SITA

NAVIGATING THE SEAMS OF SEAMLESS TRAVEL

A playbook for innovating the intermodal passenger journey

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EXECUTIVE SUMMARY

The global travel and transport industry is at a crucial turning point.

Intermodal travel will not improve on its own. It will only work if transport operators choose to work together. This white paper is an invitation to do exactly that.

SITA is calling on airports, airlines, rail operators, ports, cities, and transport authorities to partner with us to fix the parts of the journey where travel breaks down. Not all at once, and not through grand promises, but through focused, practical collaboration that improves real journeys for real people.

Passenger numbers are set to double over the next 20 years, yet most journeys still fall apart when travelers switch between transport modes. Delays ripple across networks. Information disappears. Responsibility becomes unclear. Passengers are left to figure things out on their own at moments of stress. These problems do not come from a lack of technology. They come from systems and organizations that were never designed to work together.

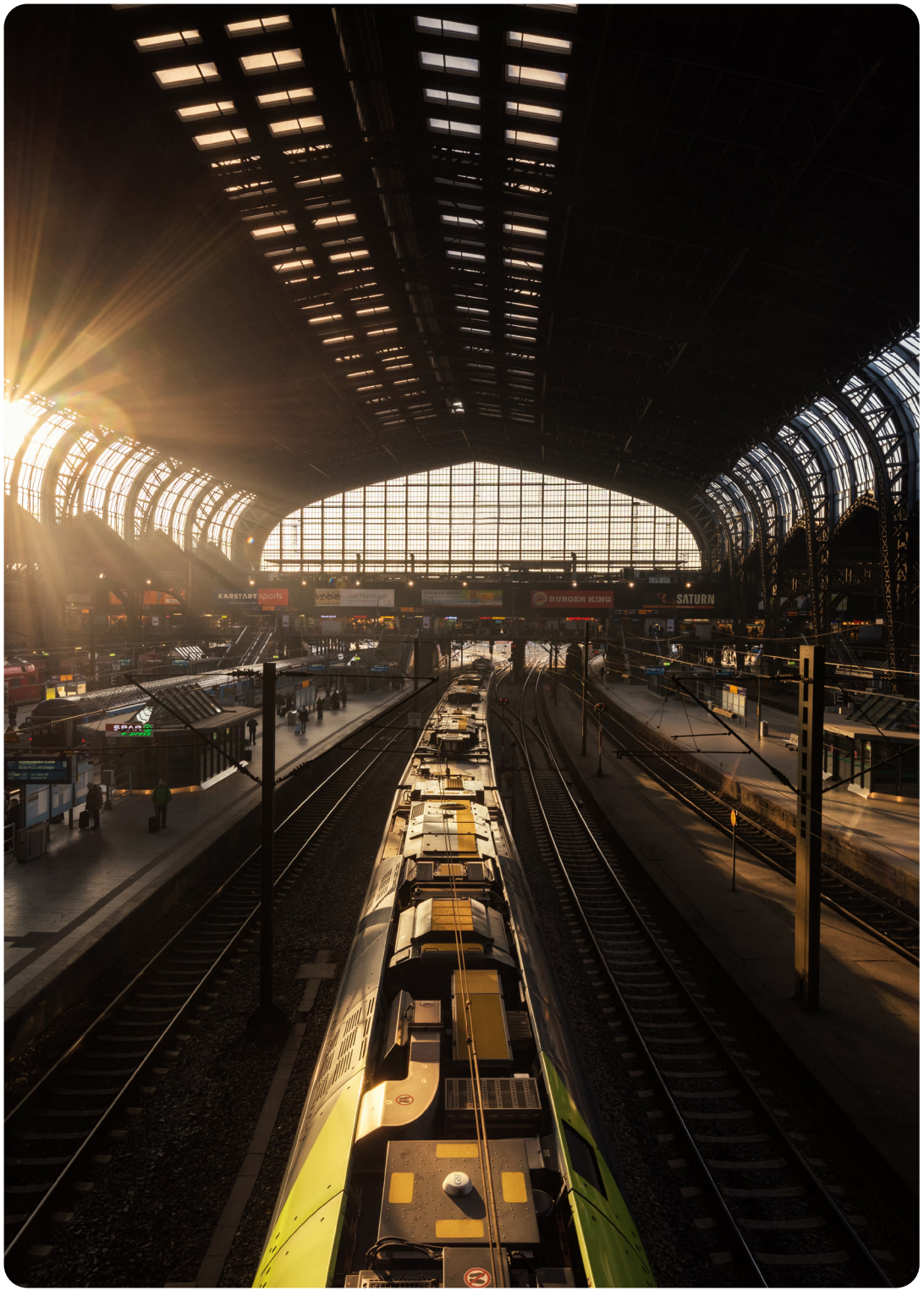
Across aviation, rail, maritime, and urban transport, operators have invested heavily in improving their own operations. But progress inside individual sectors has not translated into better journeys end to end. The biggest barriers are not technical. They are cultural, operational, and structural: siloed ways of working, limited data sharing, and a lack of common frameworks for managing tickets, baggage, and disruption across multiple operators.

