PROPOSAL TEMPLATE

Forest Service use only.

Control Number: _____

COVER SHEET

2015 U.S. Forest Service

National Urban and Community Forestry Challenge Cost-Share Grant Program

Proposals are due by May 15, 2014, 11:59 PM Eastern

INNOVATION GRANT CATEGORY:

(An estimated total amount of $900,000, may be available, approximately $300,000 per category)

Check one category per application. More than one application may be submitted by an organization.

- ☐ **Category 1:** Incorporating Urban Forests as Green Infrastructure into Urban Planning Practices that will result in improvements for ecologically underserved communities and regions

- ☐ **Category 2:** Green Infrastructure Jobs Analysis

- ✓ **Category 3:** Utilizing Green Infrastructure to Manage and Mitigate Stormwater to Improve Water Quality

PROJECT CONTACT NAME, ORGANIZATION, ADDRESS, PHONE NUMBER, FAX NUMBER AND EMAIL ADDRESS:

> Travis Miller, Regional Planning Manager
> Ohio Kentucky Indiana Regional Council of Governments
> 720 E Pete Rose Way, Ste 420
> Cincinnati, Ohio 45202
> Phone (513) 621-6300
> Fax   (513) 621-9325
> tmiller@oki.org

PROJECT TITLE: Integrating Trees Into Stormwater Management Design and Policy – A Guide for Local Decision Makers

FUNDING REQUEST AND MATCH (Note: Matching amount must at a minimum equal requested amount.)

REQUESTED: $196,270 + MATCHING: $196,270 = TOTAL PROJECT: $392,540

OUTREACH:

Note: if one check "Yes" in either of the boxes below, the applicant will be required to describe either how they plan to outreach to the identified population and/or provide a description of your underserved organization.

Is this project being developed to reach a minority or underserved population? _X_Yes ___No

Is this pre-proposal being submitted by a minority or underserved population (owned/operated/directed) business, organization or college/university? ___Yes _X_No

Applicants should also address how the issue impacts underserved communities and how the proposal can address or minimize these impacts when applicable.

Minority and underserved populations, including low income populations, will benefit from this proposal in a variety of ways. Minority and underserved populations often live in ecologically barren and economically underserved areas including floodplains and deforested urban sites and thus experience greater incidences of flooding and poorer water quality. The impacts of flooding to all flood prone communities have the potential for being reduced when communities incorporate the practices recommended by the proposed Guide. The incorporation of tree canopy, particularly in urban, deforested areas, provides many benefits to community residents. In addition to stormwater mitigation, these areas and the underserved residents will benefit from the economic, environmental, and human health benefits trees have proven to provide.

The Project Team will strategically identify underserved communities within the OKI region utilizing current data maintained by OKI including demographic information, tree canopy area, and floodplain locations. Representatives from the minority and underserved communities will be invited to participate on the project advisory committee and, as described in more detail within the proposal, emphasis will be given to ensure meaningful engagement of minority and underserved communities throughout the project. These methods will be included within the final Guide in order for their employment by other regions.

LIST PROJECT PARTNERS: Project Partner letters are to describe their role and contribution with the project.

LETTERS OF SUPPORT INCLUDED In APPENDIX:

1. Ohio Kentucky Indiana Regional Council of Governments
   720 E Pete Rose Way, Ste 420
   Cincinnati, Ohio 45202
   (513) 621-6300
   tmiller@oki.org

2. National Association of Regional Councils
   777 North Capitol Street NE, Suite 305
   Washington, DC 20002
   (202) 986-1032
   mia@narc.org

3. Davey Resource Group
   Corporate Headquarters
   1500 N. Mantua Street
   Kent, Ohio 44240
   (800) 445-8733
   Regional Office
   Walton, Kentucky
   (859) 384-8258
   Jenny.Gulick@davey.com

4. Virginia Tech University
   College of Natural Resources and Environment
   Center for Leadership in Global Sustainability
   Courtney Kimmel, Fellow and Associate Director
   900 North Glebe Road
   Arlington, Virginia 22203
   (571) 858-3339
   cekimmel@vt.edu

LIST STAKEHOLDER SUPPORT:

LETTERS OF SUPPORT INCLUDED IN APPENDIX

1. Banklick Watershed Council
   Mayor Sherry Carran, Banklick Watershed Council
   c/o City of Covington
   20 West Pike Street
   Covington, Kentucky 41011
   (859) 292-2127
   scarran@covingtonky.gov

2. Boone County Arboretum
   Kristopher A. Stone, Director
   9190 Camp Ernst Road
   Union, Kentucky 41090
   (859) 384-4999
   kstone@boonecountyky.org

3. Boone County Conservation District
   Monty Taylor, Chairman
   6028 Camp Ernst Road
   Burlington, Kentucky 41005
   (859) 586-7903
   boone@nkcd.org

4. Butler Soil and Water Conservation District
   Kelly A. Crout, Administrator
   1802 Princeton Road, Suite 300
   Hamilton, Ohio 45011
   (513) 877-3720
   CroutKA@butlercountyohio.org

5. Campbell County Conservation District
   Ronald W. McCormick, Chairman
   8351 East Main Street, Suite 104
   Alexandria, Kentucky 41001
   (859) 635-9587
   campbellcd@fuse.net

6. City of Cincinnati
   Office of Environment & Sustainability
   Larry Falkin, Director
   801 Plum Street, Room 130
   Cincinnati, Ohio 45202
   (513) 352-6991
   Lawrence.Falkin@cincinnati-oh.gov

