Cell Phone Lots at Airports (2015)

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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP SYNTHESIS 62

Cell Phone Lots at Airports

A Synthesis of Airport Practice

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AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

ACRP SYNTHESIS 62

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Cover figure: Lihue Airport Cellular Lane sign. *Credit*: Peter B. Mandle.

FOREWORD

Airport administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community, the Airport Cooperative Research Program authorized the Transportation Research Board to undertake a continuing project. This project, ACRP Project 11-03, "Synthesis of Information Related to Airport Practices," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an ACRP report series, *Synthesis of Airport Practice.*

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

By Gail R. Staba
Senior Program Officer
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A cell phone lot is typically a free parking lot at an airport that allows greeters to park temporarily until a traveler is available for pickup. These lots can assist airport operators in managing curbs and they keep greeters from waiting in unsafe areas on airport roads. However, there is a question about whether the benefits of a cell phone lot outweigh the operating and maintenance costs and foregone revenues.

Cell phone lots have ardent advocates and vocal opponents. Some of the earliest cell phone lots were a response to new security requirements implemented after 9/11 to restrict parking directly adjacent to or under a terminal. These lots provided alternative parking capacity for greeters and reduced traffic circulating past the airport curbside. Some airports with adequate parking capacity have not provided a cell phone lot, but have opted to offer customers 30 or more minutes free in hourly parking areas. Whatever the solution, free parking products do not cover airport sponsor capital, operational, and maintenance costs for these parking areas.

Airport operators are taking a second look at free parking products to see if they can find alternative ways to develop revenue streams at cell phone lots. For example, Denver International's new Final Approach cell phone lot includes restaurants, a children's seating area with iPads, a gas station, and a convenience store. Parking remains free, but the cell phone lot concessions generate revenue for the airport. Furthermore, the cell phone lot not only is a draw for greeters waiting to pick up arriving passengers, but also for airport employees, many of whom do not work in the terminal area and like the convenience of the restaurants and a service plaza.

The scope of the report included online research of 110 airports as well in-depth discussions with 21 Canadian and U.S. airports.

Lois S. Kramer as Principal Investigator and Sydney Mandel and Max Spiro, KRAMER aerotek inc. collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

CELL PHONE LOTS AT AIRPORTS

SUMMARY Airports operate cell phone lots as an element of the ground access system, allowing greeters to wait temporarily in a free parking lot until an arriving air passenger is ready for pickup. These lots can assist airport operators in managing congestion at the curb and they deter greeters from circling the airport or waiting unsafely alongside airport roads. As a parking product, cell phone lots have a cost and benefit. For most airports, cell phone lots do not generate revenue. Individual airports treat airport cell phone lots in different ways: as a vehicle staging area, a free or time-limited parking product, or a concession. The perception of its principal function has led airport operators to different decisions regarding location and capacity of the lots, and to different levels of investment in cell phone lot improvements and amenities.

Airport cell phone lots touch on many issues facing airport management today, including:

- Airport cost recovery for services rendered;
- The need for security and reduction of congestion at the curbside and around the landside terminal area;
- Air quality management on airport property;
- Revenue development for parking and other non-aeronautical on-airport businesses;
- Enhanced customer service to ensure customer satisfaction, remain competitive with other airports in the area, and respond to customer requests; and
- Use of mobile technologies to assist greeters in timing pickup of arriving passengers.

How an airport operator balances and addresses each of these issues results in a unique cell phone lot solution. The objective of the synthesis was to shed light on current airport practices to size, locate, develop, manage, and maintain cell phone lots. The intended audience for the synthesis includes airport landside and parking operations and airport managers.

This synthesis included a literature review and Internet research; an Internet search of the top 110 airports in the National Plan of Integrated Airports Systems, including social media comments about cell phone lots; an online survey of airports representing diverse geography and airport size; and follow-up telephone interviews with survey participants.

Although there have been press releases about cell phone lots and a few published articles, this synthesis represents one of the first efforts to gather data about these lots.

The report's findings are summarized here and discussed in more detail in the report that follows:

- From the airport operator's perspective, a cell phone lot provides a waiting place away from the terminal area that can lessen congestion at the curb and reduce environment pollution from recirculating and idling vehicles.
- Cell phone lots are increasingly common offerings at airports. An Internet search of 110 of the largest airports in the United States and Canada identified 96 airports with one or more cell phone lots.
- As the lots are usually free, airport operators do not recover operating and maintenance costs.
- Cell phone lots tend to be small. Of the 96 airports with cell phone lots, two-thirds (65) have fewer than 100 spaces, and 29 have 30 or fewer.

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- Airport operators interviewed for this synthesis viewed cell phone lots primarily as a customer service. Several airports have or are contemplating non-aeronautical revenue-generating activities at their cell phone lots.
- Staff from landside operations typically manages and maintains cell phone lots. Airport security patrols the lots as part of regular rounds.
- Because most airports require drivers to stay with their vehicles at all times, drivers reported (through social media) that they used the time waiting in cell phone lots to view aircraft take-offs and landings, clean out cars, walk dogs, read, or access the Internet while waiting for arriving passengers.
- In interviews, airport operators identified the following as issues:
  - Overcrowding and congestion in the cell phone lots at peak arrival times and around Thanksgiving and Christmas holidays
  - Congestion on airport access roads near the entrance or egress points of the cell phone lot
  - Use of the lot by for Transportation Network Carrier (TNC) vehicles, taxis, or other commercial vehicles
  - Notification of greeters when passengers are at the curb ready for pickup (as opposed to when the aircraft lands).

The chapters that follow examine the ways that airports address cell phone lots as an important component of ground access and how different airports operators have implemented a cell phone lot strategy that fits within their business models.

CHAPTER ONE

INTRODUCTION

HISTORY OF CELL PHONE LOTS

Airport cell phone lots came into wide use following the tragic events of September 11, 2001. At that time, the FAA implemented a comprehensive change to security measures that included the formation of TSA; temporary restrictions on unattended vehicles within 300 feet of the terminal; increased security and vehicle inspections; and prohibition of vehicles remaining at the curbside for extended periods. Security checkpoints in the terminal eliminated the possibility of meeting an arriving passenger at the gate. The introduction of cell phone lots provided an alternative to private vehicles waiting at the curb or along airport access roads to pick up arriving passengers; greeters could arrange, by phone, a rendezvous point once the arriving passenger was outside the terminal.

The creation of cell phone lots also coincided with stepped-up in capability and use of mobile phones. Mobile phone access to the Internet was possible but not widespread until good quality 3G coverage was available in the mid-2000s. Adoption of mobile technology, combined with free parking at remote cell phone lots, suggested a way to reduce congestion at terminal curbsides and traffic circulating on airport roads.

TYPES OF CELL PHONE LOTS

Cell phone lots have few design standards. Because most lots represent non-revenue facilities, many airport operators view them as necessary, but try to limit investment and management costs of the lots.

Figure 1 describes the spectrum of cell phone lots. Some cell phone lots are vacant lots, paved or unpaved, with no amenities. Airport operators may repurpose an existing paved lot, restripe the lot, and provide trash cans, lighting, and some type of security that might include fencing, regular visits by airport police, or cameras. Some airports have additional amenities such as restrooms, flight information displays (FIDS), and Wi-Fi. Other airport operators have integrated cell phone lots into existing parking options by offering up to an hour free, or by designating a specific area of a parking lot as the cell phone lot. A few airports have integrated the cell phone lot as part of an airport travel plaza, restaurant, or convenience store.

WHEN CELL PHONE LOTS ARE USEFUL AT AN AIRPORT

Airport operators provide cell phone lots for a variety of reasons:

- As a customer service for greeters who would not likely wait in a parking lot or garage;
- To reduce curb congestion and parking on access roads;
- To improve roadway safety;
- To lessen emissions by reducing circulating traffic;
- To address parking space shortages in paid lots or garages by redirecting ultra-short term customers (less than one hour) to the cell phone lot;
- To meet TSA and FAA security requirements;
- To satisfy customer and local government requests for a cell phone lot.

When cell phone lots have fewer than 30 spaces, they may not address all of the stated objectives for operating this type of parking facility.

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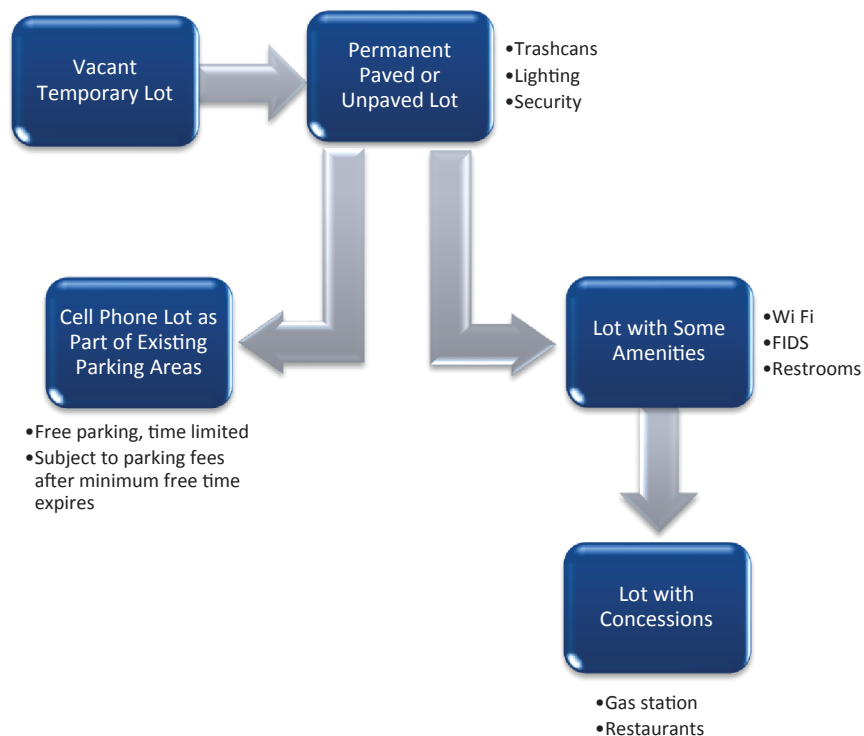
FIGURE 1 Types of cell phone lots. *Source*: KRAMER aerotek inc. (2014).

PURPOSE OF THE SYNTHESIS

The objective of the synthesis was to collect information on current practices to size, locate, develop, manage, and maintain cell phone lots at airports; and to evaluate their requirements and benefits. As such, this particular synthesis is narrow in scope:

- What are the different characteristics of cell phone lots in terms of location, size, and amenities?
- When are cell phone lots useful to an airport and why?
- What does an airport need to know to determine demand and capacity requirements for a cell phone lot?
- What part of the airport organization is responsible for cell phone lot management?
- How are cell phone lots staffed and monitored?
- What are typical hours of operations?
- What sources of revenue fund capital and maintenance costs?
- How much airport investment is needed for a cell phone lot?
- How prevalent is third-party development and management of these lots?
- Has any airport studied the impact of cell phone lots on other parking products or ground transportation choices?
- What lessons can airports with cell phone lots provide an airport contemplating a new lot or reprogramming of an existing lot?

SYNTHESIS STUDY APPROACH

To address these questions, a four-step approach was taken:

A literature review on current practices examined discussions about airport cell phone lots at airport industry conferences, written materials offered by industry journals on airport parking, and relevant ACRP publications, supported by an Internet search of the topic in newspapers and magazines.

Internet research of the top 100 airports in the FAA's National Plan of Integrated Airport Systems (NPIAS) and a few Canadian airports identified those with cell phone lots and gathered basic (and available) data on such topics as airport size, cell phone lot size and amenities, and location. This information, which was collected and assembled into a database for analysis, is discussed in chapter three.

More than 35 airports were contacted and invited to participate in an online survey and follow-up telephone interview. Of these airports, four did not have a cell phone lot and therefore only participated in the telephone interview. Twenty airports with cell phone lots began the online survey: 18 completed the survey and two airports provided a partial response. Where possible in the analysis, all airports responding to a particular question were reported: however, since not all airports responded to every question the number of responses was indicated in each table presented in chapter three.

Chapter four presents highlights from the telephone interviews. Each airport representative that participated in an interview reviewed the highlights, suggested changes, and granted approval for publication. A few participants requested confidentiality and therefore interview highlights are not published for their particular airport.

Table 1 shows the airports that participated in the telephone interviews. In addition to varying size and location, representation from airports operated by authorities, counties, municipalities, and port commissions was also sought.

TABLE 1
AIRPORTS PARTICIPATING IN THE TELEPHONE INTERVIEWS

Airports with Cell Phone Lots	Hub Size	Organization	2013 O&D Passengers (two-way)
John F Kennedy International	Large	Authority	39,571,528
San Francisco International	Large	City/county	33,615,374
Denver International	Large	City/county	27,977,660
Boston Logan International	Large	Authority	27,768,574
Toronto Pearson International*	Large	Authority	27,082,102
Seattle–Tacoma International	Large	Port commission	24,059,336
Newark Liberty International	Large	Authority	23,925,468
Phoenix Sky Harbor International	Large	City	21,249,900
Tampa International	Large	Authority	15,672,754
Ronald Reagan Washington Nat'l	Large	Authority	15,506,872
Portland International	Large	Port commission	12,554,796
Salt Lake City International	Large	City	10,876,068
Lambert–St. Louis International	Medium	Airport commission	10,138,724
Austin–Bergstrom International	Medium	City	9,162,300
Metropolitan Oakland International	Medium	Port commission	8,727,266
Louis Armstrong New Orleans Int'l	Medium	City	8,593,536
San Antonio International	Medium	City	7,630,890
Pittsburgh International	Medium	Authority	7,490,376
Indianapolis International	Medium	Authority	6,936,244
Airports Without Cell Phone Lots			
McCarran Int'l (Las Vegas)	Large	County	33,438,548
La Guardia	Large	Authority	24,059,336
Dallas/Fort Worth International	Large	Multi-city/county	22,720,416
Eppley Airfield (Omaha)*	Medium	Authority	4,042,333

Sources: Compiled by LeighFisher and KRAMER aerotek inc.
Notes:
- The U.S.DOT O&D survey does not include data for foreign-flag airlines or non-revenue passengers; therefore, the raw data from the survey will understate O&D passengers at many airports, particularly airports with a large number of foreign flags. O&D survey raw data were used to estimate the number of connecting passengers.
- The number of originating passengers is calculated by subtracting connecting passengers from total enplaned passengers. This includes domestic and international O&D passengers traveling on U.S. and foreign-flag airlines as well as any passengers making connections between two international flights and non-revenue passengers. Total passengers for both directions multiplies estimates of originating passengers by 2.
- Connecting passengers—U.S. Department of Transportation, Origin Destination Survey of Airline Passenger Traffic, Domestic, online database [accessed September 2014].
- Total enplaned passengers—U.S. Department of Transportation, ACAIS airport ranking (2013).
- Connecting data not available for Toronto Pearson and for Omaha. Omaha passengers are total passengers and Toronto Pearson O&D passengers are 75% of total passengers. Percentage of connecting passengers estimated from 2009 MIDT data.

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TABLE 2
RELATED ADDITIONAL ACRP AND TRB PUBLICATIONS

Project Number	Project Title
ACRP 03-19	Passenger Value of Time, Benefit-Cost Analysis, and Airport Capital Investment Decisions
ACRP 10-16	Ground Transportation at Airports: Best Practices
ACRP Report 10	Innovations for Airport Terminal Facilities
ACRP Report 19A	Airport Performance Indicators
ACRP Report 24	Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies
ACRP Report 30	Reference Guide on Understanding Common Use at Airports
ACRP Report 34	Handbook to Assess the Impacts of Constrained Parking at Airports
ACRP Report 52	Wayfinding and Signing Guidelines for Airport Terminals and Landside
ACRP Synthesis 36	Exploring Airport Employee Commute and Parking Strategies
ACRP Report 109	Improving Terminal Design to Increase Revenue Generation and Customer Satisfaction
TRB Special Report 215	Measuring Airport Landside Capacity

Source: Compiled by KRAMER aerotek, inc. (2014).

There is very little published research about airport cell phone lots. TRB has published a number of studies and syntheses that complement this study and provide perspective about specific ways to improve customer experience or measure performance. Table 2 lists relevant studies that are completed, pending, or in process.

REPORT STRUCTURE

Figure 2 shows the report organization with the summary and this introduction. Chapter two summarizes results of the Internet research about cell phone lots at 110 airports. Chapters three and four present a synthesis of the study findings. Chapter five contains a discussion of conclusions. Appendix A contains a list of the 110 airports studied by means of the Internet. Appendix B contains a copy of the online survey. Appendix C is the telephone guide used for follow-up interviews.
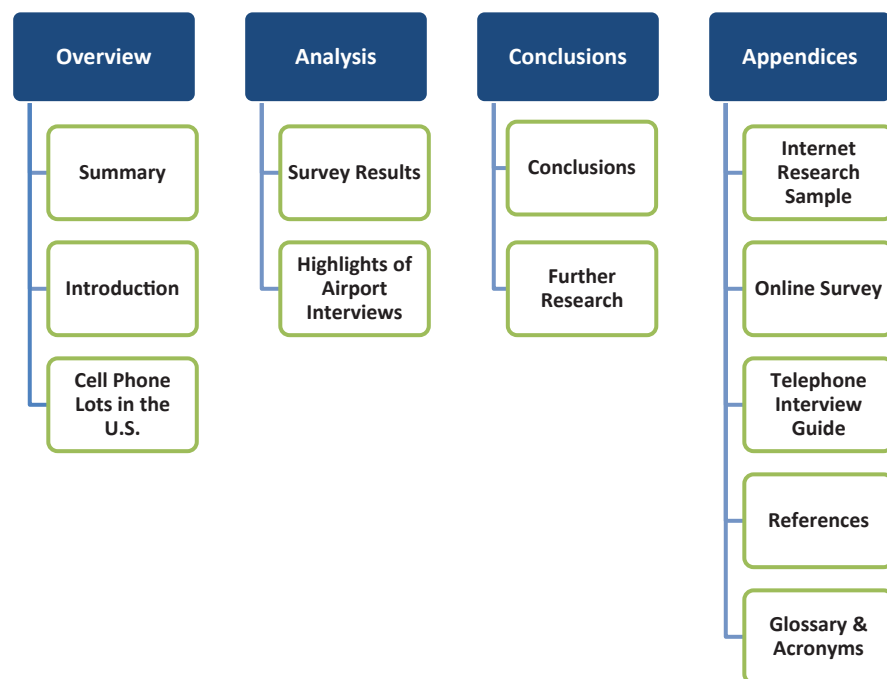
FIGURE 2 Report organization. *Source*: KRAMER aerotek, inc. (2014).

