Our sky could fall:

The long-term infrastructure and funding challenge facing RDU Airport – and our region

Preliminary task force findings and recommendations

Regional Transportation Alliance
RDU Airport Infrastructure Development (AID) Task Force
January 17, 2020

RTA is the voice of the regional business community on transportation

Executive Summary / Letter to the Region

Thank you for your support of RDU International Airport – and of our region's future success.

There is a broad understanding and appreciation for RDU Airport across our region. We are rightly proud of the beautiful facilities, ease of use, and the friendly environment. We enjoy access to a rich array of flights and destinations and an enviable, balanced mix of air carriers. The global connectivity RDU provides as America's most-connected non-hub airport is a crucial part of our region's economic success. RDU Airport is the first impression that many of our visitors have of our community – and RDU also serves a source of vital tax revenue due to the impact from jobs and tourism.

However, this growth in flights, destinations, and passengers has created—and potentially masked—an urgent need to expand infrastructure and an equally urgent funding problem for RDU.

In 2017, the Federal Aviation Administration (FAA) approved RDU's infrastructure development master plan, titled "Vision 2040", which provides airport leadership with a logical, scalable road map to respond to the impact of regional growth on RDU over time. However, **passenger levels in 2019 were the highest in RDU history. They are equivalent to the projected 2031 levels – meaning that traffic at RDU is 12 years ahead of expectations and continuing to increase.** To maintain the current levels of service and account for anticipated and accelerated capital needs, our community will need to invest between $3 and $4 billion in RDU airport infrastructure over the next two decades.

The funding for this expansion should be a shared responsibility. RDU's owners – Wake and Durham Counties, and the cities of Durham and Raleigh – currently contribute a total of $50,000 a year to the operations and capital program. The North Carolina General Assembly has been a great partner for RDU—and all of the state's commercial airports—by providing a recurring funding source for capital needs. But the principal responsibility for identifying a sustainable financial model falls on the RDU Authority and the airport's visionary leadership team, which executes a world class airport experience for travelers every day, through a host of visible and behind-the-scenes efforts.

While the airport will have significant and increasing revenue sources available as a result of more flights and passengers, state assistance, and RDU initiatives, our region will still face a funding gap for RDU between $1 and $2 billion over the next two decades. The size will depend on how quickly our region grows and how much disruption our community can tolerate in waiting for new facilities, waiting in lines, delayed flights, along with fewer flights due to lack of terminal or airfield space.

RDU is not alone in dealing with the challenges of rapid growth. Many of the regions against which we compete and benchmark ourselves–-such as Nashville, Austin and Columbus–-are making or seeking substantial investments in airport expansions to handle and stimulate future growth.

The continual upgrading and expansion of RDU is critical to the ongoing economic prosperity of the Triangle region. From business expansion, to tourism, to our global reputation as center of research, innovation, education and health care, the airport is essential. To date, improvements to the airport have been completed with little to no negative impact to travelers even though they touch critical aspects of the operations such as runways, taxiways, security lines and roadways. Future improvements will become increasingly challenging given the growth of the region, the limitations of existing infrastructure, and the size of the funding gap.

Given its long-term funding situation, and in response to a request from RDU, the Regional Transportation Alliance convened a diverse group of 12 business and community leaders to develop potential solutions, known as the RTA RDU Airport Infrastructure Development (AID) Task Force.

Our task force met monthly since September 2019. We heard from key leaders and partners including members of the RDU Airport Authority Board and several of the air carriers serving RDU. We also engaged Ricondo & Associates, the firm that developed RDU's master plan, to offer insights on changes at RDU since adoption of the airport master plan as well as potential consequences of inaction.

Our work made it clear that RDU's master plan cannot fund itself, particularly given the rapid growth in the region. Neither the legislature's investments nor the additional revenue from new flights will be sufficient to fully close the $1 to $2 billion funding shortfall. There is also no current consensus with RDU's airline partners on funding solutions or structures. And, while the airport may not be a natural partner with Umstead State Park, it needs to quickly become one, and vice versa.

It is also clear that the public has very little awareness of the accelerated rate of growth at RDU, the level of needed infrastructure over the next 10 to 20 years, the financial underpinnings of the airport, the extent of the funding challenge that has emerged, and the lack of an obvious solution to quickly address what could become a crisis for the region.

* * * * *

This report offers a series of preliminary findings, observations, and recommendations for funding. These are not intended to be the final answer to RDU's funding dilemma; rather, we advance them to highlight the issue and the extent of the problem, and to accelerate what will be necessary conversations by policymakers, the business community, and the public on possible solutions.

We believe that our region, and the business community as a whole, must become more broadly aware of the challenges facing RDU. Our community, led by the four owners of RDU and the RDU Airport Authority Board, must identify and activate a funding structure that sets RDU on a financial trajectory needed for long-term success for our region.

There is no single "magic" answer, and we have a limited and shrinking period of time for all stakeholders—including, but not limited to, the four governmental owners, the airlines serving RDU, and business and leisure air travelers—to come up with a way to ensure the long term viability of RDU. We also believe that RDU should do a review of its master plan, given our rate of growth, RDU's funding needs, and the current political environment.

We also believe that the regional business community can be a catalyst for broader, collective action to ensure the ongoing success of RDU for our region.

Identifying sustainable funding for essential growth at RDU airport is the top transportation priority of the regional business community, and it will remain so until it is successfully resolved.

Michael Schoenfeld	Joe Milazzo II, PE
Duke University	Executive Director
On behalf of the RTA RDU AID Task Force	Regional Transportation Alliance

Context for readers

The information in this "Our sky could fall" findings and recommendations document represents the best thinking of our RTA volunteer business task force as of mid-January 2020.

The Regional Transportation Alliance has not formally approved these findings or recommendations and so they should be considered preliminary. However, RTA supports their release at our annual meeting on January 17, 2020 to generate discussion and increase awareness of the issue across the region.

The task force was purposeful in seeking to advance a resolution of the funding issue by proposing a series of options while avoiding an excessive burden on any one group of stakeholders. *When seeking to resolve a multibillion dollar infrastructure funding gap, there is inevitably going to be something for everyone to like or dislike.*

Therefore, we suggest that readers treat this task force document as a whole, as a preliminary recommended *package of potential options* for the region to consider, evaluate, and improve upon.

While we believe this document represents an important contribution to and elevation of the regional conversation, we recognize the limitations of time and resources available for our volunteer task force. This document is not intended to be either "perfect" or exhaustive, and we do not have revenue estimates for several of the preliminary recommendations described herein.

Please notify us of errors, mistakes, and missing information.

Acknowledgements

The Regional Transportation Alliance RDU Airport Infrastructure Development (AID) task force would like to thank several organizations for their assistance with this ongoing RTA initiative, including:

- RDU professional staff, led by president and CEO Michael Landguth
- RDU Airport Authority Board of Directors, led by chairman John Kane
- Airlines for America
- Delta Air Lines
- American Airlines
- Southwest Airlines
- Ricondo & Associates
- RTA member firms

Note that our acknowledging of the above individuals or entities does not imply their agreement with all or any of the preliminary findings or recommendations in this report.

The Regional Transportation Alliance RDU Airport Infrastructure Development (AID) task force has been honored to serve the regional business community and the broader region in this effort, and we look forward to working together to ensure the continued success of RDU.

Brief summary of preliminary task force findings, observations, and recommendations

Overall Recommendation:
Expeditiously identify, approve, and activate a sustainable funding structure to address the $1-$2 billion funding gap at RDU over the next two decades to ensure the long-term success of RDU and the region.

Annual economic impact of RDU
- RDU's annual economic impacts exceed $12 billion and nearly 100,000 jobs
- State, local tax revenues exceed $400 million annually due to activity supported by RDU Airport

Accelerated growth at RDU
- Passenger levels in 2019 were the highest in RDU history and are equivalent to the projected 2031 levels – meaning 12 years ahead of expectations and continuing to increase.
- Peak hour usage of terminal 2 security lanes are up 50% in 2 years

Projected capital needs and funding gap
- Our region faces a funding gap for RDU between $1 and $2 billion over the next two decades, the size of which depends on how quickly we grow and how much disruption we can tolerate
- Capacity constraints will result in longer wait times and may impact flights and economic activity
- Airport infrastructure cannot be activated like a light switch; it can have decade-long lead times
- The public has little awareness of the rate of growth at RDU, the level of needed infrastructure, and the lack of an obvious solution to address what could quickly become a regional crisis

Current sources of funding
- State of NC has been a strong partner for RDU and other commercial service airports
- Federal Government will not provide significant financial help to RDU and peer airports
- Airlines oppose increases in the maximum passenger facility charge ($4.50 PFC since 2000)
- RDU has sufficient funding available for this decade's needs, and then faces a major challenge

Selected preliminary task force recommendations on funding and financing
- Increase carrier landing fees and activate general aviation landing fees
- Implement $2 airport access fee, collected via transponders; use funds for RDU roadway needs
- Reallocate local rental car taxes to airport; use funds for RDU roadways and rental car facility
- Implement premium curb access areas at terminals; use funds for RDU terminal improvements
- Propose nominal PFC increase of $1, and index for inflation, but do not focus on large increase
- Lobby FAA for accelerated environmental approvals; e.g., establish maximum 3 year timeframes
- Accelerate or increase amount of bond financing, if allowed by other covenants and supported by additional revenues such as those identified above

Selected preliminary task force observations and recommendations on land use
- Create RDU Real Estate Master Plan with specific timelines, financial requirements
- Hire master developer to review entire airport for strategic development opportunities
- Consider creation of a new "terminal 3" – north of terminal 2, away from Umstead State Park
- Offer airlines opportunity to build, fund, and operate terminal 3 – and share in capacity risk
- RDU could do a value engineering review of entire 2040 master plan to build regional goodwill
- RDU should revisit entire 2040 master plan given the reality of an adjacent, beloved state park

Identifying sustainable funding for essential growth at RDU airport is RTA's top priority for 2020.

Preliminary Findings and Observations by RTA RDU AID Task Force

Findings and Observations on RDU, Master Plan, Growth and Airport Infrastructure Development

- The RDU "Vision 2040" master plan makes logical sense and is scalable
- However, RDU's growth has swamped many of the master plan's inherent assumptions
- 2019 actual passengers equal projected 2031 levels – meaning 12 years ahead of expectations
- As a result, RDU capital development needs are 12 years behind, and falling further behind
- 14 million actual passengers at RDU in 2019, a 50% increase in 6 years
- Peak hour usage of terminal 2 security lanes are up 50% in 2 years
- Our region is anticipated to grow by another 30-40% or more in the next two decades
- RDU is executing remarkable, behind-the-scenes efforts, e.g. overnight runway preservation
- Most improvements to-date have been completed with little to no negative impact to travelers
- Future upgrades will become increasingly challenging to implement without traveler impacts
- *Projected infrastructure needs at RDU over the next two decades are $3 to $4 billion*

Findings and Observations on Economic Impact

- RDU's annual economic impacts exceed $12 billion and nearly 100,000 jobs
- One new international flight (Paris) has a projected $1.4 billion economic impact, 14,000 jobs
- State, local tax revenues exceed $400 million annually due to activity supported by RDU Airport
- RDU is an essential component to our recruitment and economic development efforts
- Affordable, convenient, competitive air travel options are necessary for businesses to compete
- Convenient air travel options are an important factor for talent retention, employee attraction
- We have a strong array of flights and destinations at RDU with an enviable, balanced carrier mix
- RDU benefits not only the local economy but surrounding areas as well
- Capacity constraints will result in longer wait times and may impact flights and economic activity
- Runway/gate expansions will create opportunities for more nonstop flights, international service
- Doing nothing will have significant economic development and personal quality-of-life impacts
- *Doing nothing is not a viable option for a growing community to remain successful*

Findings and Observations on Funding and Funding Gaps

- Airport infrastructure cannot be activated like a light switch; it can have decade-long lead times
- RDU is not alone in dealing with the challenges of rapid growth
- RDU professional staff is actively exploring and implementing revenue and expense solutions
- RDU's four owners (Durham, Wake cos.; Raleigh, Durham city) collectively invest $50k per year
- State of NC has been a strong funding partner for RDU and other commercial service airports
- RDU will receive more than $17 million in recurring annual funds from the State
- Federal Government will not provide significant financial help to RDU and peer airports
- RDU's average annual federal entitlement and discretionary funds are around $2.5 million
- All major stakeholders (e.g., federal, state, local, airlines) will need to participate in the solution
- RDU believes it can cover $2 billion in capital needs through 2029 via cash and maxing out bonds
- Additional bond financing will require sufficient operating revenues to support new debt
- RDU's master plan cannot fund itself, even with—and especially with—our accelerated growth
- RDU's moving to full cost recovery for aviation-related expenses instead of discounts to airlines
- Raising airline rates and charges has limits for RDU to remain competitive vis-à-vis other markets
- RDU's projected funding gap will still be $1 to $2 billion over next 15-20 years
- *RDU is so good, it's a problem; the effectiveness and growth at RDU means that there is little to no awareness of the looming funding issue – and of the potential impact to our prosperity*

Findings and Observations on Airline Partners and their relationship with RDU

- Airlines have been great partners for RDU travelers, adding more flights, seats, destinations
- Airline, airport, and community interests are understandably not always in complete alignment
- There is not currently agreement with airlines on means of funding required infrastructure
- Airlines want RDU to keep their costs per enplanement (CPE) low or at least competitive
- RDU recognizes that costs may track upwards to maintain a viable capital program
- Airlines oppose increases to federally authorized passenger facility charge (PFC)
- Maximum allowable PFC levels ($4.50) have been unchanged by Congress since 2000
- RDU is at maximum PFC level; proceeds are dedicated to terminal 2 repayment for many years
- Airlines want more certainty in their rates and charges; RDU desires to retain flexibility
- Airlines generally want more input in capital expenditures at all airports they serve
- *RDU should ensure ongoing and future competition, not just funding the needs of current airlines*

Brief comparative data with selected peer airports

	Austin	Columbus	Nashville	San Jose	RDU
Enplanements/year	7.7 m	4.0 m	8.0 m	7.0 m	6.3 m
Flight operations/year	208k	155k	210k	166k	209k
10 yr capital program	$4.3b	$2.0b	$2.9b	$0.3b*	$1.9b
Debt/enplanement	$102	$20	$34	$178	$74
Cost/enplaned pax	$9.03	$7.92	$7.00	$10.39	$7.50
Non-aero rev/gate	$2.9m	$1.9m	$2.0m	$3.0m	$1.9m
Days cash on hand	573	430	700	635	1135

*Note: enplanements and operations are 2018 data; RDU had 7.1m enplanements in 2019, *San Jose capital program is for 5 years only.*
Courtesy: Airlines for America (A4A), Raleigh-Durham Airport Authority (RDUAA), Ricondo & Associates, Federal Aviation Administration (FAA).