This paper sets out a practical way forward. It does not propose a single solution or platform. Instead, it offers a clear framework for collaboration, grounded in one simple idea: start with the passenger, then design backwards. When travelers have reliable information, clear options during disruption, and confidence that someone is in control, journeys feel manageable again.

The most effective progress will come from small, high-impact pilots that prove value quickly and can grow over time. The real challenge is not building new tools, but creating the trust, rules, and operating models that allow existing technologies to work together in live transport environments.

SITA works with the industry to help make this collaboration possible. As an industry-owned partner with experience across complex, mission-critical transport systems, we support operators in creating shared frameworks, governed data exchange, and practical ways of working across modes. We do this alongside our partners, not in isolation.

The opportunity is clear. By working together to fix the points where journeys fail, the industry can reduce stress for passengers, improve operations for operators, and unlock new value across the transport network. This paper is a starting point. The next step is partnership.



INTRODUCTION

The vision and the reality

The global travel and transport industry is at a crucial turning point. Passenger numbers will double over the next 20 years, yet our infrastructure, both physical and digital, is struggling to keep up. The goal of seamless, door-to-door travel has long been the industry's ideal, but it remains out of reach. In an increasingly connected world, travelers expect hopping from a plane to a train to feel as simple as switching apps on their phone. What they get instead is a reality that's disconnected, full of hassles, and frankly, frustrating.

The way forward isn't through isolated fixes, but through a fundamental shift in mindset

While individual travel and transport sectors, like aviation, rail, and maritime, have made significant progress in optimizing their own operations, they've largely failed to address the crucial gaps between them. These are the 'seams' in a journey; those handover points where the whole passenger experience falls apart and where companies are leaving money on the table.

Every day, millions of travelers stitch together their own journeys using a patchwork of apps, timetables, and transportation modes. For transport organizations, every seam in that patchwork represents a point of friction, a potential service failure, and a lost opportunity for making money and collecting data.

Our white paper isn't a proposal for a single product. Again, it's a playbook for innovation and collaboration, built on extensive research by SITA and other organizations into the intermodal ecosystem, including in-depth passenger surveys and interviews with industry experts. We dig into the biggest challenges holding the industry back and lay out a framework, presented as a set of guiding principles, for any organization or consortium that wants to build the next generation of truly connected, passenger-centric travel solutions.

The core lesson is clear: the way forward isn't through isolated technological fixes, but through a fundamental shift in mindset. We need to move away from a culture of 'every company for itself' towards real, data-driven teamwork. The passenger experience has to be the number one principle guiding every intermodal innovation. That's what our playbook is all about, offering a framework of key ideas to help lead that transformation.

THE LABYRINTH OF MODERN TRAVEL

Before we can build the future, we must start by trying to understand the deep-rooted challenges that define the present. The path to seamless intermodal travel is a labyrinth of technical, operational, and institutional hurdles.

The ecosystem challenge: a culture of silos

The travel and transport industry isn't a single entity, but a complex ecosystem of competing and cooperating stakeholders. This structure creates profound barriers to integration and smoother journeys.

Operational silos and legacy systems

Each transport mode has its own unique history, operational procedures, and, crucially, legacy IT systems. Airlines, train companies, cruise lines, and crews on the ground are basically stuck using their own custom-built software solutions that were never meant to talk to each other. All that outdated tech makes trying to share information between them a huge pain, and super expensive.

Path-dependency and institutional inertia

Established organizations often resist to the fundamental changes required for true intermodality. They've already poured a lot of money into specific tech, like one type of baggage scanner, which means they're stuck on a certain path. So it's really hard for them to switch to newer, better solutions. On top of all that, you've got red tape. The rules are written for just one type of travel, so there's no single playbook that helps or even oversees how these different companies are supposed to work with each other.

