

RELIABLE TRANSIT SERVICE



Why Software Built
for **24/7** Operations
Makes All the
Difference

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INTRODUCTION

THE HIGH STAKES OF MOVING PEOPLE

In an industry that runs 24/7, with complex shift scheduling, vehicle coordination, and passenger management, software crashes can cause major operational failures. To prevent these disruptions, many transit agencies and operators are turning to cloud solutions - but not all cloud software is created equal.

"Digital transformation" in public transportation goes beyond modernizing IT. There is a significant difference between software that is simply hosted in the cloud (cloud-based) and software that was specifically designed for the cloud (cloud-native). It might sound like a technicality, but it determines whether your operation keeps running during peak hours, or if your dispatchers are left flying blind.

This guide explains why the cloud architecture of your software is critical for maintaining service levels in modern transit operations.



THE REAL DIFFERENCE

CLOUD-BASED **vs.** CLOUD-NATIVE

To understand why this matters for a scheduler or operations manager, let's look at the two main ways transit software is deployed today.



The "Cloud-Based" (Hosted) Approach

Imagine you live in an old house with problems like cracked walls, outdated wiring, and leaky pipes. You decide to move. You pick up that entire house, problems and all, and drop it onto a piece of land owned by someone else.

This is **Cloud-Based** infrastructure (often called "Lift and Shift")

- **What it is:** You take legacy transit software (designed 20 years ago) and run it on a rented computer (a Virtual Machine) in the cloud.
- **The Problem:** It's still the same old software. If that one rented computer crashes during a runcut or bid creation, the entire system stops.
- **The Maintenance:** You still have to manage upgrades manually. If you need more processing power to run complex optimizations, you have to shut the system down to "add memory."



The "Cloud-Native" Approach

Now, imagine instead of moving the old house, you move into a modern apartment complex. Electricity, water, and security are all managed for you. If the power goes out in one block, the backup generator kicks in instantly. If you need more space for a party, the walls slide back to give you room.

This is **Cloud-Native** infrastructure

- **What it is:** The software is built from the ground up using modern tools (like "microservices"). It doesn't rely on one single computer.
- **The Advantage:** It uses the full power of the cloud provider (like AWS). It's designed to handle failure automatically.
- **The Result:** If one small part fails, say, the module calculating driver breaks, the rest of the system keeps running and recovers instantly.

SIMPLE COMPARISON FOR AGENCIES & OPERATORS



The Modern Way (Cloud-Native)

Fast. Cloud-native enables solving in minutes by instantly accessing massive computing power.

Updates happen in the background while schedulers work.

If a part breaks, a backup takes over immediately.

You mostly pay for what you use.

Feature	The Old Way (Cloud-Based)
Optimizations	Slow. Complex schedules can take hours or overnight to solve.
Updates	"System down for maintenance this weekend."
Reliability	If the server dies, dispatch goes dark.
Cost	You pay for server capacity even when buses are parked.

THE REAL COST OF DOWNTIME IN TRANSIT

Why should a Director of Operations or Service Planner care about software architecture? Because software downtime translates into service downtime which incurs significant financial penalties and erodes passenger trust.

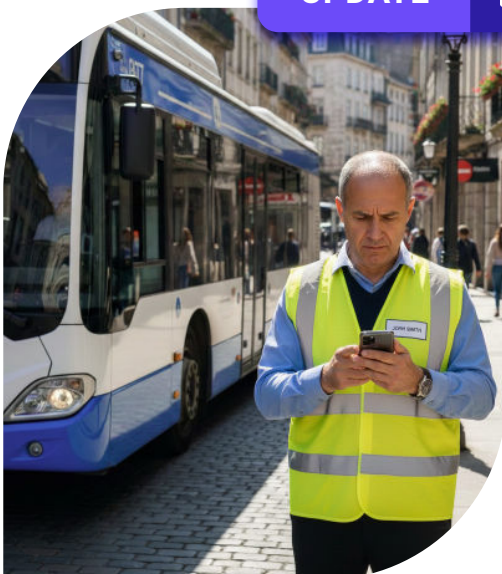
THE COST OF BEING OFFLINE

For a transit provider, software downtime leads to operational chaos.

- **Operational Paralysis:** If your dispatch software goes down, you lose visibility into where your vehicles are. You can't assign relief drivers, track on-time performance, or communicate with operators.
- **Financial Penalties:** Many authorities fine operators for missed service or lack of data reporting.
- **The "Overtime" Ripple Effect:** When systems are slow or down, schedulers and dispatchers have to stay late to finish runcuts or assignments, driving up overtime costs.
- **\$5,600 Per Minute:** [Gartner estimates](#) that the average cost of IT downtime is roughly \$5,600 per minute. For a major transit agency, the cost of stopped operations can easily exceed this when factoring in penalties and lost fare revenue.