Information on FAA national airport categories

There were 30 large hub airports in 2018 in U.S.
1-Atlanta (51.9m enplanements) to 30-Portland (9.8m), average 21.4m

There were 31 medium hub airports in 2018 in U.S., including RDU
31-Nashville (8.0m enplanements) to 61-Omaha (2.5m), average 4.8m

RDU was ranked 39th (6.3m enplanements) in 2018
If RDU's 2019 data applied to 2018, it would have been the 35th largest airport in U.S.

Source: FAA

Selected overview data for RDU Airport

RDU vital statistics

- 61 total nonstop destinations, including 5 international
- 10 airlines
- More than 600 daily take-offs and landings
- More than 35,000 daily passengers

RTA growth measures

- Around 50% increase in passenger traffic since 2013
- Around 150% increase in international traffic since 2014

Examples of recent and ongoing reconstruction and upgrade work at RDU

- Terminal 2 checkpoint: from 10 to 12 lanes in 2019, to 14 lanes in 2020
- Reconstruction of 5L-23R continues, with 117 slabs replaced overnight in 2019
- Repairs to 5R-23L occurred in 2019
- *Most improvements to-date have occurred with little to no impacts to travelers*

Selected summary of findings from Ricondo & Associates on RDU changes since master plan

RTA hired Ricondo & Associates, a Chicago-based engineering consulting firm that had developed the RDU Master Plan, to compile updated information on the potential consequences of inaction. While this was not a redo of the master plan, it did provide new information and perspectives given our rate of growth.

Average aircraft size at RDU is getting larger:

- 2015: 104 seats/departure
- 2019: 120 seats/departure
- 2025: 140 seats/departure

Which means aggregate wing span is getting larger, which is creating gate limitations

Peak periods at RDU are becoming more pronounced and broader (more sustained).

While RDU is still a predominantly an Origin & Destination (O&D) Airport, RDU **is now serving more reliever-type connections.**

Potential technology solutions for security screening lane capacity offer limited and variable capacity benefit and even some of these require additional physical space.

Source: Ricondo & Associates, study for RTA, January 2020

Summary of Preliminary Recommendations of RTA RDU AID Task Force

RDU and Local Funding Recommendations

- Continue to pursue full cost recovery of all aviation-related expenditures at RDU
- Increase existing carrier landing fees based on weight; use funds for airfield improvements
- Activate landing fees for general aviation users; use funds for airfield improvements
- Implement $2 fee payable upon exiting the airport; use funds for RDU roadway improvements; *parking customers would not pay this fee; would be collected via transponders; revenue TBD*
- Reallocate local rental car taxes to RDU; use funds for RDU roadways and rental car facility *All local rental car taxes currently raise $16m per year, or around $160m per decade*
- Implement premium curb access fees at terminals; use funds for RDU terminal improvements *this would be a premium, opt-in offering; would be collected via transponders; revenue TBD*
- Have Durham and Wake counties identify external lands that could be monetized to fund RDU
- Consider accelerating or increasing amount of bond financing, if allowed by other bond covenants and supported by additional revenues such as those identified above
- *RDU's local owners must develop or endorse sustainable funding package and own this issue*

Airport Land Use Recommendations

- RDU property is a valuable resource that should be managed to generate revenue for the airport
- RDU has the responsibility to leverage its property for compatible and complementary uses *Create RDU Real Estate Master Plan with specific timelines, financial requirements; Hire master developer to review entire airport for strategic development opportunities*
- Consider creation of a new "terminal 3" – north of terminal 2, away from Umstead State Park *Terminal 3 could be primarily focused on expanded international service offerings; Offer airlines opportunity to build, fund, and operate terminal 3 – and share in capacity risk*
- RDU could consider relocating crosswind (14-32) runway; evaluate compatible uses of that land
- RDU could do a value engineering review of entire 2040 master plan to build regional goodwill
- The situation surrounding RDU's lands and adjacent Umstead Park has been a costly distraction *RDU should revisit entire 2040 master plan given the reality of an adjacent, beloved state park*
- RDU may not be a natural partner with Umstead, but it needs to become one – and vice versa *Ask NC DNCR to authorize mountain biking in Umstead State Park at an appropriate location*

State Funding Recommendations

- Thank legislature for significant, ongoing investment in North Carolina's commercial airports *State funding generates around $17m annually for RDU, or around $170m per decade*

Federal Funding and Policy Recommendations

- Propose nominal PFC increase of $1 (to $5.50); then index PFCs to inflation going forward *A $1 PFC increase would provide $6m annually for RDU, or around $60m per decade*
- Rather than uncapping PFCs, authorize increases above these levels only with airline approval(s)
- *Do not focus on large PFC increases, as the conflict between airports and airlines appears to be unresolvable and a distraction from needed federal action on areas like FAA approval timelines*
- Lobby for accelerated FAA environmental approvals (max 3 years) via airports/airlines coalition

Overall Recommendation:

Expeditiously identify, approve, and activate a sustainable funding structure to address the $1-$2 billion funding gap at RDU over the next two decades to ensure the long-term success of RDU and the region.

Regional Transportation Alliance RDU Airport Infrastructure Development (AID) Task Force

Task force members

- Joe Anglim, Senior Director, Corporate Strategy, Red Hat, Inc.
- Jim Beley, General Manager, The Umstead Hotel and Spa
- Sarah Gaskill, President and CEO, Morrisville Chamber of Commerce
- Lauren Guy, Marketing Manager, HH Architecture
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Our sky could fall:

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Preliminary task force research report

Regional Transportation Alliance
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January 17, 2020

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The following is the draft, source RTA RDU AID task force research report that helped inform the preliminary findings, recommendations, and executive summary letter

Table of Contents – preliminary task force research report

I. Growth of the Research Triangle market

The Research Triangle market is high-growing–and high-flying–with a significant, steady population increase. The Raleigh and Durham (R&D Triangle) region has consistently been among the fastest-growing and most economically successful areas for more than 40 years, and job growth continues to well exceed state and national averages. Michael Walden, distinguished NC State economist, believes that by 2050, our region "could easily be two-thirds larger in population" than it is currently.

Raleigh-Cary Metro Area
2010 population 1,130,488
2018 population 1,362,540
Change 232,052 or 20.5% — 10th highest percentage change in the US

Durham-Chapel Hill Metro Area
2010 population 506,660
2018 population 575,412
Change 68,752 or 13.6% — 47th highest percentage change in the US

Combined Raleigh-Durham-Chapel Hill, NC CSA
Also includes: Dunn, Henderson, Oxford, and Sanford Micropolitan Statistical Areas.
2010 population 1,912,637
2018 population 2,238,315
Change 325,678 or 17.0% — 7th highest percentage change in the US

Sources
https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-metro-and-micro-statistical-areas.html

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

II. Economic importance and impact of RDU

Raleigh-Durham International Airport (RDU) is vitally important to our region's prosperity, opportunity, and quality of life. The most-connected non-hub airport in the United States, with 10 air carriers providing more than 60 daily nonstop destinations including multiple transatlantic flights. Directly employing more than 5,000 people in the center of the region, its indirect economic impacts exceed $12 billion annually and nearly 100,000 jobs in North Carolina. State and local tax revenues exceed $400 million annually due to activity supported by RDU Airport.

Sources
https://www.ncdot.gov/divisions/aviation/Documents/state-of-aviation.pdf

III. RDU overview and the RDU Vision 2040 Master Plan

Today there are 10 air carriers serving RDU, excluding regional carriers doing business as or flying for larger carriers: Air Canada, Alaska, Allegiant, American, Delta, Frontier, JetBlue, Southwest, Spirit, United. No single carrier has even one third of the market share.

RDU Terminal 2 is our airport's primary terminal, with 36 active, dynamically allocated gates. Completed less than 10 years ago, there is essentially no short-term ability to add more gates given its current configuration. RDU Terminal 1 currently has 9 gates; four more will be added later this year, bringing the total to 13 at Terminal 1, and an overall total of 49 gates across both terminals. Currently, Terminal 1 is used exclusively by Southwest; starting in April, Allegiant and Spirit will move from Terminal 2 to Terminal 1 in the new gates, which will also free up a few gates in Terminal 2.

RDU has been on a multi-billion dollar construction program for well more than a decade, including the opening of Terminal 2 in 2008 and its completion in 2011, and the upgrade and expansion of Terminal 1 in 2014. In addition, there is an ongoing refresh of parking, approach roadways, and directional signage along with the continuing preservation and reconstruction of runways, taxiways, and airplane parking aprons. Given the deteriorating pavement condition of its primary runway (5L-23R), RDU has activated an emergency preservation project with more than 100 slabs replaced during 2019 at $100,000 per slab, utilizing 18 hour runway closures to replace in place one 25' x 25' slab at a time.

RDU finalized and received approval for its "Vision 2040" Master Plan in 2017, based on 2015 base data and usage projections out 25 years. The plan has been approved by both the RDU Airport Authority Board (RDUAA) as well as the Federal Aviation Administration (FAA). The Vision 2040 plan [*www.vision2040.rdu.com*] calls for investments of more than $3 billion in landside and airside aspects of campus (e.g., terminals, runways, taxiways, roadways, ground transportation) by 2045. However, with the rate of growth, RDU believes that that number has grown to nearly $4 billion by 2045.

The number of flights, destinations, seats, and passengers have all increased dramatically over the past several years. In 2012 there were 37 nonstops. Today that number exceeds 60 – or a more than 60% increase in nonstop destinations in the past eight years. The number of enplanements has increased by more than 50% since 2013, from 4.6 million enplanements to more than 7 million in 2019, with annual increases ranging from 5% - 10% year-over-year since 2015.

The rate of growth that RDU has experienced just over the past few years is hard to fathom. The actual number of enplanements we saw in 2019 was equivalent to the projected number of enplanements we expected to see in 2031. This means that passenger traffic is running 12 years ahead of projections – and it also means that the infrastructure needed to service those levels are 12 years behind. RDU experienced its highest day, month, and year ever during 2019 in terms of passengers.

The new passengers and flights are not distributed evenly throughout the day, however, with peak hour usage of the Transportation Security Administration (TSA) terminal 2 security checkpoints having increased by 50% in just the past two years, from 1,800 to 2,700 passengers her hour.

While new flights and increasing passenger numbers certainly create added revenue, they do not automatically align with airport infrastructure development funding mechanisms or with approval and construction timelines. Nor do these additional flights automatically generate consensus between RDU airport and all of its partner airlines about specific infrastructure needs.

IV. RDU revenues and expenses

RDU will need to invest between $3 and $4 billion in capital expenditures over the next two decades, depending on how quickly our region grows, and how much delay our community can accept in waiting for new facilities – and waiting in lines. In very round numbers, the airport has identified infrastructure needs of more than $0.5 billion – each – for its proposed airfield, terminal, and consolidated rental car construction programs over the next decade, for a total of around $2 billion by 2030.

Fortunately, RDU revenues are increasing–substantially–although only part of those revenues are due to growth. In the past four years, revenues are up more than 50%, from $107 to $165 million. Around 70% or around $40m of that overall growth is due to what RDU terms "strategic positioning", the majority of which resulted from increases to airline rates and charges along with surcharges on transportation network companies (TNCs) including Uber and Lyft as well as a new premier parking product. Around 30% of new revenues were due to growth (i.e., to increases in enplanements, aka enplaned passengers or "EPAX"), primarily from increases in parking charges, along with additional aeronautical revenue, concessions, and rental car fees.

RDU's annual operating revenues are north of $150 million per year. The largest sources are parking revenues (north of $60 million) and terminal-based revenues (more than $40 million), along with rental cars and landing fees (more than $15 million each) and food, beverage, and retail concessions (more than $10 million). In addition, RDU collects more than $50 million in non-operating revenues, from passenger facility charges (PFCs) and grants.

Parking revenue represents the vast majority (90%+) of all parking and ground transportation-related revenues. Parking revenue is around $60 million, with Uber/Lyft less than $5 million, and RDU taxi service fees well less than $1 million. RDU parking market share is down from more than 50% to below 30%, while Uber/Lyft are around 25% (from nearly nothing in 2015). RDU continues to roll out initiatives including pre-paid parking and RDU Express to continue to capture revenue.

RDU also receives around $70 million annually from airfield and property development activities, including airline landing fees, gate usage fees, and airline rents within the terminals, general aviation fees, and more. RDU has activated a public-private partnership for a new general aviation corporate hangar campus.

RDU receives revenue from retail concessionaires within the terminals. Those amounts exceeded $10 million in 2018. RDU received around $15 million from rental car and other leases such as Sheetz.

RDU has more than $0.5 billion in outstanding bond debt, with an average annual debt service of more than $40 million through 2038. RDU has a bonding capacity of around $0.7 billion more, based on a 1.25x debt coverage ratio. Debt service would approach $90 million annually, and all debt capacity would be consumed during this decade.

RDU has an annual budget of around $250 million. In 2019, RDU spent around $100 million modernizing and maintaining its physical plant, from repaving the airport ring road (John Brantley Boulevard) to reconstructing runways and taxiways. RDU's expenditures in operations, capital projects, and debt service are large enough that RDU must use some of its large cash reserves.

V. RDU performance metrics

RDU's key financial performance indicators (KPIs) are all excellent. Using June 30, 2019 as a guidepoint, RDU's balance sheet metrics (i.e., cash on hand, outstanding debt per enplanement) and most revenue per enplanement metrics (operating revenue, public parking and ground transportation, and rental car revenue) were all better than peer airport averages nationally, with only concession revenue being somewhat below peer averages. Operating expenses per enplanement were also much lower (better) than peer airports.

A key measure used by both airports and airlines is the cost per enplanement (CPE). RDU has historically been between 60% and 80% of their peer airport average from 2011 through 2017, with a value ranging from \$6.29 to \$7.28. However, in the past two years, RDU's CPE value has increased to more than \$8.50, and RDU's CPE value is now within 95% of its peers. If RDU were to increase its debt service to its current capacity, the airport expects its CPE value may exceed its peer average by the middle of this decade.

VI. RDU financial plan and funding gap

During the next 10 years, if RDU were to utilize all available and expected cash, state grants, federal grants, and bonding capacity, it expects to be able to cover its projected $2 billion in capital expenditures.

However, during the following 5-10 years (2030-2040), with an anticipated additional $2 billion expenditure plan, RDU expects a $1 to $2 billion shortfall. The primary issue is a projected lack of available bonding capacity and excess cash. Because of the long lead-time required for major infrastructure projects, a financing plan to make-up this shortfall needs to be developed, and implementation needs to begin, in the very near future.

RDU can increase its rates and charges to airlines, although there are limitations beyond which increases will compromise existing and proposed service additions. RDU can and will request federal funding, although there are limitations on what is reasonably possible and there are never guarantees.

A significant reduction to its capital plan would translate into additional delays, uncertainty, and lost productivity for travelers.

In summary, the financial gap facing RDU over the next 10-20 years ranges between $1 and $2 billion, and there is no immediate solution to resolve it.

VII. Regional business community and RTA RDU AID Task Force

The Regional Transportation Alliance serves as the voice of the regional business community in the Raleigh/Durham/Cary/Chapel Hill/Research Triangle region. Formed in 2002, RTA represents more than 100 leading businesses as well as more than 25 member chambers of commerce on regional surface and air transportation issues. RTA has been a champion for transportation infrastructure in our community, with our most recent major victory being the successful acceleration of 540 in southern Wake County, now currently under construction.

