

**Strategies for Reducing Local Stormwater Utility Fees
Final Report**

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Abstract

This report documents the approach—including background, methodology, findings, and conclusions and recommendations—used to develop the *Guidebook on Stormwater Strategies for Reducing Local Stormwater Utility Fees*. The guidebook is intended to educate airport practitioners on stormwater utility financing and to help them identify, evaluate, select, and implement the most appropriate strategies to manage stormwater fees for the specific circumstances of their airport. The research conducted to develop the guidebook included a focused literature review and white paper, airport focus groups and interviews, case studies of four airports, and airport partner review of the guidebook. The guidebook aims to help airport practitioners understand the basics of stormwater fee mitigation and its regulatory context. The guidebook uses a “dual track” approach, with parallel chapters discussing strategies for airports that anticipate paying stormwater fees and for those already paying fees. The guidebook incorporates examples illustrating airport experiences and includes four case studies, which provide details regarding stormwater fee structures, challenges, and mitigation strategies of four representative airports.

Summary

Local entities specifically designed to manage stormwater (i.e., stormwater utilities) finance multiple aspects of stormwater management: stormwater infrastructure projects, replacements and improvements to infrastructure, administration and permit compliance, and maintenance projects. Stormwater utilities fund these activities through stormwater fees collected from customers generating stormwater runoff. Because the rate structures stormwater utilities use to calculate fees are frequently based on the area of impervious surface on the property, airports—which have relatively large land holdings and impervious area—can be particularly affected by these fees. The goal of Airport Cooperative Research Program (ACRP) Project 02-68 was to develop a guidebook to inform airport practitioners about stormwater utilities, their administration, and fee structures, as well as convey approaches airports have used to mitigate stormwater fees. The guidebook also provides case studies to highlight real-world experiences of airports that have implemented stormwater fee mitigation strategies.

The guidebook developed through this study provides information on stormwater fees and how they apply to airports, strategies for effectively managing the fees at airports, and lessons learned from airports that pay stormwater fees. Strategies for fee mitigation include:

- Awareness and communication with utilities.
- Advocacy for airport-related considerations regarding fee structures, credit systems, and exemptions when utilities are being established or updated.
- Gaining services from utilities (where eligible and feasible).
- Optimizing use of credit programs.
- Verifying accurate assessment of impervious area.
- Recovery of fees through lease agreements.

The guidebook provides a framework for identifying and implementing stormwater fee management strategies, including: (1) understanding stormwater fees at airports and their regulatory context, (2) identifying potential strategies for stormwater fee mitigation at both airports anticipating fees and airports already paying fees, and (3) providing guidance and examples (including the case studies) to illustrate and aid in the implementation of these strategies.

The Initial Discovery phase of this study focused on reviewing relevant literature, including articles, reports, and best practices; and assessing gaps in information needed to develop the guidebook. The resulting literature review and white paper synthesized existing information on the history and background of stormwater utilities and their fee structures as well as stormwater fee mitigation at airports.

The second phase of the project, Field Investigation and Practitioner Feedback, consisted of data collection through focus groups and interviews with airports and stormwater utilities, and development of a draft guidebook outline. At that time, the research team prepared a list with suggested case studies that would reflect diverse airport experiences with stormwater fees and fee mitigation strategies.

In the third phase of the project, Case Studies, Guidebook, and Final Deliverables, the research team developed the case studies and completed development of the guidebook, this technical report, and the implementation memorandum.

The initial draft of the guidebook was developed and sent to participating airports for review in the third phase of the study; it was revised based on airport input and feedback from the project panel. The guidebook can be used to guide airport decision-makers and practitioners through the process of developing effective strategies for stormwater fee mitigation given the particular circumstances, needs, and challenges faced by their airport. Some key points were consistently highlighted during the interviews, focus groups, and case studies and are summarized in the following bullets.

- Understanding why stormwater programs are implemented, how they are developed and managed, how their fees are structured, and their applicability to airports, will help airport decision-makers and practitioners advocate for airport concerns when communicating with stormwater utilities. Early airport involvement during development of stormwater utilities is advantageous but does not always happen.
- Several approaches to fee mitigation were discussed with the airports participating in the study and are covered in the guidebook. The strategies that arose most often include:
 - Communication and outreach approaches, including maintaining awareness and effective communication within the airport and between the airport and the utility.
 - Strategies based on the airport's land uses and stormwater management, including applying for credits, verifying accuracy of impervious area, parcel consolidation, and requesting services from the utility (if the airport is eligible).
 - Recovering stormwater fees from on-site tenants by including stormwater fees in the expenses upon which lease agreements are based.
 - Negotiating with the stormwater utility to achieve fee reductions and exemptions by demonstrating independence from the local stormwater system.

To ensure effective implementation, each stormwater fee mitigation strategy requires case-specific considerations depending on the airport's characteristics, the relationship between the airport and its stormwater utility, and the local stormwater management legal and policy framework. The guidebook aims to provide information about a variety of airport and stormwater utility experiences, perspectives, and strategies for fee mitigation that will be helpful to all airports that currently pay or anticipate paying stormwater fees in the future.

1. Background

The cost of maintaining and improving stormwater infrastructure has risen substantially over the years. One way in which local governments have funded stormwater infrastructure management—including maintenance, replacements, improvements, administration, and permit compliance—is by assessing stormwater fees and billing property owners. An entity established to provide stormwater services (and fund them through fee assessments) is referred to as a stormwater utility. The utility may determine fees using any of several fee structures, but the most common structures are based on impervious area. Airports, which have significant amounts of impervious area associated with runways, taxiways, parking, and access roads, can be particularly affected by fees. The goal of ACRP Project 02-68 was to develop a guidebook to provide information on stormwater fees and how they apply to airports, strategies for airports to effectively manage stormwater fees, and lessons learned from airports' experiences.

This section of the technical memo provides background on the project and summarizes key definitions, common challenges faced by airports regarding stormwater fees, and how the guidebook resulting from this project addresses those issues. Section 2 describes the research approach undertaken for ACRP Project 02-68. Section 3 summarizes the findings of the research and their application to the development of the guidebook. Finally, Section 4 draws upon findings and conclusions from the research and offers recommendations for future research. Several appendices provide details about each phase of the study.

Stormwater Utilities and Fee Assessment

The 2016 version of Western Kentucky University's annual stormwater utility survey identified nearly 1,600 stormwater utilities in the United States and estimated that the true number is between 2,000 and 2,500. A stormwater utility may be a stand-alone entity or the utility may reside within an existing utility or government department such as the department of public works or the water and/or wastewater department. The utility managers consider the stormwater needs of the community and set up a governing body and funding mechanism (i.e., stormwater fees) to determine the funds required for anticipated stormwater management needs. Many utilities offer credit programs through which fees are reduced if the property owner takes certain measures to manage runoff and reduce the burden on the local stormwater system. Also, some utilities exempt certain land uses from their fee structures.

A utility may assess stormwater fees by any of several fee structures, with the most common structures based on the impervious area of a property. Impervious surface is defined as pavement, building footprints, sidewalks, decks, etc., which are tied to runoff rates and pollutant loadings. Basing stormwater fees on impervious area is considered equitable and affords visibility and transparency to the public and local government. Other common structures include flat rates (all properties pay the same amount) and structures with either rates or flat fees categorized by tiers of impervious area. A utility may assess non-residential and residential properties according to different structures. Below are brief definitions of common fee structures.

The Equivalent Residential Unit (ERU). A system based on impervious area, with a rate set per ERU. An ERU is the average or median impervious area for a single-family residence (SFR). This approach is by far the most widely used fee structure for stormwater utilities.

Impervious Area. Fees are assessed according to the amount of impervious area in square footage, with a rate set per 500 or 1,000 square feet (sq. ft.).

Tier System. Impervious area is divided into tiers, with all properties falling within a given tier paying the same stormwater fee. Tiers may also be based on percentage of impervious area on a property. The fee within each tier may be flat, or there may be different ERUs for each tier.

Flat Fee. Every parcel is assessed the same stormwater fee. A dual system is a variation on the flat fee in which there are different flat fees for residential and non-residential properties.

Residential Equivalent Factor (REF). Runoff from a standard storm is determined for an average SFR, and fees are based on the ratio of runoff from the property in question to that of the average SFR property.

Challenges, Issues, and Barriers for Airports

Stormwater fees can pose challenges to airports, including significant fees based on their large amount of impervious area, availability of services from the stormwater utility, and situations where utility programmatic guidance is incompatible with airport stormwater management needs.

Significant Impervious Area. Because of their large impervious area, airports may be subject to substantial stormwater fees that in some cases represent a sizable portion of their annual revenue. Also, some airports have property that spans more than one jurisdiction, making them potentially subject to fees from more than one stormwater utility.

Applicability of Credits to Airports. Some stormwater fee credit programs are geared primarily toward residential properties, and some practices that qualify for credits may either be unsuitable for large properties (e.g., rain barrels, rain gardens) or could conflict with airport safety concerns (e.g., structural best management practices (BMPs) that have standing water or vegetation that can attract wildlife).

Availability of Services from Stormwater Utilities. Airports generally manage their runoff on-site and may or may not discharge to a local stormwater system. Many airports do not receive services from the utility for management of their stormwater, although some do receive assistance (e.g., vegetation or trash removal, maintenance of conveyances), especially if the airport is owned by the municipality.

Revenue Diversion. Revenue diversion is the expenditure of airport revenue for purposes other than the operating and capital costs of the airport, and is prohibited under the Anti-Revenue Diversion Provision, 49 U.S.C. § 47133(a). Although this issue has been raised, airports have not yet pursued or successfully used this issue to mitigate stormwater fees.

Airports have worked to mitigate stormwater fees through a variety of approaches, including applying for credits, consolidating parcels, pursuing interlocal agreements, fee recovery through lease agreements with tenants, and advocating for legislation for airport exemptions.

The Path Forward

To help airports overcome these challenges, the research team developed the *Guidebook on Stormwater Strategies for Reducing Local Stormwater Utility Fees*. The guidebook aims to present information in a concrete, easily-digestible manner with sufficient detail to assist airport practitioners with understanding how stormwater fees have affected different airports and how airports have addressed challenges associated with stormwater fees.

Details about the research process and findings that supported development of the guidebook are provided in Sections 2 and 3 of this technical report. Below is a brief description of the types of information and guidance the research team included in the guidebook.

Understanding Stormwater Fees

The guidebook promotes an increased understanding of stormwater user fee programs, including why such programs are implemented, how they are developed and managed, how fees are structured, and applicability to airports. The guidebook also facilitates understanding of the regulatory context of stormwater management programs and fees by providing an overview of the relevant federal, state, and local types of regulation and permitting.

Guidance on Identification and Selection of Stormwater Fee Strategies

The guidebook provides information and guidance regarding how stormwater fee mitigation strategies can be and have been implemented, both for airports that are currently subject to stormwater fees and for airports that are anticipating paying stormwater fees in the future.

Based on the literature review and data collection described in Section 2 of this report, the guidebook discusses five broad categories of stormwater fee mitigation approaches and activities for airports that currently pay fees:

1. Awareness of basic information about the local stormwater utilities and the fees the airport is paying;
2. Approaches based on the airport's land uses and stormwater management (e.g., credit programs);
3. Recovery of fees through lease agreements;
4. Approaches centered on outreach and communication with utilities; and
5. Approaches that involve governance.

For airports that do not currently pay stormwater fees, the following broad categories of approaches are discussed:

1. Awareness of stormwater utility developments;
2. Strategies for communication both internally at the airport and with the developing utility;
3. Advocating for airport considerations during stormwater fee development;
4. Future stormwater management planning at airports; and
5. Approaches that involve governance.

Lessons Learned

The guidebook includes four case studies illustrating a variety of experiences with stormwater utilities and lessons learned.

2. Research Approach

This project was completed in the following three phases: initial discovery of existing information, data collection through interactions with airports, and use of the information and data to develop the guidebook. Phases and tasks are summarized in Figure 1.

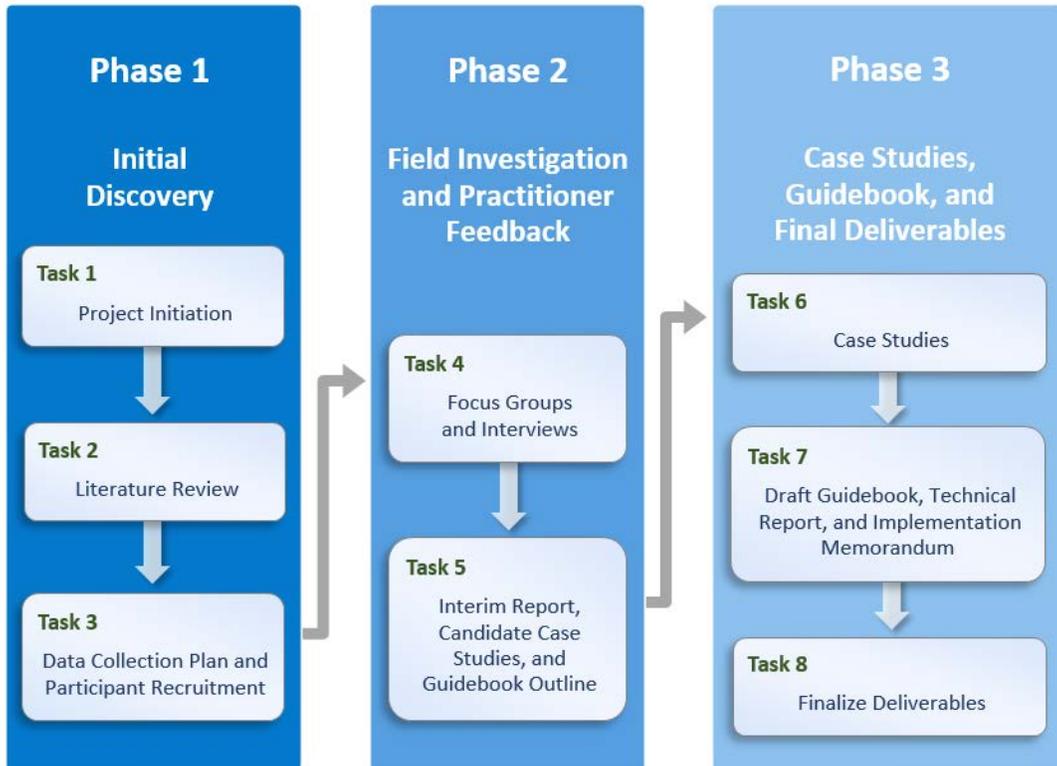


Figure 1. Phases and Tasks of ACRP 02-68.

Phase 1: Initial Discovery (Tasks 1–3)

In Phase 1, the research team identified, reviewed, and synthesized existing information relevant to the project. Information gaps were identified and plans were formulated for the data collection conducted during Phase 2. Phase 1 consisted of the following tasks:

- **Task 1: Project Initiation.** The research team completed administrative tasks, including development of the amplified work plan and participation in a kickoff conference call to discuss project goals, deliverables, and timeline. As part of this task, the team also responded to panel comments on the proposal and amplified work plan.
- **Task 2: Literature Review.** The research team reviewed existing literature information and identified data gaps to be filled to support the development of the guidebook, including planning for data collection during Phase 2. The information reviewed included key aspects of stormwater utilities, such as fee structures, applicability to airports, and fee mitigation strategies. Literature was synthesized in *ACRP 02-68 Task 2: Literature Review Strategies for Reducing Local Stormwater Utility Fees at Airports*. In addition, the research team developed a white paper (*ACRP 02-68 Task 2: White Paper: Strategies for Reducing Local Stormwater Utility Fees for Airports*) summarizing the history of stormwater utilities, their development, and their management.

- **Task 3: Data Collection Plan.** The research team developed and submitted a data collection methodology for filling the information gaps identified during preparation of the literature review and white paper for ACRP and panel review. The data collection plan outlined the selection process and criteria for identifying proposed participating airports. It included a description of the procedures for conducting focus groups and interviews with airport staff and stormwater utility representatives and described the plan for developing three to five case studies. The appendices of the plan included a list of 31 candidate airports and 7 candidate utilities for potential inclusion in the study, example pre-interview and discussion questions for airports participating in interviews or focus groups, and examples of information requests sent to airports contributing case studies. (Appendix A of this technical report includes a complete copy of the Data Collection Plan and Case Study Plan.)

Phase 2: Field Investigation and Practitioner Feedback (Tasks 4–5)

Phase 2 focused on data collection through focus groups and interviews with airports and stormwater utilities. A draft guidebook outline was developed based on information gathered in Phase 1 and Phase 2. A list of suggested case studies was also compiled. Phase 2 consisted of the following tasks:

- **Task 4: Focus Groups and Interviews.** Upon receipt of panel feedback on the data collection plan, the research team finalized the list of participants, drawing from candidates on the initial list with the goal of representing as many airport sizes, Federal Aviation Administration (FAA) regions, climates, and experiences with stormwater utilities as possible. The team conducted three focus groups via teleconference, which included a total of seven airports and three stormwater utilities. Additionally, the team conducted 11 individual telephone interviews with airports and one interview with a stormwater utility. Interviews lasted approximately one hour, and focus groups lasted no longer than an hour and a half. Out of the list of 31 airports and seven stormwater utility participants proposed in the data collection plan, a total of 18 airports and four stormwater utilities participated in the focus groups and interviews. Four participating airports do not currently pay stormwater fees but are interested in or concerned about the topic; their questions and perspectives were valuable for learning about the type of guidance to include in the guidebook to help airports in their situation. During the focus groups and interviews, the following topic areas were addressed: stormwater management practices, experience with stormwater fees, utility-airport interactions, stormwater program exemptions and credits, and regulatory and jurisdictional issues. After the focus groups and interviews, written summaries were sent to the participants for review. The results of these interviews and focus groups were submitted in *ACRP 02-68 Task 4: Revised Technical Memorandum on Focus Groups and Interviews* and reflected edits and comments from participants.
- **Task 5: Interim Report.** Phase 2 included submission of *ACRP 02-68 Task 5: Interim Report*, an annotated outline of the draft guidebook, and a list of potential airports to be featured as case studies. The interim report presented the results of all prior work done for the project during Phases 1-5 for the project panel's review and approval. It presented an analysis of the information collected and supported the next steps of the project. The annotated outline of the draft guidebook was guided by the initial framework developed in the advanced work plan and was expanded and annotated based on the results of Tasks 1-5. A list of potential case studies was also submitted as part of this task and discussed with the project panel at the interim meeting.

Phase 3: Case Studies, Guidebook, and Final Deliverables (Tasks 6–8)

In Phase 3 of the project, the research team developed the case studies and completed the draft and final guidebook, this technical report, and the implementation memorandum. Phase 3 consisted of the following tasks:

- **Task 6: Case Studies.** The research team completed additional in-depth interviews (up to an hour and a half) with selected airports who had participated in the initial focus groups and interviews during Task 4. Interviews were also conducted with the stormwater utilities that assess fees for the case study airports. Case study participants were selected to present a variety of concrete examples showcasing airport experiences with stormwater fees and strategies used to mitigate fees. Prior to conducting the in-depth interviews, the research team issued preliminary requests for information to the airports regarding their experience with stormwater fees and strategies to reduce fees. Discussions with the case study airports focused on confirming the information collected from the preliminary questions and gaining additional insight into topics pertinent to the airport, such as its permit type, governance, and other factors having bearing on its success with stormwater fee mitigation strategies. Conversations with the associated utilities covered how the utilities operate, challenges they face, how they assess fees and credits for the airports, and their thoughts and recommendations regarding airport concerns. Discussions with the airports and utilities were used to develop four case studies for inclusion in the guidebook. The research team provided narrative summaries of calls for each utility to review. The airports reviewed their respective case studies. To the extent possible, the case studies included information about the airport's current or anticipated stormwater fees, permitting, and the advantages and/or disadvantages of the fee mitigation strategies used at the airport. The case studies also contained lessons learned and recommendations with sufficient detail to assist airport practitioners with the identification of appropriate mitigation strategies for their particular airport and its conditions.
- **Task 7: Draft Guidebook, Technical Report, and Implementation Memorandum.** As part of this task, the research team developed the draft guidebook, this technical report, and the implementation memorandum. The draft guidebook was developed based on the annotated outline from Task 5, with refinement in content and structure based on panel feedback during the interim meeting and information gained from the case studies. The draft guidebook was directly informed by information collected during the data collection process in Phases 1 and 2 of the project and conveys background information followed by systematic guidance on several categories of approaches to mitigate stormwater fees. In addition to the case studies, the guidebook includes examples from the participating airports to illustrate key points. The draft guidebook was sent to four airports to review, three of which were case study participants. Some participating airports asked to remain anonymous in published documents. The research team has therefore elected to keep all case studies and textbox examples anonymous and has not specified participating airports explicitly in either the guidebook or this technical report.
- **Task 8: Finalize Deliverables.** The research team incorporated comments received from the project panel review of draft versions into the final deliverables. The final deliverables include the final technical report and appendices, the final implementation memorandum, and the final guidebook. The research team also developed a webinar presentation aimed at familiarizing airport practitioners and their partners with the content of the guidebook.

3. Findings

Findings from the Literature Review and Data Gaps

The literature review (*ACRP 02-68 Task 2: Literature Review Strategies for Reducing Local Stormwater Utility Fees at Airports*) and the associated white paper describe common stormwater fee methods and approaches to reducing stormwater fees. A summary of the findings is provided below, and Appendix B includes the full literature review summary and white paper.

Common Stormwater Fee Methods and Structures

Impervious area is often the basis for stormwater fees because it reasonably estimates runoff contribution and pollutant loadings, and can be estimated through readily-available geographic information system (GIS) data. Approximately 80 percent of stormwater utilities use impervious area as the basis for calculating fees. The ERU system, which is based on impervious area, is by far the most widely used fee system for stormwater utilities, followed by the flat fee, tier, and REF systems. Other fee systems include those based on the gross area and intensity of development, size and number of water meters, gross property area, and number of parking spaces. However, these systems are much less common than ERU, flat fee, tier, and REF systems. When determining which fee system to adopt for the proposed stormwater utility, local governments typically consider the equitability, administrative costs, and transparency of the proposed system.

Legal Challenges from Implementing Stormwater Utilities

During the literature review, the research team identified several cases in which the implementation of stormwater utilities in the United States were subject to legal challenges. According to the 2014 study conducted by the National Association of Clean Water Agencies (NACWA), there are two central categories into which legal challenges against stormwater utilities can be classified:

- “Authority to enact, implement and fund program”: A local or regional entity must be legally authorized by the state to implement a stormwater program and assign stormwater user fees. Enabling legislation (e.g., state laws, constitution) varies among and within states, but if it is not clearly defined, stormwater fees may be deemed unconstitutional.
- “Legality of financing mechanism and methodology”: Many cases have sought to determine whether a stormwater user charge is a fee or a tax. If the charge is deemed a tax, it is unconstitutional in most cases because stormwater utilities do not have the legal authority to administer a tax. However, the charges have been considered fees in most cases. Additionally, several cases have challenged rate methodology and structure, how fees relate to the cost of services provided, and whether properties paying larger fees receive proportional benefits in stormwater services.

The research team also identified several best practices and lessons learned for developing stormwater utilities to avoid litigation, including:

- Striving for financial transparency, including the ability to justify fees and services provided;
- Charging fees proportional to the property’s contribution to stormwater runoff; and
- Enacting “voluntary” customer participation in the stormwater program or giving customers the option of opting-out if stormwater is managed on-site.

Potential Approaches for Reducing Stormwater Fees at Airports

According to the literature, the most effective approach for reducing airport stormwater fees is for airports to be involved in the planning and development of the stormwater fee structure during the early stages of the process. Utilizing credit systems that are commonly built into stormwater fees may also allow the airport to obtain a fee reduction. For example, if a property owner reduces stormwater runoff generated from the property through use of BMPs, the property owner may be eligible to apply for credits toward their stormwater fees. Finally, airports may be able to make the case for exemptions or use of an alternate fee structure through appeals or negotiation, even if the stormwater utility fee has already been implemented.

Participation in Development of Stormwater Utilities

While it is difficult for local municipalities to reach out to every stakeholder during development of stormwater utilities, it is critical to identify large impervious cover entities— such as airports—and involve them in the utility’s early stages of development. It is also important for municipalities to publicize the importance of the developing utility. Available guidance in the literature on the role of stakeholders in the utility development process is fragmented. The Water Environment Federation (WEF) published an article that provides guidance for avoiding “pitfalls” in setting stormwater utility fees and gaining stakeholder support. The WEF identifies the following key guidance:

- Stakeholders should be involved early in the utility development process to provide input on what will or will not work for them, informing the potential establishment of exemption and/or fee structures;
- Stakeholders should be encouraged to confirm what land they own and to share these findings with the utility;
- Stakeholders should routinely conduct surveys of their impervious surfaces to determine what areas should be included in the calculation of their stormwater fees; and
- Appeals or defenses are case-specific and may or may not apply to another property.

Airport staff participation in stormwater advisory committees allows continued engagement in decisions about the management of the stormwater utility even after its rate structure has been established. Case studies from the literature show that stakeholders who are involved in establishing and maintaining advisory committees benefit from direct access and input to decisions on updating rate structures for stormwater utilities.

Data Gaps Concerning Airport-Specific Challenges

Based on the literature review, the research team identified several areas where further information was needed to understand how airport-specific challenges factor into their experiences with stormwater fees and fee mitigation. Legal issues, regulatory compliance, and the added expense of stormwater fees were all common issues that airports have encountered with respect to stormwater management. The experience of the Hartsfield-Jackson Atlanta International Airport elucidated challenges with FAA guidance and the impact of airport-specific regulations on stormwater utility fees. The major gaps in information identified during the literature review included the following:

- The level of service provided by the utility, including how the level of service is represented in the fee, how the “voluntary” aspect of stormwater utilities factor into the level of service, and how airports can opt out if they treat their stormwater onsite;
- Potential revenue diversion considerations if an airport maintains its own stormwater infrastructure and pays a stormwater fee;

- Cases where airports pay stormwater fees to multiple jurisdictions, possibly with different structures and fee systems; and
- Stormwater fee allocations to tenants, including if costs are shared among onsite businesses, vendors, and/or airlines.

Additionally, general considerations regarding how stormwater fees affect an airport's annual budget and the nuances of the relationship between airports and stormwater utilities were highlighted as major areas in need of further investigation, specifically through discussions with case study airports and municipalities. The magnitude of fees, interactions with local municipalities, and available mitigation strategies were identified as concerns that were expected to vary among airport sizes and types, emphasizing the need for a diverse set of airports to be included as case studies.

Findings from the Focus Groups, Interviews, and Case Studies

The information obtained from the focus groups, interviews, and case studies informed the development of the guidebook. The Task 4 submittal *Revised Technical Memorandum on Focus Groups and Interviews* presented the results of the focus groups (with seven airports and three stormwater utilities), the interviews (with 12 airports and one stormwater utility), and the case studies (with four airports and their corresponding stormwater utilities). The findings from conversations with key airport personnel during these interactions are summarized below. Additional details are presented in the focus group and interview summaries, and the case studies (Appendix C).

Knowledge of Stormwater Utility and Fees

Challenge: Several airport challenges were identified during the interviews, focus groups, and case studies that could be overcome with increased knowledge of activities related to local stormwater utilities, organized internal communications, and increased communication and outreach with the local stormwater utility. For the most part, interviewed airport personnel were not involved during the development of the local stormwater utilities. They did not, therefore, have the opportunity to advocate for the airport's concerns regarding fees. In some cases, an airport's property spanned more than one jurisdiction, making it subject to fees from more than one utility and increasing the complexity of information airport staff need to be aware of.

Approach: Early and regular communication with the entities charging stormwater fees is essential to forging a bilateral working relationship and ensuring the airport's fair treatment under the stormwater fee structure.

Summary: First, it is essential for airports to understand which local agencies operate and maintain the local stormwater infrastructure to identify which agencies might implement stormwater fees. Airports should keep a list of the points of contact within the stormwater management agencies and review it annually for updates. An airport employee should be delegated as the primary point of contact for the local stormwater utility. The contact information for that designated airport staff member should then be provided to the stormwater utility to encourage prompt and accurate notification regarding any changes in stormwater programs or policies. Establishing communication and maintaining regular contact with those involved in a stormwater utility is key for the airport as it can foster information sharing both while a fee program is being developed and after it is in place.

If development of a stormwater utility is underway near an airport, then an advisory committee has likely been established by the local government to help garner public support. If an institutional advisory committee exists, the airport should join the committee if possible, or, at a minimum, connect with key members. All communication related to stormwater fees should be documented to share among airport staff and to maintain long-term records. Because the development, implementation, and operation of a

stormwater utility and its fee program are having long-term effects, it is important to maintain relevant and complete information to ensure continuity of communication during airport staff turnover.

In cases where an airport is located in more than one local stormwater utility jurisdiction, airports are encouraged to ask to be involved in the fee assessment process. Airport staff can then review impervious area calculations with the stormwater utility and, as necessary, request that the utility perform an on-site survey to check against the calculations. If the airport has adequate staff resources, airport managers might consider calculating the airport impervious area independently and providing the calculations to the stormwater utility.

Services Provided by Stormwater Utility Charging Fees

Challenge: Entities charging stormwater fees may not provide services for the operation and maintenance of stormwater infrastructure at airports.

Approach: Airports should understand whether the stormwater utility has the authority to provide stormwater management services to the airport and if so, which services are most appropriate.

Summary: Many of the airports that participated in interviews, focus groups, or case studies noted that they did not receive stormwater operation and maintenance services from the local stormwater utility. Some airports receive maintenance assistance, especially if the airport is city- or county-owned. This assistance may include removal of vegetation or trash at stormwater structures or from stormwater conveyances such as ditches. Also, stormwater utilities may maintain infrastructure outside of the airport property that benefits the airport. Services are more likely to be available if the airport is owned by the jurisdiction associated with the stormwater utility rather than another jurisdiction or a separate airport authority. In some cases, the stormwater utility may not be able to provide stormwater services to the airport because the airport is considered commercial rather than public property. Even if the utility cannot provide routine services to the airport, the airport may be able to contract services from the stormwater utility for certain situations, such as when specialized equipment is needed.

Some airports participating in interviews, focus groups, or case studies indicated that they did not request services from the utility because stormwater maintenance at airports requires specialized training. Although this is true for the airside, some airports have been able to receive services from the local stormwater utility on the landside, where maintenance of stormwater infrastructure does not differ greatly from maintenance at other property types. Such maintenance may include mowing, trash removal, and channel maintenance.

Scheduling to have airport infrastructure operation and maintenance done by stormwater utilities may also be challenging. One airport acknowledged that they can submit projects to the utility but admitted that it can take a while for the stormwater utility to complete the project due to other demands. As a result, this airport usually completes these projects itself before the utility can get to it. If the utility has the authority to provide services, it may be valuable to keep an open dialogue with utility staff to work out scheduling.

Applicability of Credit and Development/Redevelopment Requirements to Airports

Challenge: Stormwater BMPs included in stormwater utility fee credit programs may not be appropriate for airports.

Approach: In cases where the stormwater utility recommends BMPs for credit that are inconsistent with airport safety concerns, airports should request flexibility with respect to which BMPs are eligible in the crediting program based on the airport's unique characteristics.

Summary: State and local stormwater regulations may specify or promote particular BMP types that could conflict with safety concerns for an airport, such as standing water or certain types of vegetation that can attract wildlife. For example, to obtain stormwater fee credits, one airport was required to install bioswales on the airside to address increased stormwater runoff from a new fixed-base operator (FBO). Because the bioswale design could create standing water which could potentially attract wildlife, the airport has not installed the airside bioswales. Similarly, requirements for use of low-impact development BMPs may need to be reconciled with the airport's stormwater management needs when development or redevelopment is taking place. Some BMPs may serve as effective strategies for an airport's stormwater management but may not be automatically credited if they are not included in the local stormwater utility's credit program.

Use of some BMPs that potentially create standing water or certain types of vegetation within 10,000 feet of an airport runway may be discouraged by the FAA. Airports should confer with the stormwater utility regarding which BMPs will qualify for credits and whether there is flexibility if the airport needs to deviate from state or local stormwater management guidelines on which credits are based.

Revenue Diversion

Challenge: Stormwater fees that are not spent on the capital or operating costs of the airport may be considered revenue diversion.

Approach: As of the writing of this report, airports have not pursued or successfully leveraged the issue of revenue diversion to mitigate their stormwater fees. Some municipalities have argued that it is not revenue diversion because the municipality provides the airport with yearly funds; the stormwater fee is essentially returning a portion of the funds received back to the municipality. If the stormwater utility can provide services to the airport, that alleviates the concern about revenue diversion.

Summary: Several federally-funded airports participating in this study expressed concern that the payment of stormwater fees would be considered revenue diversion by the FAA and a violation of the Anti-Revenue Diversion Provision, 49 U.S.C. § 47133(a) because the fees are not expended for the capital or operating costs of the airport. No airports have pursued or successfully used this issue to mitigate stormwater fees. In some cases, FAA and other funding sources are tracked so that federal funds are not used to pay fees. In one case, at the Port of Portland, Oregon, it was determined by court decision, and affirmed in an appeal, that stormwater utility fees were not in violation of the FAA Grant Assurances. For clarification, it is recommended that airports considering this strategy for mitigation of stormwater fees consult their local FAA Regional or District office.

Mitigation Strategies to Address Multiple Challenges

Several additional approaches for airports to mitigate stormwater fees came to light during the interviews, focus groups, and case studies. Information about these approaches informed the development of the guidebook and are described below.

Including Fees in Lease Agreements: Airports may choose to include stormwater fees as part of their overall expenses upon which lease agreements are based. The airport may choose to charge tenants according to their use of the airport stormwater system.

Negotiating with Stormwater Utilities: Some airports have successfully reached agreements with their utilities to achieve fee reductions and exemptions through their on-site stormwater management practices and independence from the local stormwater system.

Advocating for Exemptions: Some stormwater utilities have exempted certain airport land uses from stormwater fees—including runways, taxiways, and aprons. In these cases, airports may still pay fees on

other areas (e.g., terminals and parking lots), or they may be exempt from stormwater fees entirely if they are owned by the municipality or county charging the fees.

Establishing a Municipal Separate Storm Sewer System (MS4): Establishing an MS4 separates an airport from the legal framework of the existing stormwater fee program. This approach requires legal expertise and negotiations with regulators to complete.

4. Conclusions and Recommendations

Local governments or stormwater utilities finance stormwater infrastructure projects, replacements and improvements to infrastructure, administration and permit compliance, and maintenance projects through stormwater fees collected from customers generating stormwater runoff. Because the rate structures stormwater utilities use to calculate fees are frequently based on the area of impervious surfaces on the property, airports—which have relatively large land holdings and vast areas of impervious surfaces—can be particularly impacted by these fees. The goal of ACRP Project 02-68 was to develop a guidebook that would inform airport practitioners about stormwater utility financing and strategies to manage stormwater fees at airports.

The best options for managing stormwater fees vary depending on airport size and type, governance, impervious surface area, and local stormwater management policies. While different portions of the guidebook may be applicable to each airport depending on their familiarity and experiences with stormwater utilities, the guidebook aims to provide stormwater management and fee mitigation guidance relevant to all airports. Some key points were consistently highlighted during the interviews, focus groups, and case studies conducted in the development of the guidebook; they are summarized in the following bullets.

- Understanding why stormwater programs are implemented, how they are developed and managed, how their fees are structured, and their applicability to airports, helps airport decision-makers and practitioners advocate for the fair treatment of the airport under their stormwater utility.
- While there are challenges to mitigating stormwater fees at airports, there are strategies featured in the guidebook that address those challenges. For example:
 - Utilizing stormwater fee mitigation strategies based on the airport’s land uses and stormwater management, including taking advantage of credits and exemptions and establishing an MS4;
 - Recovering stormwater fees from on-site tenants by including stormwater fees in the expenses upon which lease agreements are based;
 - Negotiating with the stormwater utility to achieve fee reductions and exemptions by demonstrating independence from the local stormwater system; and
 - Reviewing impervious area calculations to ensure accurate calculations and potentially working with the utility to consolidate parcels to reduce fees for airports paying parcel-based stormwater fees.