7. City of Lebanon
   Scott Brunka, P.E., Deputy City Manager
   50 S. Broadway
   Lebanon, Ohio 45036
   (513) 228-3103
   sbrunka@ci.lebanon.oh.us

8. Clermont County Office of Environmental Quality
   Paul Braasch, Director
   4400 Haskell Lane
   Batavia, Ohio 45103
   (513) 732-7745
   pbraasch@clermontcountyohio.gov

9. Clermont County Soil & Water Conservation District
   John McManus, District Administrator
   1000 Locust Street, P.O. Box 549
   Owensville, Ohio 45160
   (513) 732-7075
   jmcmanus@clermontcountyohio.gov

10. Dearborn County Plan Commission
    Mark McCormack, Director of Planning & Zoning
    215 B West High Street
    Lawrenceburg, Indiana 47025
    (812) 537-8821
    mmccormack@dearborncounty.in.gov

11. Dearborn County Soil and Water Conservation District
    Rita Cutter, District Coordinator
    10729 Randall Avenue, Suite 2
    Aurora, Indiana 47001
    (812) 926-2406
    rita.cutter@in.nacdnet.net

12. Green Umbrella, Regional Sustainability Alliance
    Brewster Rhoads, Executive Director
    4138 Hamilton Avenue, Suite D
    Cincinnati, Ohio 45223
    (513) 541-1538
    Brewster@GreenUmbrella.org

13. Kenton County Conservation District
    Marc F. Hult, Chairman
    6028 Camp Ernst Road
    Burlington, Kentucky 41005
    (859) 586-7903
    Kenton@nkcd.org

14. Mill Creek Watershed Council of Communities
    Jennifer Eismeier, Executive Director
    1223 Jefferson Avenue
    Cincinnati, Ohio 45215
    (513) 563-8800
    jeismeier@millcreekwatershed.org

15. Northern Kentucky Area Planning Commission
    Dennis Andrew Gordon, FIACP, Executive Director
    2332 Royal Drive
    Fort Mitchell, Kentucky 41017
    (859) 331-8987
    dgordon@nkapc.org

16. Partnerships for the Environment
    Sarah Hippensteel Hall, PhD, Co-Chair
    38 E. Monument Avenue
    Dayton, Ohio 45402
    (937) 223-1271
    shippensteel@miamiconservancy.org

17. Sanitation District No. 1
    David E. Rager, Executive Director
    1045 Eaton Drive
    Ft. Wright, Kentucky 41017
    (859) 578-7450
    drager@sd1.org

18. Taking Root
    Scott Beuerlein, Chair
    720 E Pete Rose Way, Suite 420
    Cincinnati, Ohio 45202
    (513) 619-7666
    sbeuerlein@gmail.com

19. Warren County Regional Planning Commission
    Stanley C. Williams, AICP, Executive Director
    406 Justice Drive
    Lebanon, Ohio 45036
    (513) 695-1223
    Stan.Williams@co.warren.oh.us

20. Warren County Soil and Water Conservation District
    Jeff Thomas, District Administrator
    320 East Silver Street, Suite 300
    Lebanon, Ohio 45036
    (513) 695-1337
    jeff.thomas@co.warren.oh.us

ABSTRACT: Summarize the proposed project in 200 words or less.

Integrating Trees Into Stormwater Management Design and Policy – A Guide for Local Decision Makers will be a valuable resource for promoting, facilitating and increasing the use of trees for stormwater management. In spite of the proven value of trees for reducing stormwater flows and pollutants, there is widespread lack of understanding, acceptance, and credibility of their use for managing stormwater. The Guide will overcome these barriers by providing a practical tool that informs local governments of options and best practices for including trees in stormwater facility design regulations and policies.

OKI and its team of national partners will develop a guide that is applicable across the nation. OKI will identify the most practical solutions based on perspectives of local government in its tri-state region. Davey Resource Group will draw upon its vast knowledge and understanding of forests and green infrastructure to ensure that the Guide is scientifically sound and feasible. Virginia Tech will compile a national inventory of local government policies and incentives for integrating trees into stormwater management solutions. NARC will work with OKI and its other members to ensure the Guide's applicability to other regions, with particular interest to ensure applicability for arid and tropical climates, and to promote it through NARC's national membership.

Proposal Narrative Template: *(The Innovation proposal narrative is not to be more than 10 single spaced pages.) Please make sure each page is numbered.*

1. Project Description (20 points), only one category may be selected per submission:
This project fulfills priority issues described in *Category 3: Utilizing Green Infrastructure to Manage and Mitigate Stormwater to Improve Water Quality* of the Innovation Grant Category.

Across the nation, the use of trees for managing stormwater has a long way to go to reach full potential. Research over the last decade has provided science and documented the value of trees as a viable stormwater management strategy. Trees and green cover have the ability to reduce the peak flow of stormwater runoff from urbanized areas and also to filter out pollutants and sediment before the runoff enters streams. While much work has been done to better understand the value of trees in stormwater management, few communities have embraced trees as a component of stormwater facility design and policy. Many are still unaware of the viable options they have regarding the use of trees in their community's stormwater management systems. In fact, a guiding goal and recurring theme for next steps, outlined in a recent National Academies of Science workshop focused on urban forestry, was to provide tools and resources to communicate and demonstrate trees as a "credible" strategy for regulatory control programs and to promote more "tree friendly" urban development policies.

