



CONTEXT

The WTTC's latest annual research shows the Travel & Tourism sector experienced 3.5% growth in 2019, outpacing that of the global economy (2.5%) for the ninth consecutive year. Over the past five years, one in four new jobs were created by the sector, making Travel & Tourism the best partner for governments to generate employment.

WTTC Members have identified Security & Travel Facilitation as a top priority with the need for absolute requirements for security processes to be as robust as possible. A global, cross-industry solution which allows people to travel more securely is urgently required. WTTC has been addressing this challenge through our Seamless Traveller Journey Programme (STJ) which is an ambitious initiative that brings together public and private sector stakeholders with technology providers to agree on models that will ultimately facilitate a seamless travel experience. The aim is to identify models which are globally interoperable, technology agnostic and cover the end-to-end journey from booking, through air travel and incorporating cruise, hotel, car rental and other non-air products where necessary.

Significant technological advances can help overcome the COVID-19 crisis. Contactless technologies, biometrics, faster clearance, among other solutions, may decrease the risk of pathogen transmission.

Transformations of the travel experience through technological advances, notably biometrics and the use of digital identity, show strong opportunities to enable a seamless and secure end-to-end traveller journey, while promoting sector-wide growth. Such a solution aligns with the World Travel & Tourism Council's (WTTC) consumer research undertaken in five European countries and in the United States, suggesting that, on average, 4 in 5 international and domestic travellers would be willing to share their photographs in advance of travel to speed up their journey. By capturing and uploading biometric and biographic data prior to travel, border and security agencies will be able to authenticate and pre-clear travellers in advance of arrival, thus reducing cumbersome checks and queues at ports and airports. This will in turn enhance security across the whole system, relieve pressure on infrastructure and capacity constraints, improve the traveller experience and ensure that the economic potential of Travel & Tourism to create jobs and drive economic growth can be fully realised.

From a traveller's perspective, this vision is exemplified by a journey during which the traveller no longer needs to present travel documents and boarding passes multiple times to a variety of stakeholders at different stages of their journey. Rather, travellers will be able to book transportation, check in, proceed through security, cross borders, board their aircraft, collect luggage, rent a car, check in and out of their hotel and other non-air services, and access myriad destination services, simply by confirming their identity and booking data.

WTTC has consulted with over 200 stakeholders to map existing initiatives and have begun to develop a roadmap to take this initiative forward. WTTC has identified potential future models which may deliver an end-to-end traveller journey and has also compiled over 80 existing initiatives within the Travel & Tourism sector that employ biometrics. What has become clear from our work so far is that there is no "one-size-fits-all" solution, and even more crucially, that a solution will only be achieved by working collaboratively across national boundaries and based on strong partnerships between both private companies and government entities.

COST-BENEFIT ANALYSIS OF THE STJ PROGRAMME

The World Travel and Tourism Council (WTTC) Seamless Traveller Journey (STJ) Programme offers to align initiatives and technologies in such a way that the end-to-end passenger journey for air travel, hotel, cruise and car rental can be as seamless as possible in terms of security and identification.

A Cost-Benefit Analysis (CBA) has been undertaken to build a coherent and integrated narrative, that outlines the key assumptions of STJ Programme deployment, and their implications for the travel and tourism industry. The CBA was conducted to understand the scale, timeline and distribution of benefits and costs to the cruise, hotel and car rental sectors. STJ comprises a range of identity management and biometric technologies, all of which aim to ensure a seamless end-to-

end journey which enhances security and improves the traveller experience. It is recognised that these concepts are at various stages of implementation; a few are already emerging - e.g. Identity as a service (IDaaS), whilst others will require both technology and policy developments that may take many years.

These barriers will vary by region and sector.

This assessment considers the impact of all the underlying concepts being deployed in an integrated manner. It presents one of many plausible scenarios to give indicative costs and benefits of STJ integration and the technologies themselves. Some assumptions are relaxed in the model under various scenarios used for sensitivity testing.

As part of the STJ Programme, this Cost-Benefit Analysis (CBA) helps understand the scale, timeline, and distribution of benefits to the cruise, hospitality, and car rental sectors across regions.