In summer 2019, RDU asked RTA to review the current situation facing RDU and to explore potential solutions. As a result, RTA agreed to convene a task force to focus on infrastructure development and funding challenges facing the airport.

The Regional Transportation Alliance launched the RTA RDU Airport Infrastructure Development ("AID") task force in early September 2019, naming a diverse group of 12 business leaders from RTA member firms, committed to thoughtfully reviewing funding mechanisms for current and projected plans at the airport.

RTA RDU AID task force members include:
- Joe Anglim, Senior Director, Corporate Strategy, Red Hat, Inc.
- Jim Beley, General Manager, The Umstead Hotel and Spa
- Sarah Gaskill, President and CEO, Morrisville Chamber of Commerce
- Lauren Guy, Marketing Manager, HH Architecture
- Linda Hall, CFO, The Research Triangle Foundation of North Carolina
- Rob Herman, GM/Executive Director, Workstation Business Unit, Lenovo
- Harold Hicks, Senior Director, Real Estate, Fidelity Investments
- Monty Irvin, PE, President and CEO, Ramey Kemp and Associates, Inc.
- Dave Krauss, Managing Director, Credit Suisse
- Sarah Quinlan, Managing Director, Carolantic Fund
- Mike Schoenfeld, VP Public Affairs and Government Relations, Duke University
- Gray Styers, Attorney, Co-chair of Infrastructure Practice, Fox Rothschild LLP

RDU senior management has been very engaged in and supportive of the task force throughout the process.

"Having the business community take a fresh look at our revenues and expenses creates a tremendous opportunity for the airport to share understanding, gain insight and build support. We are grateful for the partnership and we look forward to learning together." – Michael Landguth, Raleigh-Durham Airport Authority President and CEO

RTA RDU AID task force journey

The task force held five group meetings – one per month from September 2019 through early January 2020.

Discussion topics at these meetings included**:**

- Current and projected funding needs, as expressed by RDU senior professional staff
- Current growth projections, and changes in those projections over time
- Current revenue options, and potential ones
- Overall challenges facing RDU Airport, and general challenges that airports of its size and growth rate face

The following were the specific agendas for those meetings:

- **RTA task force meeting 1 was held on September 25, 2019.** This initial meeting was a meet-and-greet and overall level set, including a deep dive from RDU senior professional staff.
- **RTA task force meeting 2 was held on October 25, 2019.** This second meeting was a question and answer session based on review of information received during and subsequent to the first meeting.
- **RTA task force meeting 3 was held on November 22, 2019.** The third meeting of the task force included a conversation with representatives from the three largest air carriers serving RDU, as well as a representative from Airlines for America (A4A), the trade association that represents all major air carriers.
- **RTA task force meeting 4 was held on December 17, 2019.** The forth meeting was a discussion with a few members of the RDU Airport Authority Board.
- **RTA task force meeting 5 was held on January 7, 2020**. The fifth meeting was a discussion of all information received to date. It also included a discussion of new information provided by Airlines for America and Ricondo & Associates.

VIII. Background and Discussion on Findings and Recommendations

Note: This section provides background information that helped inform some of the preliminary findings and recommendations of the RTA RDU AID task force.

Please see the "Our sky could fall: The long-term infrastructure and funding challenge facing RDU Airport – and our region – Preliminary task force findings and recommendations" report for specifics.

<u>Background on preliminary findings</u>

RDU is so good, it's a problem.

- RDU is a well-managed, attractive, fast-growing, and well-connected airport.
- RDU is rightly appreciated by the region for its value, connectivity, and aesthetics. While more awareness can obviously be helpful, the business community generally recognizes the value of having a major, high-quality airport in the center of the region.
- We effectively received a new airport nine years ago with the completion of terminal 2, and the number of new flights and destinations.
- However, "no good deed goes unpunished" – the effectiveness of RDU means that there is little to no broad awareness of the looming funding and operational problem facing the airport – and of the potential impact to our economy and prosperity.

The Master Plan makes logical sense and is scalable.

- While we are not airport civil engineers, our sense is that the master plan appears to be sound and well-thought out in terms of the needs of a growing airport serving a dynamic region.
- During the creation of the Vision 2040 master plan, RDU considered 14 runway alternatives and 24 terminal capacity enhancement alternatives.
- The plan, including its passenger projections, have been reviewed and approved by both the Airport Authority Board and the Federal Aviation Administration.
- The plan is robust in that it provides event or usage-based triggers to activate various elements of the plan – that has come in handy, and much sooner than expected, given the recent growth.
- However, RDU's growth – and changes in airline flight planning including aircraft type – has swamped or moved away from many of the master plan's inherent assumptions.

The situation concerning RDU and Umstead Park has been a distraction and a lost opportunity.

- The RDU Authority Board has approved the expansion of an existing quarry north of I-40 onto adjacent RDU land. The agreement would provide around $25 million for RDU.
- In general, our task force agrees that the Authority should be looking for new, productive revenue sources, including leveraging lands that RDU owns or controls. Our task force will defer to the courts to determine whether RDU has the authority to enter into an agreement for the quarry without further approvals from the four constituent owners.
- Our task force was divided on whether the quarry itself is a good idea, due to the potential impacts on the adjacent county and state park, municipal greenways, and the multi-use trail.
- While we have no collective opinion on the use of the land for the quarry, we recognize that the controversy surrounding the quarry has an impact on the issue of funding RDU.
- Clearly, the quarry contribution to RDU would be more than 20 times what the four owners of the airport will collectively provide to the airport over the next quarter century, based on current funding agreements.

- On the other hand, the total amount that the quarry will provide represents no more than 1-2% of the total projected funding gap.
- *Moreover, the controversy over the quarry has clearly created a distraction, consuming valuable staff and board time, energy, focus, and political capital – and this issue has thus far been a lost opportunity to have a needed conversation with the region about the sheer magnitude of the funding gap facing the airport – that gap will be $1 to $2 billion, whether or not the quarry moves forward.*
- *In addition, our concern is that these battles will only intensify as the region and airport grows, resulting in potential burn-out of airport professional staff and further, negative consequences for commerce and the region as a whole.*

The region loves RDU, and it treasures Umstead State Park. We need them both to get along.

- The issue of the quarry is really a subset of an ongoing, natural source of conflict between two 5,000 acre neighbors.
- While airports and state parks are not ideally suited next to each other, they need not be fundamentally incompatible, and our region needs them to both be successful for generations to come.
- However, to the extent that they are not natural neighbors, we believe that advocates for both RDU and Umstead State Park should revisit some assumptions that have created or exacerbated conflict and should try to work together.

RDU should revisit its master plan given the reality of an adjacent, beloved state park and the need to manage risk.

- RDU has actually done well with this, given that its primary future terminal expansion plan involves adding gates on the west side of terminal 2, and shifting the primary runway further to the west – away from Umstead.
- While RDU is adding gates this year along terminal 1 – the one nearest to Umstead – this is the only available short-term option to add capacity.
- While expansion along terminal 1 can be an important short-term solution to capacity constraints, the more that investments can be focused on the west side of the airport – away from Umstead – the better off RDU will be.
- The expansion of terminal 2 is delayed until the runway can be relocated. When this occurs later in the new decade, several existing gates at terminal 2 would need to close to construct new terminal "arms".
- Going forward, one option would be for RDU to consider the creation of a new "terminal 3" north of terminal 2 – and away from Umstead – that may buy the airport more time, particularly as the creation of new gates at terminal 2 will take existing ones out of service.
- RDU could give airlines the opportunity to build, fund, and control terminal 3 – and to share in the capacity risk. For example, it could be 15 gates, representing 25% of a future expanded total. This would be a significant percentage, but still ensure RDU retains control of the majority of its terminal infrastructure.
- RDU wants and *should* have control over all of its land from a safety and security standpoint, to say nothing of its revenue potential.
- However, while it absolutely has that authority, the past few years have made it clear that actual, potential, or proximate impacts to adjacent land will consume time, money, and attention.

- RDU should consider hiring a firm to review the master plan, given the context of the political, advocacy, and funding environment, including the adjacent state park, and evaluate the potential of other capacity possibilities on the west side of the airport.
- The firm should also do a value engineering exercise for the various plan elements.

Umstead State Park should allow mountain biking within its 5,500+ acres.

- The State Department of Cultural and Natural Resources has listed the five best places to mountain bike in North Carolina. All of them are state parks (Medoc Mountain, Dismal Swamp, Lake James, Lake Norman, Hanging Rock); some are larger and some are smaller than Umstead.
- *https://www.ncdcr.gov/blog/2018/06/11/best-five-places-mountain-bike-north-carolina*
- There are groups that want RDU lands to serve as a mountain biking area. This may be understandable in the abstract, but it is untenable in reality. There may be forested lands at RDU, but there is no "RDU Forest". The areas that need protected from development are the state park, and that is a rational conversation to have, not the land within RDU itself.

The funding gap cannot be closed solely by additional debt.

- While RDU currently has large cash reserves, those are effectively spoken for by various short-term financing game plans over the next several years.
- RDU believes that they can use remaining bonding capacity to get them through the end of the decade, but at that point they would be capped out for more than a decade.
- RDU cannot issue a new "bond" without having a commensurate funding source to support the debt service.
- However, it is worth considering various scenarios, and refining the sensitivity analysis of those scenarios, whereby accelerating or increasing amounts of bond financing could make additional funds available (or allow more efficient coordination of capital improvements), if allowed by other bond covenants and the North Carolina Local Government Commission, and supported by additional revenues identified above.

The State of North Carolina has been an incredible partner for RDU and other NC airports.

- North Carolina is already a leader in state funding for commercial service airports
- The State of North Carolina is making significant, needed, investments in RDU and other commercial service airports. This is unheralded, somewhat unheard of nationally, and should be greatly appreciated.
- Recurring funding from the State will be around $17 million per year, or $0.17 billion per decade

The Federal Government has not been as helpful, for RDU and for other medium-hub airports.

- Our understanding is that medium-hub airports like RDU are "caught in the middle" between typical funding solutions.
- The larger hub airports receive funding via direct investments from their primary hub airlines, as well as additional revenue from passenger facility charges received from the sheer volume of passengers including connecting patrons.
- The smaller airports receive funding from federal programs via reallocation from other airports.
- In addition, the Federal government has unspent balances in various airport funds, but some of those are being used to reduce the federal structural deficit
- The good news is that RDU is able to assess and use passenger facility charges collected on each ticket.

- Congress authorizes passenger facility charge (PFC) levels that each airport can charge. Existing PFC revenues at RDU are dedicated to terminal 2 mortgage repayment until 2031.
- While Congress can authorize increases in the PFC above the current cap, airlines oppose increases in PFCs on tickets (nationally, not just for RDU) for a variety of reasons. One reason may be concerns about the nexus between PFC levels that are collected by the airlines and whether those expenditures will benefit those airlines. They are united in their opposition to PFC increases and have been quite effective in doing so.

There is a lack of agreement between RDU and airlines on some infrastructure and funding issues.

- At first glance, the interests of the airport and the airlines would seem to be naturally aligned. RDU obviously needs airlines, since people don't go to RDU to visit the airport, they go to the airport to visit other places. In addition, while many airlines fly to our region, they all land at RDU.
- However, upon closer inspection, there is sometimes a divergence of interests, and therefore of positions.
- While airlines may exist to serve customers, they need to make profits to continue to succeed, and each airport (and aircraft) must serve as a profit center or those airplanes may move. *As a business organization, RTA supports the free market and wants each of the airlines serving RDU to do well – and to do well here.*
- Airlines have expressed concerns about capital expenditures at airports across the country. And, they actively oppose PFC increases as noted above.
- To that point, while RDU clearly has capital investment needs, there is a lack of agreement or consensus on the degree of "needs" identified by RDU – due to both competitive pressures, uncertainty, etc.
- We have found that airlines want more input on capital expenditure programs at RDU Airport (and elsewhere). While airline input is both reasonable and welcomed, RDU wants to provide more than the minimum infrastructure needed in order to better accommodate future growth and community demands at the airport.
- RDU has a responsibility to serve its airlines well – and that includes airlines that are not here yet. Therefore, RDU may justifiably want to make investments in capacity above and beyond what some or all of the airlines currently at RDU may believe to be necessary or desirable.
- The community benefits from more competition, individual airlines may or may not. The business community wants fees as low as possible so that all airlines can succeed, including those that are not here yet, or have the potential for more growth here.

RDU is moving to full cost-recovery.

- Airlines seem to want more certainty on rates and charges through longer-term lease agreements, rather than at-will arrangements currently set via ordinance at RDU.
- RDU has set rates via ordinance by policy for many years, and RDU's current costs per enplanement (CPE) are relatively low ($7.50, which is below the medium-hub peer airport average)
- Airlines continue to push to keep rates and charges, and ultimately CPE levels, down, with the potential of reduced service if those levels do not remain competitive
- RDU has been unwilling to raise rates and charges above low/medium levels, even given the growth, and its current financial situation, for fear of losing service

- RDU is approaching full-cost recovery for aviation-related rental rates in the terminals, with most elements ranging from around 2/3 to more than 95% recovery. It is prohibited by the FAA from making a profit on aviation-related items.
- There does not appear to be a significant increased ceiling for revenue in this area.

Background on preliminary recommendations

Consider an airport access fee

- We propose the implementation of an airport campus access fee. This will be collected from all vehicles entering any portion of the campus.
- For simplicity, and to keep individual costs down, every vehicle would pay the same campus access fee, every time, upon exiting the airport ring road system.
- We would encourage interoperability with the NC Turnpike Authority's NC QuickPass system
- Vehicles that park at RDU would not also have to pay this fee
- Advantage: this is a user fee, only visitors to RDU pay, rather than the general public.
- By way of comparison, DFW charges $2 to access the terminal area, and $6 to use DFW Airport roadways to cut through the airport and avoid congestion
- *https://www.dfwairport.com/cs/groups/webcontent/documents/webasset/p3_121894.pdf#page=21*
- Another possibility would be to implement a fee for use of Aviation Parkway near the airport, whether or not vehicles enter RDU. This could provide more revenue but obviously be more complicated to implement, so it is not a current preliminary recommendation.