Because the approaches to mitigating stormwater fees may differ significantly between different airports, the guidebook resulting from this research project provides information about a variety of airport and stormwater utility experiences, perspectives, and strategies for fee mitigation. Each strategy is complex and involves case-specific considerations depending on the airport’s characteristics, the relationship between the airport and its stormwater utility, and the local stormwater management legal and policy framework in order to be effectively implemented. Additional tools and guidance may be needed to help airports successfully identify and implement stormwater fee mitigation strategies.

Bibliography

- Addison, TX. (2014). *Stormwater Utility: Frequently Asked Questions*. Retrieved from: https://addisontexas.net/ckeditorfiles/files/2014%20new%20site%20files/stormwater_faq.pdf.
- American Society of Civil Engineers (ASCE). (2013a). 2013 Report Card for America's Infrastructure. Accessed 19 Jan 2017: <http://www.infrastructurereportcard.org/>.
- American Society of Civil Engineers (ASCE). (2013b). 2013 Report Card for America's Infrastructure: Wastewater. Accessed 23 Jan 2017: <http://www.infrastructurereportcard.org/wastewater/>.
- American Society of Civil Engineers (ASCE). (2017a). 2017 Report Card for America's Infrastructure. Accessed 19 Jan 2017: <http://www.infrastructurereportcard.org/>.
- American Society of Civil Engineers (ASCE). (2017b). 2017 Report Card for America's Infrastructure: Wastewater. Accessed 2 March 2018: <https://www.infrastructurereportcard.org/cat-item/wastewater/>.
- Aschbrenner, J. (2015). Unpaid water fees highlight tension between City, Guard. *The Des Moines Register*. Accessed 19 Jan 2017: <http://www.desmoinesregister.com/story/news/local/des-moines/2015/11/06/unpaid-water-fees-highlight-tension-between-city-guard/74631356/>.
- Asotin County, WA. (2009). *Chapter 10.30 Storm Drainage and Surface Water Management Utility*. Retrieved from: http://www.asotincountystormwater.com/Content/SWAG/Pullman_Stormwater10_30.pdf.
- Berahzer, S.I. (2014). *Approaches to Stormwater Management: Stormwater Utilities and Green Infrastructure*. University of North Carolina at Chapel Hill Environmental Finance Center (UNCEFC). Retrieved from: https://efc.sog.unc.edu/sites/www.efc.sog.unc.edu/files/White%20Paper_Stormwater%20Overview%20for%20Rincon_GA_v6.pdf.
- Berthiaume, J., Quiroz, E., and J. Ivey. (2014). "Facilitating Fees: Avoiding the pitfalls in setting stormwater utility fees while getting stakeholder support." *Water Environment & Technology*. November 2014 Issue. Retrieved from: <http://stormwater.wef.org/2015/08/facilitating-fees/>.
- Black & Veatch. (2014). *2014 Stormwater Utility Survey*. Retrieved from: <http://bv.com/docs/default-source/management-consulting-brochures/2014-stormwater-utility-survey>.
- Campbell, W.C. (2010). *WKU Stormwater Utility Survey*. Bowling Green, KY: Western Kentucky University. Retrieved from: <http://www.wku.edu/engineering/documents/swusurveys/wku-swusurvey-2010.pdf>.
- Campbell, W.C. (2013). *WKU Stormwater Utility Survey*. Bowling Green, KY: Western Kentucky University. Retrieved from: http://www.wku.edu/engineering/civil/fpm/swsurvey/western_kentucky_university_swu_survey_2013.pdf.
- Campbell, W.C., Dymond, R.L., Kea, K., and A. Dritschel. (2014). *Western Kentucky University Stormwater Utility Survey*. Retrieved from: https://www.wku.edu/seas/documents/wku_swu_survey_2014_incorporating_rd_comments.pdf.

Campbell, W. C., Dymond, R. L., & Dritschel, A. (2016a). *Western Kentucky University Stormwater Utility Survey*. Retrieved from: <https://www.wku.edu/seas/documents/swusurvey-2016.pdf>.

Campbell, W.C., Dymond, R.L., Kea, K., and A. Dritschel. (2016b). WKU Stormwater Utility Database, personal communication. warren.campbell@wku.edu.

Campbell, W.C., Dymond, R., Key, K., and A. Dritschel. (2017). *Western Kentucky University Stormwater Utility Survey 2017*. Retrieved from: http://www.nctcog.org/envir/seecclean/stormwater/resources/SWU_Survey_2017.pdf.

CDM Smith. (2015). ACRP Legal Research Digest 25: Analysis of Federal Laws, Regulations, Case Law, and Survey of Existing Airport NPDES Permits Regarding Tenant-Operator Responsibilities under NPDES and Stormwater Management BMPs under Owner/Airport's Operating Permits. Transportation Research Board of the National Academies. <https://doi.org/10.17226/22101>.

Chesapeake Bay Foundation. (2015). *Local Stormwater Utilities, Authorities, and Fees*. Annapolis, MD. Retrieved from: http://www.cbf.org/document-library/cbf-guides-fact-sheets/Best-Practices-Guide_Stormwater-Utilities-and-Fees_Final89b4.pdf.

Chicago Metropolitan Agency for Planning (CMAP). (2013). *The Value of Stormwater Utilities for Local Governments in the Chicago Region*. Illinois. Retrieved from: <http://www.cmap.illinois.gov/livability/water/stormwater>.

City of Bangor. (2011). *Final Project Report: Bangor Stormwater Utility Planning (ARRA 604b)*. Retrieved from: <http://www.bangormaine.gov/filestorage/422/1924/1926/FinalProjectReport073011.pdf>

City of Bellevue, W. (2012, January). Retrieved from City of Bellevue Stormwater Management Guide: http://www.ci.bellevue.wa.us/pdf/Utilities/Stormwater_Guide_M1.pdf.

City of Durham, NC. Undated. Stormwater Appeals Form. Accessed 19 Jan 2017: <https://durhamnc.gov/844/Stormwater-Appeals-Forms>.

City of Fort Myers. (2009). *Policy for Adjustments of Stormwater Fees*. Retrieved from: <http://www.cityftmyers.com/DocumentCenter/View/1239>.

Douglas. (2014, April). *Hartsfield-Jackson Atlanta International Airport's Experience with Stormwater Fees*. Retrieved January 10, 2017, from Airports Council International-North America: http://www.aci-na.org/sites/default/files/douglas_stormwater.pdf.

EFC. (2014, January). *Local Government Stormwater Financing Manual: A Process for Program Reform*. Retrieved from University of Maryland Environmental Finance Center: Retrieved from: [https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_\(1\).pdf](https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_(1).pdf).

Evans, M. (2016). Commissioners debate airport de-annexation, stormwater fees. *Winston-Salem Journal*, p. 2. Retrieved from: : http://www.journalnow.com/news/local/commissioners-debate-airport-de-annexation-stormwater-fees/article_9524abc4-873d-5e26-804a-f2862a5ee6ec.html.

FAA. (August 2007). *FAA Advisory Circular No. 150/5200-33B - Hazardous Wildlife Attractants on or Near Airports*. Burlington, MA.

FCS Group. (January 2012). *Final Report for Effective Cost Recovery Structure for WSDOT, Jurisdictions, and Efficiencies in Stormwater Management*. Redmond, WA. Retrieved from: http://leg.wa.gov/JTC/Documents/Studies/Stormwater/StormwaterFinalReport_web.pdf.

Federal Aviation Administration (FAA). (2004). *FAA Advisory Circular No. 120-60B - Ground Deicing and Anti-Icing Program*.

Federal Aviation Administration (FAA). (2007a). *FAA Advisory Circular No. 150/5200-33B - Hazardous Wildlife Attractants on or Near Airports*.

Federal Aviation Administration (FAA). (2007b). *FAA Advisory Circular No. 150/5220-18A - Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*.

Federal Aviation Administration (FAA). (2013). *FAA Advisory Circular No. 150/5300-14C - Design of Aircraft Deicing Facilities*.

Federal Aviation Administration (FAA). (2015). The National Transportation Atlas Database 2015 (NTAD2015). Retrieved from:
https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_atlas_database/2015/index.html

Federal Aviation Administration (FAA). (2016). *FAA Advisory Circular No. 150/5200-30D - Airport Field Condition Assessments and Winter Operations Safety*

Florence, SC. (2007). Article IV. Drainage and Stormwater Management. *Code of Ordinances*. Retrieved from:
https://www.municode.com/library/sc/florence/codes/code_of_ordinances?nodeId=COOR_CH12MUUT_ARTIVDRSTMA.

Floyd, A. (2005). Airport budget woes partly due to new fee: Stormwater utility charge. *Athens Banner Herald*, p. 1. Accessed 19 Jan 2017:
http://onlineathens.com/stories/022605/new_20050226048.shtml#.WIEku032Z9B.

Hartsfield-Jackson Atlanta International Airport (ATL). (2014). *Hartsfield-Jackson Atlanta International Airport's Experience with Stormwater Fees*. Accessed 10 Jan 2017, from Airports Council International-North America: http://www.aci-na.org/sites/default/files/douglas_stormwater.pdf.

Houseal, I. (2013). Memorandum: Stormwater Service Charge Draft Finance Committee Recommendations to Council. *City of Portland, ME*. Retrieved from:
<http://portlandmaine.gov/DocumentCenter/View/5386>.

Hoyle, Tanner & Associates, Inc. (2006). *Credit Manual for Stormwater Fees*. South Burlington, VT. Retrieved from: http://www.sburstormwater.com/wp-content/uploads/downloads/manuals/credit_manual.pdf.

Jolley, J.W., Tuccillo, M.E., Young, M.L., Barrett, M., and Lantin, A. (2017). *ACRP Research Report 174: Green Stormwater Infrastructure Volume 1: Primer and Volume 2: Guidebook*. Transportation Research Board, Airport Cooperative Research Program. Retrieved from: <https://www.nap.edu/download/24817>.

Luck, T. (2016). City approves airport deal with County. *The Chronicle*. Retrieved from:
<http://www.wschronicle.com/2016/05/city-approves-airport-deal-county/>.

Maker, M. (2017). Public Outreach and Education (Figure). Annapolis, Maryland, USA: MFSG.

Mericas, D., Longworth, J., and K. Shannon. (2016). ACRP Research Report 169: Clean Water Act Requirements for Airports. Transportation Research Board of the National Academies. <https://doi.org/10.17226/24657>.

Metropolitan Area Planning Council (MAPC). (2014). *Stormwater Financing/Utility Starter Kit*. Retrieved from: http://www.mapc.org/sites/default/files/SW_financing-utility_kit_3-23-14_full.pdf.

National Association of Clean Water Agencies (NACWA). (2014). *Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs*. Washington, DC. Retrieved from: <http://stormwater.wef.org/wp-content/uploads/2015/01/NACWAs-Navigating-Litigation-Floodwaters.pdf>.

National Association of Flood and Stormwater Management Agencies (NAFSMA). (2006). *Guidance for Municipal Stormwater Funding*. Washington, DC. Retrieved from: <https://www.epa.gov/sites/production/files/2015-10/documents/guidance-manual-version-2x-2.pdf>.

New England Environmental Finance Center (NEEFC). (2005). Stormwater Utility Fees: Considerations & Options for Interlocal Stormwater Working Group (ISWG). Retrieved from: <http://digitalcommons.usm.maine.edu/water/5/>.

Northeast Ohio Regional Sewer District (NEORS). (2016a). Title V: Stormwater Management Code. *Code of Regulations of the Northeast Ohio Regional Sewer District*. Cleveland, OH. Retrieved from: http://www.neorsd.org/!Library.php?SOURCE=library/Title%20V_Stormwater-Management-Code_July-19-2012.pdf&a=download_file&LIBRARY_RECORD_ID=4274.

Northeast Ohio Regional Sewer District (NEORS). (2016b). *Stormwater Fee Credit Policy Manual*. Cleveland, OH. Retrieved from: https://www.neorsd.org/!Library.php?a=download_file&LIBRARY_RECORD_ID=4699.

Natural Resources Defense Council (NRDC). (February 2012). *Financing Stormwater Retrofits in Philadelphia and Beyond*. New York, NY. Retrieved from: <https://www.nrdc.org/sites/default/files/StormwaterFinancing-report.pdf>.

Pasco County, FL. (2016). *Stormwater Utility Fee: Frequently Asked Questions*. Retrieved from: <http://www.pascocountyfl.net/DocumentCenter/Home/View/6194>.

Peachtree City, GA. (2006). Article III. Stormwater. *Code of Ordinances*. Retrieved from: https://www.municode.com/library/ga/peachtree_city/codes/code_of_ordinances?nodeId=PTIICOOR_CH82UTSE_ARTIIIIST.

Pioneer Valley Planning Commission (PVPC) et al. (1998). How to Create a Stormwater Utility. Retrieved from: http://www.pvpc.org/sites/default/files/storm_util.pdf.

Port of Seattle. (2014a). *Stormwater Utility Charter*. Retrieved from: https://www.portseattle.org/About/Commission/Meetings/2014/2014_11_25_RM_6d_attach.pdf.

Port of Seattle. (2014b). *Memorandum: Second Reading of Resolution No. 3696, as amended, Authorizing Stormwater Utility Formation*. Seattle, WA. Retrieved from: https://www.portseattle.org/About/Commission/Meetings/2014/2014_11_25_RM_6d.pdf.

Reilly, F.J., Munson, K.M, Kobayashi, L.S., and M.D. Whooley. (2014). Stormwater Best Practices for State and Counties of Hawai'i. Hawai'i Community Foundation, Report HCF40C1. Retrieved from: https://www.researchgate.net/profile/Francis_Reilly/publication/289537354_Stormwater_Best_Practices_for_State_and_Counties_of_Hawai'i/links/568fcf0208aed0aed810b865.pdf?origin=publication_list.

Transportation Research Board (TRB). (2009). *Deicing Planning Guidelines and Practices for Stormwater Management Systems*. ACRP Report 14. Retrieved from: <http://www.trb.org/Publications/Blurbs/161758.aspx>.

Transportation Research Board (TRB). (2011). *Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids*. ACRP Report 45. Retrieved from: <http://www.trb.org/Publications/Blurbs/165328.aspx>.

Transportation Research Board (TRB). (2012a). *Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials*. ACRP Report 72. Retrieved from: <http://www.trb.org/Publications/Blurbs/167504.aspx>.

Transportation Research Board (TRB). (2012b). *Winter Design Storm Factor Determination for Airports*. ACRP Report 81. Retrieved from: <http://www.trb.org/Publications/Blurbs/168117.aspx>.

Transportation Research Board (TRB). (2014). *Critical Issues in Aviation and the Environment. Circular Number E-C184*. Retrieved from: <http://www.trb.org/Main/Blurbs/170577.aspx>.

Transportation Research Board (TRB). (2014). *Critical Issues in Aviation and the Environment. Circular Number E-C184*. Retrieved from: <http://www.trb.org/Main/Blurbs/170577.aspx>.

Transportation Research Board (TRB). (2015). *Balancing Airport Stormwater and Bird Hazard Management*. ACRP Report 125. Retrieved from: http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_125.pdf

U.S. Department of Transportation, Bureau of Transportation Statistics (BTS). (2016). *2015 U.S.-Based Airline Traffic Data*. Retrieved from: https://www.rita.dot.gov/bts/press_releases/bts018_16.

UMEF. (2014). *Local Government Stormwater Financing Manual: A Process for Program Reform*. Retrieved from University of Maryland Environmental Finance Center: [https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_\(1\).pdf](https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_(1).pdf)

United States District Court: District of Oregon, Portland Division. (2016). *Complaint for Declaratory and Injunctive Relief*. Retrieved from: https://www.acina.org/sites/default/files/1_complaint_for_declaratory_relief.pdf.

United States Environmental Protection Agency (U.S. EPA). (2003). Fact Sheet: *Protecting Water Quality from Urban Runoff*: https://www3.epa.gov/npdes/pubs/nps_urban-facts_final.pdf

United States Environmental Protection Agency (U.S. EPA). (2009). *Funding Stormwater Programs*. Retrieved from: <https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/FundingStormwater.pdf>.

United States Environmental Protection Agency (U.S. EPA). (2012). *Effluent Limitations Guidelines and New Source Performance Standards for the Airport Deicing Category; Final Rule*. Retrieved from: <https://www.gpo.gov/fdsys/pkg/FR-2012-05-16/pdf/2012-10633.pdf>.

United States Environmental Protection Agency (U.S. EPA). (2013). *Evaluation of the Role of Public Outreach and Stakeholder Engagement in Stormwater Funding Decisions in New England: Lessons from*

Communities. United States EPA, Office of Policy. Washington, D.C.: United States Environmental Protection Agency. Retrieved from: <https://www.epa.gov/sites/production/files/2015-09/documents/eval-sw-funding-new-england.pdf>.

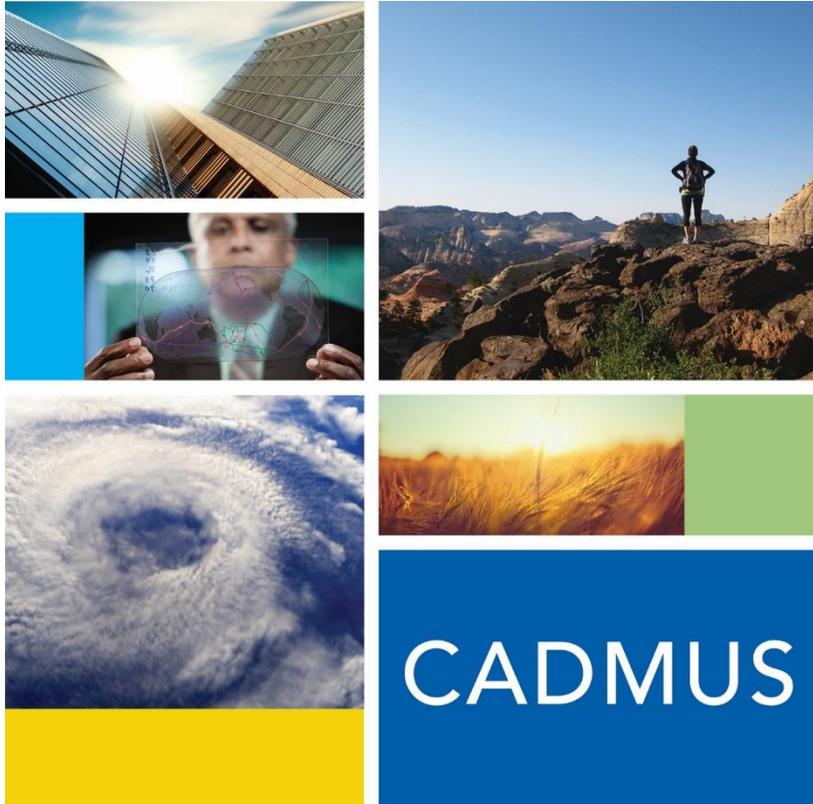
United States Environmental Protection Agency (U.S. EPA). (2014). *Getting to Green: Paying for Green Infrastructure, Financing Options and Resources for Local Decision-Makers*. EPA 842-R-14-005. Retrieved from: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100LPA6.txt>.

University of Maryland Environmental Finance Center (UMEFC). (2014). *Local Government Stormwater Financing Manual: A Process for Program Reform*. Retrieved from University of Maryland Environmental Finance Center: [https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_\(1\).pdf](https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_(1).pdf).

Vermont Agency of Natural Resources. (2002). *The Vermont Stormwater Management Manual: Volume I - Stormwater Treatment Standards*. Montpelier, VT. Retrieved from: http://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Resources/sw_manual-vol1.pdf.

Water Environment Federation (WEF). (2013). *User-Fee-Funded Stormwater Programs*. Alexandria: Water Environment Federation.

Appendix A. Data Collection Plan and Case Study Plan



**ACRP 02-68:
Data Collection Plan and
Case Study Plan**

March 13, 2017

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Introduction

This Data Collection Plan (Task 3) describes the methodology for using focus groups, interviews, and case studies in Phase II (Field Investigation and Practitioner Feedback) of this project to fill gaps identified in Task 2 (the literature review and white paper). The information collected during this stage will provide information needed to complete the guidebook. Work outlined in this Plan will proceed upon approval by the Project Panel.

Some of the critical gaps that were identified during the literature review and will be addressed during Phase II, include:

- How FAA guidance and other airport-specific regulations affect stormwater utility fees,
- How stormwater utility fees apply to airports whose property spans more than one jurisdiction,
- How consistently exemptions are allowed for taxiways and runways,
- How airports allocate the costs of stormwater fees,
- What services are provided to an airport by a stormwater utility if the airport manages their stormwater onsite, and whether the airport should be subject to stormwater fees,
- How airports deal with different types of stormwater fee structures,
- How airports have been involved in the development of stormwater utilities, and
- Which strategies airports have pursued to mitigate stormwater fees and which strategies have been effective.

While there are several agency documents and local news articles either briefly describing airport experiences with stormwater utility fees or alluding to airport inclusion in stormwater utilities, the available information pertaining to the relationship between airports and stormwater utilities is fragmented. The concerns, including magnitudes of fees, interactions with local municipalities, and available mitigation strategies are expected to vary among airport sizes, types, and geographic locations. The data collection plan presented here provides the approach we will use to interact with airports and a small number of municipalities to learn about their experiences and fill the data gaps.



Chapter 1: Data Collection Plan

Introduction

We propose to fill critical information gaps via a series of three focus groups (with three to five participants per group) and up to 15 interviews (under Task 4) to be conducted with airport staff and stormwater utility representatives. Additional detailed data will be gathered under Task 5 with three to five case studies. The objectives of the **focus groups** and the **interviews** are to:

1. Gain information about airport experiences, including information about any unpublished approaches to stormwater fee reduction currently being implemented at airports.
2. Gather information and references to help in final selection of airports for case studies.

The three focus groups will be conducted via web-enabled teleconference, each lasting up to an hour and a half. The groups will be organized based on characteristics such as airport region, size, and experience with stormwater fees. Up to 15 one-on-one interviews will be conducted via a half hour to one hour telephone calls to learn details about the airports' experiences and stormwater fee reduction strategies, including answers to any specific questions we may have. The general topics will be similar to those covered in the focus groups, but will allow more detailed discussion because of the one-on-one format.

The objectives of the **case studies** are to:

1. Collect more detailed information from selected airports regarding their experiences with stormwater fees and the challenges they have faced.
2. Learn about the strategies used by the case study airports to mitigate stormwater fees, including strategies that were successful and those that were not.

The case studies will be conducted via telephone discussions, each approximately two hours long.

The results from the focus groups and interviews will be presented in a technical memo for Project Panel review and approval during Phase II of the project. The results from the case studies will be presented in individual write-ups for Project Panel review and approval during Phase III of the project.

Identification of Potential Partner Airports and Stormwater Utilities

Our team has compiled a list of 31 confirmed and potential partner airports and ports for participation in the focus groups and interviews in Task 4 (Figure 1; Table A1- 1 in Appendix 1). The team is in varying stages of communication with our proposed airports and ports; 13 have committed to participate, and we are in communication with 18. The final composition of the list of these participants is subject to Project Panel review and approval.

Selection Process and Criteria

The list of proposed airports was developed to represent a range of airport sizes, climates, and geography. In addition, participants from municipalities and port facilities have been identified. Five airports submitted letters of interest at the time of the proposal. Additional airports were identified using a combination of research results for the literature review, recommendations from team members, locations of airports with respect to stormwater utilities, and other airport characteristics (airport size, climate zone, and FAA region). The final list of airport and municipal participants will be subject to Project Panel review and approval.

Review of Literature and Recommendations from Team Members.

During the research performed for the literature review for Task 2, we identified eight examples of airports located within stormwater utilities (one is exempt). Team members have also suggested 12 potential airports based on professional knowledge of the airports and high stormwater fees per unit area imposed by the local stormwater utilities.

Location within Stormwater Utilities

To identify airports located within stormwater utilities, we developed a dataset using geographic information systems (GIS) to capture those airports located within five miles of at least one stormwater utility. The analysis used geo-referenced locations from the WKU Stormwater Utility Survey (Campbell et al., 2014) in comparison to U.S. airports (based on the geo-referenced locations from the Department of Transportation (DOT) data¹). The database we developed indicates whether an airport in the DOT database is located within 5 miles of one or more stormwater utilities and identifies the stormwater utilities (i.e., municipalities), locations, and information on fees and fee types. This dataset does not indicate whether an airport is located within the boundaries of nearby utilities or if the airport is exempt from fees. We used the pool of airports identified as being close to stormwater utilities as a starting point and searched for additional information (e.g., articles, municipal codes, direct communication with the airports) to help determine whether or not potential airports are subject to stormwater fees.

Airport Size, FAA Region, and Climate Zone

The dataset developed to identify airports close to stormwater utilities also includes the FAA region, climate zone, and airport size for each airport:

Airport primary/non-primary and hub categories were calculated based on enplanement data, FAA categories (Table 1), and 2015 national air traffic data.^{2,3}

¹ U.S. Department of Transportation, Bureau of Transportation Statistics. The National Transportation Atlas Databases 2015 (NTAD2015):

https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_atlas_database/2015/liner

² https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories

³ https://www.rita.dot.gov/bts/press_releases/bts018_16



Table 1. Definition of FAA Airport Categories

Airport Classifications		Hub Type: Percentage of Annual Passenger Boardings	Common Name
Commercial Service: Publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service	Primary: Have more than 10,000 passenger boardings each year	Large: 1% or more	Large Hub
		Medium: At least 0.25%, but less than 1%	Medium Hub
		Small: At least 0.05%, but less than 0.25%	Small Hub
		Nonhub: More than 10,000, but less than 0.05%	Nonhub Primary
	Non-primary	Nonhub: At least 2,500 and no more than 10,000	Nonprimary Commercial Service
Nonprimary (Except Commercial Service)		Not applicable	Reliever and General Aviation

Source: https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories

Climate zone assignments are based on those developed by the *U.S. Department of Energy's (DOE) Building Technology Program*⁴, which divides the United States into regions based on temperature and relative humidity (Figure 1).

Geographic Distribution: Figure 1 also shows the FAA regions, which were used to ensure that the selected airports are distributed across the country.

Information on these characteristics was used to develop a list of potential airports that covers different airport sizes, FAA regions, and climate zones (Figure 1; Table A1- 1 in Appendix 1).

⁴ https://www1.eere.energy.gov/buildings/publications/pdfs/building_america/ba_climateguide_7_1.pdf

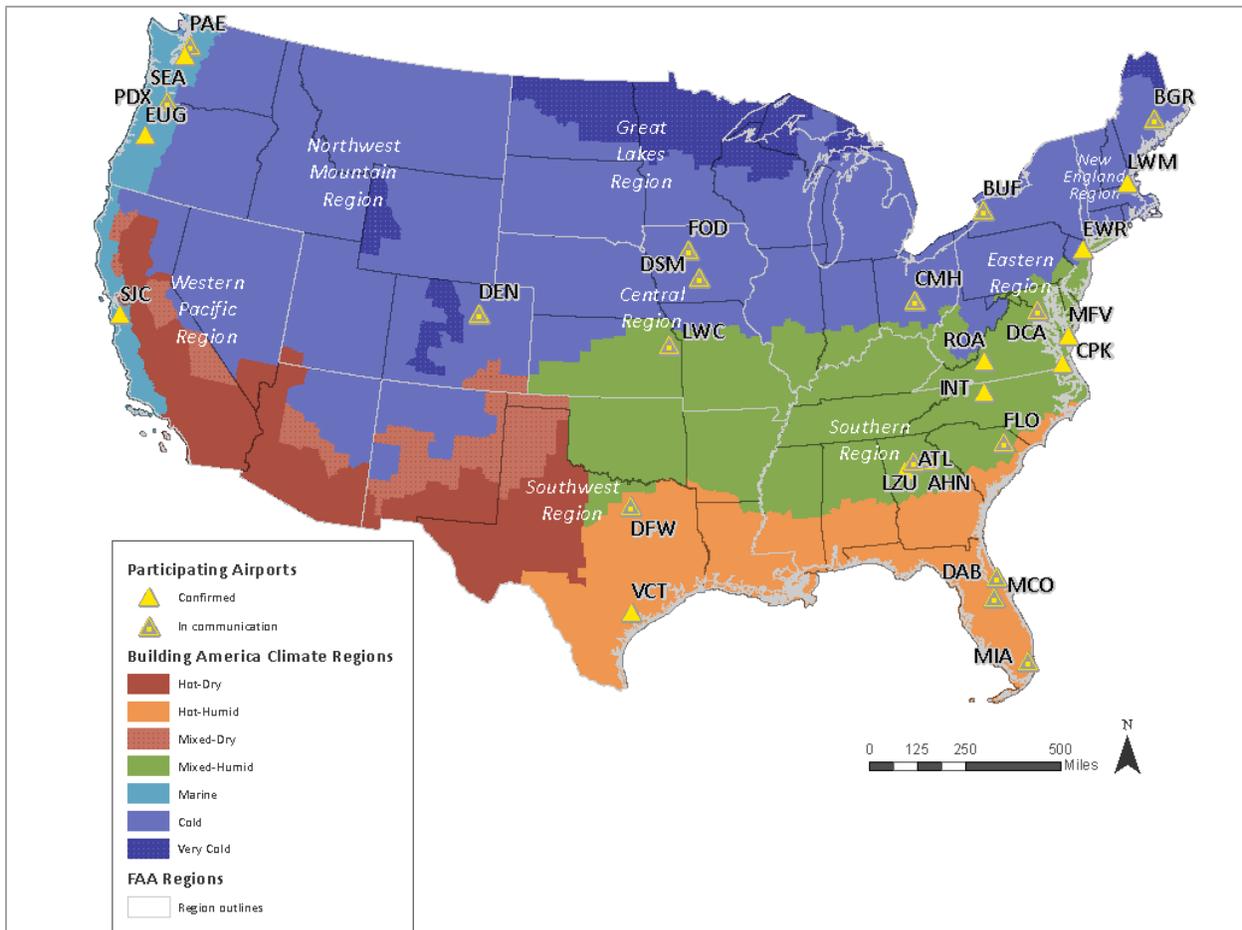


Figure 1. Map of Proposed Participating Airports for Focus Groups, Interviews, and Case Studies, along with FAA Regions, and Climate Zones

Utility Experiences

A proposed list of stormwater utilities was also selected to represent as much as possible those regions where stormwater utilities are most popular. The utilities proposed in Table 2 represent a range of characteristics, including exemptions and credits, and whether there have been appeals regarding stormwater fees. Three utilities have agreed to participate; the team is in communication with the other utilities in the table.



Table 2. Potential Stormwater Utilities for Focus Group

City/County	State	Status	Nearby Airport	Fee Type	ERU (sq. ft.)	Fee	Airport Involvement	Exemptions	Credits	Other
Abilene ¹	TX	Y	Abilene Regional Airport	Tiered		\$2.45				
Bangor ²	ME	P	Bangor International Airport	ERU	3,000	\$1.83	X ³			
Stuart ⁴	FL	P	Witham Field	ERU	3,707	\$3.95			X	
Norfolk ⁵	VA	Y	Norfolk International Airport	ERU	2,000	\$10.24				
Northeast Ohio Regional Sewer District ^{4,6}	OH	P	Northeast Ohio Regional Airport	Tiered	3,000	\$5.05		X ⁷	X	
Raleigh ⁴	NC	P	Raleigh–Durham International Airport	Tiered					X	
South Burlington ^{4,8}	VT	Y	Burlington International Airport	Tiered	2,700	\$5.94				X ⁹

Note: Information on exemptions, credits, etc. is based on current information available and may not be accurate or complete for all stormwater utilities (i.e., there may be exemptions, etc. that we are not yet aware of).

¹ <http://abilenetx.com/city-hall/departments/public-works/stormwater-services>

² <http://www.bangormaine.gov/filestorage/422/1924/1926/FinalProjectReport073011.pdf>

³ Airport representative involved in initial discussions.

⁴ Water Environment Federation (WEF). (2013). *User-Fee-Funded Stormwater Programs*. Alexandria: Water Environment Federation.

⁵ <https://www.norfolk.gov/index.aspx?NID=1689>

⁶ http://www.neorsd.org/ Library.php?SOURCE=library/Title%20V Stormwater-Management-Code July-19-2012.pdf&a=download_file&LIBRARY_RECORD_ID=4274

⁷ Airport runways or runways and taxiways are exempt from fee.

⁸ <https://www.epa.gov/sites/production/files/2015-09/documents/eval-sw-funding-new-england.pdf>

⁹ Airport made special payment arrangements with utility.

Selection of Airports and Utilities for Focus Groups and Interviews

The proposed airports and municipalities will be divided into focus groups and interviews. (A subset will also be recruited to serve as case studies; see Chapter 2). The team has used a combination of criteria as shown in Table 3 and described below to make preliminary assignments of participants to focus groups. Collectively, three to five participants in each of three focus groups amount to a total of nine to 15 focus group participants.

Table 3. Summary of Data Collection Methods

Data Collection Method	Selection Criteria	No. of Participants	Format
Focus Groups	(General) Climate, size	9–15 total	Group discussions
Two Airport Groups	Experience, fee structure, and geographic distribution	3–5 per group	1 to 1.5-hour group web-enabled conference or telephone discussion
One Stormwater Utility Group	Four regions where stormwater utilities are most popular	3–5 for this group	1 to 1.5-hour group web-enabled conference or telephone discussion
Interviews	Climate, geographic distribution, size	Up to 15	Brief half-hour to 1-hour individual telephone interviews
Case Studies	Experience with stormwater utilities, strategies to reduce fees, size, geographic distribution, governance, permit type, and complexity	3–5 airports	2-hour individual telephone interviews

Focus Groups

Our team will identify 3–5 participants for each of the three focus groups, as follows.

Two focus groups with airports/other transportation facilities: For each of these web-enabled teleconference focus groups, we will invite three to five airports. Group composition will be designed to provide a balance of types of experience with stormwater utility fees and fee structures, and geographic distribution. To the extent possible, we will include airports varying in type and size classifications and representing different climate zones. We anticipate that discussion among representatives from a diverse group will help highlight differences in concerns, challenges, and other experiences among different types of airports. Our priority, however, will be to engage practitioners or airports who offer the most valuable information for our research.

One focus group with stormwater utilities: The third web-enabled teleconference focus group will involve representatives from three to five stormwater utilities or jurisdictions charging stormwater fees, as identified above.



Interviews

Up to 15 partner airports will be selected for one-on-one telephone interviews from the pool of potential participants. (One to three representatives from other transportation facilities, such as ports, will be selected as well). These partners will be selected based on climate, geographic distribution, and size. Also, if an airport specifically requests either an interview or a focus group, we will attempt to accommodate that preference.

Conducting the Focus Groups

Each focus group will be approximately one to one-and-a-half hours in duration. Approximately three to five airports (or utilities and municipalities for the third group) will participate in each of the three focus groups, for a total of nine to 15 organizations. Focus groups will occur via teleconference or web-enabled video-conferencing platform at a mutually agreeable time. A suitable time will be arranged via a Doodle Poll or other similar process.

For facilitation, two team members will attend each focus group – a senior team member to facilitate the discussion, and a junior team member to record notes and transpose them to electronic format for further analysis and use. The focus groups will begin with a short PowerPoint presentation to introduce the goals of the group and to help initiate discussion.

Approximately one week before the focus groups, all participants will receive an introduction letter, a short list of Panel-approved questions, and an agenda of topics to be covered during the discussion. The short list of questions will enable the team to collect preliminary data and will enable more efficient use of the focus group session. The proposed pre-discussion questionnaire is included in Appendix 2.

During the focus groups, the primary facilitator will introduce the general topics for discussion and will draw upon our set of proposed questions (Appendix 2, Section A2-2) to initiate and guide discussion. In this way, we will focus on the types of information needed to help fill information gaps identified during the discovery phase. We will submit the set of questions to be used during the discussions for Project Panel review and approval, and the final set of questions will be tested at the first focus group.

Topics that may be covered during the focus groups include but are not limited to:

- Rationale for establishing a stormwater fee collection system.
- Typical fees paid per month by airports and other transportation facilities.
- Common fee structures and their respective advantages and disadvantages.
- Relationship between fees charged and services provided.
- Financing stormwater infrastructure capital improvements and O&M.
- Airport strategies for working with the utilities.
- Airport strategies for obtaining exemptions or credits to reduce fees.
- Suggestions regarding which airports would be good candidates for case studies.

