



bpx PLX Routing Optimization & Behavior Benchmarking

Company background

bpx energy — bp's US onshore oil and gas business — is headquartered in Denver and, from there, manages world-class assets that span Texas and Louisiana. bpx is making a significant step for the company's aims to reduce emissions and enhance production while improving reliability of bpx's assets. bpx has a large scale development program that is focused on drilling, completing, and producing wells efficiently and in an environmentally conscious way.

Project Description

What is PLX?

Perfect Lap Execute (PLX) is an AI-powered voice assistant designed to revolutionize bpx field and office operations. With a voice-enabled interface, PLX delivers real-time insights on well statuses, automates data entry tasks, and helps dictate notes—all aimed at increasing wrench time and reducing administrative burden.

By aggregating millions of data points across hundreds of well sites, PLX allows operators to:

- Focus on high-priority tasks and safety leadership
- Navigate their day using prioritized, optimized worklists
- Listen to briefings with well insights rather than switch between apps
- Reduce paperwork and time spent entering data into multiple systems

Why it matters:

Field operators manage complex and dynamic asset portfolios while ensuring production reliability and compliance. PLX streamlines this responsibility using advanced analytics and AI-driven workflows—empowering operators with actionable information at the right time and place.

PLX is currently launching on two routes in Eagle Ford and is expected to expand to all bpx field employees later in the year.

Problem Statement

Current field operator driving behavior is not always aligned with the most efficient or preferred routes. With the launch of PLX, bpx is aiming to shift behavior by guiding operators using optimized routing logic. However, we lack a formal benchmark for current routing performance and behavior to compare against post-PLX implementation.

Understanding this behavior gap—both spatially and operationally—will allow us to better quantify routing impact, improve wrench time, and inform future PLX feature development.

Key Objectives:

This project will benchmark operator behavior using historical NAUTO GPS breadcrumb data, evaluate route suggestions generated by PLX using Esri's StreetMap Premium (SMP) dataset, and identify GIS and routing network gaps.

Student Scope & Tasks

1. Benchmark Operator Driving Behavior Using NAUTO

- Use historical NAUTO breadcrumb data to reconstruct operator movement patterns prior to PLX implementation
- After PLX deployment, continue collecting NAUTO breadcrumb data to evaluate how routing behavior changes
- Identify trends or improvements in drive time, adherence to suggested paths, and stop sequences

2. Evaluate Routing Behavior Changes Over Time

- Compare pre-PLX NAUTO routes to post-PLX NAUTO routes to detect how operator behavior shifts once PLX begins guiding daily routing
- Focus on metrics like detours, route length, unnecessary backtracking, and stop efficiency

3. Assess GIS Network Contributions to Routing Outcomes

- Validate that PLX leverages accurate GIS road data (e.g., speed limits, access restrictions)
- Identify issues (e.g., closed gates, missing roads) that may cause detours or drive-time inefficiencies
- Recommend spatial data corrections to support better PLX-generated routes in the future

4. Develop Route Efficiency Metrics and Visualization Tools

- Propose a repeatable KPI framework (e.g., % of optimal route used, extra miles, idle time) that bpx can adopt to monitor PLX value
- Deliver dashboards or static visualizations to show behavior evolution over time

Expected Deliverables

- A spatial dashboard showing NAUTO breadcrumb routes before and after PLX launch, with annotations of key differences or behavior shifts
- Route behavior comparison metrics (e.g., drive time, detours, path complexity) across at least two test routes
- A GIS-based diagnostic identifying data mismatches that may cause inaccurate routing
- A presentation or executive summary highlighting the impact of PLX routing logic on operator efficiency and routing adherence
- Suggested improvements to the GIS routing network to further enhance PLX performance

Desired Skillset

- Python & Pandas
- ArcGIS Pro
- GIS Spatial Analysis
- Jupyter Notebooks
- Data Visualization
- ArcGIS Experience Builder or Dashboards
- SQL
- Understanding of routing concepts (e.g., least-cost path, speed profiles)

- AI/ML interest

Preferred Team Size

This project is well-suited to a team of 3–4 students, with a maximum of 5. Ideal team makeup includes a mix of GIS/Geospatial, CS/Data Science, and analytics backgrounds.

Internship Possibilities

Upon completion of the field session, bpx is open to discuss internship opportunities.

Location

Students will work at CSM campus or their agreed location and meet with their bpx contact on a bi-weekly basis in person or via teleconferencing.

Resources

bpx can provide AWS cloud resources, ArcGIS licensing, and data access in support of the project.

Contact(s)

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