The goal of this CBA is to identify the potential costs and benefits associated with the STJ concept over the next 30 years. The key finding from the CBA confirms that there is significant value to the industry for continuing to develop the seamless traveller journey of the future. Over the period 2020-2050, global benefits across all sectors associated with the STJ are \$459 billion, while total costs are estimated at \$110 billion. The net impact of global STJ adoption will drive a present value benefit of \$349 billion to industry. This benefit is highest for the hotels sector (\$259 billion) and lowest for the cruise sector (\$17 billion). However, benefit to cost ratios (i.e. dollar benefit per dollar investment) were highest for the cruise sector (27.7) and lowest for the hotel sector (3.9).

This Summary report provides an overview of:

- The high-level economic modelling approach, including critical assumptions
- The net results of the modelling work and expected benefits and forecast costs
- Conclusions of this work

The cost benefit analysis report was prepared by WTTC, Atkins, and in direct engagement with industry stakeholders over the period encompassing Q3 2019 to Q1 2020. As the impact of COVID-19 has spread globally, the aviation and tourism industries have been severely affected and thereby the numbers and figures associated with this report bear little comparison in actuality compared to the colossal impact of the global pandemic on the tourism sector.

Atkins calculated costs and benefits independently for each industry as there are no aggregated economic figures available that affect this. Qualitatively, and some of the benefits are unlocked wholly by the end to end process, but the attribution is linked back to the individual industry due to these figures being available for us to model against.

Whilst the effects of COVID-19 dwarf the proposed costs and benefits in financial terms, this report should be a roadmap articulating the potential of technology to support, accelerate, and help rejuvenate an industry that has suffered significantly. Many of the initiatives and concepts behind the Seamless Traveller Journey theorised consideration of consumer choice when it came to potential benefits associated with issues such as contact-free access to hotel rooms and rental vehicles, or the opportunities enabled by better understanding of itineraries and how people were moving internationally between places of tourism interest. These transformed processes may be critical to enabling the economic restart of the global tourism industry, and while the numbers have changed, the concepts and benefits presented in this report may be of critical importance to the global tourism industry as it begins its recovery from the pandemic.

METHOD

To account for the potential benefits of the STJ a structured framework was used to cover the full spectrum of technology impacts and economic effects. A three-step approach was used to ensure all relevant impacts were captured, analysed and evaluated (Figure 1). This approach is defined below.



Figure 1: A three-step approach to technology impact assessment

- Impact identification was conducted to list all potential impact areas and consider the perspectives of all relevant stakeholders. We used a hybrid Delphi method integrating elements of interviews and workshops so that all methods complement each other and include a comprehensive understanding of the sectors, impact areas and stakeholders' views.

¹ The Delphi method is a structured communication technique which relies on a panel of experts, usually with multiple rounds of review, to construct a final list of parameter estimates. The approach is particularly powerful where existing data is unavailable.

- Impact analysis was performed to define STJ functionalities, map their quantitative impacts on the industry sectors and identify opportunities for:
 - o process optimisation.
 - o resource management improvements; and
 - o increase of revenue generation potential.

Expert opinion (interviews, expert panels) also informs this stage of the study. The impact analysis was broken down into three elements:

- **Defining the technology functions:** The technology functions to deliver the STJ along with the benefits that could be delivered were defined.
- **Constructing the benefits matrix:** The benefits from the STJ were assigned across cruise, hotel and car rental sectors. The benefits were assigned according to a technology impact and associated benefit function.
- **Constructing the deployment curves:** Deployment curves for each region were developed to define the pace of deployment of the STJ enabling technologies. The deployment curves were developed based on various assumptions regarding consumer readiness to adopt technology; consumer, government, and business adoption of the STJ and the regional regulatory landscape regarding the STJ.