We anticipate that the discussion topics will evolve during the focus groups depending upon the experiences of the participants. We will also assess whether the participant airports are willing and able

to share information and documents on the stormwater fees they pay and how those fees fit into their overall budgets, any regulatory issues they are facing, their overall stormwater management practices, their experiences interacting with the local stormwater utilities, and type of data and information; where appropriate, we will request permission to use such data. (This information will also help in clarifying the best choices for case studies.)

The first focus group will occur via teleconference or web-enabled video-conferencing platform at a time determined to be convenient for as many parties as possible. Based on the results of the first focus group, our team will refine the questions for the remaining focus group sessions.

The potential focus group participants will be selected from those listed in Table A1- 1 in Appendix 1 and are subject to Project Panel approval. The distribution of participants among the groups will be finalized as telephone and email communications proceed over the coming weeks and we establish the various airports' schedules.

After the focus groups, notes will be compiled and distributed to the Project Panel and will also be sent to the participants to solicit corrections. If needed, follow-up calls may be made to the participants to clarify information. The outcome of these focus groups will be synthesized during incorporation into the guidebook.

Conducting the Interviews

We will undertake up to 15 individual interviews to gather additional information from specific airport practitioners. Each interview will last approximately half an hour to one hour and will be conducted by telephone unless interviewees are located close enough to a team member to make an in-person meeting cost-effective. Participants will be sent an introductory letter, questions, and topics similar to those provided to focus group participants.

An interview protocol will be developed, including a list of interview questions for each airport to guide the team interviewer. Interview questions will be developed based on the questions asked and topics covered in the focus groups, but they will be refined for greater specificity and will take into account issues and questions raised during the focus groups. We will submit a set of standard interview questions for Project Panel review and incorporate the Panel's feedback into the final set of interview questions.

The standard set of questions will be tailored as appropriate for the individual airports (e.g., going into the specifics of their experience with stormwater fees or other information known about the airport). Also, questions will be further refined based on the results of the first one or two interviews.

As with the focus groups, notes will be compiled after the interviews. The notes will be distributed to the Project Panel and will also be sent to the participating airports to solicit any corrections. If needed, follow-up calls may be made to the participating airport staff to clarify information. The outcome of these interviews will be synthesized during incorporation into the guidebook.



Chapter 2: Preliminary Case Study Plan

Introduction

The objective of the case studies is to present concrete examples of airport experience with stormwater fees and strategies used to mitigate fees. Case study write-ups will include lessons learned and will be written in an easily digestible manner and with sufficient detail to assist airport practitioners in understanding how stormwater fees have affected different airports and how airports have addressed challenges associated with stormwater fees. The information collected for the case studies will be included in the guidebook.

This case study plan describes how the case studies will be conducted and is subject to Project Panel approval.

Case Study Selection

From the pool of partner airports who participate in the interviews and focus groups, we will identify case study candidates based on a set of criteria that balances several factors such as airport size and type, geography, and climate. We will also take into account various factors as we learn about them through the focus groups and interviews:

Experience with Stormwater Utilities: Airports that pay stormwater fees will have varying degrees of experience with the jurisdictions charging such fees. At one end of the spectrum, an airport may have little experience with stormwater utilities and may have only recently begun to pay fees. At the other end of the spectrum, an airport may have paid fees supporting local stormwater infrastructure for many years and successfully (or unsuccessfully) managed the costs of such fees. Some airports may have participated in the local municipality’s development of a stormwater utility. Others may have found it necessary to appeal all or part of the fees. We will gain a fuller understanding of each airport’s experience during the focus groups and interviews.

Stormwater Fee Structure: The fee structure imposed by the stormwater utility or local government determines which strategies an airport can consider to mitigate stormwater fees in that jurisdiction. As a result, the fee structure will be one of the criteria by which candidates for interviews and focus groups will be selected. The fee structure for utilities can be extracted from the 2014 WKU Stormwater Utility Survey (Campbell et al., 2014) and from preliminary questions that we will ask prior to focus groups and interviews.

Governance: Our team will use the governance structure of the airport and local government to identify case studies to include in the Guidebook. Governance of the airport is critical to understanding what strategies may be used to manage stormwater fees. For example, it is expected that an airport owned by a municipality charging stormwater fees may have more leverage to negotiate rates or exemptions than one that is owned and operated by the county or state government or an independent authority.

Permit Type and Complexity: The requirements of the stormwater discharge permit at a given airport usually drive the implementation of stormwater fees. As a result, the type and complexity of the discharge permit will be used to identify appropriate case study examples.

At this time, we have identified five airports whom we may invite to participate at the case study level (Table 4). We will further vet this list and make any appropriate changes according to the above selection criteria as the interviews and focus groups progress and we learn more about airport experiences. A key criterion in the final selection will be the airports’ availability and willingness to provide the extra effort and input to serve as a case study.

Table 4. Preliminary Identification of Potential Case Study Airports

Airport	Airport Code	City	State	Fee Type	Notes on Selection
Smith Reynolds Airport	INT	Winston Salem	NC	Tiered	Airport has volunteered to serve as a case study. Fees are extremely burdensome to the airport, and options are being sought for resolution. Good example of a small airport for whom fees are a serious hardship.
Hartsfield-Jackson Atlanta International Airport	ATL	Atlanta	GA	ERU	Airport faces high fees. Its property spans more than one county and municipality with stormwater utilities.
Des Moines International Airport	DSM	Des Moines	IA	Flat	Would provide diversity in geography and climate (central U.S., cold climate) and fee structure. Issue with the National Guard, which is located at the airport, refusing to pay fees.
Norman Y. Mineta San Jose Intl	EUG	San Jose	CA	Tiered	Provides diversity in size (medium hub), geography (west coast), and climate (marine).
Bangor International Airport	BGR	Bangor	MA	ERU	Small New England Airport. Utility has relatively low rates. Airport was involved in the development of the stormwater utility.

Conducting the Case Studies

Case studies will involve an additional phone interview with airport representatives lasting approximately 2 hours. This longer call will allow us to discuss in greater detail the topics that were covered in the initial focus groups or interviews in which the airports will have participated.

As with the focus groups and interviews, two team members will attend each call – a senior team member to facilitate the discussion, and a junior team member to take notes. The case study interviews may or may not be web-enabled, depending upon whether the airport representatives or the team wishes to share their screens to show data or graphics as part of the discussion.



Approximately one week before a case study interview, the participant will receive an agenda of topics to be covered during the discussion and a short list of requests for data or documents (if the airport is willing and able to share them). A questionnaire will also be sent, similar to that sent prior to the focus groups and interviews, but containing more detail and targeted to any specific issues the airport is in a position to address (e.g., particular problems they have faced or strategies they have implemented). A brief list of example topics for a case study interview is provided in Appendix 3: Case Studies—Example Preliminary Information Requests and Interview Content More specific agendas and the pre-interview questionnaire will be developed based upon the outcome of the focus groups and interviews.

Participants will be given the opportunity to review and comment on the resulting case study write-ups. We will also invite case study airports to review the draft guidebook.

Appendices

Airport/Port/Airline Name	Code	City	State	Status	Airport Size					Geographic Distribution							Climate						
					Large Hub	Medium Hub	Small Hub	Other Primary	Non-primary	New England	Eastern	Southern	Central	Great Lakes	Southwest	Northwest Mountain	Western Pacific	Very Cold or Cold	Hot-Dry	Hot-Humid	Marine	Mixed-Dry	Mixed -Humid
Orlando International Airport	MCO	Orlando	FL	P	X							X								X			
Port of Portland		Portland	OR	Y												X					X		
Port of Seattle		Seattle	WA	Y												X					X		
Portland International Airport	PDX	Portland	OR	P		X										X					X		
Roanoke Regional Airport	ROA	Roanoke	VA	Y				X			X												X
Ronald Reagan Washington National	DCA	Washington	DC	P	X						X												X
Seattle-Tacoma International Airport	SEA	Seattle	WA	Y	X											X					X		
Smith Reynolds Airport	INT	Winston Salem	NC	Y					X			X											X



Airport/Port/Airline Name	Code	City	State	Status	Airport Size					Geographic Distribution							Climate						
					Large Hub	Medium Hub	Small Hub	Other Primary	Non-primary	New England	Eastern	Southern	Central	Great Lakes	Southwest	Northwest Mountain	Western Pacific	Very Cold or Cold	Hot-Dry	Hot-Humid	Marine	Mixed-Dry	Mixed -Humid
Snohomish County (Paine Fld)	PAE	Everett	WA	P					X												X		
Victoria Regional Airport	VCT	Victoria	TX	Y					X		X									X			
TOTAL				31	8	4	1	5	7	2	6	7	3	1	1	7	1	7	0	4	5	0	10

Appendix 2. Focus Group and Interview Discussion Questions

A2-1. Pre-Discussion Questionnaire and Discussion Questions

Pre-Discussion Questions for Airports

1. To which communities do you pay stormwater fees? (Does your property span more than one municipality or county?)
2. What is the structure of the fee you pay (flat, tiered, ERU, etc.), and what is the fee based on (e.g., impervious area)?
3. How long has your airport been subject to stormwater fees? Have the fees increased/decreased over time?
4. How much do you pay per month? Per year?
5. How do you recover the costs of stormwater fees (e.g., do you charge airlines and other businesses on the property)? How do you allocate stormwater fees to tenants? Are costs shared among airlines as well as businesses and vendors onsite?
6. How do stormwater fees affect your airport's operations and finances? Do stormwater fees considerably impact your airport's annual budget? If yes, what percentage of your annual budget do stormwater fees constitute?

Pre-Discussion Questions for Stormwater Utilities

1. When was your utility established and how long have fees been charged?
2. What is the structure of the fee (flat, tiered, ERU, etc.)? Does the structure differ between residential and non-residential customers? If the fee is ERU-based, what is the ERU?
3. What is the fee based on (e.g., impervious area)?
4. What services does your stormwater utility provide? Do these services differ between residential and non-residential customers?
5. If a property collects and treats stormwater runoff onsite, is it still charged a fee?
6. Which land uses are exempted?
7. Do you have a credit program? If so, how long has it been in place?
8. Can you send us data, documents, and web links related to fees, codes, ordinances, and budgets?

Suggested Talking Points to Include in Focus Group and Interview Agenda/Introductory Letter
Stormwater Management. How your facility manages stormwater and how your present and planned stormwater management relates to the goals and services of the stormwater utility.

Experience with Stormwater Fees. Your involvement and experience with stormwater utilities, the history of the stormwater utility, and the impacts of fees on the airport's budget.

Stormwater Program Exemptions and Credits. Which land uses are exempt, whether airports have initiated requests to be exempted, and a discussion of credit programs.



Regulatory and Other Conflicts. How well stormwater fee programs agree with airport-specific regulations (e.g., revenue diversion), operational practices, and airport planning.

A2-2. Expanded Set of Suggested Talking Points and Questions for Focus Group and Interview Discussions (Internal for Team and to be Adapted and Refined for Interviews)

Talking Points and Questions for Focus Groups and Interviews with Airports

Airport Background: Stormwater Management

1. How does your airport manage stormwater? Is stormwater exclusively managed/treated on-site? Where is stormwater discharged to? Does the stormwater utility help you with stormwater permit compliance?
2. What are stormwater concerns for your airport? What are the pollutants of concern at your airport? What drainage problems do you have at your facility?
3. How does the stormwater fee relate to stormwater management at the airport? Does your airport benefit from the stormwater utility? In what ways? What services does the airport receive from paying the fee?
4. Do you have an impervious surface inventory (i.e., impervious area that generates stormwater runoff that is treated or controlled by airport stormwater management vs. impervious area that generates stormwater runoff that is controlled or treated by the stormwater utility)?
5. Are there ways in which the stormwater utility *could* assist or help with stormwater management on airport property?

Airport Strategies for Reducing Fees

Development of the Fee

1. How and when did you find out about the proposed fee and how it might impact your airport?
2. To what extent were you involved in the development of the stormwater fee or the stormwater utility? Were you ever contacted by a local municipality or proponent of the stormwater utility? Were you invited to attend public meetings or discussions regarding the proposed utility?
3. If you were involved in the planning stages, were you able to provide input and negotiate? Could you offer advice to an airport involved (or looking to get involved) in this early planning?
4. If you were not involved in the planning stages, do you think it would have made a difference? Would you have been able to negotiate a less expensive fee and/or a fee structure more favorable to airport properties? Might you have been able to negotiate exemptions or credits?
5. Do you know what percentage of the stormwater utility's total revenues your fees constituent?
6. Do you consider "airport involvement in the development of a stormwater fee" to be an effective strategy in reducing potential stormwater fees paid by airports?

Stormwater Credit Programs/Incentives

1. Are you eligible to participate in a stormwater credit program tied to your fee? If yes, could you explain the program? Is there a uniform credit program for both residential and non-residential



- customers? What do you receive a credit for (e.g., reducing impervious area, incorporating GSI, etc.)? How much credit do you receive?
2. Has your airport been incentivized by a reduction in stormwater fees to install GSI BMPs or other stormwater management measures? Has your airport considered installing GSI BMPs to reduce fees? Do you foresee this happening in the future?
 3. On average, do the reduced fees equal or outweigh the costs of installing GSI BMPs or other stormwater management infrastructure?
 4. What are some issues related to stormwater credit programs? Do you think these programs appeal equally to airports versus other customers?
 5. Do you consider “making use of stormwater credit programs” to be an effective strategy in reducing stormwater fees paid by airports?

Exemptions and Appeals

1. Is your airport or part of your airport (i.e., runways and taxiways) exempt from the stormwater fee? What is the rationale behind the exemption?
2. How did your airport (or part of the airport) come to be exempt? Was it written into the original fee and municipal code? Did the airport negotiate for an exemption or make an appeal to the utility? When did the exemption go into effect?
3. Have you ever appealed a fee you believed to be unfair? What was the rationale behind the appeal? If so, what was the result of the appeal?
4. Do you consider “negotiating for exemptions (at least partial)” to be an effective strategy in reducing stormwater fees paid by airports?
5. Do you consider “appealing the stormwater fee” to be an effective strategy in reducing stormwater fees paid by airports?

Other Approaches

1. Are there other strategies not discussed here that you consider to be effective in reducing stormwater fees paid by airports?
2. What advice and lessons learned would you offer to other airports in addressing stormwater fees?

Airport-Specific Challenges

1. How do stormwater fee programs conflict with airport-specific regulations (e.g., revenue diversion)? Has your airport faced concerns over revenue diversion due to simultaneously maintaining your own stormwater infrastructure and being subject to a stormwater utility fee?
2. How do stormwater fee programs conflict with airport operations (e.g., wildlife management)? If the stormwater fee includes a credit program, how is the airport limited by FAA regulations in reducing impervious area or incorporating GSI?
3. Does the stormwater fee program take these limitations into consideration?

4. How do airports deal with stormwater fees from multiple jurisdictions with different structures and fee systems? How does your airport track which parcels of land fall under which jurisdiction to prevent “double-dipping” (i.e., paying two different fees for the same parcel)?
5. What are some other conflicts or challenges airports have experienced with stormwater utility fees?

Talking Points and Questions for Focus Group with Utilities

Development of the Stormwater Fee

1. Describe public outreach to communities affected by the potential stormwater fee. Did you reach out to airports and other properties with large amounts of impervious area? To what extent were these stakeholders involved in initial planning and development of the stormwater fee?
2. How did you decide the structure of the fee? Did the public and other stakeholders weigh in on this?
3. Was there opposition to the fee? From whom?
4. Were any exemptions to the fee considered at that time?
5. Was a stormwater credit program considered at that time?
6. Did you coordinate with other utilities in nearby municipalities for those areas that fall under multiple jurisdictions?

Stormwater Credit Program

1. Does your stormwater utility include a stormwater credit program?
2. Why is a stormwater credit included or not included?
3. Please describe the stormwater credit program.
4. Does the program differ between residential and non-residential properties?
5. Has the program been successful? Are large property owners (particularly airports) incentivized to participate?

Exemptions and Appeals

1. Are any properties (particularly airports) exempt from the stormwater fee?
2. Please explain exemptions and the rationale behind exempting certain properties over others.
3. Are properties allowed to appeal a stormwater fee they believe it to be miscalculated or unfair?
4. If so, have you received many appeals? In general, what is the outcome of these appeals?

Ongoing Implementation

1. What are some ongoing issues you have experienced in implementing stormwater fees as they relate to large properties? Is there ongoing opposition or has the fee been accepted for the most part?
2. Has anyone refused to pay the fee?
3. Have airports and other large properties subject to more expensive fees practiced any other strategies in trying to reduce their fees?



Appendix 3: Case Studies—Example Preliminary Information Requests and Interview Content

We anticipate requesting the following materials from airports if they are available and approved for use in a case study write-up:

- Airport maps showing facilities and layout, boundaries of airport property, municipal or county boundaries, and stormwater management infrastructure and BMPs.
- Organization chart depicting staff involved with sustainability and/or stormwater management.
- NPDES permit (MSGP, MS4, or individual stormwater permit).
- Stormwater Pollution Prevention Plan (SWPPP), master plan, and sustainability plan.
- Agreement or ordinance defining airport role and responsibilities for stormwater management vis a vis the responsibilities of the utility or agency.
- Data and schematics on existing stormwater BMPs, including any that are designed to minimize site runoff (i.e., green stormwater infrastructure).
- Stormwater fees paid over the last several years and documentation of credits (if applicable).
- Any publicly available documents related to requests for exemptions or other challenges to stormwater fees.

Pre-interview questions and discussion points will be developed based on information gained during the focus groups and one-on-one interviews. They will be similar in general scope to those for the focus groups and interviews, but will contain greater detail and focus on further exploring the specific situations for each airport.

Appendix B. Literature Review Summary and White Paper

ACRP 02-68 Task 2: Literature Review Strategies for Reducing Local Stormwater Utility Fees at Airports

January 2017

Prepared for
ACRP
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The National Academies

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES PRIVILEGED DOCUMENT

This report, not released for publication, is furnished only for review to members of or participants in the work of the CRP. This report is to be regarded as fully privileged, and dissemination of the information included herein must be approved by the CRP.

The Cadmus Group, Western Kentucky University, MFSG, and Parametrix.

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Introduction: Why Local Governments Use Fees to Finance Stormwater Infrastructure

Many local governments are facing large capital and operating expenses to replace aging stormwater infrastructure and to build new systems to comply with regulations and accommodate increased stormwater volumes due to climate change and development (i.e. increased impervious areas). According to the latest report card from the American Society of Civil Engineers (ASCE), the cost of replacing aging infrastructure in the US will reach \$3.6 trillion by 2020 (ASCE, 2013a). The report found that over the next 20 years wastewater and stormwater needs would require \$298 billion in capital investments (ASCE, 2013b). These national numbers reflect the current challenges that local governments encounter to fund infrastructure in a political and economic climate where using other forms of public financing may no longer be viable (i.e., raising other taxes).

The regulatory climate has also increased the cost of maintaining stormwater infrastructure as revisions to EPA National Pollutant Discharge Elimination System (NPDES) stormwater regulations have resulted in additional monitoring and operation and maintenance (O&M) requirements. For example, at the federal level, the promulgation and implementation, in 2004, of the NPDES Phase II stormwater regulations has resulted in prescriptive stormwater requirements to improve water quality. The Phase II regulations required municipalities above a certain population to develop and implement a stormwater management plan and a set of 10 measures that have increased the cost of stormwater management in many cases. In order to finance the staff and equipment to implement these plans, many local governments have turned to stormwater fees. In 2004, a peak expansion occurred in governments incorporating stormwater fees, corresponding to implementation of the Phase II regulations (Campbell, 2010).

Despite growing stormwater concerns, many municipalities lack a source of funding intended solely for stormwater management (WEF, 2013). There are several funding sources available, including taxes and general funds, stormwater utilities, fees, grants, bonds, loans, and public-private partnerships. However, many of these options may be inequitable (US EPA, 2014). For example, property taxes are deposited into a general fund, which is then used to fund a wide range of local agencies, including but not limited to public works, police and public safety, parks and recreation, transportation, social services, and education. Although stormwater management can be funded through a general fund, it may not be considered a high-priority compared to other public services. Furthermore, taxes may not be equitable as they exempt certain groups and properties and are based on value. As a result, taxes are not directly tied to how much stormwater runoff a certain property generates. As shown in Table 1, the source of funding that appears to provide a dedicated, equitable funding source is a stormwater utility (US EPA, 2014).

Table 1: Funding Options for Stormwater Management (Source: US EPA, 2014)

Funding Source	Description	Advantages	Disadvantages
Taxes and General Funds	Funds raised through taxes such as, property, income, and sales that are paid into a general fund.	<ul style="list-style-type: none"> • Consistent from year-to-year • Uses an existing funding system 	<ul style="list-style-type: none"> • Competition for funds; • Tax-exempt properties do not contribute; • System is not equitable (does not fully reflect contribution of stormwater runoff)
Fees	<p>Funds raised through charges for services such as inspections and permits.</p> <p>Funds raised through developer impact fees are one-time charges linked with new development.</p>	<ul style="list-style-type: none"> • Specific permit and inspection fees allow for more direct allocation of costs for services provided • Addresses potential stormwater impacts related to new construction 	<ul style="list-style-type: none"> • Funding not available for larger projects or system-wide improvements • Developer impact fees may be an unreliable source when development slows (due to market downturns/contractions) • Requires administrative framework to assess and manage
Stormwater Utility	A stormwater utility generates its revenue through user fees and the revenues from the stormwater charges will go into a separate fund that might be used only for stormwater services.	<ul style="list-style-type: none"> • Dedicated funding source • Directly related to stormwater impacts • Sustainable, stable revenue • Shared cost • Improved watershed stewardship • Addresses existing stormwater issues 	<ul style="list-style-type: none"> • Feasibility study required for implementation, fee structure, and administration of utility • Approval by vote of the local legislative body • Perception by the public of a “tax on rain”
Grants	State and federal grants provide additional funding for water quality improvements and flood protection.	<ul style="list-style-type: none"> • Existing sources available for stormwater-related funding • Does not require repayment 	<ul style="list-style-type: none"> • Competitive • Typically one-time, project-specific, or time-constrained funds • Often requires a funding match
Bonds	Bonds are not a true revenue source, but are a means of borrowing money. “Green” bonds are a new source of funding dedicated to environmentally friendly projects, including clean water projects.	<ul style="list-style-type: none"> • Existing sources available for stormwater-related funding • Can support construction-ready projects • Can provide steady funding stream over the period of the bond 	<ul style="list-style-type: none"> • One-time source of funds • Requires individual approval for each issuance • Requires full repayment • Possible interest charges • Requires dedicated repayment revenue stream • May require design-level documents to be prepared in advance • Likely requires voter approval • Can have high transaction costs relative to requested amount

Funding Source	Description	Advantages	Disadvantages
Loans	Low-interest loans may be secured, but are generally used for planning and capital projects.	<ul style="list-style-type: none"> Existing sources available for stormwater-related funding Offers low- or no-interest financing 	<ul style="list-style-type: none"> One-time source of funds Requires full repayment
Public-Private Partnerships	Contractual agreement between a public agency and a private sector entity that allows for the private sector participation in the financing, planning, design, construction, and maintenance of stormwater facilities.	<ul style="list-style-type: none"> Can reduce costs to government Significantly leverages public funding and government resources Ensures adequate, dedicated funding Improved O&M Shared risk 	<ul style="list-style-type: none"> Perceived loss of public control Assumption that private financing is more expensive and belief that contract negotiations are difficult

Given increasing stormwater management needs and a lack of adequate funding, some communities in the US have established stormwater utilities (WEF, 2013). A stormwater utility is an entity that operates like a water utility. It has the ability to administer and collect user fees that are used to fund the stormwater management program (MAPC, 2014; NAFSMA, 2006; US EPA, 2009). A service fee may be implemented in the absence of a stormwater utility (MAPC, 2014). However, it can be argued that establishing a stormwater utility provides further benefits.

According to a recent survey of stormwater utilities, a stormwater utility consists of a program that defines stormwater needs, a governing body, and a funding mechanism (i.e., user fee) to ensure adequate funding to meet anticipated stormwater needs (Black & Veatch, 2014). A stormwater utility assesses the community's current and future stormwater needs, establishes a fee charged to residential, industrial, and commercial properties based on these needs and related to services provided by the utility to control and treat stormwater, and implements projects to address stormwater management within the community. There are some initial obstacles in planning and successfully implementing a stormwater utility, including implementing a feasibility study, the need to gain public support, and the need for an approval vote from the local jurisdiction. However, these obstacles are usually outweighed by the important benefits of stormwater utilities:

- 1. Stormwater utilities are intended to provide a reliable and dedicated funding source.** Revenue from stormwater utility fees are intended to be used solely for stormwater management. This eliminates the competitive aspect related to other sources of funding (e.g., general fund, grants, loans, etc.) (Black & Veatch, 2014; CMAP, 2013; UMEFC, 2014; MAPC, 2014; WEF, 2013; US EPA, 2014).
- 2. Stormwater utility fees are more equitable compared to other stormwater funding mechanisms.** It is important to note that a fee is not a tax. Therefore, tax-exempt properties (e.g., churches, hospitals, public properties, and schools) are subject to the fee. In addition, stormwater utility fees are often based on a property's impervious area rather than its value. Furthermore, stormwater utility fees are directly related to the service benefits received by

customers (Black & Veatch, 2014; CMAP, 2013; UMEFC, 2014; MAPC, 2014; WEF, 2013; US EPA, 2014).

- 3. Stormwater utilities can encourage watershed stewardship through incentivizing property owners to reduce stormwater runoff.** Stormwater utility programs often include a credit system, offering property owners a rebate if they reduce impervious area or implement measures to treat and reduce stormwater runoff. (Black & Veatch, 2014; CMAP, 2013; UMEFC, 2014; MAPC, 2014; US EPA, 2014; WEF, 2013).
- 4. Stormwater utilities allow for enhanced coordination of NPDES Compliance.** The 2014 Black & Veatch stormwater utility survey found that 73 percent of respondents must comply with both NPDES and MS4 permit requirements. Communities that implement stormwater utilities will be able to more effectively manage compliance with permit requirements (MAPC, 2014).

Stormwater utilities were first implemented in the 1970s and have been growing in popularity since, with approximately 1,600 identified in the US in a 2016 survey (Campbell et al., 2016a). There is a wide variety of stormwater utilities across the United States. Furthermore, the 2013 WEF report on user-fee-funded stormwater utilities notes that “there are varying degrees of detail in user fee programs for stormwater,” regarding fee method and structure, credit systems, and enabling legislation granting the utility the authority to administer a fee, among other factors. The report identifies “a key distinguishing characteristic” of stormwater fees that factors into a utility’s overall success and effectiveness: the fee “reflects a reasonable estimate of the need for service caused by specific customers of the system” (WEF, 2013).

Common Stormwater Fee Methods and Structures

In the process of developing a stormwater utility, future stormwater costs and needs must be projected. Fees are then based on these projected costs to meet stormwater needs. The intent is to establish a rational nexus between the user fee and the cost of providing a service (Black & Veatch, 2014; MAPC, 2014; WEF, 2013). It is imperative for a stormwater fee to be highly visible in order to be accepted by the public and local government. A 2013 WEF report regarding stormwater utility fees explains that stormwater service demands are made up of “multiple cost-causative parameters,” including such factors as “peak rate of runoff, volume of discharge, pollutant contribution, and customer service” (WEF, 2013). However, evaluating these parameters to establish fees is complex, requires intensive data collection and analysis, and would be difficult for the general public to understand. As a result, property characteristics (e.g., impervious area, gross area, and intensity of development) reasonably estimate runoff contribution and may be used as a basis for stormwater fees or for establishing a unit of service. Impervious area is most commonly used as a basis for setting stormwater fees because it is tied to runoff rates and pollutant loadings, and corresponding GIS data are readily available (NAFSMA, 2006). Impervious area of parcels is generally a data point that is readily available in more real property databases maintained for local property tax administration. According to the 2014 Black & Veatch stormwater utility survey, approximately 80% of stormwater utilities used impervious area as the basis for calculating fees.

The Equivalent Residential Unit (ERU) system, based on impervious area, is by far the most widely used fee system for stormwater utilities (Campbell et al., 2016a; CMAP, 2013; MAPC, 2014; US EPA, 2009; WEF, 2013). The 2016 WKU database identified approximately 762 ERU utilities in the US (Campbell et al., 2016b). It is also called by other names such as Equivalent Service Unit or Equivalent Runoff Unit, but the basic idea is the same: “an ERU is generally defined as the average impervious area on a single-family residential (SFR) parcel” (US EPA, 2014). In some cases, an ERU may be represented by the median impervious area on an SFR parcel or the average of all residential parcels (CMAP, 2013; US EPA, 2014; Campbell et al., 2016a). The ERU method strikes a balance between complexity and equity compared to flat fees (which are too simple and not as equitable) and other more complex methods (which are also more equitable, but generally much more expensive to maintain). Another benefit of the ERU method is that it has withstood several legal challenges. One drawback is that it only accounts for impervious cover and does not consider runoff generated from pervious surfaces (Reilly et al., 2014). In some parts of the country (particularly the Southwest), the soils are expansive and with water can become nearly impervious making it difficult to measure and justify the use of the ERU method to establish a rate.

To establish an ERU, a community or its contractor estimates the average impervious, or hard, surface of a SFR parcel. Impervious surface is defined as pavement, building footprint, sidewalks, decks, etc. The theory is that the amount of impervious surface has a strong correlation to the amount of runoff produced by the property, and therefore, the fee is more transparent to the public (MAPC, 2014). A base fee, or a single ERU fee, is charged for a SFR parcel. In the US, the median ERU is approximately 2,900 square feet, and the median monthly base fee is approximately \$4.00. Fees for multi-family and non-residential parcels are also based on their respective impervious area relative to the ERU (Chesapeake Bay Foundation, 2015; CMAP, 2013; MAPC, 2014; US EPA, 2014; Campbell et al., 2016a). For instance: if a community has a 3,000 square foot ERU and a \$4.00 base monthly fee, a small store

with 30,000 square feet of impervious surface would have a fee equivalent to 10 ERUs and would pay \$40 per month for its stormwater fee. In some systems, residential property owners pay for a single ERU regardless of the size of the home. In other fee systems, residential properties are divided into small, medium, and large properties with each division having a different fee so that the owner of a 1,000 square foot bungalow is not paying as much as a 30,000 square foot mansion. Properties with large amounts of impervious surface (e.g., airports and shopping malls) benefit from a larger ERU because the impervious area is divided by the area that makes up one ERU.

The second most popular fee system is the flat fee (Campbell et al., 2016a). The 2016 WKU database has identified 233 flat fee systems (Campbell et al., 2016b). One positive benefit of flat fee systems is that they greatly reduce administrative costs since it is a relatively simple structure. On the other hand, flat fee systems are not as equitable as ERU systems (Reilly et al., 2014). In a flat fee system, every parcel pays the same stormwater fee. The fee may be determined by spreading the cost across properties based on some relevant standard (e.g., land use) or spread generally across properties at a similar rate (MAPC, 2014). This system benefits parcels with large amounts of hard surface because they would pay the same as a single-family home. A variation on the flat fee is a dual system where residential properties pay one fee and nonresidential properties pay another, usually higher fee. For example, residential properties in Warren County, Kentucky pay \$4 a month and nonresidential properties pay \$11 per month. The WKU database has identified 106 dual fee systems.

The third most widely used fee system is the tier system, used by at least 230 communities (Campbell et al., 2016b; 2016a). Impervious area is divided into tiers, and each property falling within a given tier pays the same stormwater fee. For example, one tier might range from 20,000 to 50,000 square feet of impervious surface. Any property falling within that tier would pay the same fee. For instance, a property with 20,001 square feet of impervious surface would pay the same fee as a property with 49,999 square feet. The community will have several tiers. Ultimately, properties with very large amounts of impervious surface such as airports would normally pay less in this system than in an ERU system. (An ERU system is essentially tier system with an infinite number of tiers.)

A fourth fee system is the Residential Equivalent Factor (REF) system (Campbell et al., 2016a). The 2016 WKU database has identified 139 REF systems (Campbell et al., 2016b). These are quite popular in Minnesota, but only a few are found in other states. In this system, the runoff from a standard storm is determined using standard hydrologic methods for an average single family residential property. Runoff from other properties is determined by the same method. Fees are based on the ratio of runoff from the property in question to that of the average single family residential property. For example, if the standard storm is 2 inches in 24 hours, then if an average residential property produces 0.5 inches of runoff and a commercial property produces 1.5 inches of runoff, then the commercial property would pay 3 times as much per acre as residential properties. The standard storm might be defined in the ordinance as 2 inches, or the average 1-year, 24-hour storm, or other storms. The amount of rainfall chosen is crucial for the calculation of the fee. The higher the amount of rainfall in the standard storm, the lower the fee for non-residential properties. The less the rainfall amount, the more it benefits residential customers.

Some methods used involve gross area and intensity of development, rather than impervious area alone. The intensity of development (ID) method categorizes parcels (including vacant and undeveloped properties) based on the percentage of impervious area relative to the parcel's gross area. The

equivalent hydraulic area (EHA) method bills parcels based on the runoff generated from both pervious and impervious surfaces (US EPA, 2009; WEF, 2013). These methods may be considered more equitable and more robust compared to the ERU approach, but they are often resource-intensive to implement and more complicated to explain to customers compared to impervious area methods (Reilly et al., 2014; US EPA, 2009). Therefore, they are less commonly used by local governments.

Other fee systems are used, including fees based on the size and number of water meters, the gross property area, and the number of parking spaces. These methods are much less common than the systems discussed above (i.e., ERU, REF, tiered, flat).

US EPA suggests these additional factors should be considered when setting a stormwater utility fee: population size, poverty rate, median household income, and geographical or other site characteristics (US EPA, 2014). Stormwater utilities should also consider including a credit program for property owners, which is discussed in the next section. See Table 6 for examples of stormwater utility fees in the US (Reilly et al. 2014).

Table 2: Stormwater Utility Fee Examples (Source: Reilly et al., 2014)

Location	Fee type	Fee structure	Description
Aurora, IL ^a	Flat fee	Water and sewer service account holders charged a flat bimonthly fee.	Aurora's stormwater management fee fund is financed primarily through a \$6.90 bimonthly charge to each residential and business water and sewer service account.
Bay County, FL ^b	Flat fee	Residential and non-residential: stormwater utility fee billed annually as a non-ad valorem charge on the Bay County Property Tax Bill.	The Board of County Commissioners approved a stormwater utility ordinance in 2005, which established a flat stormwater fee for developed residential and non-residential parcels.
City of Ann Arbor, MI ^c	Impervious surface fee—tiered system	Single and two-family res: four rate tier system, depending on the square footage of impervious area. Commercial and other: billed on the basis of impervious area per acre, plus a quarterly customer charge.	One of the first cities to provide incentives to reduce impervious area. It now raises about \$5 million/year for stormwater management. The city uses a parcel-based fee system in which impervious surfaces are identified via aerial photography. Residents can view their property online and dispute areas that have been classified as impervious.
Philadelphia, PA ^d	Impervious surface fee—ERU	Residential: based on the average amount of impervious cover on residential properties in the city (ERU). Non-residential: based on property's specific square footage of impervious area and the total square footage.	Switched from a fee system based on monthly water consumption to a parcel-based fee system based on impervious surface area. This added 50,000 new stormwater-only customers (commercial parking lots and other properties without water service). This decreased charges for 6,000 existing customers and increased rates for 28,000 customers. The increased fees have been enough to encourage some property owners to install green practices.
Arvada, CO ^e	Impervious surface fee—actual impervious	Residential and non-residential: based on the actual amount of impervious area on a single parcel.	Arvada has measured the impervious area of every parcel in the city, and fees are based on the amount of impervious area. Every property in town has a different fee. According to Arvada's website, the stormwater management utility service charge for 2014 is \$0.00298 per 1,000 square feet of impervious area located on property per bi-monthly billing.
West Saint Paul, MN ^f	Impervious surface—REF fee	REF fee setting method: Single-family res: single REF Commercial or other: REF based on the volume of runoff generated.	West Saint Paul's REF system is based on the Natural Resources Conservation Service (NRCS) method of calculating runoff. Soils are divided into four hydrologic groups with different infiltration rates. Properties are assigned REFs on the basis of land use (single family res, other res, public/semi-public, commercial, or industrial).