CHAPTER TWO

RESULTS OF INTERNET RESEARCH ABOUT CELL PHONE LOTS

This chapter provides an overview of Internet-available information on cell phone lots at airports in the U.S. and Canada. The research was primarily drawn from airports' own websites; Google Earth (for estimates of cell phone lot distance to main terminal and downtown); and social media, particularly Foursquare, a location-based site, and Yelp, for customer comments about cell phone lots. The search focused on:

- The top 100 airports in the 2013 NPIAS, measured by enplaned passengers;
- The ACI-NA 2012 Passenger Services Survey (list of airports with cell phone lots);
- Articles about airport cell phone lots; and
- A sample of Canadian airports.

Appendix A lists the airports studied.

INCIDENCE OF CELL PHONE LOTS AT U.S. AND CANADIAN AIRPORTS

The data search included 110 airports representing the largest airports in the United States by enplanements and a sample of Canadian airports. Ninety-six (96) airports in the sample, or about 87%, operated cell phone lots; Table 3 shows the breakout by airport size. The sample of large- and medium-hub airports is almost 100%; the small-hub sample represents about 57% of small hubs; and the non-hub airports are under-represented. Many non-hub airports offer free parking for all users.

Airports that elect not to offer a cell phone lot either have alternative free parking where greeters can wait to pick up arriving passengers, or have made an explicit decision not to include a cell phone lot as a parking option.

SIZE OF CELL PHONE LOTS

Figure 3 shows the reported number of parking spaces at cell phone lots. Sixty-five (65) airports have cell phone lots with fewer than 100 spaces, and of this group, 29 airports had 30 or fewer spaces. There is no apparent correlation between the size of a cell phone lot and other variables such the number of arriving passengers or percent of passengers picked up in private vehicles.

AIRPORTS WITHOUT CELL PHONE LOTS

Table 4 shows the 13 airports with no cell phone lot. There are a few large airports that stand out in the list, including Dallas/Fort Worth International (DFW), McCarran International (LAS), and LaGuardia (LGA). Newark Liberty International (EWR) may also give up its lot in the future; see profile in chapter four.

Telephone interviews with several airports without cell phone lots indicated that most of these airport operators had considered a cell phone lot, but decided against it for a number of reasons:

- The airport provided alternate and specific pickup areas for arriving passengers;
- The airport had recently closed the cell phone lot and reused it for staging a construction project;
- There was low community demand for a cell phone lot; or
- The airport sponsor follows a parking model that requires users to pay for parking privileges at the airport.

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TABLE 3
AIRPORTS WITH OR WITHOUT
CELL PHONE LOTS

Hub Size	Sample Size	Airports with Cell Phone Lots	No Cell Phone Lot
Large	30	27	3
Medium	38	34	4
Small	40	34	6
Non-Hub	2	2	0
Total	110	97	13

Source: Compiled by KRAMER aerotek inc. (2014).
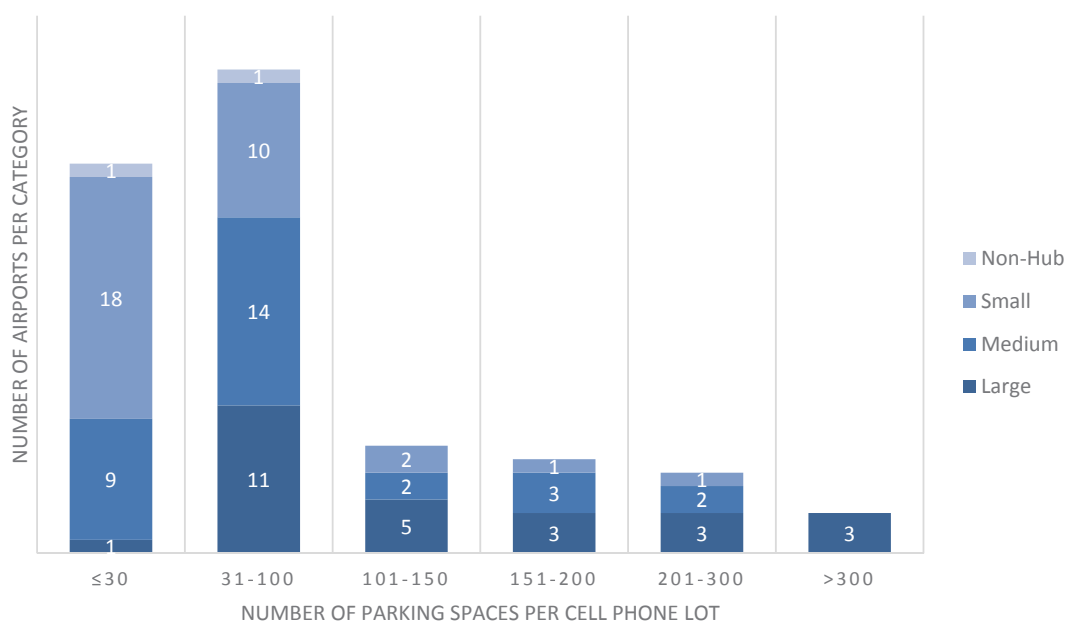
FIGURE 3 Number of parking spaces at cell phone lots. *Source*: Compiled by KRAMER aerotek inc. (2014).

TABLE 4
AIRPORTS WITH NO CELL PHONE LOTS

City	Airports with No Cell Phone Lot
Burbank	Bob Hope
Dallas/Fort Worth	Dallas/Fort Worth International
Greensboro	Piedmont Triad International
Guam	A.B. Won Pat International
Las Vegas	McCarran International
Little Rock	Bill and Hillary Clinton National/Adams Field
Mesa	Phoenix-Mesa Gateway
New York	LaGuardia
Norfolk	Norfolk International
Omaha	Eppley Airfield
Santa Ana	John Wayne Airport-Orange County
Syracuse	Syracuse Hancock International
Windsor Locks	Bradley International

Source: Compiled by KRAMER aerotek inc. (2014).

TABLE 5
EXAMPLES OF AIRPORTS WITH CELL PHONE LOTS AND FREE HOURLY PARKING

City	Airports	Number of Cell Phone Lot Parking Spaces	Free Hourly Parking
Anchorage	Ted Stevens Anchorage International	30	30 minutes
Buffalo	Buffalo Niagara International	70	2 hours
Calgary	Calgary International Airport	65	30 minutes
Dallas	Dallas Love Field	45	30 minutes
Lexington	Blue Grass	30	30 minutes
Memphis	Memphis International	26	30 minutes
Oklahoma City	Will Rogers World (2 cell lots)	74	1 hour
Richmond	Richmond International	40	59 minutes
Tallahassee	Tallahassee Regional	30	30 minutes
Tampa	Tampa International	350	59 minutes
Wichita	Wichita Mid-Continent	16	30 minutes

CELL PHONE LOTS AND FREE HOURLY PARKING

Some airport operators offer a short grace period (10 minutes is the International Parking Institute Standard) should a visitor park in the wrong area or if no spaces are available. At many airports, this is not enough time to complete a pick-up of passengers. However, some airport operators offer both cell phone lots and free hourly parking ranging from 30 minutes to two hours. The provision of free parking is common, and these parking policies are difficult to terminate. Table 5 lists examples of airports that offer some amount of free hourly parking in addition to free parking in a cell phone lot.

AIRPORTS WITH MORE THAN ONE CELL PHONE LOT

Some airports operate cell phone lots in more than one location. Oklahoma City has two lots; Phoenix Sky Harbor International operates three—one lot near Terminals 2 and 4 and one lot located further out adjacent to its Sky Train Station. The airport operator sees a need to publicize the lot near the Sky Train Station because cell phone lot users tend to congregate in the East Lot near Terminal 4, which handles about 80% of arriving passengers.

AIRPORTS THAT COMBINE CELL PHONE LOTS WITH OTHER PARKING PRODUCTS

A few airports have carved out space for a cell phone lot within existing parking facilities. The advantage of this approach is that free parking is available in a specific lot and for a limited time. Because entry to the lot usually requires a parking ticket, conversion to paid parking after the free period expires is easy, and the airport already has installed card readers and pay systems at exits for paid parking. Airport operators who have adopted this approach include General Mitchell International in Milwaukee, Vancouver International Airport, Kansas City (Missouri) International, Pittsburgh International, and Edmonton International Airport.

The combined approach requires available capacity in some existing parking but has the advantage of allowing the airport to offer a cell phone lot with no additional facility requirements as well as the opportunity to collect revenue for parking after the first hour.

AIRPORTS THAT INTEGRATE A CELL PHONE LOT WITH A TRAVEL PLAZA CONCESSION

The original concept of a cell phone lot involved free parking and no revenue-generating activity. Some airports, including Denver International Airport (DEN) and Indianapolis International Airport (IND), are reconsidering this approach, and integrating cell phone lots with travel plazas. (These examples are discussed in more detail in chapter four.)

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TABLE 6
AMENITIES AT CELL PHONE LOTS—INTERNET SURVEY

Hub Size	Sample Size	Restrooms	Portable Toilets	FIDS	Restaurant	Food Trucks	Vending Machines	Gas	Wi-Fi
Large	26	2	8	9	1	1	3	1	4
Medium	34	1	3	7		1	1		3
Small	34		1	3		1			3
Non-Hub	2								
All Airports	96	3	12	19	1	3	4	1	10

Source: Compiled by KRAMER aerotek inc. (2014).

The original cell phone lot at DIA opened in the summer of 2001 because airport users wanted a free place to wait for arriving parties. It was located in the "simplest and easiest" place it would fit, according to a manager, approximately three miles from the terminal. Although the lot was small, it served its purpose very well at first, but soon became very congested during peak times. Airport staff came up with a plan to relocate the lot: installing a food court in a vacant building near an already existing airport gas station, adding some amenities, and expanding the parking around the building. The project developer and the airport shared the cost of increasing the parking capacity, and the new cell phone lot was completed in 2013.

Indianapolis International also transitioned to a concession-based cell phone lot. IND did not have a cell phone lot prior to the opening of its new Midfield Terminal in 2008. When the new terminal was designed, the program included a small cell phone lot (later expanded) on the in-bound approach to the terminal. In 2013, a travel plaza with amenities including food, restrooms, and Wi-Fi opened nearby. The cell phone lot run by the airport has seen use decline since the travel plaza opened.

AMENITIES

Customers tend to view cell phone lots as destinations because users are required to stay with their vehicles while waiting. Table 6 shows the amenities listed on airport websites for cell phone lots. With the exception of some airports that have elected to incorporate cell phone lots into travel plazas, most of the existing cell phone lots offer very few amenities. Judging from the 96 airport sample, only a few airports offer amenities, primarily FIDS, portable toilets, and Wi-Fi, and even these amenities are not prevalent.

RULES AND HOURS OF OPERATION

Tables 7 and 8 provide a snapshot of rules and hours of operation. Most airports require cell phone lot users to stay with their vehicles; however, beyond this, there are few regulations posted, suggesting that airports do not want to post rules that will require continuous enforcement.

CUSTOMER EXPERIENCE AT CELL PHONE LOTS AS REPORTED IN SOCIAL MEDIA

Among information gathered about cell phone lots were many comments in social media. Most of these were on Foursquare, the social network where people "check in" to venues with their smartphones and post photos and comments about their experiences. Yelp, the popular business review site, yielded a few comments about cell phone lots as well.

TABLE 7
OVERVIEW OF RULES AND HOURS OF OPERATION

Hub Size	Sample Size	Posted Hours	User Time Limits	Posted User Rules
Large	26	4	12	20
Medium	34	4	14	8
Small	34	3	7	30
Non-Hub	2	1	1	2
No. of Airports	96	12	34	60

Source: Compiled by KRAMER aerotek inc. (2014).

TABLE 8
DETAIL ON CELL PHONE LOT RULES

Rule	No. of Cell Phone Lots Where Rule Is Posted
Vehicles must be attended at all times	45
Cars left unattended will be towed	21
No commercial vehicles/trucks	16
Must stay in car at all times	11
No idling (or maximum idling time five minutes)	6
No for-hire vehicles	3
No overnight parking (or no camping)	3
No littering	2
No alcohol	1
No feeding birds	1
No gambling	1
No parking on grass	1
No soliciting	1
Turn off headlights when waiting	1

Because users are required to provide a location when "checking in" or reviewing these lots, Google Earth made it possible to determine the distance of the cell phone lot to the terminal, number of parking spaces, and visible amenities. The comments left by Foursquare and Yelp users mostly related to amenities customers like to see in cell phone lots, problems they have noticed, and the ways in which they keep themselves occupied while waiting for arriving passengers.

There are some inherent biases that will crop up when gathering data this way. Of 110 airports, 51 had been the subject of multiple entries about the cell phone lot. Even acknowledging the limitations of voluntary customer feedback, the comments provide an interesting perspective on customer experience.

Generally, cell phone lot users who post comments tend to have low expectations for these parking lots. Clean bathrooms, trash cans, good lighting, and a sense of security are elements with positive feedback. Users also want excellent directions to the cell phone lot and directions from the lot to the terminal for passenger pickup. Some users noted that when multiple aircraft arrive at approximately the same time, many vehicles try to return to the terminal simultaneously, causing congestion at the exits.

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SURVEY RESULTS

While the Internet survey produced basic data about the availability and size of cell phone lots, it left many questions unanswered, such as:

- What were the airports' initial reasons to have a cell phone lot and have they changed over time?
- How were cell phone lot locations selected?
- As airport operators gained more experience with the lots, have locations for the lots remained fixed or have they changed?
- How did the airport determine the number of parking spaces needed in a cell phone lot?
- Who operates the lots?
- What were the capital costs to develop the lot and what are annual maintenance costs?
- Are cell phone lot users a distinct group of airport patrons?
- Do airports track customer satisfaction with the lots?
- What amenities are important for a cell phone lot?
- Which amenities does the airport actually offer?
- What are the biggest issues that airports encounter with a cell phone lot?

An online survey (Appendix B) was prepared to pursue these questions, and a telephone interview guide (Appendix C) developed. Thirty-two (32) airports—28 with cell phone lots and four without—were invited to participate. Twenty (20) airports with cell phone lots answered some or all questions in the online survey, and 17 completed the survey. These airports and four without cell phone lots agreed to telephone interviews. Participating airports with cell phone lots included:

- Austin–Bergstrom International
- Boston Logan International
- Denver International
- Indianapolis International
- Lambert–St. Louis International
- Louis Armstrong New Orleans International
- Metropolitan Oakland International
- Phoenix Sky Harbor International
- Pittsburgh International
- Port Authority of New York and New Jersey (John F. Kennedy International and Newark Liberty International)
- Portland International
- Ronald Reagan Washington National
- Salt Lake City International
- San Antonio International
- San Francisco International
- Seattle–Tacoma International
- Tampa International
- Toronto Pearson International.

Airports without cell phone lots that participated in telephone interviews included:

- Dallas/Fort Worth International
- Eppley Airfield
- McCarran International
- Port Authority of New York and New Jersey (LaGuardia).
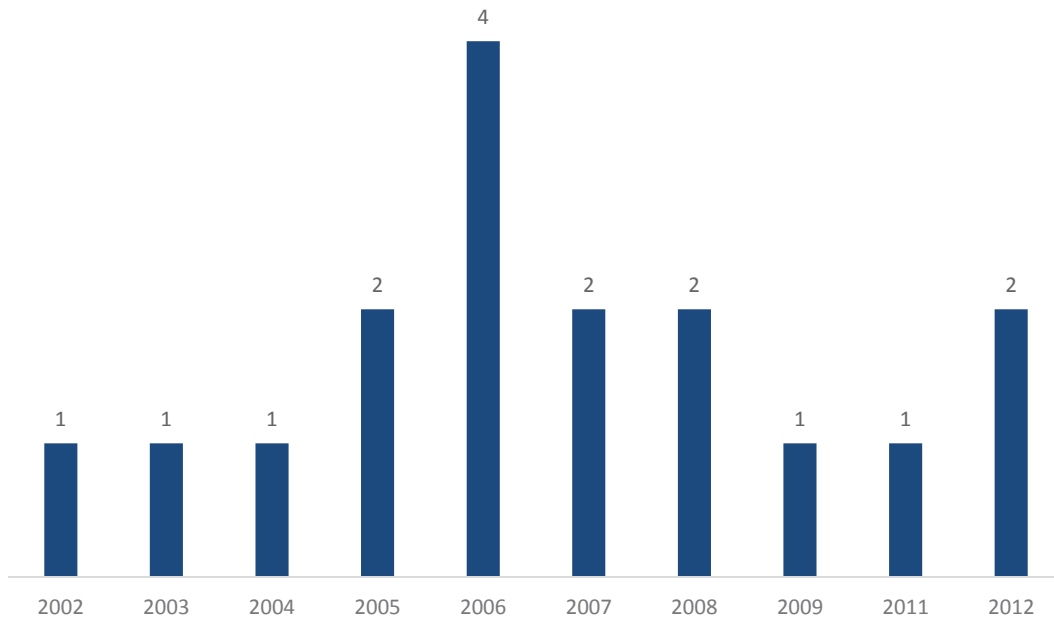
FIGURE 4 Years that cell phone lots opened. Sample size = 17 airports responded. *Source*: Online survey by KRAMER aerotek inc. (2014).

INITIAL REASONS FOR OPENING A CELL PHONE LOT

The first cell phone lots were created more than a decade ago. Figure 4 shows the year when participating airports opened their cell phone lots, and Figure 5 indicates the reasons why airports developed a cell phone lot. Reductions in curbside congestion and recirculating traffic were the top two reasons given for offering a cell phone lot. In addition, airports cited customer requests for cell phone lots.

CELL PHONE LOCATION AND RELOCATION

Airports tend to locate cell phone lots where space is available (Table 9). At Boston Logan (BOS), for example, construction of the consolidated car rental area required the relocation of the cell phone lot and the new location allowed for an increase in parking spaces. Seattle–Tacoma International (SEA), has moved its lot three times and may move it again in the future.
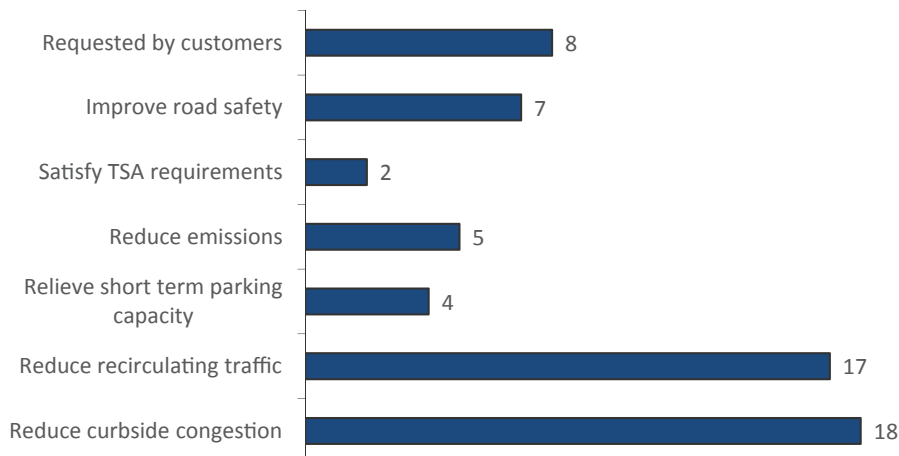
FIGURE 5 Initial Reasons to Offer a Cell Phone Lot. (Check all that apply.) Sample Size = 20 airports responded to this question; 17 airports completed the survey. *Source*: Online survey by KRAMER aerotek inc. (2014).