Competition over collaboration

While partnerships exist, the underlying culture is often one of competition. Operators hesitate to share valuable data on schedules, passenger loads, and operations. Why? They're worried about losing their edge or even their customers to a rival. This creates information black holes at the very points where data sharing is most needed.

The intermodal challenge: the complexity of the seams

When siloed systems are forced to interact, specific and significant challenges start to show up at the seams of the journey.

The ticketing complexity

For passengers, intermodal travel is just a headache. The lack of integrated ticketing and payment systems forces passengers to navigate multiple booking platforms, manage a portfolio of tickets, and understand different fare rules and conditions.

All that discouraging complexity makes most people not want to bother with trips that mix flights, trains and cruise ships.

The disruption domino effect

We've all been there: a single delay kicks off a domino effect that can wreck a passenger's whole trip. Without shared data and coordinated response plans, a delayed train or cruiseship, for example, can easily lead to a missed flight, with no clear process for re-booking or assistance, leaving the passenger stranded.

The baggage hurdle

Getting a bag moved smoothly between different companies is still a massive logistical headache. With everyone having their own standards, different security rules, and tracking systems that don't sync up, handling bags between travel modes is high-risk and expensive. That's why most operators steer clear of it entirely.

The liability question

When disruption occurs in a multi-operator journey, who's responsible? The lack of clear, legally binding agreements on liability and passenger care creates a state of limbo where each operator can defer responsibility. This leaves frustrated travelers caught in the middle and makes a bad passenger experience even worse.

THE PASSENGER EXPERIENCE

The passenger experience is the central principle of intermodal innovation

When you're up against such massive intermodal challenges, it's tempting for companies to just put their heads down and focus on fixing their own internal operations. But what our research and other industry research makes crystal clear is that putting the passenger experience at the heart of innovation isn't just a 'soft' goal; it's a core business strategy.

The fragmented journey directly translates into passenger anxiety and frustration. Our research finds that travelers' top complaints aren't about small inconveniences. They're about fundamental emotional and logistical headaches, like the stress of not knowing what's next, the hassle of transfers, and the burden of having to figure everything out themselves and puzzle one journey together.

Negative experiences bring direct business impacts. They diminish brand loyalty, decrease demand for potentially profitable intermodal routes, and cut non-aeronautical revenue. Think about it: a stressed-out passenger sprinting to their gate isn't going to stop to buy a coffee. That's why any successful innovation has to start with one simple question:

"How does this enhance the passenger experience?"

The stress of uncertainty

The fear of the unknown, unpredictable delays, unclear instructions, and a lack of reliable information, is one of the biggest sources of passenger stress.

The hassle of transfers

The physical act of navigating large, unfamiliar hubs and moving baggage between modes is another major point of friction.

The burden of self-integration

Passengers are tired of being their own travel agents, forced to piece together and manage their journeys from a patchwork of disconnected services.

A FRAMEWORK FOR INNOVATION

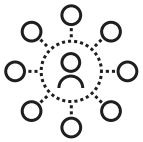
Key considerations for intermodal travel

To innovate in the complex space of intermodal travel and transport, you can't just wing it. You need a solid game plan. That's why we've boiled down all our research into a set of key principles; a framework as a guide to help anyone building a new, connected travel solution. Our ideas come from a deep understanding of what passengers actually need and what it really takes for different companies and systems to work together smoothly.

1.

EMPOWER THE PASSENGER

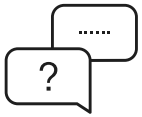
The antidote to passenger anxiety is empowerment. Travelers need to feel they're in control of their journey, not merely subject to its whims. This means moving beyond simply providing information to delivering intelligence, agency, and trust.



Provide data a passenger can trust

The highest priority is to eliminate fragmented information. In today's landscape, a passenger undertaking a simple air-rail journey might need to consult a rail operator's app for train status, an airline's app for flight details, and a third-party app to navigate between air and rail. This 'self-integration' is a big mental burden.

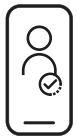
A truly passenger-centric solution merges all these data streams into a trustworthy, reliable platform. This means a unified, dynamic timeline where passengers can see their entire door-to-door itinerary in real-time, from the taxi arriving at their home to the train's platform number and the flight's boarding gate. This aggregated view transforms a series of disconnected events into one cohesive, manageable journey.