Index PFCs, or have airports and airlines set PFCs together

- Passenger Facility Charges (PFCs) were set by Congress in 2000.
- RDU first implemented a PFC in 2003, at $3. This Authority's application was amended to $4.50 in 2004, the maximum level federally authorized at the time, and still the maximum level.
- RDU's revenue from its $4.50 PFC generates more than $25 million per year.
- In so far as the consumer price index has increased from 172 to 258 during the past two decades, a 50% increase, this would mean that a $4.50 PFC "should" be around $6.75 now.
- *https://inflationdata.com/Inflation/Consumer_Price_Index/HistoricalCPI.aspx?reloaded=true*
- *https://www.rdu.com/wp-content/uploads/2019/02/RDU-2019-2020-BUDGET-BOOK.pdf*
- *https://www.rdu.com/rdu-presents-its-proposed-2019-2020-airport-budget-to-the-board-of-directors/*
- *Conceptually*, we think that the cap on PFCs should be increased, and/or indexed to an agreed-upon inflation measure. North Carolina state motor fuels taxes like gasoline have been indexed in this manner for decades.
- *As a practical matter,* our sense is that the likelihood of success in Congress is low, because airlines are organized, effective, and have a reasonable point to make. In addition, if the history of the *federal* motor fuels tax for surface transportation is also a guide – that tax hasn't been increased since 1993 – we don't see a significant increase happening anytime soon.
- Our proposal is a nominal increase in the PFC of $1 now, to $5.50, and then automatically increase it by an even $1 on July 1st – but only in those years when inflation as reflected in the consumer price index (or similar) would call for that level of increase or greater. This is far below the "modernizing" level that many airports are requesting, but it would provide some additional revenue capacity through a funding source that hasn't been adjusted in two decades.

- Congress could also eliminate the PFC cap entirely, but then require airports to get individual airline approvals for any PFC increases above inflation levels, and also to allow PFC levels to vary by airline, based on a desired project-by-project basis. Airlines would then get a veto on any increases to this funding source above a basic PFC cost-of-living increase.
- *Either way, we do not plan to focus on large PFC increases as the conflict between airports and airlines appears to be unresolvable and a distraction from needed federal action on other areas such as FAA approval timelines.*

Accelerate FAA approval processes

- Approval timelines for runways and other vital infrastructure appear to us to be incredibly long and unresponsive, and this is increasing costs and risk.
- From an RDU standpoint, there will be no new gates added to Terminal 2 until 2028; i.e., subsequent to runway relocation.
- Rather than blaming a particular party or process element, our suggestion is to simply set a fixed maximum timeline; e.g., three years for an environmental impact statement.
- Airports and airlines should work together on this policy initiative.

Local governments need to determine and take ownership of the RDU funding solution – either directly, or by proposing/endorsing viable alternatives

- The four "owners" of the airport – the cities of Raleigh and Durham, and the counties of Durham and Wake – each appoint two members to the 8-member Authority board.
- Currently, these four entities neither make a material financial contribution (they each pay $12,500 annually) nor receive a direct financial benefit – although the entire region and state benefits handsomely from the existence and continued success of RDU.
- However, the airport's owners – and other local entities – could consider helping to fund the airport directly.
- One option would be to raise or allocate property tax revenue to pay for it. This would not require legislation.
- A second option would be to allocate existing vehicle rental taxes to RDU. Those are currently going to transit service (5% fees) and county general funds (1.5% fees). To be clear, reallocating funding from one mode to another will create the potential for a political battle, and potentially require legislation; on the other hand, the rational nexus between rental cars and the airport is much higher than that for say rental cars and using transit. In addition, transit receives around $150 million in new local taxes each year from recent voter referenda – excluding property taxes – while RDU receives only $50,000 in local taxes.
- Of course, the local governments need to decide how to best fund the airport – either directly, or by proposing/endorsing viable alternatives.
- References:
    - For Rental Car fees:
        - 1.5% from Wake County for General Revenue
        - *http://www.wakegov.com/tax/business/rentalvehicle/Pages/default.aspx*
        - 5% from GoTriangle for Transit
        - *https://gotriangle.org/vehicle-rental-taxes*
        - 8% from the State of NC for General Revenue
        - *https://www.ncdor.gov/taxes-forms/other-taxes-and-fees/motor-vehicle-lease-and-subscription-tax*

IX. Appendix: Information from Ricondo & Associates and Airlines for America

RTA hired Ricondo & Associates, a Chicago-based engineering consulting firm that had developed the RDU Master Plan, to compile updated information on the potential consequences of inaction. While this was not a redo of the master plan, it did provide new information and perspectives given our rate of growth.

Average aircraft size at RDU is getting larger:

- 2015: 104 seats/departure
- 2019: 120 seats/departure
- 2025: 140 seats/departure

Which means aggregate wing span is getting larger, which is creating gate limitations

Peak periods at RDU are becoming more pronounced and broader (more sustained).

While RDU is still a predominantly an Origin & Destination (O&D) Airport, RDU **is now serving more reliever-type connections.**

Potential technology solutions for security screening lane capacity offer limited and variable capacity benefit and even some of these require additional physical space.

See following pages for details.

Source: Ricondo & Associates, study for RTA, January 2020

Airlines for America (A4A)

RTA also requested that Airlines of America compile a review of infrastructure development funding mechanisms and structures in place by several peer airports. Airports reviewed included Columbus, San Jose, Nashville, and Austin.

See following pages for details.

Source: Airlines for America, 2019

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Deferred Terminal Investment Consequence Review
Raleigh-Durham International Airport

PRESENTED TO:
Regional Transportation Alliance

PRESENTED BY:
Ricondo & Associates, Inc.

PRESENTED ON:
January 17, 2020

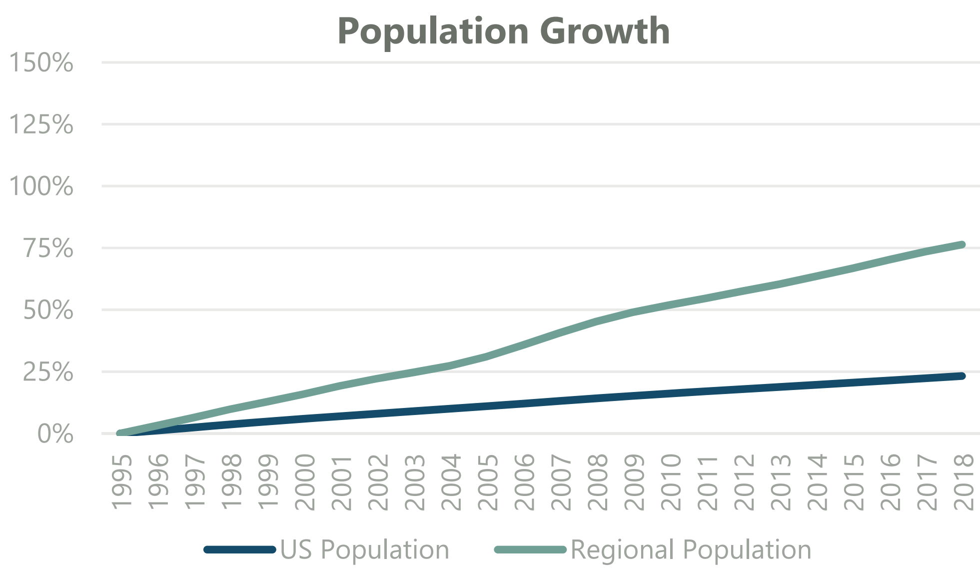
Analysis

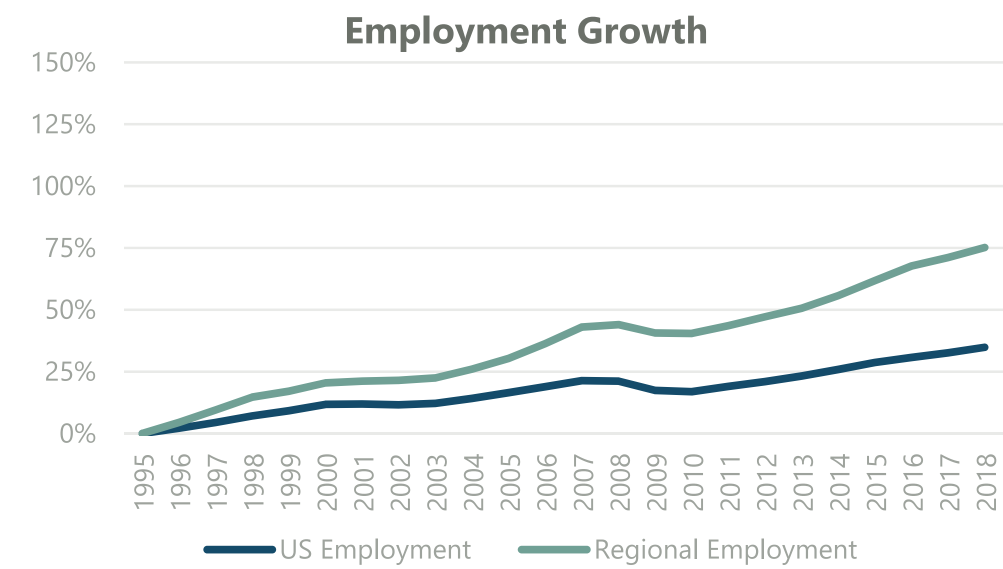
- Objective: Identify and describe anticipated consequences of deferring investment in and improvement of terminal facilities based on a qualitative review of master plan assumptions and analyses
- 3-step process
  - Review changes (activity, operational, physical)
  - Evaluate impacts
  - Estimate consequences (qualitative or quantitative)
- Present preliminary and final conclusions to Task Force and at RTA Annual Meeting
- Assumptions
  - All existing facilities are fully staffed and operated in an efficient manner
  - Planning is based on demand of the average day of the peak month (not peak day)
  - Planning does not consider irregular operations

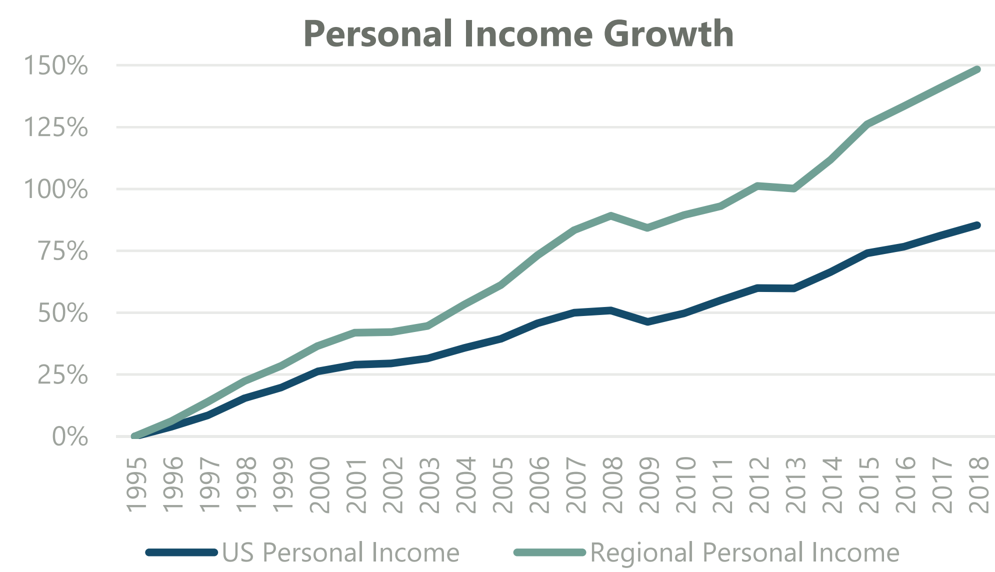
Preliminary Conclusions

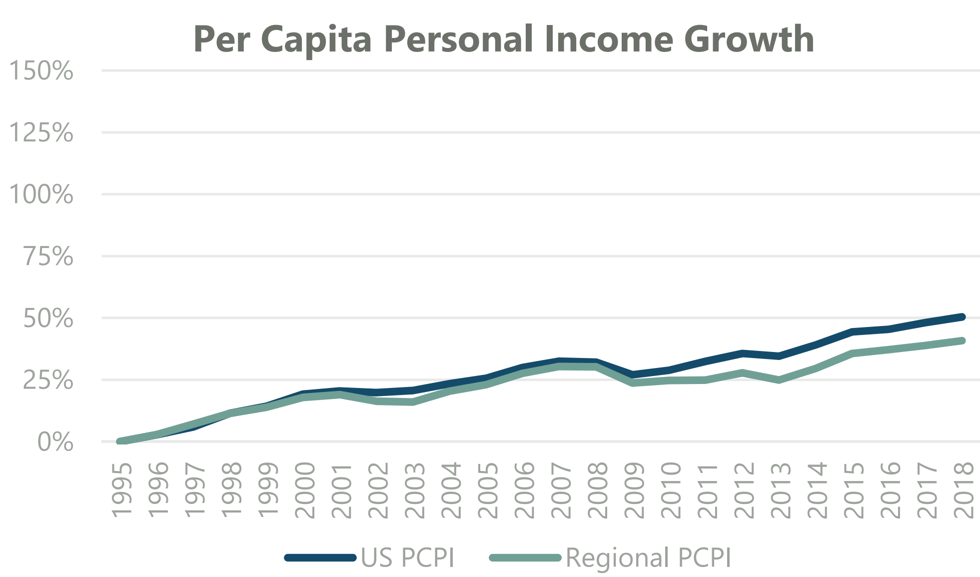
- Characteristics of demand have changed since Master Plan completed
  - **Passenger:** Socioeconomic and demographic drivers
  - **Aircraft Operations**
    - More intensive gate utilization (daily departures/gate)
  - **Airline Operations**
    - Increasing average aircraft size: 104 seats/departure (2015) → 120 seats/departure (2019) → ~140 seats/departure (2025 est.)
    - Increased reliever-type connections through RDU
    - Gate dimensional limitations
  - **Peaking characteristics**: peak periods are higher and broader (more sustained)

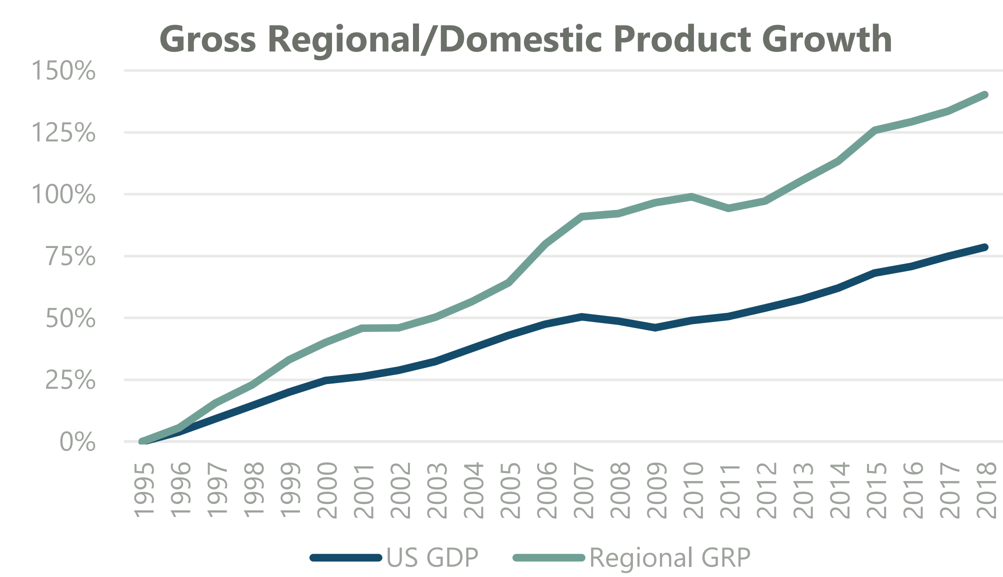
US and Regional Socioeconomic Growth Since 1995