Table 1: Technology functions associated with the STJ

Technology function	Description	Benefit	Example
Identification	Proof of identity linked to the user through a service platform.	Rapid processing of customers due to the elimination of most on-location physical identity document checks and pre-verified payment.	Customer is identified utilising biometric matching at cruise embarkation, negating the requirement for check-in having provided an authenticated enrolment via a mobile platform prior to arrival at the cruise terminal.
Real time data sharing	Operators using data about traveller behaviour, in the moment, to optimise decision making about the deployment of assets and people.	Operational changes that can be optimised to reflect customer travel updates.	Hotels utilising real-time check-out data to drive responsive room turnaround allowing a more flexible check-in offering.
Consumer preferences	Sharing of user preferences through the identity service provider. Such data may include historical bookings; travel history; consumptive patterns; etc.	Upselling and cross selling opportunities where products can be matched to user preferences.	Rental companies will be able to combine customer preference data stored with identification functions to make dynamic offers of specific models of vehicle, for example.

- Economic impact assessment was performed by attributing monetary values to the impacts identified in the previous steps. An interactive, economic model was constructed that features a series of toggles that can be adjusted to explore alternative scenarios regarding the STJ. At its core, the model computes the following parameters:
 - o **Defining the industry baseline;** industry baselines are a do-nothing scenario (without STJ).
 - o **STJ benefits forecast;** uses both an 'impact' parameter and a 'magnitude' parameter to forecast the benefits. The benefits are always a function of sector revenues or costs.
 - o **STJ cost forecast;** uses parameter estimates of IT infrastructure in an average hotel and extrapolates these values to all sectors with some scaling factors. The values are reported as a proportion of annual or periodic sector cost.
 - o **Calculating net economic effects;** Gross Present Values (PV) were calculated for both benefits

and costs for each sector and region. These were then netted off to derive the Net Present Value (NPV) estimate for the STJ. A series of benefit to cost ratios were also calculated, that express the proportion of benefits per dollar investment.

A central scenario was used for reporting the overall cost and benefit results. A further two alternative scenarios (one more pessimistic than the central and the other more optimistic) were used for sensitivity testing of the model.

GENERAL ASSUMPTIONS

Multiple assumptions were made for the parameters used through the CBA. The following assumptions feature in the model:

- Deployment scenarios and the baseline scenario were developed for 30 years (2020-2050). 2020 is assumed as the base year.
- Deployment scenarios assume the rate at which technologies can be deployed for each region. The actual rate of deployment may vary from this hypothetical potential.
- The deployment scenarios were fixed across sectors, although in practice this may exhibit some variation.
- Hotel, cruise and car rental sectors include all business types and sizes. The definition is broad to avoid market segmentation which would add considerable complexity to the model.
- A discount rate of 7% was adopted, based on the literature and the nature of STJ vision .
- The deployment of STJ technology is not assumed to vary by sector, only by region.
- The cost of STJ-enabling technology will fall at an average rate of 10% per 5-year period up to 2050. This reflects a maturing technology market.
- The number of beneficiaries of the STJ is a direct function of the deployment rate.
- Since the STJ is an integrated concept, it is assumed factors exogenous to the model (e.g. deployment of biometrics within the aviation context) are complimentary to the rates of deployment in the model.
- A scale factor for estimating costs assumes an economies of scale effect when deploying technologies in larger premises. The inverse of this operation is also true. This adjustment effects the unit price of deployment.
- The future growth of each sector in the industry baseline is assumed to lie between current CAGR forecasts and long-run GDP forecasts.
- The CBA assumes a constant deployment rate across sectors and fixed internally for regions. This allows a segment of the market (that has deployed biometrics) to be valued in conjunction with the STJ concept.
- All impact functions of the STJ concept can be valued through either change to aggregate sector revenues or costs. In practice, some elements of the concept may have indirect effects.
- The costs and benefits derived from the STJ concept is underpinned by the deployment of biometric technology.

² US Office of Management and Budget guidance, 2018; UK Treasury, Central Government Guidance on Appraisal and Evaluation, 2018

RESULTS

The CBA model provides a forecast of future cash flows over the period 2020-2050 with the deployment of the STJ. The benefits are estimated as either a function of operations streamlining (cost reduction) or an improvement in cash-flows (revenue enhancement). Costs are estimated according to CAPEX, OPEX and transaction cost of deployment. Both costs and benefits are scaled according to the deployment curves.