OKI and its partners will develop an integrated tool and resource kit titled, "Integrating Trees Into Stormwater Management Design and Policy – A Guide for Local Decision Makers", as a step in filling this gap. The Guide will be organized to inform two distinct environmental types: developed and undeveloped environments. This structure will enable the guide to be of practical use for communities located in urban, suburban, and rural areas – typical of the mix within regions the partners and stakeholders associated with this proposal serve. The Guide will include design templates for the wide variety of proven stormwater practices, including wooded wetlands, bioretention and bioinfilltration, tree check dams, alternating side slope plantings, multi-zone filter strips, forested filter strips, linear stormwater tree pits, stormwater dry ponds and others as appropriate based on the literature review and stormwater engineer engagement during the Guide development process. The Guide will also provide practical information regarding long term maintenance of these green infrastructure solutions, and also on ordinances, policies, and ecosystem benefit analysis for local governments' consideration.

OKI will work with its tri-state membership to engage local government representatives in identifying the most practical solutions for integrating trees into stormwater solutions. Project Advisory Committee representatives will include elected officials, land planners, stormwater engineers, and facility maintenance professionals from each type of community addressed by the Guide: urban, suburban, and rural. The project team will identify low income, minority and underserved communities in the OKI region prior to formulating the Advisory Committee to ensure their representation on the Advisory Committee. The OKI Environmental Justice Advisory Committee, a standing committee established to oversee the implementation of the

OKI Environmental Justice component of the OKI Public Participation Plan, will provide guidance and input to the formulation of the project Advisory Committee to ensure minority, low income, elderly, people with disabilities, and zero car household population groups are appropriately represented. The project team will also identify underserved communities by analyzing existing tree canopy and floodplain maps of the region and the OKI Environmental Justice Advisory Committee will also provide guidance and input to this identification and representation selection process. This diversity of representation will help ensure that the stakeholder civic engagement process is meaningful and that final recommendations are sustainable, feasible, adaptable and explained so as to be incorporated by decision makers at all levels -- from policy makers to enforcement to installation and maintenance. The Guide will incorporate the methods employed to meaningfully engage underserved populations in its development to benefit other regions on best practices for addressing and prioritizing increased tree canopy in underserved communities – often void of tree canopy assets.

Davey Resource Group will draw upon its vast knowledge and understanding of community forest resources and tree benefit analysis to inform the Guide and assure that it's based on accurate, current, and defensible science. As a national consulting firm, Davey Resource Group will bring knowledge and experience from its work with many municipal clients on similar issues into the final products to assure their applicability nationwide. Davey Resource Group will provide particular attention to consider methods appropriate for climatic conditions differing from the OKI Midwest region, including both arid and tropical climates. Additionally, Davey Resource Group will provide nationwide promotion and exposure for the results of this project.

Virginia Tech's Center for Leadership in Global Sustainability will research and compile local government policies being used throughout the nation that integrate trees into stormwater management solutions. Special attention will be given to identify those policies implemented by underserved communities. Policies will include adopted local government ordinances and programs that best promote the utilization of forest resources in stormwater facility design. The research team will examine these policies to identify documented successes and best practices in terms of implementation and performance and will also research funding mechanisms for implementing practices included in the Guide. Select solutions will be expanded into vignettes and case studies to illustrate strategic lessons and will include examples of particular interest for underserved communities. This information will also inform the development of a decision-support tool to guide the formation and implementation of local policy.

The National Association of Regional Councils (NARC) will work with the OKI team and its national membership to ensure that the Guide is adaptable and replicable in regions across the United States. NARC will obtain input from select regional planning organizations and the project Advisory Committee to ensure the Guide's adaptability nationwide, particularly regions with arid and tropical climates. Following Guide production, NARC will promote its availability and use through NARC's membership nationwide, feature it during 2016 and 2017 Annual

Conferences and Exhibition and through NARC's national outreach channels, including national partner organizations. NARC will maintain the web resources on their website to ensure easy access to materials and wide-scale distribution.

The Guide's target audiences include the professional staff who advise local government decision makers, including planners, engineers, public works officials and code officials. A major barrier in the usage of trees in stormwater solutions will be eliminated when this audience begins to sanction tree planting as a "credible" strategy in official regulatory control programs. Additionally, the Guide's associated video and webinar products will be designed for community groups and commissions charged with making policy decisions regarding development.

2. Originality and Innovation (5 points): This proposal includes many innovative components. There is currently not a nationally applicable, user friendly guide available to local communities that advocates trees as a credible, practical stormwater management solution, and none that address the different needs of urban, suburban and rural community types. The innovative partnership proposed to develop the Guide that includes academia, government leadership, private industry, and a national professional planning organization, has the capability to bridge the gap between the science and the practical use of best practices at local levels. The products proposed to distribute the recommendations of the Guide, described in Section 5, will utilize the latest technology in order to maximize efficient distribution to all types of communities, nationwide.