Deliver proactive, actionable information

Don't wait for passengers to discover a problem. Solutions must monitor the journey and proactively alert passengers to potential disruptions. A truly empowering system must be able to deal with what-if scenarios, by answering the immediate follow-up question after a disruption: "What do I do now?" This means calling on predictive analytics to calculate the impact of the delay on the rest of the itinerary and immediately presenting pre-vetted, actionable solutions.

For example, the system could offer a choice between booking a taxi to make the original flight, accepting an automatic re-booking on the next available flight, or switching to an alternative rail service, complete with updated timings and costs. This turns a moment of crisis into a moment of controlled decision-making, directly addressing the core anxiety of the unknown.



Ensure transparency and control over data

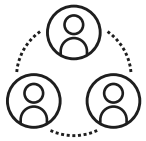
If we want passengers to actually use new, data-heavy services, we've got to earn their trust first. That means building every new innovation on two key principles: being totally transparent and putting the passenger in the driver's seat. This means moving away from opaque, all-or-nothing privacy policies towards a model of granular, consent-based permissions.

For instance, a passenger might be prompted to grant temporary access to their location data specifically to receive live walking directions through a complex terminal, or to share their Digital Travel Credential (DTC) with an airline for a single trip to enable a seamless, biometric boarding process. By clearly articulating the value of exchange, for example: "share this data to receive this specific benefit", and making consent easy to grant and revoke, operators can build the long-term trust. That's essential for a truly personalized and connected travel future.

Offer context-aware information

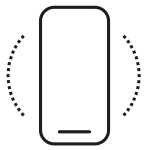
The info you give a traveler has to be about more than just their schedule. It needs to be about what's happening around them, right at that moment. If someone's sprinting to catch a train, they need to see the platform number and how long it'll take to walk there, not a special offer on perfume.

But it needs to go much deeper than that. A global solution must have local street smarts. Recommending a walking route in Mumbai during a monsoon, for example, isn't helpful. Being truly context-aware means looking at the whole picture: who the traveler is, what they're trying to do that minute, and the realities on the ground, from the weather to the local culture. That's how you avoid overwhelming people with useless info and give them something that's actually smart and helpful, especially within the seams between journey segments.



Recognize different traveler personas

A business traveler wants totally different things from a trip than someone on vacation. For a person on a business trip it's all about speed and being on time. For a vacationer it's probably more focused on cost and comfort. To be effective, a system's interface, alerts, and recommendations must adapt intelligently to the user's specific journey purpose and preferences, differentiating between distinct needs.



Support all levels of tech proficiency

Any new design has to work for everyone. It's got to be inclusive and accessible. A smooth digital trip can't just be for the tech-savvy. We can't create a system where some people breeze through the airport while others get left behind. That means designing with the 'digital divide' in mind, making sure our tools work for everyone, including older passengers or anyone who isn't super comfortable with new tech.

And think about why so many people still prefer paper tickets. For a lot of travelers, that piece of paper is a trusted safety net in case their phone dies or the tech glitches. Any digital system has to earn that same level of trust by feeling rock-solid or by having simple, easy-to-find backup options.

Just as important, you've got to have real people ready to help when technology isn't enough. That could be a one-tap video call from a kiosk or just a clearly marked help desk that's easy to find. Forcing everyone down a purely digital path with no 'off-ramp' to a real person is a total recipe for failure and frustration.

2.

DESIGN FOR A DIVERSE AND PERSONALIZED EXPERIENCE

When it comes to travel, a 'one-size-fits-all' solution just doesn't cut it. Any real innovation has to be flexible and personal from the ground up, and that all starts with simply nailing the basics.

3. BUILD A VIABLE AND TRUSTWORTHY ECOSYSTEM

A passenger-facing solution is only as good as the collaborative ecosystem that powers it. Engaging operators is not just a technical challenge. It's a commercial and political one. Success all comes down to building a framework that's not only powerful but also trusted, fair, and value-driven for all participants.

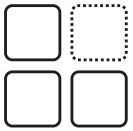
Demonstrate mutual value

The value proposition of intermodal travel must be multifaceted. For an airport, the value lies in gaining enhanced operational awareness. For example, knowing the real-time passenger load from a delayed inbound train allows them to dynamically reallocate security lanes and prevent bottlenecks. For an airline, the value is in accessing new revenue streams through truly integrated services, like offering a single-ticket "Rail & Fly" product that expands their market reach far beyond the airport's immediate vicinity. For both, the ultimate payoff is improved passenger satisfaction that reflects positively on their brand.