The results of the CBA are reported by region and by STJ sector. When aggregated up to the highest level, the net impact of the global STJ adoption by 2050 is forecast to drive a present value of \$349 billion to industry - this represents a benefit cost ratio of 4.16. The highest NPVs are associated with North America and European region for hotels (Figure 2). For car rental, the NPVs are greatest for the Asia Pacific and North American region. Lastly, for cruise the highest NPVs are associated with North America and Europe. Overall, the hotel sector accounts for the highest global NPV (\$259 billion) while the cruise sector accounts for the lowest NPV (\$17 billion).

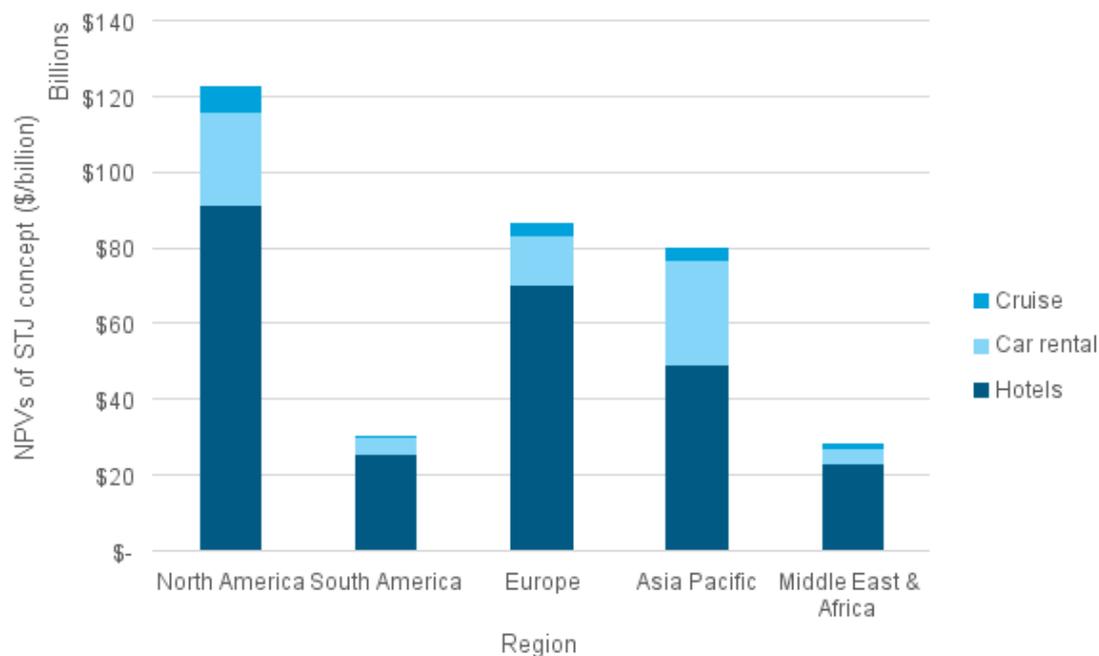


Figure 2: Net Present Values (NPVs) of STJ concept by sector and region

The Capital Balance Sheet for the CBA period (2020 to 2050) shows the headline costs and benefits (Table 2). The benefit to cost ratios is highest for the North America region (4.23) and lowest for South America (3.99). The highest NPVs for all sectors are associated with North America, Europe and Asia-Pacific region.