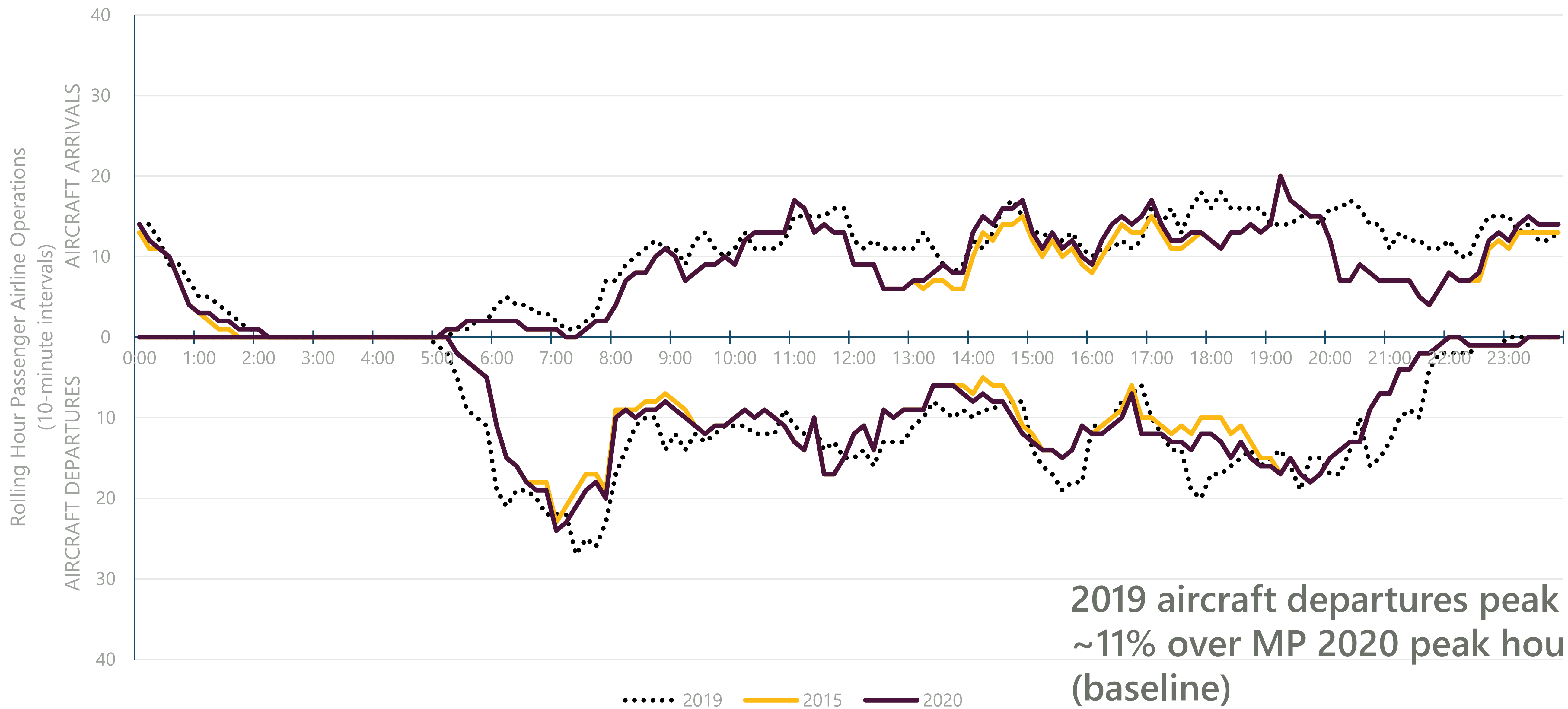






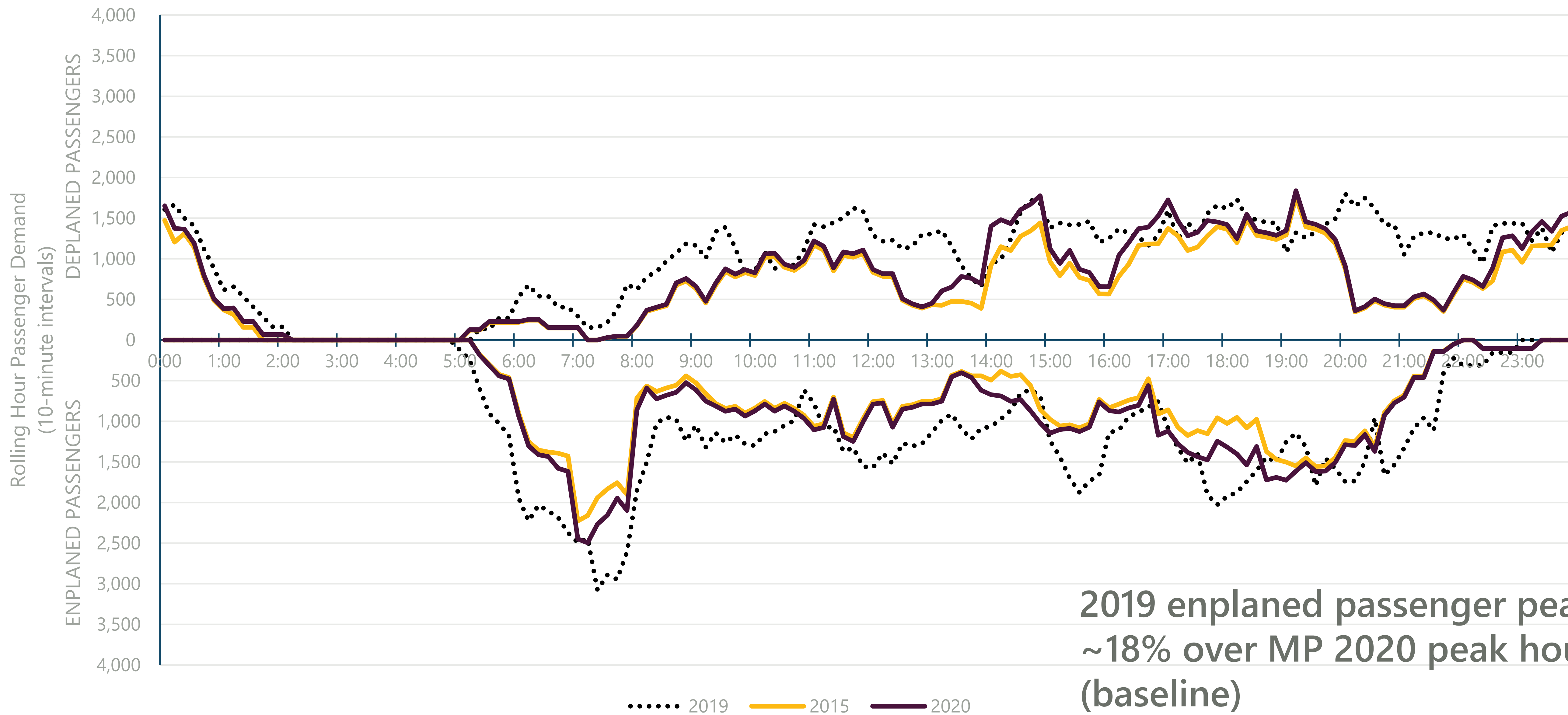
Source: Woods & Poole Economics, Inc., 2019. Growth of dollar value variables are based on real (2012 equivalent) values.
Note: Region includes Raleigh-Durham-Cary, NC CSA, plus Moore and Warren Counties.

Design Day – Rolling Hour Passenger Airline Operations (2019 vs. Master Plan Results)



Sources: Innvoata (2019); Raleigh-Durham International Airport Master Plan Study.
Notes: Representative days are Friday, June 21, 2019 and Friday, July 31, 2015.

Design Day – Rolling Hour Passenger Demand (2019 vs. Master Plan Results - Baseline)



2019 enplaned passenger peak ~18% over MP 2020 peak hour (baseline)

Sources: Innvoata (2019); Raleigh-Durham International Airport Master Plan Study.
Notes: Representative days are Friday, June 21, 2019 and Friday, July 31, 2015.

Terminal Facilities

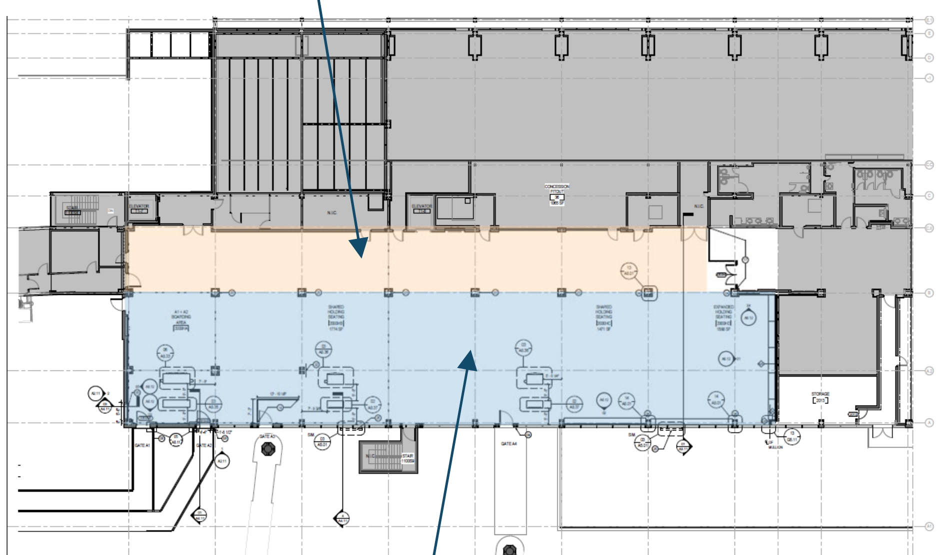
Terminal 1 Modifications Since Master Plan

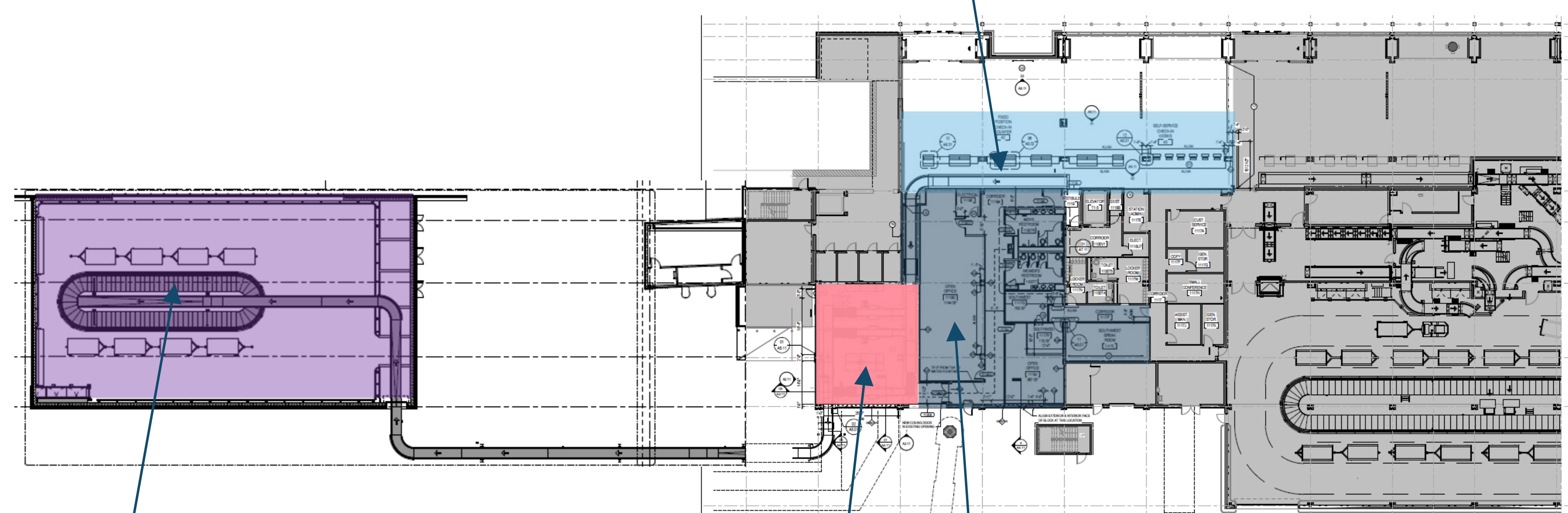
- Transitioning to Common Use Gates
- Physical modifications

4 Gates Activated on Terminal 1

Expanded Passenger Circulation Area

Expanded Airline Check-in Area and Baggage Handling System





Renovated Holdrooms Serving Four New Gates

New Baggage Makeup Room

New Airline Ticket Office

New TSA Checked Baggage Inspection Screening Area

Terminal 2 Modifications Since Master Plan

Security Checkpoint

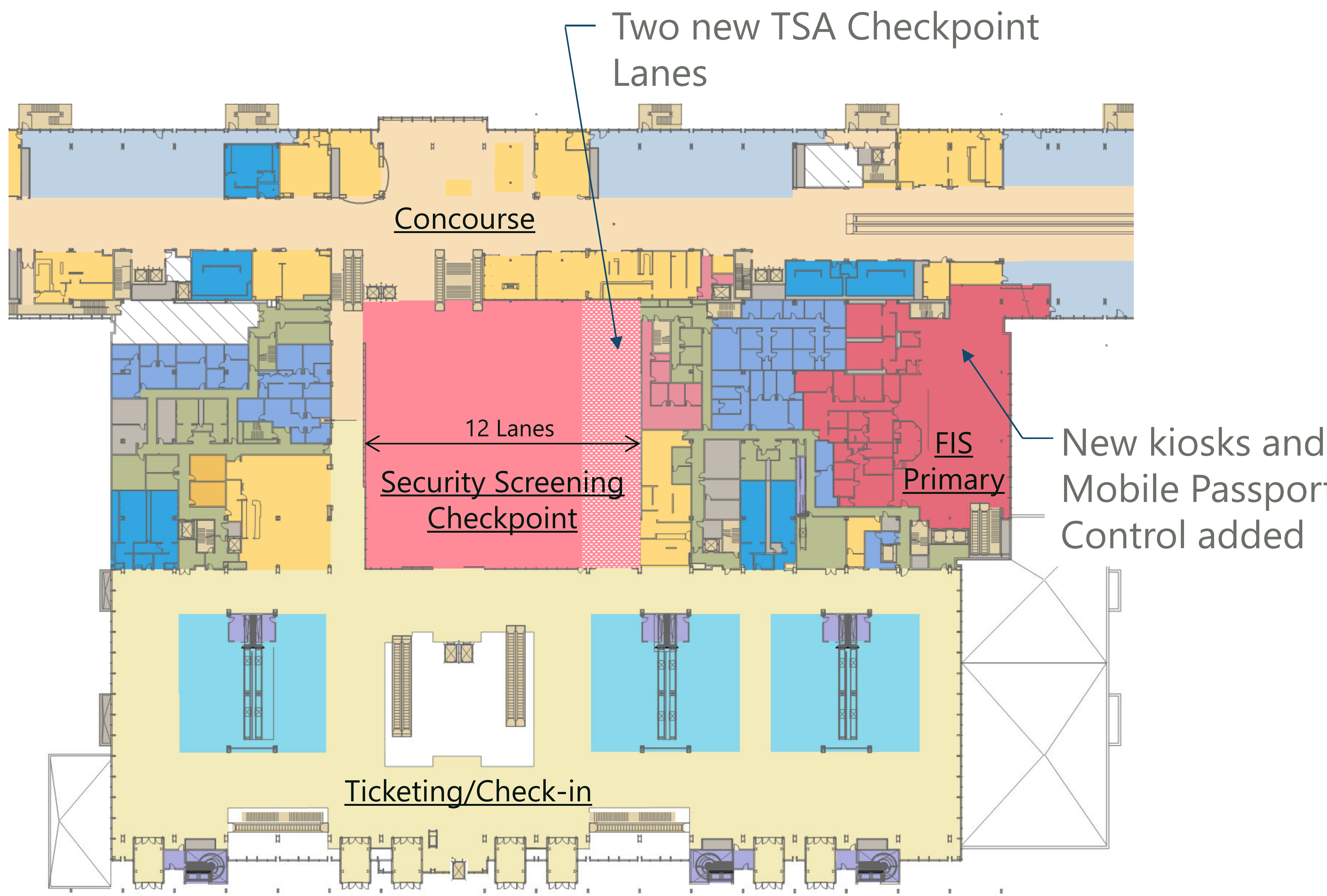
- Two TSA security screening checkpoint lanes added May 2019
- Plans developed to add two more lanes in the future