3. Literature Review (5 points): There is sound data to support the benefits of trees and forests as part of green infrastructure systems to manage stormwater volume[1], but as this grant category's purpose statement suggests, there are significant barriers to implementation. The suggested

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[1] Examples of academic research into the benefits of trees and forests for stormwater management:

- Bartens, J., Day, S. D., Harris, J. R., Dove, J. E., & Wynn, T. M. (2008). Can urban tree roots improve infiltration through compacted subsoils for stormwater management? *Journal of Environmental Quality*, *37*(6), 2048–2057.
- Clinton, B. & Vose, J. (2006). Variation in Stream Water Quality in an Urban Headwater Stream In the Southern Appalachians. Water, Air, and Soil Pollution, 164(3), 331-353.
- Hirokawa, K. (2011). Sustainability and the Urban Forest: An Ecosystem Services Perspective. Natural Resources Journal, 51(1), 233.
- Hirokawa, K. (2012). Urban Forests as Green Infrastructure. In *Greening Local Government: Legal strategies for promoting sustainability, efficiency, and fiscal savings* (p. 257). American Bar Association. Retrieved from http://ssrn.com/abstract=2142516
- McPherson, E. G., Simpson, J. R., Xiao, Q., & Wu, C. (2011). Million trees Los Angeles canopy cover and benefit assessment. *Landscape and Urban Planning*, *99*(1), 40–50.
- Nowak, D. J. (2011). *Assessing Urban Forest Effects and Values: Los Angeles' Urban Forest*. United States Dept. of Agriculture, Forest Service, Northern Research Station.
- Nowak, D. J., & Dwyer, J. F. (2007). Understanding the benefits and costs of urban forest ecosystems. *Urban and community forestry in the northeast*, 25–46.
- Nowak, D. J., Noble, M. H., Sisinni, S. M., & Dwyer, J. F. (2001). People and trees: Assessing the US urban forest resource. *Journal of Forestry*, *99*(3), 37–42.

priorities for this category illuminate some of these challenges – incomplete data regarding water and pollutant interception capacity of trees; uncertainties about long-term performance and maintenance requirements; unavailability of standardized design solutions and specifications to meet stormwater management requirements; few and dispersed examples of credit and incentive programs to encourage the incorporation of trees into stormwater management plans; and general knowledge gaps among stormwater management decision-makers about the benefits trees can play in achieving their reduction goals.

All of these questions are being explored among the urban forestry and green infrastructure research community, as well as at the local level through implementation and policy experiments.[2] There are numerous websites and publications available online detailing the benefits of trees and forests for stormwater management[3], and a growing collection of technical

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[2] Examples of states, regions, cities, and municipalities incorporating trees into their stormwater management programs:

- Austin, TX - Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring, Monitoring Case Study—Vegetated Water Quality Buffer Strips http://www.fhwa.dot.gov/environment/ultraurb/5mcs7.htm
- Ann Arbor, MI http://www.a2gov.org/government/publicservices/fieldoperations/forestry/Pages/UrbanForestBenefits.aspx
- Sandy, OR http://www.ci.sandy.or.us/index.asp?Type=B_BASIC&SEC={A9D3CDDE-3BA0-42DE-BE30-4E321A155AA8}&DE={9A778F06-B805-4295-8997-75CC00478666}
- Oregon – Green Streets http://www.oregonmetro.gov/index.cfm/go/by.web/id=26335
- New Hampshire – Protecting Water Resources and Managing Stormwater - http://www.unh.edu/unhsc/sites/unh.edu.unhsc/files/pubs_specs_info/stormwater_guide.pdf
- Pittsburg, PA http://treepittsburgh.org/sites/default/files/documents/UFMP/pages/pittsburgh_urban_forest_master_plan_201208_-_41-50_goals_-_plan.pdf
- Vancouver, WA http://www.cityofvancouver.us/publicworks/page/stormwater-management-plan
- Gibson, British Columbia (Canada) - http://www.gibsons.ca/eco-assets

[3] Examples of websites and publications available providing information about the benefits of trees and forests for stormwater management:

- Forests for Watersheds - Watershed Forestry Resource Guide- http://www.forestsforwatersheds.org/reduce-stormwater/
- Day, S. & Dickinson, S. (2008). *Managing stormwater for urban sustainability using urban forests and structured soils* - http://urbanforestry.frec.vt.edu/stormwater/Resources/TreesAndStructuralSoilsManual.pdf
- National Association of State Foresters (February 2011) *Briefing paper: Trees, Forests and Stormwater: A Primer for State Foresters* http://www.stateforesters.org/urban_forest_stormwater_primer
- Arbor Day Foundation - Tree City USA Bulletin 55 – *How Trees Can Retain Stormwater Runoff*
- Charles River Watershed Association (2009). *Trees, Stormwater, and the Urban Environment* http://www.crwa.org/pubs/StormwaterTreesUrbanEnvMar09.pdf
- International Society of Arboriculture (2001). *Guidelines for Developing and Evaluating Tree Ordinances* http://www.isa-arbor.com/education/onlineResources/treeOrdinanceGuidelines.aspx

guides to help urban foresters and city managers understand the technical elements of using trees as a stormwater Best Management Practice (BMP).[4]

What is missing at this point is a current comprehensive collection of information about what has worked, and suggestions for cities and regions looking to integrate urban forestry as an active part of their green infrastructure plan to manage stormwater -- a compendium of case studies detailing the successes and challenges, best practices, models, and templates to other planners and decision makers interested in integrating trees and forests into their own stormwater management programs. This project will fill that gap. A thorough literature review of the current research on the science and policy of urban forestry, specifically as a stormwater management strategy in the US context will be completed during the first two quarters of the project to inform its framing and content.