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TABLE 9
REASONS FOR CELL PHONE LOTS RELOCATION

Response	No.
Location of the cell phone lot has remained the same	10
Previous site needed for other purposes	4
Lot was too small	2
Airport management relocated cell phone lot to add amenities (such as food services)	2
Do not know	1

Sample size = 17 airports responded.
Source: Online Survey by KRAMER aerotek inc. (2014).

GROUND TRANSPORTATION MODE CHOICES

Not many of the participating airports had data on how arriving passengers depart the airport, but seven airports provided survey data or estimated modal choices for arriving passengers. With the exception of Oakland and San Francisco airports, which participated in a joint Bay Area Ground Access Survey, each airport described an individualized approach to estimating ground transportation choices for arriving passengers. Consequently, results shown in Table 10 do not lend themselves to airport comparisons. That said, each airport demonstrated interesting characteristics. For example, Boston Logan, located close to downtown Boston, has high rates of taxi use, while Indianapolis has a high rate of private cars that are left in parking lots during owners' travel. Private car pick-ups and drop-off are prevalent at many of the western airports, including Seattle, Phoenix, San Francisco, and Oakland.

RELATIONSHIP BETWEEN ARRIVING PASSENGERS AND CELL PHONE LOT SPACES

Table 11 relates an estimate of arriving origin and destination (O&D) passengers in the sample with the number of cell phone lot spaces available at the particular airport. The table suggests that cell phone lots serve a very small percentage of arriving passengers picked up by friends, relatives, or business associates.

TABLE 10
GROUND TRANSPORTATION CHOICES FOR ARRIVING PASSENGERS

City	Private Car Parked at the Airport	Private Car Picked-up or Dropped Off	Rental Car	Taxi/Vehicle for Hire	Hotel Shuttle	Bus or Other Public Transit	Other Shared Ride Vans or Buses
Boston	15%	25%	9%	27%	3%	17%	4%
Indianapolis	69%	10%	14%	5%	2%	—	—
Oakland	18%	42%	15%	11%	3%	11%	—
Phoenix	19%	34%	28%	13%	4%	2%	—
San Francisco	NA	38%	17%	17%	4%	15%	9%
Salt Lake City	31%	36%	16%	3%	8%	6%	—
Seattle	7%	35%	16%	18%	5%	19%	—

Sample size = 7 airports responded.
— =
Sources:
- Boston: 2013 Logan Airport Air Passenger Ground-Access Survey, Massport (April–May 2013).
- Indianapolis: Estimates provided by the GTC Manager (November 2014).
- Oakland and San Francisco: 2014–2015 Bay Area Airports Ground Access Survey (October 2014).
- Phoenix: Airport Travel Demand Model Update and Data Collection, HDR Engineering (2012).
- Salt Lake City: TransSolutions data collection (May 2014).
- Seattle: Estimate by airport operations (2014).

TABLE 11
RATIO OF O&D PASSENGERS (ONE-WAY) AND CELL PHONE LOT SPACES

Airport	2013 Estimated O&D Passengers (one-way)	Cell Phone Lot Spaces	Ratio of Spaces to One-Way O&D Passengers (X 1000)
Austin–Bergstrom International	4,581,150	65	0.0142
Boston Logan International	13,884,287	61	0.0044
Denver International*	13,988,830	203	0.0145
Indianapolis International*	3,468,122	231	0.0666
John F Kennedy International	19,785,764	373	0.0189
Lambert–St. Louis International	5,069,362	180	0.0355
Louis Armstrong New Orleans Int'l	4,296,768	25	0.0058
Metropolitan Oakland International	4,363,633	30	0.0069
Newark Liberty International	11,962,734	150	0.0125
Phoenix Sky Harbor International	10,624,950	262	0.0247
Pittsburgh International	3,745,188	150	0.0401
Portland International	6,277,398	30	0.0048
Ronald Reagan Washington Nat'l	7,753,436	35	0.0045
Salt Lake City International	5,438,034	82	0.0151
San Antonio International	3,815,445	83	0.0218
San Francisco International	16,807,687	70	0.0042
Seattle–Tacoma International	12,029,668	330	0.0274
Tampa International	7,836,377	350	0.0447
Toronto Pearson International	13,541,051	115	0.0085

Sources: LeighFisher and KRAMER aerotek inc. (2014).
Notes:
- The U.S. DOT O&D survey does not include data for foreign-flag airlines or non-revenue passengers; therefore, the raw data from the survey will understate O&D passengers at many airports, particularly airports with a large number of foreign flags. O&D survey raw data was used to estimate the number of connecting passengers.
- The number of originating passengers is calculated by subtracting connecting passengers from total enplaned passengers. Included are domestic and international O&D passengers traveling on U.S. and foreign-flag airlines as well as any passengers making connections between two international flights and non-revenue passengers.
- Connecting passengers—U.S. Department of Transportation, *Origin Destination Survey of Airline Passenger Traffic, Domestic,* online database [accessed September 2014].
- Total enplaned passengers—U.S. Department of Transportation, ACAIS airport ranking (2013).
- Connecting data not available for Toronto Pearson International Airport. Toronto Pearson O&D passengers are 75% of total passengers. Percent of connecting passengers estimated from 2009 MIDT data.
- Denver and Indianapolis cell phone spaces include spaces associated with third-party concessions associated with cell phone lots.

PERCENT OF CELL PHONE LOT SPACES TO TOTAL AIRPORT PARKING SPACES

Table 12 shows the ratio of cell phone lot spaces to total airport parking spaces. These ratios show a little more consistency, ranging from just under 0.5% to 2.5%.

DETERMINATION OF DEMAND FOR CELL PHONE LOT SPACES

Most airports surveyed offer cell phone lots as a free customer service (Table 13). However, most airports reported that, more often than not, the dimensions of an available parcel determined the capacity of the lot. Some airports managed high use of cell phone lots by opening additional spaces or deploying ground transportation crew and airport police to direct traffic. Often establishing cell phone lots involved reuse of other parking lots or staging areas. If an airport wanted to de-emphasize the cell phone lot in favor of other hourly parking options, it might limit capacity to 20–30 spaces and minimalize advertisement of the lot.

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TABLE 12
RATIO OF CELL PHONE LOT SPACES TO TOTAL AIRPORT PARKING SPACES

Airport	Cell Phone Lot Spaces	Estimated Total Airport Controlled Parking Spaces	Percent of Cell Phone Lot Spaces
Austin–Bergstrom International	65	11,500	0.57%
Boston Logan International	61	16,072	0.38%
Denver International	203	41,683	0.49%
Indianapolis International	231	23,000	1.00%
John F Kennedy International	373	15,000	2.49%
Lambert–St. Louis International	180	8,800	2.05%
Louis Armstrong New Orleans Int'1	25	6,325	0.40%
Metropolitan Oakland International	30	6,563	0.46%
Newark Liberty International	150	18,400	0.82%
Phoenix Sky Harbor International	262	22,168	1.18%
Pittsburgh International	150	13,200	1.14%
Portland International	30	14,230	0.21%
Ronald Reagan Washington Nat'1	35	9,180	0.38%
Salt Lake City International	82	11,824	0.69%
San Antonio International	83	8,582	0.97%
San Francisco International	70	8,648	0.81%
Seattle–Tacoma International	330	13,330	2.48%
Tampa International	350	23,300	1.50%
Toronto Pearson International	115	23,000	0.50%

Notes:
- Denver and Indianapolis cell phone spaces include spaces associated with third-party concessions associated with cell phone lots.
- Total airport-controlled parking spaces obtained from individual airport websites.
- Cell phone lot spaces obtained from Online Survey by KRAMER aerotek inc. (2014).

MOST EFFECTIVE LOCATION FOR A CELL PHONE LOT

Survey respondents agreed that the most effective location for a cell phone lot had the following attributes:

- Being on a road with direct access into arrivals drive lanes;
- Being on a road located before the main terminal;
- Being in a location that does not take away from the generation of revenue; and
- Being within two minutes' driving time of the terminal.

CELL PHONE LOT OPERATOR

Most airports operators manage cell phone lots directly as a part of ground transportation and parking. Seventeen (17) of the 19 responses indicated that the airport operator managed the lot and that this arrangement has remained consistent for the last five years.

TABLE 13
WAYS THAT AIRPORTS ESTIMATE PARKING SPACES FOR
CELL PHONE LOTS (CHECK ALL THAT APPLY)

Approach	Responses
Capacity Determined by Dimensions of Available Parcel	13
Best Guess	4
Observations by Airport Staff	2
Demand Study	1
Experience with Previous Cell Phone Lot	1

Sample size = 16 airports responded.
Source: Online survey by KRAMER aerotek inc. (2014).

CAPITAL, OPERATING, AND MAINTENANCE COSTS

Because most airport operators have not elected to convert cell phone lots into a revenue-generating activity, annual maintenance costs typically are handled as part of the general operating and mainte-nance budget of the airport. SEA did indicate that its cell phone lot (330 spaces) cost approximately $3.2 million to develop and improve over the years, and required about $120,000 in yearly main-tenance. This included landscaping, cleaning costs, snow removal, and an allocation of costs for overhead to manage, secure and maintain the lot. Most airports did not disclose annual operating costs for cell phone lots.

USE OF THE CELL PHONE LOT AND CUSTOMER SURVEYS

Based on survey responses, cell phone lots are mostly unattended. Airports patrol cell phone lots as part of the regular security of airport property, typically every one to two hours. For airports where cell phone lots are integrated with other parking facilities, cell phone lot users are more easily counted using the parking tickets pulled upon entry. Some operators use pneumatic road tubes across the entry to make sample counts of users. Several cell phone lots in the survey have security cameras.

AMENITIES

Figure 6 shows amenities offered at 15 of the airports participating in the survey. Most lots offer lighting and trash cans. Eight airports have FIDS in the cell phone lots; nine airports have either portable toilets (six) or restrooms (three). Four cell phone lots offer Wi-Fi.

CELL PHONE LOT ISSUES

Cell phone lots present some common issues. The following list represents frequent comments by both airport operators participating in the survey and customers commenting through social media.

- Airports with 30 or fewer parking spaces in the cell phone lot reported occasional overcrowding during peak periods of aircraft arrivals or during holidays.
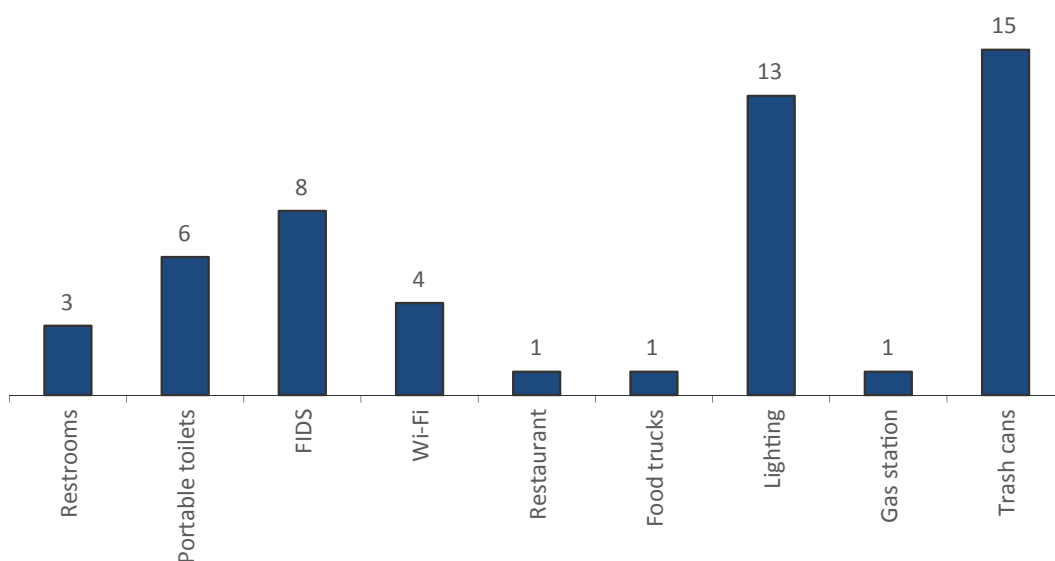
FIGURE 6 Amenities offered at cell phone lots in the survey. (Check all that apply.) Sample size = 15 airports responded. *Source*: Online survey by KRAMER aerotek. inc. (2014).

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- Congestion also can occur at the exit and entrances at the same times. If the parking spaces are not striped, congestion problems may increase, as vehicles tend to congregate near the exits.
- Free cell phone lots can compete with hourly parking unless existing parking facilities are already operating at capacity, in which cases some airport operators view the cell phone lots as congestion relievers.
- At some airports, commercial vehicles, taxis, and limousines reportedly use the cell phone lots.
- Good directions and signs to the cell phone lot and back to the terminal are very important.

Airports believe that cell phone lots cater to a customer base unwilling to pay for parking. However, none of the airports participating in the survey had tested that assumption.

CHAPTER FOUR

HIGHLIGHTS FROM AIRPORT INTERVIEWS

While the online survey attempted to find common ground among cell phone lots, every airport solution is somewhat different. Eighteen (18) airports with cell phone lots and four airports without participated in telephone interviews during the months between July and September, 2014, to address the differences and individual airport issues. The profiles below highlight the most interesting aspects of each airport interview.

BOSTON LOGAN INTERNATIONAL (BOS)

Sponsor—Massachusetts Port Authority (Massport)
Contact—Lourenço Dantas, Senior Transportation Planner

Background

Logan Airport's close proximity to downtown Boston influences its parking and passenger pickup patterns. Greeters in private cars pick up 25% of arriving passengers, and taxis or cars for hire pick up another 27%.

In 2007, Massport designated 50 spaces of an overflow parking lot toward a cell phone lot at BOS. In 2009, as part of a roadway-improvement project, Massport moved the lot to an area that accommodated 61 spaces. The new lot is lighted and open 24/7. A gas station and Dunkin' Donuts store are close by, but not connected to the lot.

This cell phone lot is particularly useful because at BOS, parking capacity is limited by state air quality regulations—that is, a parking freeze—in place since the 1970s to protect Boston's air quality (Figure 7). BOS's constrained parking supply is not sufficient to meet passenger demands. Parking garages reach capacity each week, typically by Monday evening or Tuesday morning, which has prompted the airport to offer a variety of ground transportation services to accommodate its passengers. This occurs despite Logan's charging one of the highest daily parking rates in the nation, $29 per day. Short-term rates are as low as $3 per half-hour in the terminal area garages.

Future Plans

Because BOS is also constrained by limited acreage, new development at the airport always requires displacement of other activities/land uses. The future of this cell phone lot could be in flux, should Massport embark on building a new international terminal or expand airside operations. Massport would like to make the lot bigger and return it to its original location because it was easier to access. If the lot were to move, no new amenities would be added.

Management

Massport enforces a variety of rules for its cell phone lot to ensure it runs smoothly: Drivers must stay in their cars, can only wait 30 minutes, and must wait for their passenger to be at the

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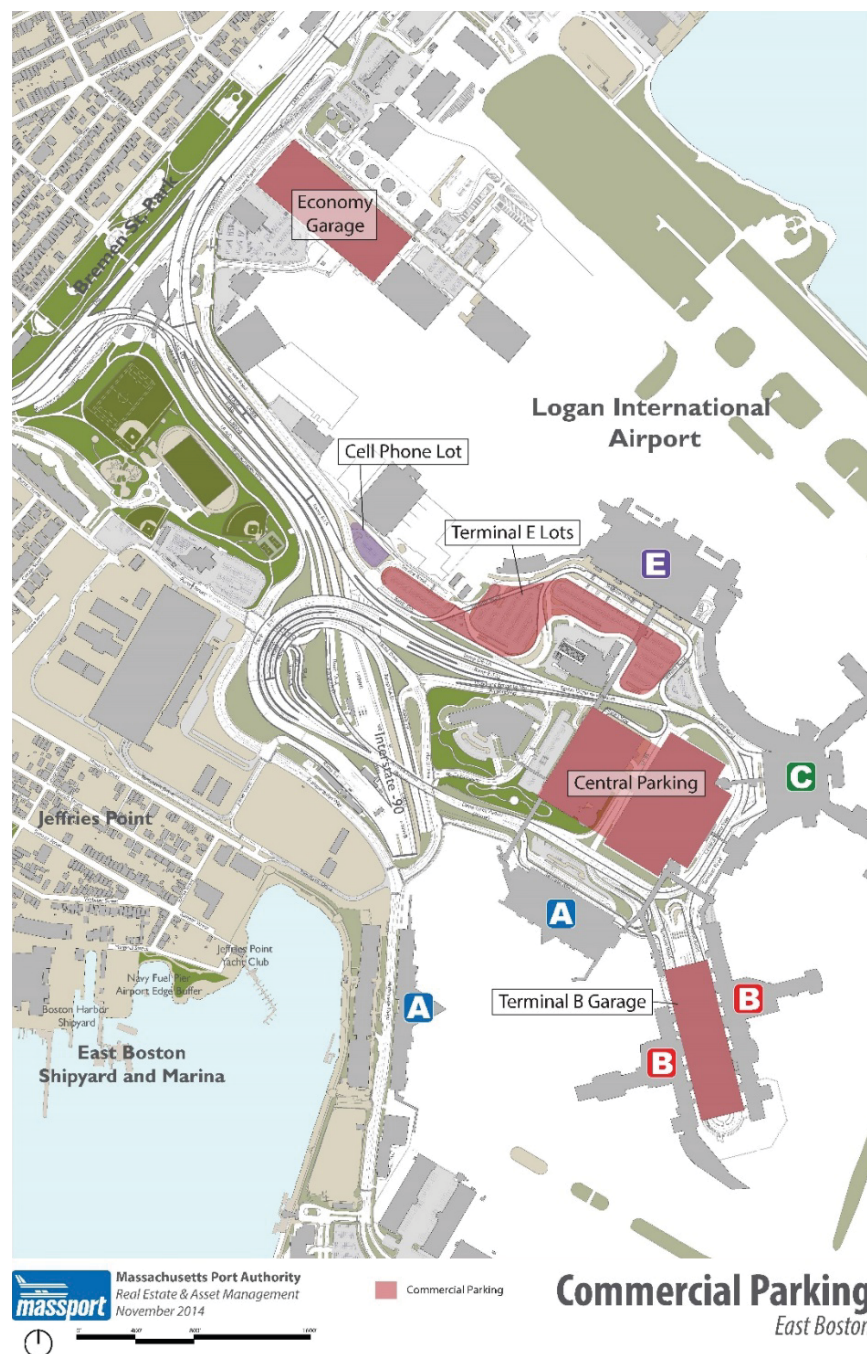
FIGURE 7 Boston Logan Airport parking. *Source*: Massport.

curb before they can park in the arrival zone. These rules are posted on a large sign in the middle of the lot, and are enforced by Massport staff who have authority to ticket and tow unattended vehicles (Figure 8). Additionally, state troopers periodically patrol the lot and manage the curb at the terminals.