Table 2: Capital balance sheet summarising costs and benefits for STJ

Capital Balance Sheet for Period 2020 - 2050						
	North America	South America	Europe	Asia Pacific	Middle East & Africa	Global
	\$ (M)	\$ (M)				
Benefits						
Baseline value	\$8,597,189	\$2,826,468	\$6,405,166	\$6,340,187	\$3,077,776	\$27,246,785
Cruise benefits	\$7,718	\$372	\$3,941	\$3,808	\$2,043	\$17,882
Hotel benefits	\$122,301	\$34,428	\$95,238	\$65,765	\$30,778	\$348,510
Car rental benefits	\$31,169	\$5,606	\$16,402	\$34,739	\$5,095	\$93,011
Gross Present Value of Benefit	\$161,188	\$40,406	\$115,580	\$104,312	\$37,916	\$459,402
Liabilities						
Cruise costs	(\$273)	(\$13)	(\$151)	(\$131)	(\$76)	(\$645)
Hotel costs	(\$31,159)	(\$8,861)	(\$25,052)	(\$16,607)	(\$7,978)	(\$89,657)
Car rental costs	(\$6,687)	(\$31,244)	(\$3,580)	(\$7,426)	(\$1,144)	(\$20,080)
Gross Present Value of Cost	(\$38,119)	(\$10,118)	(\$28,783)	(\$24,164)	(\$9,198)	(\$110,382)
Net Present Value	\$123,069	\$30,288	\$86,798	\$80,147	\$28,718	\$349,020
Benefit Cost Ratio	4.23	3.99	4.02	4.32	4.12	4.16

BENEFITS

The total value of benefit forecast to be created from the Seamless Traveller Journey across all sectors and regions is \$459 billion. The hotel sector stands to accrue the most total benefit, followed by car rental and cruise (Figure 3). These benefits are highest in the North American region for the hotel and cruise sectors. The Asia Pacific region has the highest expected benefit for the car rental sector.

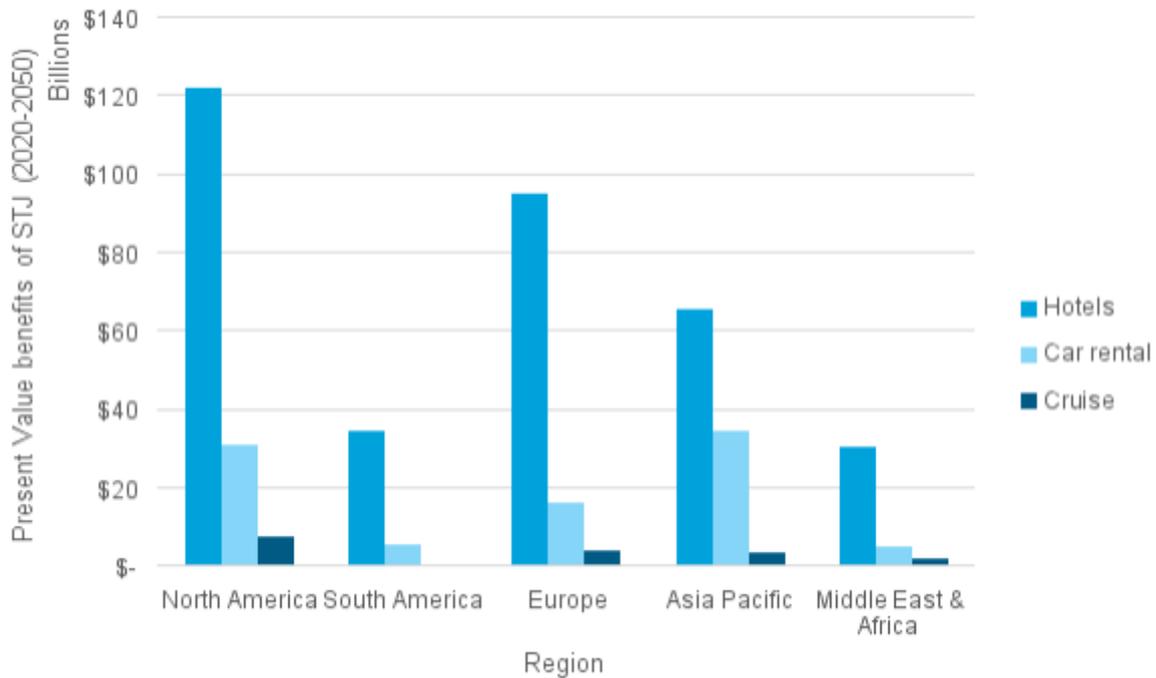


Figure 3: PV benefits according to each sector and region for the STJ concept

A final breakdown of all benefits reported by benefit function and sector is illustrated in Figure 4. The proportions on the chart demonstrate the share of benefit attributed to each function and sector. The benefits are either a function of operational streamlining (a cost saving) or an improvement in cash flows (a revenue enhancement). More customer bookings (a revenue enhancement related to improved customer satisfaction) accounted for the highest overall share of benefit from the STJ. Other important benefits include reduced card holding fees, lower payroll and opportunities for personalisation and customisation through sales.