Legal Challenges from Implementing Stormwater Utilities

The introduction and implementation of stormwater utilities in the United States has been subject to some legal challenges. Campbell (2013) identified 76 legal challenges in the US, with 16 cases ending in a decision that was unfavorable to stormwater utilities (Figure 1). A 2014 study conducted by the National Association of Clean Water Agencies (NACWA) highlights two central categories for stormwater utility legal challenges:

- “Authority to enact, implement and fund program” (NACWA, 2014): A local or regional entity must be legally authorized by the state (via state laws, constitution, etc.) to implement a stormwater program and assign user fees. The legality of an individual stormwater utility is essentially derived from state or local laws, including “the constitutional and statutory provisions governing the authority of local governments and special purpose districts in your state, as well as the case law interpreting those provisions” (NAFSMA, 2006). Enabling legislation varies among states and within states, but if it is not clearly defined, that may be cause for a stormwater fee to be deemed unconstitutional.
- “Legality of financing mechanism and methodology” (NACWA, 2014): Many cases have sought to determine whether a stormwater user charge is, in fact, a fee or a tax. If the charge is deemed a tax, it is unconstitutional in most cases because stormwater utilities do not have the legal authority to administer a tax. However, in most cases, the stormwater charges have been considered to be fees (CMAP, 2013; NACWA, 2014). In addition, several cases have challenged rate methodology and structure, how fees relate to the cost of services provided, and whether properties paying larger fees receive proportional benefit in stormwater services (NACWA, 2014; NAFSMA, 2006).

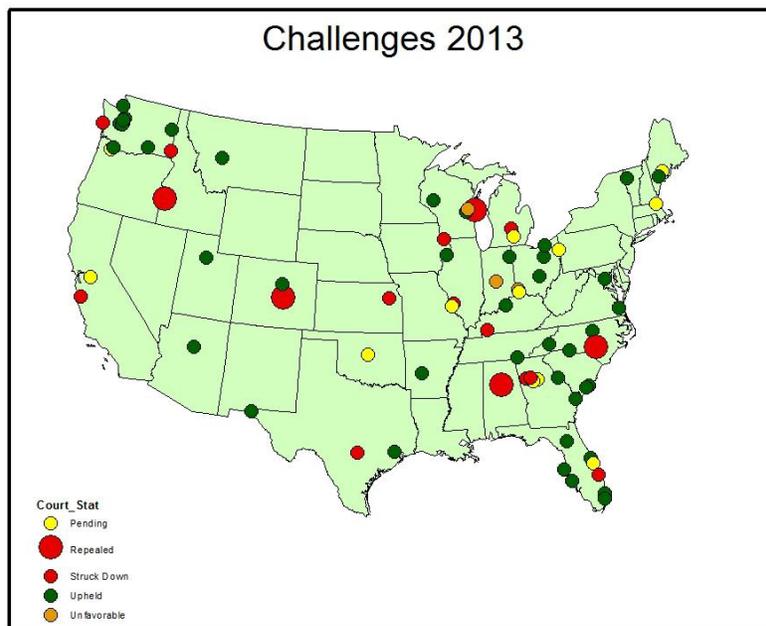


Figure 1: Stormwater Utility Legal Challenges and Outcomes (Source: Campbell, 2013)

For the most part, stormwater utility fees have been upheld in court cases, but litigation can and should be avoided. The best approaches to avoiding litigation is for major stakeholders (e.g., airports) to be involved in the development and maintenance of a stormwater utility and for the stormwater utility to conduct extensive public outreach to the community during early planning. Of course, it is also important for stormwater utilities and stakeholders to understand what is permissible by state and local laws. The authors of the NACWA white paper conclude by emphasizing that the "...legality and viability of any specific fee program will be based on a variety of factors including the specific structure of the fee and the specific law of the state in which the utility is located. What works in one state may not work in another" (NACWA, 2014). Despite the overall importance of local and state laws, several best practices and lessons learned in developing stormwater utilities can be extrapolated from past cases, including:

- Stormwater utilities should strive for the utmost financial transparency with the ability to justify fees and services provided;
- Fees charged to specific properties (particularly those with large amounts of impervious area) should be proportional to contribution to stormwater runoff; and
- Customer participation in the stormwater program should be "voluntary," or customers should have the option to opt-out if stormwater is managed onsite (NAFSMA, 2006).

Potential Approaches to Reduce Stormwater Fees at Airports

Airports may be subject to significant stormwater fees because of large amounts of impervious surface from parking lots, terminals, ramps, runways, and taxiways. For example, the Roanoke-Blacksburg Regional Airport paid up to \$200,000 in stormwater fees in 2016 (without credits) (source: personal communication with W. Campbell, 2017). In addition, airports face many challenges in complying with strict stormwater regulations and potentially conflicting Federal Aviation Administration (FAA) regulations (TRB, 2014). As EPA imposes new standards and states and local governments expand their stormwater requirements to meet local needs and water quality improvement goals, airports must rebuild or expand impervious infrastructure while meeting new stormwater rules requiring expensive and maintenance intensive best management practices (BMPs). In some cases, these BMPs not only address runoff from new impervious areas and runoff management needs but also from existing impervious areas. The cost challenges are exacerbated by limited BMP options. For example BMPs like stormwater detention ponds can be wildlife attractants. The use of such ponds within 10,000 feet of an airport runway is discouraged by the FAA for safety reasons (TRB, 2014).

The most effective approach to reduce stormwater fees is for airports to be involved with planning and developing the stormwater fee structure from an early stage of the process. Another approach is for airports to utilize credit systems commonly built into stormwater fees. Credit systems may offer a fee reduction, for example, if a property owner reduces stormwater runoff generated from his/her property. Finally, if a stormwater utility fee has already been implemented, airports can still make the case for exemptions or a different fee structure through appeals and negotiation.

Table 3 provides examples of airports located within the jurisdiction of stormwater utilities. The table includes the stormwater fee method, and any approaches taken to mitigate airport stormwater fees (if known). Stormwater utility data (fee type, ERU, fee) are provided by Campbell et al. (2016a), and from other sources listed in Table 3.

Table 3: Examples of Airport Stormwater Fees and Mitigation

Airport Name	City/County	State	Fee Type	ERU (sq. ft.)	Fee	Initial Involvement	Exempt	Credits	Appeal	Other	Source
Portland International Jetport	Portland	ME	ERU	1,200	\$6.00		X ¹				Houseal, 2013
Southwest Florida International Airport	Fort Myers	FL	ERU	500	\$0.96		X ²				City of Fort Myers, 2009
Atlanta Regional Airport-Falcon Field	Peachtree City	GA	ERU	4,600	\$3.95		X ¹				Peachtree City, 2006
Smith Reynolds Airport	Forsythe County	NC	Tiered	43,560	\$69.25				X ³		Evans, 2016 ; Luck, 2016
	Winston-Salem	NC	Tiered	43,560	\$69.25				X ³		
Hidden Lake Airport; Pilot County Airport-X05	Pasco County	FL	ERU	2,890	\$3.92		X ¹				Pasco County, 2016
Athens-Ben Epps Airport	Athens-Clarke County	GA	REF		\$3.50				X ³		Floyd, 2005

Airport Name	City/County	State	Fee Type	ERU (sq. ft.)	Fee	Initial Involvement	Exempt	Credits	Appeal	Other	Source
Florence Regional Airport	Florence	SC	ERU	2,500	\$3.50			X			Florence, 2007
Hartsfield - Jackson Atlanta International Airport*	Clayton County	GA	ERU	2,950	\$3.75			X			ATL, 2016
	College Park	GA	ERU	3,523	\$3.00			X			
Addison Airport	Addison	TX	Tiered	1,000	\$2.75		X ¹				Addison, 2014
Portland International Airport	Portland	OR	ERU	1,000	\$3.24		X ⁴				US District Court, District of Oregon, 2016 ; Personal communication with J. Rosholt (Parametrix)
Des Moines International Airport	Des Moines	IA	ERU	2,349	\$10.95					X ⁵	Aschbrenner, 2015
Pullman-Moscow Regional Airport	Asotin County	WA	ERU	3,500	\$7.00		X ¹				Asotin County, 2009
Burlington International Airport	South Burlington	VT	Tiered	2,700	\$5.94					X ⁶	US EPA, 2013

Airport Name	City/County	State	Fee Type	ERU (sq. ft.)	Fee	Initial Involvement	Exempt	Credits	Appeal	Other	Source
Bangor International Airport	Bangor	ME	ERU	3,000	\$1.83	X ⁷					City of Bangor, 2011
Seattle-Tacoma International Airport*	SeaTac	WA	Negotiated Interlocal Agreement		\$443,000 per year					X ⁸	Port of Seattle, 2014 ; Personal communication J. Rosholt (Parametrix)
Spokane International Airport	Spokane	WA	ERU	43,560	\$926		X ⁹				Personal communication J. Rosholt (Parametrix)
Eugene Airport*	Eugene	OR	Tiered	1,000	\$1.49						Campbell et al. (2016a)
Roanoke-Blacksburg Regional Airport*	Roanoke	VA	ERU	500	\$0.90						Campbell et al. (2016a)
Chesapeake Airport	Chesapeake	VA	ERU	2,112	\$7.35						Campbell et al. (2016a)
Bowling Green-Warren County Regional Airport	Warren County	KY	Dual		\$4/month (residential); \$11/month (non-residential)						Campbell et al. (2016a)

* Included in ACRP 02-68 proposal preliminary list of partner airports.

¹ Airport runways or runways and taxiways are exempt from fee.

² Entire airport is exempt from fee.

³ Airport has requested stormwater utility to exempt runways and taxiways from fee.

⁴ Airport is exempt from fee because it operates and maintains own stormwater.

⁵ Some airport properties refuse to pay fee.

⁶ Airport made special payment arrangements with utility.

⁷ Airport representative involved in initial discussions.

⁸ Fees go toward retirement of stormwater bonds through 2018. Identified projects benefit both the City and the Port.

⁹ Airport and adjacent business park is exempt through a joint operating agreement as long as the airport maintains its own stormwater system.

Proactive Participation in Development of Stormwater Utilities

Much guidance exists for local municipalities interested in developing a stormwater utility. In particular, local municipalities are encouraged to engage in extensive public outreach and stakeholder involvement programs, as public and stakeholder support is a major factor in the success of stormwater utilities. Local communities must make the case for decaying infrastructure, the potential for large EPA fines, and other causes that may resonate with the public to gain political support. While it is difficult to reach every stakeholder, it is important to publicize the importance of a stormwater utility to the community so that everyone understands the need. Potential stormwater utilities may specifically target non-residential property (i.e., properties with larger amounts of impervious area) owners to gain support. WEF (2013) identifies “large impervious cover entities such as airports and rail and ship yards” as a group of stakeholders that should be targeted by stormwater utilities during the early planning and feasibility stages. Airports should be contacted in these early stages, but this is not always the case. Furthermore, little guidance exists for the role of the various stakeholders in the development process. WEF has published an article that provides guidance to avoid “pitfalls” in setting stormwater utility fees and gaining stakeholder support (Berthiaume et al., 2014). This article also includes tips for the industrial stakeholder to ensure that the fee is developed and maintained appropriately from the customer’s point of view. Guidance includes:

- “Stay informed of stormwater fee programs”: This piece of guidance is a given but important to emphasize. Stakeholders should get involved early to enable them to provide input on what will or will not work for them. This would be the time to put forward recommendations for exemptions and fee structures. Furthermore, industrial and commercial stakeholders can encourage the utility to perform field surveys of their property instead of relying solely on GIS data.
- “Parcel awareness”: The authors of this WEF article encourage stakeholders to confirm what land they own and to share these findings with the utility, particularly if property cuts across city and county lines.
- “Impervious surface inventory”: Stakeholders should routinely conduct surveys of impervious surface to determine what can be included in stormwater fees. The guidance includes delineating “areas that are benefited by utility infrastructure and those that treat stormwater onsite or discharge to other systems.” In short, customers should ensure they are paying for impervious surface that generates stormwater runoff that is either controlled or treated by the utility.
- “Respect the differences”: What works as an appeal or defense for one property may not necessarily work for another. The authors note this is especially applicable to stakeholders with multi-jurisdictional properties (Berthiaume et al., 2014).

While the aforementioned tips are rather general, they do apply to airports. These tips delve into the more finite details of assessing stormwater fees (e.g., cross-cutting jurisdictional boundaries, what is served by the utility and what is served by onsite systems, etc.) that are particular to each property and become more complex when dealing with larger properties. In short, the guidance provided encourages stakeholders to take a proactive approach in assessing potential fees.

In addition, there are opportunities for airport managers to continue to engage in decisions about the management of stormwater utilities, after development of the utility rate structure, by participating in

stormwater advisory committees. In case studies of stormwater utilities in Northeast Ohio, Raleigh, North Carolina, and Palo Alto, California, lessons learned included establishing and maintaining advisory committees (WEF, 2013). These committees have direct access and input to decisions on updating rate structures.

Stormwater Credits

A stormwater credit system has been widely cited as an important aspect of stormwater utilities (CMAP, 2013; MAPC, 2014; NAFSMA, 2006; US EPA, 2009; US EPA, 2014; WEF, 2013). The 2014 Black & Veatch stormwater utility survey found that 44 percent of stormwater utilities included in the survey offer a credit program, while 56 percent do not. According to the survey: “Stormwater credits are ongoing reductions to a property’s calculated stormwater charges that are given to properties that either reduce demand on the stormwater system and/or reduce the utility’s cost of service through functional stormwater management practices and Best Management Practices (BMPs)” (Black & Veatch, 2014). In other words, stormwater credits, or a reduced stormwater fee, are given to property owners that reduce or treat stormwater runoff onsite. The idea is that property owners are incentivized to install, for example, green stormwater infrastructure (GSI) BMPs by the credits, which result in fee reduction.

Stormwater credit systems are quite varied, and ongoing reduction in fees can be accomplished through credits obtained via various mechanisms. This can be done through maintenance of stormwater treatment practices according to established standards (e.g., sizing, construction, criteria). For example, the Vermont Stormwater Management Manual (Vermont Agency of Natural Resources, 2002) describes structural and non-structural criteria and restrictions. The City South of Burlington offers credits to “single non-family residential properties” that construct and maintain stormwater treatment practices (STPs). The city allows multiple credits to be given, with the total not to exceed 50% of the stormwater fee for the property (Hoyle, Tanner & Associates, Inc., 2006). Similarly, the Northeast Ohio Regional Sewer District (NEORS) offers credits for use of stormwater control measures or other activities that “...reduce or alleviate the District’s cost of providing a regional stormwater management program...” (NEORS, 2016b). Some systems (e.g., Portland, OR) may allow a fee reduction up to 100% if properties manage stormwater runoff on site (US EPA, 2014). Other systems may prioritize different stormwater management practices. In Minneapolis, MN, for example, the stormwater credit program offers up to a 50 percent credit towards fees if a customer has implemented management practices that improve stormwater *quality* but offer up to a 100 percent credit if a customer has implemented management practices that address the *quantity* of stormwater runoff (US EPA, 2014).

In terms of stormwater quality generated from airports, deicing chemicals are of particular concern, especially since the late 1980s. At that time, many airports with deicing operations were required to switch from general NPDES permits to individual permits (TRB, 2014). In addition, EPA has developed airport deicing effluent limitation guidelines (ELG). These requirements, promulgated in 2012, have been incorporated into NPDES permits (US EPA, 2012). There are several FAA Advisory Circulars regarding deicing operations as well as several ACRP reports providing guidance for managing, controlling, and treating deicing runoff, which could be helpful in buying airports stormwater credits depending on the program (FAA, 2004, 2007b, 2013, 2016; TRB, 2009, 2011, 2012a, 2012b).

In communities contemplating new programs or updating current fees and credits, airports can potentially influence the local entity to provide additional credits for airport-specific operations, or open

discussions to negotiate service levels, services provided, focus on direct airport impacts mitigated by the airport. In many cases, the community develops a credit manual with its fee structure so that airports can lower stormwater fees by implementing infiltration systems or GSI. Understanding and using these credits is a key approach to managing the costs of stormwater fees.

Airports and GSI

GSI is a stormwater management approach that maintains, mimics, or restores the natural response of the landscape to a storm. GSI strategies can provide effective stormwater management and numerous benefits to airports, including environmental, aesthetic, economic, and social benefits (TRB, 2017). However, airports can be somewhat limited in implementing GSI due to such issues as wildlife hazards. Several guidance documents are available to help airports overcome these barriers to installing GSI: FAA Advisory Circular AC 150/5200-33B; ACRP Report 125 (2015) entitled “Balancing Airport Stormwater and Bird Hazard Management”; and ACRP 02-62: Green Stormwater Infrastructure Strategies for Airports. In particular, ACRP 02-62 offers guidance relating to wildlife hazards and GSI, as well as several GSI BMPs that have been successfully implemented at airports across the country. For example, bird balls can be used in detention ponds as a wildlife hazards management control (TRB, 2017).

Many airports have successfully installed GSI BMPs both in the landside and airside of airport property. However, the question has been raised whether the upfront costs of installing GSI is worth a fee reduction. In particular, Berahzer (2014) notes that it is often more effective to offer more substantial credits and fee reductions to non-residential properties, even though the fee reduction would not be enough to cover installation of GSI. ACRP 02-62: Green Stormwater Infrastructure Strategies for Airports cites several airports that have incorporated GSI BMPs. Airports are often driven by regulatory drivers (i.e., NPDES permits) to install GSI. However, it is unclear how often airports are incentivized by stormwater credit systems to install such measures as GSI. One airport that has received stormwater credits for GSI is Hartsfield-Jackson International Airport in Atlanta, GA. The airport pays almost \$1 million in stormwater fees annually even after stormwater credits from installing grass swales and detention facilities (ATL, 2014).

Exemptions

A recent survey of stormwater utilities reports that 7 of the 78 respondents, or 9 percent, give exemptions to airports (Black & Veatch, 2014). From news reports, it appears that many of these utilities give exemptions for runways and taxiways as well, but not for other buildings, hangars, and other infrastructure. By exempting runways, airport stormwater fees are typically based on only half of the impervious area. It was also discovered that some stormwater utilities exempt airports completely (e.g., in Fort Myers, FL) (City of Fort Myers, 2009). However, if an exemption is given to one party, it has to be recovered from other ratepayers, challenging the “equity” aspect and creating more potential for litigation. On the other hand, many stormwater utilities “...exempt areas that provide a common benefit to all ratepayers” (WEF, 2013). This would include runways and other modes of transportation, as well as properties that discharge its stormwater runoff into another watershed (WEF, 2013).

Appeals and Other Approaches

If a property owner thinks his/her fee has been calculated incorrectly, they can often initiate an appeal process. For example, the stormwater utility in Durham, NC cites errors in location, existence, area, and construction as reasons to appeal a fee (City of Durham, NC, no date). In some cases, airports have

requested that runways be exempt from fees. For example, Athens-Ben Epps Airport in Georgia requested this exemption as the airport faced more than \$40,000 annually in fees. Runways accounted for more than half of the cost (Floyd, 2005).

One alternative approach is de-annexation from a city or county limits. In the case of Smith Reynolds Airport (owned by Forsyth County, NC but also within city limits of Winston-Salem, NC), the airport authority is considering de-annexation to avoid the Winston-Salem stormwater fees, amounting to approximately \$120,000 annually (Evans, 2016). In 2015, the airport asked the city to exempt runways and taxiways from the fee, but a decision had not yet been made (Evans, 2016). Recently, the city, county, and airport came to an agreement approved by the Winston-Salem City Council: the city and the council will each provide the airport \$150,000 annually for capital expenses (Luck, 2016).

Other airports have neglected to pay stormwater fees. The Burlington International Airport in Vermont, along with the University of Vermont and the Vermont Agency of Transportation, at first refused to pay stormwater fees. The city of South Burlington, Vermont had to organize payment arrangements with these entities, who all now pay their fees (US EPA, 2013). Des Moines, Iowa, on the other hand, is still dealing with an unresolved situation. The Iowa National Guard's 132nd Wing, stationed at the Des Moines International Airport, has been refusing to pay stormwater fees since 2013. The Iowa National Guard cites overly excessive fees and owes the city more than \$260,000 (Aschbrenner, 2015).

Data Gaps: Airport-Specific Challenges

As stormwater utilities continue to be formed across the US and Canada, airports will encounter many challenges including legal issues, regulatory compliance, and additional expenses from stormwater fees. The experience of Hartsfield-Jackson Atlanta International Airport (ATL) is particularly useful in framing potential issues that airports face with stormwater utilities, including: how FAA guidance and other airport-specific regulations affect stormwater utility fees, how stormwater utility fees apply to an airport that is located in multiple jurisdictions, and how airports allocate the cost of such fees. ATL's experience with stormwater utilities has generated these questions and information needs:

- If an airport manages stormwater onsite, what service is provided by the utility and is the airport still subject to the fee? How is the level of service represented in the fee? How does the “voluntary” aspect of stormwater utilities factor in these cases? Can airports opt out if they treat all onsite and meet permit requirements? Many airports may maintain their own stormwater infrastructure since they are subject to NPDES permits. If an airport manages stormwater onsite, it can be argued that the airport does not receive a service or benefit from the utility and puts the fee's applicability to the airport under question.
- If an airport maintains its own stormwater infrastructure and also pays the fee, would that be considered unlawful revenue diversion? According to 49 U.S.C. § 47107(b)(1), 47133, airport revenue must be used for capital and operating costs of the airport, the local airport system, and other facilities owned and operated by the sponsor that are directly related to air transportation of passengers or property.
- How do airports deal with stormwater fees from multiple jurisdictions with different structures and fee systems?
- How do airports allocate stormwater fees to tenants? Are costs shared among businesses and vendors onsite and airlines? How do stormwater fees affect an airport's annual budget?

In addition, further information is needed to better understand how airports have been involved in the development of stormwater utilities.

While there are several agency documents and local news articles either briefly describing airport experiences with stormwater utility fees or alluding to airport inclusion in stormwater utilities, the information available pertaining to the relationship between airports and stormwater utilities is quite fragmented. The concerns, including magnitudes of fees, interactions with local municipalities, and available mitigation strategies are expected to vary among airport sizes and types.

References

- Addison, TX. (2014). *Stormwater Utility: Frequently Asked Questions*. Retrieved from: https://addisontexas.net/ckeditorfiles/files/2014%20new%20site%20files/stormwater_faq.pdf.
- American Society of Civil Engineers (ASCE). (2013a). 2013 Report Card for America's Infrastructure. Accessed 19 Jan 2017: <http://www.infrastructurereportcard.org/>.
- American Society of Civil Engineers (ASCE). (2013b). 2013 Report Card for America's Infrastructure: Wastewater. Accessed 23 Jan 2017: <http://www.infrastructurereportcard.org/wastewater/>.
- Asotin County, WA. (2009). *Chapter 10.30 Storm Drainage and Surface Water Management Utility*. Retrieved from: http://www.asotincountystormwater.com/Content/SWAG/Pullman_Stormwater10_30.pdf.
- Aschbrenner, J. (2015). Unpaid water fees highlight tension between City, Guard. *The Des Moines Register*. Accessed 19 Jan 2017: <http://www.desmoinesregister.com/story/news/local/des-moines/2015/11/06/unpaid-water-fees-highlight-tension-between-city-guard/74631356/>.
- Berahzer, S.I. (2014). *Approaches to Stormwater Management: Stormwater Utilities and Green Infrastructure*. University of North Carolina at Chapel Hill Environmental Finance Center (UNCEFC).
- Berthiaume, J., Quiroz, E., and J. Ivey. (2014). "Facilitating Fees: Avoiding the pitfalls in setting stormwater utility fees while getting stakeholder support." *Water Environment & Technology*. November 2014 Issue. Retrieved from: <http://stormwater.wef.org/2015/08/facilitating-fees/>.
- Black & Veatch. (2014). *2014 Stormwater Utility Survey*. Retrieved from: <http://bv.com/docs/default-source/management-consulting-brochures/2014-stormwater-utility-survey>.
- Campbell, W.C. (2010). *WKU Stormwater Utility Survey*. Bowling Green, KY: Western Kentucky University. Retrieved from: <http://www.wku.edu/engineering/documents/swusurveys/wku-swusurvey-2010.pdf>.
- Campbell, W.C. (2013). *WKU Stormwater Utility Survey*. Bowling Green, KY: Western Kentucky University. Retrieved from: http://www.wku.edu/engineering/civil/fpm/swusurvey/western_kentucky_university_swu_survey_2013.pdf.
- Campbell, W.C., Dymond, R.L., and A. Dritschel. (2016a). *Western Kentucky University Stormwater Utility Survey*. Retrieved from: <http://www.wku.edu/engineering/civil/fpm/swusurvey/>.
- Campbell, W.C., Dymond, R.L., Kea, K., and A. Dritschel. (2016b). WKU Stormwater Utility Database, warren.campbell@wku.edu.
- Chesapeake Bay Foundation. (2015). *Local Stormwater Utilities, Authorities, and Fees*. Annapolis, MD.

Chicago Metropolitan Agency for Planning (CMAP). (2013). *The Value of Stormwater Utilities for Local Governments in the Chicago Region*. Illinois. Retrieved from: <http://www.cmap.illinois.gov/livability/water/stormwater>.

City of Bangor. (2011). *Final Project Report: Bangor Stormwater Utility Planning (ARRA 604b)*. Retrieved from: <http://www.bangormaine.gov/filestorage/422/1924/1926/FinalProjectReport073011.pdf>

City of Durham, NC. Undated. Stormwater Appeals Form. Accessed 19 Jan 2017: <https://durhamnc.gov/844/Stormwater-Appeals-Forms>.

City of Fort Myers. (2009). *Policy for Adjustments of Stormwater Fees*. Retrieved from: <http://www.cityftmyers.com/DocumentCenter/View/1239>.

Evans, M. (2016). Commissioners debate airport de-annexation, stormwater fees. *Winston-Salem Journal*, p. 2. Accessed 19 Jan 2017: http://www.journalnow.com/news/local/commissioners-debate-airport-de-annexation-stormwater-fees/article_9524abc4-873d-5e26-804a-f2862a5ee6ec.html.

Federal Aviation Administration (FAA). (2004). *FAA Advisory Circular No. 120-60B - Ground Deicing and Anti-icing Program*.

Federal Aviation Administration (FAA). (2007a). *FAA Advisory Circular No. 150/5200-33B - Hazardous Wildlife Attractants on or Near Airports*.

Federal Aviation Administration (FAA). (2007b). *FAA Advisory Circular No. 150/5220-18A - Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*.

Federal Aviation Administration (FAA). (2013). *FAA Advisory Circular No. 150/5300-14C - Design of Aircraft Deicing Facilities*.

Federal Aviation Administration (FAA). (2016). *FAA Advisory Circular No. 150/5200-30D - Airport Field Condition Assessments and Winter Operations Safety*

Florence, SC. (2007). Article IV. Drainage and Stormwater Management. *Code of Ordinances*. Retrieved from: https://www.municode.com/library/sc/florence/codes/code_of_ordinances?nodeId=COOR_CH12MUUT_ARTIVDRSTMA.

Floyd, A. (2005). Airport budget woes partly due to new fee: Stormwater utility charge. *Athens Banner Herald*, p. 1. Accessed 19 Jan 2017: http://onlineathens.com/stories/022605/new_20050226048.shtml#.WIEku032Z9B.

Hartsfield-Jackson Atlanta International Airport (ATL). (2014). *Hartsfield-Jackson Atlanta International Airport's Experience with Stormwater Fees*. Accessed 10 Jan 2017, from Airports Council International-North America: http://www.aci-na.org/sites/default/files/douglas_stormwater.pdf.

Houseal, I. (2013). Memorandum: Stormwater Service Charge Draft Finance Committee Recommendations to Council. *City of Portland, ME*. Retrieved from: <http://portlandmaine.gov/DocumentCenter/View/5386>.

Hoyle, Tanner & Associates, Inc. (2006). *Credit Manual for Stormwater Fees*. South Burlington, VT.

Luck, T. (2016). City approves airport deal with County. *The Chronicle*. Retrieved from: <http://www.wschronicle.com/2016/05/city-approves-airport-deal-county/>.

Metropolitan Area Planning Council (MAPC). (2014). *Stormwater Financing/Utility Starter Kit*. Retrieved from: http://www.mapc.org/sites/default/files/SW_financing-utility_kit_3-23-14_full.pdf.

National Association of Clean Water Agencies (NACWA). (2014). *Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs*. Washington, DC. Retrieved from: <http://stormwater.wef.org/wp-content/uploads/2015/01/NACWAs-Navigating-Litigation-Floodwaters.pdf>.

National Association of Flood and Stormwater Management Agencies (NAFSMA). (2006). *Guidance for Municipal Stormwater Funding*. Washington, DC. Retrieved from: <https://www.epa.gov/sites/production/files/2015-10/documents/guidance-manual-version-2x-2.pdf>.

Northeast Ohio Regional Sewer District (NEORS). (2016a). Title V: Stormwater Management Code. *Code of Regulations of the Northeast Ohio Regional Sewer District*. Cleveland, OH. Retrieved from: http://www.neorsd.org/ Library.php?SOURCE=library/Title%20V_Stormwater-Management-Code_July-19-2012.pdf&a=download_file&LIBRARY_RECORD_ID=4274.

Northeast Ohio Regional Sewer District (NEORS). (2016b). *Stormwater Fee Credit Policy Manual*. Cleveland, OH.

Pasco County, FL. (2016). *Stormwater Utility Fee: Frequently Asked Questions*. Retrieved from: <http://www.pascocountyfl.net/DocumentCenter/Home/View/6194>.

Peachtree City, GA. (2006). Article III. Stormwater. *Code of Ordinances*. Retrieved from: https://www.municode.com/library/ga/peachtree_city/codes/code_of_ordinances?nodid=PTIICOOR_CH82UTSE_ARTIIIST.

Port of Seattle. (2014). *Stormwater Utility Charter*. Retrieved from: https://www.portseattle.org/About/Commission/Meetings/2014/2014_11_25_RM_6d_attach.pdf.

Reilly, F.J., Munson, K.M, Kobayashi, L.S., and M.D. Whooley. (2014). Stormwater Best Practices for State and Counties of Hawai'i. Hawai'i Community Foundation, Report HCF40C1. Retrieved from: https://www.researchgate.net/profile/Francis_Reilly/publication/289537354_Stormwater_Best_Practices_for_State_and_Counties_of_Hawai'i/links/568fcf0208aed0aed810b865.pdf?origin=publication_list.

Transportation Research Board (TRB). (2009). "Deicing Planning Guidelines and Practices for Stormwater Management Systems." ACRP Report 14.

Transportation Research Board (TRB). (2011). "Optimizing the Use of Aircraft Deicing and Anti-Icing Fluids." ACRP Report 45.

Transportation Research Board (TRB). (2012a). "Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials." ACRP Report 72.

Transportation Research Board (TRB). (2012b). "Winter Design Storm Factor Determination for Airports." ACRP Report 81.

Transportation Research Board (TRB). (2014). *Critical Issues in Aviation and the Environment. Circular Number E-C184.*

Transportation Research Board (TRB). (2015). "Balancing Airport Stormwater and Bird Hazard Management." ACRP Report 125. Retrieved from:
http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_125.pdf

Transportation Research Board (TRB). (2017). unpublished ACRP 02-62: Strategies for Green Stormwater Infrastructure at Airports. Transportation Research Board.

United States Environmental Protection Agency (US EPA). (2009). *Funding Stormwater Programs.*

United States Environmental Protection Agency (US EPA). (2012). *Effluent Limitations Guidelines and New Source Performance Standards for the Airport Deicing Category; Final Rule.* Retrieved from:
<https://www.gpo.gov/fdsys/pkg/FR-2012-05-16/pdf/2012-10633.pdf>.

United States Environmental Protection Agency (US EPA). (2013). *Evaluation of the Role of Public Outreach and Stakeholder Engagement in Stormwater Funding Decisions in New England: Lessons from Communities.* United States EPA, Office of Policy. Washington, D.C.: United States Environmental Protection Agency.

United States Environmental Protection Agency (US EPA). (2014). *Getting to Green: Paying for Green Infrastructure, Financing Options and Resources for Local Decision-Makers.* EPA 842-R-14-005. Retrieved from: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100LPA6.txt>.

United States District Court: District of Oregon, Portland Division. (2016). *Complaint for Declaratory and Injunctive Relief.* Retrieved from: https://www.acina.org/sites/default/files/1_complaint_for_declaratory_relief.pdf.

University of Maryland Environmental Finance Center (UMEFC). (2014). *Local Government Stormwater Financing Manual: A Process for Program Reform.* Retrieved from University of Maryland Environmental Finance Center:
[https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_\(1\).pdf](https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_(1).pdf).

Vermont Agency of Natural Resources. (2002). *The Vermont Stormwater Management Manual: Volume I - Stormwater Treatment Standards.* Montpelier, VT.

Water Environment Federation (WEF). (2013). *User-Fee-Funded Stormwater Programs.* Alexandria: Water Environment Federation.

ACRP 02-68 Task 2: White Paper Strategies for Reducing Local Stormwater Utility Fees

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This draft report has not been released for publication and is furnished only for review to members of or participants in the work of the Airport Cooperative Research Program (ACRP). This report is to be regarded as fully privileged, and dissemination of the information included herein must be approved by the ACRP.

The Cadmus Group, Western Kentucky University, MFSG, and Parametrix.

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History of Stormwater Management: Origins of Stormwater Utility Fees

Adequate stormwater management is a growing concern for many municipalities across the United States, particularly as urban areas have become developed and the natural terrain has been replaced with impervious surface. These changes in land use have led to increases in the quantity and intensity of runoff. Municipalities are faced with addressing the associated water quality and flooding issues as well as regulatory requirements for stormwater management (WEF, 2013) (CMAP, 2013); (US EPA, 2009).

The concept of stormwater management has been evolving for many years. Strategies to best manage and control runoff need to take into account a number of issues including:

- Responsibility for regulatory governance: Runoff from a property or municipality can cross governmental boundaries. Often agencies in the same watershed have conflicting policies, standards, and regulations.
- Increased focus on water quality: In recent years the quality of stormwater has become more important, and new rules affect how stormwater impacts the environment beyond flooding.
- The need for financing: Because of the complexity of regulating and managing runoff, developing a “fair and equitable” means of financing a local or regional program is critical to successfully creating and implementing a stormwater program.

Since the 1990’s, there has been a shift in the focus of stormwater projects. The Water Environment Federation (WEF) notes that before the 1990s, stormwater programs typically funded capital projects that addressed flooding, whereas more recent stormwater projects may address a wider range of issues, including water quality. Projects can also focus on stream restoration and other environmental enhancements in addition to addressing aging stormwater infrastructure (WEF, 2013).

There are a number of organizational approaches to managing stormwater and a number of approaches to financing a municipal stormwater program. The most common method of funding flood and water pollution control efforts is through the community’s general fund, which consists of revenues collected from sales taxes, property taxes, and income taxes. Normally, the governing body budgets the money from the general fund, and stormwater management may be administered within an existing department or division (e.g., public works). However, using money from the general fund means that flood and water pollution control must compete with fixing potholes, putting more police on the street, K-12 education, and other community priorities. Stormwater is often forgotten until a major flood or water pollution event occurs. Stormwater management may also be funded through the community’s water and/or wastewater utility enterprise fund, with funds coming from water and/or wastewater user fees. A third funding mechanism is a stormwater user charge program (stormwater utility) that collects and administers stormwater user fees from municipal customers who generate stormwater runoff. (UMEFC, 2014). This can be a very successful method to secure a dedicated funding source using the same legal mechanism as a water, sewer, or solid waste utility.

Although funding stormwater management through the general fund has worked for many communities, it is becoming increasingly difficult for local governments to guarantee sufficient funds to consistently meet the sharply increasing needs of stormwater programs and infrastructure as well as increasingly challenging environmental laws and regulations. Often, a community cannot find the money within the general fund required to meet Federal water pollution control standards. Therefore, a growing number of communities around the country have recognized the benefits of having the dedicated funding stream generated by a stormwater utility for stormwater operations and improvements.

Stormwater utilities have the advantages of being long-term programs that can provide a steady source of locally controlled funding to be used for stormwater management (Chesapeake Bay Foundation, 2015). The funds are dedicated to flood control, water pollution control, or both. Funding the management of stormwater infrastructure via user fees, as has been implemented in water and wastewater sectors for many years, has been widely accepted across the US and Canada (Black and Veatch, 2014) (Campbell, 2016). The City of Bellevue, Washington enacted one of the first stormwater utilities in the U.S. in 1974 (City of Bellevue, 2012). Since that time, more than 1,600 utilities have been created in the U.S., and at least 21 have been established in Canada. Surges in the rate of formation of stormwater utilities occurred after EPA enacted Clean Water Act Phase I regulations in 1990 and again when Phase II regulations began in 2003 (Figure 1).