4. Project planning and timeline (10 points): The partners are prepared and committed to produce the proposed Guide and associated products over a two-year timeline beginning July 1, 2015; completed by June 30, 2017. The first year will concentrate on Virginia Tech's research activities and initial convening of the project Advisory Committee. The project Partners will work to identify local and regional level policies and programs that integrate trees and forests into stormwater management plans. These plans will then be evaluated for efficacy, successes and challenges, best practices, and lessons learned that can be generalized to other areas. Methods for this work will likely include Internet searches, surveys, interviews, and focus groups. The results from this initial phase of research will inform the development of a decision-support matrix organizing various policies, programmatic, and financing strategies employed by places across the country to incorporate trees and forests into their stormwater management plans. This matrix will guide the vetting and refinement of our research efforts through focus groups convened by OKI by the end of Year One (July 2016).

Year Two is dedicated to the development, refinement, and dissemination of the Guide and supporting materials. The first draft of the Guide will be completed by January 2017. This will serve to solicit feedback from constituent groups and to inform the development of supporting media, including targeted webinars, briefing documents, promotional videos, web-based decision-support tools, and expanded case studies. The final draft of a complete and comprehensive web-based guide will be completed and available by Spring 2017. The last quarter of the project will be dedicated to outreach and publicizing the availability of the Guide through partner networks and dedicated outreach events (i.e. webinars, conference sessions).

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[4] Examples of technical guides for using trees and urban forests as stormwater BMPs
- EPA - *Stormwater to Street Trees: Engineering Urban Forests for Stormwater Management*; publication 841 B 13 001. Available at http://water.epa.gov/polwaste/green/upload/stormwater2streettrees.pdf
- *ASCE (2015) Low Impact Development Technology: Design Methods and Case Studies.*
- Plants for Stormwater Design, Volume I. Species Selection for the Upper Midwest. D. Shaw and R. Schmidt, 2003. Minnesota Pollution Control Agency. - http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/stormwater-management/plants-for-stormwater-design.html

Project deliverables will be produced within three distinct phases, outlined below:

Phase I: Project Initiation and Management (Months 1-3)
- Establish contracts and reporting requirements with funder and project partners.
- Develop project workplan
- Create an Advisory Committee composed of local and regional stakeholders to ensure diversity, practicality, relevancy, and replicablity of the Guide.

Phase II: Research & Guide Composition (Months 3-18)
- Compile a national inventory of local government policy and incentives for tree integration into stormwater management solutions
- Refine and expand literature review
- Identify, assess and organize forestry stormwater tools and platforms already available
- Create Guide; Review by NUCFAC & Advisory Committee

Phase III: Outreach, Technology Transfer & Professional Development (Months 18-24)
- Develop significant web presence
  - Website, training webinars, promotional video
- Disseminate guide
  - National conferences
  - Print/electronic versions

PROJECT TIMELINE	July 1 2015 – June 30 2016				July 1 2016 – June 30 2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase I: Project Initiation and Management	■							
Establish contracts and reporting requirements	■							
Finalize Workplan–Create Advisory Committee	■							
Phase II: Research & Guide Composition	■	■	■	■	■	■	■	
Literature Review and Identification and evaluation of plans/ programs	■	■	■					
Development of matrix			■	■				
Focus groups to vet findings and refine matrix				■				
Development of first draft of Guide				■	■	■		
Solicit strategic feedback to refine Guide and develop supporting materials					■	■		
Development of supporting materials and media						■	■	
Final draft of Guide available							■	
Phase III: Outreach, Technology Transfer & Professional Development							■	■
Outreach and dissemination of final products							■	■

5. Product (10 points): The primary deliverable of this project is a best management practices guide (Guide). Other important deliverables include a series of education and outreach elements that support and build on the Guide. Below is a comprehensive list of project deliverables as related to tasks and activities outlined in Section 4. The roles of the partners are indicated on the Project Budget Table by listing the products each are involved in the 'Roles' column. Role of individual OKI staff is also indicated on this Table.

Guide: The Guide will include model ordinances with best practices (for local governments' application to integrate forest resources with stormwater design); design templates for the wide variety of proven stormwater practices (wooded wetlands, bioretention and bioinfilltration, tree check dams, alternating side slope plantings, multi-zone filter strips, forested filter strips, linear stormwater tree pits, stormwater dry ponds and others as appropriate based on the literature review and stormwater engineer engagement processes); practical information regarding long term maintenance practices and policies (including sample ordinances and ecosystem benefit analysis, for local governments' consideration); and vignettes and case studies produced during the research phase. The Guide will customize these resources and tools for communities with developed and undeveloped environments and for urban, suburban, and rural environments. An Executive Summary and appendices with additional supplementary material and templates will be designed to assist with adoption of recommendations outlined in the Guide.

The Guide will include multiple tools designed as an integrated series of deliverables. Many of these tools will rely upon a literature review in order to identify the most current and topical resources. These tools include:

Design Templates: This tool will be designed primarily for the use of stormwater engineers and local planning practitioners. The templates will be based on the findings from our literature review to ensure the incorporation of the most up to date best practices and the latest technologies available. The templates will include, but are not limited to, information on the specific uses for trees considering the 1) types of trees; 2) necessary planting spacing; and, 3) estimates for their stormwater holding capacity by range of tree maturity level.

Policy/Ordinance Templates: This tool will be designed for use by local government officials, decision makers, and community based groups. The templates will be based upon our stakeholder engagement and upon our literature review findings. Examples of template types envisioned include, but are not limited to: 1) ordinances requiring the use of trees in stormwater designs; and, 2) suggested policy for incentivizing land developers to utilize trees in stormwater designs.