Customer Feedback

Massport monitors customer feedback, including comments on the cell phone lot, through its website. The cell phone lot has received mostly positive reviews, with negative reviews generally occurring during peak travel times such as Thanksgiving.

FIGURE 8 Posted rules at Boston Logan International Airport Cell Phone Waiting Lot. *Source*: Massachusetts Port Authority (2014).

Biggest Challenges

Overall, Massport's Aviation Department believes the lot has reduced curbside congestion, although there are no studies to quantify the effect of the cell phone lot on congestion. The agency's biggest challenges moving forward are that the lot is undersized and that its location is not ideal.

Lessons Learned

The cell phone lot is integral to ground transportation solutions and interdependent with other airport services. As every airport is different, it is important that airport planners consider a variety of factors before creating a cell phone lot. Given land constraints, Massport would prefer to encourage passengers to use concessions inside the terminal rather than those that are part of a cell phone lot.

DALLAS/FORT WORTH INTERNATIONAL (DFW)

Sponsor—DFW Airport Board
Contact—Armin Cruz, Vice President of Parking

DFW has made an explicit decision not to offer a cell phone lot for the following reasons:

- Cell phone lots are a benefit when vehicular traffic can be diverted from the point of destination (airline terminal) and then measurably metered back to the terminal.
- DFW is located on a highway and as such, fees are determined from the time an airport user passes the first toll gate to the moment that user exits the toll gate.
- Airlines are shifting schedules to more concentrated connecting banks, which means there are simultaneous bursts of vehicular traffic activity.
- With five terminals, and major airlines occupying several of those terminals, it is common for last-minute gate changes also to involve terminal changes. This results in noticeable relocation of curbside and roadside vehicular traffic during flight arrival banks.

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FIGURE 9 Denver International's final approach concessions and cell phone lot.

DENVER INTERNATIONAL (DEN)

Sponsor—City and County of Denver
Contact—Harold Hensley, Parking Manager

Background

The original cell phone lot at DEN was opened in the summer of 2001 because airport users wanted a free place to wait for their arriving party. According to Hensley, the lot was located in the "simplest and easiest" place it would fit, approximately three miles from the terminal. The entry and exit were conveniently accessed off Pena Boulevard, the 10-mile-long highway that brings all traffic in and out of DEN (Figure 9).

Although the lot was small, it served its purpose very well at first, but soon became very congested during peak times. The overflow caused unsafe backups onto Pena Boulevard. The lot was unstaffed except when it became so congested that parking field agents or police were dispatched to close the lot and move waiting traffic off the roadways.

The idea of moving the lot and putting concessions near the already existing airport gas station had been discussed for a while. When a building that previously housed an automobile repair facility became available, a plan was developed to install a food court in the vacant building, add some amenities, expand the parking around the building, and move the cell phone lot to that facility. The project developer and DEN shared the cost to increase the parking capacity and the new cell phone lot was completed in 2013.

During the 2013 Christmas and Thanksgiving holidays, parking staff frequently monitored the traffic flow and capacity of the lot and it appeared to be operating as intended.

Customer Response to the New Cell Phone Lot

This cell phone lot appears to be a success because it has met the customers' needs: a secure, free waiting area and a place to grab a bite to eat, sit at the outdoor tables, or take advantage of the Wi-Fi and restrooms. There appears to be what Hensley describes as "a pretty good mix" of people who frequent this lot, not only for the free parking but for the variety of food and amenities.

Judging by written and online comments, the amenities most appreciated are the Wi-Fi, restrooms, and food. Favorable comments received usually compliment DEN for turning the cell phone "parking" lot into something more habitable. Some customers have difficulty finding the cell phone lot

when using it for the first time, as it is located on the opposite side of the airport from the original lot. However, there are few other complaints.

Management

DEN provides snowplowing and traffic management during the holiday season. Commercial vehicles are welcome to use the restaurants but are prohibited from staging in the lot. DEN staff patrol the lot to enforce the restrictions placed on the commercial vehicles. The FIDS that are located in the food court of the building are operated and maintained by DEN. The restaurants are open from 5 a.m. to midnight, but the cell phone lot is open 24 hours a day. There is also a 24-hour drive-through Dunkin' Donuts.

Lessons Learned

The impact of the new cell phone lot on traffic flow appears modest but positive overall. There are still many cars circling on the main airport road, but the lot appears to have decreased congestion at the terminal curbside. DEN's other parking options still do good business, so the new lot does not appear to be competing with short-term parking.

Hensley believes that, "Cell phone lot users are those who do not want to pay any fee for parking," so these customers would have avoided paying for short-term parking even if there were no cell phone lot. His recommendation for other airports considering constructing or improving their existing cell phone lot is to place the lot where it is most convenient for the customer, then add a source of revenue in that area.

EPPLEY AIRFIELD (OMA)

Sponsor—Omaha Airport Authority
Contact: Airport Police Office

Eppley Airfield in Omaha has never had a dedicated on-airport cell phone lot because of the very limited amount of available, convenient space and the reservation of other space for future developmental needs. However, there is an area within the terminal-area parking garage known as Quick Park, which is designed for the traveler and greeters to make quick and affordable stops at the terminal and has cellular service.

INDIANAPOLIS INTERNATIONAL (IND)

Sponsor—Indianapolis Airport Authority (IAA)
Contact—Kent Ebbing, Interim Director of Parking Operations

Background

IND did not have a cell phone lot at the old Midfield Terminal; greeters circulated the airport or waited at the curb. After 2001, this became an enforcement issue. When the new terminal was designed, the project included a cell phone lot to reduce circulation and to address customer requests. The first cell phone lot held 43 spaces. That was not nearly sufficient, so IAA cut through the fence and added an additional 159 spots in the adjacent employee parking lot. This lot is located on the in-bound approach to the terminal about one-half mile out and costs about $20,000 to maintain each year (Figure 10).

This lot worked well for its first five years, but in 2013, a travel plaza opened about 500 feet away with an additional 29 cell phone parking spaces plus a 24-hour Subway restaurant, a convenience store, free public Wi-Fi, gasoline, a car wash, and restrooms.

Though the airport only provides signs to its cell phone lot, greeters are increasingly using the travel plaza rather than IAA's minimally equipped (lights, trash cans) lot. The Authority will review future use of the cell phone lot on an on-going basis.

FIGURE 10 Indianapolis International Airport cell phone lot.

Lessons Learned

According to Ebbing, if the concession travel plaza had been open when the new terminal was designed, IAA probably would not have built the cell phone lot at all, because it receives a percentage of the travel plaza's gross receipts and would not have required the initial capital expenditure and ongoing operating costs.

For a travel plaza, location is extremely important. Cell phone lot users will not support this type of facility alone. Travel plazas require high volume sales of gas, food, and convenience items. Cell phone lot users should be considered incremental revenue rather than the sole source of travel plaza revenue.

JOHN F. KENNEDY (JFK), LA GUARDIA (LGA), AND NEWARK LIBERTY (EWR)

Sponsor—Port Authority of NY & NJ (PANYNJ)
Contact—Peter A. Carbonaro, Manager, Airport Access Programs, Aviation Department, PANYNJ

One department at PANYNJ handles cell phone lots at all three airports; however, each airport has a unique approach to this service. JFK offers a very large cell phone lot of 373 spaces, though with few amenities except occasional food or ice cream trucks (Figure 11). Although originally intended solely for customers, it was eventually opened to taxis and limousines, as this cut down on airport roadway congestion. At LaGuardia, there is very little space available, establishment of a cell phone lot on airport property is currently a low priority. A cell phone lot exists at Newark Liberty, but it is not heavily advertised because it is scheduled to be demolished as part of the redevelopment of Terminal A. After this terminal project is completed, PANYNJ will focus its efforts on employee parking. If PANYNJ reestablishes a cell phone lot at Newark, it will likely be minimal and without amenities.

LAMBERT–ST. LOUIS INTERNATIONAL (STL)

Sponsor—St. Louis Airport Authority
Contact—Ann Linhorst, Ground Transportation Officer

Background

The first cell phone lot at STL was built near Terminal 1 in 2009. The cell phone lot at Terminal 2 was built a short while later because the lack of short-term parking options at the Terminal 2 garage led to traffic stress on the access roads, where vehicles picking up passengers had to wait. Together, the two cell phone lots have 180 spaces (Figure 12).
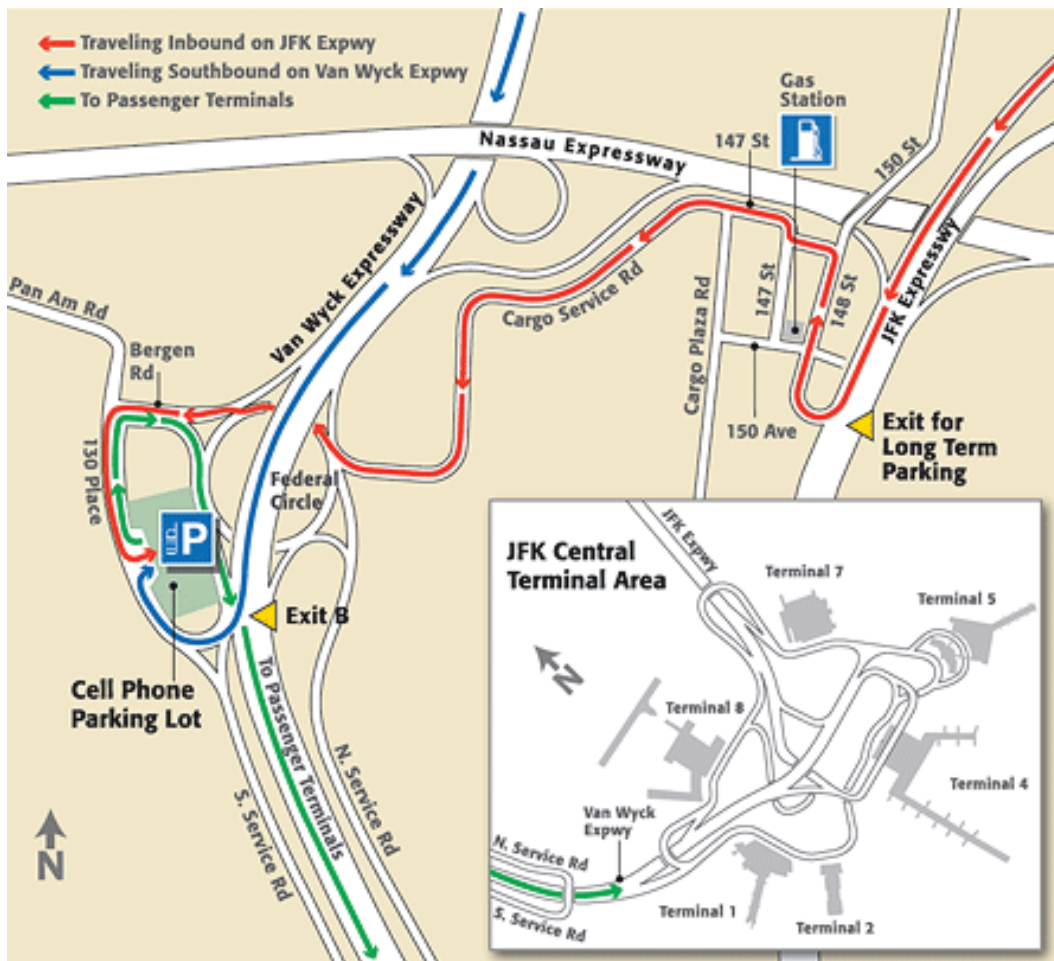
FIGURE 11 Parking map for JFK International Airport. http://www.panynj.gov/airports/jfk-cell-phone-lot.html.
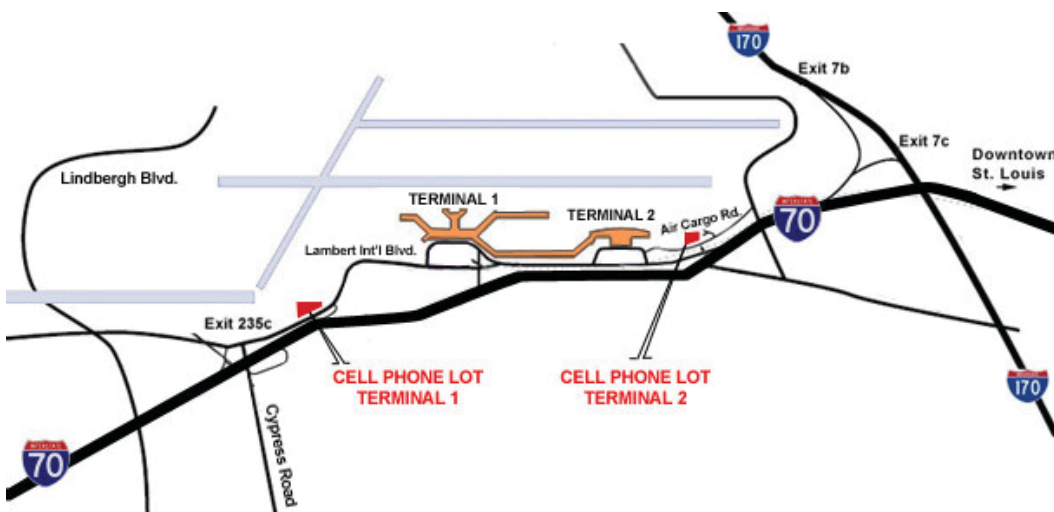
FIGURE 12 Cell phone lots at Lambert–St. Louis International Airport. http://flystl.com/AirportGuide/CellPhoneLots.aspx.

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Terminal 2 is very busy; the attached parking garage fills up during the day, Monday through Thursday. Originally, the garage was designed for hourly parking, but because of proximity, convenience, and competitive rates, frequent users of Terminal 2 often park overnight. Southwest Airlines is the primary airline operating out of Terminal 2, and the number of flights and passengers who use Southwest have grown since the terminal's original construction. When the Terminal 2 garage fills up, overflow is directed to drive approximately a mile to the Terminal 1 garage and/or Lot A, and to take the shuttle back to Terminal 2. Drivers can wait in the cell phone lot until their passengers arrive. They can then proceed from the cell phone lot to passenger pick-up and continue onto their destinations.

Both cell phone lots have roughly equal traffic, although the Terminal 2 cell phone lot is smaller. The size of the lots was dictated by the space available; Terminal 1's lot was carved out of the former American Airlines parking lot. Even though the lot sizes were not determined by a demand study, they appear to be the right size.

STL's cell phone lots have lighting, trash cans, and portable toilets. There is no separate budget for the operation of the cell phone lots.

Future Plans

STL does not have plans to enlarge these cell phone lots or to make any improvements. Ground transportation staff has looked into introducing food trucks, but there was little interest from vendors. For the time being, the cell phone lots will remain minimal, non-revenue parking.

Effectiveness of Cell Phone Lots

The cell phone lots relieve crowded parking facilities and reduce circulating traffic. There has been no competition between the cell phone lot and the parking garage, because the cell phone lot acts as an overflow area for the garage. The lots also serve as a staging area for private church shuttle buses that pick up passengers at the airport for a donation.

Cell Phone Lot Management

The ground transport department manages the cell phone lots as issues arise. There is no budget set aside for the lots; maintenance is funded out of the airport's operating budget.

STL does not post many rules at the cell phone lots except to prohibit its use by commercial vehicles, and buses in particular, because of pavement strength. No soliciting is allowed. The airport is owned by the city of St. Louis, but is located in St. Louis County. Law enforcement at the airport and in the cell phone lot is the responsibility of St. Louis City police; however, any speeding, parking, loitering, or trespassing issues fall under the jurisdiction of county law. A city police officer will issue a county ticket that in turn is processed through the county court system. None of the fines collected comes back to the airport. For example, a county trespassing ticket has a $100 fine. The city officer issuing the ticket must defend the ticket in county court, and any fines and fees collected go back to the county.

Lessons Learned

If operating a cell phone lot, STL suggests it is important to:

- Advertise the cell phone lot;
- Make the route easy to from the lot back to the terminal; and
- Provide good signage from the garages to the cell phone lot in case the garages are full and greeters need to find alternative parking.

LOUIS ARMSTRONG NEW ORLEANS INTERNATIONAL (MSY)

Sponsor—City of New Orleans
Contact—Harold Dede, Landside Manager (retired)

Background

MSY initially established its cell phone lot to decrease congestion and roadway traffic as drivers picked up arriving passengers. However, the lot is not used exclusively for private drivers. Instead, 25 spots in an existing lot have been designated as the cell phone waiting area, while the remainder of the lot is used as a staging area for taxicabs (Figure 13).

Basic amenities and services are provided at the cell phone lot. MSY provides portable toilets, trash cans, and one security guard who looks over both the cell phone lot and taxi staging area. The lot does not have a time limit for waiting drivers and is available 24/7.

Although many improvements to the cell phone lot have been discussed, none has materialized. The airport considered opening a concession stand in the lot, but decided against pursuing the project.

Issues and Challenges

MSY's cell phone lot faces a variety of challenges. First, its small size impedes it from relieving curbside congestion in a meaningful way. Instead, drivers park right next to baggage claim when no police are present or park in nearby businesses' parking lots.