Figure 4: Breakdown of benefits by benefit factor and sector

Regionally, North American hotel and cruise sectors stand to gain the most in absolute terms whilst the car rental sector in Asia Pacific is expected to see more benefit than any other region. Overall, regional benefit accumulation is in three tiers:

- **Tier One:** North America can expect more than one-third of the total net present value - \$123 billion.
- **Tier Two:** Europe and Asia Pacific stand to drive \$87 and \$80 billion in value respectively from implementing the STJ concept.
- **Tier Three:** South America will benefit \$30 billion, slightly ahead of the expected returns of Middle East and Africa which is forecasted to see \$29 billion in net gain from seamless traveller journeys.

COSTS

The investment required to deliver the Seamless Traveller Journey globally is estimated to reach \$110 billion across sectors. The costs of deployment are highest in North America and lowest in Middle East and Africa (Figure 5). Costs varied significantly by sector with over 80% (\$90 billion) of the cost anticipated to be required from hotels. The car rental sector will see in the region of \$20 billion invested to reach mass adoption of the STJ whilst the cruise industry is expected to need to spend \$650 million.

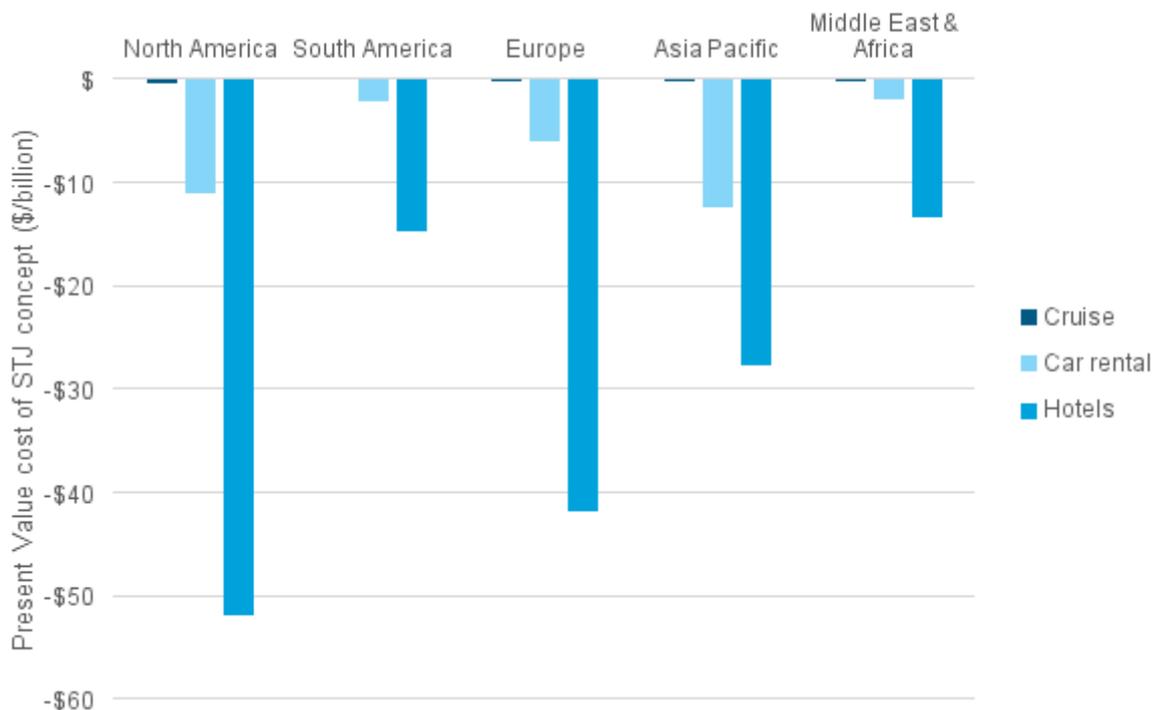


Figure 5: Global Present Value cost by sector (2020-2050)

INCORPORATING AVIATION

The economic analysis Atkins conducted for IATA's One ID initiative has been assessed alongside the STJ model.