Federal Inspection Services (FIS) Facility

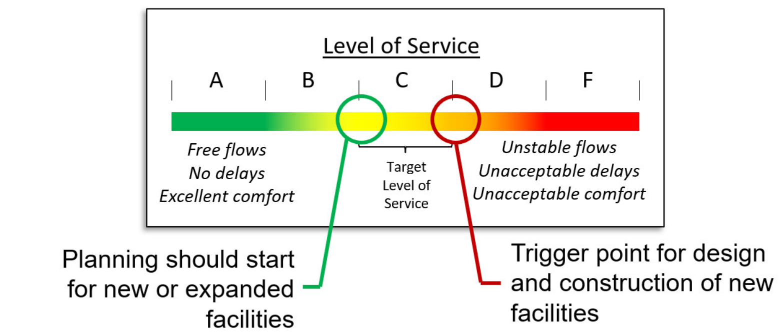
- New Global Entry Kiosks
- New Automated Passport Control Kiosks
- Instituted Mobile Passport Control Queue
- Plans to expand FIS Primary (loss of Gate C8)
- Plans to add up to 3 new international baggage claim devices

Gates

- Gate C8 - closed to accommodate expanded FIS (35 gates)



Terminal Facility Review



Critical Capacity Improvements

TSA Security Checkpoints

Federal Inspection Services (FIS) Facility (International Arrivals) Primary

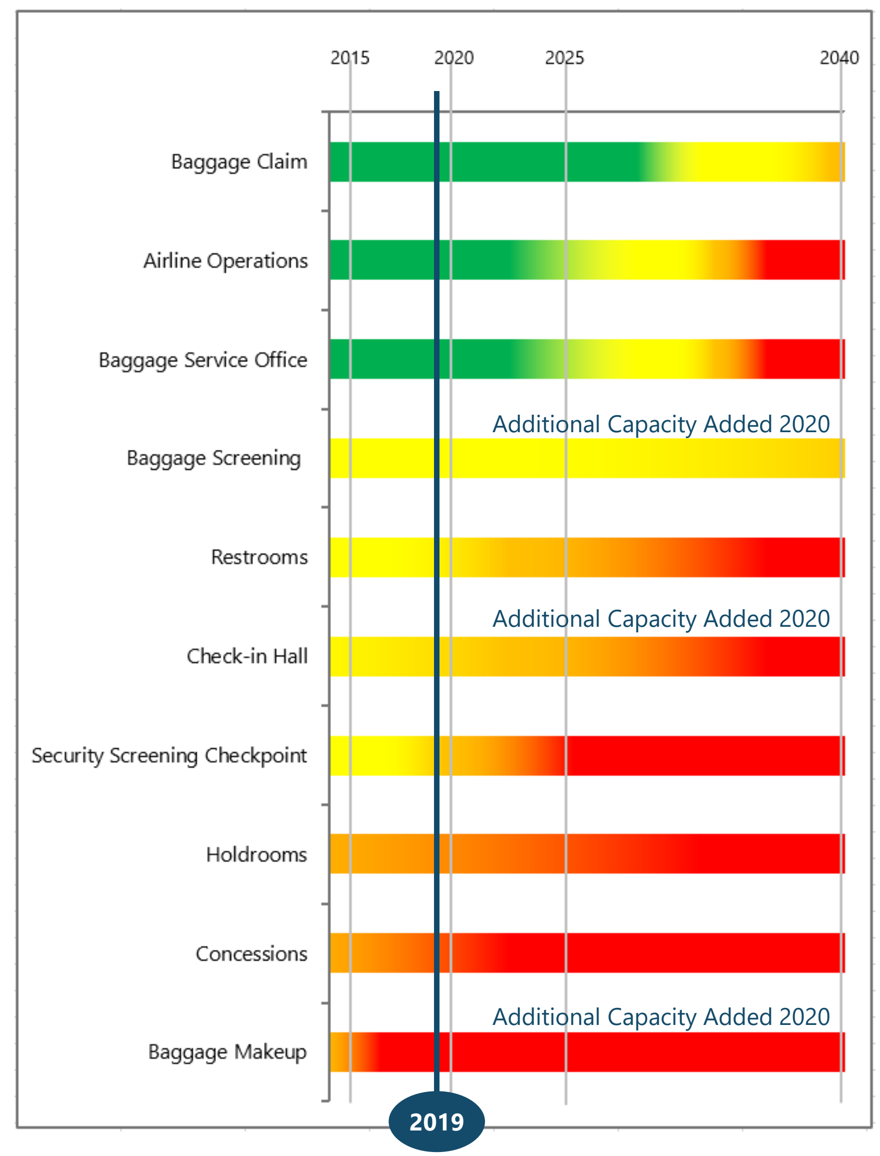
FIS International Baggage Claim

Gate Utilization

Secondary Capacity Improvements

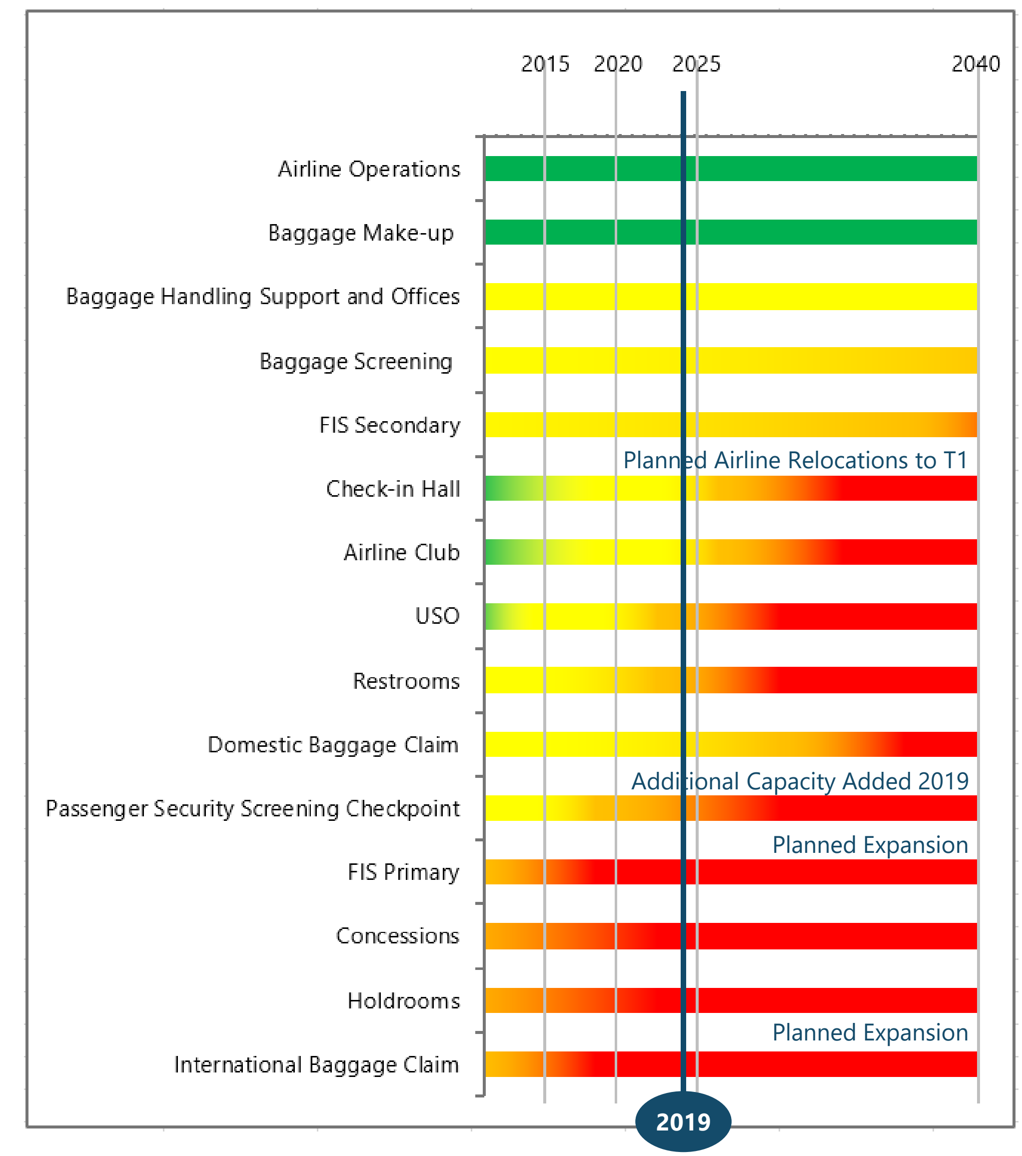
Holdroom Capacity

Terminal 1 Stoplight Chart



Terminal 1 (Southwest Airlines) tracking closely with Master Plan forecast

Terminal 2 Stoplight Chart



Terminal 2 Carriers are tracking approximately 4-5 years ahead of Master Plan requirements

NOTE: Stoplight Charts adapted from Master Plan presentation at Technical Advisory Committee Meeting #3, December 8, 2015.

Terminal Ticketing/Check-in

- Additional check-in capacity added to Terminal 1 to support planned airline relocations
- Planned airline relocations provide some check-in capacity relief for Terminal 2
- Plans to add check-in kiosks at Terminal 2
- Exploring introduction of common use of check-in facilities

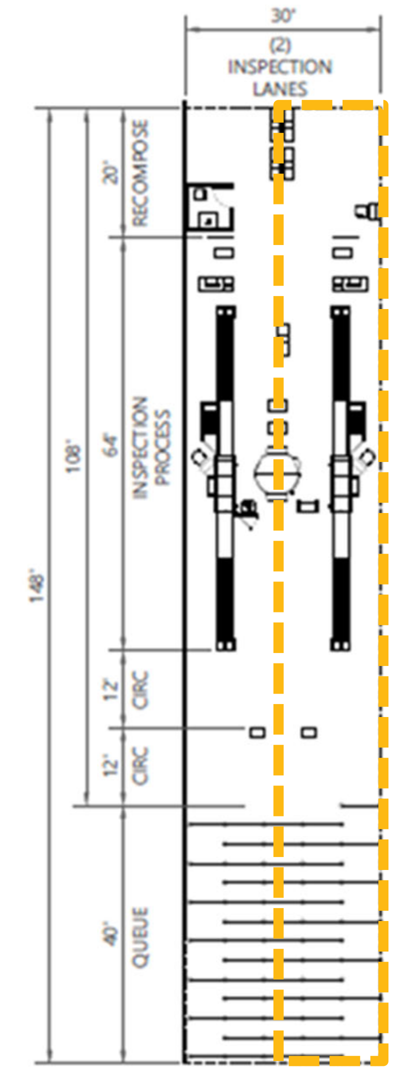
TSA Security Screening Checkpoints

Terminal 1 – additional checkpoint lane within five years
- No room for expansion within existing footprint
- Insufficient area to incorporate automated screening lane equipment

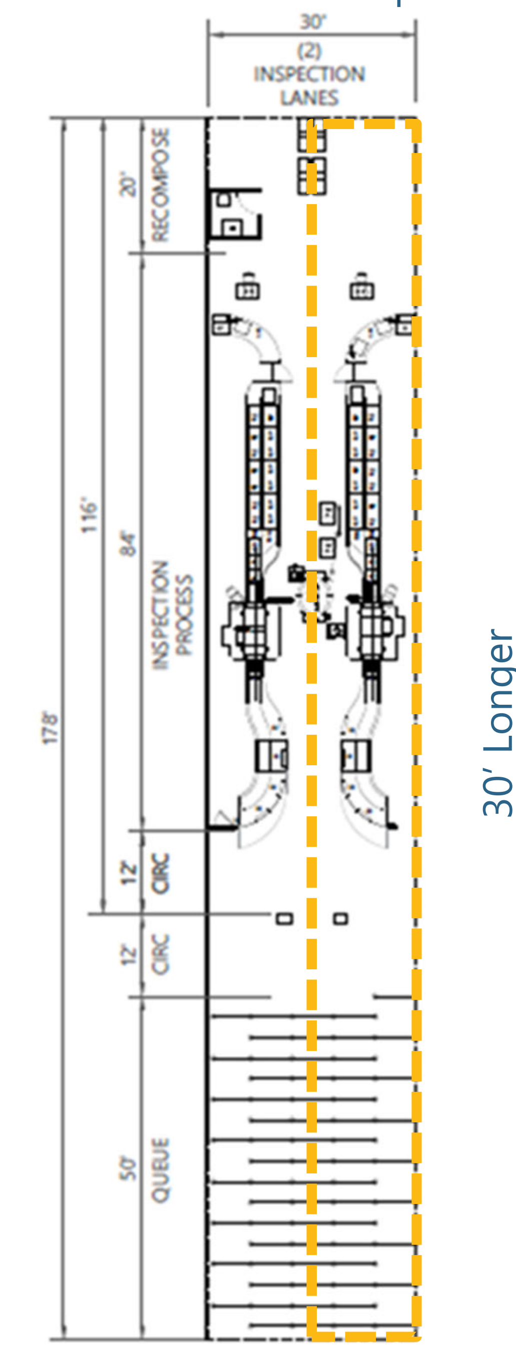
Terminal 2 – existing demand exceeds capacity during peak periods
- Airline and passenger growth over next five years will require at least two additional checkpoint lanes to maintain target wait-time level of service (LOS)
- Automated screening lanes could increase passenger throughput for standard passengers as much as 50%, but Pre✓™ throughput may not recognize improvements. Terminal 2 appears to have space at checkpoint to accommodate new technologies