In addition, the cell phone lot has limited signage. Taxi and bus drivers park in designated cell phone spots, which may confuse cell phone lot users about whether they are in the right place.
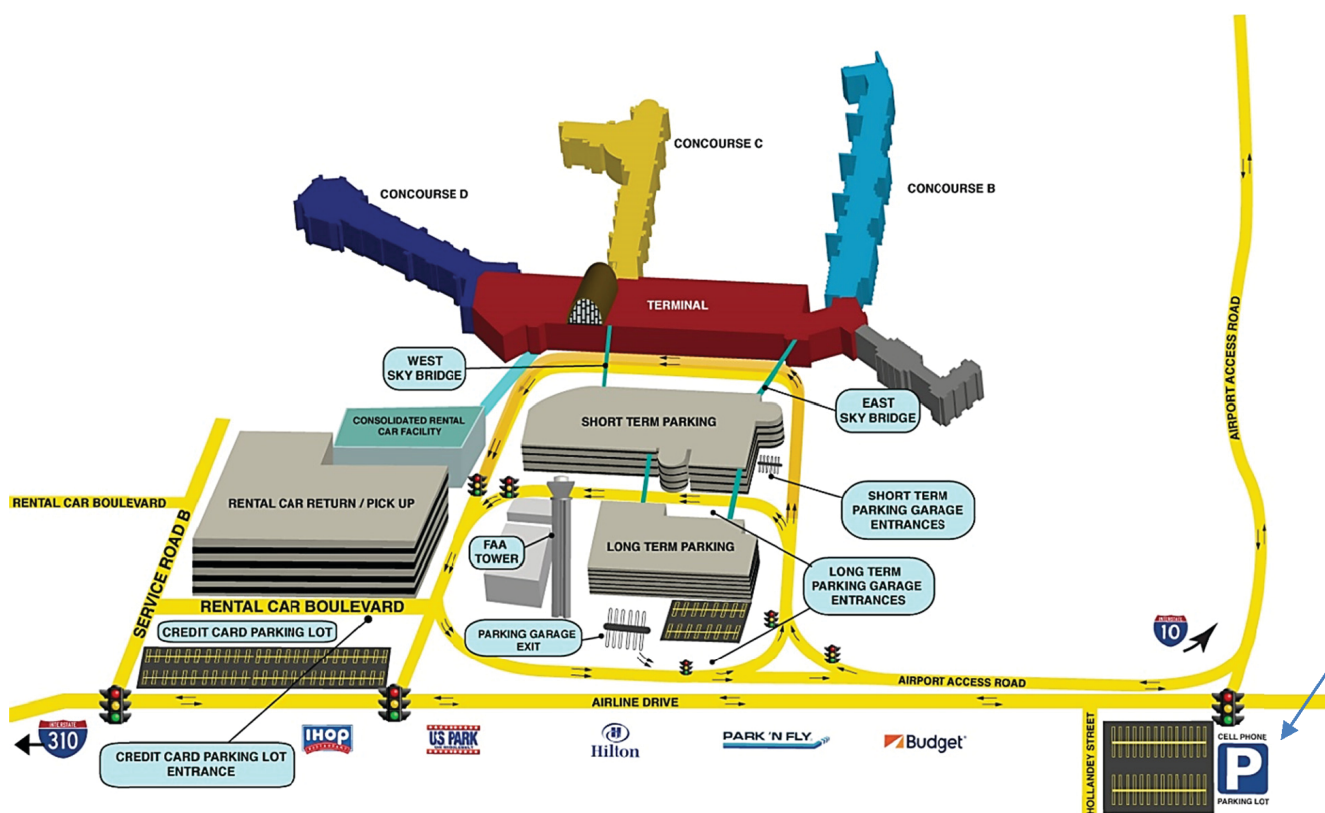
FIGURE 13 Parking facilities map of Louis Armstrong New Orleans International Airport.

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Lessons Learned

Cell phone lots are valuable assets to an airport, however they have to be measured and reviewed like any other facility. Combining taxi and bus staging areas with the cell phone lot makes sense, but may require more active monitoring of the area to make sure that each area in the lot is reserved for use by the intended group.

McCARRAN INTERNATIONAL (LAS)

Sponsor—Clark County
Contact—Scott Van Horn, Airport Concession Manager, Clark County Department of Aviation

Rather than construct a cell phone lot, McCarran International has opted to put designated areas for pick-up of passengers at both Terminal 1 and Terminal 3. Unattended vehicles are cited or towed. Hourly parking is also available, with the first 15 minutes of parking free.

OAKLAND INTERNATIONAL (OAK)

Sponsor—Port of Oakland
Contact—Stephen Gordon, Airport Business Manager

Background

The cell phone lot at Oakland is called the "Park & Call Lot." It is a small area, with only about 30 spaces. The original cell phone lot, created to mitigate congestion at the terminal curb and construction-related traffic, opened in 2004 right in front of the terminal, but it had to be moved within the year because of construction. After terminal area construction was completed, airport officials decided to maintain the Park & Call Lot as a customer service feature, but relocated it to an area adjacent to the airport's largest employee permit lot (Figure 14).

The airport has deliberately not added amenities to the cell phone lot because it prefers that greeters use the hourly parking lot, and the cell phone lot drains revenue from public parking. The policy is to keep the lot safe, maintain it to current traffic engineering standards, and provide adequate signage. However, the airport does not actively "encourage" its use. Directional and informational signage is posted, but airport administration does not advertise the lot other than pointing out its existence and location. There is no longer a curbside congestion issue for the lot to mitigate, because the terminal complex construction program increased curbside capacity by one-third. In addition, airline passenger volume declined significantly during the Great Recession, and curbside traffic volume along with it.

Management

Improvements to the lot come from the operations and maintenance budget, but there are no specific line items to fund improvements. In 2013, the lot was expanded to widen the drive aisles and improve access and egress. There are no permanently assigned staff or security personnel for the lot; the lot is monitored as needed by parking operations and airport security staff.

The lot has a posted 30-minute time limit, but this is not strictly enforced. Observations indicate that enforcement is not needed for that purpose because few people stay in the lot for 30 minutes.

Future Plans

OAK will maintain the cell phone lot. Airport staff has considered options to combine the free parking with some ways to generate additional revenue, such as the approach taken by Denver International. However, OAK is more land-constrained than Denver, with fewer appropriate, visible, and available sites. Furthermore, at Oakland, there is off-airport retail competition very close to the airport access road. Therefore, the Denver development model would be more difficult to implement in Oakland.
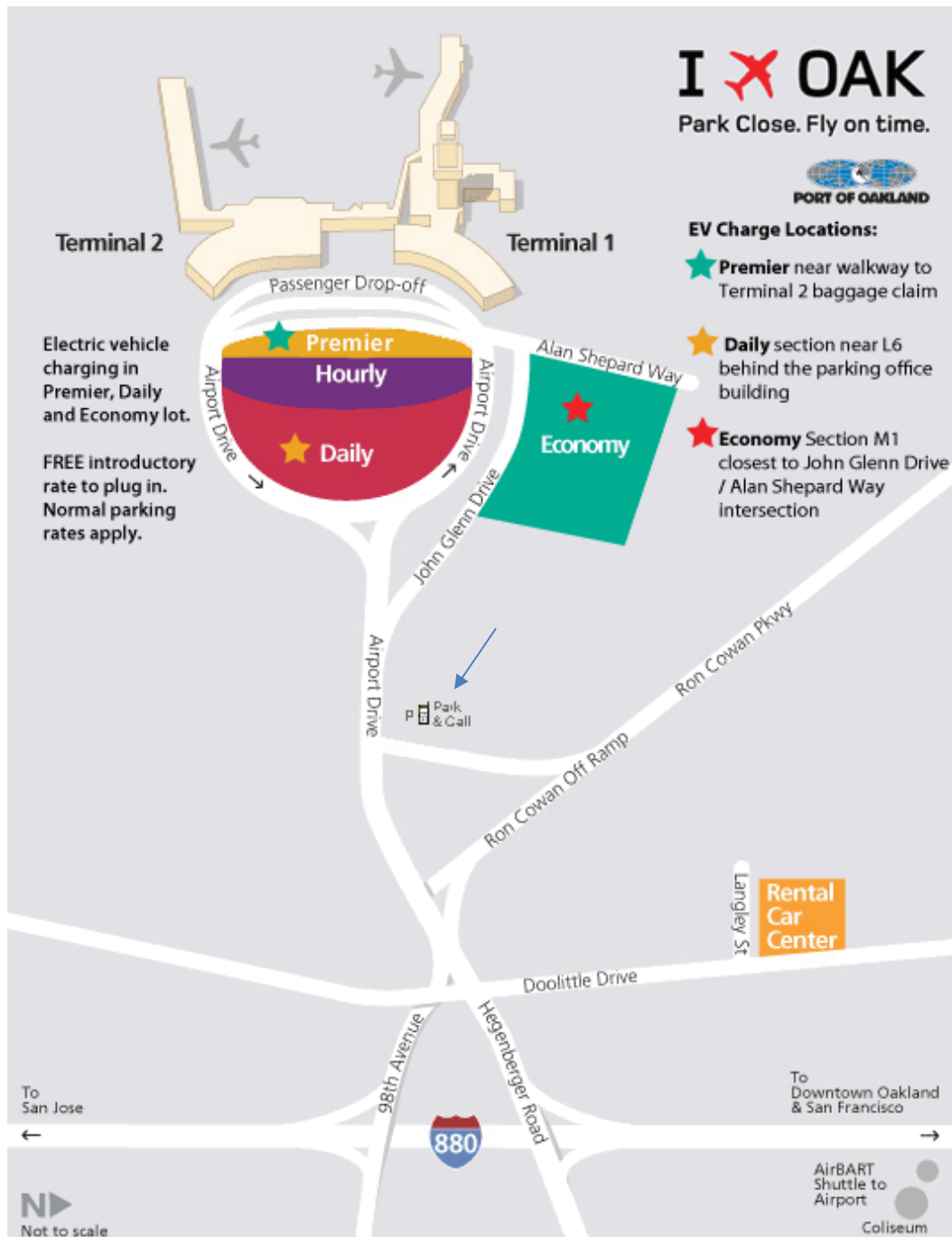
FIGURE 14 Parking map for Oakland International Airport.

Revenue Diversion

Because there is ample parking capacity at OAK, the cell phone lot likely diverts business from short-term parking. However, the airport cannot precisely estimate the extent to which this occurs. Since 9/11, only ticketed passengers may go past the terminal security checkpoints except for special circumstances; and there are relatively few retail concessions located pre-security. As a result, far fewer greeters use the short-term parking lot. In recent years, there has been a significant increase in overnight parking, concurrent with the decline in short-term parking. Greeters now represent slightly less than half of all public parking transactions, but only 7% of revenue. However, it is hard to quantify the impact of the cell phone lot on parking revenue, because even if the lot were closed, customers could find free parking in retail areas just off the airport.

Lessons Learned

Airport staff remains focused on the DEN cell phone lot model because of its ability to create a revenue stream from the cell phone lot function. Deploying parking attendants and imposing parking fees are contrary to the nature of cell phone lots. Airport staff also believes that the lot does not have to be close to the terminal, but needs to be easy to find and located just off the main access road.

PHOENIX SKY HARBOR INTERNATIONAL (PHX)

Sponsor—City of Phoenix
Contact—Floyd Johnson, Landside Superintendent

Background

PHX constructed its first cell phone parking lot in 2002, the second in the country, on the west side of the airport. The lot was created initially to reduce curbside congestion, reduce recirculating traffic, reduce emissions, and improve road safety. After a successful first year, PHX constructed the east side cell phone lot in 2003. Since their construction, both lots have remained in the same locations. In addition, PHX operates a third cell phone parking lot next to the Sky Train station, which opened in 2013, which is the farthest lot away from the terminals and is used the least. All lots are free of charge and are available 24 hours a day (Figure 15).

The closer lots have a combined 162 spaces, 77 on the west side and 85 on the east. A variety of amenities is included in the two lots. These two lots have FIDS, which displays flight statuses to customers on a 10-minute time delay. This practice is used to reduce curbside congestion as passengers retrieve their bags. The Sky Train lot is the largest, with 100 spots, making a total of 262. In addition, there are 626 short-term, paid parking spaces.

The cell phone lots require minimal maintenance. Johnson did not know the entire construction cost of each lot, except that the FIDS in the west and east lots each cost the airport almost $275,000 and $250,000 to install, respectively. All other maintenance costs are covered in the general maintenance budget.

Future Plans

There are different plans for each cell phone lot. The west lot works seamlessly and will likely remain unchanged. The airport is moving the east lot farther away from the terminal.

The Sky Train lot is also under transition. Of the three lots, the Sky Train lot is used the least because of a lack of public awareness, marketing, and relative newness. Many passengers are unaware that they can ride the free train to the lot. Consequently, the airport is in the process of splitting this
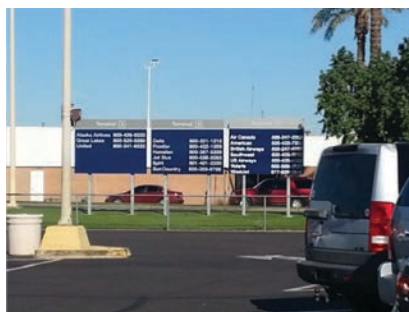
FIGURE 15 Cell phone lots at Phoenix Sky Harbor International Airport.

lot into two and dedicating each side for a different purpose. The west side of the Sky Train lot will be used for additional daily paid parking, while the east side will continue to be used as a cell phone lot. PHX plans to test the division of the lot for 12 months. If the trial is deemed successful and more cell phone traffic is brought to the Sky Train lot, the change will become permanent.

Management

The lots are not regularly staffed. The west lot rarely experiences problems; however, landside employees must regularly manage traffic flow in the east lot. These problems are can be attributed to a variety of factors, including a concentration of passengers moving through Terminal 4 and difficulties with entry and egress from the lot. Southwest Airlines and US Airways/American both operate major hubs in PHX in Terminal 4, contributing about 80% of all airport passengers.

A combination of local police, landside operations staff, and the contract parking provider cover security for the cell phone lots. They periodically drive through and monitor the lots. Additionally, PHX has installed Pedestrian Emergency Distress Systems in each of the lots, although these systems have rarely been used.

Landside is responsible for enforcement of two basic rules at the lots: Customers are not allowed to leave their vehicles, or to park overnight. A $35 fine is assessed to unattended cars, while cars left overnight are assessed a $75 dollar fine and are towed at the owner's expense.

PHX employs an innovative system to direct Transportation Network Carrier (TNC) drivers to the Sky Train station lot. PHX has a designated staging zone for these drivers.

Customer Comments

Customer service comments are filed through the airport website. The majority of complaints refer to the FIDS' perceived inaccuracy, because arrival times are delayed by 10 minutes to allow for baggage claim. In addition, the airport conducted a survey of cell phone lot users, who reported they would use the lots even if no FIDS were included. Only half of respondents owned smartphones, and most arriving passengers call their driver when they land.

Lessons Learned

Based on anecdotal reports, the cell phone lots near the terminals operate successfully. However, because of regular issues with the location and size of the east cell phone lot, this lot is too close to the terminal and does not effectively manage overflow traffic when the lot is full.

PITTSBURGH INTERNATIONAL (PIT)

Sponsor—Allegheny County Airport Authority
Contact—Eric Ruprecht, Vice President of Commercial Management & Properties

Background

PIT established a 175-space cell phone lot in 2012 after receiving requests from its board, the county, and the public (Figure 16). The lot was established at no cost to the airport other than roadway signage. All maintenance of the lot is covered under general parking lot costs.

The lot is part of the extended-term parking lot and integrated into the airport's parking system. The extended lot does not sell out. Passengers receive a card upon entering the lot, and may leave their vehicles and use the bus to go to the terminal or walk to a nearby convenience store. Initially, the airport proposed a lot that would cost $1 per hour; however, because of public resistance, PIT changed course.
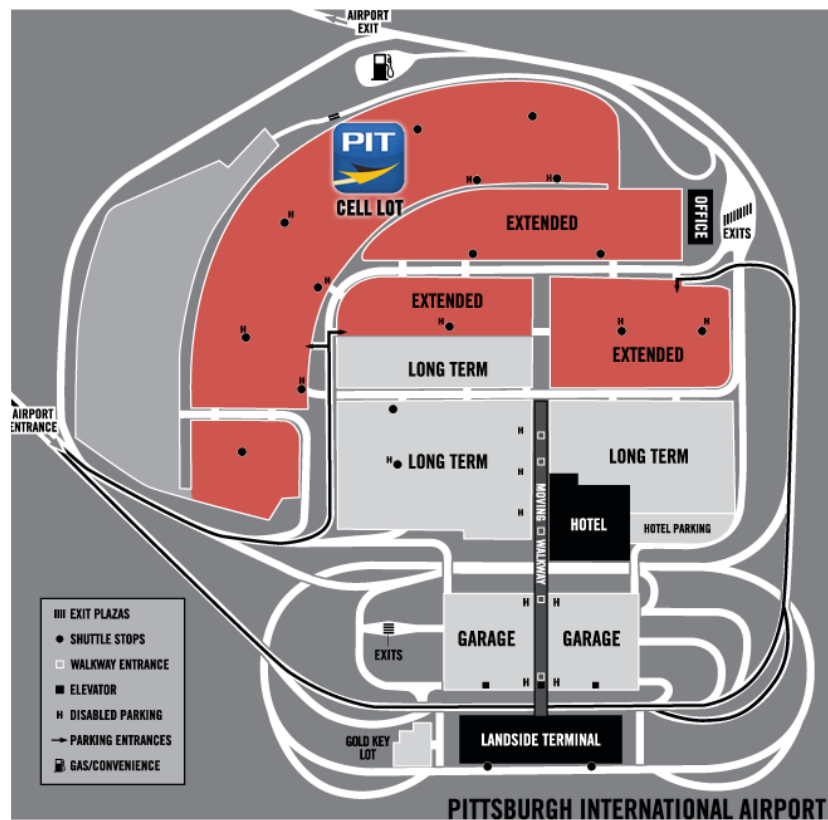
FIGURE 16 Map of parking facilities at Pittsburgh International Airport.

Now it offers a free first hour, the second hour costs $2, and the third hour costs the daily rate of $8. Despite this system, drivers can enter and exit the lot as they please, leaving a loophole for those who leave before one hour expires and return for another 59 minutes. To deter long-term parking in the lot, however, parking management warns cell phone lot users that any cars left overnight may be towed.

Management

Because of the automated card entry and payment system, no additional staff is required. PIT is one of the few airports that can monitor how many drivers use their cell phone lot. In 2012, the first year of operation, an average of 3,000 to 4,000 customers used the cell phone lot per month. During the first seven months of 2014, numbers grew substantially, as shown in Table 14.

TABLE 14
MONTHLY USERS
OF PITTSBURGH
INTERNATIONAL'S
CELL PHONE LOT (2014)

Month	Monthly Users
January	5,700
February	4,900
March	7,600
April	7,700
May	10,000
June	10,400
July	11,000

Source: Allegheny County
Airport Authority (2014).

The cell phone lot has access to a Sunoco gas station and convenience store, which serves a variety of food and provides restrooms to waiting drivers. Customers have reacted positively to the amenities. In addition, the cell phone lot is near a bus that will take users directly to the terminal.

Overall, the airport believes the cell phone lot is a suitable solution, and is pleased with the revenues generated by the concession area and by parking customers who exceed the 60-minute limit. PIT does not plan to change the lot much moving forward, although FIDS would be a welcomed addition.

Lessons Learned

Ruprecht suggests that if space allows for it, airports could consider using part of their existing lots for a cell phone lot rather than constructing a new lot. In addition, airports should not give up a financially successful part of their airport to build a cell phone lot.

PORTLAND INTERNATIONAL (PDX)

Sponsor—Port of Portland
Contact—Dawn Huddleston, Commercial Roadway Manager

Background

PDX created a trial cell phone lot during the 2005–2006 holiday season to assess its effectiveness. Primarily, the lot was created to decrease curbside and roadway congestion and minimize recirculating vehicles on the roadway. Soon thereafter, the airport constructed a free, 24-hour, 30-spot cell phone parking lot. This lot is a separate entity from the rest of the airport's short-term parking, which include 3,200 spots with an hourly parking rate of $3. Trash cans are the only amenities provided at the cell phone parking lot (Figure 17).