The two models' 30-year forecasts suggest a combined NPV of \$967 billion across the travel sector. The NPV within aviation calculated was nearly two-thirds of the total at \$618 billion compared to the \$349 billion NPV across car, hotel and cruise sectors for STJ adoption.

A gulf in the scale of benefit and a higher benefit cost ratio in aviation (15.4 compared to 4.16) may in part be down to some differences in the methodologies used, but also considers:

- the greater maturity (and historical spend) of many aviation solutions only envisaged to be deployed in many hotels, car rentals and cruise ships or terminals
- propensity for airlines and airports to collaborate and adopt standards compared to the competitive nature of car rental and hospitality

Across both models, the greatest benefit values come from improvement to traveller experience, because of time saved or as manifested in increased bookings.

CONCLUSIONS

The analysis identified large net **benefits across all sectors and within all regions**.

Revenue increases from **improved experience drives the highest quantity of benefit** through more bookings in all sectors.

The **cruise sector has the highest return on investment**, followed by car rental and then hotels. However, in nominal terms the **hotels sector derives the greatest overall benefit**.

Regionally in aggregate terms, **North America and Europe will experience the greatest benefits** from the STJ.

Whilst it is crucial to consider the differences in the modelling approach (detailed in the Technical Report) as a caveat; at a high-level, the **case for investing in Seamless Traveller Journey for the sectors in scope seems less compelling than in aviation** which was forecast to experience huge returns from investment in IATA's OneID initiative. However, the **benefit case still suggests a powerful case for each sector to proceed** without quantifying the potential for cross-organisational benefit.

During stakeholder interviews there was uncertainty regarding the quantification of some tangible benefits that were agreed to be achievable as a result of the Seamless Traveller Journey. To combat this, the impact analysis and assessment was informed by the range of interviews, the workshop sessions bringing experts together to agree and challenge on assumptions and case studies from comparable deployments in aviation and other sectors.

The approach to estimating the cost of the initiatives to implement and run a Seamless Traveller Journey were also subject to debate. For instance, the role of IDaaS (Identity-as-a-Service) type revenue models may change considerably over time and this is likely to impact the STJ concept. Estimates acknowledge this uncertainty through both sensitivity testing in the model and a conservative approach to benefit and cost estimation.

The model has been constructed so it can be updated in the future with revised input data (e.g. updated sector cost and revenue forecasts) and parameter estimates (e.g. a refined benefits matrix). Such updates should be relatively simple to incorporate into the model architecture. Given the long-run forecasting period, future updates would provide further validity to the findings and reflect changes to long term outlooks.