Consequences of not expanding T2 SSCP
- Without expansion beyond 12 lanes, queuing and wait times will exceed LOS goals and industry standards during peak periods
- Opportunities include emerging and innovation technologies
- Diminished level of service will influence passenger show-up profile

Legacy Screening Lane
2,220 Square Feet



Automated Screening Lane
2,670 Square Feet
20% increase in footprint



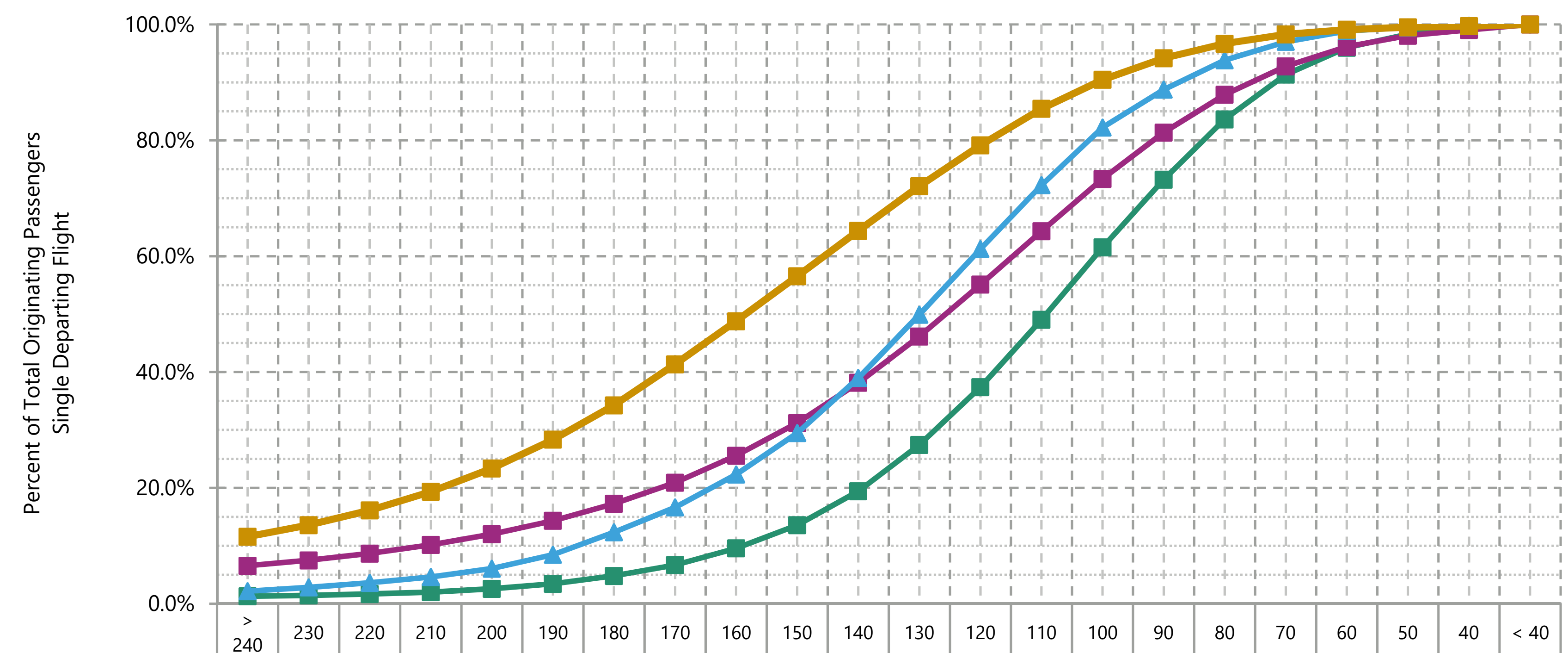
NOTE: Area per lane excludes IT and support functions.
SOURCES: Benchmarked from comparable airports,. Ricondo & Associates, Inc., January 2018 (rates); International Air Transport Association, Airport Development Reference Manual, 10th Edition, 4th Release, October 2016 (LOS); Airport Cooperative Research Program, Report 25: Air Passenger Terminal Planning and Design, Volume 1: Guidebook, 2010 (Critical dimensions); Ricondo & Associates, Inc., January 2018 (template).

Passenger Attributes – Arrival to Airport

*A **Show-up profile*** indicates the distribution of originating passengers arriving at the terminal relative to their scheduled departure time.

The chart to the right illustrates distribution metric assumptions to be quantified against passengers arriving at the security screening checkpoints and bag induction profiles at the check-in counters.

Longer airline check-in or security checkpoint lines would lead to passengers arriving earlier to compensate for potential delays getting to their gate (thus the lines would shift to the left).



	> 240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	< 40
Domestic Pre-9am	1.3%	1.4%	1.7%	2.0%	2.6%	3.4%	4.8%	6.7%	9.6%	13.6%	19.4%	27.4%	37.4%	49.0%	61.5%	73.2%	83.6%	91.4%	96.0%	98.3%	99.4%	100.0%
Domestic Post-9am	6.6%	7.5%	8.7%	10.2%	12.0%	14.3%	17.3%	20.9%	25.6%	31.2%	38.2%	46.1%	55.1%	64.3%	73.3%	81.3%	87.9%	92.8%	96.1%	98.1%	99.1%	100.0%
International Pre-9am	2.2%	2.8%	3.6%	4.6%	6.1%	8.5%	12.3%	16.6%	22.3%	29.5%	39.0%	49.9%	61.2%	72.3%	82.2%	88.7%	93.8%	97.0%	98.9%	99.5%	99.8%	100.0%
International Post-9am	11.6%	13.6%	16.1%	19.3%	23.4%	28.3%	34.3%	41.3%	48.8%	56.5%	64.4%	72.1%	79.1%	85.4%	90.5%	94.2%	96.7%	98.3%	99.1%	99.5%	99.7%	100.0%

Minutes Before Scheduled Time of Departure

Consequences of inadequate facilities

Uncertainty builds regarding ability to get through terminal processors

- Stress levels rise
- Passengers miss flights or must arrive earlier (alter arrival distribution)
- Personal and productive business time is sacrificed

SOURCE: Transportation Security Administration, Planning guidelines and Design Standards for Checked Baggage Inspection Systems, Version 6.0, September 29, 2017 (TSA Profiles).

Federal Inspection Services (FIS) Facility

FIS Primary Capacity

- 400 passengers per hour capacity
- Exceeded capacity 16 days in July and August 2019
- Passenger wait times frequently exceed 45-minute goal

FIS International Baggage Claim

- International bags frequently overwhelm single device
- Need additional international claim devices to accommodate two arriving international flights today

Consequences of Building

- Good experience for international arriving passengers leads to a good RDU reputation
- Capacity for additional international flights creates opportunities for connecting passengers (paying passenger facility charges)
- New international bag claim area frees existing international claim device for domestic use

Gate Utilization

Gate Utilization

- Approaching the threshold of practical gate utilization (typically 7 to 8 turns per day)
- Airlines achieving growth through larger aircraft, not additional flights
- Additional gates needed in near-term
- Some relief at Terminal 2 to be realized with relocation of some T2 carriers to vacant gates at Terminal 1
- Some T2 gates are limited to smaller aircraft

Consequences of high gate utilization

- Aircraft hard-standing (off-gate parking)
- Constrained ability to rebound from irregular operations
- More difficult to accommodate new entrant carriers and expansion of existing airlines
- Holdroom Congestion – passengers arrive before previous flight departs

2019: 5.4 daily departures/gate (est.)
+5 years: 6.5 daily departures/gate (est.)

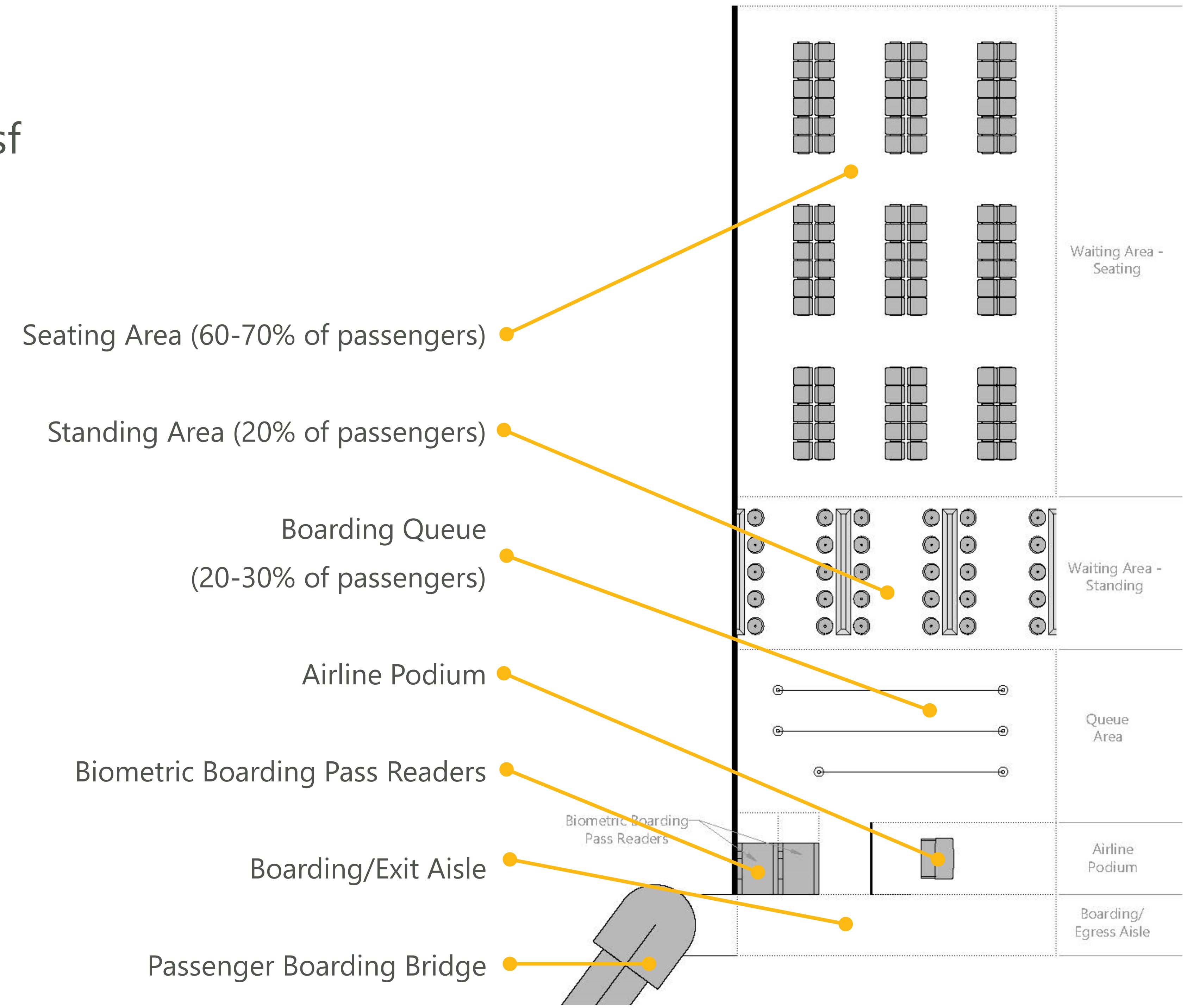
2019: 6.6 daily departures/gate (est.)
+5 years: 5.6 daily departures/gate (est.)

Holdroom Capacity

- Recommended Holdroom Size – 3,000 to 3,500 sf
- Terminal 1 - Average holdroom is less than 2,000 sf
- Terminal 2 – Average holdroom is around 2,650 sf

Consequences of deficient holdroom areas

- Lower passenger level of service, particularly at concourse ends
- Passengers sitting on floors
- Passengers blocking corridors during boarding process
- More difficult for airlines to implement boarding queues
- Limited space for new technologies



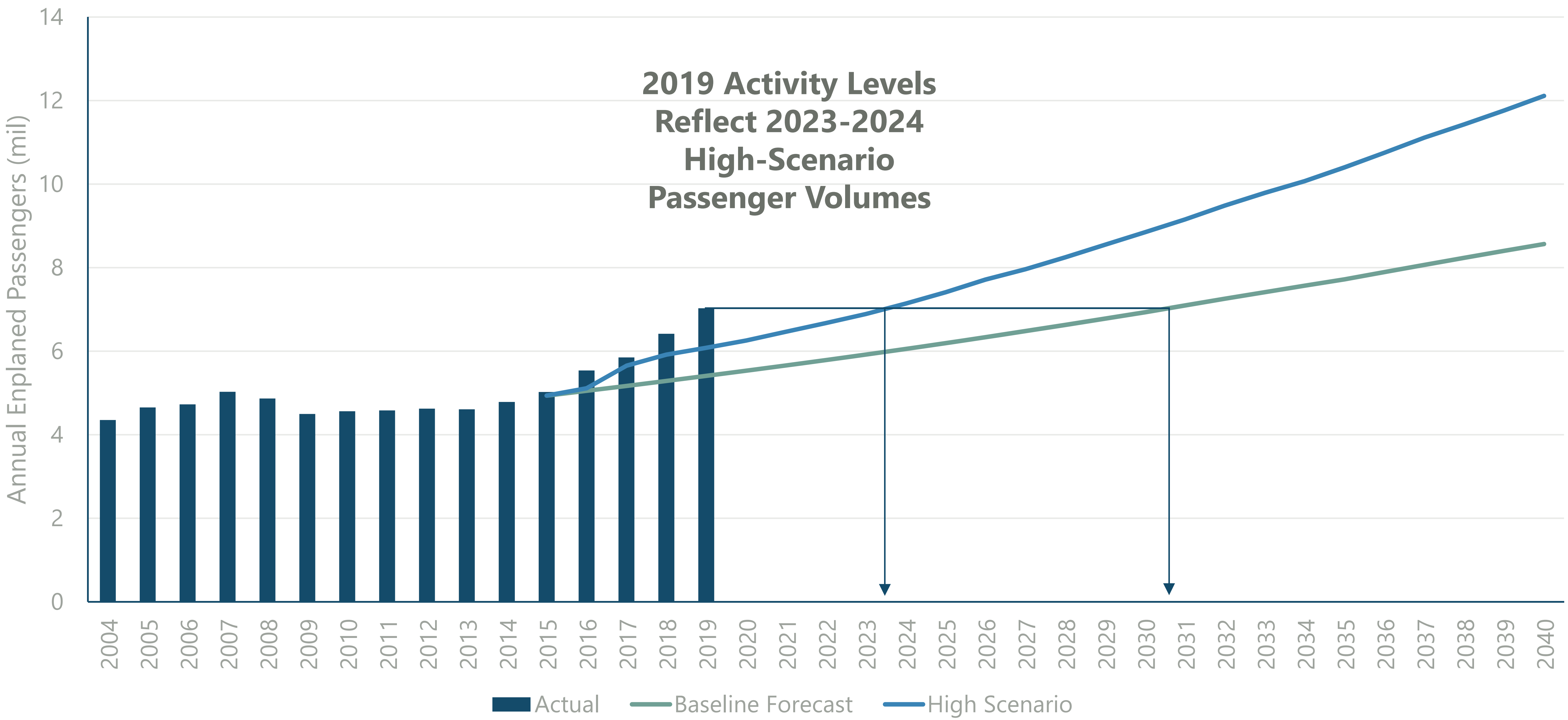
Technical Appendix

Design Day – Peak Hour Metrics (Passenger Airlines) (2019 vs. Master Plan Results)