Although many greeters use the lot, decreases in curbside congestion are not apparent because of an increasing number of passengers at the airport and the relatively small cell phone lot. The lot stays full between the peak arrival hours of 8:30 p.m. and midnight leaving some overflow traffic. This has prompted drivers to park in cargo facilities and on the side of the road while waiting for arriving passengers.

FIGURE 17 Map of parking facilities at Portland International Airport.

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Future Plans

PDX is planning an expansion of the cell phone parking lot to include a gas station and convenience store. A display monitor to track arrival status will also be included. Construction is scheduled to begin within the next year.

Management

The PDX parking department manages the cell phone parking lot. PDX does not staff its cell phone lot, provide extensive rules, or collect data on its cell phone lot. The local police department and airport supervisors provide security by periodically driving through the lot. The two posted rules for the lot state that cars must be turned off while drivers are waiting and that unattended vehicles will be towed. The general parking maintenance budget includes the costs for the cell phone lot, and no extensive renovation has been done except for restriping and repaving.

Customer Feedback

Customer satisfaction is monitored through the customer service office, where comments and complaints are forwarded to the parking department. Generally, there is a mix of positive and negative feedback, with the negative comments requesting better signage and more spaces.

Lessons Learned

Huddleston recommends that airports carefully consider the placement of their cell phone parking lots. She suggested that if the lots are too close to the terminal, drivers and passengers may use the lot as a free, short-term parking spot; so she recommends that cell phone lots be placed a short drive away.

REAGAN NATIONAL AIRPORT (DCA)

Sponsor—Metropolitan Washington Airport Administration (MWAA)
Contact—Gary Myers, Manager

Background

The DCA cell phone waiting area opened in 2006 in response to customer requests. The lot is a lighted paved pullout area on the recirculating road. Because DCA has limited land, this 35-space area was the most efficient solution available (Figure 18). Once the cell phone lot was established, the grace period in the public parking was reduced.

FIGURE 18 Cell phone lot and view of Reagan National Airport Terminal.

Management

MWAA operates the cell phone lot as a customer service. Airport security and ground transportation patrol the cell lot when making rounds. The 60-minute parking limit is enforced. The maintenance contractor empties trash as part of its contract.

Impact of the Cell Phone Lot

Because the lot is so small, it has minimal impact on reducing circulating traffic and curbside parking (Figure 19).

Issues

Land constraints influence many aspects of ground transportation at DCA. The modal choices for arriving passengers at DCA heavily favor taxis (32%) and public transit (21%). One of the most pressing issues is staging areas for commercial vehicles such as cabs and TNCs, which are not allowed to use the cell phone lot. As of 2014, approximately 1,600 taxi drivers were permitted to operate at DCA and there were about 5,700 taxi trips/day through the airport's taxicab dispatch system. However, the taxi area has non-reserved queuing space for only about 700 taxis. TNC vehicles tend to park in public parking or just pick up at the curb.

Future Plans

DCA plans to address the need for additional public parking spaces and available areas for rental car companies, other commercial ground transportation services, and employee parking.

Lessons Learned

The main amenities that appear advantageous to cell phone lot patrons are FIDS, a food/beverage concessionaire, lighting and trash cans. MWAA tried licensing a food truck at the current TSA building, but even with good food products, there just was not enough sales volume. Food trucks could be an option, but the customer base in the cell phone lot might be too limited because of the lot size.

FIGURE 19 Map of cell phone lot at Reagan National Airport (*Source*: MWAA.)

FIGURE 20 Park & Wait lot at Salt Lake City International Airport.

SALT LAKE CITY INTERNATIONAL (SLC)

Sponsor—Salt Lake City
Contact—Bruce Barclay, Operations Manager, Parking and Shuttles

Background

SLC makes a distinction between cell phone lots and park and wait lots. According to Barclay, a cell phone lot "is just paved, may or may not have lighting, and the passenger calls [the user]" to notify them of the flight's arrival. SLC's 82-space Park & Wait lot has more amenities than most cell phone lots, including FIDS, so that users do not have to rely on phone calls for arrival time; and portable toilets (Figure 20).

The Park & Wait lot was budgeted for in 2005 and opened in 2006. The area was paved, landscaping was put in, and communication fiber was run for FIDS when the lot was built, and it has remained much the same since. In some respects, the lot is in a bad location because it is "too easy to get to" for a non-revenue-producing location (Figure 21). (The lot is 200 yards from the intersection nearest to the terminal.) The airport could have used that space for something more profitable. The airport may move the lot someday and turn it into something like DEN's lot with revenue-producing concessions.
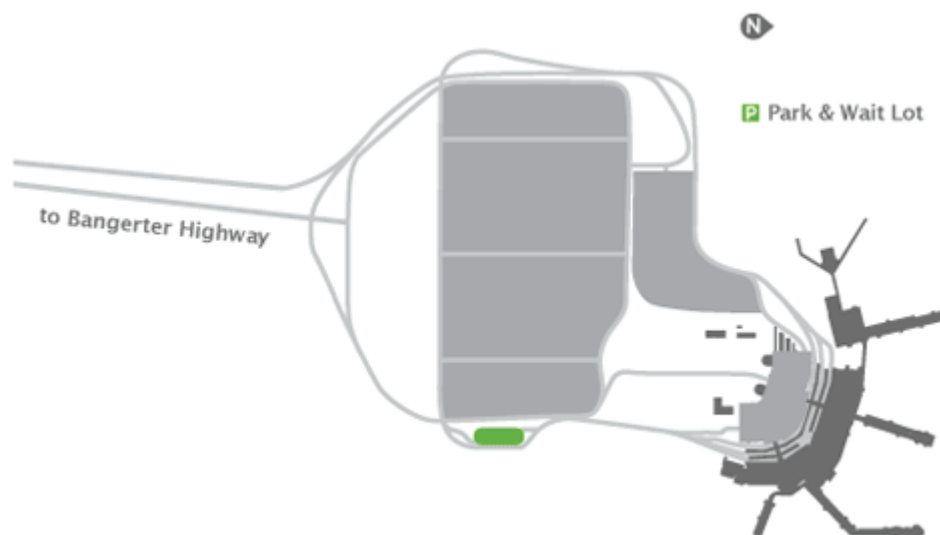

FIGURE 21 Map of Park & Wait lot at Salt Lake City International Airport. http://www.slcairport.com/pick-up-and-drop-off.asp.

Management

There is no dedicated staff for the Park & Wait lot, only maintenance workers and police on routine patrols. The lot is open 24/7 and there is no formal time limit, but if an officer sees a vehicle after two sweeps through the lot, he/she will stop to investigate. The police building and ground transport staging area is next to the lot, so supervision is relatively easy.

The maintenance department works on this lot, but other than that, not much attention is paid to it. No one breaks out the costs of the Park & Wait lot, as it is "rolled up" in other budgets.

Issues

Issues with the Park & Wait lot include crowding in the lot and congestion at the terminal curbside when everyone leaves the lot at once. The crowding problem is well-documented. Staffers go out and count cars every night, Thursday through Sunday. The largest number of cars has been 138 (in a lot with 82 spaces). The excess vehicles line up in the lot's aisles or around the perimeter. When the lot was first built, SLC used statistics from other airports to gauge the capacity that was needed, but demand appears to be exceeding the estimate.

Congestion at the terminal curbside is exacerbated by the FIDS showing flight arrivals early. The "pickup" notification appears on the screen right when baggage arrives at the carousel, but at that time, passengers from that particular flight have likely not even gotten to the baggage claim; so greeters then find themselves waiting longer than they should at the terminal, and taking up space that could be used by taxis or personal vehicles. Barclay suggests the pick-up message be delayed a little longer. In the future, the FIDS may be removed from the lot altogether, although this is a last resort.

Future Plans

A new Park & Wait Lot is scheduled to open in 2017 open with a convenience store adjacent to it. The new lot will have 125 spaces. When this concession is added, management of the Park & Wait lot area may move into the concessionaire's purview, but the airport will still monitor it. In 2018, the airport also plans to build more hourly parking spaces (3,600) and a new terminal. Airport officials have used computer modeling and simulations to estimate the capacity needed for these future improvements.

Customer Feedback

Customer feedback is received primarily through Twitter. The airport maintains a Twitter account to send out information such as parking capacity and delays, and customers sometimes respond with comments or complaints. There have been no complaints about the Park and Wait lot; there have been very few comments altogether.

Revenue Diversion

Barclay estimated that the Park & Wait lot has reduced the parking garage's revenues by 0,5%. However, this is made up for by the fact that the Park and Wait lot relieves garage capacity and reduces shuttle use by non-paying customers.

Lessons Learned

Barclay recommends that other airports use clear terminology when building a cell phone lot. A cell phone lot ought to refer to a simple slab of concrete with few amenities, while anything more involved should have a different name. Some customers might not understand the difference between the terms, particularly as more customers use smartphones instead of relying on FIDS. In

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Barclay's view, Park & Wait connotes a longer wait time. In his experience, greeters at SLC like to "hang out" with other greeters, sometimes even having tailgate parties (as mentioned on the SLC lot's Foursquare page).

SAN ANTONIO INTERNATIONAL (SAT)

Sponsor—City of San Antonio
Contact—Tamera Marberry, Parking and Ground Transportation Manager

Background

SAT operates and manages all parking at the airport themselves, including the cell phone lot, the employee lot, and shuttles. The cell phone lot opened in 2008 with 83 parking spaces. One repurposed FIDS was located at the cell phone lot, along with trash cans, and there is Wi-Fi and lighting as well (Figure 22). At the time, the initial purpose of the cell phone lot was to relieve roadway congestion. Since then, however, the roadway has become one-way, and this has reduced congestion. The cell phone lot is heavily used, especially at night when arrivals peak.

Future Plans

SAT is currently designing a new commercial development project that will incorporate a gas station, a new location for the cell phone lot (with 110 spaces), an adjacent expansion of public parking

FIGURE 22 San Antonio International Airport Parking Map. http://www.sanantonio.gov/SAT/Parking/Maps.aspx.

(500 spaces), and relocation of the taxi hold lot across the street from the gas station. The project is scheduled to be completed the summer of 2015.

Management

Like many airports, SAT takes a passive view on enforcement at cell phone lots. No commercial vehicles are allowed; nor is overnight parking. There is a four-hour limit on parking, but there are no security cameras on the existing lot. The new cell phone lot will have 24/7 recorded video and monitoring, and will have emergency call box stations installed in two locations.

SAN FRANCISCO INTERNATIONAL (SFO)

Sponsor—City and County of San Francisco
Contact—Abubaker Azam, Assistant Deputy Airport Director

Background

SFO's 70-space cell phone lot was built in 2006, at the same time that many other airports were building their own cell phone lots (Figure 23). The original goal was to reduce airport congestion and offer the lot as an amenity for customers who were not interested in parking in the garage while waiting to pick up passengers. It was also a response to complaints by the surrounding residents and business owners about waiting vehicles parking on their streets and in private parking lots. At the same time, the airport installed a new limousine staging lot so that these vehicles would also be kept off residential streets. The staging lots and the cell phone lot are conveniently located near the long-term parking garage (Figure 24).

When the cell phone lot was built, the area was already paved and had portable restrooms left from its days as a ground transportation staging area. Only a few improvements were made, such as adding FIDS, lighting, and a vending machine. The size of the lot was determined by the space available, and while this was not a scientific approach, it has worked over the years with no overflow.

There have been very few problems with commercial vehicles parking in the cell phone lot. This is the result of clear signage indicating the 60-minute time limit, and routine police patrols to check for unattended vehicles and users overstaying the time limit. The lot closes at 1 a.m. and reopens at 5 a.m., but almost no one tries to park during this time. The amenities in the cell phone lot are limited to discourage greeters from staying for an extended period.

Management

Because the cell phone lot is not revenue-producing, it is not under the airport's "parking" umbrella. It is managed on an as-needed basis as an operational convenience and customer amenity.

FIGURE 23 San Francisco International Airport cell phone waiting lot.
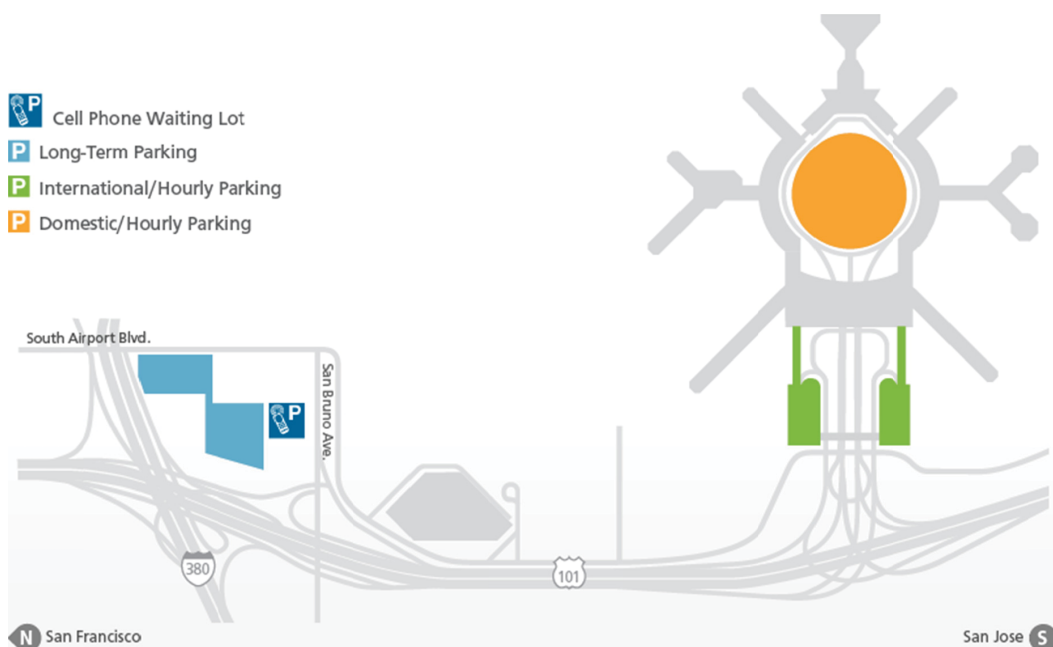
FIGURE 24 Map of parking facilities at San Francisco International Airport. http://www.flysfo.com/to-from/parking/cell-phone-waiting-lot.

There are no employees specifically assigned to the cell phone lot. Security is assumed by the Aviation Security Department, which monitors all airport cameras. Police officers also routinely patrol the lot and curbside. Curbside staff across the street from the lot do routine spot checks and report suspicious activity to security or police. Not very many tickets are issued, as the "kinder, gentler approach" results in better customer opinions of the airport.

There is no overcrowding in the cell phone lot. Capacity and usage are monitored with tube traffic counters placed across the entrance. The counter data are examined quarterly and these reports help airport officials determine cell phone lot usage.

The cell phone lot and the limo staging area share an entrance, so if there are more limos than cell phone lot cars, or vice versa, vehicles will sometimes park on the "wrong" side of the lots. However, the staging areas are heavily monitored and drivers are requested to move their vehicles to the correct side. SFO operates on a cost-recovery model, so the staffing costs for the staging areas are paid from the trip fees of commercial vehicles and vehicles for hire. These fees are adjusted annually based on cost-recovery calculations.

Future Plans

SFO's innovative policies and environmental stewardship have played a key role in decreasing the carbon footprint of the airport. In order to reduce the cell phone lot carbon footprint even further, SFO is installing a canopy structure in the cell phone lot that will shade 30 parking stalls (15 and 15, back to back) intended to make it unnecessary for drivers to idle their car engines while using their air-conditioning units.

Customer Feedback

There have been some complaints by customers about the lot being too far from the terminal. However, there is a paid parking garage close to the terminal, and customers who want to be closer to the

terminal are willing to pay for the privilege. Except for location complaints, customer feedback is mostly positive.

Issues

Traffic congestion is a big issue for SFO. According to an annual ground transportation survey, 38% of deplaning passengers are picked up in personal vehicles. To address congestion, SFO has a policy of promoting public transit, going as far as advertising on the radio during the holidays and giving employees transit benefits.

Azam views the cell phone lot not only as a convenience for customers but a way to keep the airport's roads from becoming too congested. Because the roadway is so short, the cell phone lot is essential to making sure there are no drivers on the road who do not need to be there. In this sense, the cell phone lot can be compared with a utility without cost recovery.

Cell Phone Lot Impacts

It is hard to tell what the impact of the cell phone lot has been on curbside traffic. The number of deplaning passengers has increased substantially over the years, but congestion has not increased accordingly, so the cell phone lot, likely with the help of public transportation (BART), may have contributed to lessened congestion. The lot only takes away a small percentage of short-term parking revenue, so in the long run it has been a good investment.

Lessons Learned

Azam recommends that other airports wishing to improve or build cell phone lots visit other airports and observe what works and does not work there. He routinely visits local airports when traveling to conferences, and particularly admires the DEN concession model for its cell phone lot.

SEATTLE–TACOMA INTERNATIONAL (SEA)

Sponsor—Port of Seattle
Contact—Jeff Hoevet, Sr. Manager, Airport Operations

Background

SEA has moved its cell phone lot three times, and may move it a fourth time in the future (Figure 25).

The first lot, which opened in 2006, was located along air cargo road in an unused parking area. There were about 80 spaces. SEA opened the lot because of public demand and safety concerns, and in a good faith effort to relieve parking in adjacent neighborhoods. It was a basic paved lot utilizing existing lights. The airport installed portable toilets.

Next, the cell phone lot was moved to an abandoned paved area that was part of the old U.S. Postal Service property and on the same road There were 150 spaces. The airport put in signage to direct users to the lot and created a one-way in, one-way out traffic pattern. However, during cherry harvest season, there was a problem with the trucks hauling cherries on the same road.

Two years ago, the lot was moved again to the east side of the airport expressway after the airport exit. Based on past use, SEA built a lot with 250 spaces, but in April 2014 added an auxiliary lot of 80 spaces (330 altogether). In addition, the airport installed portable toilets, curbing, landscaping, and pet relief supplies. There are quick response codes to contact airlines, plans to add Wi-Fi, and

FIGURE 25 Cell phone waiting lot at Seattle–Tacoma International Airport.

a traffic signal or roundabout to ease exit congestion. Once these improvements are completed, the cell phone lot will have cost around $3.2 million. On an annual basis, it costs $120,000 per year to maintain.

Future Plans

The current cell phone lot is likely to move again in eight years, but the improvements are not a throwaway and will be incorporated into the replacement development.

Management

Airport Landside Operations operates the cell phone lot. The airport has a contract with a cleaning company for the trash and portable toilets. There is a separate contractor for snow removal.

Customer Feedback

SEA has received feedback about congestion at the lot exit. The move to its current location has reduced congestion on the airport expressway and avoided some difficult cross-traffic patterns near the terminal.