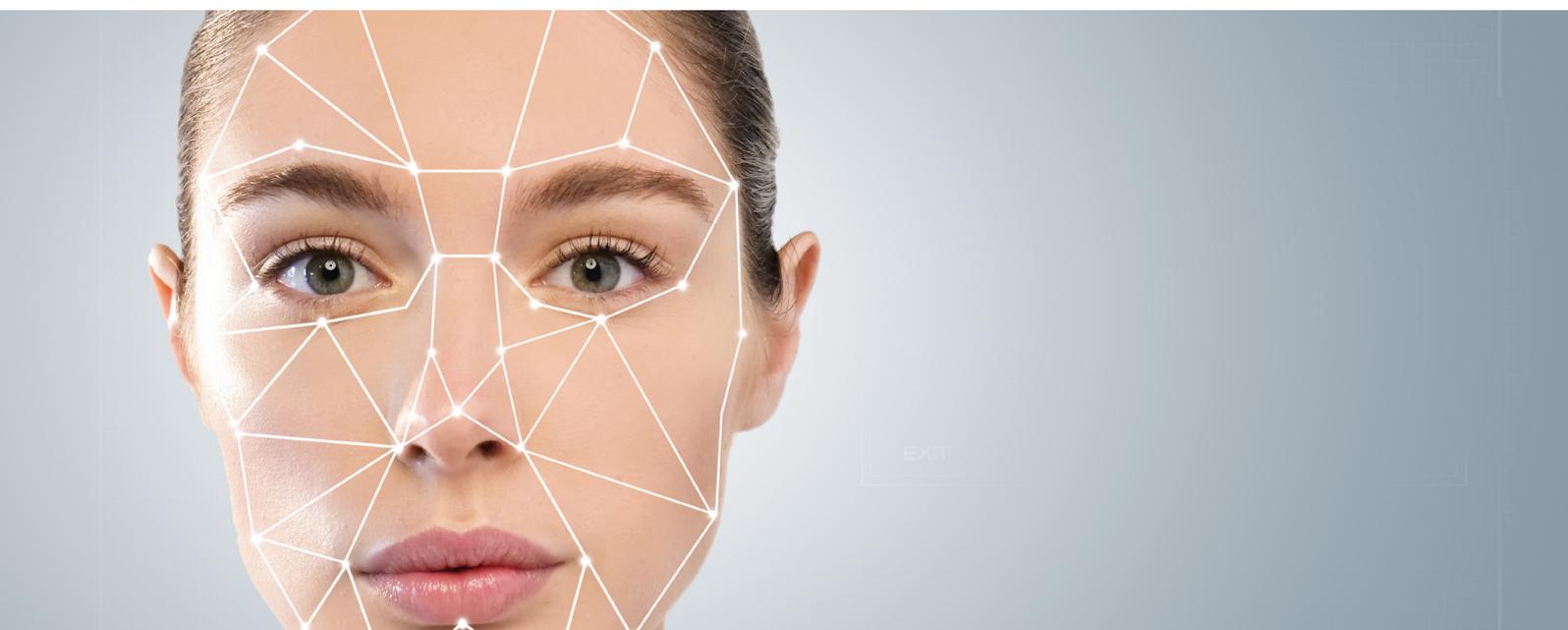
NEXT STEPS

- Given the positive outcome from the economic analysis, WTTC will continue to support the travel and tourism sector in its efforts to adopt the innovative technologies and ways of working which enable the STJ.
- Net benefits calculated in this analysis sit with the industry operators. Further consideration of the advantages of Seamless Traveller Journey to travellers themselves and governments which set the legislative agenda necessitating much of the identity-related processing of travellers should support the WTTC and industry in its attempts to encourage adaptation of regulation to unlock the value identified in this analysis.
- Governmental engagement is critical due to the regulatory attitude towards digital identity and data privacy across sectors. The ability to make processes more seamless is not necessarily constrained by identity solutions, but by a non-uniform regulatory landscape that varies by region and sector.
- Data standards and collaboration are essential enablers to unlocking additional benefits (in the form of a cross-travel modality seamless experience) not captured in this economic analysis.
- Moving forward, some trials will be necessary to demonstrate the actual costs and benefits to sectors from adopting the STJ concept. This could consist of integrated deployment of biometric technology and other enablers across pilot sites for the cruise, car rental and hotel sectors. A pilot programme will yield further insights in terms of the actual costs of deployment, realistic deployment rates and the likely benefits of a scaled-up approach. The pilot will help validate some of the assumptions taken within the model, including the benefits matrix.

This summary report was prepared by the World Travel & Tourism Council (WTTTC) in collaboration with Atkins Limited.

The authors of the report would like to thank the representatives from the following WTTTC members who participated in the interviews and workshops:

- Airside Mobile
- Amadeus IT Group
- Bucuti & Tara Beach Resort Aruba
- Carnival Corporation
- Hilton
- MSC Cruises
- Radisson Hotel Group
- Royal Caribbean Cruise Lines
- Sabre Corporation
- Vision-Box



ACKNOWLEDGEMENTS

Gloria Guevara
President & Chief Executive Officer
World Travel & Tourism Council

EDITORS

Helena Bononi
Vice-President Membership & Commercial
World Travel & Tourism Council

Will Squires
Associate Director - Digital (Cities & Infrastructure)
Atkins Limited

DESIGNER

Stephanie Church
Digital Marketing Manager
World Travel & Tourism Council



ATKINS

Member of the SNC-Lavalin Group