UPDATE



WHY OLD SYSTEMS FAIL

Old-school "hosted" setups have what engineers call "Single Points of Failure."

1. **Hardware Breaks:** Hard drives fail. If your scheduling database lives on one machine, you risk a complete system failure during critical moments like a major timetable change or roster publication.
2. **Security Risks:** Public transportation providers are prime targets for ransomware. [Sophos reports](#) that 76% of ransomware attacks happen on on-premises servers because they are harder to fix. A locked system means buses don't get assigned.
3. **The Fear of Updates:** In the old world, updating software was risky. Agencies and operators often skip critical updates because they fear breaking the delicate legacy system, leaving them vulnerable.

HOW OPTIBUS DOES IT

Let's look at how Optibus handles this. Because Optibus is a critical tool for mass transit, it serves as the operational backbone for agencies worldwide.

Optibus runs on **Amazon Web Services (AWS)** using a fully cloud-native setup. Here is how that translates to better operations:

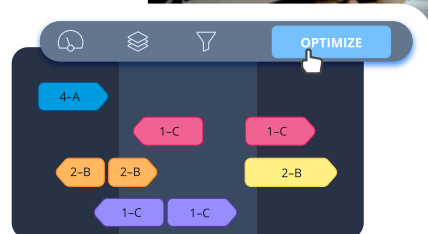
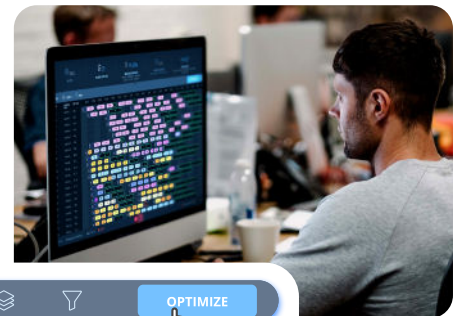
1. HANDLING MAJOR SERVICE CHANGES (SCALABILITY)

THE PROBLEM

Transit planning isn't flat. It comes in peaks. Leading up to a major timetable change or roster publication, schedulers need to run thousands of optimization scenarios to find the most efficient vehicle and driver duties. Legacy systems crash under this load.

THE FIX

Because Optibus is cloud-native, the system automatically "spins up" hundreds of processors to handle complex optimizations simultaneously. You get the supercomputer power needed to optimize millions in operational costs, exactly when you need it, and without paying more.



2. DISPATCH NEVER STOPS (REDUNDANCY)

THE PROBLEM

Vehicles run 24/7. If the server crashes at 4 AM, the morning pull-out is compromised.

THE FIX

Optibus doesn't rely on one server. Data is copied in real-time across multiple servers and different availability zones. If one server fails, another one picks up the slack immediately. The morning pull-out happens without a hitch.

3. PROTECTING THE SCHEDULE (DISASTER RECOVERY)

THE PROBLEM

Floods, fires, or massive internet outages can wipe out a physical data center or a depot's server room.

THE FIX

Optibus backs up schedule and roster data constantly to secure external cloud storage in different geographic locations. If a depot loses power, the data is safe in the cloud and accessible from anywhere.

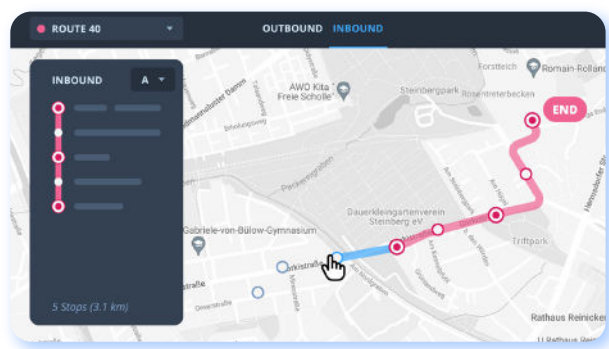
4. PASSENGER & DRIVER DATA SAFETY (SECURITY)

THE PROBLEM

Agencies and operators handle sensitive data, from driver personnel files to paratransit passenger locations, where trust and data protection are essential.

THE FIX

AWS provides world-class physical security. Built on the security global infrastructure of AWS, Optibus encrypts data (scrambles it so hackers can't read it) both at rest and in transit, ensuring it remains unreadable to unauthorized actors. This helps agencies meet strict compliance standards (like ISO 27001 and GDPR) required by public funding bodies.