Educational Video: This tool will be designed for the broadest audience, including elected officials, local decision makers, practitioners, and community members. This engaging video of 3-5 minutes in length will communicate the benefits of trees related to stormwater management and encouraging communities to take action. The team will promote the video to: 1) local government councils, planning commissions and zoning boards for play at their regular meetings or community events; 2) local public television spots; and, 3) through local government social media outlets. The video would also be a central feature on the project website.

Webinar Series: The team will produce a series of webinars tailored to specific targeted audiences, including planners, elected officials, urban foresters, and stormwater engineers. Webinars may be created for additional audiences as determined during project development.

Each webinar will be facilitated by the project team and will incorporate participations from across the county. Recordings of the webinar will be available online and promoted nationally.

Vignettes (Case Studies): Based upon the literature and case review findings, the team will develop Vignettes as easy to understand and approachable "snap shots" of an urban forestry success story. Each vignette will address one key barrier local governments face when approving development activities and how the barrier was addressed. Some of the Vignettes will be devoted to successful examples from underserved communities.

CLiGS and NARC are currently developing a website which will contextualize and synthesize the multitude of available green infrastructure and urban forestry planning and implementation tools currently available. This website, funded by NUCFAC, will be launched in March 2015 and will be leveraged as part of the toolkit focused on ordinances, policy and design templates.

Web presence: A webpage will be available on NARC's website and maintained after the conclusion of the grant as a means of providing for long term distribution of the Guide to all applicable stakeholders, including forestry and stormwater management officials, local elected officials, and regional planning organizations. NARC will further distribute findings via its electronic newsletter, *eRegions*, which together with the website will promote the Guide to the over 35,000 local governments served by NARC's regional council membership.

Advisory Committee: To help develop the Guide, a project advisory committee will be created that will include local government elected officials, planners, zoning administrators, stormwater engineers, public works directors, utility engineers, horticulturists, landscape architects, and other stakeholders in the OKI region; NARC staff and member representatives, Davey Resource Group expert staff, and Virginia Tech researchers. The Advisory Committee's structure offers opportunity to engage additional stakeholder networks and potentially increase the reach of project products to non-traditional audiences. The OKI Environmental Justice Advisory Committee will provide guidance and input to the project team to ensure the Advisory Committee is diverse and representative of minority, low income and underserved communities.

Webinar & Video Series: The Team will develop a series of educational and promotional materials tailored for specific audiences (e.g. planners, elected officials/planning commissions, urban foresters, stormwater managers) to introduce the Guide and encourage its use These materials will be designed to facilitate semi-structured, moderated discussions by government agencies and professional planners at multiple levels and will include A series of interactive webinars hosted by NARC (typically include 75 participants nationwide); a short educational video for use at community meetings (e.g. city councils, planning commissions, zoning boards) and for public television announcement spots. This 3-5 minute informational video will be designed to promote the Guide and increase the public's knowledge of the importance of urban and community forestry and of opportunities for using forest to manage stormwater.

Matrix of Policy/Program/Funding Options: Results from the initial phase of research will be used to develop a decision-support matrix to identify policies, programs, and financing strategies employed by places across the country to incorporate trees and forests into their stormwater management plans. This matrix will guide the vetting and refinement of our team's research

efforts through focus groups. The final matrix will be included as a resource within the Guide.

National Conference Exhibition: The Team will target conference sessions appropriate for promoting the Guide to professional planners and policymakers at federal, state and local levels. Venues may include meetings of NARC, International City/County Management Association, New Partners for Smart Growth, National League of Cities, National Association of Counties, the American Planning Association, American Public Works Association Congress, National Arbor Day Foundation's Partners in Community Forests, American Society of Landscape Architects, StormCon, and others as requested by USFS.

Distribution: The Guide will be made available free of charge in hard copy format and online. A webpage dedicated to housing the Guide and related information will be created on NARC's website and made available for uploading on project partner and USFS websites. This webpage will be maintained after project completion as part of NARC and the Team's continued support of green infrastructure. Ample quantities of hard copies are accounted for in the budget and will be available for strategic distribution to stakeholders identified through the project, USFS and NUCFAC. Hard copies will also be disseminated during national conferences and workshops, including NARC's annual conferences and other applicable venues.

6. Collaboration (15 points): The team as a whole is truly a unique and innovative collaboration with much strength that will expand partnerships and as well as dialogue during and after this project's completion. As further described in Section 9, project team partners represent academia, government leadership, private industry, and professional organizations at a national level. Each Partner has extensive experience with successfully leading collaborative initiatives and is committed to ensuring that this project is centered on collaboration at every phase and every level.

Beginning with the research prepared by Virginia Tech, OKI will facilitate discussion and gather input from an Advisory Committee with representatives from each of the three states and eight counties in the OKI region, and also from Ohio, Kentucky and Indiana State Urban Forestry divisions. Local stakeholders in OKI's region that have already demonstrated support for this pre-proposal include local planners and administrators, stormwater managers, non-profits, and natural resource professionals. These local stakeholders, along with additional representatives from communities and organizations that will participate on the project Advisory Committee, will generate the draft Guide through a collaborative effort.