Establish governed data sharing

Everything comes down to trust. Industry stakeholders are hesitant to share data for good reasons. They're worried about security, losing their competitive edge, and questions about who actually owns the info. The answer isn't a data free-for-all. It's a secure system with clear rules. In this model, sharing data isn't a blank check. Instead, operators enter into specific, purpose-driven agreements.

For example, an airline and a rail company might set up an agreement that permits the sharing of passenger booking data for the sole purpose of facilitating a single-ticket journey and managing disruptions on that route. The framework would clearly define what data is shared, who can access it, for how long, and critically, how liability is handled. This gives operators the control and security they need to participate with confidence.



Design for modularity and interoperability

The travel industry is a messy mix of brand-new and ancient systems. Do we try to force every stakeholder to adopt one giant, single platform? That's a total non-starter. Any real innovation has to meet these companies where they are right now. This means any new platform needs to be built like a set of Lego bricks, not a single, rigid box. It needs smart 'plugs' that can securely connect to a company's existing systems and 'translators' that can convert data from one format to another, like from an airline's system to a local bus schedule's format.

This approach makes it way easier for everyone to get on board without having to rebuild their tech from scratch. Just as important, it stops us from creating yet another 'data silo' where information is trapped. A system built this way is designed to be a connector, a hub that links up with other platforms. It's not about building a new 'walled garden' that locks everyone else out; it's about opening things up.

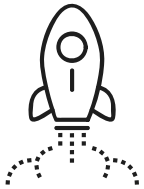
Focus on high-impact use cases

Instead of attempting to solve for every possible intermodal combination at once, the smart move is to start with one specific, manageable problem that can have a big impact. A good example is fixing the link between an airport and its main train line, a route that lots of people use. Such a project has a clear focus, you're only dealing with a handful of key players, and you know exactly what headaches you need to solve for passengers.

Another great place to start is handling all the transportation for a large international event, like the Olympics or a World Expo. An event like that creates a temporary, high-stakes situation where smooth travel is a must-have, forcing a level of teamwork between the city, event planners, and airlines that you just wouldn't see on a normal day.

Run controlled pilots

These focused projects are the perfect testbeds for a pilot program. A pilot is more than a technical trial. It's a test of the entire mini-ecosystem. The pilot phase is also where the operational model is refined. It's where the abstract concept of "shared liability" is tested in the real world, and answer questions like what is the exact protocol when a bag is missed on a pilot route? How do the airport's operations center and the rail company's control room communicate in real-time? These pilots generate the hard numbers you need to prove that the business case works. And most importantly, they show those first few partners that you're delivering real, tangible value right from the start.



Use success to build momentum

A successful pilot project is the most powerful marketing tool for driving wider industry adoption. The results should be packaged into a compelling case study that goes beyond technical specifications to tell a story of value creation. That story needs to show a clear ROI, connecting the dots between the initial investment and real-world results like making things run smoother, bringing in new money, and having happier customers.

Plus, when you pull off a pilot with a big, respected name, like a major airline or a hub airport. It's a good stamp of approval. It makes it a much safer bet for other companies to join in. That first win builds the trust needed to bring more partners to the table, creating a 'network effect' where every new company that signs on makes the whole system more valuable for everyone.

4.

START SMALL, PROVE VALUE, AND ITERATE

With an intermodal travel system this complicated, trying to fix everything at once with a 'big bang' launch is a recipe for failure. The smartest way forward is to take it one step at a time, making sure every move is backed by real evidence. This means using creative methods like Design Thinking and working hand-in-hand with partners to co-create the future of travel.

THE ATHENS ECOSYSTEM CASE STUDY

SUPPORTED BY sesar JOINT UNDERTAKING
Europe's Rail
Co-funded by the European Union

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Travel Wise FA1

Problem

In Athens, the airport, airlines the port, and the train operator just don't seamlessly connect to each other. They're working in silos. Their operating centers aren't interconnected, and they're often relying on manual procedures.

This creates painful "seams" in the journey. So when a disruption hits, like a flight delay, there's no automatic trigger. Someone literally has to pick up the phone to coordinate with all the other players. It's chaos for passengers and for the operators trying to manage it.