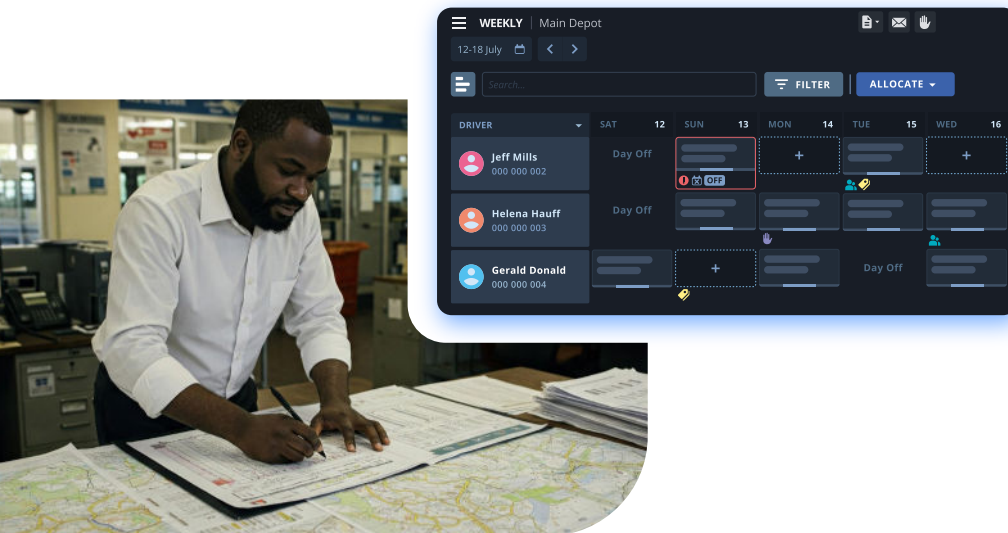
5. CONTINUOUS IMPROVEMENT (AUTOMATIC UPDATES)

THE PROBLEM

Legacy software updates often require downtime, meaning dispatchers might have to revert to paper for a night.

THE FIX

Modern cloud-native software allows for "continuous deployment." Optibus releases new features seamlessly in the background. Users log in and simply have better tools available, without disruption to services.



6. MANAGING FROM ANYWHERE (ACCESSIBILITY)

THE PROBLEM

Legacy software often ties schedulers to a specific desktop computer in the planning department.

THE FIX

Because the platform is truly web-based, staff can access the schedule, perform dispatch duties, or check rosters from home, the field, or a different depot. This flexibility is crucial for modern, resilient transit operations.

WHY IT MAKES FINANCIAL SENSE FOR PUBLIC TRANSPORTATION PROVIDERS

Switching to cloud-native is a strategic financial decision, not merely a technical upgrade.

RENTING **VS.** OWNING (CAPEX VS. OPEX)

- **The Old Way (Capital Expenditure - CAPEX):** Agencies spend huge capital grants upfront buying servers, licenses, and hardware. This locks up money that could be used for fleet or infrastructure.
- **The New Way (Operational Expenditure - OPEX):** You pay for the software as a service. This fits better into operating budgets and shifts the risk of hardware obsolescence from the agency to the provider.

SPEED IS MONEY

According to the [Puppet State of DevOps Report](#), top-performing IT teams deploy code **46 times more frequently**.

- **Faster Innovations:** While competitors struggle to patch their servers, cloud-native agencies are already optimizing for electric buses and on-demand transit.
- **Staff Efficiency:** Your IT team can stop fixing depot servers and focus on passenger-facing technology.





CONCLUSION

The cloud has evolved from a destination into the standard for modern transportation. But there is a big difference between simply moving your legacy problems to the cloud and actually building for the cloud.

Optibus's choice to use a fully cloud-native AWS architecture is not merely a technical detail, but rather a promise of service reliability. By baking scalability, security, and redundancy into the platform, Optibus ensures that agencies and operators can focus on what they do best: providing reliable transportation to the community.

ABOUT optibus

Optibus is a unified software platform for public transportation planning, scheduling, rostering, operations, real-time control, and passenger information, powered by artificial intelligence (AI) and optimization algorithms. In thousands of cities worldwide, transportation agencies and operators use Optibus to maximize the positive impact of public transportation on passengers and the planet, improve operational efficiency and service quality, promote transportation equity, reduce emissions and costs, and modernize operations.

Learn more: www.optibus.com | info@optibus.com