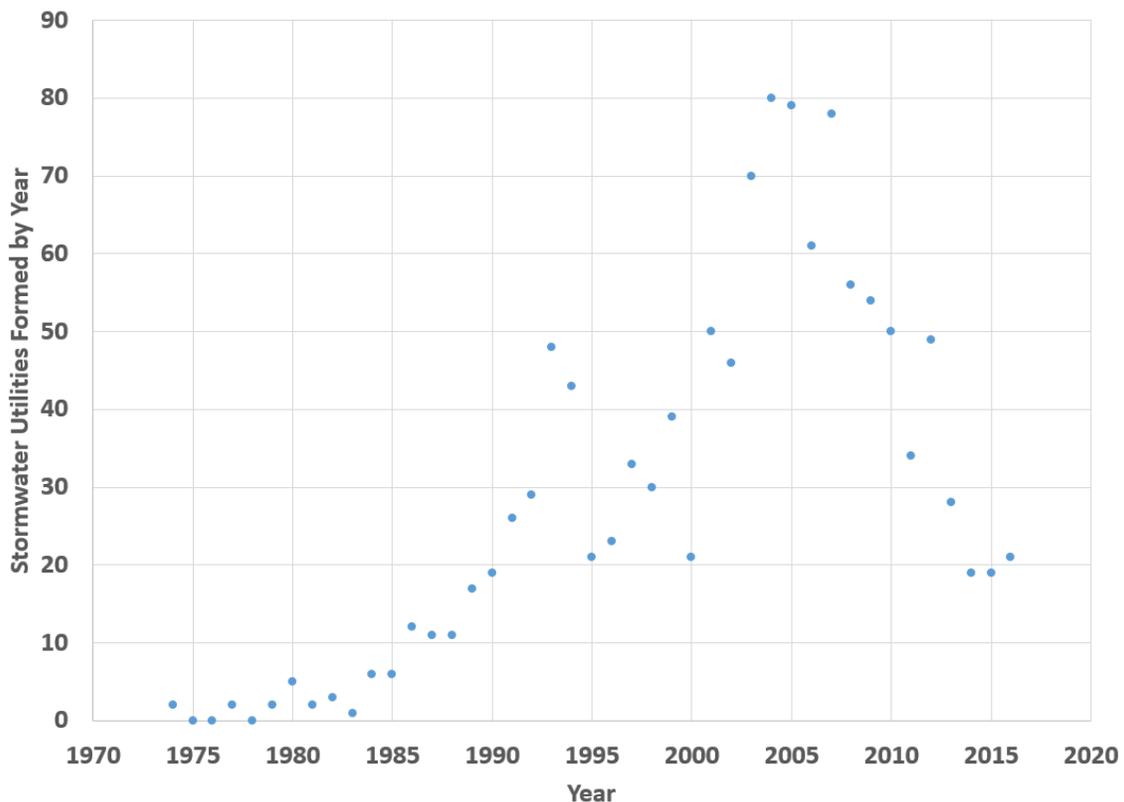


Figure 1. Stormwater utility formation by year (Campbell, 2016)

Development and Management of Stormwater Utilities

Development of a stormwater utility typically starts with a feasibility study. The feasibility study includes tasks such as the following:

- **Program assessment and development** - The current and future expenditures associated with providing stormwater service within the municipality should be identified and documented. This includes identification of best management practices (BMPs), some of which may require structural solutions and some of which may be operational in nature, maintenance of the stormwater physical system, regulatory compliance and the necessary capital investments in the stormwater system to improve and maintain the system.
- **Evaluation of funding strategies** - The stormwater program levels of service (current and future) serve as the basis for the expenditures. Based on the levels of service adopted, funding options (e.g., property taxes, enterprise funding, or a dedicated stormwater user fee) should be developed. Funding options are described in more detail below. Funding options are then analyzed to review fee structures (e.g., cost basis, credits) and identify impacts to different types of customers (e.g., residential, commercial).
- **Administration** - The key administration issues should be identified and evaluated, including billing methodology, parcel owner appeals process, billing database management, and administering credits.
- **Implementation** – steps include developing a stormwater utility ordinance, a credit manual and an implementation schedule. A program and process to educate the public and gain acceptance of this cost is essential to successfully implementing a stormwater utility.

The various components of these steps are summarized in Figure 2.

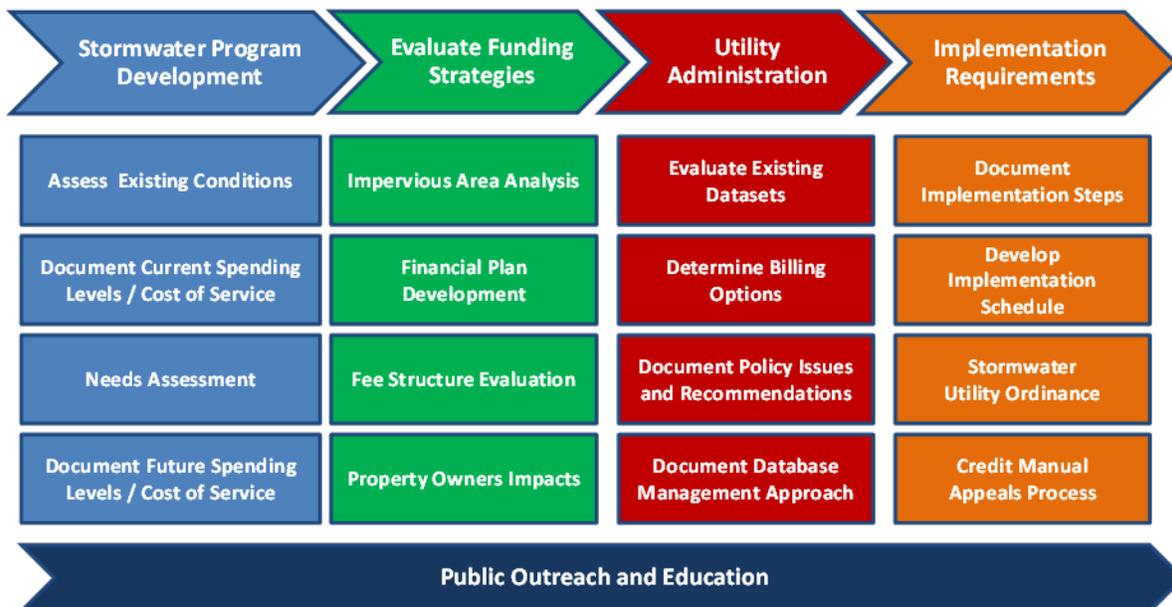


Figure 2. Stormwater Utility Feasibility Approach (Maker, 2017)

Other frameworks for developing a stormwater utility include the five-phase policy and program reform model advocated by the University of Maryland, Environmental Finance Center (UMEFC, 2014). This approach captures the same elements of the feasibility approach and includes user-friendly checklists and explanations.

Regardless of the organization and funding of a stormwater utility, there is required management, staffing and operation of programs, and activities that must be maintained (UMEFC, 2014). Resources are often required for the following elements of a stormwater program (WEF, 2013):

- **Administration and overhead** – General management, asset management, geographic information systems (GIS), IT, planning, customer service, billing, training, and public education/outreach.
- **Operations and maintenance (O&M)** – Maintenance of the drainage and collection system, including the municipal separate storm sewer system (MS4), best management practices (BMPs) and, if applicable, combined sewer system (CSS), street sweeping, and other activities.
- **Environmental permit management and regulatory compliance** – Water quality improvement, pollutant prevention, flood reduction, permit reporting, plan review and inspection and monitoring and enforcement.
- **Capital improvement program (CIP)** – Design, construction, replacement and repair of system infrastructure, such as outfalls, storm sewers, catch basins, drainage structures, detention facilities, roadway culverts/ditches and structures that might be required to implement some BMPs

These functions can be located within (and funded directly by) the stormwater fund or could be functions in another governmental departments or agencies, which are reimbursed by the host agency.

Key steps in development of a stormwater utility include (NAFSMA, 2006):

- Obtain necessary facts,
- Establish programmatic goals,
- Identify risks and assumptions,
- Identify and involve stakeholders,
- Develop a sound financial plan,
- Evaluate the proposed program to assure that it can achieve the stated goals, and
- Conduct due diligence to assure that all tasks have been accomplished.

NAFSMA (2006) provides more details on aspects of due diligence needed for effective implementation of a stormwater utility. Stakeholder engagement as noted above in Figure 2 is critical throughout the process of evaluating a stormwater utility (US EPA, 2013). This public outreach and education provides an opportunity for airports and other stakeholders with large impervious areas to participate in the utility development process.

Typically, the revenue requirements (the amount needed to be collected to cover the operating and maintenance costs of stormwater) are determined, and properties are assessed fees based on a fee structure. Fee systems should be based on estimated needs over time, with projected budgets based on the activities that will be needed to obtain goals for flood control and water quality improvement (Chesapeake Bay Foundation, 2015). Undeveloped land such as forests and parklands, as well as agricultural acreage, is generally exempted from stormwater fees.

In establishing a stormwater user charge program, the local government or utility needs to select a method for calculating the user fees. Common fee structures include (Chesapeake Bay Foundation, 2015):

- Equivalent Residential Unit System (ERU; based on a standard unit of impervious area for a residential parcel. The median ERU size is 2,900 ft²)
- Residential Equivalent Factor System (REF; based on the amount of runoff produced from average residential parcels)
- Tier System (flat fees within each tier of property size)
- Flat Fee System or Dual System (dual system has separate flat fees for residential and non-residential properties).

The most common fee system is the Equivalent Residential Unit (ERU) system (Campbell, 2016), which uses impervious surface area (e.g., buildings, pavement, sidewalks, etc.) as a surrogate for runoff to determine “use” or “service provided” regardless of climate pattern, population, regulatory environment or need. Basing the fee structure on the amount of stormwater produced by the customer is intended to be equitable and to provide an incentive to reduce runoff volumes (NRDC, 2012). This basis has withstood the “fair and equitable” legal standard in several states. In this system, fees for non-residential properties are based on the same size unit of impervious area as residential properties.

According to the WKU 2016 survey (Campbell, 2016), the flat fee is the second most frequently used method, with the tiered system the third most popular fee system.

One of the more complex issues related to charging for stormwater management is how to treat public or tax-exempt parcels. This necessitates the need to have the charge determined to be a fee, not a tax. Properties involved in the determination include:

- Highways/transportation facilities.
- School/public buildings (local, state, and federal).
- Port properties including airports.

Local agencies often propose stormwater fees as a mechanism to provide a fair and equitable system to provide a needed service where the benefits are indirect and may not always be immediately tangible (i.e. reduced runoff volume or pollution). They are also promoted as reasonable and relatively inexpensive. According to the 2016 WKU Stormwater Utility Survey, the monthly single family residential fee ranged from zero up to \$69.25 per month (with an average of \$5.11 per month) (Campbell, 2016). Monthly fees for residential customers can be used as an indicator of the variation of rates across the US, as indicated in Figure 3. Public opposition is sporadic and not highly motivated in these situations (when a new fee seems inexpensive and fair).

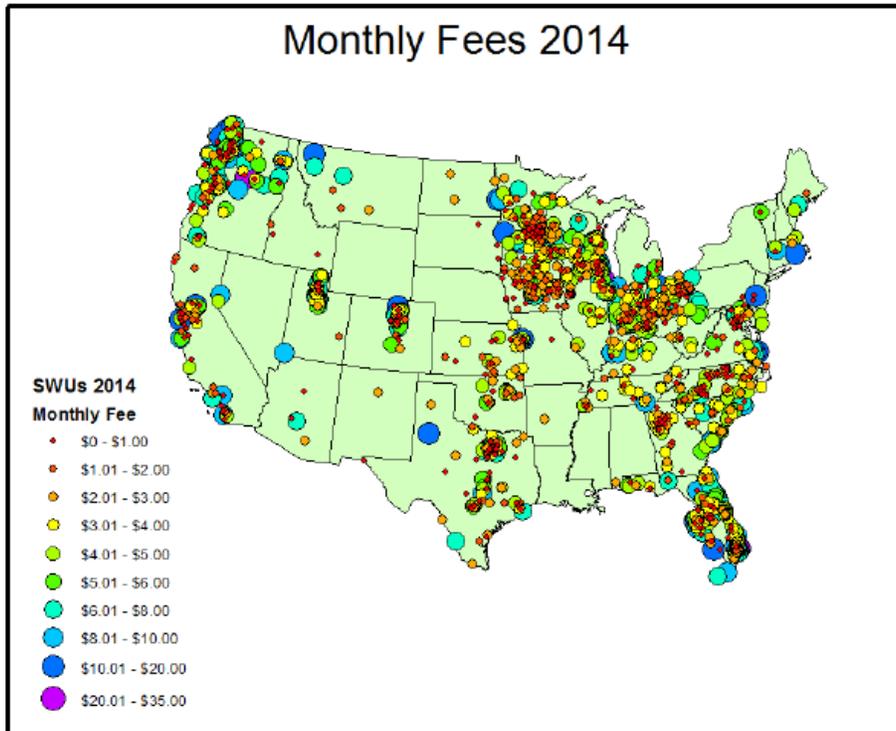


Figure 3. Spatial Distribution of Monthly Stormwater Fees (Campbell, 2014)

Applicability of Stormwater Management to Airports

For large land holdings such as airports, stormwater fees can be extremely high. Because airports have large amounts of impervious area, they may also constitute a large percentage of the total impervious area in a small community. Airports may, therefore, also pay a large percentage of the total stormwater fees collected. Because of this, an airport can be an important facility that the jurisdiction becomes dependent upon to financially support its stormwater program.

As of 2016, more than 1,600 local governments across the U.S. and Canada charged stormwater fees (Campbell, 2016). Figure 3 and Figure 4 show the density of airports of various sizes located within five miles of stormwater utilities. In certain cases, an airport's property may span more than one jurisdiction, making them potentially subject to fees from more than one stormwater utility.

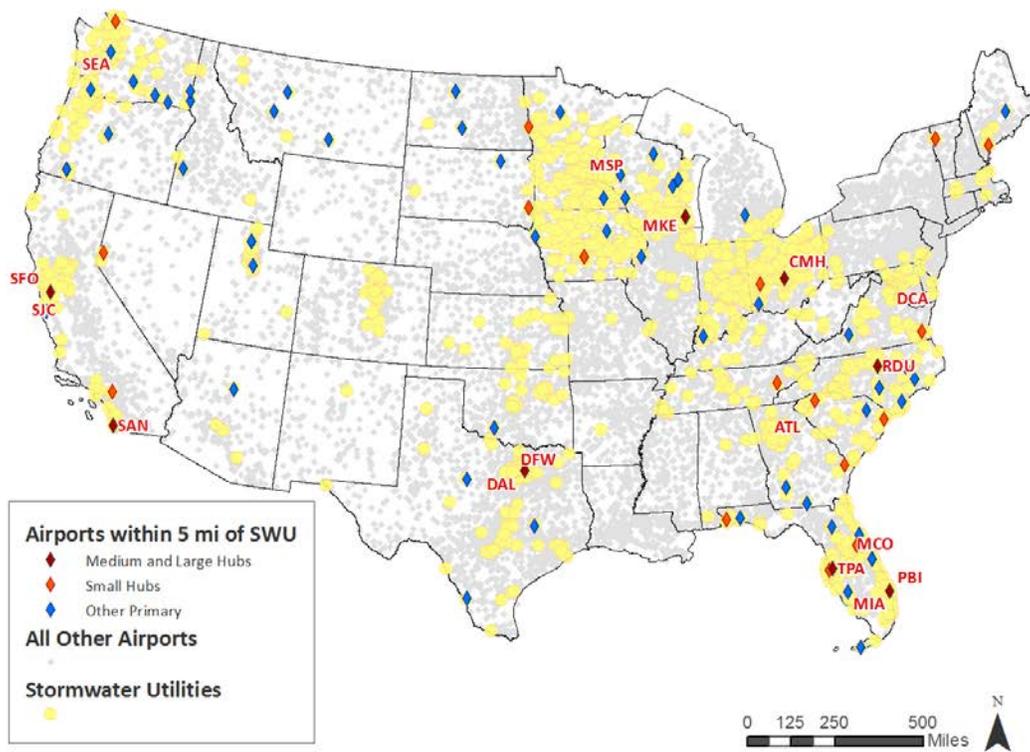


Figure 4. Map of Primary commercial airports within 5 miles of a stormwater utility, categorized by hub type. (Data from: U.S. Department of Transportation, Bureau of Transportation Statistics 2016; Federal Aviation Administration 2015 and 2016; and W. Campbell 2017.)

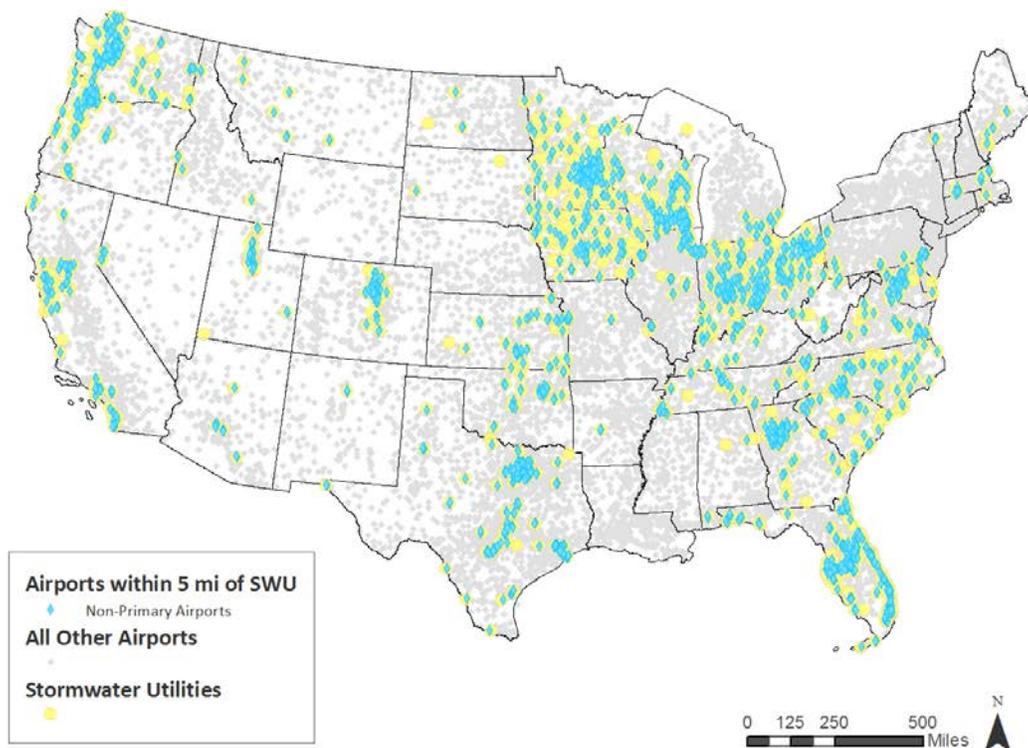


Figure 5. Map of Non-primary airports (<10,000 commercial flights) located within 5 miles of a stormwater utility (Data from: U.S. Department of Transportation, Bureau of Transportation Statistics 2016; Federal Aviation Administration 2015 and 2016; and W. Campbell 2017.)

Airport Stormwater Utility Fees

Under some systems, the rates for residential properties noted above are effectively multiplied by factors of hundreds or thousands for large institutions such as airports and universities. This can amount to high stormwater fees for airports. For example:

- The Port of Seattle and its tenants paid over \$4 million to the City of Seattle in stormwater fees in 2014, prompting the Port’s efforts to establish their own stormwater utility encompassing all port-owned property in King County (Port of Seattle, 2014).
- In 2010, Philadelphia began phasing in a new stormwater fee structure, changing from one based on potable water usage to a parcel-based structure. Under such a system, facilities with large impervious area relative to water usage experienced fee increases, and Philadelphia Airport was expected to see an increase of \$126,000 per month in its stormwater fees (NRDC, 2012).
- The Hartsfield-Jackson Atlanta International Airport is subject to stormwater utility fees from two jurisdictions, Clayton County and the City of College Park, with an additional jurisdiction, the City of East Point, considering such fees (Douglas, 2014). As of 2014, the Atlanta airport paid approximately \$820,000 in annual stormwater fees (Douglas, 2014).

Although the fees at small airports will be lower smaller due to their size, the stormwater fees can constitute a large part of their budgets. For example:

- According to a 2005 news article, Athens-Ben Epps Airport, a smaller non-primary commercial service airport in Georgia, was facing \$41,000 a year for new stormwater fees, adding a new strain to the airport's already tight budget (Floyd, 2005).
- In the City of Winston-Salem, North Carolina, Smith-Reynolds Airport pays approximately \$118,000 per year in stormwater fees, which is about 20% of its total budget (Evans, 2016).

The various stormwater fee structures can affect airports differently than single-family residential properties. Because of their large areas of impervious surface, airports are subject to particularly high stormwater fees under a system such as ERU or REF, which assess fees based solely on units of impervious area (i.e., ERUs) or a standardized quantity of polluted runoff (i.e., REF). For example, NEORS (2016) describes how in northeast Ohio, non-residential fees are based on the calculated number of ERUs multiplied by the base ERU. The number of ERUs for an airport can be large. For example, Hartsfield-Jackson Atlanta International Airport has almost 29,000 stormwater management units (similar to ERUs; equal to 2,950 ft²); (Douglas, 2014).

A tier system can benefit airports since the airport would normally fall at the top of the highest hard surface tier. For example, in Nashville's tier system the highest monthly stormwater fee for a parcel is \$400. In almost every case, an airport authority would prefer a tier system to an ERU or a REF system. A flat fee or dual system is also advantageous for airports. Under the dual fee system in Warren County, Kentucky, for example, the stormwater fee for an airport would be \$11 per month.

The preferred option for an airport is complete exemption from stormwater fees. Strategies that airports can use for obtaining an exemption could mirror strategies used by municipalities such as exempting stormwater management associated with public buildings or highways. In advocating for an exemption, the airport needs to demonstrate its importance to a community's economic health and wellbeing. The cost of stormwater fees would have to be passed on to carriers and ultimately to travelers. An alternative argument, however, is that it is preferable to design the fee structure so as not to burden a particular type of property rather than exempting a category of landowner altogether (Chesapeake Bay Foundation, 2015).

Application of Credits to Offset Stormwater Utility Fees

Credits are often established by utilities to offset costs to different types of customers or customers that reduce their stormwater volume or achieve other established goals. Credits can often be applied to achieve ongoing reductions in fees through various mechanisms such as maintenance of stormwater treatment practices according to established standards (e.g., sizing, construction, criteria). The specifics of criteria for credits are generally defined by local governments. For example:

- The City of South Burlington, Vermont offers credits to "single non-family residential properties" (i.e., commercial properties) that construct and maintain stormwater treatment practices (STPs) (HTA, 2006); the Vermont Agency of Natural Resources (VANR, 2002) describes structural and non-structural criteria and restrictions associated with these STPs. The city allows multiple

credits to be given, with the total not to exceed 50 percent of the stormwater fee for the property (HTA, 2006).

- Similarly, the Northeast Ohio Regional Sewer District (NEORS) offers credits for use of stormwater control measures or other activities that “...reduce or alleviate the District’s cost of providing a regional stormwater management program....” (NEORS, 2016). Table 1 shows an example credit system from NEORS (2016) that is applicable to both residential and non-residential properties and includes a peak flow credit of up to 25% credit and a runoff volume credit of up to 50% (for a possible total of up to 75%) as well as quality credits.
- The City of Philadelphia, well known for its progressive green stormwater infrastructure (GSI) program, provides an interactive web site, the “Stormwater Credits Explorer” (<http://water.phila.gov/swexp/>) that allows commercial property owners to assess their stormwater fees and explore potential fee reductions.

Table 1. Credits available for residential and non-residential stormwater fees (NEORS, 2016)

Credit Category	Individual Residential Category	Homeowners or Condominium Association	Commercial, Industrial, Mix-Use Development, Other Non-Residential	Public/Private School, Primary to 12
Individual Residential Property Credit	25%*			
Stormwater Quality Credit	Up to 25%*	Up to 25%**	Up to 25%	Up to 25%
Stormwater Quantity Credit	Up to 75%	Up to 75%**	Up to 75%	Up to 75%
Education Credit				25%
Total Credit Available	Up to 100%	Up to 100%	Up to 100%	Up to 100%

* An individual residential property can receive either the Individual Residential Property Credit or Stormwater Quality Credit, but not both.

** A Homeowner’s or Condominium Association can apply on behalf of its members.

The issue of credits associated with stormwater BMPs, including structural measures, is an important one for airports. Most facilities were built before the promulgation of stormwater regulations for control of runoff from construction activities. Airports can be faced with their own needs for facility expansion, with associated costs of management of construction-related runoff and increased stormwater fees due to increased impervious area. Structural stormwater BMPs can be expensive to install and will also require maintenance, but can help offset both existing and new impervious area (TRB, 2014)

Although many local governments provide exemptions or credits based on the customer’s ability to reduce runoff through infiltration, stormwater controls, or provided maintenance, airports face challenges in taking advantage of some of these credits and exemptions due to Federal Aviation

Administration (FAA) regulatory requirements. A notable concern is with the FAA regulations that discourage the development of vegetation and open water, which are often associated with certain GSI, to minimize habitat for birds and other wildlife (FAA, 2007). Some airports, however, have successfully implemented various types of GSI at their facilities, as described in the research results from ACRP 02-62 Research Project, currently in publication (TRB, 2017).

Potential Legal Challenges

The introduction and implementation of stormwater utilities in the United States has not been without legal challenges. As of the fall of 2013, 76 legal challenges had been brought forth in the United States, with 16 cases ending in a decision that was unfavorable to stormwater utilities (Campbell, 2013). For the most part, stormwater utility fees have been upheld in court cases, but litigation can and should be avoided. A 2014 study conducted by the National Association of Clean Water Agencies (NACWA) highlights two central categories for stormwater utility legal challenges: (1) the authority to enact, implement and fund the program; and, (2) the legality of the financing mechanism and methodology (NACWA, 2014)

Challenges: the Need for Guidance

Airports need more information to establish effective relationships with local municipalities and stormwater utilities to ensure that stormwater management practices are implemented in a cost-effective manner. Information needs include action steps and strategies for developing and implementing a stakeholder relationship with the stormwater utility; preventive measures to address legal issues; and guidance on fee structures and available credit programs.

Stormwater fees are a major concern for airports of all sizes. Additional case studies are needed to help utilities understand specific strategies that can be implemented to mitigate these fees. Case studies can focus on different types and sizes of utilities to illustrate the range of possible mitigation strategies.

The best approach to avoiding litigation is for stakeholders to be involved in the development and maintenance of a stormwater utility. Of course, it is also important for stormwater utilities and stakeholders to understand what is permissible by state and local laws. The authors of the NACWA white paper conclude by emphasizing that the "...legality and viability of any specific fee program will be based on a variety of factors including the specific structure of the fee and the specific law of the state in which the utility is located. What works in one state may not work in another" (NACWA, 2014).

The guidebook to be developed under this project aims to fill these information gaps by exploring the issue of stormwater fee mitigation at airports of a variety of sizes and geographic locations.

References

- Black and Veatch. (2014). *2014 Stormwater Utility Survey*. Retrieved from <http://bv.com/docs/default-source/management-consulting-brochures/2014-stormwater-utility-survey>
- Campbell, W. (2013). *Western Kentucky University Stormwater Utility Survey*. Retrieved from <http://www.wku.edu/engineering/civil/fpm/swusurvey/>
- Campbell, W. (2014). *Western Kentucky University Stormwater Utility Survey*. Retrieved from <http://www.wku.edu/engineering/civil/fpm/swusurvey/>
- Campbell, W. (2016). *Western Kentucky University Stormwater Utility Survey*. Retrieved from <http://www.wku.edu/engineering/civil/fpm/swusurvey/>
- Chesapeake Bay Foundation. (2015). *Local Stormwater Utilities, Authorities, and Fees*. Annapolis, MD.
- City of Bellevue, W. (2012). Retrieved from City of Bellevue Stormwater Management Guide: http://www.ci.bellevue.wa.us/pdf/Utilities/Stormwater_Guide_M1.pdf
- CMAP. (2013). *The Value of Stormwater Utilities for Local Governments in the Chicago Region*. Illinois.
- Douglas. (2014). *Hartsfield-Jackson Atlanta International Airport's Experience With Stormwater Fees*. Retrieved January 10, 2017, from Airports Council International-North America: http://www.aci-na.org/sites/default/files/douglas_stormwater.pdf
- Evans, M. (2016). Commissioners debate airport de-annexation, stormwater fees. *Winston-Salem Journal*, p. 2. Retrieved January 2017, from Winston-Salem Journal: http://www.journalnow.com/news/local/commissioners-debate-airport-de-annexation-stormwater-fees/article_9524abc4-873d-5e26-804a-f2862a5ee6ec.html
- FAA. (2007). *FAA Advisory Circular No. 150/5200-33B - Hazardous Wildlife Attractants on or Near Airports*. Burlington, MA.
- FCS Group. (2012). *Final Report for Effective Cost Recovery Structure for WSDOT, Jurisdictions, and Efficiencies in Stormwater Management*. Redmond, WA.
- Floyd, A. (2005). Airport budget woes partly due to new fee: Stormwater utility charge. *Athens Banner Herald*, p. 1. Retrieved from http://onlineathens.com/stories/022605/new_20050226048.shtml#.WIEku032Z9B
- HTA. (2006). *Credit Manual for Stormwater Fees*. South Burlington, VT: Hoyle, Tanner & Associates, Inc.
- Maker, M. (2017). Public Outreach and Education (Figure). Annapolis, Maryland, USA: MFSG.
- NACWA. (2014). *Navigating Litigation Floodwaters: Legal Considerations for Funding Municipal Stormwater Programs*. Washington, DC.
- NAFSMA. (2006). *Guidance for Municipal Stormwater Funding*. Washington, DC.
- NEORS. (2016). *Stormwater Fee Credit Policy Manual*. Cleveland, OH.
- NRDC. (2012). *Financing Stormwater Retrofits in Philadelphia and Beyond*. New York, NY.
- Port of Seattle. (2014). *Memorandum: Second Reading of Resolution No. 3696, as amended, Authorizing Stormwater Utility Formation*. Seattle, WA.

- TRB. (2014). *Critical Issues in Aviation and the Environment. Circular Number E-C184.*
- TRB. (2017). unpublished ACRP 02-62: Strategies for Green Stormwater Infrastructure at Airports. Transportation Research Board.
- UMEFC. (2014). *Local Government Stormwater Financing Manual: A Process for Program Reform.* Retrieved from University of Maryland Environmental Finance Center:
[https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_\(1\).pdf](https://efc.umd.edu/assets/stormwater_projects/2efc_stormwater_financing_manual_final_(1).pdf)
- US EPA. (2009). *Funding Stormwater Programs.* United States EPA. United States Environmental Protection Agency New England.
- US EPA. (2013). *Evaluation of the Role of Public Outreach and Stakeholder Engagement in Stormwater Funding Decisions in New England: Lessons from Communities.* United States EPA, Office of Policy. Washington, D.C.: United States Environmental Protection Agency.
- VANR. (2002). *The Vermont Stormwater Management Manual: Volume I - Stormwater Treatment Standards.* Montpelier, VT: Vermont Agency of Natural Resources.
- WEF. (2013). *User-Fee-Funded Stormwater Programs.* Alexandria: Water Environment Federation.

Appendix C. Technical Memorandum on Focus Groups and Interviews

ACRP 02-68 Task 4: Revised Technical Memorandum on Focus Groups and Interviews

June 29, 2018

Prepared for
ACRP
Transportation Research Board
of
The National Academies

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES PRIVILEGED DOCUMENT

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1. Summary and Overview

Cadmus has conducted three web-enabled focus groups and interviewed ten airports and one municipality by telephone to date. The first focus group comprised three large airports, the second was a discussion among three municipalities about their stormwater utilities, and the third involved four small airports. Communication is ongoing with additional airports, an airline, and a port. If we are able to schedule interviews with these organizations, those interviews will be added to the interim report. The participating airports and municipalities represent various sizes and are located in different climate and Federal Aviation Administration (FAA) regions (see Table 1).

Section 1 of this document provides a discussion of the common themes that emerged during the focus groups and interviews, and Section 2 includes more detailed summaries of each focus group and interview. Airports that are paying stormwater fees have different jurisdictional considerations, fee structures, mitigation strategies available to them (e.g., credit programs), and overall finances. For some airports, especially small airports, the fees are a substantial burden. For larger airports, the fees may represent a smaller fraction of their overall budget but still amount to large sums. Mitigation strategies ranged from agreements with the institutions, to working with credit systems, to legislation, or, in the case of one airport, establishing their own stormwater utility.

Four of the airports with whom we spoke are not currently paying stormwater fees but were interested in learning more in case they are charged stormwater fees in the future. These airports provided an interesting balance through the questions they asked of the other airports in focus groups and by illustrating situations where stormwater fees may or may not come into play in the future.

Airport Name	Airport Code	City	State	Airport Size					FAA Region							Climate						
				Large Hub	Medium Hub	Small Hub	Other Primary	Non-primary	New England	Eastern	Southern	Central	Great Lakes	Southwest	Northwest Mountain	Western Pacific	Cold	Hot-Dry	Hot-Humid	Marine	Mixed-Dry	Mixed-Humid
Nashville International Airport	BNA	Nashville	TN		X						X											X
Norman Y. Mineta San José Intl	SJC	San José	CA		X										X				X			
Paine Field Airport (Snohomish County)	PAE	Everett	WA					X						X					X			
Roanoke Regional Airport	ROA	Roanoke	VA				X		X													X
Seattle-Tacoma International Airport	SEA	Seattle	WA	X										X					X			
Smith Reynolds Airport	INT	Winston Salem	NC					X		X												X
St. Pete-Clearwater International Airport	PIE	Clearwater	FL			X					X								X			
City of Abilene	N/A	Abilene	TX										X				X					
City of Norfolk	N/A	Norfolk	VA						X													X
City of Raleigh	N/A	Raleigh	NC							X								X				
City of South Burlington	N/A	South Burlington	VT						X							X						
TOTAL		20		4	3	2	2	6	2	4	6	1	1	2	4	1	5	1	3	4	0	8

1.1. Airport Experience with Stormwater Fees

1.1.1. Fee Structures

For the participant airports, fee structures based on impervious area were the most common. This type of fee structure uses impervious area as a proxy for quantity of runoff and does not consider runoff water quality. Eight of the airports with whom we spoke are charged based on equivalent residential units (ERUs; the average amount of impervious surface on a single-family residential property) or another unit of impervious area (e.g., acres, 100 square feet). For the smaller airports, these impervious area-based fees ranged from tens to hundreds of thousands of dollars per year and can be onerous. Chesapeake Regional Airport (Chesapeake), for example, pays semi-annual payments of \$33,284.04 for a total of \$66,568.08 per year. This is 9.23 percent of the airport's annual budget. Roanoke-Blacksburg Regional Airport (Roanoke) pays \$193,475 per year, which is approximately 2 percent of their annual budget. Smith Reynolds Airport (Smith Reynolds) pays approximately \$118,000 per year (more than \$9,000 per month) in stormwater fees (approximately 20 percent of their annual net income). For the medium- and large-sized airports, total fees can be significantly larger under ERU-based fee structures. Hartsfield–Jackson Atlanta International Airport (Atlanta) pays approximately \$480,000 per year, although it is a minimal percentage of their annual budget. Seattle—Tacoma International Airport (SeaTac) has been paying approximately \$790,000 per year.

Airports paying fees to stormwater utilities with a tiered structure include Nashville International Airport (Nashville) and Paine Field Airport (Paine). Both pay by parcel according to tiers based on percent impervious area or square footage of impervious area. Paine is charged per quarter acre for tax parcels on commercial properties. They have 160 tax parcels and currently pay \$372,399 per year in stormwater fees. Nashville is charged according to a tiered structure for commercial properties that is based on square feet of impervious area, with an upper cap of \$1,300 per month for parcels greater than 1 million square feet.

