15 seconds

    setInterval(updateBusInfo, 5000);


    // Set up Mapbox

    mapboxgl.accessToken = 'YOUR_MAPBOX_ACCESS_TOKEN'; // Replace with your Mapbox
access token

    const map = new mapboxgl.Map({

        container: 'map1',

        style: 'mapbox://styles/mapbox/streets-v11',

        center: [-73.985349, 40.748817], // Initial center coordinates (longitude, latitude)

        zoom: 12, // Initial zoom level

    });


    // Simulate bus location

    let busLocation = [-73.985349, 40.748817]; // Initial bus location


    function updateBusLocation() {

        // Simulate bus movement (replace with actual bus location data)

        busLocation = [busLocation[0] + 0.001, busLocation[1] + 0.001]; // Update bus coordinates

        const busMarker = new mapboxgl.Marker().setLngLat(busLocation).addTo(map);

    }


    // Simulate real-time bus location updates every 15 seconds

    setInterval(updateBusLocation, 15000);


    // Initial data update
```

```javascript
    updateBusInfo();

    updateBusLocation();

});


const x = document.getElementById("demo");


function getLocation() {
  if (navigator.geolocation) {
    navigator.geolocation.watchPosition(showPosition);
  } else {
    x.innerHTML = "Geolocation is not supported by this browser.";
  }
}


function showPosition(position) {
    x.innerHTML="Latitude: " + position.coords.latitude +
    "<br>Longitude: " + position.coords.longitude;
}


var map_init = L.map('map', {
    center: [9.0820, 8.6753],
    zoom: 8
});
var osm = L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {

}).addTo(map_init);
L.Control.geocoder().addTo(map_init);
```

```
if (!navigator.geolocation) {

    console.log("Your browser doesn't support geolocation feature!")

} else {

    setInterval(() => {

        navigator.geolocation.getCurrentPosition(getPosition)

    }, 5000);

};

var marker, circle, lat, long, accuracy;


function getPosition(position) {

    // console.log(position)

    lat = position.coords.latitude

    long = position.coords.longitude

    accuracy = position.coords.accuracy


    if (marker) {

        map_init.removeLayer(marker)

    }


    if (circle) {

        map_init.removeLayer(circle)

    }


    marker = L.marker([lat, long])

    circle = L.circle([lat, long], { radius: accuracy })


    var featureGroup = L.featureGroup([marker, circle]).addTo(map_init)
```
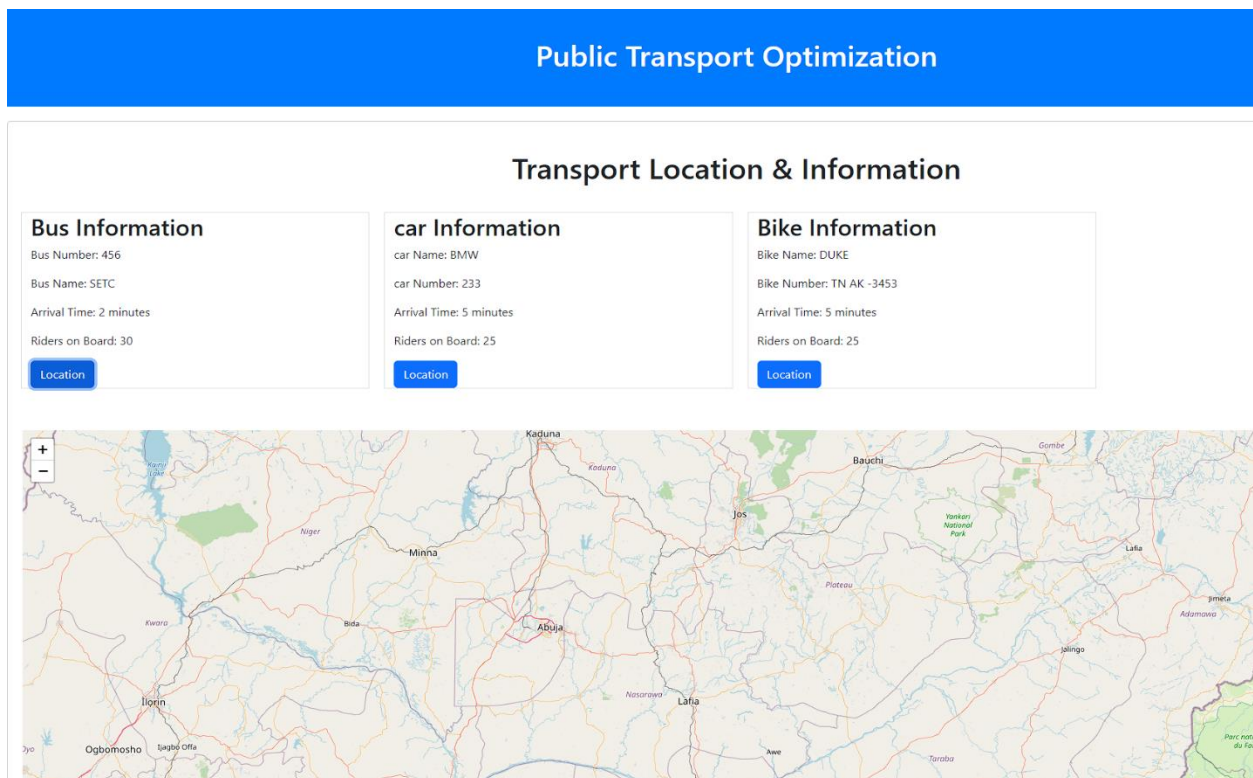
```
    map_init.fitBounds(featureGroup.getBounds())


    console.log("Your coordinate is: Lat: " + lat + " Long: " + long + " Accuracy: " + accuracy)
}
```

OUTPUT

Conclusion

In conclusion, Mathematical Optimization can help public transportation systems, especially in large cities, overcome their existing challenges and unlock next-level business growth.

Generally speaking, public transport is far more efficient and environment-friendly for cities than the means of personal transport. It can be difficult at first for people to stop using their cars, but as a result it will be better for everyone.