Lessons Learned

The cell phone lot does not align with a parking revenue strategy, but Hoevet believes that the cell phone lot introduces potential customers to other parking products.
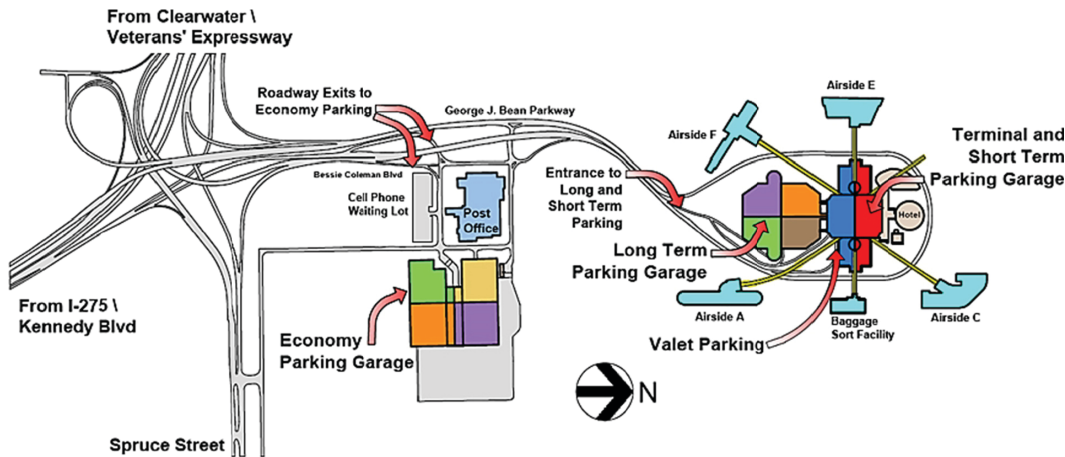
FIGURE 26 Map of airport parking at Tampa International Airport.

TAMPA INTERNATIONAL (TPA)

Sponsor—Hillsborough County Aviation Authority (HCAA)
Contact—Karl Martin, Operations Manager, Parking and Ground Transportation

Background

The first cell phone lot at Tampa International Airport opened in 2005. It was carved out of an existing overflow parking lot (Figure 26). The airport built a barrier down the middle, installed FIDS and striped 175 parking spaces. The lot's opening coincided with a curbside enforcement program, though previously greeters were allowed to wait at that curb for passengers (Figure 27).

In 2006, HCAA opened the other half of the overflow lot for hourly users. At that time, they also added another FIDS, restrooms, and vending machines. The project was planned and executed in conjunction with construction of the economy garage (Figure 28).

The cell phone lot rarely fills except sometimes on holidays. HCAA has installed loop counters in the pavement at the entrance and exits, so it knows exactly how many users are in the lot. The counters are connected into the parking revenue system.

Free parking is available at the cell phone lot for an unlimited amount of time. The only rule enforced is that users must stay with the vehicle. Airport police and the ground transportation staff patrol the lot. If a vehicle is unattended for more than one hour, it is likely to be impounded.

FIGURE 27 FIDS at Tampa International Airport Cell Phone Lot.
Posted on Jan. 24, 2013 by Harriet Baskas StuckatTheAirport.com
travel blog.

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FIGURE 28 Cell phone lot at Tampa International Airport.

HCAA also offers 59 minutes free in the short-term parking garage. If a customer stays in the garage 60 minutes or longer, the first hour is charged. However, 45% to 55% of parking transactions in the short-term parking garage are free. HCAA has tried to substitute the cell phone lot for free parking in the garages, but limited free parking in the garage was put in place a long time ago and is very popular. The rules are slowly changing. The new economy garage does not offer the first hour free. The cell phone lot is in a good location, about 1½ minutes from the terminal by car. At one time, HCAA entered into an agreement with a food truck consortium that placed food trucks in the cell phone lot. However, the vendors did not make enough money and stopped coming in. Two food trucks in the taxi staging area have operated for a long time.

The taxi staging area is relatively small. Some limousines and black cars park in the cell phone lot, which HCAA allows. Typically, personal cars stay in the cell phone lot between five and 25 minutes. Commercial vehicles tend to stay a little longer.

Contract janitorial staff takes care of cell phone area as well as the entire airport area.

HCAA used a grant to set up an electric vehicle charging station with one plug in the cell phone lot. As part of the terms of the grant, charging is free and it is well-used. The airport is installing four more stations in short-term parking and two stations in long-term parking which will not be free.

Issues

Congestion problems at the exit of the cell phone lot may occur when there is a lightning storm and aircraft weather delays. When planes are cleared to land, all the airlines experience arrivals at the same time. To address this issue, the police manage traffic at the exit to the cell phone lot.

HCAA also has realized that curbside management and the cell phone lot go hand in hand. Over the years, the curbside management program has become stricter. Now, a no-waiting or stopping program is in place and enforced. This has increased use of the cell phone lot.

Lessons Learned

Martin suggests that when planning a cell phone lot, it is important to have enough spaces; 50 is usually not enough. The lot should have FIDS, easy access, restrooms, good lighting, security, pavement, and striped parking spaces. One of the biggest challenges for TPA is that it did not build a big enough restroom facility. There are three stalls on each side, but the airport could have put in more stalls.

TORONTO PEARSON INTERNATIONAL (YYZ)

Sponsor—Greater Toronto Airports Authority
Contact—Carlo Cordi, Manager, Parking and Groundside Operations

Background

The Greater Toronto Airports Authority (GTAA) began operating its first cell phone lot in 2007 in response to public demand. After a successful trial period, the lot was expanded from 83 spaces to 300 spaces. This original cell phone lot allowed drivers to enter and exit as they pleased. However, a major construction project required the space for a lay-down area, and the cell phone lot was moved approximately 500 yards away to its current location. It has only 115 spaces, but owing to its size and location, it cannot be expanded. The only amenities the airport provides in the lot are lighting and trash cans (Figure 29).

The cell phone lot has always been an open concept. However, over the years the loitering in the lot increased to the point that in 2013 the GTAA installed a gate system allowing only 45 minutes' free parking.

Despite the GTAA's best efforts in advertising and marketing, some drivers believe that the gated cell phone lot charges for occupancy and reluctantly do not enter. Hence the GTAA faces a major safety hazard, as drivers continue to park on the side of roadways. The airport is attempting to curb this trend by making directions to the cell phone lot more readily available on Google Maps and its website; and by placing flexi-posts in some areas to discourage roadside parking.

Roaming commissionaires, mobile ambassadors, and closed circuit TV provide security for the lot, while commissionaires and mobile security patrol the lot for safety. All vehicles in the cell phone lot must be attended at all times. Commissionaires or groundside operations employee will report an unattended car before taking steps to ticket or tow the vehicle if the owner does not return.

Management

As the Manager of Parking and Groundside Operations at Toronto Pearson International Airport, Cordi is a member of the Service Delivery Team, which is ultimately responsible for the "day of" operations of the cell phone lot. VINCI Park manages all parking garages and parking lots at the airport, including the cell phone lot on behalf of the Greater Toronto Airports Authority (GTAA) (Figure 30).

Future Plans

After the current construction project is finished, the GTAA is considering moving the cell phone lot back to its original, larger location. Additionally, the GTAA is exploring a corporate advertising

FIGURE 29 Toronto Pearson International Airport cell phone lot.

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FIGURE 30 Map of parking facilities at Toronto Pearson
International Airport.

partnership to leverage the equity of all its parking facilities, including the cell phone lot. A recent study showed that 17,000 vehicles pass by the cell phone lot per day, and the GTAA is looking to partner with a telecom provider. Finally, the airport is considering installing FIDS and vending machines to contribute to the airport's non-aeronautical revenue (Figure 30).

Impacts of the Cell Phone Lot

Overall, the GTAA believes that the cell phone lot has helped to decrease curbside congestion and traffic, although parking in the terminal 1 or 3 parking garages offer many amenities, including easy and covered access to the terminals.

Lessons Learned

Cordi recommends that cell phone lots be sizeable and clearly marked. He notes that large lots help mitigate congestion issues, and suggests that an easily recognizable, physical entrance to the cell phone lot would make it more popular, especially for those drivers who circle the airport's roadways waiting to meet their passenger. Finally, he recommends that all cell phone lots across the United States and Canada have standard demarcation signs to make them more obvious to the public.

CHAPTER FIVE

CONCLUSIONS

This synthesis provided the results of initial study on airport cell phone lots, free parking areas where greeters wait before proceeding to pick up arriving passengers at the terminal curbside. Because little information about airport cell phone lots was available, a literature search was undertaken and an online search of 110 U.S. and Canadian airports performed to determine the prevalence of cell phone lots and their basic characteristics. In addition, 28 airports with cell phone lots and four airports without were invited to participate in an online survey and follow-up telephone interview. Together these instruments made it possible to assemble a picture of how airports size and locate an airport cell phone lot; determine the right combination of amenities to offer; and manage the lot.

Airports that do not offer a cell phone lot had a variety of reasons, usually specific to the airport, such as lack of space for a cell phone lot, reuse of the lot as a construction staging area, or alternative approaches to passenger pick-up areas.

Airport operators offering cell phone lots implemented one of three basic product types:

- A lot that offers free parking for users and minimal amenities such as trash cans and lighting;
- A free parking product, located in a paid parking area, that converts to paid parking, often after 60 minutes; or
- A free parking area associated with a concession (or concessions) that may offer gas, food, or a convenience store.

Of the three types of cell phone lots, the first type, parking areas with few amenities, is the most common. Airport operators tend to invest minimally in the lots, pursue few planning studies to determine demand and optimal size of the lot, and post basic rules for the lot to minimize the need for enforcement resources. Most customer feedback comes from either the airport website or social media.

The rationale for having an airport cell phone lot also varies by airport, but in the course of the telephone interviews common reasons emerged. Some cell phone lots were developed after the tragic events of September 11, 2001, as a mechanism to concentrate greeters in one location away from the terminal curbside and to reduce recirculating traffic on airport access roads. Since 9/11, cell phone lots have become popular among greeters who prefer not to pay for parking while waiting to pick up an arriving passenger.

This review showed that for many airports, the dimensions of an available parcel for a cell phone lot determine the capacity of the lot. Airport security, local police, and ground transportation staff manage and monitor the lots as part of general duties. Operating costs for a cell phone lot typically are part of the airport's landside operating budget. Few airport operators interviewed knew the actual and allocated overhead costs to operate and maintain the lot.

For airport operators that offer free parking for a limited time within an existing parking facility, activity in the cell phone lot often is monitored by the parking revenue management system. Pittsburgh International Airport, for example, noted that use of the cell phone lot increased from an average of 3,500 per month in its first year of operation (2012) to an average of 8,200 in the first six months of 2014. Tampa International, which operates a 350-space cell phone lot and offers 59 minutes free in the short-term parking garage, reported that 45%–55% of short-term parking transactions in the garage are free.

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Airport operators interviewed consider Denver International's concession area, which incorporates the cell phone lot with restaurants, a gas station, and a convenience store, to be a viable way to offer improved customer service and convert free parking to a revenue producing center. This model works if there is available land for development visible along an access road to the airport and if there are few competing gas stations and restaurants just off the airport property. Several airports interviewed are considering similar cell phone lot solutions to Denver's Final Approach development.

Airports offered the following lessons learned from operating a cell phone lot:

- It is important that a cell phone lot be large enough to accommodate demand and alleviate road and curbside congestion.
- If the objective is to reduce congestion at the curbside, cell phone lots can work more effectively if airport security limits vehicle wait time at the terminal's curbside.
- Smart phones applications and/or flight information display systems (FIDS) can alert greeters about the right time to leave a cell phone lot and pick up passengers. However, aircraft arrival times are not always indicators of when a passenger is ready for pick-up. Some airports interviewed post both aircraft arrival times and estimated times for passenger pick-up on FIDS.
- A cell phone lot could effectively include a striped area to accommodate regular demand and an overflow lot for peak arrival times and holidays.
- A cell phone lot could be located away from the terminal and on parcels that do not compete with higher revenue activity for the airport.
- Proper signage is critical to greeters' finding the lot, to getting back to the terminal, and to relocating if they find hourly parking already full.
- Critical in the design of a cell phone lot is safe and well-marked road access and egress. For those airports that have concentrated aircraft arrivals, ample space and well-marked exit lanes could minimize congestion and delays exiting the lot.
- Cell phone lots can operate effectively with minimal amenities; however, lighting and trash cans are essential.

Overall, airport operators participating in this synthesis viewed cell phone lots as a valuable customer service. However, given the limited scope of this initial synthesis, many questions remain unanswered.

- Concerning reductions in curbside congestion at the terminal and in recirculating traffic:
  - How effective are cell phone lots in reducing curbside congestion in the terminal area?
  - What metrics can an airport use to measure the extent to which a cell phone lot reduces vehicle-miles of travel (VMT) on the airport property?
- How many spaces does a cell phone lot need? A review of cell phone lot capacities and the number of arriving passengers (based upon estimates of 2013 origin and destination passengers) indicated little correlation between size of cell phone lots and the number of arriving passengers. A few airports with ground access studies were reviewed; however, no statistical relationships between the size of cell phone lots and the number of passengers picked up in private vehicles were determined. Ground access surveys paired with simple equipment to count vehicles entering or exiting a cell phone lot would begin to inform airport planners about how to best size a cell phone lot.
- Do cell phone lots divert revenue from paid parking facilities? Some airport operators believe that revenue loss with free cell phone lots is substantial; other operators believe that cell phone lot users serve a group of greeters that will never pay for parking.

There are many untested assumptions surrounding cell phone lots that lend themselves to more in-depth analysis. However, at this point, the contribution of cell phone lots to relieve congestion at the terminal curbside and to reduce recirculating and idling vehicles remains unknown and would require an analysis of individual airport ground access patterns. That said, airport cell phone lots garner favorable reviews by greeters waiting to pick up arriving passengers and remain a popular customer service offered by many commercial airports throughout the United States.

GLOSSARY

Cell phone lot—A parking lot that allows greeters to wait temporarily until a traveler is available for pickup.

Cost recovery—The recovery of direct, indirect and capital costs. Costs that are not directly accountable to a cost object (such as a particular cost center). Indirect costs may be either fixed or variable. Indirect costs include administration, personnel, maintenance, fire and police costs, and are also known as overhead.

Cross-utilization—An approach to managing airport operations to maximize the efficiency of an airport's employees could include training an employee in multiple areas so that they can switch from one role to another depending upon where they are most needed at a given time.

Customer satisfaction—Customer satisfaction is a measure of how products and services meet or surpass customer expectation. Customer satisfaction is defined as "the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals" (Farris and Bendle).

Daily spaces—Daily spaces are intended for use by customers parking more than four hours, typically for 24 hours or more.

Deplaned passengers—Passengers getting off an aircraft at an airport. Some deplaned passengers may connect at the airport and board another aircraft.

Economy or remote parking—Economy or remote parking at an airport is farther away but less expensive than parking adjacent to a terminal.

Hourly parking spaces—Hourly spaces are intended for use by customers parking four hours or less. Hourly spaces are the same as short-term spaces.

Hub type—The FAA defines primary hub airports by the percentage of annual passenger enplanements. Large hubs are airports that enplane 1% or more of annual passenger enplanements. Medium hubs enplane between 0.25% and less than 1%. Small hubs enplane at least 0.05% but less than 0.25% and non-hubs enplane more than 10,000 passengers but less than 0.5%. Non-primary non-hub airports must enplane at least 2,500 and no more than 10,000.

Non-aeronautical revenue—Non-aeronautical revenue is generated from the following types of activities:

- Concessions—Rents paid by gift shops, restaurants, newsstands. Most concession contracts also require a concession to pay a percentage of its gross revenues to the airport.
- Parking—Fees for all airport-owned parking lots.
- Advertising—Ads placed on airport walls, billboards, and buses.
- Land rent—Income from excess airport land rented for golf courses, office buildings, hotels, or farming.
- Permits—Fees paid by off-airport companies to access the airport and pick up passengers (e.g., taxis or shuttle buses).

Origin and destination passengers (O&D)—Passengers that originate at a specific airport or depart from a specific airport. O&D passengers do not include passengers at the airport to connect to another flight.

Short-term parking—Parking intended for customers who park for four hours or less.

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ACRONYMS

ACAA	Allegheny County Airport Authority
ACI	Airports Council International
AUS	Austin–Bergstrom International Airport
BART	Bay Area Rapid Transit
BOS	Boston Logan International Airport
DCA	Reagan National Airport
DEN	Denver International Airport
DFW	Dallas/Fort Worth International Airport
EWR	Newark Liberty International Airport
FIDS	Flight Information Display System
GTAA	Greater Toronto Airport Authority
HCAA	Hillsborough County Airport Authority
IND	Indianapolis International Airport
JFK	John F. Kennedy International Airport
LAS	McCarran International Airport (Las Vegas)
LGA	LaGuardia Airport
MSY	Louis Armstrong New Orleans International Airport
NPIAS	National Plan of Integrated Airport Systems
O&D	Origin and destination passengers
OAK	Oakland International Airport
OMA	Eppley Airfield (Omaha)
PANYNJ	Port Authority of New York and New Jersey
PDX	Portland International Airport
PHX	Phoenix Sky Harbor International Airport
PIT	Pittsburgh International Airport
SAT	San Antonio International
SEA	Seattle–Tacoma International
SFO	San Francisco International Airport
SLC	Salt Lake City International Airport
STL	Lambert–St. Louis International Airport
TNC	Transportation Network Carrier
TPA	Tampa International Airport
YYZ	Toronto Pearson International

BIBLIOGRAPHY

Ackerman, H., "Fids, Bids, and Rids—Could One Size Fit All?" *Airport Magazine*, April–May 2009.

Belliotti, R., F. Barich, J. Phy, P. Reed, and R. Agnew, *ACRP Report 30: Reference Guide on Understanding Common Use at Airports*, Transportation Research Board of the National Academies, Washington D.C., 2010.

"Cell Phone Lots Help Ease Landside Traffic Congestion at Airports, Nearly Half of Waiting Motorists Circulate Twice or More," *Urban Transportation Monitor*, Vol. 19, No. 18, Oct. 14, 2005.

Cook, B., "Parking's Possibilities," *Airport Magazine*, Dec. 2006.

Corgan Associates, Inc.; Ricondo & Associates, Inc.; TransSolutions, LLC; TranSecure, LLC; *ACRP Report 10: Innovations for Airport Terminal Facilities*, Transportation Research Board of the National Academies, Washington, D.C., 2008.

Economic Development Research Group, "Passenger Value of Time, Benefit-Cost Analysis, and Airport Capital Investment Decisions," ACRP 03-19. Transportation Research Board of the National Academies, Washington D.C.

Farris, P.W., N.T. Bendle, P.E. Pfeifer, and D.J. Reibstein, *Marketing Metrics: The Definitive Guide to Measuring Marketing Performance*, 2nd ed., Pearson Education, Inc., Upper Saddle River, N.J., 2010.