The City of San José's utility charges Mineta San José International Airport (San José) based on a combination structure; they pay a flat fee of \$55.45 per month plus an additional \$13.04 per acre per month (or \$65,000 per year). SeaTac pays a flat negotiated rate to the City of SeaTac.

1.1.2. Historical Fees

Some of the stormwater utilities charging the airports are older and well established. For example, the City of Des Moines, Iowa, to which Des Moines International Airport (Des Moines) pays stormwater fees, established their utility in 1995. Smith Reynolds has been paying stormwater fees to the City of Winston-Salem, North Carolina since 1996. SeaTac said that they have "always" paid stormwater fees, to their knowledge. Among the newer utilities, Roanoke's stormwater utility fee became effective in 2014. St. Pete–Clearwater International Airport (St. Pete) is subject to a relatively new stormwater fee program in Pinellas County, Florida.

1.1.3. Fee increases

Several airports described recent or potential fee increases, either because of rate increases by the utilities or because of the airport's plans for expansion. SeaTac's flat rate (negotiated in 2002) has an increase of 2 percent per year. Denver International Airport (Denver) pays a stormwater fee associated

with the industrial stormwater permit, and one of their current concerns is a potential 61 percent increase in that fee. In Nashville, the upper limit on the tiered structure for commercial properties was \$400 per month in 2009, but is currently \$1,300 per month. Chesapeake expects their fee to increase by approximately \$3,260 in the next year due to the development of their North Terminal Area.

1.1.4. Airports Not Paying Fees

Four airports (Dallas Fort Worth International Airport (Dallas Fort Worth), Lawrence Municipal Airport (Lawrence), Eugene Airport (Eugene), and Accomack County Airport (Accomack)) are not paying stormwater fees to local municipalities or counties.

Dallas Fort Worth is a standalone entity that is self-governed but owned by the cities of Dallas and Fort Worth. Although some airport property is located in two communities that have stormwater utilities (Coppell and Grapevine), the airport is not subject to stormwater fees from those cities.

Lawrence is currently not subject to stormwater fees, but airport representatives are concerned about the possibility of fees in the future if a stormwater utility is established in the city or county. About five years ago, there were only eight stormwater utilities in Massachusetts. Now, more municipalities are putting legislation forward. Lawrence has an annual budget of approximately \$600,000; an annual stormwater fee of \$150,000, for example, would be difficult to manage.

Eugene is located inside the City of Eugene's boundaries but outside of its urban growth boundary (UGB). They are not currently within the jurisdiction of the City of Eugene's stormwater utility and, therefore, not subject to stormwater fees. The City of Eugene is currently proposing that the airport be incorporated inside the UGB as commercially available property around the city expands. If that occurs, Eugene would be subject to stormwater fees.

Accomack is located on the eastern shore of Virginia in an area where sandy soils facilitate rapid infiltration of rainwater. Towns are small in the region and do not have extensive stormwater infrastructure. There are currently no stormwater utilities in the area. The need for more extensive stormwater infrastructure and stormwater utilities is not anticipated unless there is significant development in the area.

1.1.5. Relationships with Institutions Charging Fees

The airports interviewed have a variety of relationships with local jurisdictions and stormwater utilities. In some cases, an airport's property spans more than one municipality or county. Some airports are owned by one jurisdiction (e.g., a county) or operate as their own authority but are charged fees by a stormwater utility based in another entity (e.g., the local municipality or the county).

Airports value the idea of involvement during the development of stormwater utilities and setting of rate structures. Most of the airports with which we spoke, however, were not consulted during development of the stormwater utilities, and some were taken by surprise when fees were announced.

Jurisdictional relationships can be complex and affect whether an airport is charged stormwater fees and what avenues are available to them to mitigate fees. Furthermore, the airports are sometimes the utilities' highest-paying customers. A few examples of jurisdictional settings are given below.

- Chesapeake is located in the City of Chesapeake, VA and is owned by the Chesapeake Airport Authority, which is a political subdivision of the Commonwealth of Virginia. Chesapeake pays a semiannual stormwater fee to the City of Chesapeake. The stormwater utility does not provide direct services to the airport because the airport property is considered commercial. The airport does, however, receive an annual contribution of \$273,000 from the city.
- Atlanta has property located in six jurisdictions, four of which have stormwater utilities. Each fee started at a different time, but they have similar structures. However, credit programs differ, and it has been challenging to track the credit programs and to ensure that jurisdictional boundaries are clearly drawn so that land is not double counted (i.e., charged for two different stormwater fees).
- Port of Seattle aviation properties are located within the cities of SeaTac, Burien, and Des Moines, WA. The Port pays stormwater fees to all jurisdictions for airport properties.

Permitting also varies among airports.

- Paine has five drainage basins, four of which discharge to Puget Sound. The other drainage basin discharges to Lake Washington and then to Puget Sound. The airport itself holds an industrial permit but is also covered under a municipal National Pollutant Discharge Elimination System (NPDES) permit.
- San José is a municipal separate storm sewer system (MS4) but pays fees to the City of San José and must comply with the state industrial permit for stormwater discharge as well as the city's municipal/regional permit for stormwater discharge.

1.2. Airport Strategies for Reducing Stormwater Fees

1.2.1. Airport Involvement in Development of the Fees

Almost none of the airports interviewed were involved in the development of the SWUs that charge them. Some (e.g., Cleveland Hopkins International Airport (Cleveland)) were taken completely by surprise. Atlanta learned about the development of two major utilities (Clayton County and the City College Park) late in the process and was not involved in the development of the utilities. Nashville was the only airport that cited involvement in the development of the stormwater fee. Several fee proposals were sent to the airport and other landowners to solicit input.

1.2.2. Stormwater Credit Programs

The airports interviewed generally advocated taking advantage of stormwater credits to reduce fees. The success of this strategy depends in part on whether the utility offers a credit program and how the program is structured. All but four of the airports paying fees have been able to reduce their fees through credit programs. In some cases, the airport may not meet eligibility criteria (Des Moines and Gwinnett County Airport (Gwinnett)) for applicable stormwater credits. Some airports are charged fees by utilities that do not have credit programs (Smith Reynolds and San José).

Airports taking part in credit programs receive between a 20 and 50 percent fee reduction per utility. Most stormwater utilities cap credits at 50 percent, which has been a point of contention for at least one airport. South Burlington's stormwater utility noted that Burlington International Airport had

requested a 65 percent credit, but the utility capped the credit at 50 percent. The utility and airport eventually negotiated payment terms. There have been additional cases where airports believe they are not receiving all the credit they deserve.

Atlanta has been one of the most successful airports in using credit programs. The airport is subject to four stormwater fees, and the combination of stormwater credits received from different utilities has resulted in a reduction of more than 50 percent in the total amount of fees they pay. However, Atlanta believes they should be receiving more credits because all stormwater infrastructure is maintained onsite. It is also difficult for Atlanta to track all credits received from the various stormwater utilities. Credit applications often require a great deal of up-front work by the airport or a hired consultant, which may be a deterrent to applying for credits. For example, only a handful of customers have submitted credit applications to South Burlington's stormwater utility because they require a lot of work for a modest fee reduction. Airports have noted the work involved in credit programs, but most have applied for credits. Norfolk's stormwater utility explained that Norfolk International Airport has not applied for credits but that if they did, they would receive a significant credit for the BMPs already installed at the airport. The stormwater utilities with whom we spoke considered stormwater credits to be the most equitable way for airports to mitigate fees.

Credit programs vary greatly in terms of the practices that qualify and what applies to airports. Some credit programs offer an automatic credit to properties complying with a NPDES permit. For example, Paine negotiated for a NPDES-related credit, which went into effect in 2013 and saves the airport approximately \$200,000 annually in stormwater fees.

Credit programs may also be somewhat imprecise regarding which practices qualify for credits. Roanoke stated that the stormwater utility's credits are not always clearly defined, but the utility does work directly with the airport to identify stormwater credits.

1.2.3. Accurate Accounting of Land and Consolidation of Parcels

A particularly useful strategy for Atlanta has been to stay in control of the fee assessment process by calculating their own impervious area and providing these calculations to the stormwater utilities. This ensures that impervious area is not double-counted and builds a good rapport with the utilities. Atlanta has also paid close attention to jurisdictional boundaries to ensure that the jurisdictions only charge for impervious area their respective boundaries.

Because Nashville's stormwater utility charges by the parcel, Nashville reduced their stormwater fees by surveying and consolidating the many parcels of land they had accumulated and submitting the information to the city. This effort has taken a few years, but it has resulted in substantial savings for them.

1.2.1. Exemptions

In all cases, airports are not exempt from stormwater fees even if they are owned by the municipality implementing the fee. Cleveland is the only airport that could negotiate a partial exemption for its runways and taxiways. Other airports have explored this possibility, arguing that runways and taxiways are similar to highways, which are sometimes exempt from stormwater fees. But often, the utility is not

receptive to the idea. Runways and taxiways may also be exempt from Smith Reynolds' stormwater fee in the near future due to pending state legislation (see below in Section 1.2.2).

1.2.2. Legislation

North Carolina is close to approving a bill that would exempt runways and taxiways from stormwater fees statewide. The North Carolina Senate gave final approval to the bill, and the bill is headed to the governor for final approval. Smith Reynolds played a part in this bill, and the representative from the county in which the airport is located is a primary sponsor of the bill. The bill will affect only six out of 72 airports in the state. The bill stipulates that for an airport's runways and taxiways to be exempt from the fee, the "airport shall use the amount of savings realized from this exemption for attracting business to the airport and shall provide certification to the county that the savings realized shall be used for this purpose." This criterion was a compromise so that airports would have to do something in return for the exemption. Airports will still be required to pay stormwater fees assessed on other parts of their properties (e.g., hangars, terminals, and parking lots). The act will become effective January 1, 2018. Smith Reynolds will save approximately \$66,000 per year in stormwater fees.

According to both airports interviewed from Virginia (Chesapeake and Roanoke), a similar bill may also be introduced to the state legislature, but this is still in informal preliminary discussions among various airport and governmental groups.

1.2.3. Agreements with Municipalities

Direct negotiation over fees with an established utility is not generally a successful strategy to reduce fees among the airports interviewed. Several have tried negotiating with utilities for partial exemptions and more credits, but have not been successful. Direct negotiation did, however, work for Denver. They paid approximately \$500,000 annually to the City and County of Denver (CCD) until 2004, when they conducted negotiations with the city. A memorandum of understanding (MOU) with CCD clarified which parts of the stormwater infrastructure are municipal and which are industrial (i.e., what was included in the city's MS4 and what was not). The MOU made it clear that the airport would maintain its own stormwater infrastructure, particularly pertaining to deicing fluids, and would not pay stormwater fees (except for construction inspections).

Smith Reynolds and the Port of Seattle have also been moderately successful in negotiations with their respective stormwater utilities. After proposing de-annexation from the City of Winston-Salem, Smith Reynolds was able to negotiate an inter-local agreement with the city in which the city pays the airport \$150,000 per year to offset the stormwater fees and double property taxes paid by the airport. This \$150,000 is to be used for capital improvements at the airport. The Port of Seattle entered into an inter-local agreement with the City of SeaTac in 1998 after negotiating a fixed stormwater fee rate. The agreement has been renegotiated several times and is set to expire February 2018.

1.2.4. Recovery of Fees

Airports often reduce the impact of stormwater fees on their annual budgets by passing the costs through to tenants. Several airports recover fees indirectly by incorporating the cost into leases along with other fees, and a handful of airports are exploring or have explored this option. Airports that do not

currently pass fees on to tenants are attempting to keep rents low to remain competitive; they need to keep current tenants and attract new tenants.

Chesapeake recovers stormwater fees by incorporating the costs into the tenants' leases, as does Des Moines. SeaTac similarly rolls the stormwater fee into the utility costs it charges to airlines. These airports have not received pushback because the stormwater fees are not line items. In 2005, Paine began recovering stormwater fees from tenants through lease agreements. Credits are passed through to tenants unless the tenant is relying on an airport stormwater detention facility and is not paying the airport through Paine's stormwater facility policy.

Roanoke, on the other hand, absorbs stormwater fees and does not include them when determining rents for tenants. Smith Reynolds absorbs stormwater fees themselves because tenants are already paying property taxes to both Forsyth County and the City of Winston-Salem. San José notes that if they started charging tenants for stormwater fees, the airport would receive pushback, especially from the airlines. However, the airport is considering the possibility of charging tenants for stormwater fees if the need arises.

1.2.5. Establishment of an MS4

Roanoke is the only airport that considered becoming its own MS4. The airport hired a consultant to produce a cost estimate and found that it would cost approximately \$60,000 to become an MS4 and \$10,000 annually to maintain it. If the airport were to become its own MS4, the airport would no longer be a part of the city's MS4 and would not be subject to the almost \$200,000 in annual stormwater fees that the airport currently pays, resulting in a significant cost savings for the airport. Roanoke has not pursued this option due to potential political challenges.

1.2.6. Establishment of a Stormwater Utility

The Port of Seattle established its own stormwater utility in response to stormwater fees. The port owns, operates, maintains, and replaces their stormwater infrastructure and, to some extent, administers redevelopment requirements. The stormwater utility established by the Port of Seattle has a marine utility and an airport utility (for Seattle-Tacoma International Airport). The marine port of the utility is active, and the airport portion of the utility will be activated in September 2017 through commission action.

To an extent, Paine has also been operating as its own informal stormwater utility. In addition to incorporating stormwater fees into tenants' leases, the airport also charges tenants for using stormwater detention facilities constructed by the airport.

1.3. Airport-Specific Challenges

1.3.1. Lack of Stormwater Services Provided to Airports by Utility

Several airports noted that they pay fees without receiving services in return. Most airports maintain their own stormwater infrastructure. Some airports discharge to the municipality's MS4, and others do not or discharge only a portion of their runoff to a local MS4. Entities charging stormwater fees often do not provide maintenance or infrastructure improvements to airports. In particular, if the airport

property is considered commercial, then they may not be considered eligible for services. The following describe the ways in which airports receive stormwater services from entities charging fees.

- Chesapeake has explored having the utility come to the airport to inspect infrastructure and provide other services (e.g., maintain dimensions of ditches and other onsite conveyances, control vegetation, etc.). However, the city considers the airport property to be commercial, and the stormwater utility is not allowed to dedicate city resources to maintain commercial or private property.
- Roanoke does not receive stormwater services in return for the fees paid to the city. Roanoke manages its own stormwater, spending approximately \$20,000 per year for inspections, training, and sampling to comply with the Virginia Pollutant Discharge Elimination System (VPDES) permit. The airport discharges to Lick Run, a tributary that flows to Tinker Creek, and to Carvin Creek.
- Smith Reynolds does not receive services from Winston-Salem's stormwater utility in return for the fees paid. The airport holds a NPDES permit and pays for all stormwater drainage projects on airport property
- Cleveland is beginning to see benefits from their fees; the utility plans to help Cleveland with maintenance of in-stream debris racks and large detention basins.

1.3.2. Applicability of Credit Programs and Best Management Practice Requirements to Airports

In some cases, the utility has worked with an airport to find ways in which the airport can receive stormwater credits. The utility will recommend best management practices (BMPs), but sometimes these are inconsistent with FAA requirements (e.g., wildlife attractants). For example, the City of Roanoke has proposed granting credits for restoration activities conducted by the airport. However, the airport is concerned that restoration and other stormwater projects proposed by the city might attract wildlife.

State and local stormwater regulations may also specify or promote BMP types that may not be appropriate for an airport setting. For example, the City of San José required the airport to install bioswales on the airside to address additional stormwater runoff from a new fixed-base operator (FBO). However, the bioswales would create standing water for about four hours, which could attract wildlife; the airport has not installed the bioswales.

1.3.3. Revenue Diversion

Revenue diversion was mentioned in several interviews and focus groups. However, airports have not pursued or successfully used this issue to mitigate stormwater fees. Denver, for example, stated that if they had continued to pay stormwater fees (while also complying with their MS4 permit) without receiving services, it could have been construed as revenue diversion. They noted that the FAA might have worked to ensure that the airport received services. Atlanta explored whether there was revenue diversion occurring because of their multi-jurisdictional challenges. However, under attorney advice, this was not pursued further. At Gwinnett, airport projects are on Gwinnett County's list for stormwater

services. Therefore, the situation cannot be considered revenue diversion, although the airport needs to take care of urgent drainage projects on their own because they do not have time to wait in the queue.

1.4. Key Takeaways

- Airports interviewed believe that early involvement in the development of stormwater bodies and the fee structures could help them advocate for themselves, although our airport participants have not generally been involved in the process.
- Relationships between airports and the municipalities and counties in which they are located are varied in terms of ownership and permitting. These jurisdictional and ownership factors affect how (and sometimes whether) stormwater fees are assessed and other issues (e.g., whether a county or municipality can provide services to the airport).
- Credit programs are a key means used by airports to mitigate stormwater fees. Both airport participants and municipalities encouraged making optimal use of these programs. Credit programs, where available, have resulted in substantial fee reductions for some airports, though some have not obtained as much reduction as they anticipated.
- Exemptions of runways and taxiways are uncommon, although one airport does receive such an exemption. The State of North Carolina has pending legislation, which would exempt runways and taxiways if the funds are then directed to increase business at the airport.
- Airports most often pass the costs of stormwater fees on to their tenants indirectly as part of the overall facility expenses covered in rent. The airports with which we have spoken do not charge fees to their tenants as line items. Some absorb the costs without including them in the rent charged to their tenants; such choices are made in part by how competitive the airport's rent needs to be.
- Other mitigation strategies have included making sure that land is properly accounted for in the correct jurisdictions, consolidating parcels, establishing an MS4, and establishing a stormwater utility.

1.5. Considerations for Guidebook Development

The results from the focus groups and interviews provide potential approaches to managing stormwater fees at airports operating under a wide range of institutional frameworks and physical settings. There is significant variability in the way institutions charging stormwater fees are structured and operate. Similarly, airports are owned, operated, and permitted under a variety of institutional frameworks. In addition to these institutional structures, the physical setting and drainage systems at each airport further influence the circumstances under which stormwater fees are developed and charged. Although this variability presents a challenge to providing coherent guidance, the data collected during the interviews and focus groups provided several potential approaches for mitigating stormwater fees. One or more of the stories provided by participating airports can offer lessons and approaches that are applicable to the issues that a particular airport may encounter.

The concepts to be included in the guidebook can be generally categorized as described below. (These initial concepts will be refined and further developed as we receive feedback from participants on the summaries in Section 2.)

- **Understanding Fee Structure and Recovering Costs:** Guidance on understanding how fees are established and measured will be provided. Similarly, potential approaches to recovering the cost of stormwater fees will be discussed. Examples may include the transfer of fees to end users such as tenants and lease-holders. This guidance will consider the feasibility, advantages, and disadvantages of such cost recovery efforts.
- **Planning for New or Increased Stormwater Fees:** Guidance on managing the development of fee structures in collaboration with state and local governing entities will be provided. Some airports interviewed were caught off-guard by new fees or substantial changes in fees. Many airports or operating entities employ part- or full-time legislative observers or belong to organizations that do so. This issue should be elevated at airports as local governing bodies continue to look for new revenue streams to fund stormwater management. Those responsible for stormwater management at airports should be aware and on the lookout for changes to their stormwater fees and be prepared to discuss them with city, county, or utility boards. This may improve the airport's position before these changes are enacted. It is difficult to gain concessions or consider potential impacts after the changes are approved. Guidance can be used to raise awareness of the potential adverse consequences.
- **Understanding Jurisdictional Relationships:** Guidance on jurisdictional relationships, including ownership, location, franchising (utilities), easements, leases, and jurisdictional boundaries will be provided. This institutional knowledge will facilitate the airport's position and negotiating strategy when discussing the appropriateness of fees applied to the airport and its infrastructure, the services provided for the fees, and can help delineate operational responsibilities.
- **Understanding Stormwater Permitting:** NPDES permitting status is often a key consideration for relief or application of permit fees. Guidance on coordinated consideration of stormwater utility fees and permitting issues will be provided.
- **Communicating Internally and Externally:** Communication is key, both internally, within the airport, and externally, with institutions charging stormwater fees, as well as with other airports. Guidance may include, for example:
 - If an institutional advisory committee exists, the airport should become a member.
 - Airports will benefit from maintaining good internal coordination among departments. At least one airport was not initially certain whether they were paying fees and double checked with other departments. It is possible that in some cases, especially in large organizations, environmental or operational staff may be unaware of either the existence or the details of stormwater fees because they are paid elsewhere in the organization (e.g., accounting).
 - Airports who are struggling with or concerned about potential future stormwater fees may want to work with other airports to share experiences and address common stormwater utility fee issues.
 - Airport communication with the entities charging fees is critical and should include:

- Initiating contact if the airport becomes aware of upcoming stormwater fees.
 - Remaining in communication about rate increases.
- **Collecting and Verifying Critical Documentation:** Guidance will be provided on the documentation of information important for mitigating stormwater fees. Airport experiences varied widely regarding how fees were charged and if they were applied correctly. The cost of collecting information can be minor compared to the potential savings. Examples of ways to ensure documentation include:
 - Verifying that inventories of impervious area are accurate, and making sure that property is not double counted if the airport pays to more than one utility.
 - Maintaining proper documentation of discharges and how much (if any) discharges to a local MS4.
 - Careful reviewing of potential exceptions, credits, and fee reductions by providing a list of specific examples and approaches of how to:
 - Read and interpret regulatory language in ordinances
 - Apply exceptions to your airport
 - Make arguments for variances and suggest exemptions
 - Evaluate taking on more operational responsibility to gain fee reductions.
- **Collaboration with Institutions Charging Stormwater Fees:** Guidance will be provided for working with the institutions charging stormwater fees in order to:
 - Make the most of credit programs, possibly negotiating which stormwater control measures qualify for credits. Making sure credit applications are complete and highlight all relevant information. The guidance will provide examples of technical arguments used to document the benefits of airport stormwater operations.
 - Ask the utility to provide services where possible (e.g., help with landside maintenance).

2. Airport Focus Group and Interview Summaries

Below are summaries of the three focus groups and ten interviews. The personnel involved in the focus groups and interviews have all been given the chance to review the summaries. All personnel have reviewed these summaries for accuracy and provided feedback except for Hartsfield-Jackson Atlanta International Airport (Focus Group #1) and Chesapeake Regional Airport.

2.1. Focus Group #1 (Large Airports)

Participants

Denver International Airport (DEN)

Mr. Craig Schillinger, Environmental Public Health Manager

Mr. Keith Pass, Environmental Programs Manager

Hartsfield-Jackson Atlanta International Airport (ATL)

Mr. Brian Hennessey, Assistant Director, Planning and Environmental

Dallas Fort Worth International Airport (DFW)

Ms. Asciatu Whiteside, Environmental Program Manager, Environmental Affairs Department

The Cadmus Group LLC

Mr. James Jolley

Dr. Mary Ellen Tuccillo

Ms. Martha Walters

Introductions

Mr. James Jolley from The Cadmus Group LLC (Cadmus) provided background information to the focus group participants, who introduced themselves and briefly summarized their experiences with stormwater fees.

- Mr. Craig Schillinger oversees the water programs at Denver International Airport (Denver). Mr. Schillinger explained that Denver's biggest challenge is managing a stormwater collection system. He described parts of the system, which include disposing of contaminated water (with deicing fluid) offsite to a publicly owned treatment works (POTW) as well as onsite recycling. The airport is part of an MS4 program for the City and County of Denver (CCD). The airport is owned and operated by the city and county but has not paid a stormwater fee for many years. Denver negotiated with CCD so that they would not have to pay fees. The airport still must report to the city and county about what they do in terms of stormwater management.
- Mr. Keith Pass acts as the Industrial Stormwater Permit Manager at Denver. Mr. Pass described the airport's aircraft deicing system, which receives, stores, and distributes deicing fluid. Once aircraft are deiced, the runoff is collected, and the glycol is reclaimed from the collected runoff. The remaining portion of the runoff goes to the local POTW. There is a stormwater fee associated with the industrial stormwater permit. Mr. Pass explained that one of their major concerns currently is a potential 61 percent increase in that fee. The state has not increased the fee in 10 years. The airport itself encompasses 53 square miles. Most of the area lies within the City and County of Denver, but there is a small portion that falls under Adams County. Denver has only recently learned about a stormwater fee implemented by Adams County, but the fee is minimal.
- Mr. Brian Hennessey oversees environmental compliance at Hartsfield-Jackson Atlanta International Airport (Atlanta). Mr. Hennessey explained that Atlanta spans land that is located

in six jurisdictions, four of which have stormwater fees. Each fee started at a different time, but they have similar structures. However, credit programs differ, which can pose a problem. It has been challenging to track the credit programs and to ensure that jurisdictional boundaries are clearly drawn so that land is not double counted (i.e., charged for two different stormwater fees).

- Ms. Asciatu Whiteside oversees all environmental compliance for stormwater on the industrial side at Dallas Fort Worth International Airport (Dallas Fort Worth). Ms. Whiteside explained that Dallas Fort Worth is a standalone municipality. The airport does not fall under the authority of adjacent cities and, therefore, is not subject to stormwater fees from those cities. The airport manages its own stormwater collection system. Ms. Whiteside said that she is interested in hearing from the airports about paying stormwater fees and how local cities are using the fees to manage or maintain their stormwater systems.

Mr. Jolley emphasized that the goal of the project is to develop materials that will provide information to airport practitioners on: stormwater fees and how they apply to airports, lessons learned from the experiences of airports faced with stormwater fees, and strategies for reducing stormwater utility fees. He provided a brief review of stormwater fees and finally covered some challenges for airports. These challenges include: higher fees for airports if the fee is based on impervious surface; airport properties that span multiple jurisdictions and, therefore, may be subject to more than one fee; credits and exemptions; and legal challenges.

Experience with Stormwater Fees

Airport involvement and experience with stormwater utilities; history of the stormwater utility assessing the fees; and impacts of fees on the airport's budget.

In terms of airport involvement in fee development, Atlanta came in at the tail end for the development of two major stormwater utilities: Clayton County and the City of College Park. Mr. Hennessey explained that all municipal jurisdictions in the state are legally approved to establish and operate stormwater utilities. The Clayton County Water Authority (CCWA) stormwater utility was established in 2007, and College Park soon followed. Atlanta was not involved in the development of the utilities and learned about them rather late in the process. Mr. Hennessey noted that this was unfortunate, but he also pointed out that the fees put into place by both utilities were in line with what the municipalities were allowed to charge and were not as high as they could be. Atlanta also verified that each fee was applied equally throughout the jurisdiction. The CCWA fee structure is based on impervious area measured in ERUs. Residential homes pay for 1 ERU, but larger properties (e.g., the airport) can pay an astronomical amount. Mr. Hennessey also noted the stormwater utility has a credit program, but Atlanta did not have much input in the development of the program. Atlanta has also paid close attention to jurisdictional boundaries to ensure that each jurisdiction is only charging for impervious area within their respective boundaries.

- Mr. Schillinger asked if the jurisdictions were Phase I or II.
- Mr. Hennessey replied that he was not sure. Clayton County is a water authority. He doubts that College Park or the others would be Phase I or II.

Mr. Schillinger explained that Denver is a Phase I city. The Phase I concept was coming into play as the airport was being built in the mid-1990s. The airport paid stormwater fees until 2004, when Denver obtained a credit. The challenge was that Denver was paying fees without receiving substantial stormwater management services, which the rest of the city received. As a result, Denver made stormwater management at the airport more robust. Mr. Pass commented that there is a division between the airport and the rest of the county in terms of spending; money from the county's general fund is not used for the airport. That may be why the stormwater utility was not coming out to the airport to provide services. Mr. Schillinger noted that there were growing pains when trying to implement a stormwater management program while simultaneously building the airport.

Mr. Schillinger explained that when Denver sought to stop paying stormwater fees to CCD, there was initially a memorandum of understanding (MOU) between the Department of Public Works and the airport. The MOU was eventually codified with an ordinance approved by the city council. It took about nine years for the bill to be put into place. The last time the airport paid stormwater fees to CCD, it paid \$500,000 for the year. If the airport still paid all the stormwater fees today, they would now pay approximately \$2.5 million annually.

Mr. Schillinger emphasized the importance of educating people about the stormwater fee and the services that should be received in return (e.g., construction, inspection, and enforcement). In particular, there was a learning curve in determining which services the airport should be receiving. The airport does still pay a small amount in fees for construction inspectors to oversee construction activities.

Atlanta does not receive any services from the utilities and does discharge to surface water from the airport's stormwater infrastructure. One issue to consider is the point at which the water no longer belongs to the airport. Stormwater from the airport eventually flows to surface water but does not flow into the "sticks and bricks" infrastructure of the municipalities' stormwater collection systems.

Dallas Fort Worth could potentially be charged stormwater fees by two adjacent cities because the airport connects to their stormwater collection systems. The real estate department at Dallas Fort Worth is familiar with stormwater utility fees, but the airport has not yet been affected by those fees. When Dallas Fort Worth has new development projects, those projects are subject to certain stormwater design measures to control and treat stormwater runoff. The fact that the airport is already subject to these measures was probably used as an argument against charging stormwater fees to the airport. Dallas Fort Worth does not charge tenants a fee for using the airport's stormwater facility.

Stormwater Program Exemptions and Credits

Land uses that are exempt; airport requests to be exempted; and discussion of credit programs.

The CCWA has a sophisticated credit program in which Atlanta participates. If an entity does not discharge into the county's stormwater system, that entity may be eligible for a 100 percent fee reduction. However, the county does not believe Atlanta is eligible for a 100 percent reduction. Atlanta developed a stormwater management attenuation plan, which includes information regarding how the airport addresses stormwater quality and quantity (e.g., bioswales). This plan, along with a credit

application, was submitted to Clayton County, and the airport was awarded a 33 percent reduction in the stormwater fees they pay to CCWA.

The City of College Park also has a credit program, but Atlanta does not have a clear understanding about how that program works despite attempts to communicate with the utility. Atlanta estimated that they should receive a fee reduction of approximately 40 percent under College Park's credit program.

Atlanta pays a total of \$480,000 per year in stormwater fees. This includes reductions from credits. Without the reductions, Atlanta would be paying over \$1 million per year. The two utilities charging stormwater fees would probably not adopt an exemption for runways and taxiways because the airport generates the largest portion of their revenues.

Regulatory and Other Conflicts

How well do stormwater fee programs agree with: airport-specific regulations (e.g., revenue diversion), operational practices, and airport planning.

One challenge described by Denver is the differences in stormwater management at the airport vs. the city resulting from the airport's need to comply with FAA regulations. For example, water quality ponds may be used within the city to manage and treat stormwater runoff, but they can be problematic wildlife attractants at the airport. Problems arise when the airport must obtain permits for a new building or parking lot. The stormwater utility is used to seeing a water quality pond associated with new development, but the airport must use an alternate BMP type (e.g., grassy swales). The Denver Urban Drainage and Flood Control District developed an urban storm drainage criteria manual, but the airport is an exception to these guidelines due to conflicting requirements, especially on the airfield.

The issue of revenue diversion has been discussed at Denver. If Denver continued to pay stormwater fees as well as comply with the MS4 permit, the FAA might have stepped in to ensure that the airport received what they were paying for. If the airport paid \$500,000 per year and was not receiving services in return, this could arguably be considered revenue diversion. However, Denver did not need to pursue that approach to manage fees.

Atlanta had considered revenue diversion issues because of the multi-jurisdictional challenges they face. However, under attorney advice, they did not pursue this further. The City of College Park collects sales tax from the terminal and some concourses, which, in a way sets the precedent for charging the stormwater fees.

Strategies to Manage Fees

What strategies airports have employed; how well these strategies have worked; and other approaches considered for the future.

CCD began charging Denver a stormwater utility fee when the airport opened in 1995. The airport learned more about the fee and what services were (or were not) performed by the utility. Denver had stormwater infrastructure specific to the airport in place, particularly infrastructure to collect deicing fluids, so it made more sense for the airport to maintain its own stormwater infrastructure. In addition, Denver holds an industrial stormwater permit with the state. As a result, the MOU with the CCD was

intended to clarify which parts of the stormwater infrastructure are municipal and which are industrial (i.e., what was included in the city's MS4 and what was not). The MOU made it clear that the airport would maintain its own stormwater infrastructure, particularly pertaining to deicing fluids, and would not pay stormwater fees (except for construction inspections).

Going forward, Denver still has work to do to clearly define who is doing what. For example, Denver will most likely enter into another MOU with the City and County and Denver to clarify responsibilities for construction stormwater inspections. In addition, Denver plans to improve documentation of stormwater fees paid. For advice to other airports, Denver suggests that if an airport is paying fees to a jurisdiction and not receiving services in return, then an argument can be made for them not having to pay the fees. It could also be argued that charging the fees constitutes diversion of revenue.

Mr. Hennessey acknowledged that Atlanta probably would not have been able to prevent stormwater utilities from coming online. Atlanta has worked through credit programs to maximize credits and reduce fees. However, these credits are only valid for five years. As a result, Atlanta is trying to find ways to keep these credits as long as possible and also to enhance them. When updating their stormwater management attenuation plan, Atlanta tried to include practices such as permeable pavement that can help them with stormwater fee credits. A particularly useful strategy for Atlanta has been to stay in control of the fee assessment process. Atlanta calculates their impervious area and provides these calculations to the stormwater utilities. This ensures that impervious area is not double counted and builds a good rapport with the utilities.

Ms. Whiteside noted the importance of stormwater utilities to address failing infrastructure but also acknowledged the issue of airports facing high fees. It does not appear that Dallas Fort Worth will become subject to fees in the near future, but this is something the legal and commercial development departments deal with initially.

For smaller airports that are subject to stormwater fees, Mr. Hennessey suggested exploring credit programs to see if cisterns are eligible for credits. Installing cisterns could be particularly economical for smaller airports.

2.2. Focus Group #2 (Stormwater Utilities)

Participants

City of South Burlington, VT

Mr. David Wheeler, Assistant Stormwater Superintendent

City of Raleigh, NC

Mr. Scott Bryant, PE, Stormwater Administrator/Planning & Business Operations

City of Abilene, TX

Mr. Srini Valavala, Stormwater Services Administrator - City of Abilene Department of Public Works

The Cadmus Group LLC (Cadmus) and Municipal and Financial Services Group (MFSG)

Mr. Michael Maker (MFSG)

Dr. Mary Ellen Tuccillo (Cadmus)

Ms. Martha Walters (Cadmus)

Introductions

The City of Abilene, TX [Stormwater Utility Division](#) was established in 2003. Residents pay a monthly tiered rate, which is determined based on the square footage of impervious surface. Commercial properties pay per square foot, with a cap of \$50 per month. The fee has only increased once since it was established in 2003, and the structure currently places the burden on residential customers. Abilene has a NPDES permit for its MS4, and the fee structure is inadequate to pay for a stormwater management program and capital improvements. Abilene is working with a consultant to potentially revise the fee structure. The stormwater utility assesses the fee for the Abilene Regional Airport, owned and operated by the city itself. The city also assesses stormwater fees for tenants of the airport. A maximum monthly commercial rate of \$50 is charged to the airport towards its approximately 1.2 million square feet of impervious surface. Tenants of the airport are charged individually for the hard surface that they utilize for their individual operations.

The City of South Burlington, VT [Stormwater Utility](#) was established in 2005. The main driver for the stormwater utility was protecting Lake Champlain, which is a phosphorous-impaired water body. In addition, the Conservation Law Foundation issued multiple lawsuits against the city regarding Lake Champlain over a five-year period. South Burlington is an MS4. The stormwater utility fee is ERU-structured, with 1 ERU equaling 2,700 square feet. Residential properties pay a flat rate, and non-residential properties are charged according to a tiered structure.

The Burlington International Airport has the most impervious surface for a single property in South Burlington, VT, with 4,759 ERUs. There is no cap for non-residential properties, and stormwater fees from the airport total approximately \$30,000 per month (including a credit). Stormwater fees paid by the airport make up approximately 17 percent of the utility's annual revenue.