YEAR	DEPLANED PASSENGERS	ENPLANED PASSENGERS	TOTAL PASSENGERS
2019	**1,801**	**3,077**	**3,687**
2015	1,762	2,226	3,313
2020	1,837	2,496	3,451
2025	1,934	2,499	3,846
2040	2,814	3,579	5,161
YEAR	**AIRCRAFT ARRIVALS**	**AIRCRAFT DEPARTURES**	**TOTAL OPERATIONS**
2019	**18**	**27**	**38**
2015	20	23	37
2020	20	24	37
2025	20	24	39
2040	26	31	51

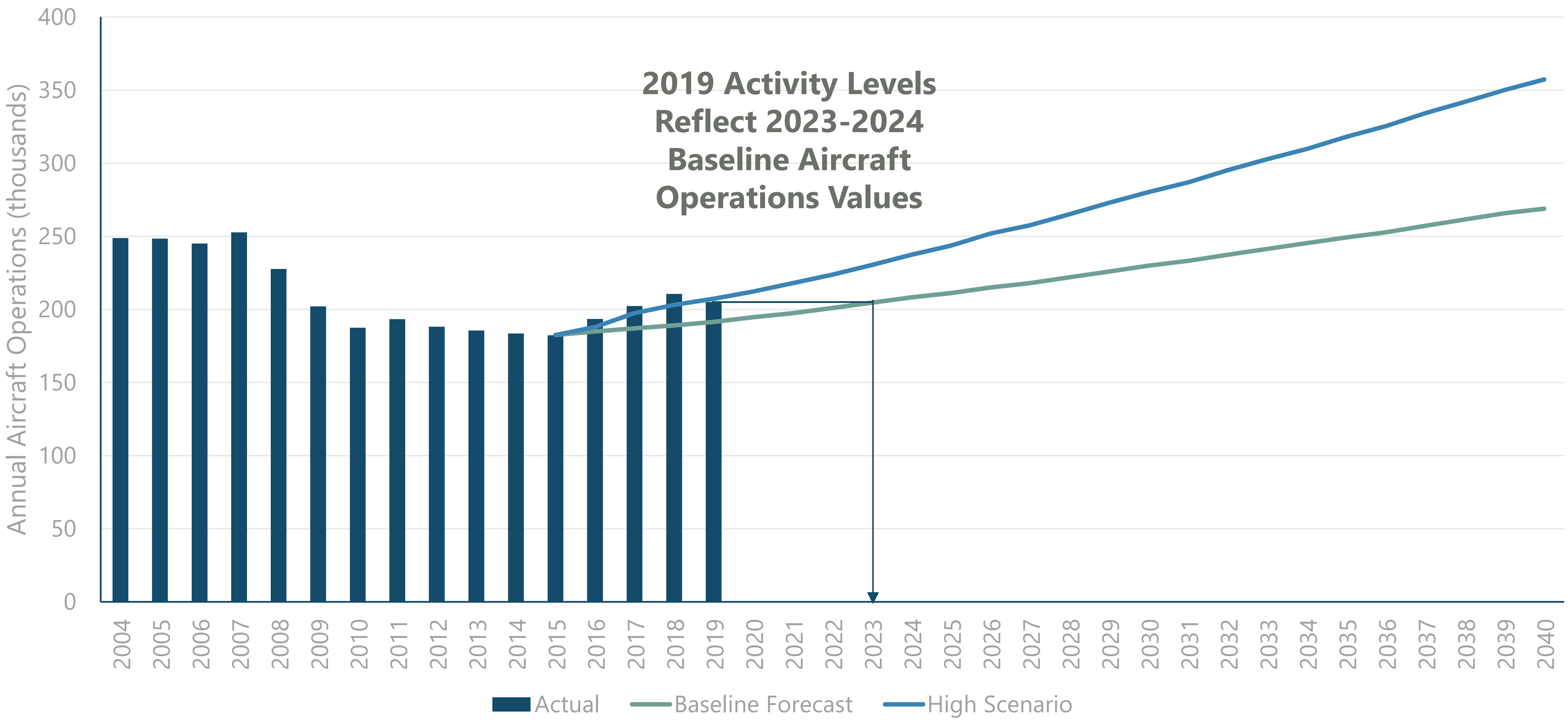
Sources: Innvoata (2019); Raleigh-Durham International Airport Master Plan Study.
Notes: Representative days are Friday, June 21, 2019 and Friday, July 31, 2015.

Forecast of Passengers – Baseline and High Scenario Comparison



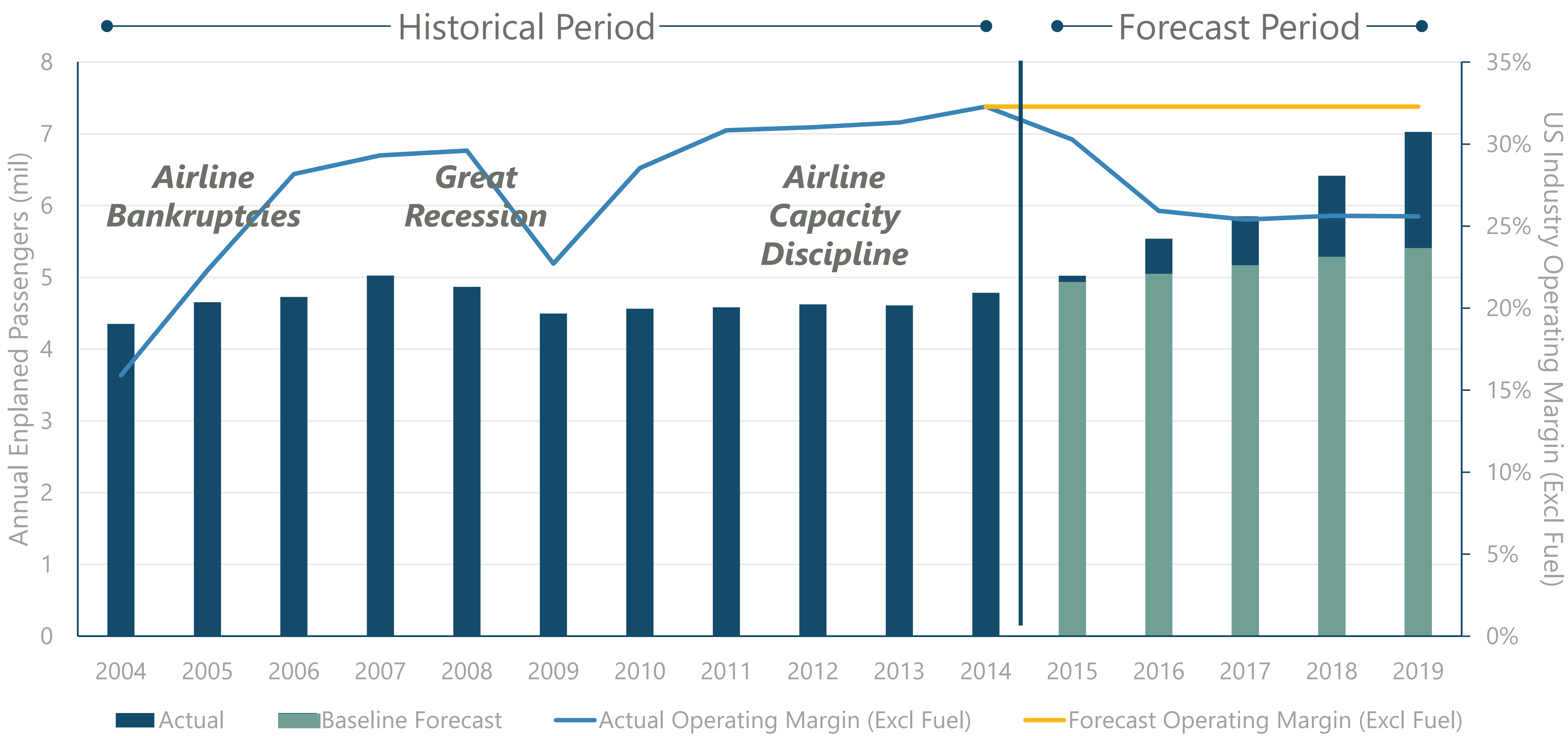
Source: Raleigh-Durham International Airport statistics; Raleigh-Durham International Airport Master Plan Study; 2014 FAA Terminal Area Forecast
Notes: Full-year 2019 is estimated. TAF is reported on a Federal Fiscal Year ending September basis

Forecast of Total Airport Operations – Baseline and High Scenario Comparison



Sources: FAA Operations Network; Raleigh-Durham International Airport statistics; Raleigh-Durham International Airport Master Plan Study
Notes: Full-year 2019 is estimated.

Higher Passenger Growth in the First Five Years Enabled by Lower Than Expected Airline Margins



Source: Raleigh-Durham International Airport statistics; US DOT Form 41; Raleigh-Durham International Airport Master Plan Study.
Note: Full-year 2019 is estimated.

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A4A RTA/RDU Airport Comparison Information

December 10, 2019

Nashville (BNA) – Bonds will Fund Significant Capital Program

Capital programs are demand-driven and scalable

- 10-year capital plan totals $2.9 billion and is mostly focused on expansion and modernization of the airport facilities to accommodate growth.
- BNA Vision 1.0 has a total cost of $1.4 billion with the largest projects being the terminal lobby and IAF at $481 million and concourse D and terminal wings at around $300 million
- BNA Vision 2.0 has a cost of $1 billion with more than half ($650 million) dedicated to concourse A expansion.
- The programs are demand-driven and scalable allowing for concrete stopping and starting points depending on future volume performance.
- The capital plan will be predominantly bond-funded with around 93% coming from existing and future bond proceeds.
- Debt per Enplanement: $33.58 in 2018
- Investment Grade Rating: A
- Days of Cash on Hand: 700 days (estimated at 620 days as BNA spends funds on program)
- Cost per Enplaned Passenger (CPE): $7.00 in FY2019, growing to $13.84 by FY2028, but remains reasonable for an airport of BNA's size and capital needs

Source: November 13, 2019 Fitch Rating Report and FAA Form 127 Report

Austin (AUS) – Current Capital Program is Sizeable but Manageable

Long-term capital program under evaluation

- Five-year capital program is $772 million
  - The airport opened a nine-gate expansion in February 2019, with last gate coming online in November 2019. Other projects include an additional parking garage, administrative building, and airport maintenance and IT complex.
  - Approximately $324 million of additional debt funding anticipated in 2021
- 10-year capital plan through 2029 is projected at $4.0 billion+
  - the airport is evaluating a new terminal and concourse and supporting infrastructure to increase capacity
  - expect bond proceeds, passenger facilities charge reserves from the airport's capital fund, grants, and prior proceeds to fund
  - the process to develop the project priority, phasing, timing, and finance plan could take several years
- The CIP can accommodate the significantly growing traffic but can be scaled to demand needs
- Debt Per Enplanement: $101.97 in 2018; profile is sufficiently strong to enable it to maintain its financial profile assessment with additional debt issuances
- Investment Grade Rating: A
- Days of Cash on Hand: 573 days at YE2018
- Cost per Enplaned Passenger (CPE): $9.03 in 2018 and will increase as the airport pursues its capital plan

Source: July 11,2019 S&P Rating Report and FAA Form 127 Report

San Jose (SJC) – Recently Upgraded Facilities and Manageable Capital Needs

No new debt required for current program

- New 6 gate, $58 million interim facility opened in phases in June and November 2019 to support current and near-term passenger growth beyond the 30 gates in terminals A and B.
- Capital needs are manageable with a five-year CIP totaling $252.8 million.
  - ➢ Major projects include an airfield geometric implementation, ramp rehabilitation, a new aircraft rescue and firefighting facility, and work on one of its large economy parking lots
  - ➢ Airport rates and charges and grants represent the primary funding sources
  - ➢ The airport does not require additional debt to fund its CIP
- A new terminal (estimated at $1.05 Billion-$1.2 Billion) is in early design phase and subject to international growth triggers
  - ➢ The City estimates financing from bonds, commercial paper, grants, PFCs and other financing options
- Debt per Enplaned Passenger: $177.71 (debt service will peak in FY2022 and then decline)
- Investment Grade Rating: A
- Days of Cash on Hand: 635 days at YE2018
- Cost per Enplaned Passenger (CPE): competitive in the $10-$11 range

Source: September 27, 2019 Fitch Rating Report, June 19, 2019 Airport Report Today and FAA Form 127 Report

Columbus (CMH) – Multi-phased approach for Long-Term Capital Program

Airport positioned to issue debt as needed

- $2.0 Billion One International Gateway project in four phases
- Near term focused on improving traveler experience:
  - New rental car facility under construction and expected to open in 2021
  - New Marriott Residence Inn opening Summer 2020
  - 1,400 additional parking spaces
- Future new terminal will provide a more modern look, greater technology features and increased options and services, modern amenities, increased efficiencies and ability to accommodate future expansion
- Funding: car rental facility charges for new rental car facility; remainder of projects funded through grants, savings, partnerships, passenger facility charges, FAA funds and borrowing responsibly
- Debt Per Enplanement: $19.79 in 2018 (no debt issued since October 2016)
- Investment Grade Rating: A+
- Days of Cash on Hand: 430 days
- Cost per Enplaned Passenger (CPE): $7.92 at YE2018

Source: FlyColombus.com, Comprehensive Audited Financial Report, FAA Form 127 Report, and July 29, 2016 Fitch Rating Report

Airport Comparison Snapshot

	Nashville	Austin	San Jose	Columbus
Enplanements (2018)	7.5 Million	7.7 Million	6.7 Million	4.1 Million
Operations (2018)	210,357	208,048	165,751	154,582
Capital Improvement Program (CIP)	$2.9 Billion, 10 Year	$772 Million, 5 Year $4.3 Billion, 10 Year	$252.8 Million,5 Year	$2.0 Billion, 10 Year
Funding	93% bond funded	Bonds, PFCs, grants and airport reserves	Rates and charges and AIP grants; No new debt	car rental facility charges, grants, savings, PFCs, partnerships, FAA funds and bonds
Debt Per Enplanement (2018)	$33.58	$101.97	$177.71	$19.79
Cost Per Enplaned Passenger (2018)	$7.00	$9.03	$10.39	$7.92
Investment Grade Rating	A	A	A	A+
Days Cash on Hand	700	573	635	430

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