OKI will also be collaborating with the Ohio EPA Central and Southwest District office on the Guide's development to ensure its practical use by MS4 systems. OKI has a long-standing relationship with Ohio EPA for regional water quality management planning under Section 208 of the Clean Water Act, as OKI is designated by Ohio, Kentucky and Indiana to conduct this planning for the greater Cincinnati metropolitan area. OKI maintains the plan, and has tackled the increasing challenges of nonpoint source pollution control and stormwater management through extensive coordination with watershed planning groups, soil and water conservation districts and numerous projects involving local governments.

Davey Resource Group will be involved in collaborative efforts through its participation on the OKI led Advisory Committee and Davey's relationships with and leadership of national and regional professional organizations such as the International Society of Arboriculture, Society of Municipal Foresters, National Arbor Day Foundation, American Forests, American Planning Association, and the American Public Works Association. The results of Davey's collaborative efforts will ensure that project outcomes will meet industry standards and that distribution and awareness is maximized across the country.

NARC's collaboration with its membership to obtain input on the Guide's practicality, applicability and replicability in other regions nationwide, including arid and tropical regions, will ensure success of the final product. As explained in other Sections, the dissemination of the final product will rely on collaboration with many partner agencies nationwide.

7. National Distribution/Technology Transfer of Your Findings (10 Points): The completed Guide and supporting materials will be made available through a dedicated webpage or subdomain hosted by NARC. The link will be posted on each partner organization's website and further distributed, along with the informational video, through each partner's network of relevant organizations and agencies. The announcement and distribution of the Guide will correspond with a series of interactive webinars designed for specific audiences (i.e. planners, decision-makers, public works officials). The partner organizations will also seek opportunities to present the Guide and its findings in appropriate conferences and meetings. The informational video will be designed for educational use by any public television or other appropriate multimedia broadcaster.

NARC, with support from all of the project partners, will work with national professional organizations and their publication editors to submit requests and content for feature articles in professional magazines including *Planning* (American Planning Association), *Landscape Architect and Specify News*, (American Society of Landscape Architects), Society of Municipal Arborists *City Trees* publication and in the APWA's *Reporter*. National distribution further bolstered by Davey's distribution network.

8. Project Evaluation (10 points): The Team will conduct performance evaluations on an ongoing basis, provide quarterly reports to USFS and prepare reports for NUCFAC's annual meetings, as needed. Feedback will be sought in all aspects of the project to determine effectiveness and to fine tune project management and application of lessons learned. To measure the project's success in meeting its objectives the Team will use the following metrics, which correspond with tasks identified in Section 4, 5 and 7.

Phase I: Project Initiation & Management (Months 1-3)
- Establishing contracts and submitting reports
- Development of project work plan to detail key deliverables, timeframe for completion and Team contacts
- Creation of Advisory Committee

Phase II: Research & Guide Composition (Months 3-18)
- Completion of literature review
- Completion of national inventory of local government policy and incentives for tree

integration in stormwater management solutions

- Ensure the relevance and replicability of Guide on a local, regional and national basis.
- Develop practical solutions to the integration of forestry in stormwater management solutions based upon local and national research
- Timely submission of project reporting
- Design, compilation and completion of Guide
- USFS and NUCFAC review of Guide

Phase III: Outreach, Technology Transfer & Professional Development (Months 18-24)
- Informational Video
- Webinar series
- Extensive web presence established, including webpage creation
- Two or more national conference sessions
- Guide and Executive Summary created and disseminated (print and electronic format) to stakeholders

The aforementioned tasks provide criteria for evaluating the project accomplishments but are not indicative of all project deliverables. Measuring the project's success is based upon the short- and long-term goals established by NUCFAC and USFS. The project's primary goal is to establish a series of best management practices and bolster urban and community forestry policy so as to facilitate and ultimately increase the integration of forestry into stormwater management strategies on local, regional and national scales,

Short-term project impacts such as number of hard copies disseminated, web traffic trends, and number of webinar and conference attendees will be recorded and reported. However, the larger goal of increased use of urban and community forestry for stormwater management purposes cannot be measured as a short-term impact. The full effects of the project will not be visible for years after its completion and will extend far beyond the initial project boundaries. The Team will manage and maintain the project websites after the funding period, to extend the time for accessing the Guide and supportive material, and will look for additional funding at the close of this project to assist in the website's maintenance.

9. Experience/Personnel/Adequacy of Resources (5 points):
Partner organizations' experience, resumes and biographies of individual personnel directly involved in activities proposed to develop and distribute the Guide are included in the Appendix.

The collective experience and organizational resources of the team (the Ohio Kentucky Indiana Regional Council of Governments, Davey Resource Group, Virginia Tech College of Natural Resources and Environment's Center for Leadership in Global Sustainability, and National Association of Regional Councils) will ensure that the Guide will be based on solid research, advocate sound techniques, be well vetted by local decision makers from across the nation, and innovatively use technology to effectively communicate recommendations to the target audiences across the nation.

As project leader, OKI, has a professional staff of 35 that includes 11 professional planners, 7 administrative and support personnel, 5 GIS/mapping professionals, 4 data analysts, 3 communications and legislative affairs specialists, a community engagement specialist and a full-

time demographer. In addition, OKI's finance department includes 3 full-time accountants with experience in administering a variety of state and federal funds, including Specialized Transportation Program and Consolidated Planning Grant funds through three state transportation departments and Clean Water Act funds through EPA and three state environmental departments.