"Food Trucks Are Now Parking in the Airport Cell Phone Lot," *Jaunted*, Feb. 19, 2013.

Gersham, Smith and Partners; Texas Transportation Institute; Human Factors North, Inc.; Big Sky, Inc.; Society for Environmental Graphic Design; and Mineta San Jose International Airport, *ACRP Report 52: Wayfinding and Signing Guidelines for Airport Terminals and Landside*, Transportation Research Board of the National Academies, Washington, 2011.

Hazel, R.A., J.D. Blais, T.J. Browne, and D.M. Benzon, *ACRP Report 19A: Resource Guide to Airport Performance Indicators.* Transportation Research Board of the National Academies, Washington D.C., 2011 [Online]. Available: http://www.jaunted.com/story/2013/2/19/61021/1599/travel/Food+Trucks+are+Now+Parking+in+the+Airport+Cell+Phone+Lot.

Jacobs Consultancy, Walker Parking Consultants, Mannix Group, and DMR Consulting, *ACRP Report 24: Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies*, Transportation Research Board of the National Academies, Washington, D.C., 2009, 161 pp.

Landrum & Brown, Inc.; AirProjects Inc.; Aerotropolis Business Concepts, LLC; and Envirosell, *ACRP Report 109: Improving Terminal Design to Increase Revenue Generation and Customer Satisfaction*, Transportation Research Board of the National Academies, Washington D.C., 2014.

LeighFisher, *Ground Transportation at Airports: Best Practices*, ACRP 10-16. Transportation Research Board of the National Academies, Washington D.C.

Richard, D.M., *ACRP Synthesis 36: Exploring Airport Employee Commute and Parking Strategies*, Transportation Research Board of the National Academies, Washington D.C., 2012.

Ricondo & Associates, DMR Consulting, and Resource System Group, Inc., *ACRP Report 34: Handbook to Assess the Impacts of Constrained Parking at Airports*, Transportation Research Board of the National Academies, Washington D.C., 2010.

Todd, J.L., "Cell Phone Lots Ease Congestion at Busy Airports," *Parking*, Nov. 2008.

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APPENDIX A

Airports Researched for Cell Phone Lots

City	Airport Code	Airport	State or Province	Hub Size	Cell Phone Lot?
Arlington	DCA	Reagan Washington National Airport	VA	L	Yes
Atlanta	ATL	Hartsfield–Jackson Atlanta International	GA	L	Yes
Baltimore	BWI	Baltimore Washington International Airport	MD	L	Yes
Boston	BOS	General Edward Lawrence Logan International	MA	L	Yes
Charlotte	CLT	Charlotte Douglas International Airport	NC	L	Yes
Chicago	MDW	Chicago Midway International Airport	IL	L	Yes
Chicago	ORD	Chicago O'Hare International Airport	IL	L	Yes
Dallas-Ft Worth	DFW	Dallas/Fort Worth International	TX	L	No
Denver	DEN	Denver International	CO	L	Yes
Detroit	DTW	Detroit Metropolitan Wayne County	MI	L	Yes
Fort Lauderdale	FLL	Fort Lauderdale–Hollywood International	FL	L	Yes
Honolulu	HNL	Honolulu International	HI	L	Yes
Houston	IAH	Houston Bush Intercontinental Airport	TX	L	Yes
Las Vegas	LAS	McCarran International	NV	L	No
Los Angeles	LAX	Los Angeles International	CA	L	Yes
Miami	MIA	Miami International	FL	L	Yes
Minneapolis	MSP	Minneapolis–St Paul International	MN	L	Yes
New York	JFK	John F Kennedy International	NY	L	Yes
New York	LGA	La Guardia	NY	L	No
Newark	EWR	Newark Liberty International	NJ	L	Yes
Orlando	MCO	Orlando International	FL	L	Yes
Philadelphia	PHL	Philadelphia International	PA	L	Yes
Phoenix	PHX	Phoenix Sky Harbor International Airport	AZ	L	Yes
Salt Lake City	SLC	Salt Lake City International Airport	UT	L	Yes
San Diego	SAN	San Diego International	CA	L	Yes
San Francisco	SFO	San Francisco International	CA	L	Yes
Seattle	SEA	Seattle–Tacoma International	WA	L	Yes
Tampa	TPA	Tampa International	FL	L	Yes
Toronto	YYZ	Toronto Pearson	ON	L	Yes
Vancouver	YVR	Vancouver International Airport	BC	L	Yes
Washington, DC	IAD	Washington Dulles International	VA	L	Yes
Albuquerque	ABQ	Albuquerque International Sunport	NM	M	Yes
Anchorage	ANC	Ted Stevens Anchorage International	AK	M	Yes
Austin	AUS	Austin–Bergstrom International	TX	M	Yes
Buffalo	BUF	Buffalo Niagara International	NY	M	Yes
Burbank	BUR	Bob Hope	CA	M	No
Calgary	YYC	Calgary International Airport	AB	M	Yes
Cleveland	CLE	Cleveland–Hopkins International	OH	M	Yes
Columbus	CMH	Port Columbus International	OH	M	Yes
Covington	CVG	Cincinnati/Northern Kentucky International	KY	M	Yes
Dallas	LUV	Dallas Love Field	TX	M	Yes
Edmonton	YEG	Edmonton International Airport	AB	M	Yes
Fort Myers	RSW	Southwest Florida International	FL	M	Yes
Houston	HOU	William P Hobby	TX	M	Yes
Indianapolis	IND	Indianapolis International	IN	M	Yes
Jacksonville	JAX	Jacksonville International	FL	M	Yes

City	Airport Code	Airport	State or Province	Hub Size	Cell Phone Lot?
Kahului	OGG	Kahului	HI	M	Yes
Kansas City	MCI	Kansas City International	MO	M	Yes
Memphis	MEM	Memphis International	TN	M	Yes
Milwaukee	MKE	General Mitchell International	WI	M	Yes
Nashville	BNA	Nashville International	TN	M	Yes
New Orleans	MSY	Louis Armstrong New Orleans International	LA	M	Yes
Oakland	OAK	Metropolitan Oakland International	CA	M	Yes
Omaha	OMA	Eppley Airfield	NE	M	No
Ontario	ONT	Ontario International	CA	M	Yes
Pittsburgh	PIT	Pittsburgh International	PA	M	Yes
Portland	PDX	Portland International	OR	M	Yes
Providence	PVD	Theodore Francis Green State	RI	M	Yes
Raleigh/ Durham	RDU	Raleigh–Durham International	NC	M	Yes
Reno	RNO	Reno/Tahoe International	NV	M	Yes
Sacramento	SMF	Sacramento International	CA	M	Yes
San Antonio	SAT	San Antonio International	TX	M	Yes
San Jose	SJC	Norman Y. Mineta San Jose International	CA	M	Yes
San Juan	SJU	Luis Munoz Marin International	PR	M	Yes
Santa Ana	SNA	John Wayne Airport-Orange County	CA	M	No
St. Louis	STL	Lambert–St Louis International	MO	M	Yes
Tucson	TUS	Tucson International	AZ	M	Yes
West Palm Beach	PBI	Palm Beach International	FL	M	Yes
Windsor Locks	BDL	Bradley International	CT	M	No
Agana	GUM	A.B. Won Pat International Airport (Guam)	GU	S	No
Little Rock	LIT	Bill & Hillary Clinton National Airport/Adams Field	AR	S	No
Akron	CAK	Akron–Canton Regional	OH	S	Yes
Albany	ALB	Albany International	NY	S	Yes
Birmingham	BHM	Birmingham–Shuttlesworth International	AL	S	Yes
Boise	BOI	Boise Air Terminal/Gowen Field	ID	S	Yes
Burlington	BTV	Burlington International	VT	S	Yes
Charleston	CHS	Charleston AFB/International	SC	S	Yes
Colorado Springs	COS	City of Colorado Springs Municipal	CO	S	Yes
Dayton	DAY	James M Cox Dayton International	OH	S	Yes
Des Moines	DSM	Des Moines International	IA	S	Yes
El Paso	ELP	El Paso International	TX	S	Yes
Fresno	FAT	Fresno Yosemite International	CA	S	Yes
Grand Rapids	GPZ	Gerald R. Ford International	MI	S	Yes
Greensboro	GSO	Piedmont Triad International	NC	S	No
Greer	GSP	Greenville Spartanburg International	SC	S	Yes
Hilo	ITO	Hilo International Airport	HI	S	Yes
Islip	ISP	Long Island MacArthur	NY	S	Yes
Kailua/Kona	KOA	Kona International at Keahole	HI	S	Yes
Knoxville	TYS	McGhee Tyson	TN	S	Yes
Lexington	LEX	Blue Grass	KY	S	Yes
Lihue	LIH	Lihue	HI	S	Yes
Long Beach	LGB	Long Beach /Daugherty Field	CA	S	Yes
Louisville	SDF	Louisville International–Standiford Field	KY	S	Yes
Madison	MSN	Dane County Regional–Truax Field	WI	S	Yes
Manchester	MHT	Manchester–Boston Regional	NH	S	Yes
Mesa	AZA	Phoenix–Mesa Gateway	AZ	S	No
Myrtle Beach	MYR	Myrtle Beach International	SC	S	Yes

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City	Airport Code	Airport	State or Province	Hub Size	Cell Phone Lot?
Norfolk	OFK	Norfolk International	VA	S	No
Oklahoma City	OKC	Will Rogers World	OK	S	Yes
Portland	PWM	Portland International Jetport	ME	S	Yes
Richmond	RIC	Richmond International	VA	S	Yes
Rochester	ROC	Greater Rochester International	NY	S	Yes
Saskatoon	YXE	Saskatoon Airport	SK	S	Yes
Savannah	SAV	Savannah/Hilton Head International	GA	S	Yes
Spokane	GEG	Spokane International Airport	WA	S	Yes
Syracuse	SYR	Syracuse Hancock International	NY	S	No
Tulsa	TUL	Tulsa International	OK	S	Yes
White Plains	HPN	Westchester County	NY	S	Yes
Wichita	ICT	Wichita Mid-Continent	KS	S	Yes
Green Bay	GRB	Austin Straubel International	WI	N	Yes
Tallahassee	TLH	Tallahassee Regional	FL	N	Yes

APPENDIX B

Online Survey Instrument

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ACRP Study of Airport Cell Phone Lots

Thank you for participating in this ACRP study of how airports develop and operate cell phone lots. We'd like to learn a little more about your airport's cell phone lot and short-term parking options. Please take a few minutes to answer these 22 questions. All individual airport responses will remain confidential and will be published only in aggregate so as to maintain anonymity of individual responses.

1. To start, please provide us with your contact information.

Name	
Job title	
Department (e.g. Operations. Parking)	
Airport	
City	
Email address	
Phone number	

History of the Cell Phone Lot

2. In what year did the first cell phone lot open at your airport?

3. What were the airport's initial reasons for opening a cell phone lot? (Check all that apply.)

☐ Reduce curbside congestion

☐ Reduce recirculating traffic

☐ Relieve short term parking capacity

☐ Reduce emissions

☐ Satisfy TSA requirements

☐ Improve road safety

☐ Requested by customers

Other reasons (please specify)

ACRP Study of Airport Cell Phone Lots

4. If the cell phone lot has moved, why was it relocated? (Check all that apply.)

☐ Location of the cell phone lot has remained the same

☐ Previous site needed for other purposes

☐ Lot was too small

☐ Lot was in an inconvenient location

☐ Airport management integrated cell phone lot function with short term parking

☐ Airport management relocated cell phone lot to add amenities (such as food services)

☐ Do not know

Other reasons (please briefly describe)

[   ]

Air Passengers and Ground Transportation

5. In calendar year 2013, how many passengers used your airport?

Arriving passengers (local) [   ]

Departing passengers (local) [   ]

Connecting passengers [   ]

Total CY 2013 passengers [   ]

6. For arriving passengers, please estimate the percent of passengers that leave the airport by:

Personal car parked at the airport for duration of the trip (estimate %) [   ]

Personal car driven by friend, relative, or business associate (estimate %) [   ]

Rental car (estimate %) [   ]

Taxi or other private vehicle for hire (estimate %) [   ]

Hotel shuttle(estimate %) [   ]

Bus, train, or other public transportation (estimate %) [   ]

Airport does not track ground transportation choices (place an 'X' in the box) [   ]

Airport Parking Capacity

58

ACRP Study of Airport Cell Phone Lots

7. How many parking spaces does the airport have in each category?

Cell phone lot parking spaces
[   ]

Hourly or short term parking spaces (parking limited to 4 hours or less)
[   ]

Total airport controlled parking spaces (including hourly & cell phone lots)
[   ]

8. How did the airport determine how many parking spaces were needed in the cell phone lot? (Check all that apply.)

☐ Demand study

☐ Best guess

☐ Ground access study for arriving passengers

☐ Capacity determined by dimensions of available space

Other method (please briefly describe.)

[   ]

9. If your airport offers free parking in paid parking garages or lots, how many minutes are free?

Number of free minutes
[   ]

No free parking (place an 'X' in the box)
[   ]

Location of the Cell Phone Lot

10. Is the cell phone lot located on the main airport access road?

○ Yes

○ No

11. From the perspective of someone driving to the airport, where is the cell phone lot located in relation to the main terminal?

○ On a road located before the main terminal

○ On a road located after the main terminal

○ In a different location (please specify)

[   ]

12. In your opinion, where is the ideal location for a cell phone lot?

[   ]

ACRP Study of Airport Cell Phone Lots

Management of the Cell Phone Lot

13. Who operates the cell phone lot at your airport?

○ Airport

○ Outside contractor

○ Other (please specify)

14. Has the operator remained the same for the last five years?

○ Yes

○ No

Comments

Costs for the Cell Phone Lot

15. Does the airport keep track of the following costs for the cell phone lot? (Check all that apply.)

☐ Initial capital costs to develop the cell phone lot

☐ Annual maintenance costs

☐ Annual staffing costs

☐ Annual security costs

16. Would you make these costs available to the ACRP research team during the telephone interview?

○ Yes

○ No

○ Some costs available, but not all

○ Cell phone lot costs included in other parking expenses

Comments

Collection of Customer Data

60

ACRP Study of Airport Cell Phone Lots

17. Does the airport count cell phone lot users?

- ( ) Each user counted
- ( ) Random sample counts
- ( ) Airport does not count users
- ( ) Other methods of estimating cell phone lot users

[text box]

18. Have you ever surveyed users of the cell phone lot to determine customer satisfaction with the lot?

- ( ) Yes
- ( ) No

If yes, please briefly describe

[text box]

Amenities at the Cell Phone Lot

19. Which amenities do you consider important for a cell phone lot to have? (1 is unimportant, 5 is very important.)

	1	2	3	4	5
Restrooms	( )	( )	( )	( )	( )
Portable toilets	( )	( )	( )	( )	( )
FIDS (flight information displays)	( )	( )	( )	( )	( )
Wi-Fi	( )	( )	( )	( )	( )
Restaurant	( )	( )	( )	( )	( )
Food trucks	( )	( )	( )	( )	( )
Night lighting	( )	( )	( )	( )	( )
Gas station	( )	( )	( )	( )	( )
Trash cans	( )	( )	( )	( )	( )

Other important amenities (please specify)

[text box]

ACRP Study of Airport Cell Phone Lots

20. What amenities does your airport's cell phone lot currently have? (Check all that apply.)

- ☐ Restrooms
- ☐ Portable toilets
- ☐ FIDS (flight information displays)
- ☐ Wi-Fi
- ☐ Restaurant
- ☐ Food trucks
- ☐ Night lighting
- ☐ Gas station
- ☐ Trash cans

Other amenities (please specify)

Cell Phone Lot Issues

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ACRP Study of Airport Cell Phone Lots

21. What are the biggest issues that your airport has encountered with your cell phone lot? (Check all that apply.)

- [ ] Taxis and limousines use the lot
- [ ] Commercial vehicles (such as trucks) use the lot
- [ ] The lot is overcrowded
- [ ] Congestion occurs at exits when flights arrive
- [ ] Not enough users
- [ ] Revenue insufficient to cover operating and capital costs of lot
- [ ] Insufficient security patrols
- [ ] The lot is difficult to find
- [ ] Way finding back to the terminal is difficult
- [ ] Cell phone lot competes with short-term parking revenues
- [ ] Cell phone lot location changes too frequently
- [ ] Customers feel unsafe
- [ ] Illegal activity in lot

Other issues (please briefly describe)

Wrap-up

22. Do you have any further comments? Is there anything related to the cell phone lot that we might not have covered?

Thank you very much for participating in this online survey. We look forward to speaking with you soon by telephone. We will send our interview questions ahead of the scheduled call.

Lois Kramer and Sydney Mandel
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lois@krameraerotek.com

APPENDIX C

Telephone Interview Guide

Interview Questions for Airports That Offer a Cell Phone Lot

Opening Questions

1. Please briefly describe your involvement and responsibilities for parking at your airport.
2. Could you give us a little history of your cell phone lot?
3. What are the main reasons for having a cell phone lot at your airport today?
4. Have these reasons changed over time?

Planning for the Future

1. Suppose you were to relocate or redesign the cell phone lot, what would you do differently?
2. What is an ideal location for a cell phone lot?
3. What does an airport need to know to determine demand and capacity requirements for a cell phone lot?
4. What are the most essential amenities that a cell phone lot should have?
5. Does your airport's lot have these amenities? If not, is the airport planning to add amenities?
6. Do you anticipate any other changes to your airport's cell phone lot in the next three to five years?

Staffing

1. How many FTE employees or contract labor staff the cell phone lot?
2. How does the airport provide security for the lot?
3. Has the cell phone lot always been managed by the airport (by a contractor)?
4. What part of the airport organization is responsible for the lot?

Hours of Operation & Rules

1. What are the hours of operation at the cell phone lot?
2. Do you post rules in your cell phone lot?
   a. If yes, how did the airport decide which rules were important?
   b. How are rules at the cell phone lot enforced?

Capital Costs and Operating Expenses

1. What sources of revenue funded construction and improvements of the cell phone lot?
2. Approximately what is the annual operating budget for the cell phone lot?
3. Does the lot generate any revenue for the airport?

Customer Satisfaction

1. Do you get customer feedback on the cell phone lot? If so, what are the main sources of that feedback?
2. What are the most frequently raised customer issues about the cell phone lot?

Impact of the Cell Phone Lot

1. Has the cell phone lot reduced circulating traffic on the main roads and at the terminal curbside?
2. Is there congestion at the cell phone lot or curbside when several flights arrive at the same time?
3. Has it had an impact on demand for other parking products at the airport?

Concluding Questions

1. What are the biggest challenges that the airport has with the cell phone lot?
2. What recommendations do you have for airports looking to build or improve their cell phone lots?
3. Do you have any additional information about your airport's cell phone lot that you wish to add?

Thanks for participating in this interview.

Abbreviations used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

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