The City of Raleigh, NC [stormwater utility fee](#) was implemented in 2004, and the City of Raleigh has been a Phase I MS4 since 1995. Before the stormwater utility fee was established, stormwater management was funded through the city's general fund. The main intent behind the stormwater utility fee was to

increase the level of stormwater management services provided for the community. The stormwater utility fee enabled the city to increase funding and resources for stormwater management through an equitable mechanism. Residential properties are charged a tiered rate based on the amount of impervious surface, and commercial properties are charged \$5 per single-family equivalent unit (SFEU), which is 2,260 square feet. The City of Raleigh also has a Stormwater Management Advisory Commission (SMAC), which meets monthly and is appointed and supported by the City Council. The utility's annual revenue is approximately \$23 million per year. The utility offers a comprehensive range of stormwater services, including water quality programs, maintenance of the public drainage system, capital improvement programs, stormwater plan and development plan reviews, floodplain management, inspections, education, outreach, master planning, and program administration. There are no airports located within Raleigh's jurisdictional boundaries. The Raleigh-Durham International Airport serves Raleigh but is located in Morrisville.

Development of Stormwater Fees

Outreach to public, airports, and other property owners; development of fee structure; and coordination with other municipalities.

When the South Burlington Stormwater Utility was in the development stage, a stormwater working group was established. The group included various parties: residents, hired consultants, and large landholders. There was a great deal of public outreach because South Burlington was the first stormwater utility in Vermont. Generally, the concept of a stormwater utility was accepted by the community due to outreach.

Flooding in 2002 was a main driver for developing and then establishing the Abilene Stormwater Utility Division in 2003. When the fee was implemented, there was a cap of \$25 for commercial properties, which was not met with much opposition.

Outreach and involvement with the community was important during the development of the Raleigh stormwater utility fee and still is on an ongoing basis. In the initial setup, various stakeholders from the community were involved in order to help them understand what the stormwater utility would entail, what stormwater programs and services the utility would support, and how the fee would work.

All the participating stormwater utility representatives agreed that there are benefits to having a dedicated fund for stormwater management. There is no competition for funds, as there is with a city's general fund, and it allows the utility to implement regulatory requirements, plan ahead, and fund necessary stormwater system maintenance and improvements.

In some cases, stormwater utilities must coordinate with other local municipalities or must provide services to properties outside jurisdictional boundaries.

- Abilene's utility may provide services to an extraterritorial jurisdiction (ETJ). However, the utility is not obligated to do so. In addition, Abilene will coordinate with surrounding MS4s to compare stormwater management programs with respect to services provided and funds. The City of Abilene must coordinate with the Texas Department of Transportation (DOT) regarding public roadways, which are covered under a separate permit issued to Texas DOT.

- Raleigh’s stormwater utility shares information and coordinates with other municipalities in cohesive approaches to addressing water quality on a watershed level since the municipalities are bound by similar requirements. Raleigh is also a member of the Clean Water Education Partnership, which is a regional partnership.
- The South Burlington Stormwater Utility is involved in a shared education program with surrounding MS4s. South Burlington also has a contract with the Town of Shelburne to provide stormwater services to the town. South Burlington coordinates with the City of Burlington regarding Burlington International Airport. The airport is located within South Burlington but is owned by the City of Burlington. As a result, one city (Burlington) pays a fee to another city (South Burlington).

Stormwater Credit Programs

When the credit program was established (established along with the fee or after); participation of large property owners in the credit program; and success of the credit program.

The South Burlington Stormwater Utility offers credits to commercial properties for stormwater treatment practices that address water quality, groundwater recharge, channel protection, and overbank flooding or extreme storms and for non-structural practices (e.g., natural area conservation, stream buffers, grass channels, etc.). In addition, an education credit is offered to schools that incorporate a stormwater curriculum, which only one school has done. Properties can receive up to a 50 percent credit. The utility caps credits at 50 percent because fee revenue must meet baseline costs of the stormwater utility. Only a few properties take advantage of the credit program. For some properties, it may not be worth the effort and expense to complete an application to receive a credit on a relatively inexpensive fee.

Burlington International Airport is one of thirteen properties to participate in the credit program. The airport originally submitted a credit application to the stormwater utility covering 133 acres of impervious surface and requesting a 65 percent credit. However, the utility caps the credit at 50 percent. The utility reviewed the application and approved a revised calculation to more accurately reflect the treatment provided to different areas of the airport. However, the airport paid fees that included the 65 percent credit rather than the credit approved by the utility. Because the two parties could not agree, a lawyer was brought in to help negotiate payment terms. The final agreement included both the stormwater fees paid to South Burlington as well as sewer fees paid by South Burlington to the City of Burlington for the sewage from South Burlington that is routed to Burlington’s wastewater treatment plant.

Abilene’s stormwater utility fee does not have a credit program. Credit programs can be resource-intensive to administer. The stormwater utility partners with the water department to handle billing; there are no specifically identified stormwater personnel actively involved with the billing. Abilene’s stormwater fee structure is straightforward and is billed based on the impervious area of the property. Abilene stormwater utility fee rate structure is relatively low when compared to its sister cities and Texas wide MS4 programs. There are identified caps both on residential and commercial fees and hence no established credits or waivers.

Raleigh's stormwater utility includes a fee crediting program that has been in place since the fee's inception. Commercial customers can receive up to a 50 percent credit for implementing peak flow management on their properties, but NPDES permittees can receive up to an additional 35 percent credit. Two customers in the fee crediting program currently have NPDES permits: North Carolina DOT and North Carolina State University. Currently, there are only four customers (with a total of approximately 80 parcels) taking part in the credit program. The utility is considering revising the credit system to incorporate peak, volume, and water quality-based credits as well as credits for non-structural credit practices (e.g., stormwater education). The utility also wants to promote the program further to encourage others to participate and address stormwater management as close to its sources as possible. The utility is also considering making the program applicable to all properties, not only commercial properties. One specific requirement that will remain pertains to development requirements. Any new development requires stormwater controls, and a property owner will only receive a credit if the stormwater controls surpass the requirements.

Exemptions and Appeals

Considerations in deciding which properties should be exempt; occurrence and frequency of appeals; and outcomes of appeals.

The South Burlington Stormwater Utility exempts railroads from fees, but does not exempt airports (runways and taxiways). City properties are not exempt from the fee either. Essentially, money is transferred from the general fund to the stormwater utility to cover fees for city-owned property. The utility also had an agreement with the Vermont Agency of Transportation (VTrans) where the utility cleaned highway catch basins and charged VTrans an increased rate instead of charging them a stormwater fee. However, state legislation addressing the relationship between VTrans highways and MS4s changed that. Currently, the utility charges VTrans for stormwater fees with a 35 percent credit, which is a higher credit negotiated by VTrans and incorporated into state law.

Raleigh's stormwater utility fee exempts undeveloped land, public streets and rights of way, developed land with less than 400 square feet of impervious surface, railroads, and developed land that drains outside city limits.

Abilene's stormwater utility fee follows exemptions laid out in Texas's Local Government Code: [Municipal Drainage Utility Systems Act](#). Exemptions include government-owned property, schools, religious organizations, cemeteries, and others. Billing and payment disputes shall be subject to informal hearing and dispute resolution procedures used by the City of Abilene. These matters may be appealed to the stormwater administrator.

Ongoing Implementation

Ongoing issues in implementation as they relate to large properties; opposition and acceptance of the fee; and other strategies practiced by large properties to reduce fees.

The Abilene Stormwater Utility Division must maintain, operate, and improve stormwater infrastructure. The division must also oversee permitting, which can be difficult with increasingly stringent stormwater regulations. Implementation of and procuring funding for permitting requirements is difficult for localities. There are also political barriers because the city wants to grow and compete with larger cities,

but increasingly stringent requirements can pose an obstacle to development. Finding a balance between implementing and enforcing increasingly stringent requirements while not impeding development is a challenge.

Raleigh's stormwater management program has been fortunate to have generous community and leadership support, especially as the community observes tangible benefits of the program (e.g., reduced flooding hazards, improved infrastructure, improved water quality). The fee remains relatively modest to support the program while also allowing the program to provide a high level of service to the community.

Even though the South Burlington Stormwater Utility had to negotiate fee payments with the Burlington International Airport, the general community has been accepting of the stormwater fee and services provided by the utility. The need for stormwater management is generally understood since Lake Champlain is located next to the city. In the future, the utility will require more funding to clean up Lake Champlain, and the stormwater fee may rise as a result. In addition, the state of Vermont is considering a state stormwater utility with an ERU-based fee because the state is struggling as a whole to raise revenue for stormwater management revenue.

Recommendations for Large Property Owners

When asked to provide recommendations to airports and other properties with large amounts of impervious surface for mitigating fees, the participants echoed that the most effective and equitable way to mitigate fees is to reduce impervious surface on one's property. Properties should implement stormwater treatment practices and BMPs and take advantage of a stormwater utility's credit program (if one is offered). The utilities noted that in the end property owners must pay for the stormwater their properties generate. Properties should be encouraged to remove impervious area, and utilities can incentivize them to do so. The ultimate benefit is less stormwater runoff impact, which would result in lower fees and a lower level of stormwater management. Another point is that a reduction in fees must be equitable. If the fee is reduced for one property without reducing impervious surface, it must be raised for another property to address the impact. Stormwater utility fees must generate a certain level of revenue to address stormwater management needs within the community.

2.3. Focus Group #3 (Small and Medium Airports)

Participants

Des Moines International Airport (DSM)

Mr. Bryan Belt, Director of Engineering

Norman Y. Mineta San José International Airport (SJC)

Mr. Robert Guerra, Planning and Development

St. Pete–Clearwater International Airport (PIE)

Mr. Mark Sprague, Deputy Director of Operations and Facilities

Lawrence Municipal Airport (LWM)

Mr. Michael Miller, Airport Manager

The Cadmus Group and Western Kentucky University

Dr. Warren Campbell (Western Kentucky University)

Dr. Mary Ellen Tuccillo

Ms. Martha Walters

Introductions

Dr. Mary Ellen Tuccillo from The Cadmus Group LLC (Cadmus) provided background information to the focus group participants, who briefly introduced themselves, and then handed it over to Dr. Warren Campbell (Western Kentucky University) to facilitate the discussion.

Dr. Campbell introduced himself and provided a brief background on stormwater fees. He explained that the most ideal stormwater fee structure for an airport is a flat fee, followed by a dual fee system and then a tiered system. The worst structure for an airport is an ERU- or Residential Equivalency Factor (REF)-based system. Dr. Campbell then began the discussion by asking the airports about their experiences with stormwater fees.

Experience with Stormwater Fees

Airport involvement and experience with stormwater utilities; history of the stormwater utility assessing the fees; and impacts of fees on the airport's budget.

Des Moines International Airport (Des Moines) is located in Polk County, and fees are paid to the City of Des Moines. The City of Des Moines stormwater utility was established in 1995, but Des Moines was not involved in its development. The stormwater fee is based on ERUs.

Des Moines must treat stormwater runoff from their impervious surfaces. Des Moines pays other fees as well, such as fees for treatment of contaminated wastewater at the Wastewater Reclamation Authority (WRA). Dr. Campbell noted that the City of Des Moines stormwater utility ordinance includes language regarding water quality and flooding. There are also flooding concerns, but water quality seems to be a major component for Des Moines. Des Moines passes stormwater fees along to tenants as part of their leases.

St. Pete–Clearwater International Airport (St. Pete–Clearwater) is subject to a relatively new stormwater fee program in Pinellas County, FL. The airport is owned by the county, but it is an enterprise and must pay the fees itself. The fee structure is based on each property’s impervious area. St. Pete - Clearwater will pay approximately \$150,000 per year, which is about 1 percent of the airport’s annual budget. St. Pete - Clearwater was not involved in the development of the stormwater utility.

Norman Y. Mineta San José International Airport (San José) is part of the City of San José, but the airport must also comply with the state industrial permit for stormwater discharge as well as the city’s municipal/regional permit for stormwater discharge. San José is an MS4 but still pays fees. The airside discharges directly to the Guadalupe River, which is a 303(d)-listed body of water. The airport spends a large amount of money to comply with various permit requirements managing the many stormwater BMPs in place. San José only pays fees for landside discharges, which go into the city’s stormwater collection system. San José is considered a commercial, light industrial, and miscellaneous non-residential property type. The airport pays a flat fee of \$55.45 per month plus an additional \$13.04 per acre per month. Out of 661 acres, 410 are impervious, which is approximately \$5,400 per month and \$65,000 per year.

Lawrence Municipal Airport (Lawrence) is currently not subject to stormwater fees, but they are concerned about the possibility of fees in the future. The concept of a stormwater utility is gaining interest in Massachusetts, with more municipalities putting legislation forward. There are currently 10 communities in Massachusetts that have adopted stormwater utilities. The issue is of particular concern for smaller airports with limited budgets. Lawrence has an annual budget of approximately \$600,000; an annual stormwater fee of \$150,000, for example, would be difficult to manage.

General Stormwater Management

Information regarding stormwater management at participating airports (e.g., BMPs, permitting requirements, discharge locations, etc.).

San José has a very robust Spill Prevention, Control, and Countermeasure (SPCC) and stormwater pollution prevention plan (SWPPP), and all the airlines comply with these policies. If an airline does not comply with stormwater controls and spill procedures, it must get its own permit. As a result, there is good voluntary compliance from the airlines. Periodically, San José must revisit it, but for the most part, airlines are agreeable to compliance.

Reducing impervious area is a primary issue at San José and drives the pursuit of green stormwater infrastructure (GSI) at the facility. That is an integral part of complying with the permit for the Bay Area and the City’s Municipal Regional Stormwater Permit (MRP) as well. San José is always planning and spending a lot of time and energy looking forward to future projects that can reduce impervious area. It does not rain often, but there is a large effect when it does. For GSI BMPs, San José has bioswales, permeable pavers, tree wells, and other BMPs along those lines.

San José discharges stormwater runoff to the City of San José’s MS4 on the landside and discharges directly to the Guadalupe River on the airside. St. Pete–Clearwater discharges to Tampa Bay and uses the Pinellas County’s MS4 permit. Des Moines discharges to three different creeks around the airport

campus and to the City of Des Moines wastewater. Everything is regulated by Des Moines' NPDES permit and associated SWPPP.

St. Pete-Clearwater is subject to the Southwest Florida Water Management District's (SWFWMD's) rules regarding water quality and quantity. St. Pete-Clearwater is redeveloping their master plan to look at impervious area as a whole. If there is a large piece of land that can be divided among three tenants, all three could be served by a central stormwater pond rather than three individual ponds. St. Pete-Clearwater emphasized the importance of airport zoning in determining the appropriate size of a detention pond. The airport tries to make the most efficient use of space, and determines which areas of the airfield are not buildable.

Des Moines is employing infrastructure similar to St. Pete-Clearwater, but calling it a "regional detention basin." Des Moines is developing the south quadrant to include a detention basin, which will be sized appropriately for the full buildout. For the most part, the basin will be dry, but it must be designed and constructed to meet 100-year capacity and hold 48 hours' worth of runoff. The regional detention basin might not reduce ERUs dramatically, but it will allow Des Moines to use space more efficiently to meet NPDES requirements.

Stormwater Program Exemptions and Credits

Land uses that are exempt; airport requests to be exempted; and discussion of credit programs.

St. Pete – Clearwater receives a fee reduction of about 50 percent due to credits. There are no exemptions for the airport.

San José does not receive credits or fee reductions, and runways and taxiways are not exempt from the fees.

Des Moines became an airport authority five years ago. The authority wants to negotiate with the City of Des Moines to lower stormwater fees. However, the authority must prioritize the various topics they want to bring to the city. The Des Moines Airport Authority has internally discussed the possibility of treating runways and taxiways like a roadway system. In the City of Des Moines, public roadways are exempt from stormwater fees. If the airport authority argued for exemption of runways and taxiways, it would be a large hit to the utility's funding. The Air National Guard leases 172 acres at the airport, and they unsuccessfully fought the fee a few years ago. Today, Des Moines is still paying the stormwater fee. Des Moines is not eligible for credits.

Regulatory and Other Conflicts or Considerations

How well do stormwater fee programs agree with: airport-specific regulations (e.g., revenue diversion, operational practices, and airport planning.

Bird strikes are not a major problem for St. Pete – Clearwater. There is one wet pond adjacent to a runway, but there are no serious difficulties with migratory birds because they go to nearby Tampa Bay. There are some bird strikes simply because there are large bodies of water nearby, not because of the airport's constructed ponds. Every 10 years, St. Pete – Clearwater has a capital plan to clean out oysters in outfalls.

San José deals with bird strikes. The issue is that San José is landlocked, and there is no place to build out because it is surrounded by communities. On the airfield, there are burrowing owls, which is an endangered species, and the airport is required to protect them under state law. There are several strikes from raptors, and recently a Canadian goose hit a plane as well. However, the main issue for San José is with the city's stormwater program. The city required the airport to install bioswales on the airside with a new FBO. However, the bioswales would create standing water for about four hours, which would attract wildlife, and the airport has not installed them yet. San José currently has a request for proposal (RFP) out to address this issue. Rain has a significant impact on the airport, and new regulations require treatment of some of the runoff onsite.

For St. Pete – Clearwater, SWFWMD measures the impervious area at the airport and figures out how many ERUs. Their estimate is accurate compared to an approximate number the airport came up with.

Des Moines checks what the City of Des Moines estimates against what the airport has mapped out and tabulated. The city updates records every four to five years. If the airport has a project that reduces impervious area, it may take a while for the project to be incorporated into the fee.

Strategies to Manage Fees

What strategies airports have employed; how well these strategies have worked; and other approaches considered for the future.

San José does not currently pass along the stormwater fee to tenants. If San José started charging tenants for stormwater fees, the airport would receive pushback, especially from the airlines. However, San José is considering the possibility of charging tenants for stormwater fees if the need arises. Since the airport already charges tenants for other usage fees and the airport is growing (currently serves about 11.5 million customers per year), they want to try and keep prices competitive and not run into conflicts with tenants. San José has not had the opportunity to pursue other strategies to mitigate fees because the airport is owned by the city. The city uses their parcel map. San José once questioned historical data that were inaccurate, and the city made the corrections.

Even though the stormwater utility is a relatively new, the St. Pete – Clearwater airport has already been incorporating the stormwater fee into leases. However, St. Pete – Clearwater only passes a small percent of the fee on to the airlines in their lease agreements. St. Pete – Clearwater has the world's largest U.S. Coast Guard base, which is government-owned property. The base is subject to stormwater fees separately from St. Pete – Clearwater. There is also a U.S. Army Base that also pays its own fees.

To alleviate stormwater fees, the Des Moines airport is looking at a centralized deicing location to reduce the area of apron generating runoff. Des Moines has already done this on the cargo side, which reduced the area from 70 acres to 30 acres.

None of the airports were considering de-annexation from the city or county in which they are located. Des Moines for example, would not be able to pursue such a strategy because the City of Des Moines leases to the airport authority.

Airport Recommendations

Recommendations offered by participating airports to an airport that is newly subject or will be subject to stormwater fees in the future and perspective from an airport not yet subject to stormwater fees.

San José recommended requesting the FAA's assistance if an airport is at odds or in conflict with a county or city because of stormwater fees.

- As an airport that is not currently subject to stormwater fees, Mr. Miller asked about challenges airports have faced in dealing with fees and what FAA has said about the reasonableness of fees being charged.
- It is unclear if the FAA has weighed in on stormwater fees. The FAA was helpful to San José when the City of San José required the airport to install a bioswale on the airside. The FAA wrote a letter of support to explain to the city that the bioswale could pose a wildlife hazard on the airside.
- Des Moines had a similar issue with the City of Des Moines. The FAA served as a valuable resource and aided when the city was trying to introduce bioswales.

Mr. Miller explained that he was curious about FAA's stance on the reasonableness of the fee. In New England, the conservation commissions are very strong at the local level. Lawrence is already familiar with BMPs, and the airport looks at impacts on stormwater runoff when planning new projects and implements BMPs to reduce those impacts. The concern is that the stormwater fees would be too crippling for the airport. Lawrence is owned by the City of Lawrence but is located in another municipality. If and when a stormwater fee is implemented, there may be additional requirements placed upon the airport. Mr. Miller was also curious to see if this was a revenue diversion issue that could be legally challenged, but his impression from the discussion was that it is not.

- Dr. Campbell noted that these fees have been challenged across the country. Ideally, flat fees are most favorable to airports, but the flat fee structure is not always fair. An airport could negotiate for a tiered structure, but the airport would have to know about and be involved in the utility's development. He also recommended working with other entities that would be likely to challenge fees: railroads, school districts, and churches.

At Lawrence, runoff from the airside is covered under a NPDES permit. The runoff is discharged to a wooded area from where it then discharges to a river. Mr. Miller asked if a utility would take into consideration the volume of flow going into their stormwater system or if the utility only considers impervious surface when assessing the fee.

- Dr. Campbell replied that a community college in Key West successfully challenged the stormwater fee because the runoff did not discharge to the utility's system. It is best practice for a stormwater utility to have a credit system to accommodate this scenario. In addition, a credit system will make the fee look less like a tax.

Dr. Campbell recommended to Lawrence that someone from the airport be involved in the development of a local utility that would affect them. They should try to negotiate the fee structure as well as a good credit program. However, Mr. Miller responded that it would be unlikely for a representative from the airport to be appointed to a committee that is involved in the development of a stormwater utility.

2.4. Accomack County Airport (MFV) Interview

Airport: Accomack County Airport

Airport Staff Present: Barbara Haxter

Cadmus Team Members Present: Mary Ellen Tuccillo, Martha Walters, and Ava Lazor

Airport Background and Experience with Stormwater Fees

Accomack County Airport (Accomack) is a county-owned airport that operates as its own department under the supervision of the Accomack County Administrator.¹ Accomack is a relatively small airport that facilitates approximately 7,500 operations a year consisting mostly of smaller, single-engine aircraft and military operations. Accomack County provides the airport with infrastructure management and maintenance assistance, though stormwater management infrastructure is not currently in place at the airport. Because the local municipalities do not have stormwater utilities, Accomack does not pay stormwater fees, nor do they anticipate that fees will be introduced in the near future.

Accomack does not have extensive stormwater infrastructure. The site has ditches, and water flows in a stream that winds around the airport and eventually flows into the Chesapeake Bay. However, because the soil is porous, most rainwater infiltrates into the soil in the area between the paved surfaces and the apron; heavy rainfall is needed for there to be flow in the ditches. Accomack has an oil/water separator for the separation of hydrocarbons and removal of suspended solids from stormwater prior to reaching the outfall. No deicing is done at the airport, nor is there a large volume of refueling with trucks.

Accomack County recently hired an environmental staff member to evaluate stormwater issues across the county. Local communities are small and do not currently have extensive stormwater infrastructure. Overall, the county is in the early stages of evaluating stormwater concerns. Stormwater fees are not anticipated in the near future. Significant development would be needed before there would be a need for stormwater utilities on the eastern shore of Virginia where Accomack is located.

¹ Accomack County, Virginia. "FAQ." <https://co.accomack.va.us/departments/airport/faq> (accessed July 6, 2017).

2.5. Chesapeake Regional Airport (CPK) Interview

Airport: Chesapeake Regional Airport

Airport Staff Present: Chris Schrantz

Cadmus Team Members Present: Jim Jolley, Mary Ellen Tuccillo, and Martha Walters

Airport Background and Experience with Stormwater Fees

Chesapeake Regional Airport (Chesapeake) is located in the City of Chesapeake, VA and is owned by the Chesapeake Airport Authority, which is a political subdivision of the commonwealth of Virginia. Chesapeake serves as a general aviation (GA) reliever airport for Norfolk International Airport. Chesapeake pays a semiannual stormwater fee to the City of Chesapeake. The fee is based on three parcels of land: 4.338 acres; 6.610 acres; and 392.706 acres. The fee structure is ERU-based, with one ERU equivalent to 2,112 square feet. The airport is charged \$7.35 per ERU. They have been subject to the fee since 2005 and paid \$29,320.38 in the first year. Currently, the airport pays semi-annual payments of \$33,284.04 for a total of \$66,568.08 per year, which is 9.23 percent of the airport's annual budget. The fee is expected to increase by approximately \$3,260 in the next year due to the development of the North Terminal Area.

Chesapeake has a complex relationship with the City of Chesapeake. The airport is owned by the airport authority but receives an annual contribution from the city of \$273,000. As described above, the airport pays stormwater fees to the city, but the stormwater utility does not provide direct services to the airport because the airport property is considered commercial.

Other general notes about Chesapeake and the City of Chesapeake's stormwater utility include the following:

- Chesapeake was not involved in the development of the fee.
- Chesapeake has its own NPDES permit.
- Chesapeake has documentation of impervious area on the airport property and does not rely solely on the utility's calculations.

Airport Strategies for Reducing Fees

Chesapeake has considered several strategies to mitigate stormwater fees without success. The U.S. Navy has an auxiliary landing field at the airport, and they must also pay stormwater fees.

Stormwater Credit

In 2008, Chesapeake was granted a 40 percent credit after the city reviewed their parcels. Before 2008, the airport had not known about the credit program. They applied through the Department of Public Works. The credit is based on retention ponds, buffer strips, and other BMPs at the airport.

Recovering Fees from Tenants

Chesapeake recovers the stormwater fee from its tenants. The stormwater fee is incorporated into the tenants' leases. The airport has not encountered opposition to this because the stormwater fee is not included as a line item on the lease. Furthermore, Chesapeake is economically competitive in terms of hangar space. The hangar space is currently full, and there is a waiting list for new tenants. Chesapeake customers include 2 FBOs, 1 specialized aviation service operator (SASO), 88 hangar tenants, and 9 sewer customers.

Exemptions

Airports in Virginia are not yet publicly lobbying for runway and taxiway exemptions. The Department of Aviation is talking with the Department of Environmental Quality, and the Virginia Secretary of Transportation is considering ways to mitigate fees.

Airport-Specific Challenges

The City of Chesapeake's stormwater utility does not maintain stormwater infrastructure at Chesapeake or provide other stormwater management services to the airport. Also, stormwater runoff from the airport flows to waterways that lead to the Northwest River. Chesapeake has not seen the city maintain these waterways once the stormwater leaves the airport.

Chesapeake has explored having the utility come to the airport to inspect infrastructure and provide other services (e.g., maintain dimensions of ditches and other onsite conveyances, control vegetation, etc.). However, the city considers the airport property to be commercial, and the stormwater utility is not allowed to dedicate city resources to maintain commercial or private property. Thus, there is no codified agreement binding the stormwater utility to provide maintenance services to Chesapeake, and the airport does not see direct benefits from the almost \$70,000 it pays in fees.

There was one instance when the utility came out to dredge ditch banks and to remove vegetation. However, this was a situation where the airport did not have proper equipment, and the airport paid utility staff.

Paying stormwater fees is not seen as revenue diversion at Chesapeake. FAA funds are guarded very closely, and funds that pay stormwater fees and FAA funds do not intersect. Chesapeake did bring up the FAA revenue diversion argument. The city countered that they provide the airport with funds on a yearly basis. As a result, the airport is essentially returning a portion of the funds received from the city back to the city in the form of stormwater fees.

Chesapeake must keep wildlife restrictions in mind when designing stormwater management infrastructure to minimize standing water. There are, therefore, no "basins" that can hold standing water on airport property, but there are ditches.

Lessons Learned

When asked to provide advice to other airports that are newly subjected to stormwater fees, Chesapeake recommended the following:

- A rate structure based on percentage of impervious surface would probably be more favorable to airports than a fee structure based on ERUs.
- It is important to be proactive in considering credit programs offered by the utility.
- It might be useful to talk to tenants and phase-in a fee to cover the square footage of the space they are occupying. That would at least help to offset some of the costs.

2.6. City of Norfolk, VA Stormwater Utility Interview

Stormwater Utility: City of Norfolk, VA

Stormwater Utility Staff Present: June Whitehurst

Team Members Present: Mary Ellen Tuccillo and Martha Walters (Cadmus); Michael Maker and Edward Donahue (MFSG)

Stormwater Utility Background and Experience with Airports

Development of Stormwater Fee

The City of Norfolk's stormwater utility fee was established in the early 1990s and was prompted by Phase I MS4 requirements for stormwater management. Prior to the fee, the city's general fund paid for stormwater management activities related to flood mitigation. The structure is ERU-based. Residents pay one ERU, whereas commercial entities pay multiple ERUs based on the amount of impervious area.

The City of Norfolk established one of the first stormwater utilities in its area. The utility coordinates with six other Phase I MS4 communities regarding stormwater programs and stormwater fees. The utility takes several factors into consideration when developing the fee, including program costs, affordability for residents, and what other stormwater utilities charge.

Stormwater Credit Program

When the fee was implemented in the early 1990s, a credit program was also implemented. The program awarded credits for stormwater BMPs and also awarded credits if a property was covered under an individual VPDES permit. The current credit program is similar to the initial program except that the VPDES credit is no longer offered. The maximum credit one can receive is 60 percent. Furthermore, the current program applies to both residential and non-residential customers whereas the original program only applied to non-residential customers. The Virginia State Code was revised to require stormwater utilities to offer a rate reduction to an entity that has installed a BMP on their property (residential or non-residential). Norfolk and other Virginia stormwater utilities were unaware of this policy until after it had gone into effect. Other stormwater utilities already had credit programs in place prior to the policy change, but they were only applicable to commercial properties because administering residential credit programs is resource-intensive and provides little benefit.

Norfolk International Airport does not participate in the credit program even though the airport has several BMPs throughout the airport grounds and most likely treat stormwater runoff due to industrial permit requirements. If the airport were to apply for credits, it would probably receive a substantial fee reduction and, therefore, could greatly benefit from the credit program.

Exemptions and Appeals

All properties were assessed a fee when the fee was first implemented except for the Virginia Department of Transportation and the Naval Station Norfolk. However, Virginia State Code was recently changed to fully exempt MS4s from stormwater fees. This exempted Old Dominion University, Norfolk State University, and Tidewater Community College, all of whom have had MS4 permits for years. The

Norfolk utility's revenue dropped by \$500,000. Municipal properties are also exempt from the stormwater fee.

Norfolk International Airport is fully charged stormwater fees. The airport has approached the utility about decreasing the rate, and the utility indicated that the airport could get their own MS4 permit or apply for credits. The airport is currently covered under the city's MS4 permit. The airport has the second largest amount of impervious area in Norfolk. If the airport were exempt, the utility would lose a large amount of revenue. To be exempt, however, the airport would have to implement their own MS4 program, obtain an MS4 permit, and meet Phase II MS4 general permit requirements

Property owners may ask to have the impervious area on their property re-measured. When the utility does measurements, more impervious area is usually identified. Original impervious area measurements were made in the early 90s, whereas measurements are now done using aerial photography. The accounting staff has conducted audits strategically throughout the city to see where the utility is charging too much or too little.

Ongoing Implementation

To administer the newly re-implemented credit program, the utility must inspect BMPs, review applications, and track rate reductions. It is a labor-intensive process that ultimately reduces revenue. Only four residential property owners have applied for credits, and no commercial property owners have applied. The utility tries to make it easy for residents and property owners to implement voluntary BMPs where the municipality may take credit towards regulatory compliance. The utility has also set up mechanisms (e.g., self-reporting) to make it easier to administer the program.

The Norfolk stormwater utility has increased fees by 3 percent annually ("inflation rider") since 2007. Recently, one dollar per ERU per month was added to be set aside for much-needed large drainage projects.

Ongoing implementation issues include providing funds to manage the aged infrastructure and addressing water quality mandates in a cost-effective manner. One suggested mechanism for management to consider is to decrease the residential rate slightly and gradually increase the non-residential rate. This would also incentivize large non-residential properties to reduce impervious area. Those large properties could also be encouraged to take advantage of the credit program and implement BMPs on a larger scale.

2.7. Cleveland Hopkins International Airport (CLE) Interview

Airport: Cleveland Hopkins International Airport

Airport Staff Present: Beau Williams

Cadmus Team Members Present: Mary Ellen Tuccillo, Martha Walters, and Ava Lazor

Airport Background and Experience with Stormwater Fees

Cleveland Hopkins International Airport (Cleveland) is located in and owned by the City of Cleveland, OH. Cleveland pays stormwater fees to the Northeast Ohio Regional Sewer District (NEORS), a combined municipal sewer district. The fee structure is based on non-residential ERUs that are calculated on the basis of impervious area. NEORS began charging stormwater fees in 2010, but a lawsuit opposing the fees suspended the fee program for approximately two years. NEORS ultimately won the suit on the ruling that the fees aligned with their charter to reduce pollution. Cleveland was not part of the group of plaintiffs that promulgated the suit. The airport has paid \$135,416.16 annually in stormwater fees for the past two to three years.

Cleveland is beginning to see benefits from NEORS in exchange for their stormwater fees. Although they did not receive benefits while the lawsuit was taking place, the sewer district now plans to resume helping Cleveland maintain their in-stream debris racks. NEORS has also stated that they will help the airport maintain its large detention basins if they qualify as a “regional asset” through an application process. To qualify a basin must have 300 or more acres draining to it which currently one to two basins meet that criteria. Cleveland is assessing costs of maintenance, escorting NEORS onsite for maintenance, and of providing NEORS necessary information that may include potentially sensitive information relating to infrastructure. NEORS has a local cost share program that invests a portion of collected fees back to the communities for storm water management but these are generally larger projects. Maintenance projects of \$50,000 or less are typically easier to complete within the Cleveland procurement process.

Other general notes about Cleveland and the NEORS include the following:

- Cleveland was not involved with NEORS in the development of the fee;
- Cleveland has its own individual Ohio EPA NPDES industrial stormwater discharge permit and NEORS Administrative Order industrial waste water discharge permit (disposal of aircraft deicing fluid and storm sewer debris dewatering); and
- NEORS generates Cleveland’s estimates of impervious surface area with aerial imaging, which Cleveland occasionally cross-checks for accuracy.

Airport Strategies for Reducing Fees

Although Cleveland is not currently recovering stormwater fees from its tenants, they have taken advantage of credits and exemptions to reduce their stormwater fees.

Stormwater Credit

Cleveland has several detention and retention basins and bioretention cells on the premises, for which they receive some stormwater fee credits. However, some of Cleveland's BMPs and stormwater initiatives did not align with NEORS's crediting structure, which is geared towards smaller static business and residential stormwater needs than the airport's dynamic infrastructure needs. For example, rain gardens, rain barrels, and vegetated roofs were part of the credit structure but largely impractical for airports. Cleveland has established stormwater management programs that were in place for 10-years prior to the NEORS Stormwater Program. Many of the existing BMPs (including oil-water separators, deicing pads, wash bays, etc.) at Cleveland were required by Ohio EPA construction and industrial NPDES permits or part of Cleveland compliance strategies. Cleveland has a Master Storm Water Management Plan that it created to manage the placement BMPs without compromising airfield safety initiatives. To Cleveland it seemed NEORS did not include many stakeholders when it developed its fee and credit structure. NEORS's Stormwater Program is focused on stream/river maintenance and improvement, soil erosion, and stormwater quantity control and for entities like Cleveland, the program appeared to be redundant to Ohio EPA NPDES permits, less comprehensive than Cleveland programs, and an expense that Cleveland sees little return from. NEORS requires annual applications to receive stormwater fee credits, and the airport plans to reapply using their existing credited and uncredited BMPs. The FAA does not aid the airport in this process. Cleveland would also like to consider rain harvesting to offset the use of domestic water use for irrigation and potential credits with NEORS.

Exemptions

When stormwater fees were initially introduced, Cleveland negotiated for the exemption of their runways and taxiways as public rights-of-way following an Ohio DOT precedent. Exempting these surfaces reduced their current stormwater fees by more than half. Many of Cleveland's aprons were also later exempted from the airport's stormwater fee calculation although they were initially included as parking areas.

The airport has two deicing areas of 27 and 12 acres, respectively. Because they collect and treat the deicing runoff from these pads, Cleveland would like to negotiate to have these surfaces exempted from their existing stormwater fees as well. They also recently installed 7,300 square feet of green roofs that use a polyethylene modular tray system. They would like to see these green roofs factored into their credits, perhaps using flow monitors to measure the net decrease in stormwater runoff they will provide instead of using assumptions and calculations.

Airport-Specific Challenges

Cleveland is an older facility with a lot of aging infrastructure that needs to be improved. Although the specific opportunity costs of the stormwater fees taken from their O&M budget are not tracked, the airport is confident that the more than \$135,000 per year they pay in stormwater fees could be used for other ventures, such as improving their infrastructure, hiring more employees, or engaging in pavement management. Additionally, the airport is located adjacent to the International Exposition Center (I-X Center), a convention and exhibition hall that, according to their lease, is liable to pay the stormwater fees associated with their 24 acres of roof and surrounding 50 acres of impervious surfaces. The I-X

Center is owned by the airport and if the lease is not renewed Cleveland will be responsible for paying stormwater fees for this area as well.