We knew we had to help fix this

Solution

We're partnering with the EU's TravelWise project to build the solution. We're creating the 'brain', an Intermodal Data Platform, that connects everyone.

It pulls in all the data, like flights, trains, ships, even weather and local activities, and puts it on one simple dashboard. We're not just handing over software. We're in this together, sitting down with our partners and figuring it out side-by-side. This means we're tackling the tough stuff, like helping the port team move from tracking ships in Excel sheets to building modern APIs. This is how we're building a trusted 'gold' data layer everyone can rely on.

And we're making that gold data available in two ways. Our partners get the new dashboard, of course. But we're also packaging the data into simple, powerful APIs. This way they can plug this new intermodal data right into their own systems. It's all about giving them the tools that work best for them.

Impact

This is a game-changer. We're proving that a truly connected travel world isn't just a dream. This isn't just a test. Our partners are excited and see the value now. They're already asking how to plug this new 'beyond-the-airport' view into their daily operations to enhance their own product and the entire Greek travel experience.

- **We're proving our model:** We're bringing all the transport players to the table to build as one team. By listening to their different needs, we're designing a single, synergistic solution that works for everyone
- **We're solving the real problem:** The biggest challenge is data. We're helping all our partners, whether they're tech-mature or just starting, to grow, digitize, and get ready for the next step.
- **We're building the future:** This pilot is the blueprint for intermodal travel around the world. It's the spark lighting the way for SITA's next-gen platforms (Next Generation Airport Platform (NGAP) and Intermodal Data Platform (IDP)). We're creating a mature, governed data space. This will become a market enabler for new mobility services, creating anxiety-free journeys for passengers and new value for operators.

Final thoughts: from vision to value

The challenge of a seamless intermodal future is less about inventing new technology and more about creating the collaboration required to deploy the technology we already have.

The journey towards truly seamless intermodal travel is the defining challenge, and the greatest commercial opportunityfor the travel and transport industry today. For too long, the vision of a frictionless, door-to-door journey has remained just that: a vision. Passengers still experience a reality of fragmentation, anxiety, and frustration at the seams between transport modes.

Achieving true seamlessness requires a fundamental shift in perspective. The primary hurdle is not a lack of technology, but a lack of trust, aligned incentives, and deep collaboration across the ecosystem. The solution isn't to invent more isolated tools, but to create collaborative frameworks that allow us to deploy the powerful technology we already have, effectively and securely.

To conclude, the challenge of creating a seamless intermodal future appears to be less about inventing new technology and more about creating the cooperation required to effectively deploy the technology at hand. The anxiety of a tight connection or the fear of lost baggage are powerful friction points that technology must address by empowering the passenger with control, predictability, and confidence. The path forward must be incremental, use-case driven, and founded on a single, guiding principle: making the passenger experience the catalyst for innovation and the measure of success.

Want to know more? Let's talk.

SITA and intermodal at a glance

SITA is uniquely positioned to bridge the seams in the global travel network. We're applying our unparalleled experience in managing mission-critical aviation operations to solve the intermodal challenge.

- **We're the market leader in transport communications and IT.** For over 75 years, we've been the trusted partner for the air transport industry, providing the vital asset that keeps it connected.
- **We understand the intermodal world and its challenges.** We recognize that the primary hurdle is not a lack of technology, but a lack of trust and aligned incentives between operators.
- **We offer unique interoperability and global standards support.** We developed the global standard for baggage management and tracking with WorldTracer ®, used in over 2,800 airports. We create modular, interoperable platforms that meet operators where they are, connecting disparate systems without requiring costly overhauls.
- **We're the only player working end-to-end, collaborating across all stakeholders.** As a partner owned by the industry, we build the governed data-sharing frameworks needed for true collaboration between airports, airlines, rail operators, and maritime providers.

We have market-leading solutions for integrated airport management, and our biometric expertise is already creating a seamless journey in the world's busiest airports. We're now extending this proven capability to adjacent markets like rail and maritime, with successful projects at Singapore Cruise Centre and Express Rail Link in Kuala Lumpur.

Ideas are easy. It's implementing them in a risk-free way, in a live, no-fail, secure transport environment that's incredibly hard. That's where SITA's experience and industry know-how make all the difference.

We work with you to find answers that work.

Our Impact Report
& Podcasts

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