The OKI staff for this planning effort includes a planning manager, two senior planners, a project administrator and a Visual Technology Coordinator that have more than 50 years of combined management, financial and administrative experience in executing multi-million dollar local, state and federal programs and activities throughout the Tri-state region. These OKI staff members will administer the project, coordinate with project Partners and Stakeholders, and work with the Partners to prepare the final products. All staff members have training and/or experience in land use, transportation and environmental planning; regulatory and policy development; grant administration; targeting communications to a variety of audiences; and interaction with local elected officials, planners, developers, and other community stakeholders.

The other three partners involved in this proposal have a track record of successful partnerships and coordination with one another on other initiatives. NARC is currently teamed with Virginia Tech in completing the U.S. Forestry Service funded *Urban and Community Forestry Framework: A Comprehensive Approach to Integrating Forestry into Communities Nationwide* project. This project is evaluating successful green infrastructure planning and implementation processes across the U.S. to identify key elements of success and to organize the plethora of tools available online to support each step in the process. Through this analysis, NARC and VT will develop a Framework to assist regional councils and their local government partners in developing green infrastructure systems that incorporate urban forestry as an avenue to achieving goals of livability and creating vibrant communities. NARC is also currently teamed with OKI on the U.S. Department of Energy *SunShot Initiative Rooftop Solar Challenge: Solar Ready II* activity working to achieve national scale implementation of tested best management practices, training curricula and adoption strategies, to achieve widespread process standardization and have positive impact in the continual reduction of market barriers and soft costs associated with solar energy development in the OKI region and across the country. OKI is also working with the Davey Resource Group on a campaign for reforestation with a goal to plant 2 million trees in the OKI region by 2020. In 2013, Davey provided significant support for an OKI led initiative to convene other regional stakeholders to launch the Taking Root Campaign. The Campaign has already resulted in over 100,000 tree plantings and pledges for plantings in 2014, the participation of hundreds of community organizations and private sector businesses across the region, and many positive reports by all forms of news media across the OKI region.

10. Budget Justification (10 points): The Budget Narrative Table in the Appendix itemizes the labor hours and associated tasks to be performed by OKI by each of the six staff positions involved in the proposed activities. This table identifies the products, as described in Section 5, that each staff position will be contributing time toward, along with their individual roles.

$196,270 of federal funding is requested to fund this proposal. OKI's portion totals $80,030 and includes 1,410 labor hours (6 staff members) over the two year activity period. OKI will be the project lead and responsible for all administrative responsibilities, including project reporting

and management of subcontracted activities (detailed below). OKI will organize and facilitate the project Advisory Committee for the duration of the project including hosting all committee meetings, focus group discussions, working sessions, and web meetings with project partners.

Virginia Tech's portion of the federal request totals $45,000. 80% of Virginia Tech's activities are budgeted for Year 1 in order for the research, vignette and matrix development to be conducted in the project's initial phases. A team of experienced researchers will use a mixed-methodology to identify, unpack, and depict successful uses of forestry elements as stormwater management strategy. Virginia Tech will remain active during Year 2 to assist in the promotion and dissemination of the product through their national channels.

Davey's portion of the federal request totals $40,000 and will be evenly divided between years 1 and 2. Davey will commit their national staff and internal resources, including the Davey Institute and the i-Tree Team, to participate and assist OKI in facilitating the Advisory Committee group during Year 1. During Year 1, Davey will ensure that the Guide's content and best management practices recommendations are based on accurate, current, and defensible science. Davey will provide technical and scientific expertise; participate in public meetings and outreach; and contribute to the research of successful and applicable ordinances, policies, guidelines, best management practices, and regulations that encourage the use of trees as green infrastructure in community stormwater management. During Year 2, Davey will assist the team with finalization of the product by contributing to the practicality and national applicability of the Guide through its relationships with municipal clients and national arboricultural, public works, stormwater, and planning associations. During Year 2, Davey will also promote the project results and facilitate the transfer of the deliverables to clients and governments nationwide.

NARC's portion of the federal request totals $31,240 and will be evenly divided between years 1 and 2. During Year 1, NARC will work closely with OKI and facilitate NARC member input to ensure that the Guide is nationally practical, adaptable and replicable. During Year 2, NARC will lead the Team's national efforts to promote and distribute products by promoting the Guide at its 2016 and 2017 Annual Conferences and Exhibition and through its outreach channels. NARC will also maintain the web resources on their website to ensure easy access to materials.

NARC, Davey, and VT will subcontract with OKI. As stated in Section 4, contracts will be executed between OKI and each partner within the first quarter activities. OKI will begin the process of contract preparations immediately upon award notification. Each partner has committed to perform the roles described in this proposal in the partner support letters accompanying this submittal.

Each partner is providing 50% of the proposed activities as in-kind match. The sources of the match are listed on the Budget Narrative Table and are non-federal funds. Travel budget totals $8,000 and includes OKI travel necessary for presenting the final product at up to six professional conferences. Session submittals will be provided, at a minimum, to national annual conferences of APA, ASLA, LGC Smart Growth, and APWA. Travel expenses estimated for the

three partner organizations are included within their respective proposed contract amounts.

The proposed budget also includes indirect costs. A copy of the current OKI Fringe Benefit & Indirect Cost Rate Agreement is included with the appendix. The rates used in the budget are estimates for fiscal years 2015 and 2016.

Appendix: (Not part of the 10 page narrative)

Partner and Support letters – pages 22 - 47

Experience/Personnel/Adequacy of Resources support documents – pages 48 - 64

Budget Narrative Table – page 65

OKI FY15 Cost Allocation Plan (copy of indirect cost rate) – page 66-67