Lessons Learned

When the stormwater fees were first implemented, there was a lot of backlash from the affected communities that likely precipitated the 2010 lawsuit. Cleveland was not involved in the development of the stormwater utility and felt blindsided by their implementation; their project coordinators were aware of the impending fees before their upper management. Additionally, Cleveland had already invested a significant amount of money into their existing stormwater program and felt the stormwater management program operated by NEORS was not necessary for them. Being part of the early planning conversations would have managed their expectations and saved time and reduced challenges for both the sewer district and the airport.

2.8. Eugene Airport (EUG) Interview

Airport: Eugene Airport

Airport Staff Present: David Barbero

Cadmus Team Members Present: Mary Ellen Tuccillo, Martha Walters, and Ava Lazor

Airport Background and Experience with Stormwater Fees

Eugene Airport (Eugene) is in the City of Eugene, Oregon and is owned and operated by the city. At this time, runoff from the airport's facilities does not flow into the City of Eugene's stormwater infrastructure. Eugene does not currently pay stormwater fees because the airport is located outside of the City of Eugene's urban growth boundary (UGB). Because the airport is located inside the city but just outside of the UGB, Eugene is not within the jurisdiction of a stormwater utility and, therefore, is not subject to stormwater fees.

The City of Eugene is currently proposing that the airport be incorporated inside the UGB as commercially available property around the city expands. Mr. Barbero and his colleagues have been involved with urban zoning conversations, but they do not currently have strategies for how they would minimize stormwater fees in the future, if implemented. Eugene would likely recover future stormwater fees from tenants as part of the overall rent, embedded in lease agreements; this is how the airport's service development fees are currently managed.

Eugene currently has relatively good accounting of its facilities' impervious area. The accuracy of its current measurements will improve as the airport updates its master plan, which will include the incorporation of these data into a geographic information system (GIS). Eugene's environmental team has not yet estimated potential stormwater fees based on their current rate structure; the team's focus is centered on development around wetland mitigation. However, if the expansion of the UGB becomes more imminent, Eugene would reprioritize its efforts.

2.9. Gwinnett County Airport (LZU) Interview

Airport: Gwinnett County Airport

Airport Staff Present: Matt Smith

Cadmus Team Members Present: Mary Ellen Tuccillo and Martha Walters

Airport Background and Experience with Stormwater Fees

Gwinnett County Airport (Gwinnett) is located in Lawrenceville, GA within Gwinnett County. The airport pays stormwater fees to Gwinnett County. The fees are applied per 100 square feet of impervious surface. The airport has been paying a stormwater fee to Gwinnett County since 2006 when the fee was established. The fee was introduced at \$0.77 per 100 square feet in 2006 and increased to \$2.46 per 100 square feet in 2009, where it has remained. Gwinnett pays approximately \$66,000 per year in stormwater fees, which is approximately 7.5 percent of the airport's annual budget. The airport is one of the utility's largest customers.

Gwinnett County is the sole owner of the airport, but airport property is not considered a single-owner property because it has tenants that also discharge stormwater from their leaseholds. The airport is owned by the county, and stormwater fees are paid to the utility from the airport's designated funding (not the county general fund).

Other general notes about Gwinnett and Gwinnett County's stormwater utility include the following:

- Gwinnett was not involved in the development of the fee and received no advanced notice of the fee.
- The county keeps record of impervious surface via a GIS application. In 2006, the county did a baseline measurement. If there is new development and a property owner receives a building permit, the county will add that additional amount of impervious surface to the baseline measurement.
- Gwinnett discharges directly to the Alcovy River. The airport is a primary permittee to Georgia's general NPDES permit but is also covered under the county's MS4 permit.

Airport Strategies for Reducing Fees

Stormwater Credits

The Gwinnett County stormwater utility fee includes a credit program applicable to both residential and non-residential customers, who can receive up to a 40 percent credit (i.e., fee reduction). However, the program is geared more toward single-owner properties, and the airport has not been able to obtain a credit. Several items that make a property eligible for a credit, such as increasing the stream bank buffer area, are not feasible at an airport that cannot allow wildlife attractants. For the airport to receive a credit for items that could be practical, such as watershed stewardship or attending training, 20% of the tenants must be involved or participate. Since the tenants do not pay the fees, or reimburse the airport for the fees, they have little motivation to participate. For example, the airport stenciled fish on storm drains. When the airport applied for a credit, the utility rejected the application because airport tenants

did not also participate by stenciling fish on storm drains on the property they lease from the airport. Furthermore, many of the other large properties in Gwinnett County were developed after the inception of the fee, and those property owners were able to incorporate design practices that reduce impervious area.

The credits are also geared toward homeowners. When the fee was established, the general community saw it as a tax. As a result, the utility developed several types of BMPs (e.g., rain barrels) that homeowners can implement for credits but that are not applicable to large properties such as airports.

Exemptions

Public roadways and rights-of-way are exempt from the stormwater fee, but runways and taxiways are not exempt. Gwinnett asked the county about exempting runways and taxiways, but the county was not receptive to the idea.

When the utility first calculated initial measurements of impervious surface on airport property, the county included gravel paths as impervious area. The airport worked with the county to ensure that corrections were made so that only impervious surfaces were included (i.e., runways, taxiways, ramps, parking lots, and buildings) and all other areas (e.g., gravel paths and grassy areas) were exempt.

Recovering Fees from Tenants

Gwinnett has discussed the possibility of recovering stormwater fees from tenants by incorporating the fee into leases. However, prior management decided that the airport would cover the stormwater fees as part of the cost of doing business. In addition, increasing the cost of rent may not be politically feasible.

Airport-Specific Challenges

Gwinnett has not received stormwater maintenance services or infrastructure improvements from the utility. The airport has not asked the utility to perform maintenance services because maintenance of airport stormwater infrastructure requires specialized training, especially on the airfield.

The utility does include airport stormwater projects on its list of requested projects. However, airport stormwater infrastructure needs are generally time-sensitive, and the waiting period on the county list is too long. Therefore, the airport often needs to complete projects internally before the utility can address them. If the utility did not at least place airport projects on their list, then paying the stormwater fee to the county could be considered revenue diversion.

Lessons Learned

Airports should develop a system where stormwater fees can be passed on to tenants. Tenants should be paying because they often are the ones developing the property (at least in Gwinnett's case). Furthermore, recovering fees from tenants would lessen the burden on airports that are already financially strained and allow more funds to be used for purposes such as infrastructure improvements and grant matching funds.

2.10. Nashville International Airport (BNA) Interview

Airport: Nashville International Airport – BNA

Airport Staff Present: Michelle Baker, PE

Cadmus Team Members Present: Mary Ellen Tuccillo and Martha Walters

Airport Background and Experience with Stormwater Fees

Nashville International Airport (Nashville) pays a stormwater fee to Metropolitan Nashville – Davidson County (Metro). The airport is a quasi-governmental entity owned and operated by the Metropolitan Nashville Airport Authority (MNA), which is overseen by a ten-member Board of Commissioners appointed by the mayor. The rate structure is tiered based on impervious surface per parcel. The highest tier for non-residential properties is > 1 million square feet of impervious surface, billed at \$1,300 per month. The fee was instituted in 2009 when the rate for a parcel with > 1 million square feet of impervious surface was only \$400 per month. MNA is one of the largest landholders in the Metro. In Fiscal Year (FY) 2016 (July 1-June 30), Nashville paid \$35,247 in stormwater fees. A fee increase went into effect April 1, 2017, which increased the cap from \$400 per month to \$1,300 per month. Through the end of May, the airport paid \$45,126 for FY2017. For FY2018, the airport has budgeted \$55,000 for stormwater fees, which will not be enough to address the recent cap increase.

The stormwater utility operates within its budget, but there is a backlog of projects that need to be completed. In some locations, stormwater infrastructure improvements have not been made in 150 years. Furthermore, there have been catastrophic failures within the last few years during storm events, making municipal stormwater management needs more apparent. The fee was increased to accommodate the need to address these urgent infrastructure repairs.

The airport utilizes several types of BMPs, including grass ditches and vegetated swales for stormwater management. Where no aboveground options are feasible, underground detention is used. The airport considers installing a variety of low-impact options during project design and development, including the feasibility of incorporating bioswales and green roofs.

Airport Strategies for Reducing Fees

Involvement in the Development of the Fee

The Metro engaged the airport and other landowners during development of the stormwater fee, which offered an opportunity for these stakeholders to provide input in the final fee structure. There were several fee proposals and discussions back and forth between the landowners and the Metro. For example, one fee proposal would have capped the top tiered rate at \$1,400-1,500 per parcel, which was significantly higher than what was ultimately decided in 2009 (\$400 per parcel with > 1 million square feet of impervious surface).

Stormwater Credits

The stormwater utility has a credit program, but it does not appear as though the airport has been able to take advantage of these credits. The airport must also meet low-impact development (LID) standards recently set by Metro, which may coincide with what qualifies for stormwater credits.

Exemptions

Runways and taxiways are not exempt from the stormwater fee. The airport tried to obtain an exemption from the utility, arguing that the runways and taxiways could be defined as public rights-of-way. However, the utility was not receptive to the idea.

Recovering Fees from Tenants

Stormwater fees are not passed on to tenants. Tenants that rent parts of the terminal pay a flat rent, and while electricity usage is submetered and charged directly back to the tenant, water and stormwater charges are not.

Consolidating Parcels

Nashville had acquired multiple parcels over the years but had never consolidated them. Most parcels were contiguous, but there were a few residential parcels purchased for noise abatement that are not connected. The stormwater fee proposal explained that the fee would be applied per parcel. The airport estimated that their monthly stormwater fee bill would be extremely high because of the number of parcels they owned. They decided to consolidate parcels to reduce fees. The process has involved redrawing parcel boundaries and was time-consuming (three to four years). Once the lines were redrawn, there was a significant amount of paperwork to submit to the Metro. The airport has succeeded in consolidating their industrial land into about four or five parcels, while the residential parcels remain separate.

Airport-Specific Challenges

The airport does not receive stormwater maintenance services from the utility, but the airport is still subject to applicable requirements (e.g., development). Metro's enters its MS4 into an inspection and maintenance agreement with landowners and developers for each new development, which includes stormwater management. The landowner must develop an inspection and maintenance plan for stormwater management associated with the new development, and the stormwater infrastructure must be inspected on no less than an annual basis.

The airport holds an industrial NPDES permit for both deicing and non-deicing areas, which covers multiple outfalls. It also maintains a permit for industrial discharges to the municipal sanitary sewer for discharges directly from the stormwater treatment system. These typically occur at the end of the deicing season when the system is taken out of service and cleaned for inspection. Most of the stormwater runoff goes to receiving streams. The airport is located at the headwaters of two major creeks, and another nearby creek is home to a federally-listed endangered species, the Nashville crayfish. As a result, the quality of stormwater runoff is a major concern for the airport and surrounding community.

Lessons Learned

- Take advantage of credits and look for ways to mitigate fees that fit an airport's situation. In Nashville's case, consolidating disparate parcels saved the airport a significant amount in fees.
- Maintain a good working relationship with the utility.

2.11. Paine Field (PAE) Interview

Airport: Paine Field (Snohomish County Airport)

Airport Staff Present: Bill Dolan and Andrew Rardin

Cadmus Team Members Present: Jim Jolley and Martha Walters

Airport Background and Experience with Stormwater Fees

Paine Field Airport (Paine) is owned by Snohomish County. However, Paine is located in multiple jurisdictions and pays two separate stormwater fees: one to Snohomish County and one to the City of Mukilteo. The airport spans approximately 1,250 acres, with 12 acres in the City of Mukilteo, four acres in the City of Everett, and the remaining property in an unincorporated county. The City of Mukilteo's stormwater fee is ERU-based, but this fee applies mainly to one tenant located on those 12 acres. Snohomish County adopted a code that applies the stormwater fee to property in the unincorporated part of Snohomish County. Snohomish County's stormwater fee includes a flat fee for residential properties and a tiered structure based on percentage of impervious area for commercial properties (i.e., five categories: 1-20, 20-40, 40-60, 60-80, and 80-100 percent impervious). The fee is applied per quarter acre to tax parcels on commercial properties. Parcels with less than 1 percent impervious area are exempt. Paine has 160 tax parcels. Every year, about six to eight parcels undergo a change in impervious area. Currently, Paine pays \$372,399 per year in stormwater fees.

State and local government in Washington are oriented toward greener policies. The airport is located near (approximately 1.5 miles from) Puget Sound. The airport falls under scrutiny to protect Puget Sound and the endangered species within it. The endangered statuses of salmon and orca have led to increasingly stringent stormwater regulations. The airport has five drainage basins, four of which discharge to Puget Sound. The other drainage basin discharges to Lake Washington and then to Puget Sound. The airport itself holds an industrial permit but is also covered under a municipal NPDES permit.

Airport Strategies for Reducing Fees

Paine has been active in managing stormwater fees so that they do not become too overwhelming. Paine has used several innovative and business-oriented tactics to reduce the amount of fees paid by the airport. These strategies include maximizing stormwater credits, passing fees along to tenants through leases – acting somewhat like an airport stormwater utility by charging tenants that use airport stormwater infrastructure – and restructuring parcels to minimize rates (this is possible because rates for commercial properties are based on percent impervious area rather than impervious area).

Stormwater Credits

Snohomish County offers a stormwater credit if commercial property has detention onsite; the property is charged a fee category lower if there is detention onsite. In addition, Paine was able to negotiate with Snohomish County to receive a 35 percent fee reduction for holding a NPDES permit. This credit policy took effect in 2013. Paine's stormwater fees dropped from \$580,000 in 2012 to \$375,000 in 2013. Paine acknowledged that it was doing a large amount of work to comply with the NPDES permit. The airport maintains several catch basins, oil-water separators, and regional detention facilities. There were other

property owners similarly complaining about the fees, and the utility was therefore attuned to concerns regarding fairness and equality. The fee reduction was an effective mechanism for maintaining fairness because property owners with a NPDES permit are already managing their own stormwater.

Recovering Fees from Tenants

Paine has been paying stormwater fees since 1998. In 1998, stormwater fees amounted to approximately \$95,000 per year. By 2003, the fees had risen significantly to approximately \$250,000 per year. In 2005, Paine began recovering stormwater fees from tenants through lease agreements. Credits are passed through to tenants unless the tenant is relying on an airport stormwater detention facility and is not paying the airport through Paine's stormwater facility policy (see below).

Paine charges tenants differently from how the county charges the airport. The airport is charged by the county per quarter acre of impervious surface, with the rate per quarter acre determined by a five-tiered system based on the percent of impervious surface within a parcel. Paine charges tenants per square foot of impervious surface, also according to the percent of impervious surface within a parcel. Paine uses the same five-tiered categories to determine the rate per square foot. For example, if a tenant is leasing space that is all impervious but is located within a tax parcel that has 20-40 percent impervious surface, the tenant is charged a rate per square foot for the 20-40 percent impervious category. Some tenants may be located in one parcel, and others may span multiple parcels. The accounting can become complex at times, but the staff has a system for determining fees.

Stormwater Facility Policy

Around 2006, Paine developed a policy to charge tenants for using stormwater detention facilities constructed by the airport. Stormwater management requirements were becoming increasingly stringent, and every revision to the drainage code required significantly greater stormwater detention for the same amount of impervious surface. The airport was using the continuous model (back-to-back rainstorms) to design and size facilities. This model is four iterations beyond facility design in the 1980s and 1990s. These upgrades were resulting in increasing expenses at the airport. As a result, the airport began charging tenants for their proportional share of use of the airport's detention facilities. Paine charges tenants a one-time connection fee and rent for their proportional share.

This policy only applies to leases that have been signed since the policy was instated. If a lease is amended, then the tenant will become subject to the policy. The airport did not give a choice to new tenants; the policy became a requirement in the lease. Boeing is the largest tenant at Paine. About 60 percent of Boeing's leases are post-policy, and 40 percent are pre-policy. Boeing did not object to the fee. In fact, Boeing bought space in one of the airport's large regional detention facilities to manage runoff from Boeing's adjacent property.

Restructuring Parcels (for rate structure based on percentage of impervious area)

With encouragement from the county, Paine created a binding site plan/record of survey (BSP/ROS) for sectors of the airport to facilitate leasing land, which divided a number of their large parcels into smaller ones. Previously there were approximately 40 parcels, and now there are 160. The airport essentially drew arbitrary lines to divide the property into several smaller pieces of land reflecting conceptual development plans. This resulted in some lots dropping below the one percent impervious exemption

threshold and others jumping into higher percentage impervious categories – though applied to a now smaller acreage of the parcel. An example of the relative benefits of the binding site plans was seen when one large (over 160 acre) parcel within a sector without a BSP/ROS was just below the 60 percent “heavy” threshold. A tenant within that parcel proposed a one-acre facility expansion that would have brought that parcel over the 60 percent impervious threshold and resulted in an annual \$46,000 stormwater fee increase for that single 160-acre parcel. As this stormwater fee increase would have been well above the potential lease revenue from one acre, the airport had to reject the proposal, and the tenant relocated off the airport. If the development had been in a smaller parcel, the rate per acre would have been higher but applied to a smaller acreage resulting in a much smaller stormwater fee increase.

This strategy is only applicable to fees based on percent of impervious area; it would not apply to an ERU-based fee. Paine acknowledged that Snohomish County’s rate structure was more favorable than the City of Mukilteo’s ERU-based structure. The fee structure has also encouraged Paine to use pavement only where necessary. Airports may tend to over-pave. Finding areas where pavement is not needed and removing the pavement has also decreased fees particularly on large parcels bumping up against the 20 percent impervious threshold where a steep increase in the charge per acre (\$146.36/acre vs \$488.00/acre) applies. For example, Paine reconstructed runway 16L-34R. Previously, there was pavement up to the parallel taxiway even though some of the space was a taxiway object-free area. The airport was able to remove four acres of asphalt from that area, reducing both annual stormwater fees and the size of the required detention facility for the project.

Airport-Specific Challenges

Snohomish County has a complicated stormwater drainage code. Development projects must include an acceptable stormwater management program, which is usually developed by a contractor. The airport must then defend the plan in court, where they are often met with opposition from environmental activists.

Paine sees no physical investment from the county’s stormwater utility at the airport. Paine reports to the utility to show that the airport is in compliance with the municipal permit, but the county offers little assistance and no assistance with complying with the industrial permit. In fact, there is some duplication with the municipal and industrial permits. Paine discharges into MS4s. However, one drainage basin that discharges to Lake Washington flows through the unincorporated county, and two discharge to the City of Mukilteo. As a result, Snohomish County does not manage stormwater discharges downstream for three of the airport’s five drainage basins.

2.12. Port of Seattle (Seattle—Tacoma International Airport) (SEA) Interview

Airport: Port of Seattle (Seattle—Tacoma International Airport)

Airport Staff Present: Bob Duffner

Cadmus Team Members Present: Mary Ellen Tuccillo and Martha Walters

Airport Background and Experience with Stormwater Fees

Port of Seattle (the Port) aviation properties are located within the cities of SeaTac, Burien, and Des Moines, WA. The Port pays stormwater fees to all jurisdictions for airport properties, amounting to approximately \$790,000 per year. Seattle—Tacoma International Airport (Sea-Tac) and associated airport operations are located in the City of SeaTac. Stormwater fees paid to the City of SeaTac for Sea-Tac Airport are in accordance with an Interlocal Agreement (ILA) entered into in 1998. The Port contested the stormwater fees at that time and the ILA locked Sea-Tac Airport fees in at an amount based on the City's 1998 rate structure and allowed a two percent increase in the overall fee in recent years, regardless of any increased impervious surface. The Port and City of SeaTac are currently negotiating a new ILA which may include a stormwater fee based on Sea-Tac Airport's developed surface water management program and the city's current rate structure.

The Port of Seattle's stormwater fee situation is complex. The Aviation Division includes the Sea-Tac Airport itself and other associated properties that were procured for noise mitigation. Some of the noise mitigation properties are vacant, and others are being redeveloped. Stormwater fees are paid on all aviation properties. However, properties used for airport operations are treated somewhat differently; aviation properties outside of the airport boundary pay stormwater fees similar to any other commercial entity.

The City of SeaTac conducted a stormwater fee rate study in 2013 and found that projected revenue would be \$1.768 million and total expenses would be \$2.366 million. Because of the deficit, the city increased the stormwater fee by 20.32 percent in 2014, 26.8 percent in 2015, zero percent in 2016, 4.88 percent in 2017, and 6.55 percent in 2018. Fees paid by the Port make up a considerable part of the city's stormwater utility revenue.

Other notes about the Port of Seattle and the City of SeaTac include:

- The Port of Seattle's environmental group maintains records of impervious area at the airport.
- The Port has fully retrofitted the entire airport for flow control and water quality treatment and administers all NPDES requirements through its own individual permit.
- The Port was not involved in the development of the City of SeaTac's stormwater fee.

Airport Strategies for Reducing Fees

Inter-Local Agreement with Stormwater Utility

In 1998, the Port entered into an ILA with the City of SeaTac regarding the stormwater fee rate. The rate was negotiated, and a fixed rate was established through the agreement based on a historic amount of impervious surface. The agreement has been renegotiated and amended several times. The most

current agreement was set to expire in February 2018, and the Port was negotiating a new agreement with the city. The city most likely does not have ILAs with other large landholders. The only exception is an agreement with the state regarding highways.

Stormwater Credits

The municipal code for the City of SeaTac's stormwater utility includes a credit program. A 25 percent fee reduction is given to property owners that own and operate stormwater management facilities they constructed for treatment and detention. Typically, responsibility for operation and maintenance of stormwater management infrastructure is passed to the city after construction. But the 25 percent fee reduction applies to those cases in which the property owner maintains control of their stormwater infrastructure. The 25 percent credit was not included in the current ILA-based fee being paid to the city.

Exemptions

Runways and taxiways are not considered exempt from stormwater fees in the State of Washington. Washington State requires the Department of Transportation to pay local jurisdictions 30 percent of the rate charged for comparable real estate properties or no more than the rate charged to city streets in accordance with state law (RCW 90.03.525).

Recovering Fees from Tenants

Costs related to the stormwater fee are rolled into utility costs and charges to the airlines. SeaTac has not received resistance on this.

Develop Airport Stormwater Utility

The Port chose to establish a stormwater utility because it owns, operates, maintains, and replaces its stormwater infrastructure and to some extent, administers redevelopment requirements. Recently, the Port's commission established a Port stormwater utility across the entire organization. The utility has two divisions: the marine utility and the airport utility. The utility has already been activated on the marine side through commission action, and the airport portion of the utility was not yet activated at the time of this interview.

The airport utility will charge fees to tenants similar to how it does currently. SeaTac effectively operates as a utility now. The Port pays the stormwater fee to the City of SeaTac, but the fee is recovered from airport tenants. In addition, the Port maintains its own infrastructure, and the city has no obligation to provide maintenance services to the airport.

Airport-Specific Challenges

SeaTac does not receive stormwater services from the City of SeaTac in return for the fee paid to the city. The Port's argument against paying fees to the utility (and basis for establishing its own stormwater utility) is three-fold:

1. The Port constructs and maintains its own stormwater management facilities with no assistance from the city.

2. Sea-Tac discharges directly to receiving waters, and stormwater runoff discharged from airport property never passes through the city's stormwater infrastructure.
3. The Port has its own NPDES permit, and requirements regarding what is an adequate level of stormwater management are constantly evolving and becoming more stringent, especially for SeaTac.

Because the City of SeaTac is a Phase II MS4, the city maintains that they are accountable for all areas in their jurisdiction. In addition, the city notes that stormwater fees do not only go toward infrastructure maintenance, but also administering redevelopment requirements, reviews, inspections, and other activities performed by the utility. The Port believes that the airport is not subject to the city's MS4 requirements because of their NPDES individual permit. This is a topic to be discussed during negotiations for a new ILA with the City of SeaTac.

Lessons Learned

- There have been some positive and constructive interactions between the Port and surrounding stormwater utilities. For example, the Port partnered with the City of Burien to develop stormwater master plans for the development of land purchased by the Port for noise mitigation. The city worked with the Port to jointly build the stormwater facilities, and the city currently takes responsibility for maintaining those facilities.
- In the Port's and SeaTac's experiences with stormwater fees, the main issue has been authority; if government-owned property has its own stormwater infrastructure that was constructed and is maintained by the property owner, then is the local jurisdiction entitled to assess a stormwater fee on that property and if so, what does that authority entail? This issue is not always adequately addressed in local ordinances.

2.13. Roanoke—Blacksburg Regional Airport (ROA) Interview

Airport: Roanoke–Blacksburg Regional Airport

Airport Staff Present: Diana Lewis and Tim Bradshaw

Cadmus Team Members Present: Mary Ellen Tuccillo and Martha Walters

Airport Background and Experience with Stormwater Fees

Roanoke–Blacksburg Regional Airport (Roanoke) is located in the City and County of Roanoke, VA. The airport is owned by the Roanoke Regional Airport Commission, which was established in 1987. The commission is an independent subdivision of the state and is not funded by local taxes. Roanoke airport only pays a stormwater fee to the City of Roanoke. The stormwater utility fee became effective on July 1, 2014. The fee is based on square footage of impervious surface, which the city determines by calculating the area using a GIS application. The city phased in the fees, starting with \$0.30 per 500 square feet of impervious surface per month in 2014 and increasing to \$0.60 per 500 square feet per month in 2015 and \$0.90 per 500 square feet per month in 2016. Roanoke currently pays \$193,475 per year, which is approximately 2 percent of the airport’s annual budget. Roanoke absorbs the stormwater fee and does not currently recover it from tenants.

Airport Strategies for Reducing Fees

Airport Involvement in the Development of the Fee

The former airport director was aware of the potential stormwater fee in the development stage, but the airport did not have much input. There was back and forth between the airport and utility, and the airport was once informally promised a 25 percent fee reduction through the credit program. However, the airport only initially received a 20 percent reduction (see below).

Stormwater Credits

At first, Roanoke received about a 20 percent reduction in their total fees out of a possible 50 percent. The fee reduction pertains mostly to stormwater quantity. The breakdown is as follows (note that the last two credits listed below only apply to the airport’s largest parcel and not to all parcels on airport property):

- 10 percent fee reduction for parcels with impervious area that are covered by the state’s general VPDES industrial permit;
- 10 percent fee reduction for the largest parcel on the airport because it contains stormwater infrastructure that reduces stormwater flow and quantity.

In 2015, the city updated the airport’s credits, increasing the total fee reduction to approximately 27 percent. The increase includes credits for non-structural BMPs and some water quality credits for the airport’s largest parcel.

Roanoke went through an extensive process to identify areas eligible for stormwater credits. The credit program is not always clear regarding which properties and BMPs may receive credits, and at times it is

up to the city's discretion. The utility has been generally accurate in estimating impervious surface on the airport's property, although Roanoke did question the city's classification of gravel as impervious (the city responded that they have determined that gravel roads are impervious). In addition, no consideration was paid to filtration provided by grassy slopes around the runways and taxiways. These areas were charged similarly to a fully developed lot lacking grassy areas to provide filtration.

The city staff has continued to explore ways for the airport to receive additional credits, but the options would all necessitate the construction of new infrastructure at the airport. Stormwater improvements can be done as part of larger capital projects, but it is difficult and expensive to do. Roanoke does not have any stormwater infrastructure capital projects planned at this time. The latest recommendation from the city was to modify a basin on Roanoke's airfield. The cost of the project would be approximately \$30,000 to \$40,000, but the airport would only receive an annual \$3,200 fee reduction, which is minimal compared to what Roanoke pays annually.

There have been some concerns with measures proposed by the city, including wildlife hazards and property conditions. The city wanted to slow the rate of stormwater runoff by use of detention ponds rather than the current use of the concrete v-ditches. It is interesting to note that v-ditches were used because the area is prone to sinkholes. However, in a recent project to replace a failing concrete v-ditch, Roanoke used grass pavers after determining that there was no sinkhole, and the city removed about 0.3 acres from the total of amount of impervious surface for the replacement of the concrete v-ditch.

Roanoke is concerned with possible future fee increases and also with lack of clarity in the city's stormwater credit policy. The airport does receive limited stormwater quality credits although Roanoke feels more should be given based on the sampling results for TSS and TPH that are collected by the airport for compliance with the VPDES permit. These results are always provided to the city as a requirement of the VPDES permit.

Exemptions

The Roanoke stormwater utility's municipal code exempts public streets, but runways and taxiways are not considered exempt. At Roanoke, runways and taxiways are considered private property. They are included in airport property covered by the airport's VPDES industrial permit and, therefore, receive a partial credit. The Virginia Airports Operating Council will be proposing to the State Legislators that runways and taxiways be exempt from stormwater fees. The Council posits that runways and taxiways should be treated the same as public roads and highways that are currently exempt from stormwater fees. Another state (NC) is allowing this exemption. The Norfolk Southern railroads pay the most (approximately \$500,000 per year) to the utility. Norfolk Southern went through the General Assembly to get an exemption, but the proposed exemption did not receive approval.

Establish MS4

Roanoke has considered becoming an MS4. Initial cost estimates show that it would cost approximately \$60,000 to become an MS4 and \$10,000 annually to maintain it. If the airport were to become an MS4,

the airport would no longer be a part of the city's MS4 and would not be subject to the city's stormwater fees, resulting in a significant cost savings for the airport.

Airport-Specific Challenges

The city has worked with the airport continuously to find ways to grant the airport stormwater credits. However, some projects proposed by the city are not ideal for airport settings. For example, the city has proposed granting credits for restoration activities but has not included restoration in the relevant regulations. The airport is concerned that restoration and other stormwater projects proposed by the city might attract wildlife.

Roanoke does not receive stormwater services in return for the fees paid to the city. Roanoke manages its own stormwater, spending approximately \$20,000 per year for inspections, training, and sampling to comply with the VPDES permit. The airport discharges to Lick Run, a tributary that flows to Tinker Creek and Carvin Creek. The airport must continue to pay for its own improvements to the stormwater system on airport property while not benefitting from the city collections of utility fees that pay for stormwater improvements in other areas of the city.

The City of Roanoke has also been a barrier to the airport becoming its own MS4. By working to identify credit opportunities for the airport, the city has been trying to incentivize the airport to not pursue establishing their own MS4. Total Maximum Daily Load (TMDL) requirements may also be a motive for the city. The city is concerned with TMDL requirements and the potential for them to become more stringent. If the city can get the airport on board to address TMDL requirements, then it helps the city to meet those requirements.

Lessons Learned

When asked to offer advice to other airports, Roanoke emphasized the importance of being involved with the utility from the very beginning to help guide the development of the fee so that it is not onerous. In particular, it is important to explain early on how airports are unique from other commercial/industrial areas because of the federal regulations that must be followed and what potential hazards there could be with certain stormwater facilities on airport. Roanoke did try to educate city staff, but it came too late in the process. Roanoke noted that the city did not have guidance in developing the fee and credit system. Roanoke believes it should be receiving more in credits for addressing stormwater quality but notes that the utility is still trying to figure out the credit system themselves.

Roanoke recommended recruiting and working with other airports to address common stormwater utility fee issues. Airports in Virginia will be proposing that State legislators exempt runways and taxiways. This approach was discussed at a recent Virginia Aviation Conference. Roanoke mentioned that airports in Charlottesville and Norfolk have experienced similar issues with stormwater fees.

In addition, Roanoke mentioned that they are trying to remain up-to-date with the utility because the impact of the stormwater utility does not necessarily end with the fee. Roanoke's stormwater consultant noted that a stormwater utility at another airport imposed increased permit and inspection requirements along with the fee. Roanoke currently has a maintenance agreement with the utility that allows the utility to perform inspections of stormwater infrastructure at the airport. However, it is

unclear whether the utility or the airport is responsible for paying the cost of inspections. Roanoke pays for the building permit process that sometimes includes an Erosion Control and Sediment Plan and a SWPP for construction. It is not only the fee that the airport needs to closely monitor but the utility itself because there is potential for the utility to develop additional requirements aside from the fee.

2.14. Smith Reynolds Airport (INT) Interview

Airport: Smith Reynolds Airport

Airport Staff Present: Mark Davidson

Cadmus Team Members Present: Mary Ellen Tuccillo and Martha Walters

Airport Background and Experience with Stormwater Fees

Smith Reynolds Airport (Smith Reynolds) is owned and operated by the Airport Commission of Forsyth County (ACFC), which was established in 1949. Forsyth County appoints the Airport Commissioners, but does not review the ACFC's budget. The ACFC is financially self-sufficient despite the high cost of Stormwater Fees assessed by the City of Winston-Salem, which is located within Forsyth County.

The ACFC has been paying stormwater fees to the City of Winston-Salem since 1996. Commercial properties must pay \$831 per impervious acre per year. (The rate structure is tiered for residential properties.) The rate has increased over time, with a dramatic increase in 2007. The ACFC pays approximately \$118,000 per year (\$9,000 per month) in stormwater fees, which is equivalent to approximately 20 percent of the ACFC's annual net income. The ACFC does not pass the fees on to its tenants.

Airport Strategies for Reducing Fees

The ACFC has employed several strategies to reduce stormwater fees, including proposing de-annexation from the city, negotiating with the city, and pursuing state legislation that would exempt runways and taxiways from the fees.

Negotiating with the Stormwater Utility

Frustrated by the high stormwater fees and property tax from the City of Winston-Salem and Forsyth County, Smith Reynolds proposed de-annexation from the City of Winston-Salem. If Smith Reynolds were de-annexed from the city, then the airport would not be subject to property taxes or stormwater fees charged by the city. To prevent de-annexation, the city and ACFC came to an inter-local agreement in which the city would pay Smith Reynolds \$150,000 per year for capital improvement projects at the airport. In addition, the County signed the agreement and also offers \$150,000 a year.

Legislation to Exempt Runways and Taxiways

Smith Reynolds began exploring ways to mitigate their stormwater fees and the economic impact on the airport. The ACFC learned that public roadways are exempt from the fee. Smith Reynolds attempted to gain an exemption for their taxiways and runways on the grounds that they are similar to public roadways, but they were unsuccessful.

Local representatives drafted a bill to exempt runways and taxiways from stormwater fees across North Carolina. It is estimated that only 6 of 72 public use airports in the state pay stormwater fees, with Smith Reynolds and Pitt-Greenville Airport in Greenville, NC paying the most. The bill was initially met with

some opposition from a lobbying group that supports municipalities, League of Municipalities. Because some airports are owned by municipalities, that resistance was short-lived.

The draft bill states that for an airport's runways and taxiways to be exempt from the fee, the "airport shall use the amount of savings realized from this exemption for attracting business to the airport and shall provide certification to the county that the savings realized shall be used for this purpose." It would be preferable to airports if the qualifying projects were for both competitiveness and infrastructure improvements, but it should not be difficult for Smith Reynolds to meet the qualification criteria. The criteria were a compromise so that airports would have to undertake projects in return for the exemption. Airports will still be required to pay stormwater fees assessed on other parts of their properties (e.g., hangars, terminals, parking lots). The North Carolina Senate gave final approval to the bill on June 21, 2017, and the bill is headed to the governor for final approval. If the bill becomes state law, Smith Reynolds will save approximately \$66,000 per year in stormwater fees.

Airport-Specific Challenges

Stormwater fees from the City of Winston-Salem and Forsyth County have been a challenge for Smith Reynolds because they need to remain economically competitive with other airports in the area (e.g., Piedmont Triad International Airport (GSO) in Greensboro, NC). As noted above, the airport does not currently pass stormwater fees on to tenants. In addition, stormwater fees are the highest non-salary expense for the ACFC. Also, the money paid in stormwater fees could be maximized for capital projects using the FAA Airport Improvement Program's 90 percent match (the airport gets \$9 in matching FAA funds for every \$1 they spend on projects).

Smith Reynolds does not receive services or assistance from Winston-Salem's stormwater utility. The airport holds a NPDES permit and pays for all stormwater drainage projects on the airport property. Stormwater runoff from the airport is generally absorbed within the 715 acres of airport property in airfield grassy areas or creeks and does not reach the city's stormwater infrastructure. Furthermore, there is no credit system through which to offer the airport a fee reduction for managing stormwater. New developments are required to have a stormwater management plan with BMPs to address the quantity/quality of stormwater runoff they generate, but credits are not given for installing BMPs.